



OpenAIR@RGU

The Open Access Institutional Repository at Robert Gordon University

<http://openair.rgu.ac.uk>

Citation Details

Citation for the version of the work held in 'OpenAIR@RGU':

MALOREH-NYAMEKYE, T., 2013. The impact of information, education and communication (IEC) strategies in malaria prevention and control during pregnancy in Africa. Available from *OpenAIR@RGU*. [online]. Available from: <http://openair.rgu.ac.uk>

Copyright

Items in 'OpenAIR@RGU', Robert Gordon University Open Access Institutional Repository, are protected by copyright and intellectual property law. If you believe that any material held in 'OpenAIR@RGU' infringes copyright, please contact openair-help@rgu.ac.uk with details. The item will be removed from the repository while the claim is investigated.

**THE IMPACT OF INFORMATION, EDUCATION AND
COMMUNICATION (IEC) STRATEGIES IN MALARIA PREVENTION
AND CONTROL DURING PREGNANCY IN AFRICA**

THEOPHILUS MALOREH-NYAMEKYE

PhD

2013

**The Impact of Information, Education and
Communication (IEC) Strategies in Malaria Prevention
and Control During Pregnancy in Africa**

Theophilus Maloreh-Nyamekye

**A Thesis submitted in partial fulfilment of the requirements of the
Robert Gordon University
for the Degree of Doctor of Philosophy**

May 2013

Declaration

I, Theophilus Maloreh-Nyamekye, hereby declare that except for the references duly acknowledged, all the work has been my own and that this thesis has never been presented for any award, either in part or in full.

Signed:



Date: 11/04/2013

Acknowledgement

In the first place, I wish to thank God for bringing me this far with the PhD Study. Secondly, I wish to express my heartfelt thanks to my wife and family for all their moral and financial support. Thirdly, I want to thank all the respondents from Ethiopia, Ghana, Nigeria and Tanzania. Fourthly, I could not have arrived at this point if it had not been for the wonderful supervisory support by Dr Peter Wimpenny, my former Principal Supervisor (who, having retired, offered to remain on the supervisory team). I also want to remember the great input of my current Principal Supervisor, Dr Colin Macduff, for accepting the challenge of his new supervisory role. Dr Susan Gibb, also deserves a great commendation for her immense contribution to shaping the Thesis in its present form. Moreover, my gratitude goes to Dr Sylvia Wilcock, my former Academic Director for providing an enabling environment that facilitated the research process. Furthermore, I wish to acknowledge the advisory support of Mr Alex Wilson, the RGU Consultant in statistical analysis. I also want to thank Rev. Dr Joe Ibojie, Head of Father's House Church for giving me access to conduct a pilot study in his church in Aberdeen in Scotland. I could not have managed without Dr Sarahlouise, the Director, based in Adelaide, Australia, in-charge of JBI Centres in Africa, for giving me access to the African JBI Centres to collect data.

My kind regards also goes to the following people for serving as focal persons for data collection: Mrs Namatsai Mukeredzi (pilot study in aberdeen); Mr Joseph Agyapong (Ghana), Dr Linda Vanotoo (Ghana); Dr Yeetey Enuameh (Ghana); Mr George Adjei (Ghana); Professor Sudhakar Murankar (Ethiopia); Mrs Jokotade Olarerin (Nigeria); and Dr Rugola Mtandu (Tanzania). Last but not the least, I wish to remember Dr Mary Addo of the School of Nursing and Midwifery at the Robert Gordon University, for her great encouragement.

Dedication

I dedicate this work to all African women who have lost their lives over the years through the devastating effect of malaria in pregnancy; and to my lovely wife, Elizabeth Maloreh-Nyamekye; my wonderful sons, Emmanuel Nyamekye, Paa-Kwesi Nyamekye and Kofi Nyamekye whose presence has always given me a sense of joy, love and encouragement.

Abstract

Background: Malaria continues to pose a complex public health problem amongst pregnant women in Africa (Schantz-Dunn & Nour 2009; Antwi 2010), accounting for over 90% of the global malaria burden (WHO 2002; Morel et al. 2005; Schantz-Dunn & Nour 2009). However, little is known about the impact of information, education and communication (IEC) strategies in malaria prevention and control among pregnant women in Africa.

Aims and Objectives: The study sought to identify: evidence of impact of IEC strategies; feasibility, appropriateness, meaningfulness and effectiveness of the IEC strategies; challenges; best practices and key lessons to inform governments, policymakers, health partners, the academic community, directors, managers of health, frontline health professionals and health educators at institutional and community levels. Moreover, the study aimed to develop a theoretical framework to enhance the understanding of issues related to implementation of IEC strategies.

Methods: A mixed method approach was adopted. This consisted of a systematic review of evidence within the African context and an evaluation methodology involving a contextually based survey of Ethiopia, Ghana, Nigeria and Tanzania. The systematic review involved a structured search of relevant databases and websites, and hand search strategies. Three sets of evidence were identified and aggregated using a narrative synthesis approach. A survey questionnaire reflecting the outcomes of the review was sent to health professionals and lay persons in the countries under study. Primary data were analysed using SPSS Version 15.0. Non-parametric tests and sensitivity analyses were conducted to assess the nature of opinions among respondents within and across countries.

Findings: 3,440 studies were identified during the systematic review. Out of this number, 57 met the inclusion criteria. Following critical appraisal, 50 studies met the criteria for methodological quality. Ten IEC strategies were identified. These were:

- Staff training and orientation
- Advocacy

- Community mass education campaigns
- House-to-house sensitisation
- Health education in health units
- Visiting places of worship
- Women's group meetings
- Integrated health education campaigns
- Symbolism versus message delivery
- Audience segmentation versus information delivery.

The survey reveals a high level of awareness of IEC strategies among respondents in the African countries studied. The evidence of impact reported by respondents supported the findings of the systematic review. However, there were some differences, and some concerns still remain regarding the extent of impact. The study suggests that using an IEC strategy implementation equation could enhance the understanding of issues related to implementation of IEC strategies. Implications of the findings are outlined, including implications for professional practice in relation to IEC programme implementation, most especially among nurses and midwives. IEC roles and responsibilities of key actors are also proposed.

Conclusions: Despite the challenges of adopting a mixed method approach, the study highlights an important relationship between evidence and practice. This approach also helped to ensure that a comprehensive multiperspective view of IEC strategies was achieved. In designing and implementing IEC programmes, clients must be involved in order to encourage community ownership and programme sustainability. Attitudinal change and commitment is required by all stakeholders in order to achieve and maintain impact on malaria in pregnancy. Finally, while recognising the essence of feasibility, appropriateness and meaningfulness of a given strategy, it is worth noting that the key message from this study is that no one single strategy on its own appears ideal. Therefore, there is the need to pay equal attention to both institutional and community-based strategies. Doing one thing alone will not work; more evidence of impact is required to know what works and in what context.

Key Words: IEC strategies; challenges; feasibility, appropriateness, meaningfulness, and effectiveness; impact; pregnant women; malaria prevention and control; Africa; mixed method approach

Table of Contents

Item	Page
Declaration	i
Acknowledgement	i
Dedication	ii
Abstract	iii
Table of Contents	v
List of Figures	xiv
List of Tables	xvi
List of Appendices	xvii
Glossary of Key Terms, Abbreviations and Acronyms	xviii
Chapter One: Introduction and Research Context	1
1.1 Introduction	1
1.2 Key Assumptions	3
1.3 The Research Problem	3
1.3.1 Why Malaria in Pregnancy in Africa?	3
1.3.2 Why Information, Education and Communication (IEC)?	9
1.4 Research Aims and Objectives	14
1.4.1 Aims	14
1.4.2 Objectives	15
1.5 Background of Countries Surveyed	16
1.5.1 Geography and Demography	16
1.5.1.1 Ethiopia	16
1.5.1.2 Ghana	17
1.5.1.3 Nigeria	17
1.5.1.4 Tanzania	18
1.5.2 Economy	19
1.5.2.1 Ethiopia	19
1.5.2.2 Ghana	19
1.5.2.3 Nigeria	19
1.5.2.4 Tanzania	20
1.5.3 Political/Administrative Set Up	20
1.5.3.1 Ethiopia	20
1.5.3.2 Ghana	20

1.5.3.3 Nigeria	21
1.5.3.4 Tanzania	21
1.5.4 Education	21
1.5.4.1 Ethiopia	21
1.5.4.2 Ghana	21
1.5.4.3 Nigeria	22
1.5.4.4 Tanzania	22
1.5.5 Language, Ethnicity and Religion	22
1.5.5.1 Ethiopia	22
1.5.5.2 Ghana	23
1.5.5.3 Nigeria	23
1.5.5.4 Tanzania	24
1.5.6 Health Profile and Healthcare Infrastructure	25
1.5.6.1 Ethiopia	25
1.5.6.2 Ghana	27
1.5.6.3 Nigeria	31
1.5.6.4 Tanzania	35
1.5.7 Similarities, Differences and Challenges for IEC	37
1.6 Contribution to the Body of Knowledge	44
1.7 Organisation of Work	44
1.8 Summary and Conclusions	47
Chapter Two: Relevant Principles, Theories and Models of IEC	48
2.1 Introduction	48
2.2 The Working Definition of IEC	49
2.3 Review and Applications of Learning Orientations	51
2.3.1 View of the Learning Process	52
2.3.2 Locus of Learning	54
2.3.3 Purpose in Health Education	55
2.3.4 Health Educator's Role	57
2.3.5 Manifestations in Adult Learning	59
2.4 The Health Belief Model (HBM)	61
2.5 Communication in the Context of Health Information Delivery	68
2.5.1 Effective Communication	71
2.6 IEC Programme Monitoring and Evaluation Model	72

2.7 Summary and Conclusions	75
Chapter Three: Research Design and Methodology	77
3.1 The Research Methodology	77
3.1.1 Philosophical Orientation	77
3.1.2 Meaning of Mixed Method	80
3.1.3 Types of Triangulation and Application	81
3.2 Systematic Review of Evidence on IEC Strategies in Africa	86
3.2.1 Why Systematic Review of Evidence?	86
3.2.2 The Systematic Review Structure	88
3.2.3 Methods of Review	90
3.2.3.1 Initial Scoping	90
3.2.3.2 Review Questions, Aims and Objectives	91
3.2.3.3 Inclusion Criteria for Considering Studies the Review	92
3.2.3.4 Search Strategies for the Identification of Studies	94
3.2.3.5 Critical Appraisal	96
3.2.3.6 Data Extraction	97
3.2.3.7 Data Analysis/synthesis	97
3.2.3.8 Conclusion	97
3.3 Feasibility, Appropriateness, Meaningfulness and Effectiveness	99
3.4 Translating Evidence into Practice	103
3.5 Evaluation Methodology: Survey of African Countries	110
3.5.1 Introduction	110
3.5.2 Survey Questions, Aims and Objectives	111
3.5.3 Methods	111
3.5.3.1 Sampling Techniques	113
3.5.3.2 Primary Data Collection	117
3.5.3.3 Data Analysis	129
3.6 Summary and Conclusions	133
Chapter Four: Findings of Systematic Review	135
4.1 Introduction	135
4.2 Search Results	135
4.3 Methodological Quality	137

4.3.1	Critical Appraisal	137
4.3.1.1	Qualitative and Quantitative Studies	137
4.3.1.2	Notes, Texts, Opinion, and Discourse	139
4.3.1.3	Policy Documents	139
4.3.2	Appraisal of Studies	139
4.4	Development and Evaluation of Evidence	142
4.4.1	Feasibility, Appropriateness, and Meaningfulness (FAM)	142
4.4.2	Effectiveness	143
4.5	Intervention Effects	143
4.5.1	IEC Strategies	143
4.5.2	IEC Strategy Implementation Challenges	146
4.5.3	Assessing Quality of Evidence	146
4.6	Narrative Synthesis	147
4.6.1	Introduction	147
4.6.2	Groups of Evidence of IEC Strategies	147
4.6.2.1	Group 1: The Central Group of Evidence	149
4.6.2.2	Group 2: The First Semi-Central Group of Evidence	157
4.6.2.3	Group 3: The Second Semi-Central Group of Evidence	159
4.6.2.4	Group 4: The Peripheral Group of Evidence	163
4.6.3	IEC Strategy Implementation Challenges	164
4.6.3.1	Staff Knowledge, Attitude and Practices	164
4.6.3.2	Staff Shortage	165
4.6.3.3	Distance and Waiting Time	166
4.6.3.4	Women’s Empowerment	166
4.6.3.5	Poverty Versus Cost of Insecticide-Treated Nets	166
4.6.3.6	Resource Constraints	167
4.6.3.7	Cultural Beliefs	167
4.6.3.8	Health Seeking Behaviour	168
4.7	Summary and Conclusions	168

Chapter Five: Primary Data Analysis and Interpretation	172
5.1 Introduction	172
5.2 Background Information	173
5.2.1 Age Distribution	173
5.2.2 Gender Distribution	174
5.2.3 Level of Education	174
5.2.4 Faith	174
5.2.5 Profession/Occupation	175
5.2.6 Fields of Specialisation/Expertise	177
5.2.7 Place of Work	179
5.2.8 Position in Organisation	183
5.2.9 IEC Roles of Respondents in Malaria Prevention and Control	185
5.2.9.1 IEC Roles by Health Professionals and FBOs	185
5.2.10 IEC Roles of Organisations in Malaria Prevention and Control	188
5.3 Subgroup Analysis	190
5.4 Rating of IEC Strategies	193
5.4.1 Opinions of Health Professionals	193
5.4.2 Other IEC Strategies Identified	196
5.4.3 Sensitivity Analysis of Opinions on IEC Strategies	196
5.4.4 Comparison of Opinions on IEC Strategies by Health Professionals	198
5.4.5 Inter-Country Comparison on Rating of IEC Strategies	199
5.4.6 Sensitivity Analysis for Inter-Country Comparison	200
5.4.7 Comparative Analysis of IEC Strategies: Ghana	203
5.4.8 Mann Whitney Test for Inter-Group Comparison	205
5.5 Ranking of Highest and Lowest Priority Strategies	207
5.5.1 Highest Priority Strategy	207
5.5.2 Sensitivity Analysis of Highest Priority Strategy	210
5.5.3 Lowest Priority Strategy	212
5.5.4 Sensitivity Analysis of Lowest Priority Strategy	213
5.6 Rating of Level of IEC Challenge	215
5.6.1 Opinions of Health Professionals	215
5.6.2 Sensitivity Analysis of Opinions on Challenges	216
5.6.3 Inter-Country Comparison on Level of Challenge	219
5.6.4 Sensitivity Analysis for Inter-Country Comparison	221

5.6.5 Comparative Analysis on Level of Challenge: Ghana	223
5.6.5.1 Mann-Whitney Test for Inter-Group Comparison	225
5.7 Ranking of Highest and Least Priority Challenge	227
5.7.1 Highest Priority Challenge	227
5.7.2 Sensitivity Analysis of Highest Priority Challenge	228
5.7.3 Least Priority Challenge	230
5.8 Comments/Recommendations by Respondents	230
5.9 Feasibility, Appropriateness, Meaningfulness and Effectiveness (FAME)	236
5.9.1 Opinions of Health Professionals	236
5.9.1.1 Feasibility	236
5.9.1.2 Appropriateness	236
5.9.1.3 Meaningfulness	238
5.9.1.4 Effectiveness	238
5.9.2 Sensitivity Analysis of Feasibility, Appropriateness, Meaningfulness, and Effectiveness	239
5.9.2.1 Feasibility	240
5.9.2.2 Appropriateness	240
5.9.2.3 Meaningfulness	240
5.9.2.4 Effectiveness	241
5.9.3 Reasons for Low Feasibility	242
5.10 The Impact of IEC Strategies	244
5.10.1 Level of Awareness	244
5.10.2 Evidence of IEC Strategy Impact	244
5.10.3 Evidence of Non-Impact	248
5.11 Summary and Conclusions	251
5.11.1 Background Information and Subgroup Analysis	251
5.11.2 Rating and Ranking of IEC Strategies	251
5.11.3 Rating and Ranking of Challenges	252
5.11.4 Comments/ Recommendations	253
5.11.5 Feasibility, Appropriateness, Meaningfulness and Effectiveness (FAME)	254
5.11.6 Impact of IEC Strategies	254
5.11.7 Key Findings	255

Chapter Six: Discussion	257
6.1 Introduction	257
6.2 The Impact of IEC Strategies	257
6.2.1 Health Education Talks in Health Units	258
6.2.2 Staff Training and Orientation	264
6.2.3 House-to-House Sensitisation	266
6.2.4 Advocacy	269
6.2.5 Community Mass Education Campaigns	273
6.2.6 Visiting Places of Worship	275
6.2.7 Community Women’s Group Meetings	275
6.2.8 Integrated Health Education Campaigns	276
6.2.9 Symbolism Versus Message Delivery	277
6.2.10 Audience Segmentation versus Information Delivery	278
6.2.11 Incorporating Malaria Control Messages into Elementary School Curriculum	279
6.3 Challenges to IEC Programme Implementation	282
6.3.1 Distance/Access, Health Seeking Behaviour and Utilisation of Health Services	283
6.3.2 Managing Staff Shortage	286
6.3.3 Government Commitment/Political Will	288
6.3.4 Education, Poverty and Women’s Empowerment	290
6.3.4.1 Female Education	290
6.3.4.2 Managing Poverty	292
6.3.4.3 Women’s Empowerment	295
6.4 Concerns of Non-Impact	296
6.5 Overcoming Challenges	298
6.5.1 Developing Communication Strategy	300
6.5.2 Developing IEC Materials and Programme Implementation	301
6.5.3 Strengthening Capacity Building Versus Community-Based Health Education Campaigns	301
6.5.4 Attitudinal Change	302
6.5.5 Commitment and Participation	302
6.5.6 Need for Political Will	303
6.5.7 IEC Programme Monitoring and Evaluation	303
6.6 The Strategic Importance of IEC Strategies	303

6.7 Relationship Between Evidence and Practice	305
6.8 Strengths and Limitations of Methodological Approaches	308
6.9 Summary and Conclusions	312

Chapter Seven: Applying Frameworks for Implementation, Monitoring and Evaluation 314

7.1 Introduction	314
7.2 IEC Strategy Implementation Equation	314
7.2.1 Examples Based on Survey Findings Using Mean Scores:	
Health Professions Only	316
7.2.1.1 Health Education Talks	317
7.2.1.2 House-to-House Sensitisation	317
7.2.2 Example Based on Survey Findings Using Mean Scores:	
Health Professionals and FBOs Combined	318
7.2.2.1 Health Education Talks	318
7.2.2.2 House-to-House Sensitisation	319
7.2.3 Comparing the Two Case Scenarios	320
7.3 Relationship Between Feasibility and Level of Challenge	323
7.4 Limitation of the Equation	326
7.5 Strengths of the Equation	326
7.6 Minimising Limitations of the Equation	328
7.7 IEC Programme Monitoring and Evaluation	328
7.8 Summary and Conclusions	332

Chapter Eight: Conclusions, Implications, Limitations and Recommendations 333

8.1 Introduction	333
8.2 Aims and Objectives Revisited	333
8.2.1 Specific Objectives	334
8.3 Implications and Recommendation for Practice	338
8.3.1 Implications for Professional Practice	338
8.3.2 Implications for Strategic Importance of IEC Programmes	339
8.3.2.1 Proposed IEC Roles and Responsibilities of IEC programme Officers	340
8.3.3 Implications for Client and Community Participation	344

8.3.4 Implications for IEC Programme Implementation	344
8.3.5 Implications for IEC Programme Monitoring and Evaluation	345
8.3.6 Implications for the Media and Entertainment Industry	346
8.3.7 Implications for Government, Policymakers and Other Key Stakeholders	346
8.3.8 Implications for Community-Based Health Planning and Services (CHPS)	347
8.3.9 Implications for Education and Programme Sustainability	347
8.3.10 Implications for the Academic Community	348
8.4 Limitations of the Study	349
8.5 Recommendations for Further Research	350
8.6 Dissemination Strategies	351
8.7 Conclusion	351
References	353

List of Figures

Item		Page
Figure 1.1	Distribution of Endemic Malaria in Africa	8
Figure 2.1	The Health Belief Model	62
Figure 2.2	The EFQM Excellence Model	74
Figure 2.3	The IEC Strategy Impact	76
Figure 3.1	Summary of the Systematic Review Process	98
Figure 3.2	Relationships among Feasibility, Appropriateness, Meaningfulness and Effectiveness	102
Figure 3.3	Three-Circle Model of Evidence-Based Clinical Decision	105
Figure 3.4	An Updated Three-Circle Model of Evidence-Based Clinical Decision	106
Figure 3.5	Structure of the Study	134
Figure 4.1	Study Inclusion Flow Chart	136
Figure 4.2	Summary Report of Studies with Useable Information	137
Figure 4.3	Intersection of IEC Strategies Across Different Studies	145
Figure 4.4	Groups of Evidence of IEC Strategies	149
Figure 5.1	Fields of Specialisation/Expertise	179
Figure 5.2	Place of Work	180
Figure 5.3	Similarities and Differences of Positions in Organisations	184
Figure 5.4	IEC Roles of Individuals: Similarities and Differences	187
Figure 5.5	IEC Roles of Organisations: Similarities and Differences	189
Figure 5.6	The Most Highly Rated IEC Strategy	194
Figure 5.7	Sensitivity Analysis of Opinions on IEC Strategies	197
Figure 5.8	Comparison of Opinion on IEC Strategies	198
Figure 5.9	Comparative Analysis of Opinions on IEC Strategies: Ghana	204

Figure 5.10	Opinions of Health Professionals on Highest Strategy	209
Figure 5.11	Sensitivity Analysis of Highest Priority Strategy	211
Figure 5.12	Opinions of Health Professionals on Lowest Priority Strategy	212
Figure 5.13	Sensitivity Analysis on Lowest Priority Strategy	213
Figure 5.14	The Highest Challenge Among Health Professionals	216
Figure 5.15	Sensitivity Analysis of Highest Challenge	217
Figure 5.16	Comparative Analysis: Health Professionals Versus FBOs on Level of Challenge, Ghana	224
Figure 5.17	Opinions of Health Professionals on Highest Priority Challenge	228
Figure 5.18	Sensitivity Analysis of Highest Priority Challenge	229
Figure 5.19	The Least Priority Challenge Among Health Professionals	230
Figure 5.20	Comments/ Recommendations: Similarities Between Health Professionals and FBOs, Ghana	231
Figure 5.21	Comments/Recommendations: Similarities and Differences Amongst Ethiopia, Ghana and Nigeria	233
Figure 5.22	Pattern Analysis of Feasibility, Appropriateness, Meaningfulness and Effectiveness: Health Professionals	237
Figure 5.23	Sensitivity Analysis of Feasibility, Appropriateness, Meaningfulness and Effectiveness	239
Figure 5.24	Similarities and Differences on Evidence of IEC Impact: Health Professionals Versus FBOs, Ghana	245
Figure 5.25	Evidence of IEC Strategy Impact: Similarities and Differences	246
Figure 5.26	Evidence of Non-Impact: Similarities and Differences	249
Figure 6.1	Relationship Between Evidence and Practice	306
Figure 7.1	Relationship Between Feasibility and Level of Challenge	325
Figure 7.2	IEC Programme Monitoring and Evaluation Plan	331

List of Tables

Table 1.1	Background of Participating Countries	39
Table 1.2	The Thesis at a Glance	47
Table 2.1	Four Orientations to Learning	53
Table 2.2	Buchan’s 10 Point Model	66
Table 3.1	Triangulation and Application	83
Table 3.2	Steps of the Systematic Review Process	89
Table 3.3	Review Questions, Aims and Objectives	92
Table 3.4	Survey Questions, Aims and Objectives	112
Table 3.5	Evaluation of Pilot Questionnaire	120
Table 4.1	Appraisal of Studies	140
Table 4.2	List of IEC Strategies	144
Table 5.1	Age Distribution by Country	173
Table 5.2	Faith Distribution by Country	175
Table 5.3	Occupational Distribution by Country	176
Table 5.4	Occupational Distribution of FBO Representatives	176
Table 5.5	Study Sites	182
Table 5.6	Kruskal-Wallis Test Results of Rating of IEC Strategies	199
Table 5.7	Sensitivity Analysis of IEC Strategies: Kruskal-Wallis Test Results	201
Table 5.8	Mann-Whitney Test Results on Rating of IEC Strategies	205
Table 5.9	Kruskal-Wallis Test Results on Rating of Level of Challenge	219
Table 5.10	Sensitivity Analysis on Rating of Level of Challenge: Kruskal-Wallis Test Results	221
Table 5.11	Mann-Whitney Test Results on Rating of Level of Challenge: Ghana	225
Table 6.1	Dimensions of Key Issues, Level of Action and Expected Benefits	299
Table 7.1	Relationship Between Feasibility and Level of Challenge	324

List of Appendices

- Appendix 1: Findings of Data Search from Systematic Review
- Appendix 2: Assessment of Methodological Quality of Qualitative and Quantitative Studies
- Appendix 3: Quality Assessment Instrument: Notes, Texts, Opinions and Discourse
- Appendix 4: Quality Assessment Instrument for Policy Documents: Standard Guidelines/Strategic Plans/Tactical Plans /Operational Plans/Monitoring and Evaluation Report
- Appendix 5: Data Extraction Sheet for Qualitative and Quantitative Studies
- Appendix 6: Data Extraction Sheet for Notes, Texts, Opinions and Discourse
- Appendix 7: Guidelines/Strategic Plans/Tactical Plans/Operational Plans/Monitoring and Evaluation Report
- Appendix 8: Letters of Introduction
- Appendix 9: Information Sheets for Respondents
- Appendix 10: Survey Questionnaire
- Appendix 11: Approval Letters
- Appendix 12: Data Collection Guidelines for Focal Persons
- Appendix 13: Template for Extraction of Qualitative Data
- Appendix 14: Samples of Data Extraction Summary Report
- Appendix 15: References of Excluded Studies from Systematic Review
- Appendix 16: References of Included Studies from Systematic Review
- Appendix 17: Subgroup Analysis
- Appendix 18: Non-parametric Test Results on IEC Strategies and Challenges

Glossary of Key Terms, Abbreviations and Acronyms

A. List of Abbreviations and Acronyms

ACCESS: Access to clinical and community maternal, neonatal, and women's health services

ACT: Artemisinin-based combination therapy

ACTs: Artemisinin-based combination therapies

AIDS: Acquired Immuned Deficiency Syndrome

ALMA: African Leaders' Malaria Alliance

ANC: Antenatal Care

BCC: Behaviour Change Communication

BERA: British Educational Research Association

BMC: Biomed Central

BMJ: British Medical Journal

CBO: Community-based Organisation

C-Change: Communication for Change

CDC: Communicable Disease Control Unit

CHAG: Christian Health Association of Ghana

CHPS: Community-Based Health Planning and Services

CHW: Community Health Worker

CIA: Central Intelligence Agency

CIDA: Canadian International Development Agency

CINAHL: Cumulative Index to Nursing and Allied Health Literature

COMMIT: Communicating Malaria in Tanzania

CQ: Chloroquine

CRD: NHS Centre for Reviews and Dissemination

CRS: Catholic Relief Services

DANIDA: Danish International Development Agency

DDHS: District Director of Health Services

DfID: Department for International Development

DHS: Demographic Health Survey

DOT: Directly Observed Therapy

EBM: Evidence-Based Medicine

EFQM: European Foundation for Quality Management Excellence Model.

EPI: Expanded Programme on Immunization

ERIC: Educational Resources Information Centre

EU: European Union

FAM: Feasibility, Appropriateness, and Meaningfulness

FAME: Feasibility, Appropriateness, Meaningfulness, and Effectiveness

FBOs: Faith-based Organisations

FMOH: Federal Ministry of Health

GAVI: Global Alliance for Vaccines and Immunisation

GCE: General Certificate Examination

GCS: GIMPA Consultancy Services

GDP: Gross Domestic Product

GHS: Ghana Health Service

GMAG: Ghana Malaria Advocacy Guide

GMAP: Global Malaria Action Plan

GMDGs: Global Millennium Development Goals

GSMF: Ghana Social Marketing Foundation

HBM: Health Belief Model

HEWs: Health Extension Workers

H/H: House-to-house

HIV: Human Immunodeficiency Virus

HPN: Health Population and Nutrition-Donors' Group

IDA: International Development Association

IEC: Information, Education and Communication

IHRDC: Ifakara Health Research and Development Centre

IPT: Intermittent preventive treatment

IPTp: Intermittent Preventive Treatment for Pregnant Women

IPTi: Intermittent Preventive Treatment for Infants

IPTp-SP: Intermittent Preventive Treatment with Sulphadoxine-Pyrimethamine

IRS: Indoor Residual Spraying.

ITN: Insecticide-Treated Net

JBI: Joanna Briggs Institute

JHPIEGO: Johns Hopkins Programme for International Education in Gynaecology

LLIN: Long-Lasting Insecticide Treated Net

LBW: Low birth weight

MBA: Master of Business Administration

MCH: Maternal and Child Health

MCH/FP: Maternal and Child Health/Family Planning

MERG: Roll Back Malaria Monitoring and Evaluation Reference Group

MIP: Malaria in Pregnancy

MIS: Malaria Indicator Survey

MOH: Ministry of Health

MOHSW/NMCP: Ministry of Health and Social Welfare/National Malaria Control Programme

NGO: Non-governmental Organisation

NHIS: National Health Insurance Scheme

NHS: National Health Service

NICE: NHS National Institute for Health and Clinical Excellence

NMCP: National Malaria Control Programme

NPar: Non-parametric

NR: No response

ODA: Overseas Development Administration

OPD: Out Patient Department

PHC: Primary Health Care

PMI: The U.S. President Malaria Initiative

PREMA: Pregnancy Malaria Anaemia Network

PSAs: Public Service Announcements

PSI: Population Services International

PSSMC: Partnership for Social Science in Malaria Control. This is a database that catalogues titles of key research work related to malaria.

PMV: Patent Medicine Vendors

RBM: Roll Back Malaria

RCT: Randomised Controlled Trial

RDHS: Regional Director of Health Services

RHB: Regional Health Bureau

RHMT: Regional Health Management Team

SACB: Somalia Aid Coordinating Body

SAEM: Shama Ahanta East Metropolis

SI: Successful Implementation

SIGN: Scottish Intercollegiate Guideline Network

SIL: Summer Institute of Linguistics

S-M-C-R Model: Sender-Message-Channel-Receiver Model

SP: Sulphadoxine-pyrimethamine/Sulfadoxine-pyrimethamine

SPSS: Statistical Package for the Social Sciences

SSA: Sub-Saharan Africa

TBA: Traditional Birth Attendance

TV: Television

UK: United Kingdom

UNESCO: United Nations Educational, Scientific and Cultural Organisation

UN: United Nations

UNDP: United Nations Development Programme

UNFPA: United Nations Population Fund (formerly known as United Nations Fund for Population Activities)

UNICEF: United Nations Children's Fund

US: United States

USA: United States of America

USAID: United States Agency for International Development

WHO: World Health Organisation

WHO/AFRO: World Health Organisation Regional Office for Africa

B. Meaning of Key Terms

Antenatal Care: In Africa all pregnant women are expected to attend an antenatal clinic at least 4 times during pregnancy. This will provide the pregnant woman an opportunity to benefit from all relevant interventions, including routine health education; use of insecticide-treated nets and the uptake of intermittent preventive treatment.

Case Management: Malaria in pregnant women requires immediate treatment, focusing on complete cure of the infection. Currently sulfadoxine-pyrimethamine (SP) is the drug of choice in most malaria endemic countries in place of chloroquine. However, there is ongoing research work seeking to identify alternative and cost effective drugs due to resistance and a declining efficacy in some countries. Treatment protocols differ from country to country. However, efforts are being made to assume a common ground where feasible.

Community-Based Health Planning and Services: This policy has been adopted as a key strategy by the Ghana Health Service with a view to increasing access to primary health care focusing on individuals, households and communities.

Faith-Based Organisations: In this study, representatives of faith-based organisations who participated have been termed FBOs since they were recruited from religious organisations.

Federal Ministry of Health: This is used in reference to ministry of health in African countries that practise a federal system of government, such as Ethiopia and Nigeria.

Focal Persons: These were field workers who facilitated the data collection process in the study counties.

Ghana Health Service: This is a policy implementing agency under the Ministry of Health in Ghana that operates in tandem with the teaching hospitals. It is responsible for all healthcare facilities other than the teaching hospitals.

Health Extension Workers: This category of staff is employed to operate in community settings where regular health professionals such as nurses, midwives and doctors are not available. They are essentially considered as field workers who work closely with disease control officers.

Indoor Residual Spraying: Although this is increasingly being used in high transmission areas, it is largely used in epidemic prone countries.

Insecticide-Treated Net: A net that has been treated with insecticide to offer protection against mosquitoes. It needs to be treated every 6 month in order to be effective.

Intermittent Preventive Treatment for Pregnant Women: It is a public health intervention aimed at treating and preventing malaria episodes. It involves an administration of a full course of an antimalaria treatment to a population at risk at specific time points. At present sulphadoxine-pyrimethamin is given at a therapeutic dose. This is a single dose antimalarial with the best overall effectiveness for malaria prevention during pregnancy in areas with high transmission, and low resistance to SP.

Long-Lasting Insecticide Treated Net: This has a much longer lifespan compared to the ordinary insecticide-treated net, as it can last in the region of 5 years. However, it is expensive and may require donor support. It is expected that in future LLINs will be used as the most preferred form of mosquito net since it does not need to be retreated every 6 months.

Low birth weight: This is one of the consequences of malaria in pregnancy. It occurs due to lack of nutritional transfer from the pregnant woman to the foetus as a result of placental parasitaemia (due to the presence of mosquito parasites in the placenta).

Malaria control: Attempts at reducing the malaria disease burden to a level at which it is no longer considered a public health problem.

Malaria in Pregnancy: The infection of malaria during pregnancy is a major public health problem in tropical and subtropical regions across the world. In

most endemic areas of Africa, pregnant women serve as the main adult risk group for malaria. The main burden of infection during pregnancy results from infection with *plasmodium falciparum*. The symptoms and complications of malaria during pregnancy differ with the intensity of malaria transmission and thus with the level of immunity acquired by pregnant women.

Malaria Prevention: Taking appropriate steps to prevent the transmission of malaria by an infected mosquito vector to a susceptible host. For the pregnant woman, the first barrier of protection is the use of a treated mosquito net. Where an intermittent preventive treatment is given, the aim is to provide protection for the mother and foetus within the maternal blood stream and the placenta respectively.

Malaria Transmission Intensity: In relation to transmission intensity are two main types, namely stable and unstable transmission. Since malaria transmission intensity may vary within the same country (for example, Ethiopia, Mali and Mozambique) from areas of relatively stable transmission to areas of unstable or epidemic transmission, the clinical picture of malaria infection during pregnancy may likewise range from asymptomatic to severe, life-threatening illness.

MEDLINE: International Journal data-base of published medical and health science research

National Malaria Control Programme: All malaria endemic countries in Africa are expected to set up this unit to oversee all issues related to planning and implementation of malaria prevention and control.

Roll Back Malaria: This pertains to a new approach to malaria control, which shifts focus from malaria as a clinical problem to being a socio-economic or developmental problem. It therefore seeks to bring all key stakeholders together to address malaria as a disease of public health importance.

Stable/Endemic/High Transmission Zones: Most adult women in these areas have developed sufficient immunity; so that when a woman becomes pregnant *plasmodium falciparum* does not usually result in fever or other clinical symptoms. This may create a false impression in the mind of the victim that all is well. Here, the principal impact of the disease is malaria-related anaemia in the mother and the presence of parasite in the placenta (placental parasitaemia). The resulting impairment of foetal nutrition leads to low birth weight and is the leading cause of poor infant survival development.

The Three-Pronged Approach: At the Abuja Summit on 25th April 2000, a strategic framework for malaria control during pregnancy was recommended as a means of reaching the goal of the Summit regarding malaria in pregnancy. This was made up of: (1) intermittent preventive treatment; (2) insecticide-treated nets; and (3) effective case management.

Unstable/Epidemic/Low Transmission Zones: In these areas adult women have not acquired any significant level of immunity. Usually they become ill when infected with *plasmodium falciparum*. In the case of pregnant

women in epidemic prone areas the risk of developing severe malaria is said to be 2-3 times higher than that for non-pregnant women living in the same area. Maternal death may occur either directly or indirectly from severe malaria or indirectly from malaria-related severe anaemia. Other malaria-related consequences in pregnancy are LBW, spontaneous abortion and neonatal death.

Chapter 1

Introduction and Research Context

1.1 Introduction

My interest in malaria in pregnancy dates back to 1999 when I was a postgraduate student pursuing an MBA in health administration at the University of Ghana, Legon (Ghana's premier university). During this time, I served as a member of a non-governmental organisation (NGO) called Nana Yaa Foundation for Quality Maternity Services, then temporarily based at the then Department of Nursing (now School of Nursing). This organisation was set up to address issues related to maternal deaths. The organisation was named after a young woman who died during labour as a result of perceived negligence. The membership of this organisation was predominantly made up of medical doctors, nurses, and midwives together with selected lay persons with interest in maternal health. This led to my first research publication in 1999 on adolescent reproductive health published in a journal belonging to the above-named NGO.

My second publication in 2001 was also focused on adolescent reproductive health. Later, when I was employed by Ghana Health Service as a health services administrator and posted to a district hospital (Tarkwa Government Hospital), following 1 year housemanship at the regional hospital (Effia-Nkwanta Regional Hospital), my interest in pregnant women was heightened. This was due to the rate at which malaria-related maternal deaths occurred in the community where I was working, most of them resulting from delayed reporting for admission. In consultation with the district health management team, I pushed for an institutionalisation of quarterly district clinical conferences, and consequently, served as a district co-ordinator for the clinical conferences. At every clinical conference both public and private healthcare practitioners were involved to deliberate on the causes of maternal and other preventable deaths, as well as ways of preventing future occurrence.

Later, these experiences and ideas were translated into a research agenda at an international level when I was employed as a consultant/ lecturer by Ghana

Institute of Management and Public Administration. I accepted the challenge of writing an expression of interest, and subsequently a research proposal to participate in a three-country case study commissioned by the World Health Organisation in Africa. The project focused on Mali, Ethiopia and Mozambique (see GCS 2003a,b,c). This project sought to identify best practices regarding management and mechanisms of co-ordination of malaria control programmes in Africa from national, regional, district, district health facility to community levels. The study also included exploring the role of international health partners, NGOs, and community-based organisations. One of the key observations made from findings of existing literature was the fact that pregnant women were among the most vulnerable groups with regards to malaria infection. Therefore one of the terms of reference was to identify the operationality of existing malaria control policies (including their benefits to vulnerable groups) and to recommend on the way forward.

It was observed that health seeking behaviour and for that matter utilisation of maternal health services by pregnant women, especially in rural settings was a problem. It was also noticed that some women were more interested in going to traditional birth attendants and spiritualists instead of going to the clinic. Furthermore, some women were not adhering to prescribed malaria treatment, which often led to drug resistance. Among other things, it was recommended that health education be intensified in order to address the problems. These and other considerations generated my interest in the role of information, education and communication as related to malaria in pregnancy.

This chapter focuses on the key assumptions underlining the study, the research problem; research aims and objectives; the contribution of the study to knowledge; background of countries being studied; and organisation of chapters of the thesis. The chapter concludes with summary and conclusions. Before stating the research problem, there is need to describe the assumptions that set the scene for the study. The next section will therefore focus on these key assumptions.

1.2 Key Assumptions

- i. Malaria is preventable, and interventions to address it are generally effective. Therefore, pregnant women and their unborn babies should not be allowed to die due to malaria.
- ii. In order to guarantee that pregnant women are preventing and treating malaria well, they need to receive correct, accurate and appropriate messages on malaria, its prevention and control.
- iii. Pregnant women should receive the above health messages from well informed health educators, whether in the community or at health facility level.
- iv. Information received should be translated into positive pregnancy related outcomes through behavioural change.
- v. In order to sustain information, education and communication (IEC) programmes, health educators need to be updated on national malaria control policies at regular intervals through training and orientation.
- vi. In order for IEC programmes to assume strategic importance and to make a long-term impact on health seeking behaviour, there is the need to pursue advocacy at the outset of the implementation of national malaria control policies among governments, policymakers, directors, managers, health partners, media organisations, community leaders (including traditional and religious leaders); and all other key stakeholders.
- vii. For the above to see results, community participation needs to be encouraged through various social networks in order to promote community ownership of health education campaigns.
- viii. Consequently, pregnant women can become agents of behavioural change once knowledge and experience is acquired regarding malaria in pregnancy.

1.3 The Research Problem

1.3.1 Why Malaria in Pregnancy in Africa?

Malaria continues to pose a complex public health problem in Africa (Antwi 2010) where the disease accounts for over 90% of the global malaria burden

(WHO 2002; Morel et al. 2005; Schantz-Dunn & Nour 2009). It is estimated that 74% of the African population lives in highly endemic areas, while 19% lives in epidemic prone zones. Only 7% of the population lives in malaria-free or low risk areas (Antwi 2010). Therefore, malaria in pregnancy remains a significant risk to both mother and foetus (Antwi 2010).

An estimated 50 million women in malaria endemic nations across the world become pregnant. Of this number, 50% live in tropical Africa, where the transmission of the *plasmodium falciparum* is intense (Antwi 2010). Each year over one million people, mostly pregnant women and children, die as a result of malaria (Morel et al. 2005). The human toll has been described as tragic and the economic cost enormous (Sachs & Malaney 2002; Chima et al. 2003; Morel et al. 2005). Worldwide, there are 300-500 million cases of malaria throughout each year (WHO 2002; JHPIEGO 2008a; Schantz-Dunn & Nour 2009).

Thirty million African women are pregnant annually (Antwi 2010). Historically, childbirth was considered important in Africa as children were regarded as a source of pride and labour, and so the more children one had, the more economically strong and prestigious one's position in society would appear. It appears that African women are generally pronatal as they love to have children. Traditionally, barrenness was frowned upon. Women who were not able to have children were not given due recognition. However, with the introduction of western education, this perception seems to be gradually fading.

Prior to 1960 in Africa, traditional roles and societal expectation of women focused on keeping the home (including extended family members). It also included care of children as well as giving support to spouses economically by assisting them on their farms. However, the period after 1960 saw industrialisation and the progress of female education. This encouraged women to combine their traditional roles with paid employment (UNESCO 2001; Okerinde 2008).

Literature on the history of African women appeared sketchy until the 1970s, with development of the international feminist movement and the focus of scholars on Africa after World War II. From 1970 onwards, the published literature centres on the political activities of African women as well as changes in the economic landscape from subsistence farming to large scale fish farming, trading, textiles design, arts and craft and paid employment in both formal and informal sectors (Okerinde 2008; Sheldon 2008).

While society had relegated the role of women to domestication, men were perceived as the head of the family, expected to provide for the entire household as well as make decisions, including those that affected their health. Due to the difficulties in accessing historical data, earlier literature portrayed African women as passive (Okerinde 2008; Sheldon 2008). Okerinde (2008) notes that

“African communities were characterised as decentralised and non-literate. As a result, most of the written material was not from African women’s perspective” (p.6).

The author can confirm that to a large extent this view of women’s role accords with his experience as an African, born and raised.

According to Okerinde (2008), despite the fact that there was information regarding African women’s activity based on anthropological and ethnographic studies, these studies focused on African women as slaves in the 19th century. Okerinde also reports that little emphasis was laid on women’s productive and reproductive contributions to their communities. In particular, this, according to her, had to do with rural agricultural work, urban activities in the area of trading, art and craft, textile design and cloth weaving.

Despite the portrayal of a subservient role for women, there is evidence to suggest that some women played influential roles in African society (Okerinde 2008; Sheldon 2008). With the evolving role of African women in modern society, a new era is emerging for women regarding their occupational roles. Consequently, women are now recognised as a force in contemporary economic life. This trend did not emerge overnight. Rather, the exigencies of

modern quest for progress and prosperity and the realisation of the importance of education demands that the old order paves way for the new order regarding women's role in the African society. In this regard, African women began to seek paid jobs in order to meet the needs of both the nuclear and the extended family (Okerinde 2008). The improvement in female education provided a better avenue for African women to join the labour force and put to use the educational qualifications they had acquired, leading to their being economically independent and the achievement of self-esteem (Fapohunda & Fapohunda 1977; Okerinde 2008).

The mass exodus of African women to travel abroad, especially in Western countries such as the United Kingdom (UK) and the United States of America (USA), appears to have given more impetus to female empowerment as they pursue further studies and jobs as a result of higher academic qualification. In the first place, it has been noted that this trend could be linked with the liberation movement which advocated for the freedom of women from the traditional roles as housewives and mothers, irrespective of their educational attainment (Barling 1990; Okerinde 2008). Secondly, government policies in western countries, which advocate for equal job opportunities and equal pay, has also played a key role as in the case of UK legislation on Equal pay of 1970, equal pay for men and women, flexible Working Rights of 2005 and Work Families Acts of 2006 (Okerinde 2008). Therefore, some of the African women living and working abroad have come to the realisation that they too deserve to be treated in much the same way as men when they come back to Africa. Consequently, some African women have gone back to Africa, occupying high positions in society, as in the case of the current Liberian President, who originally worked in the United States of America. The number of women ministers and parliamentarians is also increasing, although men still dominate. It may be argued that the more women there are in responsible positions in society, such as political office at national and local levels, the higher the likelihood that women's concerns are advanced, including malaria in pregnancy (although there is no guarantee that this will always happen). As it is now, male dominance still persists, which has implications for female empowerment in general (Heggenhougen et al. 2003; Apusigah 2007) and

health decision making in particular, including decisions on malaria prevention and control (Heggenhougen et al. 2003; Mbonye et al. 2006b).

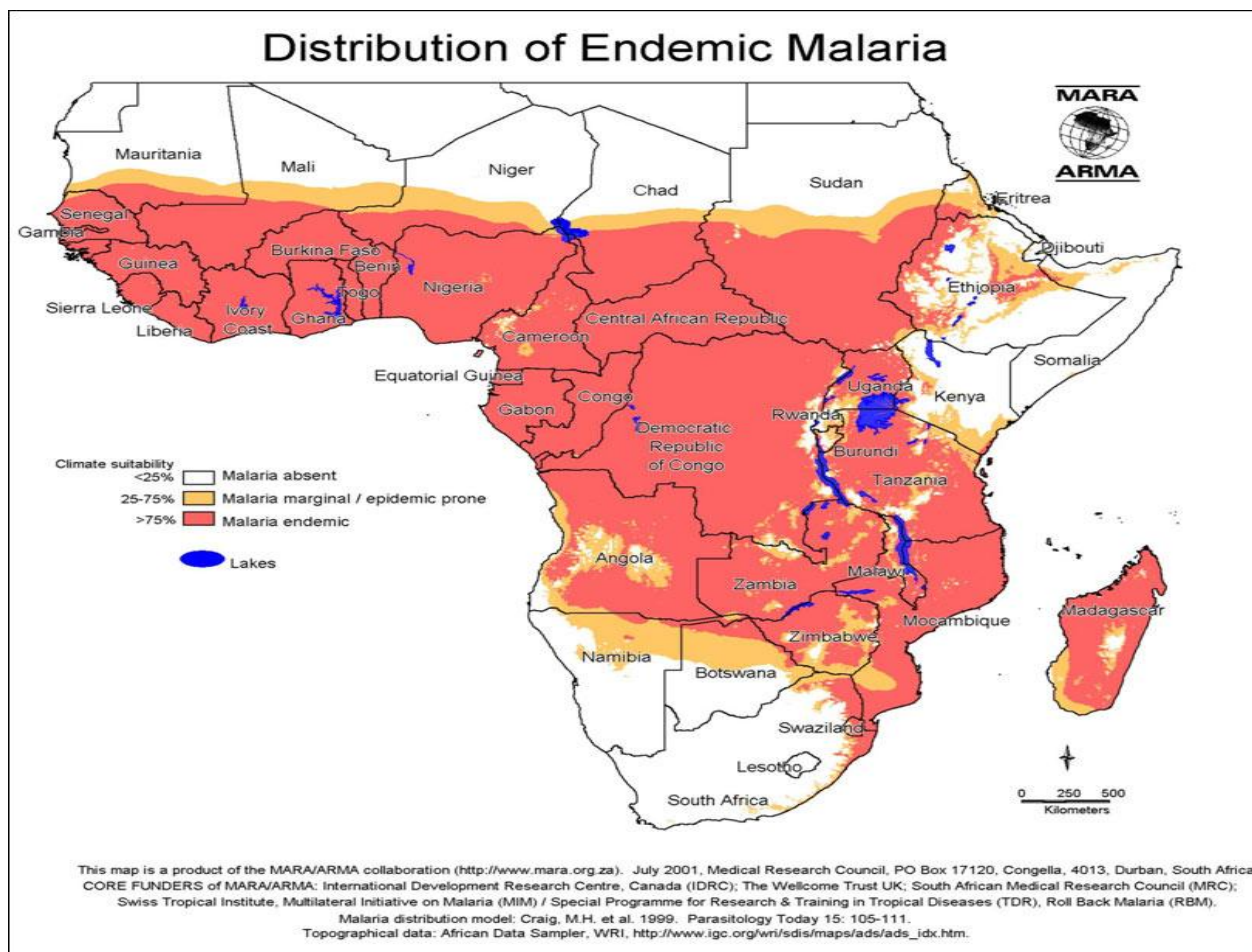
It appears that women and for that matter pregnant women, who are highly educated and have been engaged in good jobs, are normally living in urban settings; and have little problems with health. Rather, the main problem has to do with women living in deprived communities in Africa, where poverty and illiteracy is high (Adongo et al. 2005; The World Bank 2008). Other reasons why pregnant women in rural African communities are disadvantaged include lack of local amenities and access to good healthcare facilities comparable to urban areas (Gikandi et al. 2008; The World Bank 2008). Cognisant of these problems, the United Nations (UN) sought to develop a global agenda encapsulated in the Global Millennium Development Goals (GMDGs) set in September 2000. The GMDGs recognised the need for attention to be paid to pregnant women. Among other things, the plan sought to address issues of poverty, hunger, education, gender equality, improve maternal and child health and combat malaria (WHO 2010).

It is estimated that malaria causes 400,000 cases of severe maternal anaemia and 75,000-200,000 infant deaths yearly (Guyatt et al. 2004; JHPIEGO 2008a). Additionally, Lagerberg (2008) observes that pregnant women are more likely than non-pregnant women to become infected with malaria and to severe infection. He also notes that

“the effects of malaria during pregnancy include spontaneous abortion, preterm delivery, low birth weight, stillbirth, congenital infection, and maternal death.”

(Lagerberg 2008, p.1)

Figure 1.1 Distribution of Endemic Malaria in Africa



Source: The World Bank (2010a, p.1)

Malaria is more frequent and complicated during pregnancy. In endemic countries, malaria in pregnancy may account for: up to 15% of maternal anaemia; 5-14% of low birth weight (LBW); and 30% of 'preventable' LBW (Antwi 2010) (see Figure 1.1 on the extent of malaria distribution in Africa).

In accordance with the above, African leaders and international health partners also recognised malaria in pregnancy as a disease burden. This, among other reasons, led to the Roll Back Malaria Summit of African leaders and international health partners which led to The Abuja Declaration (2000). Thus in April 2000, 50 malaria endemic African countries signed the Abuja Declaration, and agreed to achieve the following targets by 2005:

- "60% of pregnant women will sleep under insecticide-treated nets or use other appropriate and affordable means of protection from malaria

- 60% of pregnant women at risk of malaria, especially those in their first pregnancies, will access preventive intermittent treatment”

(Lettenmair 2003, p. 1)

These strategic objectives were to be reviewed every five years until 2030, when malaria will no longer be a disease of public health importance (The Abuja Declaration 2000; WHO/AFRO 2000). For example, by the end of 2010 80% of pregnant women were expected to sleep under insecticide-treated nets (ITNs); while 80% of pregnant women at risk of malaria were expected to have access to intermittent preventive treatment (IPTp) (WHO/AFRO 2000). No African country was able to achieve any of the strategic objectives within the first five years of implementation as will be discussed later in this chapter (WHO/UNICEF 2006). The 2010 World Malaria Report shows that although malaria cases are showing a downward trend in several African countries following a huge effort between 2008 and 2010, gains remain fragile. Thus, the 80% target set in place is still far from being achieved (WHO World Malaria Report 2010).

1.3.2 Why Information, Education and Communication (IEC)?

Whereas extensive research has been undertaken in the area of malaria prevention and control in pregnancy in general, little work has been done in the area of information, education and communication related to malaria prevention and control, in particular among pregnant women. For example, some researchers have focused on the burden of malaria in pregnancy (Greenberg et al. 1991; Steketee et al. 1996, 2001; Verhoeff et al. 1999; van Eijk et al. 2001). Greenwood et al. (1992); Amukoye (1997); Bloland and Ettling (1999); Newman et al. (2003); and Bouchaud et al. (2000) have considered malaria drug efficacy and effectiveness.

Other researchers have focused simultaneously on use of ITNs and intermittent preventive treatment (IPTp) (WHO/UNICEF 2003; WHO 2004; WHO 2006; Yartey 2006), while others (Alonso et al. 1993; D’Alessandro et al. 1995; Huailu et al. 1995; Binka et al. 1996; Nevill et al. 1996; Hawley et al. 2003; Nganda et al. 2004; WHO/UNICEF 2006) have focused on effectiveness

of ITN use. Yet still, some have focused solely on the effectiveness of IPTp (Parise et al. 1998; Verhoeff et al. 1998; Rogerson et al. 2000; Challis et al. 2004; Kayentao et al. 2005; van Eijk et al. 2004; Briand et al. 2007).

Gamble et al. (2009) undertook a systematic review of evidence to examine the effectiveness of ITNs. The study aimed at comparing the impact of ITNs with no nets or untreated nets on malaria prevention during pregnancy. The review involved six randomised controlled trials (RCTs) (4 from sub-Saharan Africa compared to no nets and 1 trial from Asia compared with untreated nets). ITNs compared with no nets, reduced placental malaria in all pregnancies. The evidence also showed that ITNs reduced low birth weight and foetal loss in the first to fourth pregnancy, but not in women with more than four previous pregnancies. Moreover, the review showed that regarding anaemia and clinical malaria, results were not significant. The one trial in Asian women which randomised individuals to ITNs or untreated nets revealed a significant reduction in anaemia and foetal loss with regards to all pregnancies, but not for clinical malaria or low birth weight. The review concluded that ITNs have a beneficial impact on pregnancy outcome in malaria endemic areas of Africa when used by individual women or by communities.

On the issue of drug efficacy and effectiveness, Orton and Omari (2008), conducted a systematic review of 10 trials involving 1,805 participants. The review sought to compare the effects of drug regimens for treating uncomplicated *falciparum* malaria in pregnant women. According to the authors, the data were scanty. They concluded that some combination treatments seem to be effective at treating malaria in pregnancy. They however, noted that safety data were also limited.

At this juncture, the author suggests that while the above can be effective, it is not enough to recognise malaria in pregnancy as a burden of public health importance. Secondly, it is not enough to have drugs and ITNs that are efficacious and effective without having due regard to the knowledge and awareness pregnant women need about these. Thirdly, there is the need for pregnant women to know about services available regarding malaria prevention and control and how to make the most use of these. In short,

relevant health messages need to be made available and accessible to pregnant women as and when appropriate.

To ensure that the above is achieved, there is the need to ensure that health service providers have a firm grip of issues related to malaria prevention and control, including new policy guidelines on malaria control in pregnancy. Unfortunately, some health service providers seem to have inadequate knowledge of the guidelines for malaria control during pregnancy in order to be able to provide good information to their clients (Mubyazi et al. 2005; MOH, Uganda 2005; WHO 2005b; Hill and Kazembe 2006; Somalia Aid Coordinating Body 2006). For instance, in their work on review of progress and operational challenges with regards to intermittent preventive treatment of malaria in pregnancy in Africa, Hill and Kazembe (2006, p.413) point out that

“training of health workers in two pilot districts in Kenya revealed poor knowledge among health workers, with only 24% of health staff familiar with the IPT guidelines.”

Additionally, pregnant women seem to have inadequate knowledge about the consequences of malaria in pregnancy. There is also the problem of lack of appreciation of the importance of IPTp and the use of ITNs or Long-Lasting Insecticide Treated Nets (LLINs) as evidenced by low level of IPTp and ITN coverage (WHO/UNICEF 2003; Mubyazi et. al. 2005; WHO 2006; WHO/UNICEF 2006; Mboera et al. 2007; Baum & Marin 2008).

Evaluating the level of performance on ITNs use for the first five years of the implementation of the targets set within the Abuja Declaration on Roll Back Malaria (RBM) for pregnant women, it was noted that between 2000 and 2005 net use ranged from as low as 3% up to 59% out of a 60 per cent target (WHO/UNICEF 2003, 2006; WHO 2006). Only Eritrea came close to achieving the national target for the first five years of ITN policy implementation (WHO/UNICEF 2006). However, individual case studies at community and health facility levels showed far higher levels of coverage above national targets, and in some cases above 90% in eastern African countries such as Tanzania. In settings where ITN coverage was high this did not necessarily

translate into positive pregnancy related outcomes, suggesting that a combination of interventions may hold the key to making the needed impact. Within the same period (2000-2005), IPTp coverage was generally low, ranging from 1.8% (Ghana) to 72% (Malawi) for IPTp I (first dose of IPTp); and 0.8% (Ghana) to about 60% (Malawi) for IPTp II (second dose of IPTp). Similarly, IPTp coverage at local levels appeared to be higher than national averages. For instance, Malawi recorded 98% for IPTp I and 75% for IPTp II in Blatyre district in 2002 (WHO/UNICEF 2003). Any level of coverage above 60% was said to have exceeded the Abuja target. Where coverage of both ITNs and IPTp was high, this was attributed to strong awareness of consequences of malaria in pregnancy. Coverage of both strategies was generally higher in urban settings compared to rural settings. In isolated cases free supply of ITNs did not result in increased net use (Mboera et al. 2007), implying that cost alone does not determine the extent of net use. Some countries such as Eritrea, Namibia, Swaziland, Zanzibar, Kenya and Zambia have witnessed a downward trend in outpatient department (OPD) attendance and malaria infection (RBM Partnership 2007; WHO 2009). However, in others such as Uganda, there has been difficulty in implementing malaria control planned programmes due to resource constraints (WHO 2009); whilst in Nigeria health indices have been stagnant compared to African and developing countries average (Gustafsson-Wright & van der Gaag 2008), thus affecting impact in malaria prevention and control, as evidenced by increased maternal mortality (WHO World Health Statistics 2006, 2011).

Knowledge of ITNs and IPTp is critical for both pregnant women and health professionals. The importance of IEC with regards to ITN use has been demonstrated by Rhee et al. (2005). In their controlled trial with a systematic allocation of households on the use of ITNs following malaria education in Piron, Mali, it was found that households which received the educational component treated their nets, compared to those that did not. In terms of individual analysis, the authors report that the use of ITN was significantly greater among those who had received the educational intervention compared to those who did not. Compared to the pre-educational intervention, the post-educational intervention showed a significant knowledge increase about malaria. The work of Rhee et al. (2005) has been supported in Asia by Lin et

al. (2000). In their study on the promotion of ITNs in Myanmar in Asia, it was noted that health promotion messages given by midwives resulted in increase use of bednets. It was also observed that as a result of knowledge increase, most villagers were ready to purchase nets (Lin et al. 2000).

In a related study, Minja et al. (2001) reviewed a malaria prevention campaign in Tanzania in which ITNs were promoted between 1996 and 1999. The main goal of the project was to formulate a tailored IEC strategy aimed at addressing biomedical knowledge of malaria as well as malaria prevention within the context of local knowledge and practice. Despite the fact that the project did not focus on evaluating the impacts of social marketing activities (involving promotional campaigns), it was reported that there was a sharp increase in ITN ownership in the period after the project implementation. This, the authors, argued, could be attributed to the effectiveness of promotional campaigns.

In a randomised controlled trial of 37 tabias (cluster of villages) in two districts (Alamata and Raya Azebo) of Tigray in Ethiopia, Kidane and Morrow (2000) compared the effect on under-five child mortality of teaching mothers to promptly provide antimalarials to their sick children at home. This was within the framework of a community health worker approach. It was found that 190 out of 9,383 (29.8 per 1000) children under the age of five died in the intervention group compared with 366 out of 7,294 (50.2 per 1000) in the control group. The authors also found a 40% reduction in under-five mortality in the intervention localities. It was concluded that by training local mothers, as co-ordinators, to teach other mothers to give under-five antimalarial treatment, a major reduction in under-five child mortality could be achieved (Kidane & Morrow 2000). Thus, when educated, these women became agents of behavioural change and thereby, made an impact to malaria prevention and control.

In line with the above discussion, the Global Malaria Action Plan (GMAP) for 2010-2015 of the Global Roll Back Malaria Partnerships highlight the key benefits of IEC in its reference to the term 'communication'. It notes that the strategy can be used to increase knowledge regarding:

- “the transmission and prevention of malaria;
- the link between bed net use and malaria control;
- the recognition of signs and symptoms, risk groups, rapid treatment-seeking behaviour and full compliance with treatment;
- the consequences of malaria in pregnancy and the need for antenatal care which includes LLINs and, as appropriate, IPTp; and
- the motivation and intention to use tools for malaria prevention and control.”

(Global Malaria Action Plan 2010, p.1)

Thus, the key aspects of benefits regarding the role of IEC in relation to malaria in pregnancy as highlighted by GMAP involves the knowledge of how malaria infection can be transmitted; signs and symptoms of malaria, its consequences in pregnancy; prevention and control; treatment seeking behaviour; the need to attend antenatal clinics in order to benefit from insecticide-treated nets and intermittent preventive treatment.

Therefore, it may be argued that the means by which knowledge, attitudes and practices of both pregnant women and healthcare practitioners may be shaped to achieve desired impact, is through implementation of a range of strategies which may be related to information, education and communication (IEC). In effect, for malaria control to make the needed impact there is the need to emphasise IEC as part of the overall health sector strategy (Lettenmair 2003; Global Malaria Action Plan 2010).

However, despite the existence of the literature outlined above which focuses on the impact of specific IEC strategies, to date there has been no comprehensive study of impact across a range of IEC strategies related to pregnant women in Africa.

1.4 Research Aims and Objectives

1.4.1 Aims

The main aim of this study was to identify evidence of impact of information, education and communication (IEC) strategies in malaria prevention and control for pregnant women in Africa. In doing so, the study also explored the

involvement of health educators, including health care providers, international donor health partners, Non-governmental Organisations (NGOs); Community-based organisations (CBOs), Faith-based organisations (FBOs), Community leaders, traditional birth attendants (TBAs), traditional health practitioner, and other private sector organisations. The reason for the inclusion of all these groups and individuals was based on their involvement in the implementation of malaria prevention and control policies, including health education. The study also sought opinions of health professionals and lay persons on the issue being investigated.

1.4.2 Objectives

Based on a mixed method approach involving a systematic review of evidence and evaluation methodology involving survey of African countries, this study sought to achieve the following specific objectives:

- i. To identify IEC strategies aimed at malaria prevention and control during pregnancy
- ii. To identify evidence of feasibility, appropriateness, meaningfulness, and effectiveness of IEC strategies in malaria prevention and control among pregnant women
- iii. To identify evidence of challenges confronting the implementation of the IEC strategies with respect to pregnant women
- iv. To develop a theoretical framework and illustrate its application to enhance the understanding of issues related to implementation of IEC strategies among pregnant women in Africa
- v. To identify best practices and key lessons in order to inform governments, policymakers, health partners, the academic community, health directors, health managers, frontline health professionals, health educators at health facility and community levels on IEC programme development and implementation aimed at achieving desirable impact.

As will be shown later in Chapter 3, a systematic review was conducted across several African countries. However, in order to set the scene for the survey of four African countries, reported fully later in Chapter 3, an overview of the

background of these countries is now provided. The reasons for the selection of these countries are outlined in Chapter 3 (see sub-section 3.5.3.1)

1.5 Background of Countries Surveyed

In this section, the author provides an overview of the background information related to Ethiopia, Ghana, Nigeria and Tanzania. The section has been presented in this chapter as issues presented here may enhance understanding of IEC context and challenges in subsequent chapters. The key elements of this section are: geography and demography, political/administrative set up, economy, education, language, ethnicity and religion, health profile and healthcare infrastructure (access to healthcare, maternal and infant mortality, malaria burden, and key interventions); and cultural beliefs and practices related to malaria. Concluding this section, the author presents the similarities, differences and IEC Challenges among and within these countries.

1.5.1 Geography and Demography

1.5.1.1 Ethiopia

Ethiopia is located in the north eastern part of Africa (the Horn of Africa) between Latitudes 3° and 15° North and Longitudes 33° and 48° East. It shares its border with five countries notably, Eritrea in the north, Djibouti in the east, west by Sudan, south by Kenya and south-west by Somalia (FMOH, Ethiopia 2006). The surface area of Ethiopia is about 1.12 million km², with a population of 91,195,675, and an annual population growth rate of 2.9% (CIA World Factbook 2012). The vastness of the land and the population size imply that implementing IEC programmes across the country could be a daunting task in terms of finance, logistics and human resources.

Ethiopia has a rural-urban population ratio of 82.4:17.6 as of 2010 (93.6:6.4 in 1960) (Index Mundi 2010), indicating a very high rural population compared to urban population with a slow pace of change in the pattern of urbanisation. The country's rainfall is characterised by high irregularity, making Ethiopia prone to emergencies. There is usually drought and famine in most parts of the country (FMOH, Ethiopia 2006). This requires the populace to be

constantly reminded on the need to take precautions, especially during rainy seasons that could result in a malaria outbreak.

1.5.1.2 Ghana

Ghana is situated on the coast of West Africa between latitude 8° north and longitude 2° west (Travel Blog 2012). It is bordered on the west by La Côte D'Ivoire (formerly Ivory Coast), north by Burkina Faso, east by Togo and on the south by the Atlantic Ocean (Tabi et al. 2006). The country has an estimated surface area of 238,537 km² (GHS 2007). Ghana has a population of 24,652,402 (CIA World Factbook 2012), with an annual population growth rate of 2.4% (The World Bank 2010b), and a rural-urban population ratio of 48.5:51.5 as of 2010 (76.7:23.3 in 1960) respectively (Index Mundi 2010). This indicates that the country is becoming more and more urbanised, and therefore distribution of health care resources, including access to health information, must fall in line in order to ensure equity.

Ghana has three ecologically different areas of vegetation, namely, the drier tropical savannah in the north, the forest and the coastal savannah in the south. The nation's temperature ranges from 19° to 40°C, with variations in the ecology (GHS 2010).

1.5.1.3 Nigeria

Nigeria is located in West Africa between latitudes 4°16' and 13°53' north; and longitudes 2°40' and 14°41' east (Nigeria Demographic and Health Survey 2009). It shares borders in the east with Cameroon, west with Benin, north-east with Chad and to the south with the Atlantic Ocean (Foreign and Commonwealth Office 2012). The country has a total surface area of 923,709 km² (FMOH, Nigeria 2008).

Nigeria is by far the most populous country in Africa, with a total population of 170,123,740. The country has a population growth rate of 2.5% (CIA World Factbook 2012), with a rural-urban population ratio of 50.20:49.80 as of 2010 (83.80:16.20 in 1960) (Index Mundi 2010), indicating that the rural and urban populations are almost equal, and a relatively fast rate of urbanisation over

the past 50 years. Health care resources must therefore be equitably distributed, so that rural settings are not disadvantaged. The population size and the vastness of Nigeria, however, poses a great challenge in terms of provision of financial, logistics and human resources for health care programmes, including IEC programme implementation.

The Nigerian climate varies from arid in the north, with annual rains of 600-1000mm and 3-4 months duration; to humid weather to the south, with an annual average of 1,300-1,800mm (and in some coastal areas up to 2,500mm) and 9-12 months duration; making Nigeria prone to malaria all year round (FMOH, Nigeria 2008).

1.5.1.4 Tanzania

Tanzania is situated in Eastern Africa between latitude 6° south and longitude 35° east. In the north, it is bordered by Kenya and Uganda, west by Rwanda, Burundi, and Democratic Republic of Congo, south by Zambia, Malawi and Mozambique, and east by the Indian Ocean. Tanzania has a total surface area of 945,090 km² (Photius 2012).

The country has a population of 46,912,768 (CIA World Factbook 2012), with a population growth rate of 3% (The World Bank 2010b). Tanzania's rural-urban population ratio is 73.6:26.4 as of 2010 (94.8:5.2 in 1960) (Index Mundi 2010), implying that over the past 50 years the rate of urbanisation has been slow. Therefore, more investment of health care resources needs to be made in rural communities.

The Tanzanian climate varies from tropical along the coast to temperate in the highlands (CIA World Factbook 2012). The country has two distinct annual rainfall patterns, prevailing in different areas of the country. In the south, west, south-west and central regions, the rainfall is unimodal (one rainy season), which occurs between December and April. In the northern and southern parts of Tanzania, the rainfall is bimodal (two rainy seasons) characterised by short rains which occur from October to December and long

rains from March to May (Go To Africa 2012), thus making these areas more vulnerable to malaria.

1.5.2 Economy

1.5.2.1 Ethiopia

Economically, Ethiopia is considered one of the least developed nations in the world. It has a Gross Domestic Product (GDP) of US\$31.7 billion, a GDP per capita income of US\$1,100 (CIA World Factbook 2012), and a GDP growth rate of 7.2% with an inflationary rate of 33% (CIA World Factbook 2012). Poverty is a matter of concern as it has been estimated that 44% of the population lives below the poverty line (The World Bank 2004). The Ethiopian economy is based largely on agriculture which accounts for 41% of GDP and 85% of total employment (CIA World Factbook 2012). The government must therefore expand the nation's service industry in order to be less dependent on donor support, since climatic conditions are not always favourable to agriculture (see sub-section 1.5.1.1).

1.5.2.2 Ghana

Ghana is a lower middle income nation. The country has a GDP of US\$39.1 billion (The World Bank 2011); an inflationary rate of 8.7%; a GDP per capita income of US\$3,100 (CIA World Factbook 2012); and an annual GDP growth rate of 8.0% (The World Bank 2010b). The population of Ghana is 28.5% below poverty line (UN 2009). Despite her vast amount of natural and agricultural resources, poverty remains a big problem (Heyen-Perchon 2005).

1.5.2.3 Nigeria

Nigeria is a lower middle income country, and the second largest economy in sub-Saharan Africa (Foreign and Commonwealth Office 2012). It has a GDP of US\$235.9 billion, with a GDP growth rate of 6.6%, an inflationary rate of 10.8% (CIA World Factbook 2012), and a GDP per capita income of US\$2,600. In spite of oil wealth, Nigeria is not considered a rich country (Foreign and Commonwealth Office 2012), as the population is 54.7% below the poverty line (FMOH, Nigeria 2008). This is a big challenge to a nation that is already overpopulated (see sub-section 1.5.2.1).

1.5.2.4 Tanzania

Tanzania has a GDP of US\$22.9 billion, a 7.0% GDP growth rate (The World Bank 2010b); an inflationary rate of 12.7%; and a GDP per capita income of US\$1,500 (CIA World Factbook 2012). Tanzania is 35.7% below poverty line (UN 2009). The seaports of Tanzania in Dar es Salaam, Zanzibar, Tanga and Mtwara serve neighbouring land-locked countries, rendering the country a logical investment destination (Nairobi 1966; Macalester 2012; Searates/Zanzibar 2012; Zanzibar Port Corporation 2012).

1.5.3 Political/Administrative Set Up

1.5.3.1 Ethiopia

Ethiopia has a federal system of government, with powers decentralised to regions and districts. There are nine regions referred to as states, including Oromia (the study region) (FMOH, Ethiopia 2006; PMI, Ethiopia 2010).

For the purpose of public health care in the regions and districts, there are Regional Health Bureau (RHB) and district health offices at each level. There are 611 *woredas* (districts). Districts are subdivided into roughly 15,000 *kebeles* (localities). Out of these, 10,000 are rural peasant associations and the remaining 5,000 *kebeles* urban dwellers associations. In some regions like Oromia, where the study was conducted, there are administrative zones coordinating work for a number of districts (FMOH, Ethiopia 2006; PMI Ethiopia 2010).

1.5.3.2 Ghana

Ghana has a presidential and unitary system of government. Administratively, the country is divided into 10 regions, including Brong-Ahafo, Ashanti, Western and Greater Accra (the study regions), with 140 districts as at 2010 (Ghana Webpage 2010). Forty-five additional districts (or constituencies) have just been created in an attempt to deepen democracy (Ghana Webpage 2012; Peace FM Webpage 2012).

1.5.3.3 Nigeria

Nigeria has a presidential and federal system of government. The country consists of six geographic zones and 36 states, as well as the Federal Capital Territory (Abuja) (Nigeria Demographic and Health Survey 2009). There are 774 local government areas and 9,555 wards. There are three administrative levels of government, namely, the Federal Government, the State Government and the Local Government (FMOH, Nigeria 2008).

1.5.3.4 Tanzania

The government of the Republic of Tanzania is a unitary republic made up of the union Government and Zanzibar Revolutionary Government. Tanzania is divided into 26 regions, five on the semi-autonomous islands of Zanzibar, and 21 on the Mainland in the former Tangayika. The nation has a unique administrative structure as it was formed out of the union of two sovereign states of Tankagayika and Zanzibar (Nyirabu 2002).

1.5.4 Education

1.5.4.1 Ethiopia

Ethiopia has a literacy level of 29.8% among the adult population aged between 15 years and above (Index Mundi 2008). The literate adult male population is 50%, while that of females is 35% (Care 2012), indicating a dominant male literacy. Public spending on education constitutes 4.7% of GDP (The World Bank 2010c).

Such a low level of literacy may not enhance IEC programme implementation, hence much effort will need to be put into public health education campaigns.

1.5.4.2 Ghana

Among Ghana's adult population aged between 15 years and above, the literacy rate is 66.6% (Index Mundi 2009). Youth (15-24 years) literacy rates are 78.9% for females (Index Mundi 2009; The World Bank 2010b) and 81.1% for males (Index Mundi 2009), while public spending on education constitutes 5.5% of GDP (The World Bank 2010c). The level of literacy appears to be quite

encouraging, and could serve as an opportunity to pursue IEC programme implementation, although there is room for improvement.

1.5.4.3 Nigeria

In Nigeria, the level of adult (aged 15 and above) literacy is 60.8% (Index Mundi 2009), with the youth female and male (aged 15-24) literacy rate being 65.3% (Index Mundi 2009; The World Bank 2010b) and 78.1% (Index Mundi 2009) respectively. The percentage of public spending on education is 2.3% of GDP and 14.3% of the total expenditure of the three tiers of government (as at 1998) (Hinchliffe 2002).¹ Adult literacy is yet to reach its desirable level, while the current level of government expenditure on public education is difficult to determine due to lack of evidence.

1.5.4.4 Tanzania

Tanzania has an adult literacy rate of 72.9% among ages between 15 and above (Index Mundi 2009). Youth female and male (15-24 years) literacy rates are 76.4% (Index Mundi 2009; The World Bank 2010b) and 78.5% (Index Mundi 2009) respectively, exceeding the overall level of adult literacy. The percentage of public spending on education is 6.2% of GDP (The World Bank 2010c). The evidence shows quite an encouraging level of literacy. This must serve as a good ground to embark on IEC programme implementation.

1.5.5 Language, Ethnicity and Religion

1.5.5.1 Ethiopia

Ethiopia is an English speaking country. Major ethnic and linguistic groups are: Oromo, 34.5%; Amara, 26.9%; Somalie, 6.2%; Tigaway, 6.1%; Sidama, 4%; Guragie, 2.5%; Welaita, 2.3%; Hadiya, 1.7%; Affar, 1.7%; Gomo, 1.5%; Gedeo, 1.3%; and other, 11.3% (Care 2012). This diversity implies the need to identify a language commonly spoken by many, in order to enhance health information dissemination. A formal education could be useful in this regard, using English as a common medium of expression.

¹ Recent World Bank data are not available on Nigeria (see World Bank Database)

Seventy-nine percent of Ethiopians are religious (Pew Research Centre 2010). Major religious groups are Orthodox Tewahedo Church, 43%; Muslim, 33.9%; Protestant, 18.6%; and Traditional, 2.6% (Care 2012).

1.5.5.2 Ghana

English is the official language of Ghana (Tabi et al. 2006). Over 100 languages are spoken in Ghana (Berry 1994; Ghana Webpage 2012; Ghana To Ghana 2012). These are drawn from two major language groups, namely, the Kwa and Gru, with the former made up of 75% of the Ghanaian population (Ghana Country Studies 2012).

The Kwa consists of the Akan (spoken by most Ghanaians), Ga-Adangbe and Ewe (Berry 1994; Ghana To Ghana 2012). The Akan group consists of the Asante, Fante, Akwapem, Akyem, Akwamu, Ahanta, Bono, Nzema, Kwahu and Sefwi (Dolphyne 1996; Ghana Country Studies 2012). The Ga-Adangbe comprises Ga, Adangbe, Ada and Krobo or Kholi. The Ewe group involves Nkonya, Lobga, Sontrokofie, Lolobi and Likpe (Berry 1994; Ghana To Ghana 2012). The Gru comprises the Gruma, Grusi and Mole-Dabgane (Berry 1994). Health information dissemination is enhanced by the fact that most Ghanians understand and speak Asante, in addition to their individual languages.

Eighty-eight per cent of Ghanaians are religious (Pew Research Centre 2010). The main religious groups are Christians, Muslims and Traditionalist (Berry 1994; Jaman North District Profile 2010; News From Africa 2012). Christians form the largest composition (69%); followed by Muslims (15.6%) (News From Africa 2012).

1.5.5.3 Nigeria

English is the official language of Nigeria (Foreign and Commonwealth Office 2012). However, Nigeria is a multilingual nation made up of over 400 linguistic groups (Online Nigeria 2012). The people of Nigeria are Yoruba, Hausa, Fulani, Igbo (Ene et al. 2010; Foreign and Commonwealth Office 2012; Online Nigeria 2012), Ijaw and some 250 ethnic linguistic groups (Foreign and Commonwealth Office 2012).

In Nigeria, religion, language and ethnicity are closely linked (Nations Encyclopaedia, Nigeria 2012). In terms of the major ethnic groups, Hausa is the most common language spoken in the northern states of Nigeria, which are predominantly Muslim (95% Muslims and 5% Christians) (Nigeria Demographic and Health Survey 2003; Online Nigeria 2012). The people of the western states of Lagos, Oyo, Osun, Ondo and Edo speak Yoruba. This state is 60% Christian, 20% Muslim, and 20% Traditional. The eastern and southern parts of Nigeria are 96% Christian. These are the states of Abia, Anambra, Akwa, Ibom, Cross River Delta, Enugu, Imo and Rivers with the primary language being Igbo (Online Nigeria 2012).

Eighty-seven percent of Nigerians are religious (Pew Research Centre 2010). Evidence shows that, overall, the Nigerian population is 50.4% Muslim, 48.2% Christian, and 1.4% other religions (Nigeria Demographic and Health Survey 2003).

1.5.5.4 Tanzania

The official languages spoken in Tanzania are English and Kiswahili/Swahili. However, English is the primary language of commerce, administration and higher education. Arabic (widely spoken in Zanzibar) and other languages are also spoken (Culture Crossing 2012). Major ethnic groups on Mainland, 99% African (99% Bantus, comprising over 130 tribes); with the other 1% made up of Asians, Europeans, and Arabs (Culture Crossing 2012). Since Swahili and Arabic are widely spoken in Tanzania, health information messages may be disseminated in these languages in addition to English whenever the need arises.

Ninety-three per cent of Tanzanians are religious (Pew Research Centre 2010). Major religions are Christianity and Islam across Mainland (Christian, 30%; Muslims, 35%) and Zanzibar (over 99% Muslim) (Culture Crossing 2012).

1.5.6 Health Profile and Healthcare Infrastructure

1.5.6.1 Ethiopia

i. Health Status and Malaria Burden

Evidence shows that from a very low baseline starting in 1990, the nation has made tremendous progress in improving her health outcomes. Ethiopia was considered among the worst performers in East Africa for mortality in the under five year old age group. However, this has improved rapidly, overtaking neighbouring Sudan, Tanzania and Uganda (Balabanova et al. 2011). Evidence also shows that between 2004 and 2008 the percentage of births with a skilled attendant present doubled, while the percentage of women receiving antenatal care and of infants fully immunised increased by over 50%. There has also been a decline in malaria related deaths due to early diagnoses, scaling up of treatment and prevention education (Balabanova et al. 2011).

However, life expectancy is relatively low at birth – 56.56 years (male: 53.99 years; female: 59.21 years) (Index Mundi 2010); maternal mortality rate is 470/100,000, while infant mortality rate is 104/1000 live births (WHO World Health Statistics 2011). Malaria is the leading communicable disease. With regards to malaria disease burden, Ethiopia is epidemic prone. Thus, malaria transmission is seasonal and predominantly unstable (Negash et al 2005; Senay and Viridin 2006; FMOH, Ethiopia 2006). The major malaria transmission (limited to areas at risk of malaria, including Oromia, the region under study) follows the June-September rains occurring between September and December. On the other hand, minor transmission season occurs in April-May following the February-March rains (FMOH, Ethiopia 2006). Factors contributing to malaria in Ethiopia are complex and combinatorial. These involve malaria, its consequences, coverage of preventive services and general poverty (Adugna 2010). A malaria indicator survey (MIS) reported that Oromia (the study region) was lagging behind the country's other regional states in key malaria intervention indicators such as ITNs utilisation (FMOH, Ethiopia 2008; PMI Ethiopia 2010).

ii. Access to Healthcare

National health policy aims at strengthening a decentralised system. Primary health care (PHC) is designed to include preventive, promotive and basic curative and rehabilitative services. Implementation of health service extension is aimed at training and deploying health extension workers (HEWs) to be assigned to serve a population of 5,000 with two HEWs. In order to improve access to healthcare infrastructure and malaria prevention and control, Ethiopia pursues promotion of intersectoral involvement – private sector, civil society and non-governmental organisations (NGOs) (FMOH, Ethiopia 2006; PMI Ethiopia 2010, 2011). Health partners include: USAID; United States Communicable Disease Control Unit (CDC); US President Malaria Initiative (PMI); The World Bank; UNICEF; World Health Organisation; Engender Health; JHPIEGO; Department for International Development (DfID); Integrae; Global Alliance for Vaccines and Immunisation (GAVI); Health Promotion and Nutrition-Donor Group (HPN); and Catholic Relief Services (CRS) (see for example, FMOH, Ethiopia 2006; The World Bank 2008; CRS 2012; PMI Ethiopia 2010,2011; USAID Ethiopia 2012).

The share of overall health expenditure from external sources has grown considerably, largely due to the involvement of the international community (Balabanova et al. 2011). For instance, donor funding has enabled Ethiopia to develop participatory and data driven planning systems at district level feeding into the national plan (Balabanova et al. 2011). Behaviour change communication (BCC) or information, education and communication (IEC) activities in Ethiopia aim at increasing adherence to and use of malaria and HIV/AIDS interventions (Kidane and Morrow 2000; Balabanova et al. 2011; USAID Ethiopia 2012).

An IEC programme called the model family programme has been introduced in Oromia in order to encourage families and households to adhere to positive behavioural practices related to malaria prevention through the help of trained health extension workers and volunteers. In this regard, families are helped to improve their knowledge about malaria prevention actions, and are assisted to carry out specific actions that prevent malaria. Health extension workers and volunteers visit households, using flipcharts, posters, and scorecards

developed by C-Change as they give information on malaria prevention and control. The scorecards (into which core malaria control messages are incorporated) help families chart their own progress, as it guides them step-by-step in carrying out specific actions. This earns them stickers, and everybody recognises them as adherents. This has resulted in increased positive health seeking behaviours (PMI Ethiopia 2011; C-Change 2012; USAID Ethiopia 2012).

A randomised controlled trial conducted in Ethiopia suggests that teaching mothers to promptly provide antimalarials to their children has made a great impact by reducing infant mortality (see Sub-section 1.3.2). However, further studies are required on a wider scale to authenticate this outcome. Home visits by health extension workers and a score card designed to motivate families has encouraged adherence. However, the key challenges seem to be budgetary constraints, given the vastness of Ethiopia, on community-based health education campaigns and other equally competing health programmes. Other key challenges are cultural and religious beliefs; low literacy level; and poverty.

1.5.6.2 Ghana

i. Health Status and Malaria Burden

In Ghana life expectancy at birth is 61.45 years (male: 60.22 years; female: 62.73 years) (CIA World Factbook 2012). Maternal and infant mortality rates are 350/100,000 and 103/1000 live births respectively (WHO World Health Statistics 2011). The percentage of pregnant women receiving antenatal care is 90.1% as of 2008 (96% being the highest so far recorded in 2007) (Index Mundi 2012). Malaria is hyperendemic across Ghana, with the entire population at risk. The transmission of malaria occurs all year-round with seasonal variations during the rainy season. Malaria is the number one cause of all OPD cases, accounting for 32.5% of all OPD attendances (GHS 2012), 36% of all admissions and 33% of all deaths in children under five years (GHS 2007; PMI Ghana 2010).

ii. Access to Healthcare

The health system in Ghana and for that matter malaria control is managed according to the administrative set up described earlier (see sub-section 1.5.3.2). Each of the 10 administrative regions has a regional director of health services (RDHS) supported by the regional health management team (RHMT). Each region has a regional hospital, and every district has a district hospital. At the district level, the district health service is managed by the district director of health services (DDHS) (Ackon 2001). Below the district level are health centres and CHPS compounds² (Jaman North District Profile Report 2010). This structure runs parallel with the teaching hospitals, with three teaching hospitals (GHS Facts and Figures 2009), which fall directly under the Ministry of Health (Maloreh-Nyamekye 2005), while efforts at converting some of the regional hospitals are ongoing. There are also private and mission hospitals complementing government effort (CHAG 2010; Jaman North District Profile Report 2010).

As of 2008, there were 3,110 health facilities in Ghana. This includes: 3 teaching hospitals; 9 regional hospitals; and 3 psychiatric hospitals. Other health facilities involve district and other hospitals (mission, 57; quasi government, 48; private, 135; polyclinics, 18); health centres and clinics (mission, 148; government, 1,081; quasi government, 18; private, 366); and maternity homes (private, 318; government, 795) (GHS Facts and Figures 2009).

Access to healthcare in rural settings remains relatively poor. For example, only about 5% of Ghanaians have access to community health nurses through the innovative community-based health planning and services (CHPS) policy (PMI Ghana 2010). Within and around the Sampa community (where faith-based organisations were recruited), there is an inadequate number of functional health activities in the district. The ones that are available are described as poorly equipped. The service providers involve public, private, religious and traditional practitioners. There is only one government hospital in the district based at Sampa. This is often overstretched as it serves the health

² A CHPS Compound is a health post established in accordance with the CHPS policy in order to increase access.

needs of residents and nationals from adjoining towns of the neighbouring country (La Côte d'Ivoire) (Jaman North District Profile Report 2010).

Although efforts have been made to improve access to health service delivery in the Sampa district, patronage of facilities has been low due to poverty, illiteracy and ignorance. Following the introduction of the National Health Insurance Scheme (NHIS), it is hoped that people, especially the poor, will take advantage of it to access health care delivery (Jaman North District Profile Report 2010). However, like other parts of Ghana, pregnant women are exempt from paying fees during antenatal visits. Apart from access, staff shortage at the health facilities is considered to be a problem in the district. Most of the health facilities are manned largely by nurses. There is only one medical doctor for the whole district, managing the Sampa Government Hospital, resulting in a very low doctor patient ratio of 1:89,762 (Jaman North District Profile Report 2010).

As part of efforts towards increasing access, a major recent development in Ghana has been the introduction of the National Health Insurance Scheme (NHIS), initially implemented in 2006. By July 2008, 50% of the population had been enrolled, resulting in increased attendance at health facilities (PMI Ghana 2010). A recent case study at the Ridge Regional Hospital in Accra, which focused on the role of the NHIS from user and provider perspectives shows that the scheme is making a great contribution towards utilisation of health services at the facility level in Ghana (Opoku 2012). The implementing agency for the National Malaria Control Programme is the Ghana Health Service. Primary interventions include: intermittent preventive treatment (IPTp) for pregnant women; scaling-up vector control measures with emphasis on universal ITN coverage; targeted indoor residual spraying (IRS) application in selected areas; and early diagnosis with prompt and effective treatment of malaria using artemisinin-based combination therapy (ACT) (GHS 2007,2009; PMI Ghana 2010). The provision of quality maternal health services is a high priority (GHS 2009).

The media infrastructure in Ghana is relatively developed. This includes a national TV coverage, over 100 small radio stations which together cover most of the country, and print media with a few national level publications. The level of malaria awareness among the general population is considered fairly high, while many misconceptions about malaria and malaria interventions persist (PMI Ghana 2011). IEC activities are pursued as part of routine healthcare interventions (GMAG 2007; GHS Facts and Figures 2009; Ayi et al. 2010; Pfizer 2010). For example, health education officers are posted to every region (GHS Facts and Figures 2009). A study by Ayi et al. (2010) in Southern Ghana has shown that engaging children as health messengers can result in a significant improvement in the misperception that malaria has multiple causes. In this case the authors suggest a participatory approach to health education intervention to decrease malaria prevalence among children (please see Chapter 6, sub-section 6.2.11). As a result of public awareness campaigns on radio, and through community meetings, families are learning the facts of malaria and the reasons why utilising local healthcare is critical (Pfizer 2010). Consequently, malaria prevention among pregnant women is progressing. Latest evidence from Multiple Cluster Survey, released by Ghana Statistical Service in the Ghanaian Times, shows that about two-thirds (67.1%) of pregnant women received, at least, two doses of IPTp for malaria as compared to the 27.5% in 2006 (Markwei 2012).

The involvement of health partners has contributed significantly to healthcare infrastructure and health system strengthening. For instance, preliminary 2008 DHS data suggests that the malaria burden is on the decline, which has been attributed to a substantial injection of funding from the Global Fund and other sources in Ghana, leading to improved health intervention (PMI Ghana 2010). Key health partners include: The World Bank; USAID; JHPIEGO; US President Malaria Initiative (PMI); US Communicable Disease Control Unit (CDC); The Global Fund⁴; UNICEF; UNFPA; World Health Organisation; European Union (EU); DANIDA; Christian Health Association of Ghana (CHAG); Pfizer; and Ghana Social Marketing Foundation (GSMF) (see for example, Maloreh-Nyamekye 2005; CHAG 2010; PMI Ghana 2010, 2011; Pfizer 2010; The World Bank 2008).

To sum up, it may be noted that the expansion in the media landscape in Ghana, coupled with continuous provision of routine community and hospital-based health education campaigns by the health ministry and its agencies, has resulted in increased knowledge and awareness about malaria and its consequences and the need to seek medical care. It has been shown that, by engaging children as messengers, they can play a key role in significantly improving the misperception about malaria. The introduction of the NHIS has also encouraged utilisation of health services and IEC programmes. However, some of the the major challenges have been the withdrawal of the donor pool fund (*personal communication by Dr Addai Donkoh and Mr Mustapha Adam Hamid of the Ghana Health Service*); how to sustain donor support; how to break long held cultural and religious beliefs; and deal with poverty. In this regard, appropriate IEC strategies are advocated.

1.5.6.3 Nigeria

i. Health Status and Malaria Burden

Life expectancy at birth among Nigerians is 52.05 years (male: 48.95 years; female: 55.33 years (CIA World Factbook 2012). Maternal mortality rate is 840/100,000, while infant mortality rate is 138/1000 live births (WHO World Health Statistics 2011). The percentage of women receiving antenatal care is 60%, while the percentage of deliveries by health professionals is 36.3% (FMOH, Nigeria 2008). Uneke et al. (2008) have described Nigeria's health system as being in a poor state due to such factors as gross underfunding and shortage of skilled medical personnel at the primary health care level.

Nigeria has a suitable climate for malaria transmission across the country, with the exception of the area south of Jos Plateau state, where some mountains peak at 1,600 metres. Settlements lying between 1,200 and 1,400 metres can be considered low or very low risk (FMOH, Nigeria 2008).

ii. Access to Healthcare

Data from a number of surveys conducted between 1999 and 2001 give the following estimates for the number of public sector healthcare facilities: 53 tertiary and specialised hospitals, giving a population to facility ratio of 2.1 million people per hospital; 855 secondary health facilities in the 36 states and

federal capital tertiary, giving a population to facility ratio of 135,000 people per facility; 13,000 PHC facilities with a population to facility ratio of 5,500 people per facility; and the population to facility ratio of PHC centres is 24,000 people per centre. These tend to provide higher level services than PHC facilities (FMOH, Nigeria 2008). The private healthcare system consists of formal tertiary, secondary, PHC health facilities and pharmacies as well as informal pertinent medicine vendors (PMV) and drug sellers. The private sector comprising not-for-profit and for-profit health facilities provides health care for a substantial proportion of the population (FMOH, Nigeria 2008).

Sixty-four percent of the population is within 20km from a hospital. Urban areas are better served as 78% of households are within 20km of a hospital compared to 58% in rural areas. Seventy-one percent of households are within 5km of a PHC facility. Again, urban areas are better served as only 66% have similar access in rural areas. Thirty-nine percent of households live in communities visited by a community health worker (CHW) at least once a month. The average is similar in urban areas (43%) as in rural areas (38%). Sixty percent of households live within a distance from a pharmacy or PMV (FMOH, Nigeria 2008).

The 2009-2013 malaria control strategic plan preparatory process involves adoption of a top down and bottom up approach with greater emphasis on the latter, as well as consultative meetings with RBM Partners, stakeholders, states and local government agencies (FMOH, Nigeria 2008). This strategic plan aspired to achieve at least 80% of pregnant women sleeping under ITNs by 2010 and sustained coverage until 2013, with all pregnant women attending ANC receiving at least 2 doses of IPTp by 2013 (FMOH, Nigeria 2008).

IEC activities are an integral part of routine health service delivery in Nigeria (RBM Secretariat/FMOH Nigeria 2004; WHO/UNICEF 2006; Akinleye et al. 2009). The goal of the Roll Back Malaria (RBM) behaviour change communication (BCC) Strategy in Nigeria is to attain a coordinated national response for BCC programming addressing malaria prevention, control, and treatment that ensures coherent, uniform, and evidence-based interventions

from all stakeholders. The strategy addresses three priority problems: case management, intermittent preventive treatment, and insecticide treated net. Evidence suggests that different approaches need to be applied in different geopolitical zones of Nigeria, due to differences in circumstances. For example, evidence shows that the following community channels are very effective for message dissemination in the south-east: women August meetings and new yam festivals. Women's groups such as CBOs and NGOs are considered good channels to reach women on health and development issues (RBM Secretariat/FMOH Nigeria 2004).

With regards to the northern states, it is advised that generally men should be strategically targeted for a successful campaign. In this regard it is suggested that communication strategy should take cognisance of peculiarity. Men are reported to have tremendous control and influence on women's attitude, behaviours and practice in the north. Islamiya schools are said to be very relevant in the north and have a very captive audience. Targeting the teachers in these institutions for information dissemination, it is suggested, would be very useful for increased coverage and acceptability of messages. Men and women community health promoters are said to be successful when they adopt gender appropriate approaches to BCC. For instance, it is more acceptable for female community health promoters to go door to door in the community, while male community health promoters are more accepted and effective in speaking at public gatherings, such as religious services, ceremonies and markets. It is recommended that there is the need to pay special attention to states in the Sahel region because the people living in that zone are more prone to malaria epidemics at some periods of the year (RBM Secretariat/FMOH Nigeria 2004).

Available evidence suggests that local influences on behaviour and message development should be given particular attention in the course of developing communication interventions. This includes language, locally available resources, customs, traditions and religion (RBM Secretariat/FMOH Nigeria 2004). It has been noted that available and credible media sources may vary from community to community and zone to zone, and that what is needed is coordination and standardisation of messages and procedures as well as

integration between BCC efforts and overall RBM programming. For example, evidence suggests that the creation of demand should be linked with availability of the products, such as appropriate drugs, and that policies need to be developed that ensure access to the services being promoted (RBM Secretariat/FMOH Nigeria 2004). Evidence on evaluation of the above appears to be lacking. However, on the issue of access, Akinleye et al. (2009) has reported that even where there were antenatal care facilities, some women living close-by failed to enrol. This issue was earlier reported by Brieger et al. (1994) (also see Chapter 6, Section 6.4), implying the need for intensification of health education campaigns.

Currently, the injection of funds into the malaria controlled programme in Nigeria through the Global Fund against AIDS, tuberculosis and malaria has seen financial investment being made in IEC implementation programmes. For instance, according to the Federal Nigeria National Malaria Controlled Programme (NMCP) (2013), in a bid to achieve the objectives of the fund, key planned activities include implementation of appropriate advocacy, media and IEC/BCC activities in selected states on ITN usage, and disease management using ACTs and IPTp. These include posters, billboards, and radio/TV jingles. This is based on identification of some IEC challenges. For instance, in the implementation of phase 1 of the global fund grant, a key lesson learnt relates to weak IEC/behaviour change communication strategy, calling for strengthening of the strategy aimed at making a maximum impact.

Nigeria owes its infrastructural and system development success to the contribution of health partners. Major health partners include: US President Malaria Initiative (PMI); USAID; US Communicable Disease Control Unit (CDC); The World Bank (for example, The World Bank Malaria Booster Project); World Health Organisation; UNICEF; Global Fund as well as key domestic stakeholders (RBM Secretariat/FMOH Nigeria 2004; FMOH, Nigeria 2008; WHO/UNICEF 2006; The World Bank/IDA 2009; PMI Nigeria 2011).

The idea of investing in IEC programmes is encouraging as it seeks to address the weakness of current IEC strategies. However, the impact of this current intervention is yet to be seen. Other challenges that require attention include:

how to source adequate funding for health care infrastructure to serve the nation's large population; poverty and long held cultural and traditional beliefs, which need to be addressed using appropriate IEC strategies.

1.5.6.4 Tanzania

i. Health Status and Malaria Burden

In Tanzania, life expectancy is 53.14 years (male: 51.62 years; female: 54.7 years) (CIA World Factbook 2012). Maternal and infant mortality rates are 790/100,000 and 108/1000 live births respectively (WHO World Health Statistics 2011).

Malaria is one of the major causes of morbidity and mortality. It is estimated that malaria costs Tanzania more than US\$240 million annually in lost GDP (Makundi et al. 2007). Every year 14-18 million new cases are reported, leading to 120,000 deaths. Malaria is the leading cause of outpatients, inpatients and admissions of children under five years at health facilities (MOH, Tanzania 2003; Makundi et al. 2007; Mboera et al. 2007).

ii. Access to Healthcare

The distribution of health facilities has received major attention as over 70% of the population lives in rural areas (Mubyazi et al. 2005; Index Mundi 2010; MOH, Tanzania 2012). The structure of health services at various levels in Tanzania are: village health service (the lowest level of health service delivery); dispensary (the second stage of health services); health centre services (expected to cater for 50,000); district hospital (each district is supposed to have a district hospital as it is a very important level in health service provision); regional hospital (every region is supposed to have a regional hospital); referral/consultant hospitals (the highest level of hospital services); and treatment abroad (utilised where facilities and equipment are not locally available) (MOH, Tanzania 2012).

Available evidence suggests that there are 4 consultant/specialised hospitals; 17 regional hospitals; 55 district hospitals; 2 other hospitals; 409 health centres; 2,450 dispensaries; 75 specialised clinics; 18 private laboratories; and 5 private x-ray units, in addition to a number of parastatals,

voluntary/religious, private and other forms of health service delivery (MOH Tanzania 2012). In order to improve healthcare and ensure health system strengthening, including malaria control, a number of health partners have been involved. For instance, the Ministry of Health and Social Welfare/National Malaria Control Programme (MOHSW/NMCP) has mobilised its partners. These include: the Medical Stores Department; the Tanzania Food and Drug Authority; Population Services International (PSI); Africare and Plan International; Ifakara Health Research Centre; Global Fund³; and US President Malaria Initiative (IHRDC 2005; CDC-Malaria Worldwide 2012; MOH, Tanzania 2012).

The National Malaria Control programme campaign aims at improving malaria treatment and awareness through multimedia such as TV, radio, posters and music. IEC activities aim at raising awareness among the public, especially encouraging vulnerable groups (for example, pregnant women and children under age five) to seek early treatment for malaria, correct malaria treatment using the new ACTs, as well as complete the full three-day treatment. The campaign uses multimedia tools such as audio, video and public service announcements (PSAs). These are aired on TV and radio as well as through mobile video units throughout Tanzania (MOH, Tanzania 2012).

Regarding the Mainland of Tanzania, surveys have shown that although knowledge about malaria appears to be high, access and use is much lower. Due to inadequate staffing, the MOHSW Health Promotion Unit's capacity to implement IEC programmes has been described as weak. Thus, effort is limited to reviewing BCC messages/materials to ensure accuracy and coordination. The National Malaria Control Programme Unit has developed a National Communications Strategy yet to be disseminated (PMI Tanzania 2011). However, evidence shows that there is a significant improvement with regards to the impact of IEC programmes at the household level as far as knowledge and self-efficacy measures are concerned (PMI Tanzania 2011). For example, according to the 2009 Communicating Malaria in Tanzania (COMMIT) community survey, the percentage of people who believed they could hang a

³ The Global Fund aims at fighting AIDS, Tuberculosis, and Malaria

mosquito bed net increased from 60% in 2008 to 80% in 2010 (PMI Tanzania 2011).

On the other hand, Zanzibar is said to have a good acceptance and use of all malaria interventions. For example, evidence shows that IRS coverage has remained at 90%, while ITN coverage increased from 72% in 2007 to 76% in 2010. However, it is reported that other indicators such as ITN use for children and pregnant women, IPTp II coverage, use of antimalarials to treat fever and early seeking behaviour assumed a downward trend between 2007 and 2008 (PMI Tanzania 2011). This has been attributed to the fact that IEC programmes have been fragmented and ad hoc, focusing on selective interventions (PMI Tanzania 2011).

In short, although some effort has been made in IEC programme implementation in Tanzania, there remains a lot to be done, since the current effort has been described as weak and fragmented. There is the need for poverty reduction, increase in access and utilisation of health services, as well as the recruitment of more staff. Tanzania also needs to move from merely developing IEC programme materials to actual implementation.

1.5.7 Similarities, Differences and challenges for IEC

Table 1.1 and the ensuing exposition outline some of the key similarities and differences between these countries. In terms of similarities, all the participating countries have elected governments with relative political stability. In comparing similarities and differences among these countries, a number of factors have been considered, namely: geography and demography; political/administrative set up; economy; education; language; ethnicity and religion; health profile and healthcare infrastructure (access to healthcare; maternal and infant mortality; malaria burden and key interventions); and cultural beliefs and practices related to malaria (see Table 1.1).

In addition, all the countries involved consider malaria as a burden of public health importance and conform to the Roll Back Malaria programme launched in April 2000 in Abuja, Nigeria. Maternal and infant mortality rates are also

high in all the study countries (WHO World Health Statistics 2006). Moreover, all four countries are confronted with challenges of poverty and problems of access to health care, most especially in rural settings compared to urban areas (The World Bank 2008; Uneke et al. 2008; Jaman North District Profile Report 2010). Finally, regarding healthcare, key interventions common to all the countries are insecticide-treated nets (ITNs), indoor residual spraying (IRS), case management and IEC/ (BCC).

Table 1.1 Background of Participating Countries

Country and region	Population (Millions)	Cultural beliefs and practices related to malaria	Political	Economy (% below poverty line)	Education (literacy rate /% of gov't spending)	Language, ethnicity & religion	Access to healthcare	Maternal Mortality (per 100,000)	Infant mortality (per 1000)	Malaria burden	Key interventions
Ethiopia, East Africa	91.2	Strong cultural beliefs	Elected gov't. (Federal)	44%	29.8%/25.4%	Multilingual, multiethnic and multi-religious	Poor access (rural settings)	470	104	Epidemic prone (Low Transmission)	ITN;IRS; case Management IEC/BCC
Ghana, West Africa	24.7	Strong cultural beliefs	Elected gov't. (unitary)	28.5%	66.6%/24.4%	Multilingual, multiethnic and multireligious	Poor access (rural settings)	350	103	Hyper endemic (High Transmission)	IPTp; ITN; IRS; case management & IEC/BCC
Nigeria, West Africa	170.1	Strong cultural beliefs	Elected gov't. (Federal)	54.7%	60.8%/14.8%	Multilingual, multiethnic and multireligious	Poor access (rural settings)	840	138	Hyper endemic (High Transmission)	IPTp; ITN; IRS; case management ;& IEC/BCC
Tanzania, East Africa	46.9	Very strong cultural beliefs	Elected gov't. (unitary)	35.7%	72.9%/18.3%	Multilingual, multiethnic and multireligious	Poor access (rural settings)	790	108	Hyper endemic (High Transmission)	IPTp; ITN; IRS; case management & IEC/BCC

NB: African average: Maternal Mortality ratio – 910; Infant mortality ratio -100 (WHO World Health Statistics 2006). The figures highlighted in **bold print** represent WHO World Health Statistics (2011). For education, the figures at the top and bottom represent literacy rate and level of government spending respectively. The degree of cultural beliefs and practices related to malaria appears to be closely linked with religious beliefs and practices of the study countries. As will be seen later, all the study countries are multi-religious.

In terms of differences, Nigeria is the most populous country among all the countries. The differences in population density may have implications for demand in health resources, including malaria prevention and control, most especially Nigeria and Ethiopia. The major implications may be financial, human and material resource constraints regarding the implementation of IEC programmes.

While Ghana (GHS 2007, 2009; PMI Ghana 2010, 2011), Nigeria (RBM Secretariat/FMOH, Nigeria 2004 ; FMOH, Nigeria 2008) and Tanzania (Mboera et al. 2007; PMI Tanzania 2010) are located in high malaria transmission areas (stable malaria), Ethiopia is generally epidemic prone (low transmission area/unstable malaria) (Negash et al. 2005; FMOH, Ethiopia 2006, 2008; PMI Ethiopia 2010, 2011) because of high altitude (see Figure 1.1 in Chapter 1). This situation makes pregnant women less immune to mosquito bites (FMOH, Ethiopia 2006, 2008; PMI, Ethiopia 2010). Due to the fact that Ethiopia is largely located in an epidemic area, the policy of intermittent preventive treatment has been deemphasised, as there is no justification for its implementation in low transmission areas (WHO 2004). Rather, major emphasis has been placed on ITN use, use of indoor residual spraying (IRS), case management and epidemic response using early warning systems (Senay & Verdin 2005; FMOH, Ethiopia 2006, 2008; PMI, Ethiopia 2010). On the other hand, Ghana, Nigeria and Tanzania have IPTp policies with similar strategic objectives drawn from The Abuja Declaration (2000).

According to WHO World Health Statistics (2006) Tanzania had the highest maternal mortality rate (1,500/100,000) as at 2006. However, by 2011, this figure had drastically reduced to 790/100,000 ahead of Nigeria, which witnessed an upward trend from 800/100,000 to 840/100,000 within the same period (WHO World Health Statistics 2011). On the other hand, Ghana maintains the lowest level of maternal mortality rate, from 540/100,000 in 2006 to 350/100,000 in 2011. With regards to infant mortality, Ghana saw the highest rate of increase from 68/1000 in 2006 to 103/1000 in 2011, while Nigeria has the highest infant mortality rate of 138/1000 (WHO World Health Statistics 2011). It is difficult to assign clear reasons for these trends, since all the study countries have been making frantic efforts in terms of health care

delivery. However, country circumstances differ. The figures point to the need for more investment in IEC programme implementation programmes with a view to improving the health status of affected countries. While Ghana and Nigeria are within West Africa, Tanzania and Ethiopia are within the eastern part of Africa, indicating a geographical spread of participating countries. Due to geographical spread there will be some cultural differences among African countries. As a result of the vastness and population density of Nigeria and Ethiopia, there could be a great challenge in deploying resources to embark on community-based educational campaigns, compared to Ghana and Tanzania.

The study countries have a range of cultural beliefs and practices related to malaria which may be similar. There may also be similarities across cultures. However, determining all distinctive variations for the purpose of transcultural healthcare would be difficult, if not impossible (Bryt et al. 2007). Bryt et al. (2007) and Thompson (2003) suggest that managing cultural diversity has the merit of ensuring that individuals' differences are positively valued and affirmed, with due regard given to individuals' common humanity. Healthcare professionals such as nurses, midwives, health extension workers, volunteers and other professionals engaged in health promotion and health education are therefore encouraged to be culturally sensitive as well as respect cultural diversity of individuals (such as pregnant women) and communities (Lester & Glasby 2006; Bryt et al. 2007).

In terms of indigenous beliefs about malaria, while there is a general belief that malaria is caused by mosquito bites, there is also belief in other causes such as being in an 'intensive sun'; hard work; exposure to the cold; a lack of food during the fasting season and unhygienic practices; witchcraft and other spiritual forces (Agyepong 1992; Muela et al. 1998; Helman 2000, 2007; Pell et al. 2011; Adongo et al. 2005; Makundi et al. 2006). Leininger (1985), in her Sunrise model posits that, with regards to healthcare, diverse expressions, meanings, and action patterns exist in relation to different cultures, and that at the same time, there are commonalities (universalities) across cultures. The Sunrise model conveys different meanings in different cultures, which may be determined by examining individuals' and group's view of the world, social structure, language, values, beliefs, norms and life practices that are learned,

shared, and handed down from generation to generation (Leininger 1985,1991). Long held cultural beliefs and practices may therefore not be changed over night. Appropriate IEC strategies are required.

Thus, the author argues that inasmuch as there are similarities across Ethiopia, Ghana, Nigeria and Tanzania, there are also some differences regarding cultural beliefs and practices about malaria. For instance, different terminologies regarding malaria have been used. Indeed, even within same cultures, there may be different terminologies among subcultures. For example, in Ghana, within the Akan ethnic group (for example, Ashanti, Bono and Fante), malaria is referred to as *ebunu* and *atridi* (Ahorlu et al 1997; Maslove et al. 2009). In the Sampa community in the Brong-Ahafo Region of Ghana, malaria is traditionally referred to as *kabro and somaya* by the Nafana and the Jula ethnic groups respectively, although these ethnic groups live alongside Akan groups. Within the Ga-Adangbe tribe in southern Ghana, malaria fever is called *asra* (Agyepong 1992), whilst in other southern parts of Ghana it may be referred to as *asraku* (Ahorlu et al 1997; Maslove et al. 2009). In Ethiopia, malaria may be referred to as *busa* (Maslove et al. 2009); while in Nigeria several names such as *zazzabi* (Akogun & John 2005; Maslove et al. 2009), *iba* (Falade 2006; Maslove et al. 2009) and *iba losan* (Falade et al 2006; Maslove et al. 2009) may be associated with malaria. Similarly, in Tanzania, malaria has a variety of terminologies. These include *degedege* (Makemba et al. 1996; Muela et al. 2002; Comoro et al. 2003; Maslove et al. 2009); and *homa ya kowaida* (Makemba et al. 1996; Maslove et al. 2009); *homa ya malaria* (Comoro et al. 2003; Maslove et al. 2009). In Tanzania, the indigenes may draw a distinction between 'natural malaria' and 'unnatural malaria'. The former is considered easily treatable, whereas the latter is said to be caused by spirits or witchcraft (*uchawi*) and is considered more difficult to treat (Helman 2000, 2007). In a study, 73% of mothers believed the 'unnatural malaria' or 'fake malaria' could be caused by witchcraft, while 62% believed that witches had an ability to render the mosquito parasites invisible, thereby making laboratory test unable to detect the disease (Helman 2000).

The belief in witchcraft is widespread across Africa, although the level of belief varies from country to country (Pew Research Centre 2010). According to Pew

Research Centre (2010), Tanzania has the highest (93%) level of belief in witchcraft in Africa, followed by Cameroon (78%) compared to only 27% in Kenya, 29% in Uganda, and 37% in Nigeria. Furthermore, all study countries are religious and believe in superstition (Pew Research Centre 2010), and may therefore seek spiritual interventions for malaria control. These beliefs partly explain why some pregnant women may fail to attend the clinic, but rather seek alternative healthcare provided by the traditional health practitioner or the traditional birth attendant (WHO/USAID/ACCESS 2008). IEC programme managers and health education officers therefore need to package IEC messages in such a way (using a combination of IEC strategies) as to break long held beliefs (see Chapters 4, 6 and 8).

In short, an overview of cultural beliefs and practices in the countries surveyed shows that different languages and terminologies may be used to describe malaria, its symptoms and its causes. Therefore, there may be general belief in the efficacy and effectiveness of alternative medicine. There could also be differences within the same cultures. So, care must be taken in malaria control information dissemination among pregnant women of diverse linguistic and ethnic backgrounds.

Finally, the exposition shows that all the four study countries are multilingual, coupled with the fact that literacy level is still low, most especially in Ethiopia. This poses a health educational challenge for healthcare professionals, since malaria control messages need to be packaged in order to communicate effectively with pregnant women.

The above comparisons may have implications for the packaging and dissemination of malaria control messages to pregnant women. In other words, health sector ministries, health service agencies, IEC programme managers and health education officers need to recognise inter-country and intra-country similarities and differences if their goal is to make an impact among pregnant women. This recognition may be achieved by being culturally sensitive amidst cultural diversity and homogeneity at individual and community levels, both within and across different countries in Africa. Reaching every home with malaria control messages remains a daunting task,

especially in Nigeria and Ethiopia due to the factors detailed above. However, in Ethiopia, the use of health extension workers and volunteers seems to be promising in this regard.

1.6 Contribution to the Body of Knowledge

In light of the research aims and objectives, this study intends to make the following contributions to new knowledge:

- Identifying IEC strategies aimed at malaria prevention and control during pregnancy;
- Identifying challenges confronting the implementation of IEC strategies in relation to uptake of intermittent preventive treatment and use of insecticide treated nets;
- Identifying key lessons and best practices to inform governments, policymakers, health partners, the academic community, public health directors, managers, frontline health workers, and health educators at both community and health facility levels;
- Developing an appropriate framework with a view to enhancing the understanding of issues surrounding the implementation of IEC strategies in malaria prevention and control among pregnant women in Africa; and
- Identifying areas for further research in information, education and communication in malaria prevention and control in general and malaria in pregnancy (MIP) in particular.

1.7 Organisation of Work

The thesis consists of eight chapters. Each of these chapters is described briefly as follows:

- **Chapter 1** provides a general background to the study.
- **Chapter 2** focuses on principles, theories and models underpinning information, education and communication strategies in relation to malaria prevention and control. An understanding of these will provide an insight into the discussion of key findings later in the thesis.

- **Chapter 3** is concerned with the research design and methodology. Following an exposition on the mixed method approach and its relevance to the study, the author breaks down the chapter into two phases. *Phase 1* deals with the systematic review of evidence across Africa. This section lays the foundation for the rest of the study as it identified the key variables, notably the IEC strategies and challenges, which were subsequently explored in *phase 2* through a contextually based follow-up evaluation of the outcomes of the systematic review using a survey approach. *Phase 2* provides more insight into the key issues identified in *phase 1* since the survey was based on country specific cases of opinion of respondents. The study countries in *phase 2* were Ethiopia, Ghana, Nigeria and Tanzania, involving health professionals and representatives of faith-based organisations.
- **Chapter 4** presents the findings, synthesis of evidence and conclusions of the systematic review. This chapter covers the number of studies identified, the type of studies, appraisal report, data extraction, analysis of findings, narrative synthesis, summary and conclusions. Three major issues are discussed, namely the quality of evidence; the IEC strategies; and the implementation challenges leading to conclusions paving the way for *phase 2* of the study.
- **Chapter 5** entails a detailed analysis of findings of the survey covering Ethiopia, Ghana, Nigeria and Tanzania. The analysis covers: the background information of respondents; subgroup analysis; opinions of respondents on rating and ranking of IEC strategies and implementation challenges; comments and recommendations by respondents; feasibility, appropriateness, meaningfulness and effectiveness of the strategies; IEC strategy implementation challenges; opinions on the impact of IEC strategies; and summary and conclusions.
- **Chapter 6** provides a general discussion across the key findings from *phase 1* and *phase 2*. Issues discussed involve evidence of impact of IEC strategies; key challenges; concerns about non-impact; and ways of

overcoming challenges. The chapter also considers the relationship between evidence and practice; the strategic importance of the strategies; and the strengths and limitations of methodological approaches involved, leading to summary and conclusions.

- **Chapter 7** focuses on the development of theoretical frameworks and applications. This emerged from the findings with a view to explaining issues related to the implementation of IEC strategies. The chapter identifies two key frameworks namely an IEC strategy implementation equation and an IEC programme monitoring and evaluation plan. The equation entails a formula which establishes a relationship between an IEC strategy implementation success and the impact of the strategies based on feasibility, appropriateness, meaningfulness and effectiveness in relation to implementation challenges.

- **Chapter 8** is the final chapter. It covers conclusions, implications, limitations and recommendations for future studies as well as strategies for the dissemination of findings. In drawing conclusions the original aims and objectives are revisited. The implications pertain to:
 - professional practice
 - the strategic importance of IEC strategies
 - the implementation of the strategies
 - client and community participation
 - IEC programme monitoring and evaluation
 - community-based planning and services (CHPS)
 - education and programme sustainability
 - the media and entertainment industry
 - government, policymakers and other key stakeholders
 - the academic community.

On the whole, the study makes a contribution to the body of knowledge in the areas of health service management and public health.

1.8 Summary and Conclusions

This chapter began by tracing the origin of the research idea, which signified the researcher's engagement with the research topic; and followed this with key assumptions, rationale for malaria in pregnancy and IEC, as well as statement of research aims and objectives. An overview of the background of the countries surveyed was made. This was followed by a description of the intended contributions of the study to new knowledge.

The chapter may be considered as a snapshot of the entire study in that it helps the reader to gain an overview from idea generation to the completion of the project (see Table 1.2).

Table 1.2 The Thesis at a Glance

<p>Chapter 1 Introduction and Research Context:</p> <p><i>Where am I coming from?</i></p>	<p>Chapter 2 Principles, Theories and Models:</p> <p><i>What are the underpinnings?</i></p>	<p>Chapter 3 Research Design and Methodology:</p> <ul style="list-style-type: none"> • <i>How was the research designed?</i> • <i>How were data collected and analysed?</i> 	<p>Chapter 4 Findings of Systematic Review:</p> <ul style="list-style-type: none"> • <i>What did I find?</i> • <i>How did I make sense of it?</i>
<p>Chapter 5 Primary Data Analysis and Interpretation:</p> <ul style="list-style-type: none"> • <i>How did I analyse the primary data?</i> • <i>What did the data say?</i> 	<p>Chapter 6 Discussion:</p> <p><i>What did I do with the key findings?</i></p>	<p>Chapter 7 Applying Framework for Implementation, Monitoring and Evaluation:</p> <p><i>What frameworks can help provide an understanding of issues related to the implementation of IEC Strategies?</i></p>	<p>Chapter 8 Conclusions, Implications, Limitations and Recommendations:</p> <ul style="list-style-type: none"> • <i>So what?</i> • <i>What are the key messages?</i>

Chapter 2

Relevant Principles, Theories and Models of IEC

2.1 Introduction

This chapter serves as an extension to the general background discussed in the first chapter. It also provides a conceptual understanding of issues related to effective information, education and communication (IEC) strategies for subsequent chapters. Thus, the chapter is not presented as a traditional form of literature review since the study begins with a systematic review of evidence.

IEC strategies may help pregnant women to prevent disease and to improve and maintain health. In particular, it may improve the wellbeing of the pregnant woman and the unborn baby through knowledge acquisition regarding malaria, its prevention and control resulting in behavioural change. In order to appreciate the impact of IEC strategies with regards to malaria prevention and control during pregnancy, there is the need to consider the theories, models and principles underpinning any interventions. Well designed and targeted interventions have a higher likelihood of being effective if they are theory-based; for instance, if the IEC interventions draw upon a theoretical underpinning of established determinants of behaviour and behavioural change (Fishbein 2000; Panther-Brick et al. 2006). It is suggested that interventions should also present satisfactory evidence with regards to the links between psychosocial or behavioural change and actual health impact (Curtis et al. 2001; Glasgow et al. 2004; Panther-Bricks et al. 2006). It has therefore been concluded that

“a successful intervention might be more replicated if the underlying theoretical models, modes of delivery and evidence for effectiveness were more explicitly described”

(Panther-Bricks et al. 2006, p.2811)

For this reason, this chapter focuses on examining these principles, theories, and models, as well as their application to this study.

IEC is a generic term applied in the field of public health to demonstrate the role of information, education and communication to carry out public health education. Consequently, the World Health Organisation recognises IEC as a key intervention in relation to malaria control programmes in Africa (WHO 2009).

2.2 The Working Definition of IEC

According to Global Malaria Action Plan (GMAP) (2010, p.2),

“IEC is broadly defined as providing knowledge to enable individuals, families, groups, organisations and communities to play active roles in achieving, protecting and sustaining their own health”.

IEC is compared with behaviour change communication (BCC), another related concept. The Global Malaria Action Plan 2010 (p.2) notes that

“BCC includes the basic components of IEC, but starts with a focus on the key individual and group behaviours to be changed and employs a wider range of interventions beyond cognitive-based, knowledge transfer”.

Another related concept is social change, which is said to involve a more participatory way of engaging communities that focuses more on what is termed ‘client-identified end actions’ in relation to health intervention. In relation to IEC, the GMAP further suggests that communication programmes need to provide a combination of message delivery as well as other behavioural interventions and opportunities geared towards dialogue, shared learning and consensus-building to produce results (Global Malaria Action Plan 2010).

Thus, IEC may overlap with other concepts. In order to avoid confusion, the author identified and used one of the most comprehensive definitions of IEC which embraces all the above in one way or the other. Thus, this study defines

the scope of the study by adopting the definition offered by the Ministry of Health and Child Welfare/Zimbabwe National Family Planning Council as follows:

“Information, Education and Communication (IEC) in health programmes aims to increase awareness, change attitudes and bring about a change in specific behaviours. IEC means sharing information and ideas in a way that is culturally sensitive and acceptable to the community, using appropriate channels, messages and methods. It is therefore broader than developing health education materials, because it includes the process of communication and building social networks for communicating information.

IEC interventions should involve the active participation of the target audience and adopt channels, methods and techniques that are familiar to their world view. Information, education and communication is an important tool in health promotion for creating supportive environments and strengthening community action, in addition to playing an important role in changing behaviour.”

(Ministry of Health and Child Welfare/Zimbabwe National Family Planning Council 1998, p.5)

It should be noted that ‘IEC’ is now considered a recognised term and forms part of the approach to health promotion (see for example, Ministry of Health and Child Welfare/Zimbabwe National Family Planning Council 1998; Minja et al. 2001). The elements of ‘IEC’ signify its relevance. Cognisant of its importance, the World Health Organisation and all public health sector organisations within the WHO/African Region recognise ‘IEC’ as one of the important interventions of malaria prevention and control. Thus, WHO/African countries are expected to consider ‘IEC’ in the development of malaria control strategic and operational plans (for example, RBM Secretariat/FMOH, Nigeria 2004; MOH, Uganda 2005; Somalia Aid Coordinating Body 2006; FMOH, Ethiopia 2006; Ghana Malaria Advocacy Guide [GMAG] 2007; FMOH, Nigeria 2008) and malaria control programme evaluation reports (for example, MOH, Kenya 2005; FMOH, Ethiopia 2008; WHO 2009).

In short, the key elements of IEC are:

- Provision of knowledge
- Awareness creation

- Changing attitudes and specific behaviours
- Sharing information and ideas
- Active participation of target audience
- Adoption of channels, methods and techniques related to the world view (cultural context) of a target group
- Creating supportive environment
- Strengthening community action (social networks).

The above elements of IEC may be explained by learning principles, theories and models since pregnant women may be regarded as the learners within the context of this study. A focus on learning is based on the principle that pregnant women require specific key messages from health professionals in their capacity as health educators regarding malaria, its prevention and control in pregnancy. However, it must be noted that pregnant women are not passive recipients of messages on malaria. They have their own knowledge and experiences which may be brought to bear on the learning situation. Therefore, their role as adult learners requires that information and ideas are shared in such a way as to engage them as active participants within a suitable learning environment (Rogers 2002, 2003). This is aimed at changing attitudes and behaviours in such a way as to bring about positive pregnancy related outcomes. These issues are explained by four learning orientations advanced by Smith (1999).

2.3 Review and Applications of Learning Orientations

For the purpose of this study, the underpinning theories of education will be classified in accordance with Smith's (1999) framework of orientation to learning, building on the work of Merriam and Caffarella's (1991). According to Smith (1999) four different orientations of learning theories may be identified as follows: (1) The behaviourist orientation to learning; (2) The cognitive orientation to learning; (3) The humanistic orientation to learning; and (4) The social/situational orientation to learning.

Smith (1999) acknowledges the fact that in terms of categorisation further additions and sub-divisions may be made. In presenting the above-named learning orientations Smith (1999) has considered a number of aspects in his framework. These are: (1) learning theorists; (2) view of the learning process; (3) locus of learning; (4) purpose in education; (5) educator's role; and (6) manifestations in adult learning (see Table 2.1, followed by discussions).

In its original form, Merriam and Caffarella (1991) used the terms 'teacher's role', while in their current version of the framework, they have used the terms 'instructor's role' (see Merriam et al. 2007). The author holds that the terms 'teaching' and 'instruction' mean the same thing and that both are more related to pedagogy rather than andragogy (adult self-directed learning) (for example, see Daines et al. 1992; Rogers 2003; Nicklin & Kenworthy 2000; Quinn & Hughes 2007). Therefore, for the purpose of disseminating malaria control messages to pregnant women, the author is of the view that the term 'educator's role' is most appropriate, as it also connotes an andragogic meaning, whereby the pregnant woman is expected to be an active participant in the learning process.

2.3.1 View of the Learning Process

Behaviourists' (for example, Thorndike, Pavlov, Watson, Guthrie, Hull, Tolman, and Skinner) view of the learning process focuses on behavioural change as the main outcome of learning (Merriam & Caffarella 1991; Smith 1999; Rogers 2003; Merriam et al. 2007). This means that people will exhibit new behaviours with regards to the way they do things. In relation to this study, pregnant women, for example, upon learning about the importance of intermittent preventive treatment in relation to malaria prevention may respond favourably to attendance at antenatal care at the right time, ensure that they take the right dose of IPTp-SP at the right time, and may no longer attribute malaria illness to witchcraft (if that is what they perceive the cause of malaria to be) (Agyepong 1992; Helman 2000, 2007; Makundi et al. 2006; Johns Hopkins Bloomberg School of Public Health 2008b).

Table 2.1 Four Orientations to Learning

Aspect	Behaviourist	Cognitivist	Humanist	Social and situational
Learning Theorists	Thorndike, Pavlov, Watson, Guthrie, Hull, Tolman, Skinner	Koffka, Kohler, Lewin, Piaget, Ausubel, Bruner, Gagne	Maslow, Rogers	Bandura, Lave and Wenger, Salomon
View of the learning process	Change in behaviour	Internal mental process, including insight, information processing, memory and perception	A personal act to fulfil potential	Interaction/observation in social contexts. Movement from the periphery to the centre of a community of practice
Locus of learning	Stimuli in external environment	Internal cognitive structuring	Affective and cognitive needs	Learning is in relationship between people and environment
Purpose in education	Produce behavioural change in a desired direction	Develop capacity and skills to learn better	Become self-actualised and autonomous	Full participation in communities of practice and utilisation
Educator's role	Arranges environment to elicit a desired response	Structures content of learning activity	Facilitates development of the whole person	Works to establish communities of practice in which conversation and participation can occur
Manifestations in adult learning	Behavioural objectives Competency-based education Skills development and training	<ul style="list-style-type: none"> • Cognitive development • Intelligence, learning and memory as functions of age • Learning how to learn 	<ul style="list-style-type: none"> • Andragogy • Self-directed learning 	<ul style="list-style-type: none"> • Socialisation • Social participation • Associationalism • conversation

Source: Adapted from Smith (1999, p.5-6)

According to cognitivists' (for example, Koffka, Kohler, Lewin, Piaget, Ausubel, Bruner, and Gagne) perspective of learning (Merriam & Caffarella 1991; Smith 1999; Merriam et al. 2007), pregnant women may for example, experience internal mental process with regards to the information learned about intermittent preventive treatment, use of insecticide-treated nets, the cause of malaria illness, and the consequences of malaria in pregnancy. The learner may have to rely on a variety of information sources such as face-to-face health talks during antenatal care, distribution of information leaflets, listening to radio or television talk shows. Pregnant women may learn through personal interaction with other pregnant women within their community (for example, church women's fellowship, Moslem women's groups, association of market women), who had benefited from intermittent preventive treatment with positive pregnancy related outcomes. This aspect of learning falls within the domain of the social and situational orientation (Merriam & Caffarella 1991; Smith 1999; Merriam et al. 2007).

2.3.2 Locus of Learning

From the above, it may be considered in this case, that learning may result from the effect of stimuli within the external environment. This environment may either be a health care setting (for example, antenatal clinic) characterised by the influence of health workers such as nurses and midwives; or community, characterised by the influence of public health visitors, community health workers and volunteers. With regards to internal cognitive structuring, pregnant women may form their own patterns of ideas, depending upon how information is received. This process of cognitive structuring is made easier if, for example, familiar symbols are used to illustrate the effect of the mosquito parasite on human health (Ghosh et al. 2006; Tilson 2007). Moreover, educating pregnant women on the importance of mosquito nets may reinforce the idea of malaria prevention. Here, pregnant women may be taught on net treatment (Panther-Bricks et al. 2006; WHO 2006), so they can do it themselves with minimal guidance.

However, according to humanistic educators (such as Maslow and Rogers) what they may need to facilitate the learning process are the involvement of the affective (feelings, motivation, self awareness, empathy, social skills) and

cognitive apparatus (ability to process information mentally) (Merriam & Caffarella 1991; Smith 1999; Rogers 2002, 2003; Merriam et al. 2007). From the perspective of social and situational orientated theorists (such as Bandura, Lave and Wenger, and Salomon), the pregnant woman's learning may be enhanced by social interaction, which may provide an opportunity for them to consolidate ideas gathered (Merriam & Caffarella 1991; Smith 1999; Merriam et al. 2007) for example, from antenatal clinics. From this perspective it may be suggested that the better the relationship between people and the environment the better the learning outcomes, provided the relevant structures and systems to support the learning process exist.

2.3.3 Purpose in Health Education

In accordance with Smith's (1999) learning orientation framework, there may be variations in the purpose of education as applied to malaria prevention and control in pregnancy. According to the theory of behaviourism the purpose of education is to produce behavioural change in a desired direction (Merriam & Caffarella 1991; Smith 1999; Merriam et al. 2007). With regards to pregnant women's learning involvement in malaria prevention and control, the purpose of education from the standpoint of behaviourists is to encourage pregnant woman to adhere to regular antenatal clinic attendance; adhere to the uptake of all the required doses of sulphadoxine-pyrimethamine (SP) at the right time in respect of intermittent preventive treatment (IPTp); and to sleep under an insecticide-treated net (ITN) every night. For instance, within the western context, Whitworth and Dowswell (2009) in a systematic review of evidence of four trials involving 2,300 participants, sought to assess the effectiveness of routine pre-pregnancy health promotion for improving pregnancy outcomes when compared with no pre-pregnancy care or usual care. The interventions ranged from brief advice through to education in health and lifestyle over several sessions. The study shows that there was some evidence that health promotion interventions were associated with positive maternal behavioural change. The authors, however, observed that there was little evidence on the effects of pre-pregnancy health promotion and suggest that further research is required. It was therefore concluded that

"there is currently insufficient evidence to recommend the widespread implementation of routine pre-pregnancy health promotion for women of childbearing age, either in the general population or between pregnancies"

(Whitworth & Dowswell 2009, p.1)

In a related behavioural study, Wilkinson et al. (2010) evaluated the effectiveness of a woman-held pregnancy record (called the pregnancy pocket note book) concerned with improving health behaviours important for maternal and infant health. The pregnancy pocket note book was designed as a woman-focused preventive approach to pregnancy health based on antenatal management guidelines, behavioural change evidence and health formative research with the target population and health service providers. The study found that the use of a pocket note book resulted in a significant proportion of pregnant women quitting smoking. Referring to pre-term birth education, Wright et al. (2010), however, had a different opinion, holding the view that among other things, behavioural interventions are not always able to facilitate adherence. Thus, the ability of a given IEC strategy to bring about behavioural change is debatable.

In relation to health education, cognitivists, on the other hand, focus on the pregnant woman developing capacity and skills to learn better. For instance, pregnant women may be able to develop the capacity to learn about all relevant information with regards to malaria prevention. From the cognitive perspective, the work of Wilkinson et al. (2010) shows that about two-thirds of women in the pregnancy pocket note book clinic recalled receiving the information. The authors suggest the need to refocus antenatal care toward primary prevention as an avenue for the provision of essential health information and behavioural change tools aimed at consistently improving maternal and infant health. This proposition is in line with the primary health care approach as pregnant women will be able to receive relevant health messages through community health education campaigns before they begin their antenatal care visits, thereby facilitating the process of IEC intervention in healthcare facilities.

Humanistic educators consider issues of the individual becoming self-actualised and autonomous (Merriam & Caffarella 1991; Smith 1999; Merriam et al. 2007). Self-actualisation and autonomy in this case may involve the woman's ability to deal with minor ailments such as simple malaria (as opposed to complex malaria) at household level (WHO 2005a), as well as having power to take decisions affecting her health, without undue interference. Thus, humanistic theorists may be interested in pregnant women taking full control of their learning in relation to malaria prevention and control. In the case of social and situational theorists, full participation in community activities and utilisation of resources are the main focus (Merriam & Caffarella 1991; Smith 1999; Merriam et al. 2007). In this case social and situational theorists may be interested in pregnant women getting fully engaged in all community health related activities, so they can take full advantage of the local resources at their disposal in dealing with malaria related matters. For instance, if the woman attends church, she should be able to take active part in all health related activities, including malaria prevention and control designed by the church for pregnant women.

2.3.4 Health Educator's Role

Delivering multiple, complex messages to promote maternal and newborn health has been considered a challenge (McPherson 2010). Using flipchart and a pictorial booklet distributed to clients, McPherson (2010) noted that this challenge was addressed through training of female community health volunteers to counsel pregnant women and their families in the Terai region of Nepal. Thus, the role of health educators may be facilitated by their being given prior training in order to be effective. Recognising the role of educators, Tighe (2010) suggests that antenatal education should include facilitator classes, the information and preparation received as well as the social aspect of meeting other pregnant women. A number of theories may explain the role health educators play in delivering health messages.

The role of the health educator, from the behaviourist perspective, includes arranging the environment to elicit desired response (Smith 1999). This may include being respectful and polite, listening and paying attention to any particular learning concerns, recognising and respecting beliefs, values and

perceptions of the pregnant woman (see the health belief model in Figure 2.2). These approaches may also be considered as humanistic, according to Carl Rogers' student-centred approach to learning (Quinn & Hughes 2007). This view has been amplified in the work of Quinn and Hughes (2007), who note that Rogers' approaches emphasise

“relevance, student participation and involvement, self-evaluation and the absence of threat in the classroom. Rogers saw the teacher as a facilitator of learning, a provider of resources for learning, and someone who shares feelings and knowledge with the students” (p.24).

In developing countries, such as those in Africa, health education during ANC often takes place in a group situation (IHRDC 2005). In such a learning environment, the influence of outspoken women could intimidate other attendees if not held in check. Therefore, health educators should make the effort to avoid non-outspoken women being overshadowed. According to Smith (1999) cognitive learning theorists focus on structures and content of learning activity. In this regard, malaria control information should be presented in such a way as to make it very appealing to the learner to internalise. This could be achieved by the provision of pictorial booklets (McPherson et al. 2010) or a pocket book (Wilkinson et al. 2010). However, pictures in the booklet must relate to the learner's cultural context in order to make them meaningful. The use of a pocket book seems to be only relevant to literate societies, and should therefore be recommended for use by literate pregnant women. In a situation where pregnant women are illiterate, use of pictorial booklets may be a more suitable option.

Humanistic educators believe in facilitating development of the whole person. This means pregnant women should for example, be taught on early recognition of signs and symptoms of malaria; how to deal with simple malaria at the household level, including care of their children (home-based care) (WHO 2005a); and regularly attending antenatal clinics without being coerced to do so. These prevent malaria becoming a complex health problem to handle at the hospital level. According to the social and situational perspective, educator's roles include working to establish communities of practice in which conversation and participation can occur. In this regard, the learner is not

considered a passive participant, but as an active participant whose contribution in the learning situation goes a long way to achieving desired outcomes (Daines et al. 1992, 1993).

In such a situation, the educator is seen as a facilitator rather than a teacher (Daines et al. 1992, 1993; Jarvis 2006). An example of this social and situational learning orientation is reported by McPherson et al. (2010). These authors report that pregnant women were encouraged to discuss booklet content with their families. Thus, the aim of distribution of the booklet by health educators was to promote discussion among pregnant women and members of their household (McPherson et al. 2010). This practice may also help family members, including spouses and in-laws to appreciate what pregnant women experience (McPherson et al. 2010). McPherson et al. suggest that in order to produce desirable effects, health educators should simplify the content and number of messages before being scaled-up. This simplicity of packaging health messages may enhance cognitive and behavioural learning outcomes in particular.

Senanayake et al. (2010) also share the above view. The support of this view of simplifying health education messages was based on findings of their study conducted in Sri Lanka, investigating the effect of educational interventions on the efficacy of routine antenatal iron supplementation. In their study of two groups (study group and a control group), Senanayake et al. (2010) concluded that a simple health education message improved the efficacy of iron supplementation among the study group of pregnant women and not the control group. Thus, the simpler the education message the greater the learner's ability to process the message. However, the simplicity of a message may be meaningless, if it does not connect with the cultural and linguistic background of the target audience.

2.3.5 Manifestations in Adult Learning

From behavioural perspective, key objectives include pregnant women developing competency in managing home-base care, recognising when it becomes necessary to go to hospital, regular ANC attendance, adhering to all advice relevant to health care interventions designed for pregnant women,

especially in malaria prevention and control. From the cognitive point of view learners may be able to develop easier ways of grasping information on malaria prevention and control. As adult learners, the nature of their learning is self-directed (andragogic), since they may understand the essence of their learning; and may therefore put into practice what is learnt (Daines et al. 1992, 1993; Rogers 2002, 2003; Smith 1999). Finally, from the social and situational theorists perspective, the manifestations in adult learning include evidence of social participation (Smith 1999) such as celebration of African Malaria Day (MOH, Kenya 2005); taking part in community durbars and communal activities, including environmental sanitation often facilitated by community leaders, non-governmental organisations, faith-based organisations and community-based organisations. Such programmes are normally characterised by sensitisation through distribution of leaflets, T-Shirts, 'open air' cinema, route march, distribution of mosquito nets and others (WHO/UNICEF 2006; Baum & Marin 2008).

One key feature of manifestation of learning is the ability of the pregnant woman to identify her learning need. In a study in Ireland, which involved an exploration of attitudes of attenders and non-attenders towards antenatal education, mothers identified specific needs (Tighe 2010). These include the need for promotion and advertising antenatal education; the provision of postnatal education and peer mentoring, flexible availability of classes, and facilitators utilising the principles of adult learning to guide the classes. The role of fathers in attending antenatal classes was also considered important by mothers (Tighe 2010). These recommendations by mothers were to address barriers identified regarding attendance of antenatal education sessions. These included working night shifts, lack of interest, transportation difficulties, inflexible employer, and partner not attending antenatal classes (Tighe 2010). Some of these barriers may be applicable to the African context such as transportation difficulties and lack of co-operation from the spouse regarding antenatal education programme attendance (GCS 2003a, b; Mubyazi et al. 2005; Mbonye et al. 2006b).

In order to shed light on key aspects of issues related to malaria in pregnancy the Health Belief Model (HBM) may be used. An understanding of these issues

may be of help to health educators regarding IEC programme implementation among pregnant women. Although the HBM was developed for western cultures, the author is of the view that it has a universal appeal and is therefore relevant to the African context. It also takes into consideration demographic and personality factors applicable to issues of pregnant women. In a meta-analysis of 16 studies of the HBM with adults, it was noted that, among socio-psychological models of health-related behaviour, the model stood out as the most frequently cited and researched (Harrison et al. 1992). Harrison et al. (1992) also observed that the model has both intuitive and practical importance as far as the study of health behaviours is concerned. For these reasons, the next section focuses on the review of the HBM in relation to IEC in general and to malaria in pregnancy in particular.

2.4 The Health Belief Model (HBM)

The development of psychological models designed to enhance the effectiveness of health education programmes dates back to the 1950s by United States (US) public health researchers (Hochbaum 1958; Rosenstock 1966; Rosenstock 1974; Conner & Norman 2005). Such variables as socioeconomic status, gender, ethnicity and age were often associated with preventive health behaviours and use of health services (Conner & Norman 2005). Conner and Norman further note that

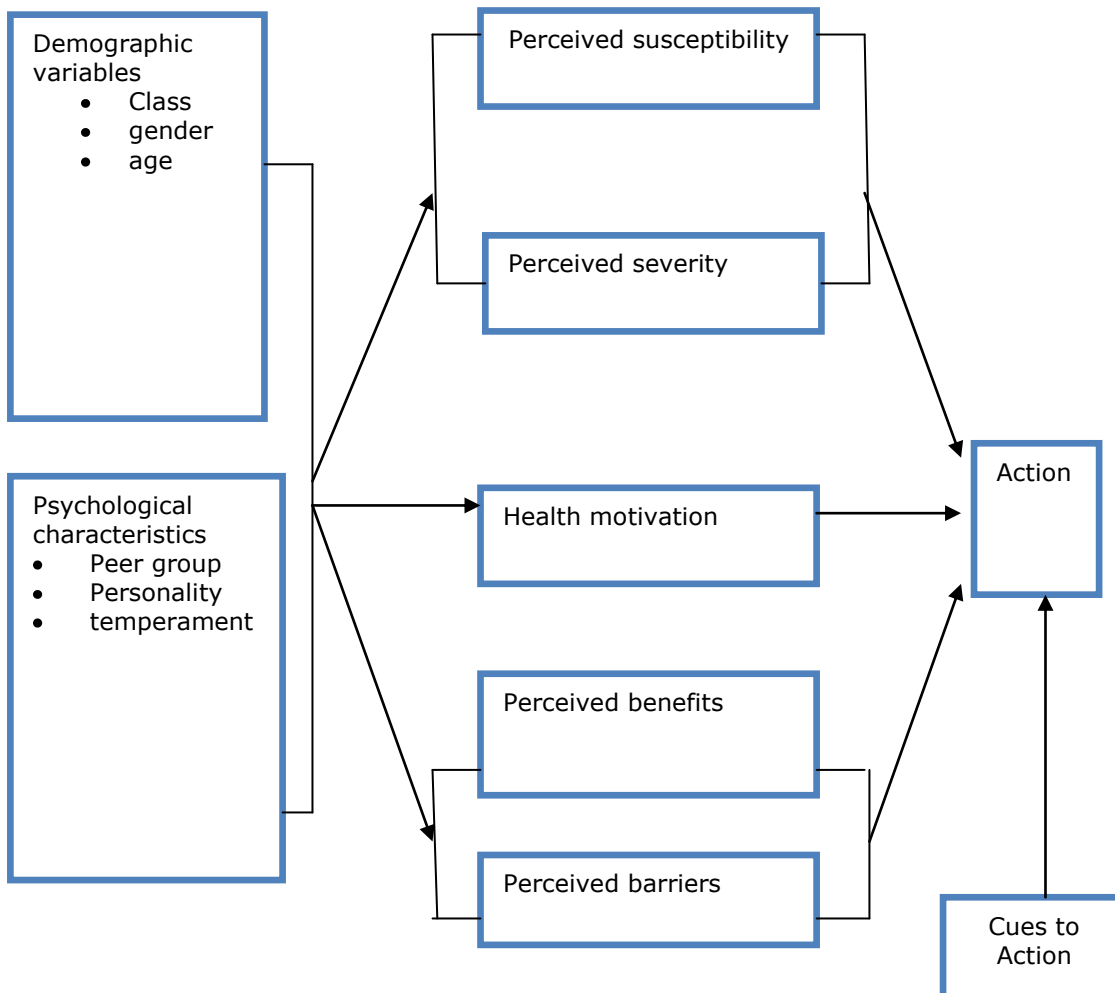
“effective health education was needed to target potentially modifiable individual characteristics which predicted preventive behaviour and health service usage and which, ideally, reflected differences in socialisation histories, indexed by demographic variables”

(Conner & Norman 2005, p.28)

The HBM (see Figure 2.1) was first developed to provide an explanation as to why people do not adopt preventive measures or attend screening (Sheeran & Abraham 1996; Furnham 1999). It has also been used to investigate issues of adherence with prescribed medication (Furnham 1999). Moreover, Croyle (2005) applied the model to develop a guide for health promotion for the national cancer institute of the United States. Furthermore, Elder et al. (1999) have applied the model in their paper entitled ‘theories and intervention approaches to health-behaviour change in primary health care’. Therefore, the

HBM could serve as a tool to enhance the understanding of issues related to IEC interventions. The key variables in the model can be applied to malaria and pregnancy.

Figure 2.1 The Health Belief Model



Source: Adapted from Furnham (1999, p.5)

Ribera et al. (2007) extend demographic variables in their treatment model of malaria in pregnancy (MIP). They have used the terms 'socio-cultural and demographic variables' and 'social context' with a view to enhancing knowledge and understanding of malaria control and antenatal care from a social science perspective. According to these authors, socio-cultural and demographic variables play an important role in distinguishing between different groups, based on age/age groups, number of pregnancies (for example, primigravidae, secundigravidae, and multigravidae), socio-economic status, marital status, religion and magico-religious beliefs, and ethnicity.

Ribera et al. (2007) note that the list presented is incomplete and that, depending upon the research setting, other socio-cultural and demographic variables may be relevant, for example, social class differences. Thus, the demographic variables in the model could be expanded to address behavioural health issues related to different contexts, including African countries.

In relation to antenatal clinic class attendance, social class differences have been widely documented by several authors in western cultures (see Townsend et al. 1990; Graham 1992; Davey et al. 1995; Cliff & Deer 1997). For instance, Cliff and Deer (1997) sought to investigate patterns of attendance and non-attendance at National Health Service (NHS) antenatal classes of first-time mothers in one of the cities of the United Kingdom. The study showed a clear hierarchy in terms of attendance and non-attendance based on social class; where middle class women were found to be the most regular attendees, closely followed by older, married, working class women. Overall, however, social class differences were accounted for by an overwhelming non-attendance rate among young, unmarried, working class women. Referring to the context of the United Kingdom, Cliff and Deer (1997) suggest that if midwives were to attract these young women, their fears and need for peer support would have to be recognised. Within the African context, a similar approach could be adopted to attract young pregnant women, mostly primiparae, who do not attend antenatal care regularly, or attend late, for fear of being ridiculed (Pell et al. 2011; Mbonye et al. 2006b).

In contrast to the above, a study conducted in Sweden has shown that primiparous women had higher attendance rate (93%), while the majority of multiparous women (81%) failed to attend (Fabian et al. 2004). The study found that factors associated with non-attendance among the primiparae were: having a native language other than Swedish; unemployment; smoking during pregnancy; and having had few antenatal check-ups. On the other hand, among the multiparae, the following factors were associated with non-attendance: being older than 35 years; low level of education; and pregnancy unplanned but welcomed. It was concluded that

“the childbirth and parenthood education programme reached the majority of pregnant women, and that non-attendees were more disadvantaged in terms of socio-demographic background and feelings about the approaching birth”

(Fabian et al. 2004, p.1)

To this end, Fabian et al. suggest that the non-attendees should be given special attention when they attended antenatal check-ups in order to ensure that childbirth and parenthood education were adopted to suit their specific needs. Therefore, utilisation of health services based on socio-demographic background is context specific.

Concerning psychological characteristics, it may be suggested that pregnant women are typically adult learners who have varied personality characteristics, temperaments, and different experiences and may belong to peer groups within their socio-economic and cultural milieu (Sheeran & Abraham 1996; Furnham 1999; Conner & Norman 2005; Helman 2007). According to social learning theory, peer group influence occurs through social interaction (Merriam & Caffarella 1991; Smith 1999; Merriam et al. 2007). Therefore, the health educator has a role in making use of these community dynamics in order to influence health seeking behaviour.

According to Furnham (1999), the HBM takes into consideration the patients' understanding of the risk associated with the disease, which depends on the way patients perceive the seriousness of the disease and how susceptible they see themselves to be – in this case, consequences of malaria infection in pregnancy. On the issue of perceived susceptibility, Ribera et al. (2007) point to two factors, namely the perceived propensity to develop clinical malaria due to idiosyncratic features of the person (for example, pregnant women, immune-compromised persons); and the perceived level of exposure (for example, living in places where malaria is associated with mosquitoes and rainfall) (Ribera et al. 2007). These authors also note that these factors necessarily lead to two research questions with regard to perceived susceptibility to malaria during pregnancy. These are: whether pregnant

women are considered particularly vulnerable to malaria; and when they are perceived to be more susceptible (related to seasonality or to risk activities).

Pregnant women, especially primigravidae are generally more susceptible to malaria infection compared to the general population of women (WHO 2002; WHO 2005a, b; Mbonye et al. 2006a; Somalia Aid Coordinating Body 2006; Lagerberg 2008). According to the HBM, the more people perceive themselves susceptible to a given health risk the more likely it is that they will take decisions towards its prevention (Furnham 1999; Nganda et al. 2004; Conner & Norman 2005; Mbonye et al. 2006b).

With reference to perceived severity, malaria is normally not perceived as severe, instead, a mild form of fever, or a self-limiting illness which does not demand immediate treatment (Mwenesi et al. 1995; Winch et al. 1996; Launiala & Kulmala 2006; Ribera et al. 2007). Studies should be directed towards the perceived severity of malaria for the mother, emphasising knowledge with regards to anaemia and maternal risk; the perceived severity of malaria for the foetus, the recognition of risk for miscarriage; and the perceived severity of the illness for the newborn. This includes the association of malaria with low birth weight and increased vulnerability to other illness (Ribera et al. 2007).

It may be argued that the more pregnant women are aware of the implications or consequences of malaria infection in pregnancy, the more they are likely to take actions or adhere to advice from the health educator (Nganda et al. 2004; Mbonye et al. 2006a). However, people may be aware of their health risk, but such awareness may not necessarily translate into positive action towards minimising or preventing such health risk due to other reasons such as lack of empowerment, long distance from health facility and staff attitude (Heggenhougen et al. 2003; Olson 2003; Mubyazi et al. 2005; Mbonye et al. 2006b).

The issue of health motivation as identified in the HBM is also considered. Following from the above discussion, it may be argued that there is no guarantee that a high awareness of consequences of malaria in pregnancy will

necessarily lead to healthier health seeking behaviours among women if they are not motivated to do so. To this end, the health educator needs to focus on motivating the learner in her process of learning; for example, by acknowledging, reinforcing and rewarding good learning behaviours (JHPIEGO 2008a).

In line with this, Buchman (1997) developed a ten-point approach for health professionals to motivate patients by increasing their self-esteem; self-efficacy and power (see Table 2.2).

Table 2.2 Buchman’s 10 Point Model

Step	Action
Step 1	“Make specific enquiries”
Step 2	“Demonstrate caring about the patient and their problems”
Step 3	“Encourage self-disclosure to gain insight and improve patient’s self-efficacy”
Step 4	“Determine patient’s knowledge”
Step 5	“Determine patient’s commitment to taking appropriate actions and as a result this establishes their existing self-efficacy”
Step 6	“Maintain an attitude of positive regard in order to empower patient”
Step 7	“Build a sense of self-responsibility in the patient in order to increase the chances of adherence”
Step 8	“Match the client’s needs and wishes”
Step 9	“Use selective positive feedback”
Step 10	“Attribute endorsed norms to a respected secondary group to encourage compliance”

Source: Adapted from Buchman (1997)

Buchman’s ten-point approach has been applied in different contexts. The model has been shown to improve adherence and compliance to health interventions. For example, Whitehead and Tones (1991) propose that interventions to improve empowerment and self-control should lead to the acquisition of decision-making skills, enhanced self-esteem and sense of personal control as well as the development of various social, health and life skills. In the context of the present study, Buchman’s approach may be useful to health educators as far as their relationship with pregnant women is

concerned, although there is no guarantee that motivating or rewarding pregnant women by increasing their self-esteem will necessarily lead to behavioural change. The framework may also serve as a motivational tool for health educators in providing knowledge and awareness towards behavioural change in relation to malaria prevention and control among pregnant women within the African context.

As regards perceived benefits, it may be suggested that if pregnant women perceive that the benefits of adhering to health advice outweigh non-adherence, they may be motivated to seek health intervention at a particular place and time. Knowledge about the benefits may either be acquired through community-based education campaigns (Olson 2003; Exchange 2005; Ali 2006; Somalia Aid Coordinating Body 2006; Mbonye et al. 2008) or health facility-based (Miafo et al. 2004; Nganda et al. 2004; van Eijk et al. 2004; IHRDC 2005; van Geertruyden et al. 2005; Mubyazi et al. 2005; Launiala & Kulmala 2006; Launiala & Honkasalo 2007; Owusu-Adjei et al. 2007; Mubyazi et al. 2008); or a combination of both (Nganda et al. 2004; IHRDC 2005; Tilson 2007). Pregnant women may learn through social networks, such as meeting with other women with similar experiences, either formal or informal meetings. Common places of meeting may include places of worship (either in the church or mosque, depending upon the person's religious inclinations); market places (Exchange 2005; Somalia Aid Coordinating Body 2006) or women conferences.

Concerning perceived barriers, a number of barriers to seeking health information and interventions, and for that matter, barriers to the implementation of IEC strategies, have been reported in the literature. These include long held beliefs, values and practices. Others include trust in other forms of healthcare other than orthodox medicine partly due to staff attitude and long waiting times (WHO/UNICEF 2003; Mubyazi et al. 2005; WHO 2005a; Johns Hopkins Bloomberg School of Public Health 2008a); poor access to health care due to such factors as long distance from the nearest health facilities (GCS 2003a; Mubyazi et al. 2005) ; poverty and powerlessness to take own decisions regarding health care decisions (Heggenhougen et al. 2003; Mbonye et al. 2005; Mboera et al. 2007)

The health belief model outlines the way clients or patients seek a balance between their perception of risk and the benefits associated with a particular course of action. Furnham (1999, p.4) argues that the

“likelihood that a particular behaviour will be adopted by patients is also influenced by specific cues to action – cues that trigger behaviour.”

One of these cues, according to Conner and Norman (2005) is health education. In effect, health education, together with the individual’s personal health motivation, determines the probability that a patient may adopt a particular course of action (Furnham 1999).

In the context of this study, this course of action may include for example, the pregnant woman understanding and adhering to the health educator’s advice on the need to regularly attend antenatal care to receive intermittent preventive treatment, as well as sleep under ITNs every night.

2.5 Communication in the Context of Health Information Delivery

Communication is an essential component of any public health education (Croyle 2005; WHO 2005a). It is deemed important as it helps one to understand the role of health educators in communicating information (a message) to pregnant women. Indeed, it may be argued that without communication, educators cannot perform their function in disseminating health information to a target audience.

Communication has been defined as the process of

“exchanging information, sharing ideas and knowledge”

(Ministry of Health and Child Welfare/Zimbabwe Family Planning Council 1998, p.6)

According to Chung (1987) the communication process is commonly defined as the process by which a person (the sender) transmits information (a

message) to another person (the receiver). Thus, information is an integral part of IEC. Without information the health educator has nothing to transmit. At this juncture, it may be argued that it is not enough to have information (a message) if the communication process is not appropriate. For the purpose of this study, the terms 'information' and 'message' are used to mean the same thing.

According to Croyle (2005, p.2051)

"communication theory explores 'who says what, in which channels, to whom, and with what effects.' It investigates how messages are created, transmitted, received, and assimilated. When applied to public health problems, the central question theories of communication seek to answer is, 'How do communication processes contribute to, or discourage, behaviour change?'"

In the light of the present study, IEC strategies need to identify the health educator (the person to deliver the message) and the audience to receive the message (pregnant women). It is also important to determine what channel the health educator is using; for example, whether it is face-to-face, radio, television or internet, bearing in mind the effect that the chosen channel will make regarding the message being delivered. In creating the messages, the health educator may have to use words, symbols and metaphors (Chung 1987; Boddy 2002) understood by the pregnant woman. For example, medical terminologies on malaria may have to be reduced to the understanding of the audience within a given cultural context (Launial & Kulmala 2006). In order to ensure that the message is assimilated there is the need to develop a feedback mechanism. This is only possible if the communication process is two-way in nature, whereby the health educator asks questions regarding the message shared as in the case of routine antenatal health education sessions. It is not possible to determine whether the message is understood or not if such a feedback mechanism is not in place. This is what happens when the communication process is one-way. Both one-way and two-way communication processes may be explained by two communication models. These are respectively S-M-C-R Model and the Convergence Model (Ministry of Health and Child Welfare/Zimbabwe Family Planning Council (1998). According to the S-M-C-R Model, (1) communication is said to have occurred when there

is a *Sender (S)*, a *Message (M)* to be sent, a *Channel (C)* for carrying the message, and a *Receiver (R)* of the message; (2) the message receiver ought to interpret the message in order to understand it correctly; (3) It is assumed that the purpose of communication is to bring about change in knowledge, attitude or behaviour of the 'receiver'.

It has been noted that the major weakness of this model is that it does not permit any real dialogue between the 'sender' and the 'receiver' and therefore cannot enhance communication effectiveness (Ministry of Health and Child Welfare/Zimbabwe National Family Planning Council 1998). Therefore, another communication model is required in order to enhance communication effectiveness. To this end, the convergence model has been suggested. The Convergence Model recognises that communication consists of a dialogue and the exchange of information and ideas to arrive at a shared understanding (Ministry of Health and Child Welfare/Zimbabwe National Family Planning Council 1998). According to the authors, the model also promotes the idea that individuals are active participants (as opposed to being passive) who bring their own experience to the process of communication (for example, experience of previous antenatal clinic attendance and child delivery), occurring over time, involving such activities as listening, reflection, expressing ideas and adapting feelings and behaviours (for example, during face-to-face interaction at health education sessions in a health unit). The authors argue that, theoretically, as more communication takes place, the area of mutual understanding increases. This perhaps stems from the view that both the educator and the audience get to know and understand each other at a personal level through face-to-face interactions.

In relation to the convergence model, the authors also present a number of underlying communication principles as follows:

- One selects what one sees
- One interprets selectively what one sees
- One chooses what can be remembered and what one wants to forget
- Words and meanings fall within a context and form part of relationship

- The process of communication occurs over time, and should therefore be considered a product (Ministry of Health and Child Welfare/Zimbabwe National Family Planning Council 1998).

In the context of this study, this means that in communicating with pregnant women, the health educator needs to bear the above principles in mind. For example, the educator should help the learner to select the most appropriate learning cues and symbols, and help them to remember the key messages by relating them to their cultural context and experience. At this juncture, it may be suggested that IEC programme managers and implementers must take these principles into consideration when designing IEC strategies.

2.5.1 Effective Communication

Communication may be classified as 'good' and 'effective' (Chung 1987). Communication is good when the sender's message is correctly understood by the receiver. On the other hand, it is considered

"effective only when the sender achieves an intended response from the receiver."

(Chung 1987, p.400)

Chung notes that the model shows the steps needed to be taken in order to communicate effectively. The process of communication fails if either the sender or the receiver fails to encode or decode the symbols of the message in the same way. One could also run into difficulties when the wrong communication channels are used; as in the case of transmitting a sensitive message that needs subtle interpretation as a written instruction without a chance of getting feedback (Boddy 2002). It is suggested that in order to ensure effective communication, one has to consider four factors. These are:

- perception (hearing a message, decoding and interpreting it)
- communication channels
- nonverbal signals (body language)
- listening (stop talking, putting speaker at ease, aiming to understand, being aware of personal prejudices, being alert to what the speaker is not saying, and asking questions appropriately) (Boddy 2002).

Although communication models were originally developed to suit the communication process in organisational contexts, they may be applicable in the context of the current research in a number of ways. In the first place, the health educator needs to see himself/herself as the sender in relation to the learner (the pregnant woman) with regards to information related to malaria prevention and control during pregnancy. On the other hand, the learner has to see herself as the receiver, who needs to make sense of the information (decoding and interpreting message). Secondly, in carrying out health education, the educator needs to decide which of the channels is most appropriate in order to achieve the most desirable learning outcome. Finally, knowledge of the communication process may help educators to know how to package their message, identify cues that may affect information delivery, and how to best engage the attention of the target audience.

2.6 IEC Programme Monitoring and Evaluation Model

Following the development of an IEC strategy and implementing it using various channels of communication, one needs to ensure that the strategy is implemented according to plan in order to achieve predetermined objectives. In other words, the author suggests that for IEC programme success and for that matter its impact to be guaranteed, there is the need to monitor and evaluate progress of work at regular intervals; hence the need for IEC programme monitoring and evaluation framework. Therefore, the purpose of this section is to review ways by which IEC programmes may be monitored and evaluated in order to ensure impact of the programme is recorded for future planning.

In evaluating health programmes different frameworks may be used. For instance, Wright et al. (1994) evaluated community care with regards to people with learning disability using inputs, processes and outcomes (intermediate and final outcomes). This framework may be compared with the World Health Organisation's general framework for monitoring home-based management of malaria (WHO 2005a) focusing on inputs, process, output, outcomes and impact (also see RBM Monitoring and Evaluation Reference Group [MERG] 2005; RBM Partnership 2009). While Wright et al.'s 'inputs' and

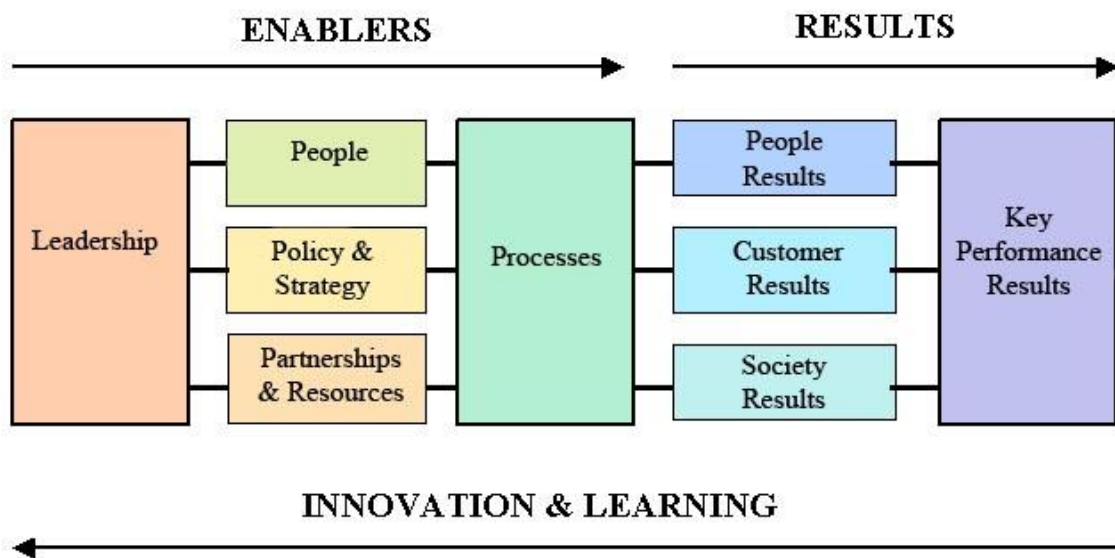
'processes' are similar to those of WHO 2005a, the 'output' and 'impact' aspects are missing. However, the 'output' component of WHO (2005a) seems to correspond to Wright et al.'s 'intermediate outcomes'; whereas Wright et al.'s 'final outcomes' correspond to the 'impact' components of WHO. The differences are probably due to the context and focus of evaluation. Since WHO's (2005a) framework involves communication in relation to malaria control, the issue of impact cannot be left out. It may however, be argued that in all cases of project evaluation there is the need to conduct impact assessment in order to identify the extent to which the long-term goals of the project or programme has been achieved. Perhaps the 'final outcomes' of Wright et al. (1994) may be considered as 'impact'.

Another framework for consideration is the European Foundation for Quality Management Excellence Model (EFQM) (The EFQM Model 1999, 2005). The model consists of enablers and results. According to this model, the enablers are those factors that help to achieve the results of organisational performance. On the other hand, the results are the outcomes of the effects of the enablers. These two concepts are then translated into nine variables namely, leadership, people, policy and strategy, partnership and resources and processes as enablers; and customer, people, society and key performance results. On the reverse side of the model are the concepts of learning and innovation which focus on key lessons emerging from the application of the enablers through achievement of results in organisations (see Figure 2.2).

Some similarities and overlaps with the other frameworks may be drawn. For example, the input and process indicators may be considered as enablers, whereas the outcomes and impact may be regarded as results identified in the EFQM Excellence Model. In all these frameworks, three distinct factors may be gleaned. These are: input or resource required to carry out an evaluation, the process involved and the outcome. From the perspective of quality management, these factors may be further reduced to enablers and results since the goal of programme monitoring and evaluation is to ensure quality improvement in accordance with predetermined objectives. For the purpose of this study emphasis will be laid on enablers defined as *input* (resources) and

process; and results defined as *impact* with the pregnant woman as the primary audience, with the recognition of any challenge that programme implementers may encounter. Currently, this aspect has been neglected in all the frameworks reviewed (see how this is addressed in Chapter 7, Section 7.7).

Figure 2.2 The EFQM Excellence Model



Source: The EFQM Excellence Model (1999, 2005)

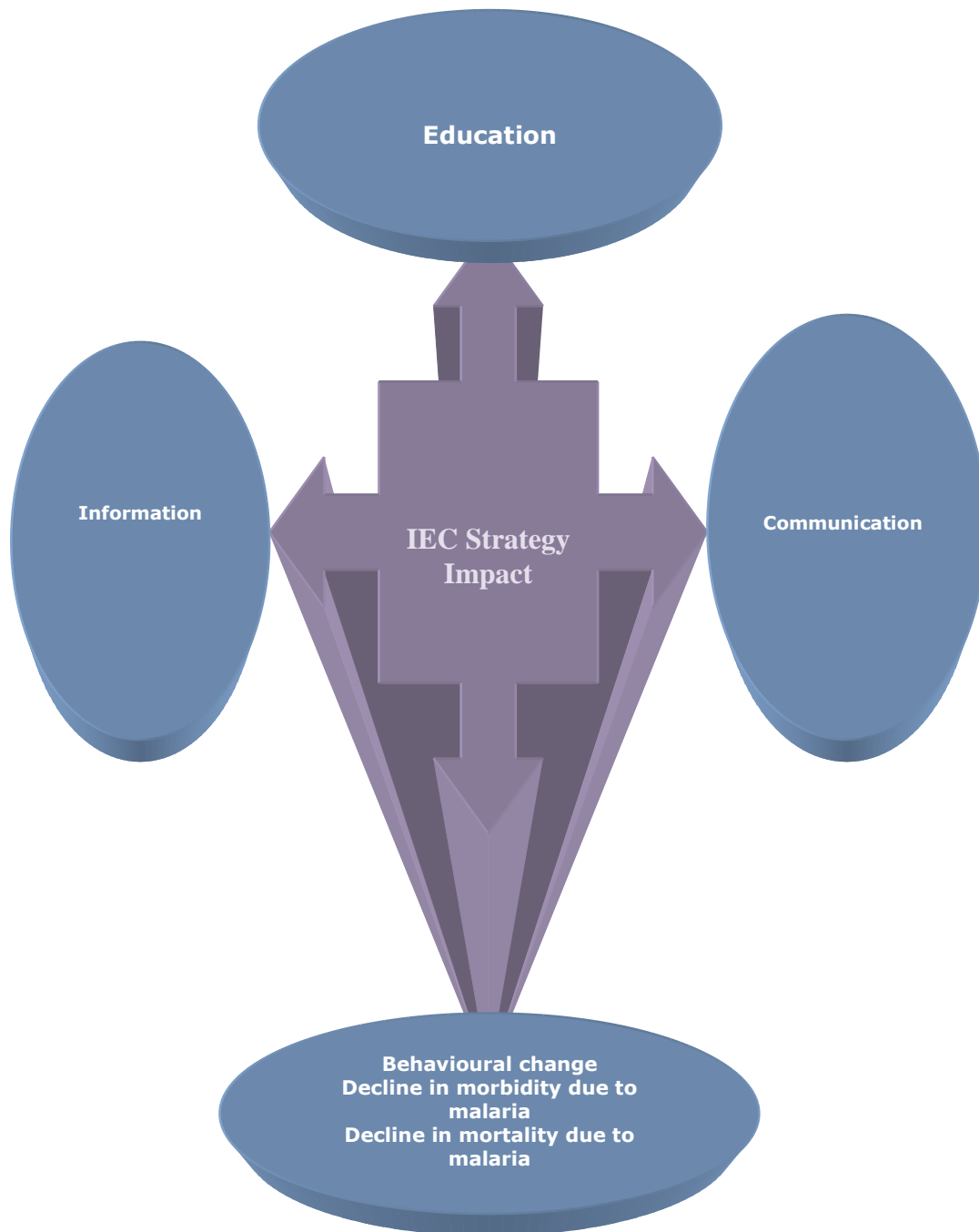
In designing a monitoring and evaluation plan for an IEC programme implementation there is the need to determine whether the strategy is feasible, appropriate, meaningful and effective (Pearson et al. 2005; JBI Reviewers’ Manual 2008), for the purpose of this study within the African context. For instance, in determining its feasibility one may have to engage with the practical issues on the ground as in the case of resource (financial, material and human resources) requirement for programme implementation. On the issue of appropriateness, the IEC programme manager needs to ensure that a given strategy will find expression within the cultural context in order to guarantee that the strategy in question is embraced by pregnant women. The issue of meaningfulness points to the extent to which pregnant women can make sense of the malaria control message, so they can internalise it. Finally, the strategy has to be effective in order to serve the purpose for which it was

intended. Without these indicators programme managers may be heading towards failure before 'embarking on the journey' of reaching out to pregnant women. Using these indicators one may be able to collect data from key stakeholders, the outcome of which could feedback into the monitoring and evaluation plan. This could serve as the basis for future effort in order to achieve desirable impact.

2.7 Summary and Conclusions

This chapter has considered the principles, theories and models underlying IEC. Despite a range of educational perspectives, it appears that in this case change needs to be seen in behavioural terms. Without such a change it may be difficult for pregnant women to adhere to health educators' advice related to malaria prevention and control. This means that health educators need to focus on factors that will motivate pregnant women to develop positive attitude towards meeting their own health needs. Such a motivation may only occur if pregnant women understand what they stand to gain. They also need to be encouraged to take a leading role in making health decisions. Thus, the extent to which a given IEC strategy is able to bring about the needed behavioural change and positive pregnancy related outcomes regarding malaria prevention and control in the context of this study is termed 'the IEC strategy impact' as shown in Figure 2.3. In effect, such an impact is expected to reflect in utilisation of appropriate healthcare interventions with a view to achieving a decline in maternal and infant morbidity and mortality due to malaria.

Figure 2.3 The IEC Strategy Impact



Therefore, in order to bring about behavioural change leading to decline in maternal morbidity and mortality due to malaria, IEC strategies need to be feasible, appropriate, meaningful and effective (the relationship between these are considered in Chapter 3, Section 3.3).

Chapter 3

Research Design and Methodology

3.1 The Research Methodology

In order to achieve the aims and objectives of the study a mixed method approach involving two complementary methodological approaches was used. By using this approach, it was anticipated that the study outcomes could be validated and authenticated. Thus, the study design comprised two phases:

- *Phase 1:* a systematic review of IEC Strategies in malaria endemic countries in Africa.
- *Phase 2:* an evaluation of outcomes of the systematic review using a survey of Ethiopia, Ghana, Nigeria and Tanzania.

Before detailing the methods used in each of these phases, it is important to explain the underlying research methodology through reference to the literature on mixed method research. In this regard, the author will focus on an overview of the philosophical orientation of the mixed method approach; the meaning of mixed method and triangulation; and types of triangulation applicable to the study. Finally, strengths of the mixed method approach are highlighted.

3.1.1 Philosophical Orientation

For the past four decades, there has been what is termed 'paradigm wars' along the lines of different traditions of research methods. Initially, these 'paradigm wars' were between the quantitative and qualitative traditions of research (Maxcy 2003; Tashakkori & Teddlie 2003; Creswell 2009; Teddlie & Tashakkori 2009). This was followed by the emergence of a mixed method approach as a third force, which sought to combine both quantitative and qualitative methodologies as a new form of scientific inquiry (Denzin 1970; Rees and Bath 2001; Tashakkori & Teddlie 2003; Brannen 2005; Creswell 2009; Teddlie & Tashakkori 2009).

Opponents of the mixed method approach argued that since the quantitative and qualitative methods have opposing philosophical persuasions, the use of

mixed methods (combining the two research traditions) was inappropriate, and epistemologically incoherent and incompatible (Kuhn 1962, 1970, 1996; Smith & Heshusius 1986; Guba 1987; Sale et al. 2002). The opponents of the mixed method approach disagreed on the relative merits of the theories underpinning the approach (Tashakkori & Teddlie 2003; Teddlie & Tashakkori 2009; BERA 2011). For instance, according to the British Educational Research Association (BERA) (2011, p.1)

“the principal objection to mixed methods research – is that it violates the belief that specific methods are inextricably linked to certain ontological and epistemological ideas, and that the data derived from each must therefore be interpreted in different ways and are not compatible.”

However, at a philosophical level, those who uphold the mixed method approach countered the incompatibility thesis by positing a different paradigm known as pragmatism (for example, see Howe 1988; Tashakkori & Teddlie 1988; Maxcy 2003; Morgan 2007). Thus, the philosophical orientation most often associated with mixed method research is pragmatism (for example, see Howe 1988; Tashakkori & Teddlie 1998, 2003; Biesta & Burbules 2003; Maxcy 2003; Bryman 2006; Morgan 2007), although other mixed methodologists associate it with the transformative-emancipatory perspective (development of a new ‘paradigm’ claiming to have made previous debates less relevant, with emphasis on a study of the underprivileged and minority groups) (Teddlie & Tashakkori 2009; BERA 2011) (for example, see Mertens 2003). In support of mixed methods, Howe (1988, p.10), argues that

“the compatibility thesis supports the view, beginning to dominate practice, that combining quantitative and qualitative methods is a good thing and denies that such a wedding is epistemologically incoherent.”

The practice of designing and conducting a single research study from a multidimensional perspective has been greeted with a significant amount of interest by several researchers over the past two decades and is not just a recent phenomenon (for example, see Jick 1979; Howe 1988; Breitmayer et al. 1993; Foster 1997; Rees & Bath 2001; Thurmond 2001; Pool et al. 2010; BERA 2011). This increasing interest has been explained by the fact that the

mixed method approach provides innovation (Jick 1979), rich and unbiased data (Denzin 1970; Jick 1979; Thurmond 2001) that can be interpreted with a high degree of assurance (Jick 1979; Breitmayer et al. 1993; Thurmond 2001) with a view to achieving strong internal and external validity and reliability, as well as a comprehensive multiperspective view (Boyd 2000; Thurmond 2001; Perone & Tucker 2003). Conducting mixed method research may be challenging as there may be difficulties in adopting this method inasmuch as there are strengths (Owens 1989; Morse 1991; Rees & Bath 2001; Johnson & Turner 2003; Creswell 2009; Teddlie & Tashakkori 2009). However, in this case, it was worth pursuing this research approach since it increased credibility of the findings and added to the robustness of the data (Owens 1989) (evidence of strengths and limitations of the mixed method approach as applied in the current study are discussed in Chapter 6, Section 6.8).

For the purpose of this study, pragmatism was adopted as a philosophical underpinning as this orientation fits well with the aims and objectives of the study. The term 'Pragmatism' is defined as:

"a deconstructive paradigm that debunks concepts such as 'truth' and 'reality' and focuses instead on 'what works' as the truth regarding the research questions under investigation. Pragmatism rejects the either/or choices associated with the paradigm wars, advocates for the use of mixed methods in research, and acknowledges that the values of the researcher play a large role in interpretation of results."

(Tashakkori & Teddlie 2003, p.713)

Research questions are answered with information presented in both narrative and numerical forms (Tashakkori & Teddlie 2003; Teddlie & Tashakkori 2009). In the present study the systematic review of evidence, which triangulated different types of data, applied a narrative form of synthesis with the generation of themes on IEC strategies and challenges (see Chapter 4). On the other hand, the survey data analysis involved a blend of narrative and statistical interpretation of data (see Chapter 5).

3.1.2 Meaning of Mixed Method

The mixed method approach has been described as using an array of terminologies, such as 'combination', 'integration', 'synthesis', 'multimethod' and 'mixed method' (for example, see Tashakkori & Teddlie 1998, 2003; Brannen 2005; Creswell 2009; Teddlie & Tashakkori 2009; Pool et al. 2010). The term 'mixed method' has been defined in different ways, but all pointing to the same meaning (for example, see Tashakkori & Teddlie 1998, p.17-18; Tashakkori & Teddlie 2003, p.711; Brannen 2005, p.4; Tashakkori & Creswell, 2007, p.4; Johnson et al. 2007, p.119-121). In some cases, some authors have given several definitions in a single project. For instance, Johnson et al. (2007, p.119-121) have presented 19 definitions of a mixed method approach. One of the most comprehensive definitions is that offered by Brannen (2005, p.4) as follows:

"Mixed method research means adopting a research strategy employing more than one type of research method. The methods may be a mix of qualitative and quantitative methods, a mix of quantitative methods or a mix of qualitative methods... mixed methods research also means working with different types of data. It may also involve using different investigators..."

Rees and Bath (2001) have also provided a similar definition. In agreement with this observation, Pool et al. (2010) argued that mixed method does not always imply a combination of qualitative and quantitative approaches.

The mixed method approach may be grouped into two categories, namely 'between-or across method' and 'within-method' (Kimchi et al. 1991; Thurmond 2001; Tashakkori & Teddlie 2003; Teddlie & Tashakkori 2009). This study used between-method and within-methods. Mixed method also means working with different types of data (Rees & Bath 2001; Thurmond 2001; Brannen 2005). For instance, in this study, the systematic review of evidence involved three types of data: qualitative/quantitative; expert opinion; and policy documents (see Chapter 4).

Within the combination of qualitative and quantitative methods are data collection and analysis approaches (Tashakkori & Creswell 2007). Other key

elements in the definitions are research questions (Tashakkori & Teddlie 2003), integration of findings and inferences (Tashakkori & Creswell 2007). This means that inasmuch as both qualitative and quantitative methods are combined in different ways, the type of research question may also determine whether a mixed method design is appropriate. With findings obtained from different sources, the need to integrate (or synthesise) these findings in a systematic manner is also crucial in order to draw inferences from the overall findings, and for that matter appropriate conclusions.

The range of mixed method research is reflected in the design used in the current study. As noted in Chapter 1, the current study involved a systematic review of evidence and a survey of Ethiopia, Ghana, Nigeria and Tanzania. Unlike the traditional combination of qualitative and quantitative study, this kind of design was distinctive as the systematic review itself involves a combination of methods in the context of secondary research.

One key methodological concept of the mixed method approach is triangulation (Tashakkori & Teddlie 2003). Triangulation may be defined as:

“the combination of two or more data sources, investigator, methodological approaches, theoretical perspectives, or analytical methods within the same study”

(Thurmond 2001, p.253)

This definition takes into consideration the investigator, the sources of data, the process of data collection and analysis as well as the theoretical underpinnings. This definition is useful as it does not restrict the meaning of triangulation to just methodologies as defined by Denzin (1978, p.291), who suggested that the concept only involves a combination of methodologies.

3.1.3 Types of Triangulation and Application

Triangulation metaphor originated from navigation and military strategy whose measurement involve trigonometry (Smith 1975; Jick 1979; Tashakkori & Teddlie 2003). Following the basic principles of geometry (whose strength lies in the fact that multiple viewpoints allow accuracy), organisational researchers are able to improve upon the accuracy of judgments made through the

collection of different data bearing on the same phenomenon (Jick 1979; Tashakkori & Teddlie 2003).

The above definition of triangulation is reflected in a number of types of triangulation consistent with mixed method research. These involve combining different sources of data, methodology of data collection and analysis, different theoretical perspectives and disciplines. Most of these are applicable to the current study. Table 3.1 overleaf summarises the relevance of various types of triangulation to the study. Each type of triangulation has characteristic features. The application of these characteristics is shown in adjacent columns, followed by reference sources of the various types of triangulation.

Table 3.1 Types of Triangulation and Application

No	Type of triangulation	Characteristics	Relevance to study	References
1	Data sources	<ul style="list-style-type: none"> • Time (times data were collected) • Space (for example, place/setting) • Person (for example, different groups of respondents) 	<ul style="list-style-type: none"> • Time: systematic review focused on 2000-2008 • Place/setting: survey conducted in 4 different countries, namely Ethiopia, Ghana, Nigeria and Tanzania • Group of Respondents: 2 groups of respondents identified: Health Professionals and FBOs 	Denzin (1970); Fielding & Fielding (1986); Kimchi et al. (1991); Miles & Huberman (1994); Thurmond (2001); Bauwens (2010)
2	Investigator	<ul style="list-style-type: none"> • More than one observer, interviewer, coder, or data analyst • Confirmation among investigators without prior discussion/ collaboration/consultation with one another, adds to credibility of observations 	<ul style="list-style-type: none"> • The entire study was conducted by the author. Therefore this type of triangulation was not applicable. 	Denzin (1970); Thurmond (2001)
3	Methodologic	<ul style="list-style-type: none"> • multimethod, mixed method, or methods of triangulation • May be subcategorised into: <ol style="list-style-type: none"> i. Within-method ii. between- or across method 	<ul style="list-style-type: none"> • In terms of within-method, the systematic review involved triangulation of 3 types of data. In analysing the quantitative data, the author used different techniques. • In the case of between methods both systematic review and the survey, complemented each other. This offered an external validity (see chapter 3 and 4). 	Flick (1998); Greene & Caracelli (1997); Barbour (1998); Polit & Hungler (1995); Thurmond (2001); Creswell (2003); Perone & Tucker (2003); Bauwens (2010)

Table 3.1 Types of Triangulation and Application (Cont'd)

No	Type of triangulation	Characteristics	Relevance to study	References
4	Theoretical	<ul style="list-style-type: none"> • Use of multiple theories or hypothesis when examining a phenomenon • May be used to test various theories by analysing information from the same data set • Intent is to conduct the study with multiple lenses and questions in mind, to lend support to or refute findings 	<p>The background literature involved a review of different principles, theories and models to enhance the understanding of issues related to IEC strategies. As will be seen later, these ideas helped in the design of an IEC strategy implementation equation and IEC monitoring and evaluation plan, and for that matter the entire study (see chapters 2, 3 and 7)</p>	<p>Denzin (1970); Mitchell (1986); Kimchi et al. (1991); Boyd (2000); Assiegmann & Blin (2006)</p> <p>Boyd (2000); Thurmond (2001); Bauwens (2010)</p>

Table 3.1 Types of Triangulation and Application (Cont'd)

No	Type of triangulation	Characteristics	Relevance to study	References
5.	Data-analysis	<ul style="list-style-type: none"> The combination of two or more methods of analysing data. Techniques can include different families of statistical testing or different techniques to determine similarities or validate data 	In the current study, a variety of methods of data analysis was used. For the systematic review, narrative synthesis which fell within the tradition of qualitative study was used (see chapter 4, section 4.6). For the primary study, data were analysed quantitatively using Non-parametric tests, notably Mann-Whitney and Kruskal-Wallis Tests) and qualitatively to identify the extent of consensus of opinion between two independent samples from Ghana involving health professionals and FBOs on one hand, and three different independent samples from Ethiopia, Ghana and Nigeria. Thus, the data-analysis triangulation method was applicable in the study (see section 3.5.3.3 and chapter 5, section 5.4).	Kimchi et al. (1991); Thurmond (2001)
	Interdisciplinary	Where the research process is informed not only by a single academic discipline, but also by two or more other disciplines		
6.			The research was informed by different academic disciplines, notably health service management and public health (see chapter 8, sub-section 8.3.10)	Janesick (1994); Bauwens (2010)

Since the first part of the study focused on systematic review of evidence, the next section considers what was done in this regard.

3.2 Systematic Review of Evidence on IEC Strategies in Africa

3.2.1 Why Systematic Review of Evidence?

In recent times systematic reviews have been widely accepted on the grounds that they offer a reliable source of information about the effectiveness of health care. They are said to be more than in-depth literature reviews, and are pieces of research in their own right and undertaken with the same degree of care as primary research (Bannigan et al. 1997). Systematic reviews

“involve finding, appraising and synthesising evidence from scientific studies to obtain a reliable overview of research in a specific area”

(Bannigan et al. 1997, p.1)

In reviewing a number of studies regarding a particular topic, systematic reviews are able to synthesise evidence with a view to providing guidance and recommendations for practice (Bannigan et al. 1997).

In this study, the specific review area is '*the impact of information, education and communication (IEC) strategies in malaria prevention and control during pregnancy in Africa*'. Another dimension highlighted by Bannigan et al. (1997) is that the review can serve as guidance for further research. This is because systematic reviews enable the researcher to identify gaps or areas that require further investigation, and thereby advance knowledge. According to Chalmers and Altman (1995), unlike conventional narrative reviews of literature, systematic reviews necessitate the application of an explicitly stated and reproducible methodology for locating, appraising and synthesising evidence from original studies in order to provide empirical answers to scientific questions. Applying the opinion of Chalmers and Altman (1995), the current study intends to locate, appraise and synthesise evidence.

The following reasons account for the popularity and continuous development of systematic reviews. These include the following:

- The need for clinicians, nurses, therapists, researchers, healthcare managers, policymakers and consumers to manage huge amount of information for decision making in healthcare practice (Cochrane Handbook 2007; Hemington & Brereton 2009);
- The need to efficiently integrate valid information to serve as basis of decision making (Mulrow 1994);
- The need to provide consistent results applicable to a wide range of contexts (Antman et al. 1992; Oxman & Guyatt 1993);
- The need to limit errors or minimise bias and reduce chance effects with a view to providing reliable results from which conclusions can be drawn to make informed clinical decisions (Antman 1992; Oxman & Guyatt 1993);
- Consequently, decisions can be based on the totality of the best available evidence (Cochrane Handbook 2007).

Comparing systematic reviews to non-systematic reviews and their consequences, Nelson (1998) concludes that systematic reviews, particularly those that are published without delay, provide an opportunity to determine the most reliable evidence on which to make decisions. It may be deduced from this argument that systematic reviews, inasmuch as they are considered useful, may make the best impact if they are published quickly. This could make the evidence readily available to healthcare practitioners, thereby ensuring timeliness of information use. This argument may however, be challenged on the grounds that, there is no guarantee that quickly published work will be used, not until the right people are aware and use it. Therefore, it may be concluded that any review is considered useful only, and only if, it has been disseminated to the right people at the right place and time, with the right attitude to make use of the evidence (see Section 3.4).

The overwhelming nature of literature vis-à-vis the busy work schedules of healthcare professionals to read due to time constraints, and the inability of some to sift through the available data, require that a wide range of evidence is pooled to make evidence-based inform decisions (Oshana 2006; Hemingway & Brereton 2009). It has also been argued that despite the fact that the

number of research studies in nursing has increased recently, there are no sufficient

“synthesised research findings, in the form of systematic reviews, to provide practitioners with digestible and readily accessible materials to use”

(Parahoo 2006, p.443)

Therefore, this thesis intends to make a contribution in this regard.

3.2.2 The Systematic Review Structure

According to Chalmers and Altman (1995) the systematic review process involves locating, appraisal and synthesis of evidence. Nelson (1998) offers a detailed step-by-step approach to undertaking a review (also see Thomas et al. 2004). This consists of seven (7) steps: (1) formulating the problem; (2) locating and selecting studies; (3) critical appraisal; (4) collecting data; (5) analysing and presenting results; (6) interpreting results; and (7) improving and updating reviews (see Table 3.2).

What appears to be missing in the 7 steps is the initial scoping. Even if this is part of step 1, it is not explicit. In conducting a scoping review on health system quality reporting, Brien et al. (2010) observe that the method allowed them to characterise and catalogue the extensive body of literature in relation to health system report cards, following a review of 10,102 studies. Marsella (2009) explored the literature pertaining to the transition into palliative care. This technique helped her to identify critical areas for further research. Furthermore, in their scoping review on complementary and alternative medicine and the mass media, Weeks and Strudsholm (2008) found the process useful in helping to identify 16 studies relevant to their research objectives. To this end, this review began with an initial scoping, before using the above-named steps as a guide.

Table 3.2 Steps of the Sytematic Review Process

Steps	Process	What I did
1	Formulating the problem or question	Based on the research problem defined in chapter 1 research questions were set in line with the aims and objectives (see Table 3.3).
2	Locating and selecting studies	A number of sources of data (for example, databases and websites) were identified resulting in the selection of potentially relevant studies (see sub-section 3.2.3.4).
3	Critical appraisal	Relevant studies were critically appraised after an initial evaluation of potentially relevant studies (see sub-section 3.2.3.5)
4	Collecting data	Data were extracted from studies considered to have contained useful evidence (see sub-section 3.2.3.6)
5	Analysing and presenting results	A narrative synthesis approach was used in analysing and presenting results (see sub-section 3.2.3.7)
6	Interpreting results	In synthesising the evidence, the author made sense of the evidence (see Chapter 4, Section 4.6)
7	Improving and updating reviews	Although phase 1 was conducted before proceeding to phase 2, the author had to go back to the studies reviewed after the second phase to ensure that the review and the synthesis were appropriately done, and that the evidence was appropriately discussed in the light of the survey data (see Chapter 6).

Source: Adapted from Nelson et al. (2004)

3.2.3 Methods of Review

3.2.3.1 Initial Scoping

The data collection process began with an initial scoping to fine-tune the focus of the study. In other words, it sought to pre-test the data collection tools, including the inclusion and exclusion criteria, the protocols for assessing methodological quality, and the means of extracting data. Initially, the perspective was to look more generally across malaria prevention and control in relation to pregnant women. It was realised that a wide range of data exist on malaria prevention and control in pregnancy in Africa, thus providing a rationale for the author's choice of a systematic review. Through the scoping approach the reviewer sieved through data and collated findings (see MacInnes 2005). Marsella (2009, p.1) notes that

"a scoping review is a technique used to map relevant literature and address research gaps in a field of interest".

Scoping is often undertaken in a newer field of enquiry, and it may be regarded as an initial step to systematic reviews (Mays et al. 2001; Marsella 2009). This author holds that since little work appears to have been done in the area of IEC related to malaria in pregnancy in Africa, the current area of enquiry is relatively new.

For these reasons the scoping preceding the current study was conducted between June 2008–August 2008 in order to identify what evidence existed generally. The scoping sought to identify the impact of malaria control policies and strategies on the prevention and control of malaria among pregnant women in Africa. It covered studies published between 1994 and 2008. The results were mainly on insecticide-treated nets (ITNs) and intermittent preventive treatment (IPTp). Factors affecting the progress of malaria control policy implementation and recommendations for scaling-up for impact were summarised as follows:

- Information, education and communication
- Making use of existing structures and systems
- Providing an enabling environment: leadership, motivation, provision of quality care through training, supervision, monitoring and evaluation
- Deployment of an integrated approach to policy implementation

- Developing and strengthening of local capacity
- Multidisciplinary teamwork
- Developing more alternative and cost-effective drugs due to reduction in the efficacy of suphadoxine-pyrimethamine in some malaria endemic countries
- Government commitment
- Support from health partners
- Provision of free ITNs to pregnant women
- Increasing free LLINs coverage among pregnant women.

It was realised that addressing all the issues summarised above in one single review was impossible and impractical, considering the time frame required for the study. After a close study of the factors necessary for scaling up for impact, the author came to the conclusion that information, education and communication (IEC) was the most critical subject for further investigation. The reasons for the selection of the current topic have already been discussed in Chapter 1 (see sub-section 1.3.2).

Following the scoping, the main search process began with review questions.

3.2.3.2 Review Questions, Aims and Objectives

In order to enhance understanding of the relationship between the review questions and the research aims and objectives outlined in Chapter 1 (see Section 1.4), the latter has been revisited as shown in Table 3.3.

Table 3.3 Review Questions, Aims and Objectives

	Research Aims and Objectives Revisited	Research Question
1	To identify evidence of impact of information, education and communication (IEC) strategies in malaria prevention and control for pregnant women in Africa (main aim)	What is the evidence of impact of IEC strategies in malaria prevention and control among pregnant women in Africa?
2	To identify IEC strategies aimed at malaria prevention and control during pregnancy	What are the information, education and communication strategies (IEC) in malaria prevention and control among pregnant women?
3	To identify evidence of feasibility, appropriateness, meaningfulness, and effectiveness of IEC strategies in malaria prevention and control among pregnant women	What is the evidence of feasibility, appropriateness, meaningfulness and effectiveness of IEC strategies?
4	To identify evidence of challenges confronting the implementation of the IEC strategies with respect to pregnant women	What are the challenges confronting the implementation of the IEC strategies?

3.2.3.3 Inclusion Criteria for Considering Studies for the Review

i. Target Population

- Pregnant women aged 15-49: These are sometimes called pregnant or expectant mothers.
- Health educator: This is defined as any person responsible for providing health education to pregnant women with regards to malaria prevention and control, either directly or indirectly. In this context, health educators at the operational level (community and hospital levels) are said to be directly engaged, while those at the policy level are considered indirectly engaged. Examples of direct health educators at the hospital or health centre include nurses, midwives, medical or physician assistants, doctors and pharmacists. At the community level examples of health educators include public health nurses, community health nurses, voluntary health workers, community health workers, including health extension workers (HEWs), community leaders, religious leaders, leaders of women groups, and focal persons of non-governmental organisations and local health partners of the donor community. An indirect health educator is defined in this study as any health worker at the policy level with an interest in the training of health educators involved in malaria health education among pregnant

women. This includes malaria control managers, programme officers from the national malaria control and reproductive health units.

- Setting: All malaria endemic countries in sub-Saharan Africa.

ii. Types of study

The study involved qualitative and quantitative studies (published and grey literature); notes, texts, opinions and discourse (published and grey literature); and policy documents (standard guidelines/strategic, tactical & operational plans/monitoring and evaluation reports) (published and grey literature).

iii. Interventions

Interventions involve any studies that use some form of information, education and communication (IEC) strategies in malaria prevention and control in pregnancy.

iv. Outcome measures

- Feasibility, appropriateness, meaningfulness and effectiveness of IEC strategies in relation to malaria prevention and control interventions (such as use of insecticide-treated nets and intermittent preventive treatment) during pregnancy.
- Challenges confronting implementation of IEC strategies: These include behavioural factors (for example, cultural beliefs, knowledge, attitude and practices) and non-behavioural factors (for example, the cost of acquiring an ITN in relation to poverty, distance from health facility, poverty, women's empowerment; staff shortage).

v. Periodicity

Only studies or documents produced between 2000 and 2008 were considered, where the base year represents the year of the endorsement of the Roll Back Malaria (RBM) programme adopted in Abuja, Nigeria. The base year symbolised a new beginning in the malaria control effort in sub-Saharan Africa (The Abuja Declaration 2000).

vi. Language

Only studies or documents produced in English were considered for inclusion. This was to avoid the cost and complexity of translation.

3.2.3.4 Search Strategies for the Identification of Studies

In accordance with the JBI Reviewers' Manual (2008) the stages of search involved (1) identification of search terms; (2) initial search; and (3) subsequent search. These are described below:

i. Stage 1: Identification of search terms

Key words for the search were identified based on the background literature. These search terms include 'malaria', and 'pregnancy' or 'pregnant women' or 'pregnant mother', 'Africa', and 'malaria prevention' or 'malaria control', and 'role of' and 'information, education, communication' or 'IEC' or 'health education' or 'counselling' or 'health communication' or 'communication strategies' or 'awareness creation', or 'awareness campaigns' or 'educational campaigns' or 'promotional campaigns' and 'intermittent preventive treatment' or 'IPTp'. The rest are 'insecticide-treated nets' or 'insecticide treated-bed nets' or 'ITNs' and 'media campaigns' and 'health worker' or 'health educator' and 'Feasibility' or 'appropriateness' or 'meaningfulness' or 'effectiveness' and 'behaviour change communication' and 'scaling-up for impact'. The words were used in different combinations to yield specific results (see Appendix 1.1).

ii. Stage 2: Initial search

This stage involved identifying all potentially relevant papers irrespective of language or status of publication: whether published, grey literature, in press, and in progress.

iii. Stage 3: Subsequent search

This involved using the above listed search terms in combination in different databases. Data were gathered by electronic and hand search. The decision as to which sources of data to search were informed by the experience at the scoping stage. Knowledge of other sources emerged as the study unfolded. The databases and websites were identified as follows:

- **Database and Search Engines used**

This involved a search of specific databases. These were: MEDLINE (2000-2008); Cochrane (2000-2008); ERIC (2000-2008); PsycInfo (2000-2008); Maternity and Infant care (2000-2008); Pre-CINAHL (2000-2008); CINAHL (2000-2008); Health Education Research (2000-2008); InfoHealth (2001-2008); Health Communication (2000-2008); and Partnership for Social Sciences in Malaria Control (PSSMC) (2000-2008) (see Appendix 1.1).

- **Websites**

Here, major websites searched were: World Health Organisation/WHO RBM Partnership; Johns Hopkins Bloomberg University School of Public Health; George Washington University School of Public Health; JHPIEGO (an affiliate of John Hopkins University School of Public Health); Gate Foundation; Malaria International Foundation; PREMA-EU; Malaria Matters; and Global Health Council (see Appendix 1.2).

- **Hand searching**

Hand searching was completed for the following journals: *American Journal of Medicine and Hygiene*; *European Journal of Medicine and International Health*; *Malaria Journal*; *Journal of Obstetrics and Gynaecology*; *Journal of Family Practice*; and the *Oxford Journal of Public Health* (2000-2008).

- **Reference Lists**

Reference lists of papers were also reviewed (see Appendix 1.3).

- **Contacts**

A colleague visiting Ghana was asked to search the Adabraka Polyclinic (now part of Ridge Regional Hospital) Library (the main library for Ghana Health Service, Accra). Two other contacts were made to authors of potentially relevant papers - one in Spain and one in Uganda (see Appendix 1.4).

3.2.3.5 Critical Appraisal

Following the identification of relevant papers, critical appraisal was carried out based on three appropriate appraisal tools focusing on the three types of studies namely: (1) quantitative and qualitative studies (and mixed methods) (published and unpublished); (2) opinion papers (text, notes, opinion and discourses) (published and unpublished); and (3) policy documents (published and unpublished). In carrying out the appraisal, the author took into consideration the existing tools for conducting systematic reviews and whether these tools were relevant to the study. While recognising the usefulness of some of these tools (for example, the Joanna Briggs Institute and the Cochrane protocols), a gap was identified. The gap had to do with the ability of existing tools to appraise policy documents. After carefully studying these tools, there was the need to develop an additional tool for appraising malaria control policy documents to fill this gap. Thus, while some of the appraisal tools were adapted from existing ones to suit the current study, new ones were developed.

The tools were categorised in accordance with the type of study consistent with the inclusion criteria. These involve (1) Assessment of Methodological Quality of Qualitative and Quantitative Research papers; (2) Quality Assessment Instrument: Notes, Texts, Opinions and Discourses; (3) Quality Assessment Instrument on Policy documents: standard guidelines/strategic plans, tactical plans, operational plans/monitoring and evaluation reports. The first set of tools was developed in accordance with the work of Luke et al. (2004) and SIGN (2008). The second set of tools was adapted from the Joanna Briggs Institute's critical appraisal tools on expert opinion (see JBI Reviewers' Manual 2008, p.152, section 6.9). The third set of tools focusing on policy documents was created by the researcher since no institution had an appraisal tool for policy documents. However, an understanding of the JBI tool on expert opinion facilitated the creation of this tool as well as the work of Macduff (2007) (For details of all appraisal tools see Appendices 2-4). The ideas of Macduff (2007) on policy documents are related to the evaluation of aims and objectives, context, context relevance, focal relevance and related relevance. Context relevance refers to the importance attached to the overall context of the issues being investigated. In other words, it involves the

premise from where a policy opinion originates. Focal relevance relates to the specific issue under investigation, while related relevance involves other related issues, which have indirect bearing on the subject of investigation (Macduff 2007).

In order to facilitate the appraisal process all papers were coded (001-057). Only the included papers were reported in the presentation of results (see Chapter 4, Table 4.2).

3.2.3.6 Data Extraction

Following critical appraisal, data were extracted from all included studies meeting the criteria for methodological quality or quality assessment criteria using appropriate extraction forms (see Appendices 5-7).

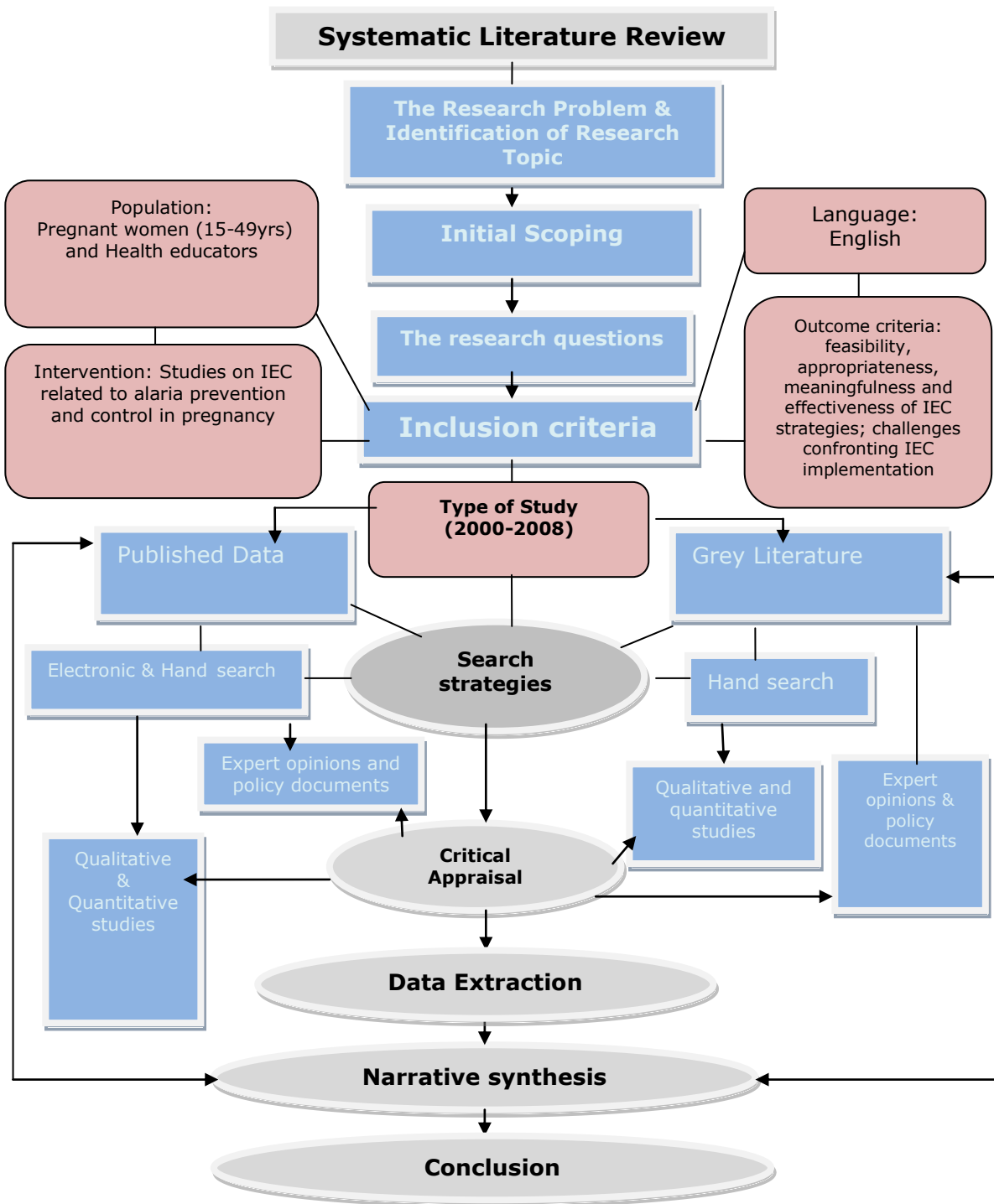
3.2.3.7 Data Analysis/Synthesis

Due to the heterogeneity of evidence a narrative synthesis approach was adopted (see JBI Reviewers' Manual 2008).

3.2.3.8 Conclusion

In short, the review was conducted by the author from scoping to data analysis, subject to the approval by the principal research supervisor (secondary reviewer). The review was carried out based on the inclusion criteria applied to all identified papers, following a consensus reached with the secondary reviewer. With regards to the selection process, potentially relevant studies were identified irrespective of the type of study, population, period of publication and language of publication. Using appropriate appraisal tools, papers were then subjected to critical appraisal. Information was then extracted and subjected to narrative synthesis (Chapter 4, Figure 4.1 shows the stages of the selection process and associated result at each stage). Following the synthesis, conclusions were drawn regarding the key issues identified (a summary of the systematic review process is presented in Figure 3.1).

Figure 3.1 Summary of the Systematic Review Process



Having considered the systematic review process, it is important to examine issues of feasibility, appropriateness and effectiveness as they play a key role in the evaluation of implementation of IEC strategies.

3.3 Feasibility, Appropriateness, Meaningfulness and Effectiveness

The Joanna Briggs Institute (JBI) Reviewers' Manual (2008) recognises the importance of feasibility, appropriateness, meaningfulness and effectiveness (FAME) in relation to research evidence. In a similar vein, the author holds the view that identifying evidence on the impact of IEC strategies with regards to malaria prevention and control during pregnancy requires a consideration of these FAME dimensions.

JBI and its collaborating institutions have developed a manual for guiding reviewers involved in systematic reviews. The central focus of this manual and for that matter JBI is FAME (Pearson et al. 2005; JBI Reviewers' Manual 2008). In this regard,

"the institute regards any indication that a practice is effective, appropriate, meaningful or feasible, that is derived from experience, expertise, inference, deduction or the results of a rigorous inquiry as a form of evidence."

(JBI 2008a, p.1)

Since this study begins with a systematic review of evidence, the author deems it fit to adapt the ideas of the FAME as described in the JBI Reviewers' Manual (2008) (also see JBI 2008a).

According to this manual the FAME dimensions are defined as follows:

- 'Feasibility' is

"the extent to which an activity is practical and practicable. Clinical feasibility is about whether or not an activity or intervention is physically, culturally or financially practicable or possible within a given context."

(JBI Reviewers' Manual 2008, p.11)

- 'Appropriateness' is

"the extent to which an intervention or activity fits with or is apt in a situation. Clinical appropriateness is about how an activity or intervention relates to the context in which care is given."

(JBI Reviewers' Manual 2008, p.11)

- 'Meaningfulness' is

"the extent to which an intervention or activity is experienced by the patient. Meaningfulness relates to the personal experience, opinions, values, thoughts, beliefs, and interpretations of patients or clients."

(JBI Reviewers' Manual 2008, p.11)

- 'Effectiveness' is

"the extent to which an intervention, when used appropriately, achieves the intended effect. Clinical effectiveness is about the relationship between an intervention and clinical or health outcomes."

(JBI Reviewers' Manual 2008, p.11)

In relation to appropriateness, Panther-Bricks et al. (2006) suggest that behavioural change strategies should not only be culturally sensitive but also culturally compelling (how to propel intention to change to actual behavioural change). For the purpose of this study the author defines 'feasibility' as '*the extent to which one believes a given intervention can be adopted*'; while 'appropriateness' is '*the extent to which a given intervention finds expression within a given cultural context*'. Furthermore, 'meaningfulness' is defined as '*the extent to which one believes an intervention message makes sense to the target audience*'. Finally, 'effectiveness' is '*the extent to which one believes an intervention meets its intended purpose*'.

The importance of feasibility, appropriateness, meaningfulness and effectiveness (FAME) to JBI was demonstrated by the development of the FAME scale which was

"developed to complement the inclusive, pluralistic approach to evidence that characterises JBI reviews"

(JBI Reviewers' Manual 2008, p.11) (also see Pearson et al. 2005)

In other words, the FAME scale takes account of all types of studies, ranging from meta-analysis and systematic reviews to expert opinion.

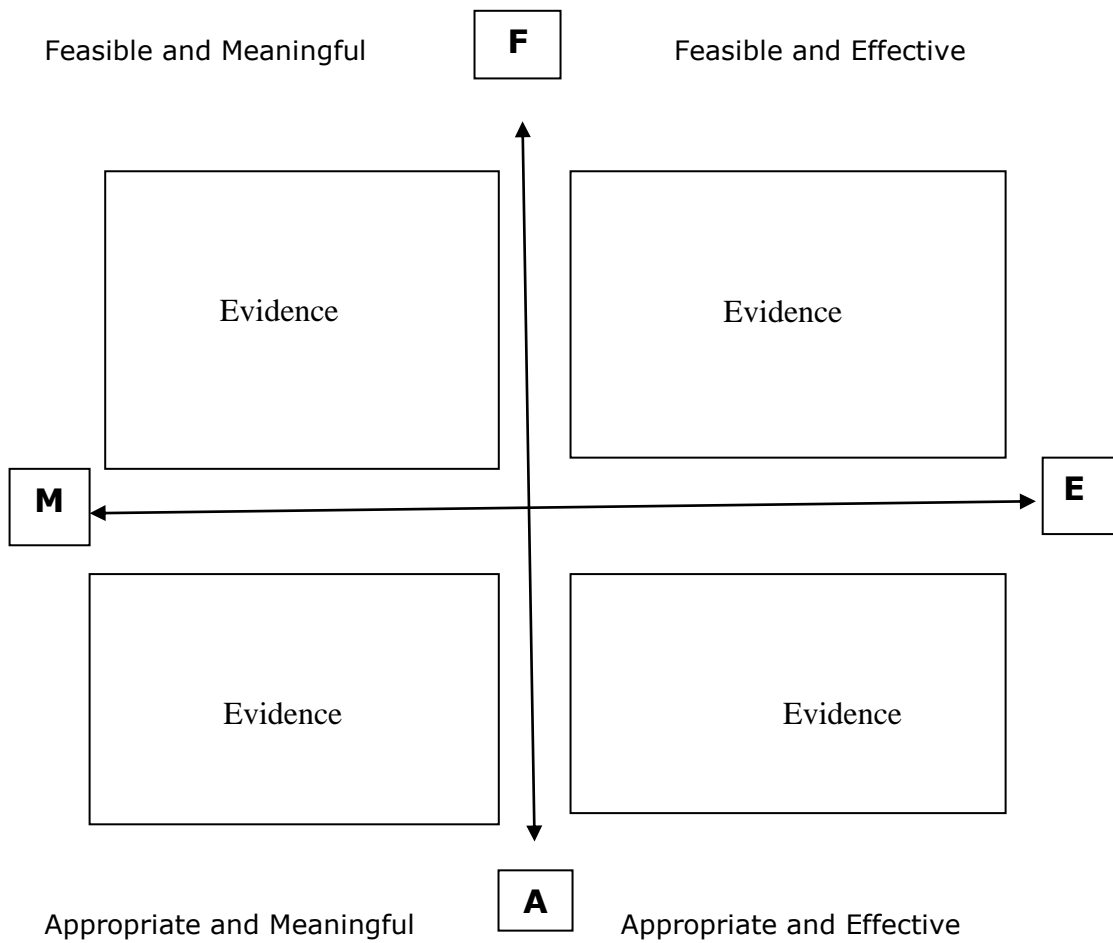
The JBI model of levels of evidence shows that evidence may be evaluated in terms of its feasibility, appropriateness meaningfulness or effectiveness.

Where the evidence is quantitative and homogeneous, a meta-analysis approach is used in order to synthesise evidence of effectiveness. On the other hand, where the evidence is qualitative related to feasibility, appropriateness and meaningfulness, a meta-synthesis approach is used. However, a narrative synthesis approach is used where the evidence involves both qualitative and quantitative studies, and expert opinion, notes, texts and discourses and for that matter heterogeneous (JBI Reviewers' Manual 2008). The current literature appears to have neglected policy documents as sources of evidence. This omission needs to be corrected as such sources of evidence may address critical issues relevant to the issue being investigated. A consideration of all sources of evidence, including policy documents is consistent with the work of Greenhalgh et al. (2004) in their meta-narrative on diffusion of innovations in service organisations; Clegg's (2005) critique of systematic review in relation to educational policies in which randomised controlled trials have been criticised for being considered as 'gold standard' of evidence to the neglect of other forms of evidence; and Rycroft-Malone et al.'s (2004) analysis of what counts as evidence in evidence-based practice.

In order to demonstrate the relationships among the FAME dimensions Figure 3.2 has been constructed by the author. It shows that the FAME dimensions can be displayed graphically on X and Y axes, where the Y-axis has feasibility-appropriateness relationship (F-A). On the other hand, meaningfulness-effectiveness relationship may be shown on the X-axis (M-E). However, the two axes are not sacrosanct. Therefore, other relationships may be derived. In this case, the author suggests that it is possible to have a feasibility-meaningfulness (F-M); appropriateness-meaningfulness (A-M) and appropriateness-effectiveness (A-E) relationships. There could also be F-A-M combinations or F-A-E combinations (see Chapter 4 sub-sections 4.4.1 and 4.4.2 on evidence of possible combinations as well as overlaps). This means that it is possible to have evidence pertaining to any of the combinations. These combinations partly explain why evidence could be synthesised using meta-analysis, meta-synthesis or narrative synthesis. For the purpose of the present study narrative synthesis has been used for the first phase of the study (see Chapter 4 Section 4.6).

Figure 3.2 Relationships among Feasibility, Appropriateness, Meaningfulness and Effectiveness

F = Feasibility; A = Appropriateness; M = Meaningfulness; E = Effectiveness



Having considered possible relationships among feasibility, appropriateness, meaningfulness and effectiveness (FAME) above, it is worth establishing the relationship between the FAME, IEC strategy implementation success and impact, and how the FAME might result in IEC strategy impact. At this juncture, the author wishes to tentatively suggest that an IEC programme or strategy is likely to make positive impact if there is evidence to suggest that a given IEC strategy is feasible, appropriate, meaningful and effective to implement and can prevail against any potential or actual challenges.

This may be demonstrated mathematically as follows:

IECsip = IEC Impact, where

IEC Impact = $f(a+m+e)-c$, where

f=Feasibility;

a=appropriateness;

m=meaningfulness;

e=effectiveness;

c=level of IEC strategy implementation challenge

IECsip= IEC Strategy implementation success among pregnant women.

In the above equation, it is assumed that IEC strategy implementation success is a function of feasibility, appropriateness, meaningfulness and effectiveness, subject to any identifiable challenge. The author also suggests that 'Feasibility' is critical to the relevance of 'appropriateness', 'meaningfulness' and 'effectiveness' because no programme can be considered appropriate, meaningful or effective if it cannot be implemented in the first place. On the other hand, for an intervention to be effective it must be carried out appropriately. Although a professional judgement is required to determine whether or not an intervention is effective the experience of the patient or client receiving the intervention also needs to be respected (in this case the pregnant woman); hence the importance of meaningfulness in clinical decision making (JBI Reviewers' Manual 2008) (see further details and illustrations on the above equation in Chapter 7, Sections 7.2 to 7.5).

3.4 Translating Evidence into Practice

This section is based on the premise that evidence identified through systematic review is meaningless unless it is linked up with healthcare practice through its application by healthcare practitioners, managers and policymakers. The essence of this section is therefore an attempt to review issues related to the relationship between evidence and practice. These issues appear to revolve around research evidence; expert opinion; and patient experience and preferences in practice settings.

The debate about evidence translation into practice dates back to the emergence of evidenced-based medicine (EBM). On its introduction EBM was considered a 'new paradigm' for the practice of clinical medicine (Satterfield et al. 2009). The purpose of EBM was

"to develop and promote an explicit and rational process for clinical decision making that deemphasised intuition and unsystematic clinical expertise while emphasising the importance of incorporating the best research findings into clinical care"

(Satterfield et al. 2009, p.370)

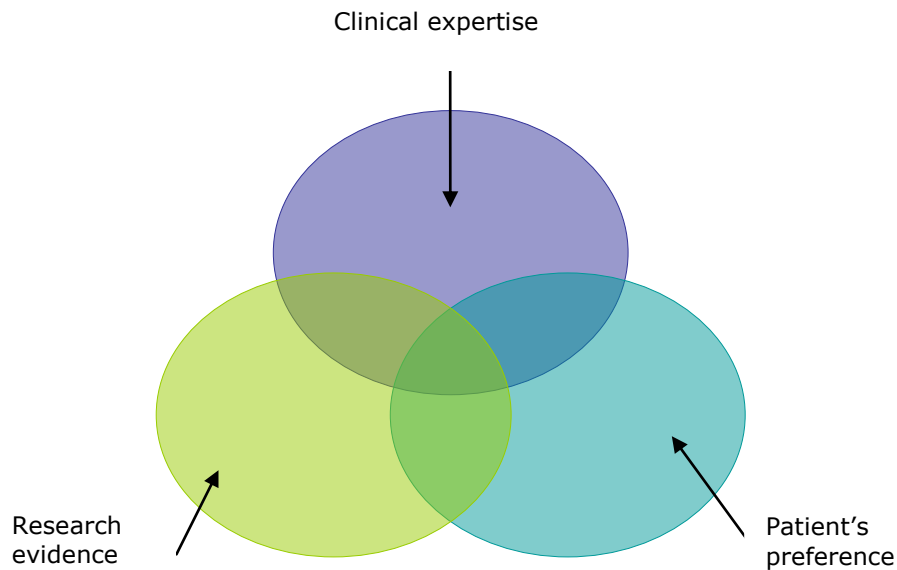
According to these authors, this model emerged as a product of decades of advances in research and epidemiologic methodologies, medical informatics, and innovations in medical training programmes. Following a series of important critical exchanges within the medical community, EBM was defined more explicitly as

"the consciousness and judicious use of current best evidence from clinical care research in the management of patients"

(Satterfield et al. 2009, p.371)

Satterfield et al. (2009) report that the initial model for evidence-based clinical decision involved three circles, namely, research evidence, clinical expertise and patient preferences. These three circles, according to them, illustrate the distinct but overlapping sources of data that might be used when making clinical decisions (Figure 3.3).

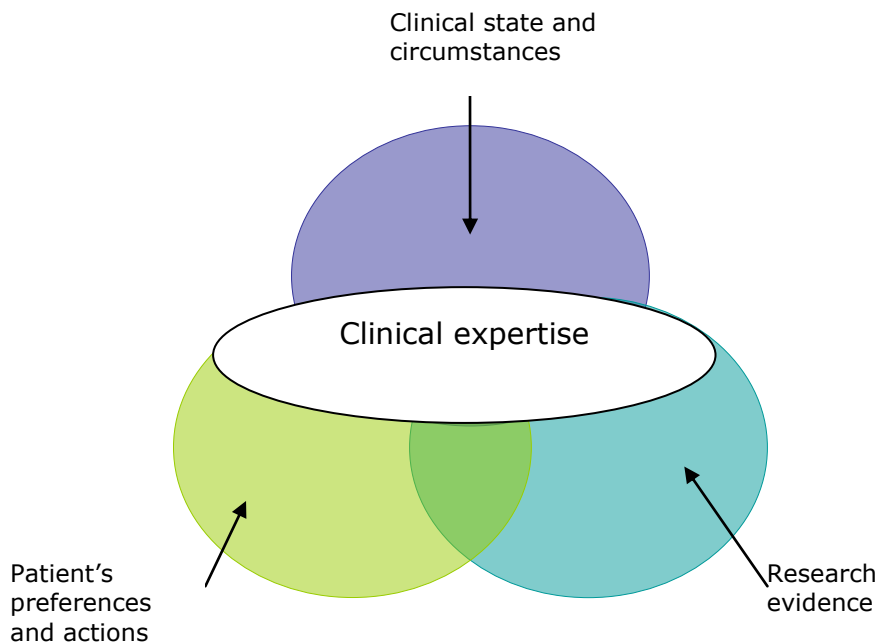
Figure 3.3 Three-Circle Model of Evidence-Based Clinical Decision



Source: Adapted from Satterfield et al. (2009, p. 371)

Although the original model was said to be conceptually appealing, Satterfield et al. (2009) argue that it lacked explicit guidance in how the circles or sources of data were to be integrated when making decisions, and in particular, when the research evidence was at odds with either experience or the patient's preferences. Furthermore, the authors observed a lack of clarity regarding the scope, relative value and appropriate applications of 'clinical expertise'. To this end, the model was then updated with a view to addressing these concerns. This attempt involved changing the clinical expertise circle to 'clinical state and circumstances' and shifting 'clinical expertise' to the intersection points of the new three circles (Satterfield et al. 2009) (see Figure 3.4 overleaf). By placing clinical expertise at the centre of the diagram, Satterfield et al. suggest that the value of clinical experience in guiding EBM decision making process is highlighted. This, they suggest, offers a noteworthy concession with regards to the importance of the individual practitioner. In this case, the individual practitioner is considered a user of both research evidence and information based on patient preferences for the purpose of clinical judgement.

Figure 3.4 An updated Three-Circle Model of Evidence-Based Clinical decisions



Source: Adapted from Satterfield et al. (2009, p.372)

The progress of EBM had had an impact on nursing with regards to evidence-based nursing practice (Melnik et al. 2000; Satterfield et al. 2009). The impact of EBM on evidence-based nursing is evidenced in the area of research utilisation (concerned with translating research findings into practice) (Titler 1997), which hitherto, is said to have neglected patient's preferences or clinical judgement (Satterfield et al. 2009).

Clinical expertise now involves ones ability to elicit, appropriately appraise, and consequently, integrate these sources of data (Haynes et al. 2002; Satterfield et al. 2009). The systematic review process of the current study is consistent with this practice (see Section 3.2.2). Although the three circles model was updated due to inherent conceptual problems (Satterfield et al. 2009), the updated version (patient preferences and actions, clinical expertise and research evidence) was based primarily on medical informatics, clinical epidemiology, biostatistics, and critical appraisal skills. The understanding based on patient's preferences was regarded as 'primitive', and exactly how clinical expertise would guide the integration of the three circles was

considered unclear (Strauss et al. 2005; Satterfield et al. 2009). It was again reiterated that although the name EBM includes 'evidence', it was not intended to mean that evidence was the most important source of information (in contrast to patient's preferences or clinical circumstances) but, rather, a necessary but not sufficient aspect of clinical decision making. Satterfield et al. (2009) note that more recent explications of the model had further defined 'evidence' with the inclusion of an evidence hierarchy with a view to helping EBM users appraise and integrate multiple types of evidence.

Evidence-based medicine, which was driven by the biomedical model and given prominence to quantitative evidence, has been criticised as being too positivistic in orientation (Clegg 2005), despite the recognition that evidence from systematic reviews and meta-analysis is less likely to provide information that is 'misleading' on the effect of an intervention (Sackett et al. 1996; Rycroft-Malone et al. 2004). The prominence of quantitative evidence over other forms of evidence has generated major concerns among scholars. Thus, the pre-eminence given to research about effectiveness, with emphasis on randomised controlled trials (RCT) as 'gold standards', has been widely debated in the literature (Kitson et al. 1998; McCormack et al. 2002; Rycroft-Malone et al. 2004; Clegg 2005). It has been observed that those who are in favour of this research tradition are influenced partly by socio-political factors (Clegg 2005); financial considerations, risk reduction and professionals trying to increase their status against the backdrop of increased managerialism (Traynor 2002; Rycroft-Malone et al. 2004; Clegg 2005).

Referring to nursing practice, Rycroft-Malone et al. (2004, p.81) argue that

"the practice of effective nursing, which is mediated through the contact and relationship between individual practitioners and patient can only be achieved by using several sources of evidence".

This view was earlier expressed by Kitson (2002). From a multidisciplinary perspective, Rycroft-Malone et al. (2004) note that the centrality of the relationship between nurses' contact with patients and other health professionals plays a complementary role regarding the role of scientific

evidence. They therefore suggest that the nature of evidence is broader than evidence based on research (Rycroft-Malone et al. 2004). In this regard evidence has been categorised into propositional and non-propositional knowledge, where the former refers to evidence that is

“formal, explicit, derived from research and scholarship and concerned with generalisability”

(Rycroft-Malone et al 2004, p.3)

The latter evidence is described as

“informal, implicit and derived primarily through practice”

(Rycroft-Malone et al. 2004, p.3)

It is regarded as part of what is termed '*professional craft knowledge*' (Rycroft-Malone et al. 2004, p.3). Craft knowledge has been described as the tacit knowledge of professionals. Non-propositional knowledge has also been considered personal knowledge associated with life experience and cognitive resources (intellectual capacity) that one brings to the practice environment to enable one to think and perform ones professional duties (Higgs & Titchen 1995, 2000; Eraut 2000; Rycroft-Malone et al. 2004). It is argued that by ascribing prominence to propositional knowledge, implies that other forms of evidence are neglected regarding the delivery of health services (Rycroft-Malone et al. 2004). For this reason, Joanna Briggs Institute has incorporated evidence on qualitative studies, notes, texts, opinions and discourses into their hierarchy of evidence. The key elements of the hierarchy of evidence, according to Joanna Briggs Institute are: feasibility, appropriateness, meaningfulness and effectiveness (Pearson et al. 2005; JBI Reviewers' Manual 2008).

In reference to evidence-based practice in their conceptual framework, Kitson et al. (1998) have considered the interplay of the level and nature of evidence, the context or the research environment, and the method or the way in which the process is facilitated. In their conceptual framework regarding these three elements Kitson et al. (1998) argue that for research evidence to be

successfully implemented in a practice situation, there is the need to give equal weight to all the three elements cited, since current research has failed to draw conclusions as to which of them is most important. The framework has since been refined (see Kitson et al.'s [2008] Promoting Action on Research Implementation in Health Services [PARiHS] framework). In its present form, Kitson et al. (2008) have argued that within the model, successful implementation (SI) was represented as a function (f) of the nature and type of evidence (E) (or guideline), the qualities of the context (including local context, resources, physical and political influences) within which the evidence was being implemented, as well as the way the process of implementation is facilitated (F); $SI=f(E,C,F)$. It thus, seeks to show that the three elements (evidence, context and facilitation) required for translating evidence into practice are interdependent (Kitson et al. 2008).

In relation to evidence translation, the PARiHS model seems to overlap with Glasziou's (2004) Pipeline Model. According to the Pipeline Model, a series of events occur in a linear fashion: awareness of relevant evidence (for example, IEC strategies); acceptance of the evidence; applicability (by adoption) to practice for that group of patients, availability of resources and ability to carry out the intervention in the appropriate context; action taken by practitioner; agreed to by patients; and adherence by patients at the end of the pipeline. In this model the health professional is the facilitator of the process of evidence translation. The extent to which the evidence could be successfully translated into practice also depends upon the context within which it is implemented, since implementation challenges may differ from one context to another (see Chapter 6, Section 6.3).

The ultimate success of the process of translation, it is argued, depends upon the extent to which the health professional is aware of the evidence, how the evidence is accepted, applied and action taken to ensure that the evidence reaches the patient as the final consumer. Glasziou (2005) suggests that the pathway as depicted in the pipeline is similar to a 'leaky' pipeline through which evidence flows (also see Wimpenny et al. 2008). Building on the work of Pathman et al. (1996), Glasziou (2005) also identified specific stages along the pipeline (earlier cited above), suggesting that leakage occurs at specific

points, leading to reduction of evidence between the stages of implementation, so that by the time the evidence reaches the patient, a certain percentage of it would have been lost. This leakage may be related to barriers (Wimpenny et al. 2008) or challenges in relation to the process of implementation of evidence. Glasziou's Pipeline Model has been criticised for being overly linear (Wimpenny et al. 2008). However, Wimpenny et al. (2008, p.6) acknowledge its strengths with respect to the

“different stages where impact could be identified and improved.”

It may be argued that the stages of awareness, through acceptance, adoption and action are also applicable to the patient, irrespective of the health message delivered.

Evidence may be meaningless unless it is used in practice settings. In order to examine the extent to which evidence implementation makes an impact in practice, there is the need to evaluate it. For this reason, the next section focuses on the evaluation of the outcome of the systematic review, based on a survey approach.

3.5 Evaluation Methodology: Survey of African Countries

3.5.1 Introduction

The systematic review led to identification of 10 IEC strategies and 11 IEC programme implementation challenges. This evaluation methodology involved a survey of four African countries with a view to validating and authenticating the outcome of the systematic review of evidence by health professionals and faith-based organisations. This section on Phase 2 covers the research questions; aims and objectives; sampling techniques; a pilot study; primary data collection in Africa; data analysis; and summary and conclusions. By consensus analysis method, the author was able to analyse the expert opinions expressed.

3.5.2 Survey Questions, Aims and Objectives

The Phase 2 of the research sought to conduct an evaluation on the outcomes of Phase 1 of the study by seeking contextually based opinion to complement the systematic review the author had undertaken. This was aimed at achieving the aims and objectives set in Chapter 1 (see Section 1.4). In this section, these aims and objectives are revisited in the light of the survey questions as shown in Table 3.4.

3.5.3 Methods

The second phase of the study used a survey approach to evaluate the outcome of the systematic review. Survey techniques are useful in a variety of ways (Crombie & Davies 1996; Bowling 1999, 2000; Bowling & Ebrahim 2005). Surveys can be conducted among different groups of respondents, including health professionals, patients and their carers (Crombie & Davies 1996). By using a survey approach, the researcher is able to seek opinion on pertinent issues from a number of participants from geographically disperse populations at the same time using questionnaires (for example, see Onwujekwe et al. 2000; Njagi et al. 2004; Baum & Marin 2008). A multi-stage sampling technique was used. This involved a combination of sampling approaches, namely convenience, quota and snowball at different stages. While data were collected using questionnaire, the data were analysed using a consensus analysis approach. Each of these methods is described in turn.

Table 3.4 Survey Questions, Aims and Objectives

Research Aims and Objective: Research Question Revisited	
1	To identify evidence of impact of information, education and communication (IEC) strategies in malaria prevention and control for pregnant women in Africa (main aim)
	What is the evidence of impact of the IEC strategies with regards to malaria prevention and control among pregnant women based on specific context and experiences?
2	To identify IEC strategies aimed at malaria prevention and control during pregnancy
	<ul style="list-style-type: none"> • What are the information, education and communication strategies (IEC) in malaria prevention and control among pregnant women? • What is the expert opinion on the rating/scoring of IEC strategies?
3	To identify evidence of feasibility, appropriateness, meaningfulness, and effectiveness of IEC strategies in malaria prevention and control among pregnant women
	What are the opinions of health professionals and lay persons on feasibility, appropriateness, meaningfulness and effectiveness of IEC strategies?
4	To identify evidence of challenges confronting implementation of the IEC strategies with respect to pregnant women
	<ul style="list-style-type: none"> • What are the challenges confronting implementation of the IEC strategies? • What is the expert opinion on the rating/scoring of IEC strategy implementation challenges?
5	To develop a theoretical framework and illustrate its application to enhance the understanding of issues related to implementation of IEC strategies
	What theoretical framework can be developed in order to enhance the understanding of issues related to the implementation of IEC strategies?
6	To identify best practices and key lessons in order to inform governments, policymakers, health partners, the academic community, health directors, health managers, frontline health professionals, health educators at health facility and community levels on IEC programme development and implementation aimed at achieving desirable impact
	What best practices and lessons can be identified concerning IEC interventions in malaria prevention and control in pregnancy in order to inform governments, policymakers, health partners, the academic community, health directors, health managers, frontline health professionals, health educators at health facility and community levels?

3.5.3.1 Sampling Techniques

A multi-stage sampling technique was used in which the author identified groups or organisations, obtained names of prospective participants or individuals within these groups or organisations to act as focal points for data collection. From these groups or organisations, participants were then sampled (see Babbie 1990; Creswell 2009). This approach was used because the author did not have direct access to respondents (Creswell 2009). The multi-stage sampling technique involved the following stages:

i. Stage 1: Determining an 'expert'

In recruiting participants, there was the need to determine who an 'expert' was regarding malaria, its prevention and control. Two groups of respondents were targeted. These were health professionals (herein defined as 'experts') and members of faith-based organisations (FBOs) (herein defined as 'lay experts' or 'lay persons'). In effect, for the purpose of the study, health professionals were considered 'experts' based on their knowledge and experience of malaria, its prevention and control in Africa, including malaria in pregnancy. In the case of lay participants, they were considered 'lay experts' on the grounds that they had knowledge and experience of either serving as carers of malaria patients, or having been malaria patients themselves or having lived in areas of malaria.

ii. Stage 2: Targeting first group of respondents

The author targeted health professionals from the Joanna Briggs Institute (JBI) Collaborating Centres in Africa through the use of the JBI website. Centres have links to local health services in addition to being sited in university settings.

iii. Stage 3: Reaching out to the JBI Centres in Africa by convenience sampling

In order to ascertain which centres would be willing to take part, the author contacted the Director of JBI Centres in charge of the African Region, based in Adelaide, South Australia (see Appendix 8.1). Although 13 African countries were

identified, only four of them expressed interest in participating in the study. These were Ethiopia, Ghana, Nigeria and Tanzania.

iv. Stage 4: Linking with other organisations by snowball approach

After gaining access to the JBI Centres, the researcher was able to communicate with the conveners (JBI centre directors facilitating data collection) in the above-named country centres. The researcher requested at least six more participants, who were linked to other health organisations, such as ministries of health and health research institutions in selected universities. Under an ideal situation, where a sample is randomly chosen, it serves as an initial contact of the sampling process (Useem 1973; Heckathorn 1997). However, in this case, this was not possible. Since the sampling frame of the target population was not readily available, the snowball approach helped to identify others who had relevant health knowledge and experience, and could give an opinion on the evidence from the systematic review (for example, see Goodman 1961; Heckathorn 1997; Bowling 1999, 2000).

v. Stage 5: Recruiting Faith-Based Organisations (FBOs) in Ghana

It was felt that relying on the opinions of healthcare professionals alone would not provide sufficient breadth to address the research questions. This stemmed from the fact that IEC roles have often been considered by some as unstrategic, and essentially as interventions of frontline health professionals (Lettenmair 2003). Therefore, there was the need to involve lay persons. For this reason, one community was identified for a case study with which to compare opinions of health professionals. For this purpose the Sampa Community located in the Brong-Ahafo Region (Jaman North District Profile Report 2010) was targeted. Firstly, recruiting FBO representatives allowed the researcher to gain access to a cross-section of members of the Sampa community, where malaria is endemic. Secondly, representatives of FBOs are readily available to provide information on the issue being investigated. Thirdly, as organised religious institutions, Christian and Islamic organisations have leaders (who served as gatekeepers) through whom the researcher was able to gain access to the respondents. Christians and

Muslims were particularly targeted as they form the bulk of FBOs in the Sampa community (Jaman North District Profile Report 2010). Fourthly, this segment of the population live in a malaria endemic area within a rural community (Jaman North District Profile Report 2010), where healthcare facilities are inadequate compared to urban settings (see Chapter 1, sub-section 1.5.6.2[ii]). Although predominantly lay people (but professionals in other disciplines) (see Chapter sub-section 5.2.5 Table 5.4; and sub-section 5.2.6), they were all literate, and were therefore in the position to express their opinion in writing, coupled with their personal knowledge and experience in relation to malaria, its prevention and control. It was therefore expected that their views would provide potentially different perspectives to those of the health professionals, who had expertise in the subject matter, coupled with the fact that most of them live in urban areas where healthcare infrastructure is readily available (see Chapter 5, Table 5.5). The FBO representatives were recruited by a quota sampling approach (see Carlson et al. 1994; Bowling 1999, 2000). Specifications were given to focal individuals (people who helped to collect the data) with regard to the number and type of participants required (see Appendix 9, Section C).

vi. Stage 6: Determining the Number of Participants

The issue of numbers of participants is crucial in surveys (Babbie 1990; Bowling 1999, 2000; Creswell 2009). Since the sampling approach was non-probabilistic no power calculation was undertaken. Rather, the basis for determining the number of participants was their availability to participate by convenience (Erickson 1979; Bowling 1999, 2000). With regards to participants from JBI Centres, the specific number of participants could not be determined. This was because not all JBI Centres specialise in malaria research. Only people who felt they could participate were recruited. However, as noted earlier at least six additional participants linked to health organisations were targeted. On the other hand, the number of participants from FBOs was determined based on the ratio of Christians to Muslims within the Sampa community (Jaman North District Profile Report 2010).

Although some authors do not subscribe to the use of non-probabilistic sampling for the selection of participants (see Erickson 1979; Babbie 1990; Heckathorn 1997; Creswell 2009), the approach suited the purpose of the current study. This is because the people within the population could not be given an equal chance of being selected because not everybody had knowledge and experience about the subject being investigated. In all, 214 participants were targeted. Out of this number 50 were FBOs representatives (30 Christians and 20 Muslims) (see Appendix 13). The difference in the ratio of Christians to Muslims was based on the fact that 80% of the target population was made up of Christians, while Muslims constitute 15%, with the remaining 5% being traditional worshippers (Jaman North District Profile Report 2010). Since the study sought to elicit expert opinion, the total number of respondents was considered adequate as the sampling was non-probabilistic, and consistent with opinion seeking (see Abrahamson & Abrahamson 1999; Caulkins & Hyatt 1999; Caulkins 2001).

The groups of samples (notably health professionals and FBO representatives) were regarded as heterogeneous since they operate from different countries under different circumstances and contexts. The heterogeneity of the study participants and for that matter their opinions were heightened by the inclusion of participants from faith-based organisations at the community level. As such, their opinions were bound to vary. This gave room for diversity and information richness. Since respondents were selected from four different countries of geographically diverse population across Africa (see Chapter 1, Table 1.1), it may be argued that some amount of generalisability of opinions could be achieved, although representativeness was not the goal of this approach. Combined with the outcomes of the systematic review, the opinions of respondents were regarded as a reflection of the general view of respondents across malaria endemic countries in Africa (see Chapter 6, Section 6.8 on strengths and limitations).

3.5.3.2 Primary Data Collection

The primary data collection was carried out in two stages. The first stage involved a pilot study in Aberdeen, Scotland. Conducting a pilot study is an important part of a survey, as it represents a fundamental phase of the research process (Leon et al. 2010). As an important element of a good study design (van Teijlingen et al. 2001; van Teijlingen & Hundley 2002), it helped to establish the content validity of the data collection instrument and improved the questions, format and scales designed for the instrument (Creswell 2009). Moreover, the pilot was conducted with a view to identifying any potential weaknesses in the planning process (Gardner et al. 2003). This helped to minimise any risk or uncertainty that might have potentially affected the outcome of the study (Turner 2004). Using this approach the researcher was able to examine the feasibility of conducting the study on a larger scale (Leon et al. 2010) in Ethiopia, Ghana, Nigeria and Tanzania in line with the sampling technique.

The data collection involved administration of questionnaires by email and post (Bowling 1999, 2000; Bowling & Ebrahim 2005; Dillman 2007), depending upon what was considered appropriate by the respondent. However, because of the involvement of focal individuals in the data collection process, some respondents received questionnaires directly. The challenge of using email and postal approaches to questionnaire administration is that the respondent must be literate (Bowling & Ebrahim 2005). Secondly, the questionnaire must be straightforward (Bowling & Ebrahim 2005). Therefore, in order to make the completion of questionnaire easy, an attempt was made to make questions straightforward through pilot testing. For instance, sample questions and answers were given where appropriate for the purpose of illustration in order to minimise difficulties of completion. This was essential as the questionnaires were to be completed some distance from the researcher and in a different context.

i. Pilot Study: Pretesting the Questionnaire

- **Seeking Authorisation and Administering Questionnaires**

A pilot study was conducted in a Christian Church based in Aberdeen, Scotland, predominantly made up of people of African origin. Following an acceptance of a letter of introduction (see Appendix 8.2), the questionnaires were administered to 10 members.

Apart from the church, 10 additional questionnaires were administered to a number of Africans living in Aberdeen, Scotland, with different occupational backgrounds. Prior to this, these participants were contacted both by phone and face-to-face in order to seek their consent. A return of the questionnaire meant consent was given by the respondents (see Appendix 9). The pilot study was conducted amongst people who had experience, general knowledge of malaria, its prevention and control in Africa. It was a two-week study carried out between 16th and 31st August, 2009.

- **Response Rate for Pilot**

Of the 20 questionnaires sent out, 16 were completed and returned. Thus, the overall response rate was 80%. Out of the 16 questionnaires received, only 1 was received by post. All the rest were received by hand.

- **Background Information of respondents**

In terms of background information, all the respondents aged between 33 and 50 years. Most (75%) of the participants were females. Although it was not deliberate that more women than men were to be selected, this coincidence could be considered critical since women are more likely to be informed or interested in issues of pregnant women than men in Africa. The level of education of the participants could be described generally as very high ranging from Ordinary level to PhD. Forty-four percent of the respondents attained masters degree; followed by people with Diploma (19%), then PhD and First Degree holders (13% each); and finally General Certificate Examination (GCE) Ordinary level and others (6 each). Despite this high level of literacy, some of the respondents considered the

standard of the language in the questionnaire too high. This may be due to the fact that most respondents in the pilot study were not health professionals. All respondents said they were Christians.

The study showed that the professional background of respondents cut across several disciplines. These involved medical doctors, nurses, a pre-registration pharmacist, a community health worker, an environmentalist, consultants, a research scientist, a support worker, and a safety engineer. Related to the professional backgrounds were fields of specialisation of respondents. These involved general medical practice; adult nursing; occupational psychology; education; support work; planning, monitoring and evaluation; strategic environmental assessment; forest ecology; information technology; safety engineering and risk management; social science and policy advice on inequality. This is important as it helped to identify divergent opinions of both lay people and health professionals.

In terms of country of origin most (69%) of the respondents came from West Africa, specifically Ghana and Nigeria. The rest were from Malawi, South Africa, Uganda and Zimbabwe. Thus, the pilot study covered people from different parts of Africa (West, East and Southern Africa), with the exception of the Northern part of Africa where malaria is virtually non-existent. In effect, the pilot study covered respondents from both malaria endemic and epidemic areas of Africa. This mirrors the background of respondents of the main study.

- **Evaluation of Questionnaires**

The questionnaires were evaluated based on 7 criteria as follows:

- Understanding
- Clarity
- Ambiguity
- Language
- Style of presentation
- Readability

- Length of completion of pilot questionnaire (see Table 3.5).

Table 3.5 Evaluation of Pilot Questionnaire

No	Variable	Frequency			Percent			Total (%)
		Yes	No	N/A	Yes	No	N/A	
1	Understanding (scoring)	15	0	1	93.75	0.00	6.25	100
2	Clarity	11	2	3	68.75	12.50	18.75	100
3	Ambiguity	2	11	3	12.50	68.75	18.75	100
4	Language	11	1	4	68.75	6.25	25.00	100
5	Style of Presentation	11	2	3	68.75	12.50	18.75	100
6	Readability	14	1	1	87.50	6.25	6.25	100

NB: N/A = Not applicable

- **Understanding: Scoring**

Ninety-four per cent (n=15) of the respondents noted that the scoring was easy to do. In fact, one of the respondents even indicated that it was "very easy".

- **Clarity**

Sixty-nine percent (n=11) of the respondents were of the view that the questions were clear; while only 12.5 % (n=2) felt otherwise, with the remaining 18.3% (n=3) not applicable.

- **Ambiguity**

In line with the issue of clarity, 69% (n=11) of the respondents noted that there was no ambiguity in any of the questions. One respondent (a staff nurse) even indicated that the 'questions were straight forward'. However, one of the respondents who thought otherwise noted that some questions, under background information, were irrelevant. Others felt some of the questions on challenges were ambiguous. Additionally, there was a face-to-face discussion with one of the respondents. Some of the strategies and challenges found to be loaded with many issues demanding separate responses were taken on board. Any element of ambiguity was addressed by rephrasing some of the questions and inserting any relevant information where appropriate. Questionnaires found to be

too loaded and demanding separate responses were split. For example, a question related to knowledge, attitude and practices were split into three separate questions.

- **Language**

Sixty-nine per cent (n=11) of the participants held that the language of the questionnaire was appropriate. Commenting on language, one respondent indicated that it did seem that the questionnaire was meant for '*high powered individuals*' referring to people of high academic standing and malaria control specialists. Re-echoing this concern, the only respondent who was undecided on whether or not the language of the questionnaire was appropriate noted that the

"language is pitched high especially the introduction and the background information – quite technical".

(Support Worker, Father's House Church)

This concern was rectified by rewording some of the language of the questionnaire.

- **Style of presentation**

Sixty-nine per cent (n=11) of respondents held that the style of the presentation was acceptable. One respondent (a staff nurse) even noted that it was '*very acceptable*'. Therefore the style was maintained.

- **Readability**

In the case of readability, about 88% (n=14) said the font size was readable. One participant (a staff nurse) even observed that '*everything was clear*'.

- **Length of completion of Pilot Questionnaire**

The shortest time spent by respondents was 13 minutes (1 staff nurse) and the longest time spent was 3.5 hours (a pre-registration pharmacist). On the whole, 38% (n=6) of participants managed to complete the questionnaire within 30 minutes; while 20% (n=3.2) of them spent 60 to 90 minutes. Three (19%) were

however, undecided on the length of time spent on completion of the questionnaire.

Only one respondent expressed concern about the fact that the questionnaire was voluminous and time consuming. To that effect, one respondent described the questionnaire as a 'report', rather than a questionnaire. With this concern in mind, part of the introductory section of the questionnaire was removed and added to the participant's information leaflets. Questionnaires that were meant for distribution by post were two-sided photocopied in order to shorten the volume of the questionnaire and cost of printing.

- **Conclusions: Pilot Study**

On the whole, the standard of the questionnaire was considered high and appropriate to the issues of IEC strategies for malaria and pregnant women. Changes were made to ensure the language of the questionnaire was suitable for lay experts as well as health professionals.

In terms of scoring, opinions varied markedly, with health professionals providing similar responses. Few participants were undecided during the evaluation of the questionnaire on ambiguity, language, clarity and style of presentation, with about 76% of respondents providing favourable response across all the evaluation measures. The final questionnaire was therefore revised taking into consideration all the observations. To this end, it may be concluded that the pilot study was very helpful in shaping the questionnaire for data collection.

ii. Final Design of Questionnaire

Following the pilot study, the final version of the survey questionnaire was designed. The major feature of the design was a five-point Likert Scale for the rating of responses. A ranking approach was also used to complement the rating. According to Cruse (1986) and Massey Ratings (2011), 'ranking' is an ordinal number (for example, first, second, and third in order of importance) that indicates the placement of what is being evaluated or judged. On the other hand,

'rating' involves a continuous scale measurement, and therefore should be interpreted on a scale such as the Likert Scale by comparing it with other ratings (Massey Ratings 2011). While questions on rating focus on comparing different items based on a common scale, ranking questions seek to draw comparisons between different items to one another (Vovici Corporation 2011).

A five-point scale, which is odd-numbered, was preferred, as it provided respondents an option for indecision or neutrality (Markusic 2009; Chomeya 2010). The five-point Likert Scale used was bipolar, with extremes at either end (Streiner & Norman 2003; Trochim 2006). It was also unidimensional scaling (Trochim 2006), since it was an ordered, one-dimensional scale from which respondents were able to choose one option that best aligned with their view (Changing Minds 2011). This type of Likert Scale is commonly used. Using this scale allows respondents an opportunity to make a choice, whether at the lower end, middle or upper end of the scale (Likert 1932; Garland 1991). With an inclusion of a mid-point ('moderate'), respondents were offered an opportunity to make a choice among the various options. Denying respondents this opportunity could have potentially prevented them from expressing genuine opinions much to the detriment of the outcomes of the study.

There appears to be a limited literature systematically comparing the difference between 'rating' and 'ranking' (Alwing & Krosnick 1985). While some have used the two terms interchangeably (The American Heritage Dictionary 2000; SIL International 2004), others hold the view that they are different (Munson & McIntyre 1979; Krosnick & Alwin 1988; Ovada 2004; Massey Ratings 2011; Vovici Corporation 2011). The third school of thought is that the two are similar with respect to ordering the aggregate preferences of the sample, but different with regard to the latent variable structure underlying the measures (Alwing & Krosnick 1985). Researchers are still divided over the preferability of the two measurement approaches, albeit extensive discussion and analysis over the past three decades (Ovadia 2004). According to Ovada (2004, p.1), the debate stems from a

"false premise that one method must be used to the exclusion of the other."

This study used both 'rating' and 'ranking' in a complementary fashion based on the assumption that none of the two is considered complete without the other (Ovada 2004). This is supported by an analysis of data from the 1995 to 1997 World Values Survey which showed how using both rating and ranking techniques could result in distinct valid conclusions on the differences in value importance among nations across the world (see Ovada 2004). Since the two measurement methods complemented each other, the author is of the view that the two methods could be considered two sides of the same coin, with a dual benefit. This is because, the author anticipated a possibility that in designing the questionnaires using the Likert Scale a problem could arise whereby respondents could have been influenced by the way previous questions were answered (Changing Minds 2011). For example, if they had indicated 'very low', 'moderate' or 'very high' in a row, there was the tendency that some respondents might have continued to indicate 'very low', 'moderate' or 'very high'. This could have made it difficult to determine any genuine differences regarding the ratings, as rating allows participants to assign items the same, resulting in less differentiation amongst items (Vovici Corporation 2011).

In order to address this problem, the author asked respondents to rank which IEC strategy or challenge they would consider the highest or lowest priority strategy; and highest or least priority challenge respectively, irrespective of the way previous ratings were made. This way, a distinction was drawn between rating of individual strategies and challenges in isolation, and ranking of the same strategies and challenges in relation to each other respectively. Thus, the two categories of questions complemented one another.

The questionnaire was made up of two sections (Sections A and B) (see Survey Questionnaire in Appendix 10).

- **Section A**

This section was made up of instructions for the completion of the questionnaire. The section also included contact addresses of the author (as the principal investigator) and the principal supervisor for the purpose of any queries and return of questionnaire.

- **Section B**

Section B involved 11 questions as follows:

- **Question 1:** This covered background information of respondents. These were: age, gender, level of education, profession/occupation, faith, field of specialisation/expertise, place of work, position in organisation, respondents' and their organisation's IEC roles in malaria prevention and control. Other questions were: country, region and district of residence as well as country of origin.
- **Question 2:** The question involved IEC strategies for malaria prevention in pregnant women. In this question, respondents were asked to rate the list of 10 IEC strategies on a 1-5 Likert Scale, where 1=very low priority; 2=low priority; 3=moderate; 4=high priority; and 5=very high priority. Where possible, justifications or comments were asked to support the rating. Apart from the list provided, respondents were also asked to add any known IEC strategy and rate this accordingly.
- **Question 3:** This was an extension to *Question 2*. In this question, respondents were asked to nominate the top 3 and the least priority strategy by inserting the number of the strategy in the appropriate box. In order to ensure accuracy in answering the question, sample questions and answers were provided as a guide.
- **Question 4:** In relation to *Question 3*, respondents were asked to comment on their choice of highest or lowest priority strategy.

- **Question 5:** Question 5 was concerned with IEC strategy implementation challenges. In this question, a list of 11 statements on challenges with regards to malaria prevention and control in pregnant women were given. Here, respondents were asked to circle their response with respect to level of challenge on a 1-5 Likert Scale, where 1=very low; 2=low; 3=moderate; 4=high; and 5=very high. Each rating was expected to be justified where possible. In addition to the list of statements provided, respondents were urged to add any known challenge.
- **Question 6:** This was an extension to *Question 5*. In this question, respondents were asked to look through the challenges listed in the previous question and nominate the highest 3 challenges and the least challenge by inserting the number of the challenge in the appropriate box. In order to ensure accuracy in answering the question, sample questions and answers were provided as a guide.
- **Question 7:** In relation to *Question 5*, respondents were asked to comment on their choice of highest and least challenge.
- **Question 8:** This question asked respondents to indicate whether they were aware of any impact of IEC strategies by ticking the appropriate box.
- **Question 9:** In this question, respondents were asked to provide details of their personal experience within the context of their country specific situation.
- **Question 10:** In Question 10, respondents were asked to provide any additional comment (s) or recommendation (s) as to how some of the challenges mentioned could be addressed.
- **Question 11:** This question focused on feasibility, appropriateness, meaningfulness and effectiveness (FAME) of IEC strategies. Here, respondents were asked to rate on a scale of 1-5, where 1=very difficult;

2=difficult; 3=moderate; 4=easy; and 5=very easy for feasibility; and 1-5 scale for appropriateness, meaningfulness and effectiveness, where 1=very low; 2=low; 3=moderate; 4=high; and 5=very high by ticking the appropriate response. In order to ensure completion, operational definitions of FAME were given. A sample question and answers were also provided to serve as a further guide.

iii. Data Collection in Africa

- **Ethical Considerations**

The study proceeded with an ethical approval given by the Robert Gordon University Research Ethics Committee and Sub-committee of the School of Nursing and Midwifery (see Appendix 11.1). In an attempt to address any ethical concerns, participants were informed that the data to be collected would be confidential and anonymous. In this regard, data would be stored and protected in accordance with the Data Protection Act 1998. Data would only be used for academic purposes, including publications.

In order to ensure anonymity, the questionnaire was deliberately designed to exclude names of respondents. Issues of consent were also addressed. A return of the questionnaire meant consent to participate in the study. Therefore, no consent forms were given to participants (see Appendices 9 and 10).

To enhance participants' understanding of the study, the researcher produced an information leaflet which set out a brief background of the researcher, the research topic, the aims and objectives of the study, the study design and ethical considerations. Participants were informed that the data would not be identifiable to individuals. In addition, participants were informed that they could choose to opt out of the study at any stage (see Appendix 9).

- **Addressing Gate Keeping Issues**

It has been suggested that in order to gain access to research sites or individuals within them, a number of steps should be taken. It is also argued that regardless

of the method of research, permission needs to be sought through appropriate gate keepers (Unsworth 2002). Since all the Collaborating Centres participating in the study were part of Joanna Briggs Institute (JBI), permission was sought from the Regional Director in charge of JBI Centres in Africa, based at the Headquarters of the Joanna Briggs Institute in Adelaide, South Australia (see Appendices 8.1 and 11.2). Letters were also sent to appropriate conveners of various JBI centres for their permission (see Appendices 8.3 and 11.3) and appropriate authorities within the Ghana Health Service, notably the Director of Public Health and the Regional Directors of Health Services of the regions where data were collected (see Appendix 8.5). With regards to the FBOs, authorisation was sought from the heads of the various Christian churches and Muslim groups based in Sampa in the Brong-Ahafo Region of Ghana (see Appendices 8.4 and 11.5). Finally, letters to individual respondents were incorporated into the information leaflet purposely addressed to them (see Appendix 9). Once access had been established, samples were selected.

- **Administration of Questionnaires**

This aspect of data collection utilised the services of focal persons at various research settings in the study countries. In order to enable the focal persons to optimally administer the questionnaire, clear guidelines were given to them based on study protocols (see Appendix 12). With regards to the JBI Centres, each centre convener was expected to double as a focal person and a participant as and where appropriate, depending upon field of specialisation. In the case of the representatives of FBOs, a focal person (with a background in population studies and family life education) was nominated from the Sampa District Council. The questionnaires were administered between September 2009 and March 2010. Email and postal addresses for JBI Centres were obtained through the JBI website (see JBI 2008c) to facilitate the distribution of questionnaires. It was realised through telephone conversation with the focal person from Sampa in Ghana that there was no internet facility for emails. In the case of Nigeria, although there was an internet facility, it was not always reliable. With regard to Swaziland, no email address was available in the JBI webpage. For these reasons questionnaires

were sent by post to focal persons in the affected countries, for distribution. However, no response was received from Swaziland. Further follow-up yielded no results. Therefore, no additional questionnaires were sent by post to Swaziland and all other countries who failed to acknowledge receipt. For countries like Cameroon, Kenya and Uganda, no further contacts were made due to difficulties involved in addressing ethical and administrative issues.

- **Follow-up**

The first batch of the questionnaires was sent out by 30th September 2009. Three to four weeks after dispatch of the questionnaires, a follow-up was made through email or telephone to assess the progress of data collection. Clarifications were given to focal persons where appropriate. The last batch of questionnaires was received by 10th March 2010.

- **Finance and Budgeting Issues**

Where appropriate, focal persons were reimbursed the cost of postage of returned questionnaires and administrative cost related to data collection.

3.5.3.3 Data Analysis

Data were analysed based on consensus analysis approach. This provided a technique for identifying certain patterns of agreement (similarities) and disagreement (differences) regarding a domain of knowledge among individuals (for example, IEC related to malaria in pregnancy) within a specified social setting (Ethiopia, Ghana, Nigeria and Tanzania).

In justifying the need for using consensus analysis approach, Abrahamson and Abrahamson (1999, p. 233) observed as follows:

“There is sometimes interest in learning the opinions of people with special knowledge or interest, in order to ascertain their consensus (majority opinion) or, if there is no consensus, to map their disagreements. The group may be a panel of experts who have skills and knowledge relevant to some field of healthcare, or of professionals or laymen who have a special interest in some situation or topic, such as a community and its problems.”

Through this approach, the author was able to identify the relative importance (Abrahamson & Abrahamson 1999) of identified IEC strategies and challenges from the perspective of both health professionals and lay persons.

The author shares the opinion of Abrahamson and Abrahamson (1999) that the use of expert opinion may be particularly appropriate in the case of developing countries (such as the countries under study), in situations where 'hard' data may not be readily available. This is because it was difficult to identify evidence of IEC strategies in a systematic form in Africa, regarding pregnant women, in the area of malaria prevention and control. Analysing opinions of respondents filled this gap.

Consensus analysis can allow for the identification of individuals who are most and least competent regarding the domain of knowledge under consideration (Allen & Measham 1991; Caulkins & Hyatt 1999). However, the essence of the current study was not to test knowledge and competence but to seek opinion and the extent of consensus of opinions expressed using appropriate statistical test, mean and percentage scores (Caulkins 2001; Unsworth 2002; Brown 2008). Qualitative data analysis also helped to illuminate the extent of similarities and differences. Thus, both quantitative and qualitative techniques were used to analyse the data.

With regards to the quantitative data analysis, SPSS Version 15.0 was used. Means and percentages were calculated for item scores as and where appropriate. Two non-parametric tests were conducted as well as sensitivity analysis. The first non-parametric test was the Mann-Whitney Test. This was used to compare statistical differences and similarities between opinions of two independent samples from Ghana, namely health professionals and faith-based organisations. The second non-parametric (NPar) test was the Kruskal-Wallis Test used to test statistical differences of opinions among respondents from Ethiopia, Ghana and Nigeria. The non-parametric tests were conducted for both rating of

the IEC strategies and the challenges, where the level of significance was defined as $p \leq 0.05$ with a 95% confidence interval. Non-parametric tests were conducted to examine differences and similarities among the groups as data were not normally distributed (Brown 2008). The advantage for applying these tests was the author's ability to analyse the opinions of different groups or independent samples at the same time (Brown 2008). In the case of the sensitivity analysis, this was carried out to identify any change in outcomes following the inclusion of lay respondents. The sensitivity analysis was also used to compare the outcome of the pattern analysis of feasibility, appropriateness, meaningfulness and effectiveness of the IEC strategies among health professionals only, with the inclusion of FBOs in order to observe any change in outcomes (see Chapter 5, Section 5.9).

In terms of means, opinions were considered similar where there were no statistically significant differences in the opinions of respondents regarding either the IEC strategies or the challenges. However, opinions were considered different where there were statistically significant differences. Based on percentages, consensus on ranking of highest or lowest priority strategy or highest or least challenge was said to have been reached where a given strategy or challenge was identified by all countries involved in the study at the same time.

The qualitative data were analysed using a textual analysis approach (for example, see Silverman 1993). This was guided by a template developed by the author in order to manage the data extracted from responses to open-ended questions in the questionnaire (see Appendix 13). However, due to the amount of data from the four countries, a narrative summary was undertaken to synthesise the key findings and present them diagrammatically. These were then integrated with the quantitative data where appropriate (see Chapter 5). The advantage of including the qualitative data was that it helped to enrich the content and quality of the mixed data and for that matter the conclusions (Sellitz et al. 1964; Silverman 1993). This is partly because it often illuminated meaning. In this way,

a degree of internal validity was ensured, consistent with the mixed method approach (Boyd 2000; Thurmond 2001; Perone & Tucker 2003).

In determining the extent of consensus using qualitative techniques, Venn diagrams were used to demonstrate the extent of consensus among the participating countries (see Chapter 5, Figures 5.21; 5.25; and 5.26). In addition, within one country (Ghana), the same approach was used to determine differences and similarities of opinions between health professionals and faith-based organisations (see Chapter 5, Figures 5.20 and 5.24).

The three features of consensus analysis: the possibility of identifying agreement patterns; culturally correct information in relation to the local setting; and the ability of individuals to closely match the culturally central version of knowledge – point to the relevance of consensus analysis as a tool for investigating knowledge diversity and similarity among individuals participating in a research setting (Caulkins & Hyatt 1999). Since the survey was conducted within country-specific contexts in Africa, the issue of cultural sensitivity was crucial. Different countries do things differently, and even within same country, there may be cultural variations, as in the case of the Igbo, Yoruba and the Hausa in Nigeria regarding the use of traditional medicine for malaria control (Ene et al. 2010; Ma-Ni 2011). This may impact on opinions, although there may be similarities within and across countries (Helman 2000, 2007; Ene et al.2010).

Borgatti (1997) argues that where there are cultural similarities, the extent of disagreement in opinion might be explained by knowledge differences amongst respondents. Therefore, in analysing consensus amongst respondents in the study countries, the extent of similarities and differences could also be explained by cultural and knowledge factors. From a cultural perspective, Borgatti (1997) suggests that the only force that draws respondents to a given answer is the culturally correct answer. However, Breiger et al. (2001) argues that 'True' answers are determined by the overall consensus of all respondents. This is probably because, the results take into account the totality of opinions expressed

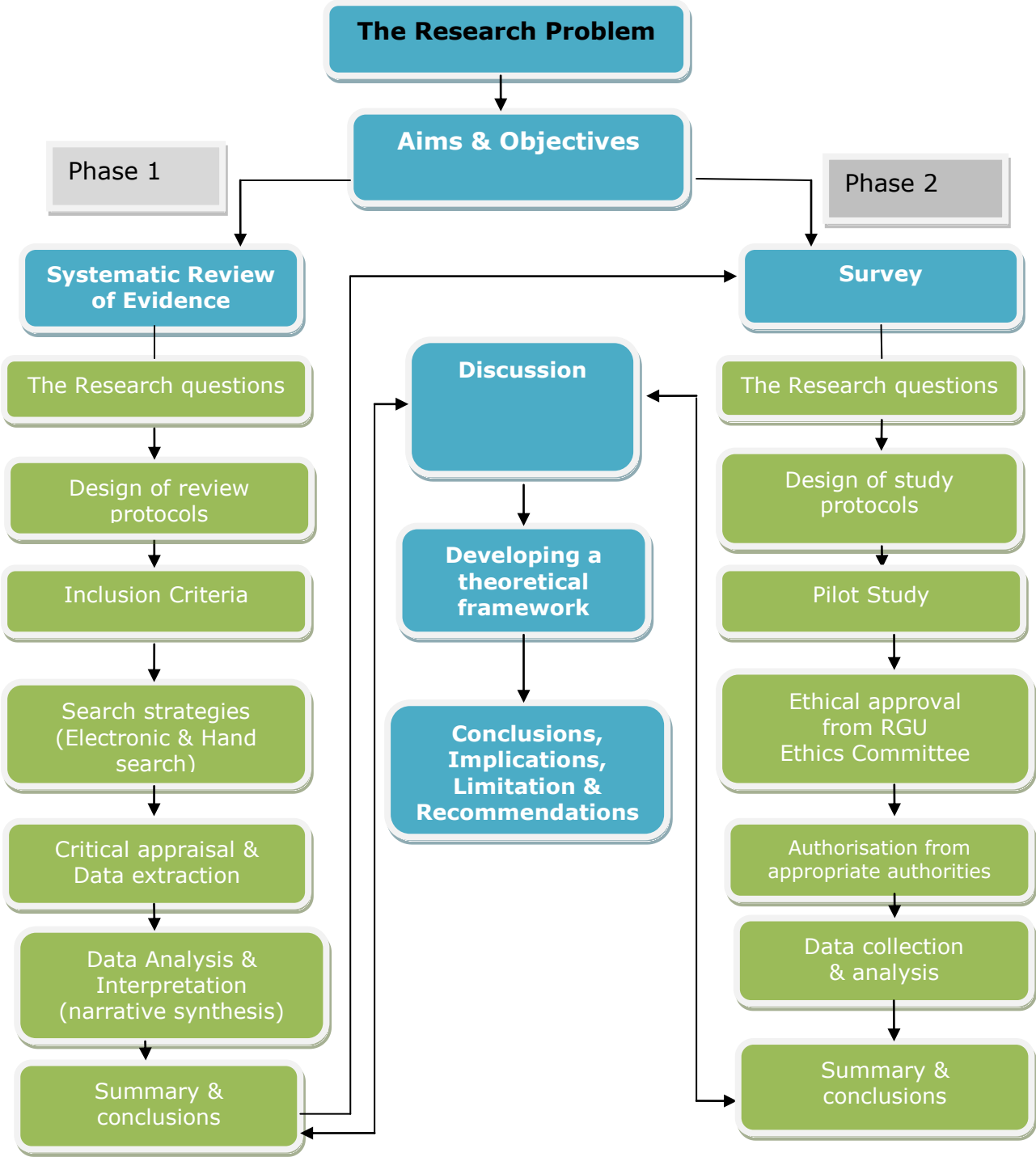
amongst all respondents. Therefore, this study laid emphasis on the overall level of consensus among respondents across all participating countries.

In identifying differences and similarities amongst respondents, the author identifies two major types of agreement (or non agreement). These are what Caulkins and Hyatt (1999) describe as coherent and noncoherent agreements. Caulkins and Hyatt (1999) note that the coherent agreement involves a high degree of consensus, while the noncoherent agreement pertains to a low consensus on the part of the population of interest. In this study both high and low degrees of consensus were identified depending on the level of statistical significance related to the rating of IEC strategies and challenges. Moreover, where a given strategy or challenge was ranked by most respondents as the highest priority, this was considered to be a high consensus or coherent agreement. Where there was no consensus, this was specified (see Chapter 5, Sections 5.4 and 5.5).

3.6 Summary and Conclusions

The mixed method approach involved a systematic review of evidence and an evaluation of the outcomes of the systematic review through a contextually based follow-up survey in Ethiopia, Ghana, Nigeria and Tanzania. In the first place, by using these two approaches, the author was able to identify and appraise available evidence to explore the outcome in an appropriate context. Secondly, the survey provided more insight based upon opinions of groups within and across the study countries. This provided a benefit, which could be described as more than the sum of the two parts, resulting from the complementary role of both phases of the study. Thus, the research design proved beneficial in helping to achieve the research aims and objectives, despite inherent limitations (see strengths and limitations in Chapter 6, Section 6.8). An overview of the relationship between the systematic review (phase 1) and the country survey (phase 2) is summarised in Figure 3.5.

Figure 3.5 Structure of the Study



Chapter 4

Findings of Systematic Review

4.1 Introduction

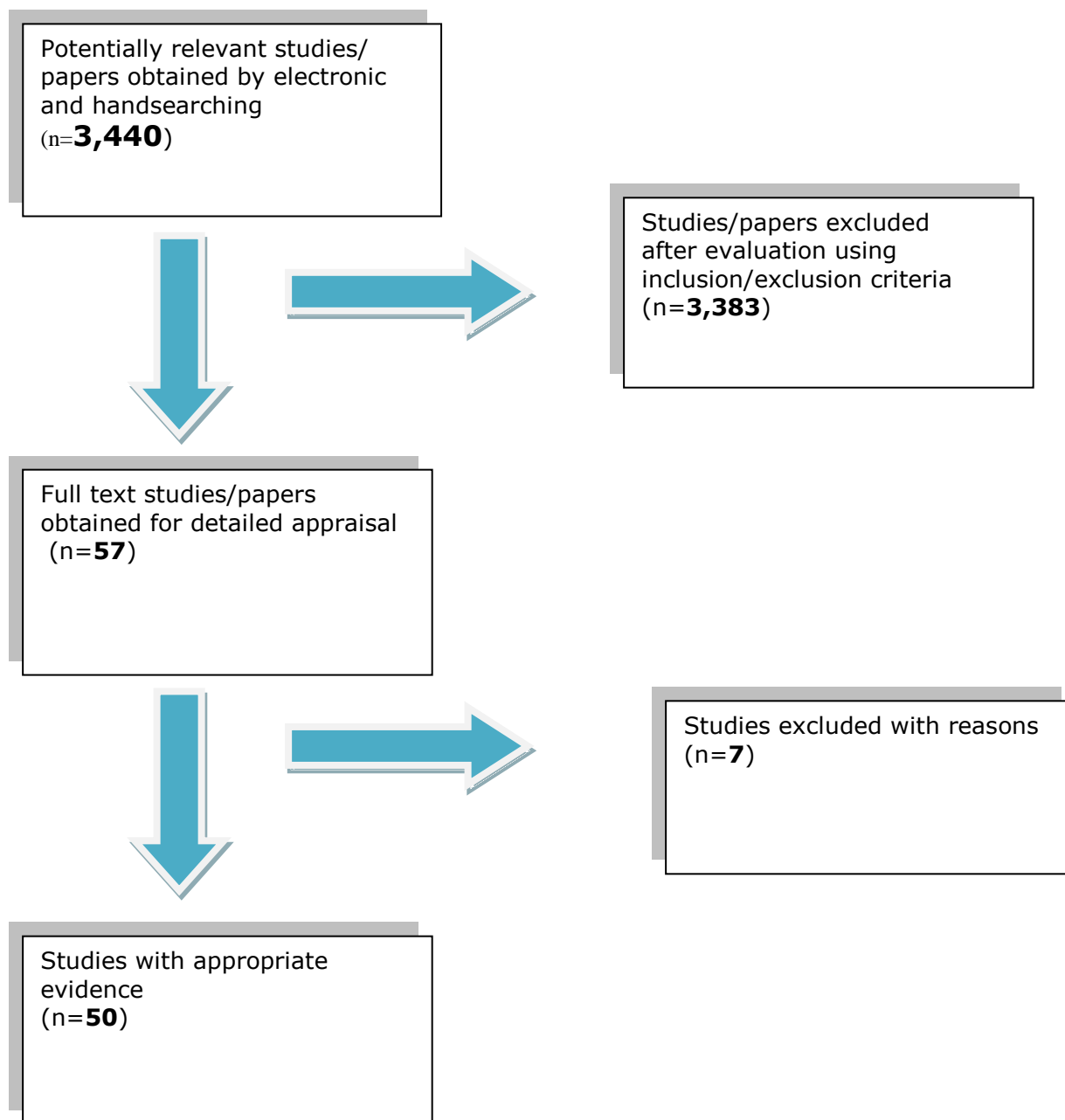
This chapter is a product of the the first phase of the study (notably the systematic review of evidence) as presented in Chapter 3. It covers the following sections:

- Search results
- Methodological quality
- Development and evaluation of studies
- Intervention effects
- Narrative synthesis
- Summary and conclusions

4.2 Search Results

Three categories of evidence were identified: (1) qualitative and quantitative, including mixed methods; (2) notes, texts, opinion and discourses; and (3) policy documents. The combined electronic and hand search yielded 3,440 studies summarised in Figure 4.1 overleaf (also see Appendix 1 on how search results were obtained). These studies were screened for eligibility based on inclusion/exclusion criteria, resulting in 57 studies. The key elements of the inclusion criteria were type of study, the population (participants), interventions and outcome measure in accordance with the protocol.

Figure 4.1 Study Inclusion Flow Chart



Source: Adapted from NHS Centre for Reviews and Dissemination (CRD) (2001)

4.3 Methodological Quality

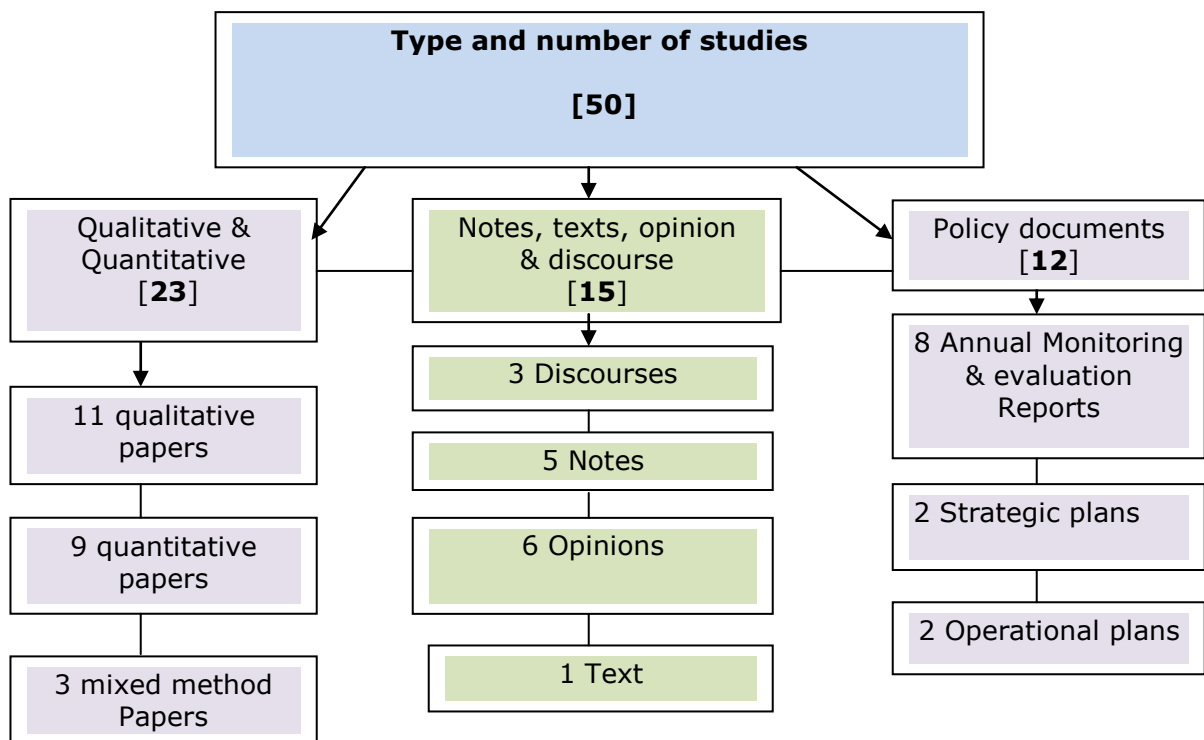
4.3.1 Critical Appraisal

In all, 57 papers (coded 001-057) were subjected to a critical appraisal (see Figure 4.1) based on three appropriate appraisal protocols (see Appendices 2-4). Out of the 57 papers appraised 50 were included for data extraction (see Appendices 5-7 for data extraction protocols). Out of this number, 23 (46%) were made up of qualitative and quantitative papers (of which 11 were purely qualitative, 9 purely quantitative and 3 mixed methods). There were 15 (30%) opinion papers (including notes, texts and discourses) and 12 (24%) policy documents (including monitoring and evaluation reports, strategic, tactical and operational plans) (see Appendix 14 for samples of data extraction summary).

4.3.1.1 Qualitative and Quantitative Studies

Figure 4.2 shows the different types of studies and the number of studies involved in each category. Each type of study is described.

Figure 4.2 Summary Report of Studies with Useable Information



i. Qualitative

This category consists of 11 papers: 1 hospital-based cross-sectional study (Tanzania) (Kabanwanyi et al. 2008); 1 community and hospital-based qualitative case study (Tanzania) (Mubyazi 2005); 1 community-based case study (Uganda) (Kiwuwa & Mufubenga 2008); 2 ethnographic studies (Malawi) (Launiala & Kulmala 2006; Launiala & Honkasalo 2007); 2 exploratory studies (Uganda) (Mbonye et al. 2006a,b); 1 case study (Tanzania) (Hetzl et al. 2007); 1 hospital-based case study (Kenya) (van Eijk et al. 2004); 1 exploratory study (Tanzania) (Mubyazi et al. 2008); and 1 household and community study (Ghana) (Owusu-Adjei et al. 2007).

ii. Quantitative

There were 9 quantitative studies. These involved 1 nationwide household survey (Nigeria, Senegal, Uganda and Zambia) (Baum & Marin 2008); 1 hospital-based survey (Tanzania) (Nganda et al. 2004); 1 community effectiveness trial (Burkina Faso) (Gies et al. 2008); 1 cross-sectional community-based household survey (Kenya) (van Eijk et al. 2005); 1 community survey (Ghana) (Hommerich et al. 2007); 1 community-based cross-sectional survey (Kenya) (Oumal et al. 2007); and 1 cross-sectional study (Rwanda) (van Geertruyden et al. 2005); 1 community-based survey (Kenya) (Guyatt et al. 2004); and 1 community and hospital-based study (non-randomised community trial) (Uganda) (Mbonye et al. 2008).

iii. Mixed Methods

There were 3 studies using mixed method approach: 1 secondary and qualitative studies (sub-Saharan Africa [SSA], with particular emphasis on Malawi, Zambia and Kenya) (Hill & Kazembe 2006); 1 community survey and interviews (Kenya) (Gikandi et al. 2008); and 1 cross-sectional qualitative and quantitative survey (Burkina Faso) (Miaffo et al. 2004).

4.3.1.2 Notes, Texts, Opinions and Discourse

There were 15 papers on notes, texts, opinions and discourse. This included 1 discourse (Mali) (Johns Hopkins Bloomberg School of Public Health 2008a); 1 opinion (Uganda) (Mufubenga 2003); 4 notes (SSA) (Otolorin 2008a,b) (JHPIEGO 2008a,b); 1 discourse (Tanzania) (Ali 2006); 1 notes (East Africa) (International Federation of Red Cross Societies/JHPIEGO 2006); 2 opinion (SSA) (Tilson 2007; Roman et al. 2008); 1 discourse (Kenya) (Olson 2003); and 1 text (SSA), with a special reference to Nigeria (WHO 2005a). The rest were 1 opinion (Uganda) (Batega 2004); 2 opinion (SSA) (Lagerberg 2008 and Lettenmair 2003).

4.3.1.3 Policy Documents

There were 12 policy documents. These included 8 monitoring and evaluation reports on SSA (WHO/UNICEF 2003; WHO/UNICEF 2006; WHO 2006; WHO 2005b; RBM Partnership 2005); Eastern and Southern Africa (WHO/USAID/ACCESS 2008); Zambia (UNICEF Zambia/Malaria Consortium/Young 2000); and Tanzania (IHRDC 2005). Others were 2 strategic plans on Uganda (MOH, Uganda 2005) and Somalia (Somalia Aid Coordinating Body 2006). The rest were 2 operational plans on Uganda (Johns Hopkins Bloomberg School of Public Health 2008b) and Nigeria (RBM Secretariat/FMOH, Nigeria 2004).

4.3.2 Appraisal of Studies

The methodological quality varied according to the type of study. The qualitative and quantitative studies were appraised according to the work of Luke et al. (2004) and the Scottish Intercollegiate Guideline Network (SIGN) (2008). In assessing methodological quality of the qualitative and quantitative studies, four levels of grading were designed within the protocol on a scale of 0-3 based on the work of Luke et al. (2004) on network innovation. These were Grade 0 (absence); 1 (low); 2 (medium) and 3 (high). The grading tool consisted of 5 elements, namely (1) Theory Robustness; (2) Methodology. Data supporting arguments; (3) Applicability/Implication for practice; (4) Generalisability; and (5) Ethical Acceptability (for details of components within each element, see Appendix 2).

According to Table 4.1 below, 7 purely qualitative studies were rated 'high'; 8 purely quantitative rated 'high'; and 1 mixed method 'high'. Furthermore, 2 purely qualitative studies were rated 'medium-high'; and 1 purely quantitative 'medium-high'. Finally, 4 studies were rated 'medium'. These involved 2 purely qualitative studies and 2 mixed methods. No purely quantitative study was rated medium.

Papers on notes, texts, opinions and discourses; and policy documents were all rated on a scale of 1-8 (where 1-4 represent 'low', 5-6 'average', 7 'fairly high' and 8 'high'), though there were differences in the elements of the assessment instruments (see Appendices 3 and 4). Out of the 15 studies on notes, texts, opinions and discourses, 8 were rated 'high' and 7 rated 'fairly high'. None of the included studies was either rated 'low' or 'average'. In the case of the studies on policy, 9 were rated 'high' and 3 rated 'fairly high'. None of the policy documents included was either rated 'low' or 'average' (see details in Table 4.1 below). Table 4.1 shows only papers from which data were extracted, although the coded papers (001-057) involved all the 57 papers appraised.

Table 4.1 Appraisal of Studies

A				
Qualitative and Quantitative Studies				
I				
Purely Qualitative				
Code	Study	Standard Scale	Overall Grade	Interpretation
001	Launiala & Honkasalo (2007)	0-3	3	High
002	Mubyazi (2005)	"	3	High
003	Kiwuwa & Mufubenga (2008)	"	2/3	Medium-high
004	Mbonye et al (2006a)	"	3	High
005	Kabanywanyi et al (2008)	"	3	High
006	Owusu-Adjei et al. (2007)	"	2	Medium
008	Mubyazi et al (2008)	"	3	High
009	Mbonye et al. (2006b)	"	3	High
010	Hetzel et al. (2007)	"	2	Medium
011	van Eijk et al. (2004)	"	2/3	Medium-high
012	Launiala & Kumala (2006)	"	3	High

Table 4.1 Appraisal of Studies (Cont'd)

II Purely Quantitative				
Code	Study	Standard Scale	Overall Grade	Interpretation
013	Baum & Marin (2008)	''	3	High
014	Nganda et al. (2004)	''	2/3	Medium-high
015	Gies et al. (2008)	''	3	High
016	van Eijk et al. (2005)	''	3	High
017	Guyatt et al. (2004)	''	3	High
018	Hommerich et al. (2007)	''	3	High
019	Oumal et al. (2007)	''	3	High
020	van Geertruyden et al. (2005)	''	3	High
021	Mbonye et al. (2008)	''	3	High
III Mixed Methods				
Code	Study	Standard Scale	Overall Grade	Interpretation
022	Hill & Kazembe (2006)	''	2	Medium
023	Gikandi et al. (2008)	''	3	High
024	Miaffo et al. (2004)	''	2	Medium
B Notes, Texts, Opinion and Discourse				
Code	Study	Standard Scale	Overall Grade	Interpretation
026	Tilson (2007)	1-8	8	High
027	Johns Hopkins Bloomberg School of Public Health (2008a)	''	7	Fairly high
028	Batega (2004)	''	8	High
029	Otolorin (2008a)	''	7	Fairly high
030	Roman et al. (2008)	''	8	High
031	Ali (2006)	''	8	High
032	JHPIEGO (2008a)	''	7	Fairly high
033	JHPIEGO (2008b)	''	7	Fairly High
034	International Federation of Red Cross Societies/JHPIEGO (2006)	''	7	Fairly High
036	Lettenmair (2003)	''	8	High
037	Otolorin (2008b)	''	7	Fairly high
038	Olson (2003)	''	8	High
039	Mufubenga (2003)	''	8	High
040	Lagerberg (2008)	''	8	High
041	WHO (2005a)	''	8	High
C Policy Documents				
Code	Study	Standard Scale	Overall Grade	Interpretation
044	WHO/UNICEF (2003)	1-8	8	High
045	WHO/UNICEF (2006)	''	8	High
046	WHO (2006)	''	8	High
048	MOH, Uganda (2005)	''	7	Fairly high
049	WHO/USAID/ACCESS (2008)	''	7	Fairly high
050	Somalia Aid Coordinating Body (SACB) (2006)	''	8	High
051	UNICEF Zambia/Malaria Consortium/Young (2000)	''	8	High

Table 4.1 Appraisal of Studies (Cont'd)

C	Policy Documents			
052	Ifakara Health Research Development Centre (IHRDC) (2005)	''	8	High
053	Johns Hopkins Bloomberg School of Public Health (2008b)	''	7	Fairly high
054	WHO (2005b)	''	8	High
055	RBM Partnership (2005)	''	8	High
056	RBM Secretariat/FMOH, Nigeria (2004)	''	8	High

NB: Papers coded 007, 025, 035, 042, 043, and 057 were excluded (see Appendix 15)

4.4 Development and Evaluation of Evidence

In evaluating the evidence, four indicators were used in accordance with the JBI Reviewers' Manual (2008). These were represented by the acronym 'FAME': feasibility, appropriateness; meaningfulness and effectiveness (see Chapter 3, Section 3.3). The 'effectiveness' component of the 'FAME' was used to evaluate the quantitative evidence gathered. It must be noted, however, that there were overlaps among the indicators across and within a number of studies. In particular, feasibility, appropriateness and meaningfulness were closely knit together in several studies, despite their conceptual differences. As a result, during synthesis, there was the need to group feasibility, appropriateness and meaningfulness together on one hand, and effectiveness on the other.

4.4.1 Feasibility, Appropriateness and Meaningfulness (FAM)

In all, evidence from 45 studies was evaluated based on feasibility, appropriateness and meaningfulness. Six of the 45 studies, notably: Olson (2003); Ali (2006); Tilson (2007); Hill and Kazembe (2006); Roman et al. (2008); and van Geertruyden (2005) contained evidence of effectiveness. Therefore, 39 studies were fully consistent with feasibility, appropriateness and meaningfulness. These were: Launiala and Honkasalo (2007); Mubyazi (2005); Kiwuwa and Mufubenga (2003); Mbonye et al. (2006a,b); Kabanywany et al. (2008); and Owusu-Adjei et al. (2007). Others included: Hetzel et al. (2007); van Eijk et al. (2004, 2005); Launiala and Kulmala (2006); Guyatt et al. (2004); Hommerich et al (2007); Oumal et al. (2007); Gikandi et al. (2008); Miaffo et al. (2004); The Johns Hopkins Bloomberg School of Public Health (2008a,b);

JHPIEGO (2008a,b); Batega (2004); Otolorin (2008a,b); International Federation of Red Cross Societies/JHPIEGO (2006); Lettenmair (2003); Mufubenga (2003); Lagerberg (2008); WHO/UNICEF (2003); WHO (2005a,b); WHO/UNICEF (2006); WHO (2006); MOH, Uganda (2005); WHO/USAID/ACCESS (2008); Somalia Aid Coordinating Body (2006); UNICEF Zambia/Malaria Consortium/Young (2000); IHRDC (2005); The Johns Hopkins Bloomberg University School of Public Health (2008a,b); RBM Partnership (2005); and RBM Secretariat/FMOH Nigeria (2004).

4.4.2 Effectiveness

Out of the 50 studies, only 9 papers produced evidence compatible with effectiveness. These were Baum and Marin (2008); Nganda et al. (2004); Gies et al. (2008); van Geertruyden (2005); Mbonye et al. (2008); Hill and Kazembe (2006); Roman et al. (2008); Olson (2003); and Ali (2006). Out of these studies, only the first three were fully compatible with effectiveness.

4.5 Intervention Effects

4.5.1 IEC Strategies

Ten IEC strategies were identified within the evidence, namely: staff training and orientation (17 studies) (2) advocacy (9 studies); (3) community mass education campaigns (12 studies); (4) house-to-house sensitisation (2 studies); (5) health education talks in health units (29 studies); (6) visiting places of worship (1 study); (7) community women group meetings (1 study); (8) integrated health education campaigns (4 studies); (9) symbolism versus message delivery (6 studies); and (10) audience segmentation versus information delivery (4 studies). The evidence is summarised in Table 4.2.

Table 4.2 List of IEC Strategies

Code	IEC Strategies	No of studies	Reference
1	Staff training and orientation	17	8,11,12,13,15,16,19,22,23,27,35,36,37,44,45,48,49
2	Advocacy	9	3,13,23,31,37,39,48,49,50
3	Community mass education campaigns	12	1,2,5,7,14,19,23,29,35,37,40,50
4	House-to-house sensitization	2	20,37
5	Health education talks in health units	29	4,7,8,9,10,12,13,15,17,18,21,22,26,27,28,29,30,31,32,33,35,36,37,39,40,41,42,43,46
6	Visiting places of worship	1	1
7	Community women group meetings	1	37
8	Integrated health education campaigns	4	17,34,45,47
9	Symbolism versus message delivery	6	18,19,35,39,40,48
10	Audience segmentation versus information delivery	4	10,35,37,40

NB: For references see list of references of included studies of the systematic review under Appendix 16.

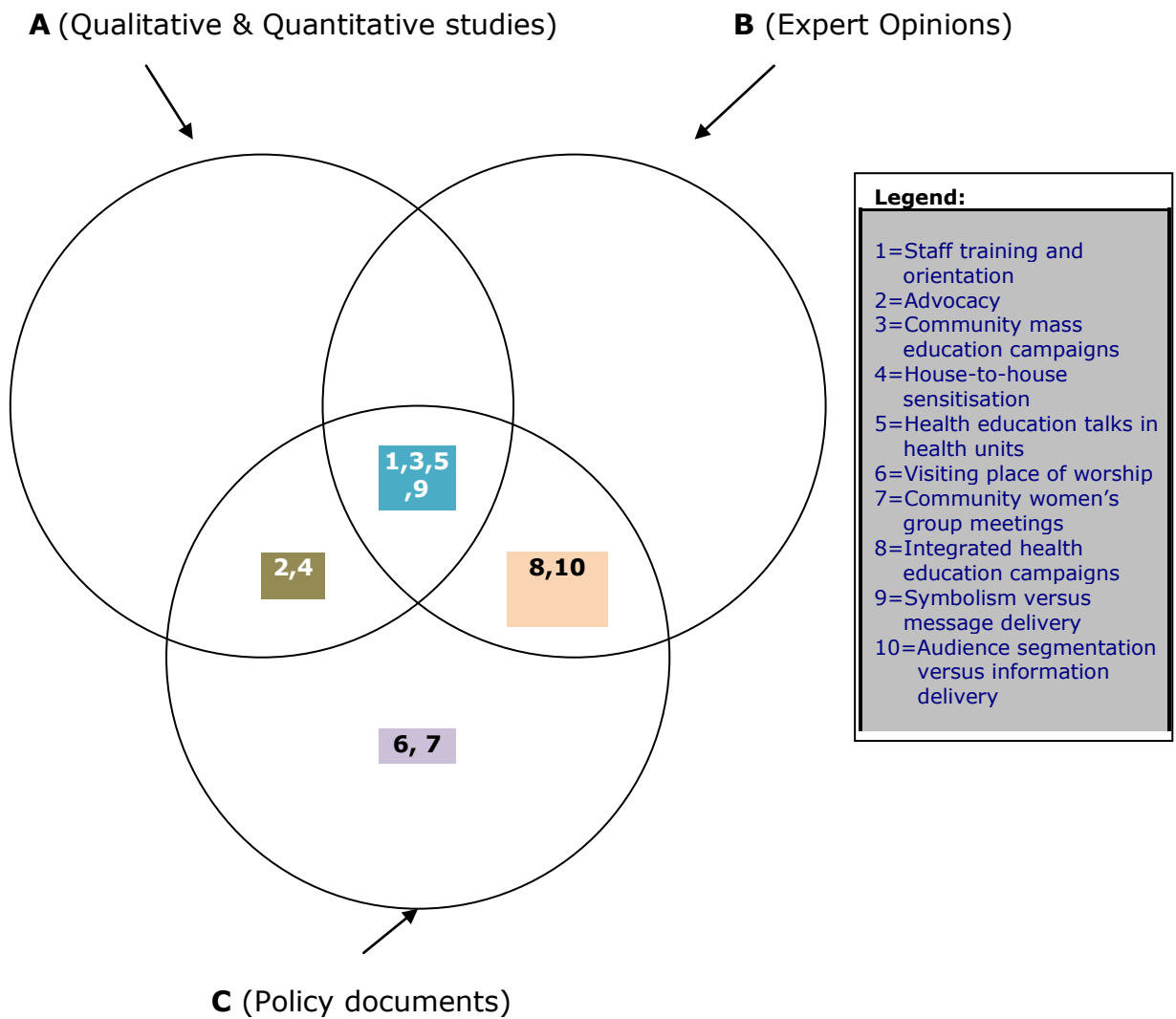
Table 4.2 shows that health education talks in health units strategy, is most often present in the evidence, and therefore serves as the major source of health information as far as malaria prevention and control is concerned, since most studies focused on this strategy. Figure 4.3 illustrates the overlap in the distribution of the identified IEC strategies across different studies. Out of these strategies, four of them featured in all the three types of evidence (see Figure 4.3). These were:

- Staff training and orientation
- Community mass education campaigns
- Health education talks in health units
- Symbolism versus message delivery.

House-to-house sensitisation and advocacy were identified in both qualitative/quantitative studies and policy documents; while visiting places of worship and community women’s group meetings were identified in policy documents only. Integrated health education campaigns and audience

segmentation versus information delivery were identified in an intersection between evidence from expert opinion and policy documents.

Figure 4.3: Intersection of IEC Strategies Across Different Studies



4.5.2 IEC Strategy Implementation Challenges

Apart from the above strategies, a number of challenges confronting the implementation of IEC were identified. The major challenges reported were:

- Staff knowledge, attitude and practices
- Staff shortage
- Distance and waiting time
- Women's empowerment
- Poverty versus cost of ITNs
- Resource constraints
- Cultural beliefs
- Health seeking behaviour.

4.5.3 Assessing Quality of Evidence

In the first place, the quality of evidence varied according to the type of study, whether qualitative or quantitative, expert opinion, or policy documents. Out of the 50 papers reviewed, 23 qualitative and quantitative research (including mixed methods) focused on the issue being investigated. This implies that little research has been done in the study area. Only 1 randomised control trial (Gies et al. 2008) and 1 non-randomised community trial (Mbonye et al. 2008) were identified. In all, 9 studies focused on effectiveness. Only 3 studies were fully focused on effectiveness.

No study met all the criteria for measuring methodological quality, although overall, those studies reviewed scored highly. Of the 23 qualitative and quantitative papers assessed in accordance with Luke et al. (2004) and SIGN 50 appraisal checklists (see SIGN 2008), 16 (7 purely qualitative studies, 8 quantitative and 1 mixed method studies) were rated high. With regards to the expert opinion 8 of the 15 studies were rated high; while in the case of the policy documents 9 out of the 12 studies were rated high.

As may be observed, overall, there was a high level of heterogeneity across the evidence. This did not permit meta-analysis of the quantitative data. However,

one strength of the diversity lies in the wide range of evidence. This created an opportunity to review a wide range of evidence to reach conclusions on IEC strategies. Given the present nature of malaria prevention and control, the relevance of policy documents was helpful since they often shape practice and provide overall direction to health service delivery for malaria prevention and control in pregnancy.

4.6 Narrative Synthesis

4.6.1 Introduction

The following discussion is a narrative synthesis of the evidence on the impact of information, education and communication (IEC) strategies in malaria prevention and control in pregnancy in sub-Saharan Africa based on studies between 2000 and 2008. Following the systematic review of these studies, a number of observations were made. These were related to groups of evidence of IEC strategies and IEC strategy implementation challenges.

4.6.2 Groups of Evidence of IEC Strategies

On the issue of the strategies identified, the major challenge for synthesising evidence was how to classify the evidence. In the end, based on the principle of what counts as evidence (see Rycroft-Malone 2004), the author classified the evidence into four groups across the three types of evidence reviewed. The evidence was put into groups 1 to 4. *Group 1* was classified as central while *Group 4* considered peripheral. *Groups 2* and *3* were however, classified as semi-central since both of them intersected with one type of evidence each.

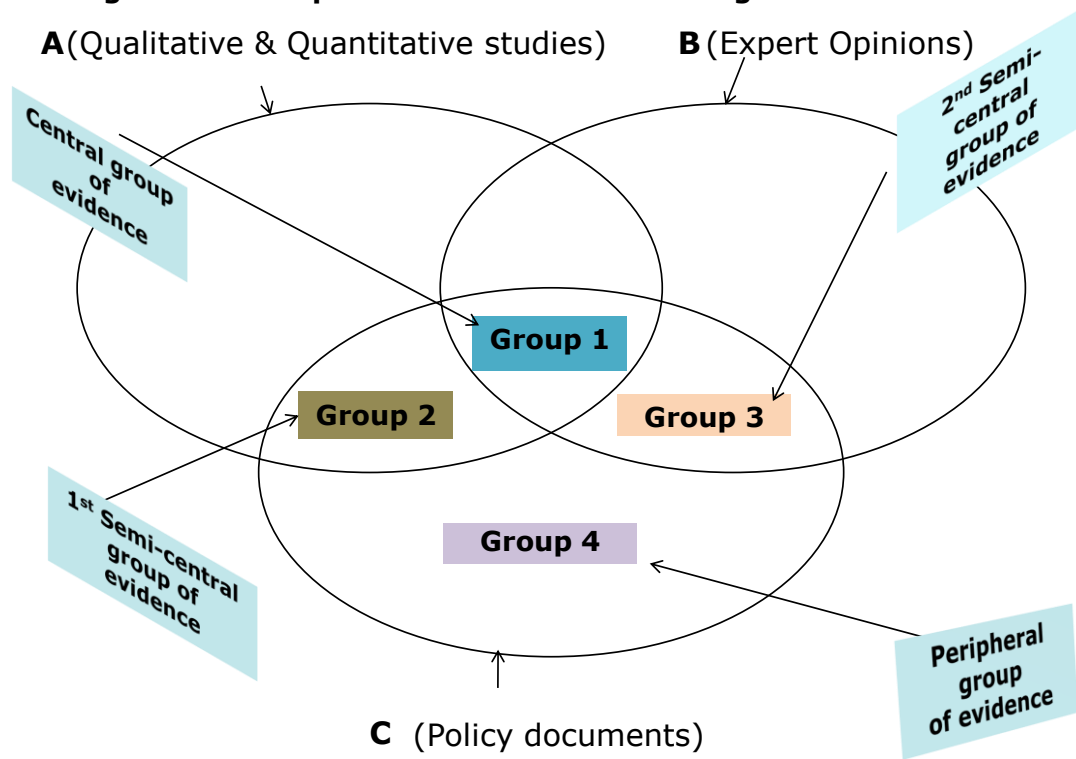
The centrality of the evidence was determined by its ability to feature in all the three types, namely qualitative and quantitative studies, expert opinion and policy documents. A group was described as semi-central if a given evidence intersected between two types of evidence, while the peripheral group was the one limited to only one type of evidence. For this reason, the 10 identified IEC strategies have been put into the four groups of evidence. These are:

- Group 1: Central group of Evidence

- Group 2: 1st group of Semi-Central Evidence
- Group 3: 2nd group of Semi-Central Evidence
- Group 4: Peripheral group of Evidence.

The difference between Group 2 and Group 3 was that the the former related to an intersection between A and C only (qualitative/qualitative and policy documents only). On the other hand the latter related to intersection between B and C only (expert opinion and policy documents only) (see Figure 4.4). A close look at the diagram reveals that all the studies in one way or another relate to health policy since policy documents (C) intersected with qualitative and quantitative studies (A) and expert opinions (B). This is probably because the various studies focus on either the strategic aspect or the operational aspect of the implementation of malaria control policies. In practice, research may inform a decision to enact a new policy or change an existing policy. On the other hand, the need for implementation of a new policy may call for research in order to establish the viability of either the policy itself or the implementation process. For instance, malaria parasite resistance to chloroquine for chemoprophylaxis in a number of African countries led to the implementation of intermittent preventive treatment policy using sulphadoxine-pyrimethamine, after a series of studies in affected countries (WHO/UNICEF 2003; WHO 2004; Crowley et al. 2007; Gies et al. 2008; Roman et al. 2008).

Figure 4.4 Groups of Evidence of IEC Strategies



4.6.2.1 Group 1: The Central Group of Evidence

The Group 1 of the evidence involved 4 IEC strategies. These are: (1) health education talks in health units; (2) staff training and orientation; (3) community mass education campaigns; and (4) symbolism versus message delivery.

i. Health Education Talks in Health Units

More than half (58%) of the studies reported on this strategy. Effectiveness of health education talks remains limited. This was evident mainly from 1 randomised control trial conducted in Burkina Faso (Gies et al. 2008). In this study, uptake of intermittent preventive treatment with sulphadoxine-pyrimethamine (IPTp-SP) was higher with health education in the intervention group (70%) (leading to a reduction in placenta parasitaemia and LBW) in health units compared to the group without health education (49%). However, there was no significant difference between the intervention and control groups with regards to pregnancy related outcomes, implying that perhaps a large scale

intervention may be required in order to identify extent of effectiveness (Gies et al. 2008) (see Appendix 14). The effectiveness of health education sessions was also evident through a logistic regression model (Nganda et al. 2004), in which it was realised that attendance at maternal and child health (MCH) education sessions was the only factor predictive of IPTp-SP uptake. On the other hand, it was found that knowledge of malaria predicts use of insecticide-treated nets (ITNs). To this end, it was concluded that individual knowledge of malaria was an important factor for women sleeping under nets, and not IPTp uptake, where the latter depended on information delivery by MCH systems (Nganda et al. 2004).

In Nganda et al.'s study 26% (76/293) of women attended the MCH for the first time during the first trimester; 65% (192/293) in the second trimester and 9% (25/293) in the third trimester. The conclusion of Nganda et al. (2004) may be challenged by the fact that good coverage of both ITN and IPTp-SP use depends on health education, whether this education is received in a health facility or not. This is because any new malaria control policy may become operational only and only if awareness is created in the first instant. For example, until 2000 very little was known about the relevance of ITNs and IPTp in malaria control. However, following the Abuja Declaration of the Roll Back Malaria concept staff have been trained to educate the public on the importance of ITN and IPTp (The Abuja Declaration 2000; WHO/UNICEF 2003; WHO 2004).

The effectiveness of health education was also evident through the use of a multidisciplinary approaches to health education reported in 1 study (WHO/UNICEF 2003). This approach led to a rapid increase in IPTp coverage in one district in Malawi, where 75% of 2 doses of IPTp-SP coverage in pregnant women was achieved. This also showed the value of multidisciplinary approach to health education.

Evidence also shows that most (over 2/3) respondents identified health workers as repository of knowledge, especially their ability to provide face-to-face explanations of health issues (Mbonye et al. 2006b). In line with this, Mubyazi et

al. (2005) observed a high level of staff awareness regarding IPTp policy. This underscores the meaningfulness of face-to-face message delivery in health units in malaria endemic countries in Africa. However, such a picture may be marred by the alleged negative attitude of some staff (Mubyazi et al. 2005), coupled with the perceived lack of communication skills of nurses in delivering health education during antenatal visits, as evident in a one-way communication by nurses. As a result of this, respondents in some cases could not provide accurate feedback on what was taught. When asked, some pregnant women said sulphadoxine-pyrimethamine was bitter and therefore thought to be harmful (Launiala & Honkasalo 2007). This and other misconceptions need to be addressed. In the light of this, it has also been suggested that pregnant women need to know that foetal complications due to malaria in pregnancy may occur in the absence of maternal illness (Oumal et al. 2007). Therefore health educators need to emphasise this in order to improve demand for IPTp (Oumal et al. 2007).

On the other hand, a two-way communication is a common feature of interactive discussions, which has a cascading effect of even affecting health seeking behaviours of sceptics (Olson 2003; Johns Hopkins Bloomberg School of Public 2008a).

In order for pregnant women to use malaria control intervention services, they need to be considered as individuals who have unique beliefs and cultural norms that may influence their health seeking behaviour. Health educators are advised to be patient, tolerant and to speak with low tone of voice during message delivery. Educators need to deliver information in detail, but simple terms, (JHPIEGO 2008a, b; Tolorin 2008a,b).

The appropriateness and effectiveness of health education is further illuminated by increased knowledge and high recall of over 90% among respondents about information on malaria during group sessions (van Eijk et al. 2004; van Geertruyden et al 2005; Owusu-Adjei et al. 2007). However, it may be difficult to attribute increased knowledge solely to health education sessions organised in

health units, since pregnant women may also have acquired knowledge through other channels such as radio talk shows, TV soap opera, road shows, places of worship, house-to-house sensitisation by community health workers and volunteers and many others (see IHRDC 2005; Ali 2006; Somalia Aid Coordinating Body 2006).

ii. Staff Training and Orientation

Staff training and orientation may be described as a starting point in the dissemination of new information on national malaria control policy interventions to pregnant women (primary audience) through health educators (secondary audience).

There is evidence that training and orientation can make a positive impact on health seeking behaviour. For instance, through a cascading approach to staff training on malaria in pregnancy, countries such as Tanzania, Uganda, Kenya, Ghana, Burkina Faso and Madagascar, made significant success in capacity development, which resulted in increased IPTp coverage exceeding 90% (JHPIEGO 2008b; Roman et al. 2008; WHO/USAID/ACCESS 2008). Focused antenatal care training has been lauded for being integrative and systematic. This has led to efficient strategy implementation, despite its resource implications (WHO/USAID/ACCESS 2008). For those benefitting from this training approach for the first time, the appropriateness and meaningfulness of training is evident in the fact that it has helped them to do things they could not do previously, especially giving women the care needed during ANC visits (see International Federation of Red Cross and Crescent Societies/JHPIEGO 2006). The training of traditional birth attendants (TBAs) has been described as appropriate and meaningful, as their training has provided staffing backup to support the existing number of trained staff, most especially in rural communities, where TBAs have been embraced for their knowledge and familiarity with the culture of pregnant women. This innovation has been sustained by supportive supervision of malaria in pregnancy (MIP) programme implementation in order to provide opportunity for mentorship and constructive feedback. This has also led to quality

improvement in service delivery (see Hill & Kazembe 2006; Roman et al. 2008; WHO/USAID/ACCESS 2008).

Citing the feasibility of training and orientation, Mufubenga (2003) reports that:

- At least 35% of public and private health workers in Uganda received orientation on the implementation of the MIP control strategy
- Training was integrated into the reproductive health training modules, with a total of 28 district trainers/supervisors coached in training of frontline health workers.

Acknowledging the benefits of staff training, one member of staff from Kenya made the following remarks as evidence of feasibility and appropriateness of training support:

“Before ANC services were strengthened and improved, I didn’t have the time to offer all services... some I did not even know about. But now I can do my work and give women the care they need.”

(International Federation of Red Cross and Crescent Societies/JHPIEGO 2006, p.3)

iii. Community Mass Education Campaigns

The effectiveness of community mass education campaigns was reported in only 1 non-randomised community intervention trial carried out in Uganda (Mbonye et al. 2008). This intervention partly resulted in early use of intermittent preventive treatment (IPTp). It was also noted that most women adhered to 2 doses of sulphadoxine-pyrimethamine (SP). In both healthcare facilities and community, women experienced a reduction in malaria episodes, anaemia, parasitaemia and low birth weight (LBW). After controlling for age, education, parity and occupation, significant differences were found for parasitaemia, reported episodes of malaria and birth weight. This, according to the authors, indicates the importance of adhering to IPTp. It is very likely that such adherence would not have been possible, if pregnant women had not been mobilised and sensitised

through the help of trained community health workers and peer mobilisers. Other possible factors that may have accounted for adherence include community women group meetings, national malaria day celebrations and the role of faith-based organisations (FBOs) such as churches, involving Christian women fellowships; and Muslim women groups. Other variables may include professional women associations (for example, dressmakers, hairdressers and market women) and wives of professionals from various groups such as police, army and football teams.

Baum and Marin (2008) in their four-nation survey, report on the extent to which community mass education campaigns influenced the use of ITNs across Nigeria, Senegal, Zambia and Uganda between 2000 and 2006. Modest increase in ITN coverage was partly attributed to education campaigns, although the gains did not attain the Abuja targets of 60% (see The Abuja Declaration 2000). Modest gains recorded were as follows: Nigeria, 7%-14%; Senegal, 22%-42%; Zambia, 4%-22%; and Uganda, 5%-31%. The proportionate gains were: Nigeria, 0-5%; Senegal, 5-31%; Zambia, 0-14% and Uganda, 1-15%. In this campaign, pregnant women and households were reached through a mass communication campaign strategy, whereas health workers were reached through interpersonal communication. These, along with advocacy among governments, made a positive impact, but only at a low level (see sub-section 4.6.2.2[ii]).

Using two or more channels at the same time in the mass education campaign may have had a synergistic effect compared to using a single channel. This argument is supported by the work of the Ifakara Health Research and Development Centre (IHRDC 2005) in Tanzania, in which a combination of channels were used. These included road shows, cinema, comedies, music and dancing competitions, sports festivals (also see Olson 2003; Hetzel et al. 2007); football tournament, public lectures, distribution of brochures, and health education at the MCH (IHRDC 2005; Hetzel et al. 2007). With this approach, women who could not benefit from the 'open air' campaigns due to domestic commitments were not left out. Other channels included TV programmes, use of

radio spots, radio soap opera, the internet, newspapers, distribution of booklets to community leaders, organising malaria days, outreach days, community meetings, teapots, water points and use of market places (Somalia Aid Coordinating Body 2006). However, it is not possible to know which channel worked most effectively.

The most preferred channel by community members, including pregnant women across the papers reviewed was radio (for example, see RBM Secretariat/FMOH, Nigeria 2004; IHRDC 2005; Mubyazi et al. 2005; Somalia Aid Coordinating Body 2006). The reason for radio preference is not too clear. This may be either based on economic reasons or reasons of convenience. Economically, more people appear to be able to afford radios compared to TV. People such as nomads and internally displaced persons (due to war or a natural disaster) may also be more easily reached through radio rather than other channels, such as television or health facilities. However, media/channel preference may be dictated by place of dwelling, whether urban or rural; by age, gender and by religious affiliation; or by geographical segment (see RBM Secretariat/FMOH, Nigeria 2004; Somalia Aid Coordinating Body 2006).

It is noted that 'open air' mass education campaigns may not always be appropriate for pregnant women who may likely be engaged in household activities, and therefore may not have time to participate. Health education in health units is therefore often recommended (IHRDC 2005).

iv. Symbolism Versus Message Delivery

Perhaps the most important evidence in the review is the emphasis on delivering messages using appropriate and meaningful symbols, language and metaphors the audience is familiar with as against using medical terminology and language alien to the target audience. The basic essence of communication is the assumption that the receiver understands or decodes the message in much the same way as the sender (Boddy 2002). One quality of a good educator is the ability to communicate in symbols, metaphors and language well grounded in the

culture of the audience (Launiala & Kulmala 2006; Launiala & Honkasalo 2007). Using terms alien to the audience is a recipe for communication ineffectiveness as evidenced by the work of Launiala and Honkasalo (2007) among nurses and midwives (in a Malawian antenatal care unit), who spoke during health education sessions in a language different from that of the participants (Chiyao community in Malawi). The nurses spoke the language called Chechewa, not understood by the audience.

Launiala and Kulmala (2006) also studied the above-named population, and emphasised the need to be cautious when explaining the risk of malaria, since the local meaning of malaria is related to many febrile illnesses. For instance, Launiala and Kulmala (2006, p.116) note as follows:

“the local meaning of *malungo* contains an assumption that malaria is a common and fairly harmless disease for pregnant women. Moreover, the women have little detailed knowledge on the adverse consequences of malaria in pregnancy. It is therefore, a major challenge for malaria prevention programmes to improve their knowledge about the local understanding of malaria.”

In relation to this, the authors expressed concern about the potential difficulties illiterate pregnant women face understanding complicated medical terminologies, while at the same time being a significant target of all sorts of health education messages (Launiala & Kulmala 2006).

In relation to this, Miafo et al. (2004), in their study in Burkina Faso, note that self-reported compliance matches well with oral instruction given by health workers during ANC visits; and that oral information is effective in bringing about behavioural change, even in the presence of high illiteracy rates. In line with this, Johns Hopkins Bloomberg School of Public Health (2008b) reiterate the need to identify symbols, people and facilities that provide correct information and services for malaria prevention and treatment. Tilson (2007) observes the effectiveness of avoiding what she terms ‘shock fears’ (intimidating messages) in education campaigns as these tend to put people off. She reports that after switching to more positive metaphors (messages) understood and accepted by

the audience (for example, 'down malaria', a message synonymous to the way local Christian preachers in Kenyan deal with the 'devil'), demand for ITNs increased four-fold during a pre-test (pilot testing of new campaign message), and subsequently. A post-test (actual education message dissemination) saw a five-fold increase in demand for nets following delivery of the right message coupled with distribution of subsidised ITNs through health units.

4.6.2.2 Group 2: The First Semi-Central Group of Evidence

This group was found within the intersection of qualitative/quantitative studies and policy documents. Two strategies were identified under this group, namely house-to-house sensitisation and advocacy.

i. House-to-house sensitisation

House-to-house sensitisation strategy was found within an intersection between a quantitative study involving a non-randomised controlled trial (Mbonye et al. 2008) and a policy document (Somalia Aid Coordinating Body 2006).

The feasibility, appropriateness and meaningfulness of house-to-house sensitisation lie in the fact that it encourages face-to-face interaction between health educators and their audience. Educators are part of the communities and therefore know the localities in which they operate. They speak the indigenous language and understand the culture of their audience and may therefore be embraced by community members. The work of Mbonye et al. (2008) reveals the benefits of house-to-house visiting by adolescent peer mobilisers, traditional birth attendants, drug shop vendors and community reproductive health workers. The study showed that 67.5% (1404/2081) of pregnant women received two doses of SP compared with 39.9% (281/704) in health units. The prevalence of malaria episodes saw a reduction from 49.5% (906/1830) to 17.6% (160/909) ($p < 0.001$); and from 39.1% (161/412) with health units ($p < 0.001$). However, anaemia was significantly less prevalent in both arms. There was a lower proportion of low birthweight of 6.0% compared to 8.3% with health units ($p < 0.03$). Few abortions and stillbirths were recorded in either arm.

ii. Advocacy

Malaria advocacy is:

“concerned with both patient care and policy change and implementation. In the patient care environment, advocates are concerned with providing appropriate information on prevention, treatment and management of malaria, improving the capacity of health workers and enabling care givers to give the most suitable care to those suffering from malaria...”

(Ghana Malaria Advocacy Guide [GMAG] 2007, p.15)

Therefore, in practice, advocacy may be described as a process through which policy decisions and behaviours could be influenced in order to achieve the desired outcomes. For instance, evidence shows that one may influence governments to waive tax on the importation of ITNs (Baum & Marin 2008) and allocate more district level funds aimed at net distribution to vulnerable groups (GMAG 2007).

The above definition is relevant to this study for a number of reasons. In the first place, the welfare of pregnant women, regarding the suitability of care for women suffering from malaria applies. Secondly, for the welfare of pregnant women to get the needed attention, advocacy effort must be ongoing in line with malaria control policy changes and the implementation of new policies. As new policies are enacted so the need to pursue continuous advocacy become critical as a way of creating awareness among key stakeholders to solicit their support and to influence behaviour, most especially at the community level, where advocacy is rudimentary in Eastern and Southern African countries (WHO/USAID/ACCESS 2008).

Reaching out to health workers by health education campaigners, Baum and Marin (2008) report in their nationwide household survey that interpersonal communication was used. This is critical, since health workers are the frontline operatives who have direct contact with pregnant women, and therefore must be knowledgeable and be motivated to pursue health education to influence health

seeking behaviour. In line with GMAG's (2007) observation about the practical relevance of advocacy, Baum and Marin (2008) reveal in their study that governments were prevailed upon to reduce or waive taxes and tariffs on the importation of ITNs and ITN materials. This resulted in modest gains in ITN use in Nigeria, Senegal, Uganda and Zambia, although these gains alone were not sufficient to attain the Abuja target of 60% (see further details under community mass education campaigns).

The systematic review also reveals that advocacy played a key role in addressing widespread fears and concerns about IPTp-SP, fuelled by the Tanzanian media (WHO/USAID/ACCESS 2008). Since the media plays a crucial role in mass public education, it was not surprising that this media scare could become a source of worry to health ministries. In this case, a meeting among stakeholders, including the media led to a positive public perception about the IPTp-SP. In the light of this, it has been suggested that advocacy efforts need to build a sense of urgency among leaders, persuading them through a variety of media, including the radio, print media and interpersonal channels, all aimed at supporting malaria prevention and control among pregnant women (for example, supporting prompt and proper treatment of pregnant women with fever) (Johns Hopkins Bloomberg School of Public 2008b).

4.6.2.3 Group 3: The Second Semi-Central Group of Evidence

Integrated education campaigns and audience segmentation versus information delivery were the strategies identified between evidence on expert opinions and policy documents only.

i. Integrated Health Education Campaigns

Integrated health education campaigns is an IEC strategy which involves disseminating a variety of health information alongside other public health interventions, such as an expanded programme on immunisation; maternal and child health/family planning; and distribution of ITNs (WHO/UNICEF 2006). This approach is considered cost-effective because educational campaigns are carried

out to address a variety of issues at the same time. According to the selective primary health care strategy,

“the best way to improve health was to fight disease based on cost-effective medical interventions”

(Magnussen et al. 2004, p.2)

For instance, while educating pregnant women on the use of ITNs, interventions such as antenatal care, expanded programme on immunisation, family planning, Vitamin A supplementation and mebendazole administration may be carried out (see WHO/UNICEF 2006). Despite the benefit of the cost-effectiveness involved, this may result in some confusion since too many things are done at the same time.

In one study, RBM Partnership (2005) gave an account of two integrated education campaigns in Zambia and Togo. In Zambia, the Zambia Red Cross, with the support of the Zambia Ministry of Health, UNICEF and the Canadian International Development Agency (CIDA), conducted an integrated social mobilisation and community education campaign. A survey conducted after the campaign saw more than 80% of all beneficiaries benefiting from ITN interventions in five districts. A similar campaign was carried out in Togo. This resulted in over 90% coverage of all age groups, including pregnant women, leading to this strategy achieving a coverage of 80-90% of ITN use. In another study (WHO/UNICEF 2006), the integrated approach involved a simultaneous campaign on ITN use, and maternal and child health. This approach, in part, led to a modest increase in ITN use across sub-Saharan Africa, most especially among Eastern and Southern African countries. However, it was noted that, only Eritrea (53.4%) came close to achieving the Abuja target of 60% within the first five years of implementation (WHO/UNICEF 2006).

Lettenmair (2003), on his part suggests that there is the need to balance an integration of malaria communication with other health education and

communication programmes (for example, integrating malaria control programmes with reproductive health programmes). In this regard, Lettenmair notes that strategic communication leads to demand creation, and that communication, through different channels is the best way to change individual and community attitudes and practices. Emphasising the role of different channels in integrated education campaigns, Lettenmair (2003) argues that, electronic and print media can make IPTp during pregnancy a normal and safe practice, as well as convince the public that ITNs are safe for pregnant women.

ii. Audience Segmentation versus Information Delivery

Perhaps one of the first steps of a good IEC strategy is its ability to identify the audience segments. In this regard, two sets of audience may be considered. These are primary and secondary audiences. According to the Kenya Ministry of Health's Malaria Communication Strategy document, the primary audience involves:

- pregnant women living in malaria risk areas
- care givers in households with children less than five years in malaria endemic zones
- heads of households in malaria risk areas
- heads of households in highland epidemic prone zones.

On the other hand, the document notes that a secondary audience involves:

- partners of pregnant women
- community influencers of pregnant women (for example, community leaders, chiefs, elders and politicians/political players)
- health care workers
- service providers at the community level (for example, shopkeepers, kiosk owners, and chemists/drug retailers)
- decision makers in government, media, development partners and relevant private sector organisations;
- political, administrative and community leaders in malaria endemic zones

- decision makers from NGOs, professional bodies and community groups working in malaria or related areas (MOH, Kenya 2005).

While recognising the contribution of these two audiences in a variety of ways, this study mainly focused on pregnant women. Even among pregnant women a different set of audience may be identified (see RBM Secretariat/FMOH, Nigeria 2004).

Addressing the issues of malaria in pregnancy in respect of different geographical segments of the Nigerian population, it has been suggested that there is the need to make IEC messages generic, without losing sight of adapting additional messages to suit the cultural background of the three audience identified namely, pregnant women who do not attend ANC at all; pregnant women who regularly attend ANC; and pregnant women who register for ANC too late to benefit from 2 doses of IPTp (RBM Secretariat/FMOH, Nigeria 2004). Thus, messages and materials should be tailor-made to suit different target groups. Emphasising segmentation during social marketing, Tilson (2007) reports the practice of Population Services International (PSI), an NGO that provides subsidy along with educational campaign for rural dwellers (considered to be comparatively poor). This partly resulted in a five-fold increase in demand for ITN use in Kenya.

The appropriateness and meaningfulness of this strategy may be viewed from the fact that messages are designed to address a variety of audiences, bearing in mind individual cultural differences based on different geographical zones or religious affiliation. At the same time educators are able to design generic messages that cut across different population segments (for example, rural, urban, women, youth, rich, poor, nomadic, the internally displaced, first time users of ANC, primigravidae, secundigravidae, multigravidae). Audience segmentation versus information delivery strategy therefore has a potential to address educational needs holistically (for example, see RBM Secretariat/MOH, Nigeria 2004; Somalia Aids Coordinating Body 2006; Tilson 2007; IHRDC 2005).

4.6.2.4 Group 4: The Peripheral Group of Evidence

Visiting places of worship and community women's group meetings strategies were identified in policy documents only.

i. Visiting Places of Worship

Visiting mosques to educate members of the Muslim community (Ali 2006) could be described as appropriate. Given the fact that Muslims pray up to five times a day, this form of worship provides an opportunity to reach out to women. The impact of this intervention may even be reinforced by Muslim religious leaders known as Imams, when they are trained to support health education campaigns (Exchange 2005).

ii. Community Women's Group Meetings

This strategy was identified in one study, namely Somalia Aid Coordinating Body (2006). The meeting of women to discuss health-related issues, including malaria in pregnancy may have a beneficial impact on pregnancy-related outcomes. Such meetings may provide opportunities for women to share experiences related to benefits of seeking early health checks during pregnancy, most especially antenatal care visits or maternal and child welfare clinics in group contexts (IHRDC 2005). For example, personal testimonies on positive effects of IPTp-SP may have a potential of demystifying beliefs that SP is harmful, as some are made to believe (Launiala & Honkasalo 2007).

This, the author believes, shows that through this IEC strategy, pregnant women may benefit from social networks through meeting other women by sharing knowledge and experiences. This may also result in behavioural change, although there is no guarantee that this will always happen (see the working definition of IEC in chapter 2 adapted from Ministry of Health and Child Welfare/Zimbabwe Family Planning Council 1998).

4.6.3 IEC Strategy Implementation Challenges

Following extraction of evidence of IEC strategies, evidence of challenges confronting implementation of IEC strategies were identified. The major challenges identified were:

- Staff knowledge, attitude and practices
- Staff shortage
- Distance and waiting time
- Women empowerment
- Poverty versus cost of ITNs
- Resource constraints
- Cultural beliefs
- Health seeking behaviour.

4.6.3.1 Staff Knowledge, Attitude and Practices

The review identified evidence that some staff disseminate false information to service users (Mubyazi et al. 2005; Hill & Kasembe 2006; Mbonye et al. 2006a; Oumal et al. 2007). This may be attributed to a number of factors - that some members of staff do not receive regular training and orientation on new national malaria policies, or they do not practice based on available evidence. This may be exacerbated by two factors: (1) staff receiving conflicting messages on malaria control policies from the public health sector; private sector organisations, including mission hospitals; health partners and non-governmental organisations (NGOs) (Hill & Kazembe 2006; Guyatt et al. 2004); (2) the involvement of media organisations in the dissemination of health messages, contrary to ministries of health malaria control policies, making the effort of health workers in information dissemination a difficult task. For instance, a media scare in Tanzania was caused by false messages delivered to the public on IPT-SP. This problem was only resolved through advocacy (WHO/USAID/ACCESS, 2008).

It has also been alleged that some staff, such as nurses and midwives are rude to pregnant women attending antenatal clinics:

"We are sometimes rebuked by nurses as if we are young children."

(Mubyazi et al. 2005, p.7)

Another woman stated:

"They address you as if you have come to beg them for money from them or as if they are forced to attend to you at the clinic."

(Mubyazi et al. 2005, p.7)

The perception of staff attitude has been confirmed by Mbonye et al. (2006b). Such behaviours can discourage women from utilising ANC services, despite any health education received. No matter how knowledgeable staff may be, if such knowledge is not presented in the right manner and in the right atmosphere, little impact may occur. For instance, Hill and Kazembe (2006) and Guyatt et al. (2004) report that, despite 96% of staff being aware of malaria control policies, paradoxically, only 5% of pregnant women use ITNs in Kenya. Launiala and Honkasalo (2007) also illustrate how poor communication skills by nurses can affect the way information is given and understood.

Relating to the issue of knowledge, Guyatt et al. (2004) conclude that confusion over use of IPTp policy (for example, curative instead of preventive purposes) can affect behavioural change among recipients.

4.6.3.2 Staff Shortage

Staff shortage has also been reported as a major problem affecting employee motivation to perform activities relating to malaria prevention and control (Mubyazi et al. 2005). Shortage of staff may affect the extent to which quality time is spent on face-to-face education, alongside other healthcare interventions. It is perhaps for this reason that the training of traditional birth attendants (TBA) and other extension workers has been welcomed to support the already strained staff numbers (WHO/USAID/ACCESS 2008).

4.6.3.3 Distance and Waiting Time

A distance of more than 5km from the nearest healthcare facility may be considered less than ideal for health service users to travel (GCS 2003a). The review shows that some women have to trek long distances to the nearest health facilities in most rural African communities (Mubyazi et al. 2005; Mbonye et al. 2006). This may be exacerbated by inaccessible roads in hard-to-reach areas. In some cases there may be the need to cross a river by boat in order to get access to a suitable healthcare facility.

Under such circumstances, pregnant women may be even more frustrated if further waiting is required when they reach the clinic (Hetzl et al. 2007). Thus, waiting time serves as a further discouraging factor.

4.6.3.4 Women's Empowerment

It is one thing for an African pregnant woman to be aware of the need to acquire a mosquito net, and another having the courage to purchase one, even if she has the means to do so. Women who acquire nets without authorisation from their spouses may be considered to be going out with other men for money for that purpose (Mbonye et al. 2006b). In one study, a woman was only able to acquire a net after she had been able to persuade her spouse to attend an ITN awareness campaign (Olson 2003). Thus, the ultimate decision may often rest with the man and sometimes in-laws of the pregnant woman (Johns Hopkins Bloomberg University School of Public Health 2008b).

4.6.3.5 Poverty Versus Cost of Insecticide-Treated Nets

Poverty in Africa is widespread. This also affects affordability of health-related cost such as purchase of insecticide-treated nets (ITNs) (Mufubenga 2003; Batega 2004; WHO/UNICEF 2006). The cost of nets as a challenge is debatable. Although several studies have reported this as a major challenge (WHO/UNICEF 2003; Guyatt et al. 2004; Nganda et al. 2004; WHO/UNICEF 2006; WHO 2006), it may be argued that there is no guarantee that people will always use nets,

even if they acquire it free of charge. For instance, in one study (Mboera et al. 2007) in Tanzania, where ITNs were given free of charge, only 30% of beneficiaries used them.

4.6.3.6 Resource Constraints

As awareness of importance of antimalarial drugs increases, so the demand for the drugs may increase. The challenge is that health facilities may have problems of ensuring regular supply of these drugs in order to meet the increasing demand (Mubyazi et al. 2005; Hill & Kazembe 2006). This means that healthcare providers should be prepared to make antimalaria drugs readily available when embarking on awareness creation. This is because pregnant women may be discouraged from using the services available in the clinics as a result of lack of trust placed on the ability of health facilities to guarantee regular supply of antimalarial drugs (Hill & Kazembe 2006). Related to this is the problem of limited funding, as well as delays in the release of funds for planned programmes, including IEC programmes, targeting pregnant women. Other problems involve lack of good healthcare infrastructure such as laboratory facilities (Mubyazi et al. 2005). In effect, lack of funding may affect resource availability, which in turn, may affect utilisation of health services, including health education talks in health units.

Guyatt et al. (2004) conclude that awareness does not necessarily translate into behavioural change among recipients due to intervening factors such as shortage of supplies.

4.6.3.7 Cultural Beliefs

It can be difficult to address long held beliefs, despite health education. For example, the belief that health problems are caused by witchcraft still exists in several African countries. Some people still believe that malaria in pregnancy is caused by people who want to bewitch the pregnant woman in order to kill her baby (Mbonye et al. 2006b; Johns Hopkins Bloomberg School of Public Health 2008b). According to Mbonye et al. (2006b), there is also the belief amongst

users that mosquito nets can cause excessive heat and suffocation and that the chemicals used for net treatment can kill. Moreover, adolescents and men believe that they are not at risk of malaria and that only pregnant women and children are at risk (Mbonye et al. 200b). For these reasons, Mbonye et al. recommend the need to design a health promotion package to demystify such beliefs.

4.6.3.8 Health Seeking Behaviour

Health seeking behaviour may be affected by stigma associated with for example, teenage pregnancy. As a result, a number of pregnant teenagers (considered the most vulnerable women regarding malaria in pregnancy) (Mbonye et al. 2006b) may be reluctant to attend antenatal clinics for fear of being seen and ridiculed by others. This is more common in rural communities. Thus, although pregnant mothers may be aware about the necessity of attending clinics, they may either delay in attending, not attending at all or even, in extreme cases may abort the pregnancy (Mbonye et al. 2006b).

Some people may also classify malaria as a minor self-limiting ailment (Launiala & Kulmala 2006). In this case, it may be argued for example, that if pregnant women do not perceive the severity of malaria as a health risk, they may not be motivated to seek advice, and for example, use nets as a means of protection against malaria (Mbonye et al. 2005).

4.7 Summary and Conclusions

The systematic review identified 3,440 studies through electronic and hand search. Out of these, 57 (1.7%) studies were selected for critical appraisal. Of this number, 7 studies were excluded for various reasons. Of the 50 studies with useable information, 23 were made up of qualitative and quantitative studies (11 purely qualitative, 9 purely quantitative, and 3 mixed methods); 15 papers on expert opinion; and 12 policy documents.

In terms of quality of evidence, none of the studies selected met the criteria for methodological quality. However, there was a high level of heterogeneity across

the quantitative evidence. For this reason, it was not possible to meta-analyse these studies. As a result, a narrative synthesis was undertaken using the framework of feasibility, appropriateness, meaningfulness and effectiveness in accordance with the JBI Reviewers' Manual (2008). First, evidence was pooled according to the three different categories of studies; namely all qualitative and quantitative data; expert opinion and policy documents. All the evidence was then synthesised according to key themes of IEC strategies identified.

Ten strategies emerged in the review as follows:

1. Staff training and orientation (17 studies)
2. Advocacy (9 studies)
3. Community mass education campaigns (12 studies)
4. House-to-house sensitisation (2 studies)
5. Health education talks in health units (29 studies)
6. Visiting places of worship (1 study)
7. Women's group meetings (1 study)
8. Integrated education campaigns (4 studies)
9. Symbolism versus message delivery (6 studies)
10. Audience segmentation versus information delivery (4 studies).

Evidence on effectiveness was limited. Only 1 randomised controlled trial (RCT) (Gies et al. 2008) was identified. This RCT showed that health education resulted in 70% increase IPTp coverage among pregnant women in Burkina Faso. This also led to a reduction in placenta parasitaemia and LBW. However, there was no significant difference in these outcomes between the intervention group and the control group. In a non-randomised controlled trial (Mbonye et al. 2008), IEC interventions led to a modest increase in the uptake of IPT, resulting in reduction of malaria episodes, placental parasitaemia, anaemia and LBW. Training of community resource persons; community mobilisation involving mass education; and sensitisation campaigns were the main IEC interventions involved. Across Nigeria, Senegal, Uganda and Zambia, advocacy amongst governments and

policymakers coupled with mass education campaigns and interpersonal campaigns resulted in modest increases in the use of insecticide-treated nets (ITNs) (Baum & Marin 2008).

Due to the limited number of studies on effectiveness, it was difficult to fully appreciate the extent of effectiveness, and indeed, the impact of IEC strategies in malaria prevention and control during pregnancy in Africa. Therefore, this calls for researchers to focus on assessing the effectiveness of IEC strategies in malaria prevention and control, especially in the area of malaria in pregnancy on a wider scale.

The studies also showed that implementation of IEC interventions may be feasible, meaningful and appropriate both at the health facility and community levels leading to an increased use of ITNs and IPTp uptake. However, lessons on challenges and bad practices have also been identified in isolated cases, especially with regard to the way nurses and midwives communicate with their audience during antenatal education sessions (see for example, Mubyazi et al. 2005 and Launiala & Honkasalo 2007).

It was challenging to categorise the evidence gathered. On reflection, it was decided in the end that the evidence should be classified based on the principle of what counts as evidence using the term 'group'. In classifying the evidence, four groups were identified. These groups of evidence should be examined and interpreted with caution since in practical terms they do overlap and complement each other. Strictly speaking, no IEC strategy should necessarily be superior to the other. Prioritising IEC strategy solely based on the number of studies may be misleading. It is possible that peripheral evidence may have more practical relevance in one context, compared to either central group of evidence or either of the groups of semi-central evidence. To that effect, ones decision must be guided by what works best in a given context. The best way to judge the potential of evidence related to IEC in pregnancy is to subject it to some form of test in a real life situation in the form of primary research for purposes of

validation (see phase 2 on data collection in Chapter 3, and findings in Chapter 5).

In all, health education talks in healthcare facilities appear to be a dominant feature as an IEC strategy, followed by training and orientation, community mass education campaigns and advocacy respectively, judging from the point of view of studies reviewed. The major challenges confronting the implementation of IEC strategies have also been discussed; until these are addressed IEC strategy implementation efforts may be fruitless.

The major implication for healthcare practice is the need to package and deliver health messages related to malaria in pregnancy, bearing in mind such factors as cultural and religious beliefs, linguistic background, age, parity and the socio-economic status (see Helman 2000, 2007; Bryt et al. 2007; Ribera et al. 2007). In an isolated case, the evidence shows that the attitude of some healthcare professionals is poor. In this regard, it is suggested that, if this is the case in practice, then the attitude of healthcare professionals towards pregnant women needs to be positive in order to encourage utilisation of antenatal services, including malaria prevention and control in pregnancy. There is also the need for increased financial, human and material supply (including increased drug supply and healthcare infrastructure in deprived communities) to support malaria prevention and control in order to sustain IEC programmes implementation.

The community mass education campaigns and house-to-house sensitisations among pregnant women and the entire community are consistent with the concept of primary health care, which seeks to bring healthcare to the doorstep of the population at risk in Africa. However, the feasibility of undertaking these on national/African wide programme would, at present, remain a daunting task.

Chapter 5

Primary Data Analysis and Interpretation

5.1 Introduction

While the previous chapter focused on the findings, discussions and conclusions of the systematic review of evidence, in this chapter, the author reports the findings of the evaluation of the former through survey using questionnaires. Of the 214 questionnaires anticipated, 118 were received from Ethiopia, Ghana, Nigeria and Tanzania. This represents an overall response rate of 55%. Of the 118 questionnaires received, 69 (58%) came from Ghana; 27 (23%) from Ethiopia, 21 (18%) from Nigeria and 1 (0.8%) from Tanzania. Out of the Ghanaian respondents 43 (62%) were drawn from FBOs and 26 (38%) from health professionals. Most (96%) of the questionnaires were received by post. Only five (4%) of the questionnaires were received by electronic mail (4 from Ghana and 1 from Tanzania). Among the representatives of FBOs, 84% were lay persons (although "lay", many were professionals) and 16% health professionals. This outcome was accidental, as respondents were recruited within churches and mosques. With 16% of members of FBOs being health professionals, there was the likelihood that some responses of the FBOs could be similar to those of the health professionals who were non-FBO representatives.

In this chapter the author provides both statistical (quantitative data) and narrative summary (qualitative data) in accordance with the data collection instrument. The quantitative findings relate only to Tanzania where the results cover all four countries, or where reference is made to qualitative findings. Where a small sample is involved, any comparison between countries excludes Tanzania.

The chapter covers the following sections:

- Background of respondents
- Rating of IEC strategies
- Ranking of highest and least priority
- Rating of IEC strategy implementation challenges
- Ranking of highest and least challenge

- Comments/Recommendations on addressing challenges
- Feasibility, appropriateness, meaningfulness, and effectiveness of IEC strategies
- Impact of IEC strategies.

5.2 Background Information

This section covers age, gender, level of education attained, faith, professional/occupational background, field of specialisation/expertise, place of work, position in organisation, and individual and organisational roles regarding malaria prevention and control.

5.2.1 Age Distribution

Overall, 86% of the respondents aged below 50 years, suggesting that only a few of those in employment may retire within the next few years. Most of the older respondents aged above 50 years came from Ghana (see Table 5.1 below). This was partly due to the involvement of lay respondents such as clergy and farmers.

Table 5.1 Age distribution by country

Variable	Country where you live				Total
	Ethiopia	Ghana	Nigeria	Tanzania	
15-19	0	2	0	0	2
20-24	5	8	0	0	13
25-29	15	18	3	0	36
30-34	4	7	5	0	16
35-39	2	5	7	0	14
40-44	1	7	4	0	12
45-49	0	6	1	1	8
50 and above	0	16	1	0	17
Total	27	69	21	1	118

5.2.2 Gender Distribution

There was a dominance of male respondents, 71 (62%), with 44 (38%) females. Forty-four of the males were Ghanaians, 21 Ethiopians, 5 Nigerians and 1 Tanzanian. By the same token, Ghana had the highest number of female respondents (22), followed by Nigeria (16) and Ethiopia (6). However, there were 3 missing responses on gender among Ghanaians, bringing the total valid responses to 115 out of 118 (95%).

5.2.3 Level of Education

With regards to the highest level of education attained 40 (35%) of the respondents held a first degree; 33 (29%) diploma, 19 (17%) masters, 2 (2%) PhD holders; and 21 (18%) other qualifications. The two PhD holders were from Ghana. There were more masters holders from Ethiopia than all the participating countries. On the other hand, Nigeria had the highest number of respondents with a diploma. Both Ghana and Ethiopia had an equal number of respondents with a first degree.

The other forms of qualifications included: fellowship; advance diploma; high national diploma; General Certificate (GCE) Ordinary level; and a 4-year teacher training Certificate A. The rest were: Senior High School Certificate; Senior Secondary School Certificate; and Makaranta (Local Islamic qualification). Three respondents did not respond.

5.2.4 Faith

Table 5.2 below shows that on the whole, there were far more Christians (82%) than Muslims (18%) of all valid responses. Ghana had the highest number of Christians and Muslims due to the inclusion of representatives of FBOs. Eight people did not respond. This brought the total number of valid responses to 110.

Table 5.2 Faith Distribution by Country

Variable		Country where you live				Total	Percent
		Ethiopia	Ghana	Nigeria	Tanzania		
Faith	Christianity	24	47	18	1	90	82
	Islam	2	15	3	0	20	18
Total		26	62	21	1	110	100

5.2.5 Profession/Occupation

There were 19 (16%) nurses; 13 (11%) doctors; 13 (11%) midwives; 13 (11%) nurse/midwives; 13 (11%) teachers; 12 (10%) disease control officers; 5 (4%) pharmacists; and 2 (2%) managers. Thirty-two percent of the respondents involved: lecturers, biomedical scientists, biomedical researchers, epidemiologists, health services administrators, medical laboratory technologists, laboratory technicians, health extension workers, nutrition officers, environmental health officers, zonal health officers, and medical (physician) assistants. The rest were: health officers, health information officers, dispensary technicians, accountants, accounts officers, the clergy, Imams, traders, and farmers.

Table 5.3 shows that most of the medical doctors and nurses/midwives came from Nigeria; while most of the disease control officers came from Ethiopia. The study also shows that among respondents was neither a disease control officer, a 'pure' midwife (midwives without nursing qualification) nor a 'pure' nurse (nurses without midwifery qualification) among the Nigerian respondents. The one respondent from Tanzania was a medical doctor. Only Ghana included health managers, although in real terms some of the other professional groups fell within management category. The number of pharmacists across Ethiopia, Ghana and Nigeria was almost evenly distributed. There were 13 teachers (the largest group of lay persons) from Ghana as part of representatives of FBOs (see Table 5.4).

Table 5.3 Occupational Distribution by Country

Variable	Country where you live				Total	Per cent
	Ethiopia	Ghana	Nigeria	Tanzania		
Doctor	1	2	9	1	13	11
Nurse	8	8	3	0	19	16
Midwife	1	2	0	0	3	3
Nurse/Midwife	0	5	8	0	13	11
Pharmacist	2	2	1	0	5	4
Disease Control Officer	8	4	0	0	12	10
Manager	0	2	0	0	2	2
Teacher	0	13	0	0	13	11
Others	7	31	0	0	38	32
Total	27	69	21	1	118	100

The occupational distribution of representatives of FBOs is presented in Table 5.4.

Table 5.4 Occupational Distribution of FBO Representatives

Profession	No	Percent
Teacher	13	30.2
Accountant	1	2.3
Account officer	1	2.3
Clergy	4	9.3
Chief Imam	1	2.3
Farmer	2	4.7
National Service Person	1	2.3
Trader	2	4.7
Student	8	18.6
Nurse	5	11.6
Midwife	1	2.3
Disease Control Officer	1	2.3
N/R	3	7.0
Total	43	100

NB: NR represents no response.

5.2.6 Fields of Specialisation/Expertise

In this section, data are presented textually using a Venn diagram, making it possible to identify the similarities and differences among the study countries. The various fields of specialisation of respondents are summarised in Figure 5.1. It could be seen that there are differences and similarities across the main countries under study, namely Ethiopia, Ghana, and Nigeria. In the case of Tanzania, the field of specialisation cited by the sole respondent was health service management. The areas of specialisation common to all the countries were public health and hospital pharmacy.

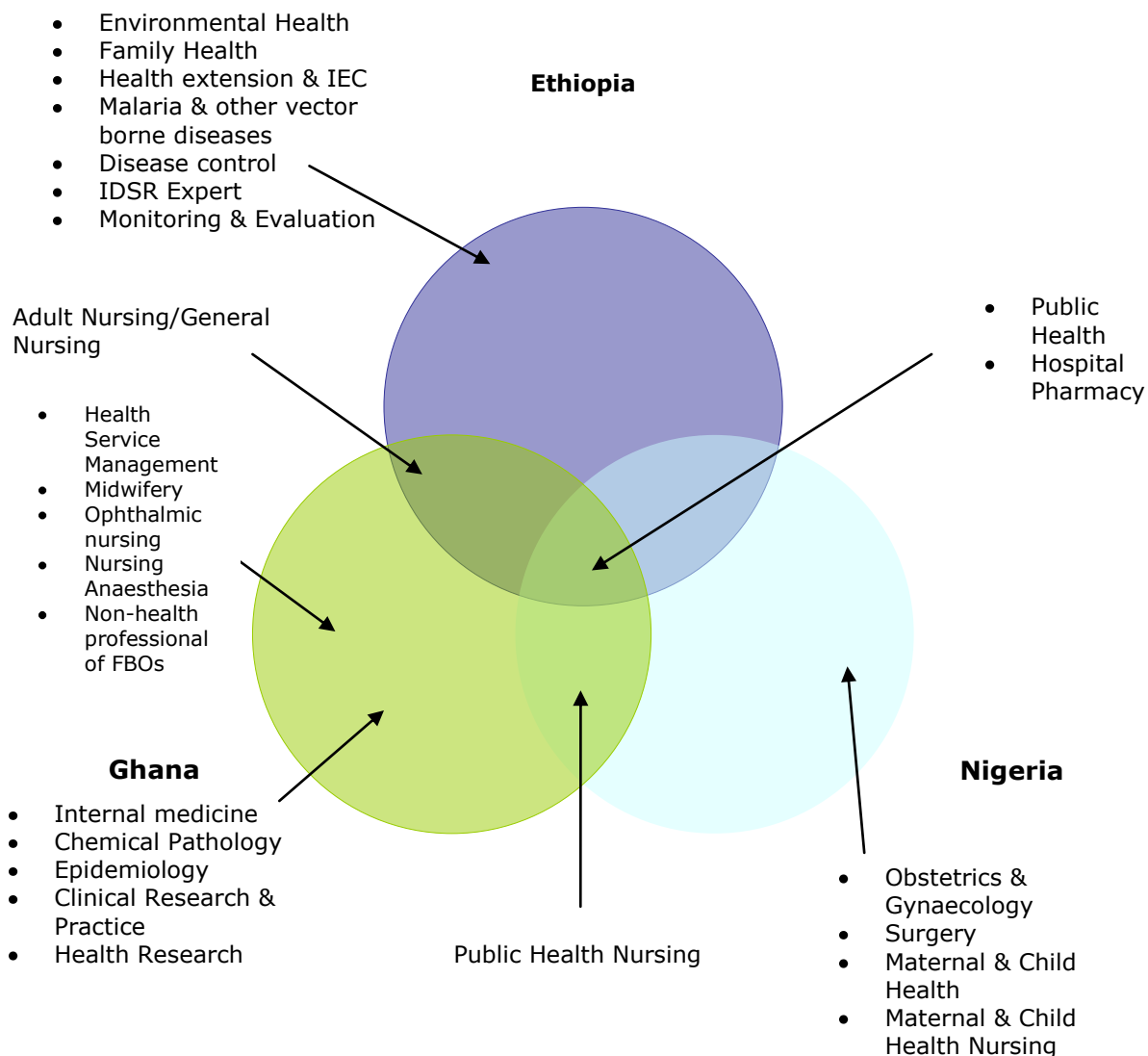
The fields of expertise may be categorised into either hospital or community-based health disciplines. In the case of lay people recruited in Ghana as representatives of FBOs the areas of specialisation were:

- teaching
- preaching and counselling
- basic education
- population studies
- accounting
- management
- government and political science
- mathematics and education
- biology
- Islamic teaching
- theology and sociology
- social studies
- religion and moral education
- agricultural extension
- cashew farming.

At this juncture, it must be noted that the above backgrounds of the FBO representatives were not deliberately selected. They were recruited based on their availability at the time of data collection as members of religious organisations, with the overriding factor being their knowledge and experience as

either having been malaria patients before, or having taken care of malaria patients, or having lived in rural settings where malaria is endemic (see Chapter 3, sub-section 3.5.3.1[v] for further details). Their opinions would therefore complement those of the health professionals or provide potentially different perspectives. Nevertheless, this picture (of diverse areas of specialisation) has implications for a potential wide variety of opinions on the issues under investigation. Such opinions may be based on professional expertise or lay perspectives as well as personal experience concerning malaria, its prevention and control. Most of the FBO representatives are professionals in other disciplines. This, coupled with their personal experience regarding malaria prevention and control, could potentially enrich the outcome of the study due to the diverse perspectives they have (see for example, Sections 5.8 and 5.10).

Figure 5.1 Fields of Specialisation/Expertise

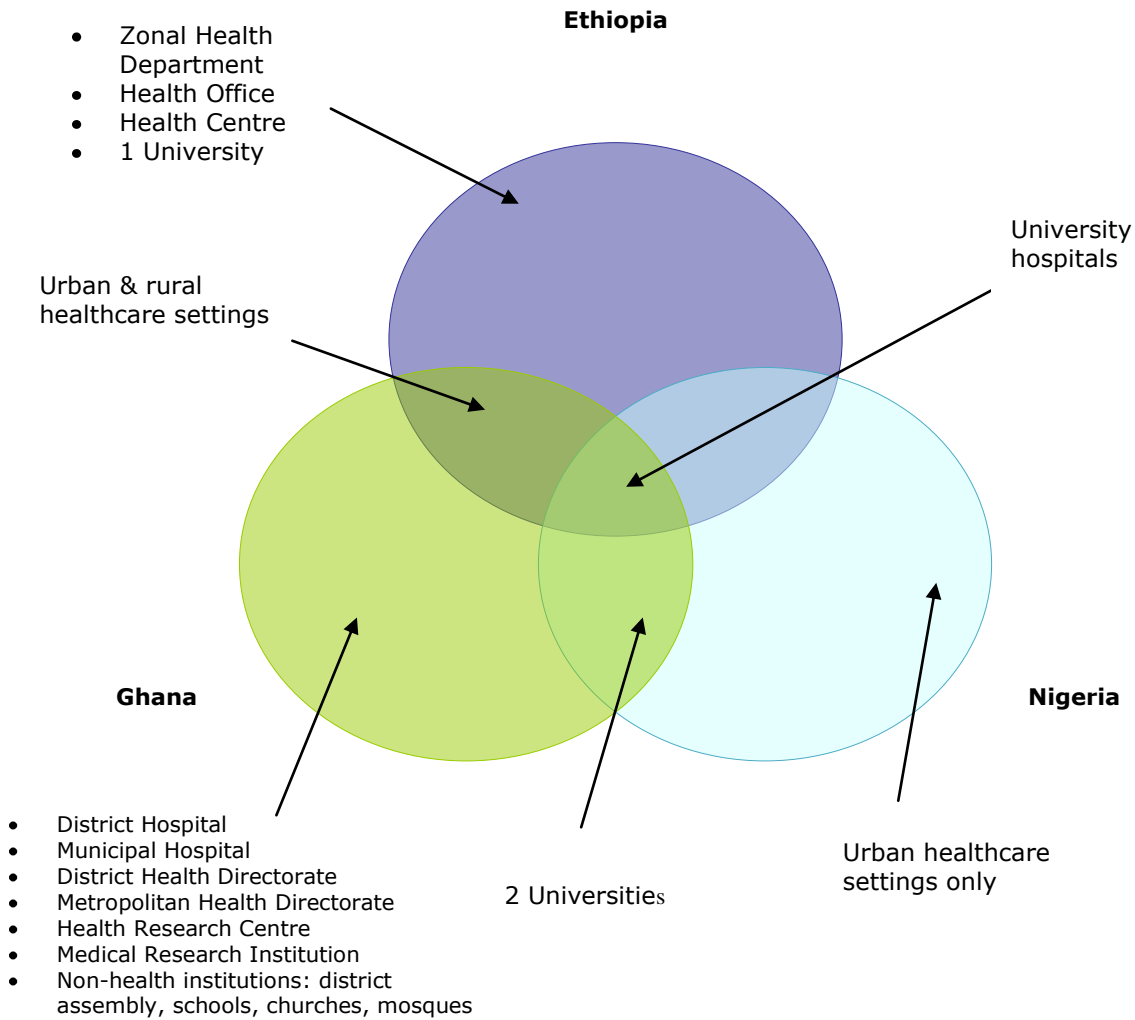


NB: Figure 5.1 excludes details of non-health professionals of FBOs and information on Tanzania since Tanzania was represented by only 1 respondent.

5.2.7 Place of Work

As with fields of expertise, data are presented textually using a Venn diagram to demonstrate the similarities and differences amongst the participating countries. It may be inferred from Figure 5.2 overleaf that the only commonality between these three countries related to place of work in relation to organisation of health care were university hospitals.

Figure 5.2 Place of Work



NB: Figure 5.2 excludes details of non-health professionals of FBOs and information on Tanzania since Tanzania was represented by only 1 respondent.

However, with regards to Ethiopia, only one specialised university hospital was involved. On the other hand, both Ghana and Nigeria had two university hospitals as places of work of some of their respective respondents. While respondents from Ethiopia and Ghana were from both urban (for example, Jimma and Sekondi-Takoradi respectively) and rural healthcare settings (for example, Moyale and Sampa respectively), those from Nigeria were only limited to urban settings (Abuja and Ibadan). With regards to Ethiopia, the specific places of work

involved specialised hospitals, zonal health offices, district hospitals and health centres.

Among the health professionals from Ghana, the places of work were generally two-fold. There were those who worked within the Ghana Health Service either in a district hospital, a district health directorate or a health research centre, including a JBI Centre; and those working at the university level either as university hospital workers or lecturers and doctoral students in allied health, public health and biomedical research departments (in Accra and Kumasi). In the case of the representatives of FBOs from Sampa in Ghana (working in rural settings only), places of work of respondents included: district hospitals, churches (the Roman Catholic Church; the Presbyterian Church of Ghana; the Methodist Church; Assemblies of God Church; and the Church of Pentecost), primary schools, junior high schools, senior high schools and vocational institutions. Other places of work involved: agricultural institutions, the Ghana Water Company, community market places and farms.

In the case of Tanzania, the place of work was the Ministry of Health Headquarters based in Dar es Salaam (urban), the nation's capital city (see Table 5.5 for further details of study sites).

Table 5.5 Study Sites

No	Country	Region/State/Province	Zone/District	Urban (City)	Rural (Town)
1	Ethiopia	Oromia	Jimma; Gimbi; Moyale; Illu- Abador; and Quellem Wallepa	Jimma	Gimbi; Moyale; Illu-abador; and Quellem Wallepa
2	Ghana	Greater Accra; Ashanti; Brong-Ahafo; and Western	Jaman-North; Kintampo-North; Shama-Ahanta East Metropolis (SAEM); Ashanti Akim South (Juaso District)	Accra; Kumasi; and Sekondi-Takoradi	Sampa, Kintampo, Akim Oda
3	Nigeria	Oyo and Abuja	Ibadan and Abuja	Ibadan and Abuja	
4	Tanzania	Dar es Salaam	Konondoni; Ilala; and Temeke	Dar es Salaam	

NB: Abuja is a federal capital territory and a state on its own. Dar es Salaam is an administrative province with 3 districts. Representatives of FBOs were recruited from Sampa.

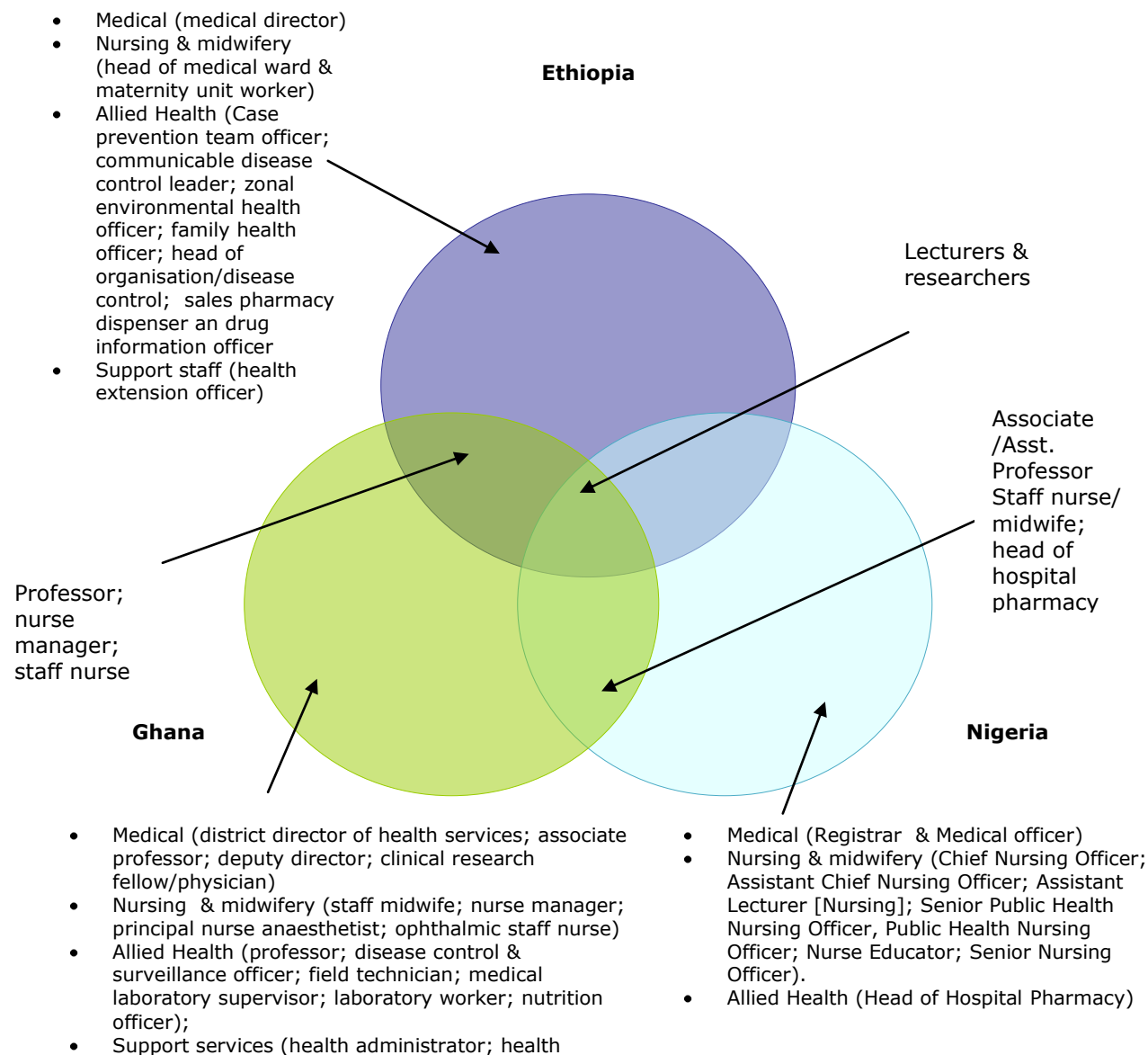
5.2.8 Position in Organisation

In this section data are presented in textual form using a Venn diagram to portray similarities and differences among the three main study countries (Ethiopia, Ghana and Nigeria). As may be inferred from Figure 5.3, there were similarities and differences among the study countries with regards to positions occupied by respondents in their respective organisations. Among health professionals, positions were grouped under medical, nursing and midwifery, allied health and support staff for the sake of convenience.

Firstly, common to the three countries, were positions of lecturers and researchers. Secondly, both Ethiopia and Ghana shared positions of professor, nurse manager/head of nursing and staff nurse. Thirdly, both Ghana and Nigeria had positions of assistant/associate professor.

In relation to Tanzania the position occupied by the sole respondent was programme officer related to national malaria control. With regards to lay respondents of the faith-based organisations from Ghana, main positions cited involved: the head minister of church; district Church overseer; circuit minister; church pastor; parish priest; and an imam. The rest were: district planning officer, secretarial staff, head teacher, agricultural extension officers, student leaders, self-employed farmers and traders.

Figure 5.3 Similarities and Differences of Positions in Organisations



NB: Figure 5.3 excludes details of non-health professionals of FBOs and information on Tanzania since Tanzania was represented by only 1 respondent.

The next section, presented qualitatively, focuses on IEC roles with regards to malaria in pregnancy either at individual or organisational level. These roles have been categorised in accordance with the three levels of management: strategic (corporate or top management); tactical (divisional or middle); and operational (frontline) levels (for example, see Duncan et al. 1995; Keuning 1998; Alter 2001); or a combination of these. For the purpose of this study, these three

traditional levels of management were adopted in relation to IEC roles as these levels appeared conceptually less complex than the four levels (corporate; strategic; divisional; and operational) (see for example, Dixon 2002). The strategic roles refer to those associated with senior management positions. The tactical roles involve middle level management with delegated functions from the strategic level. In the case of operational roles, these pertain to the day-to-day activities of frontline workers in the organisation.

5.2.9 IEC Roles of Respondents in Malaria Prevention and Control

The study showed that at individual level, IEC roles were all operational in nature. In the case of representatives of FBOs, specific IEC roles mentioned were:

- educating clients on discharge in hospitals
- educating hospital clients at exit points
- educating the general public
- giving advice to and engaging students on malaria, its causes, problems and prevention
- village educational campaigns in collaboration with district assembly
- counselling and advising in churches and mosques.

On the whole, only Tanzania failed to provide a response on IEC roles at individual level.

5.2.9.1 IEC Roles by Health Professionals and Representatives of FBOs

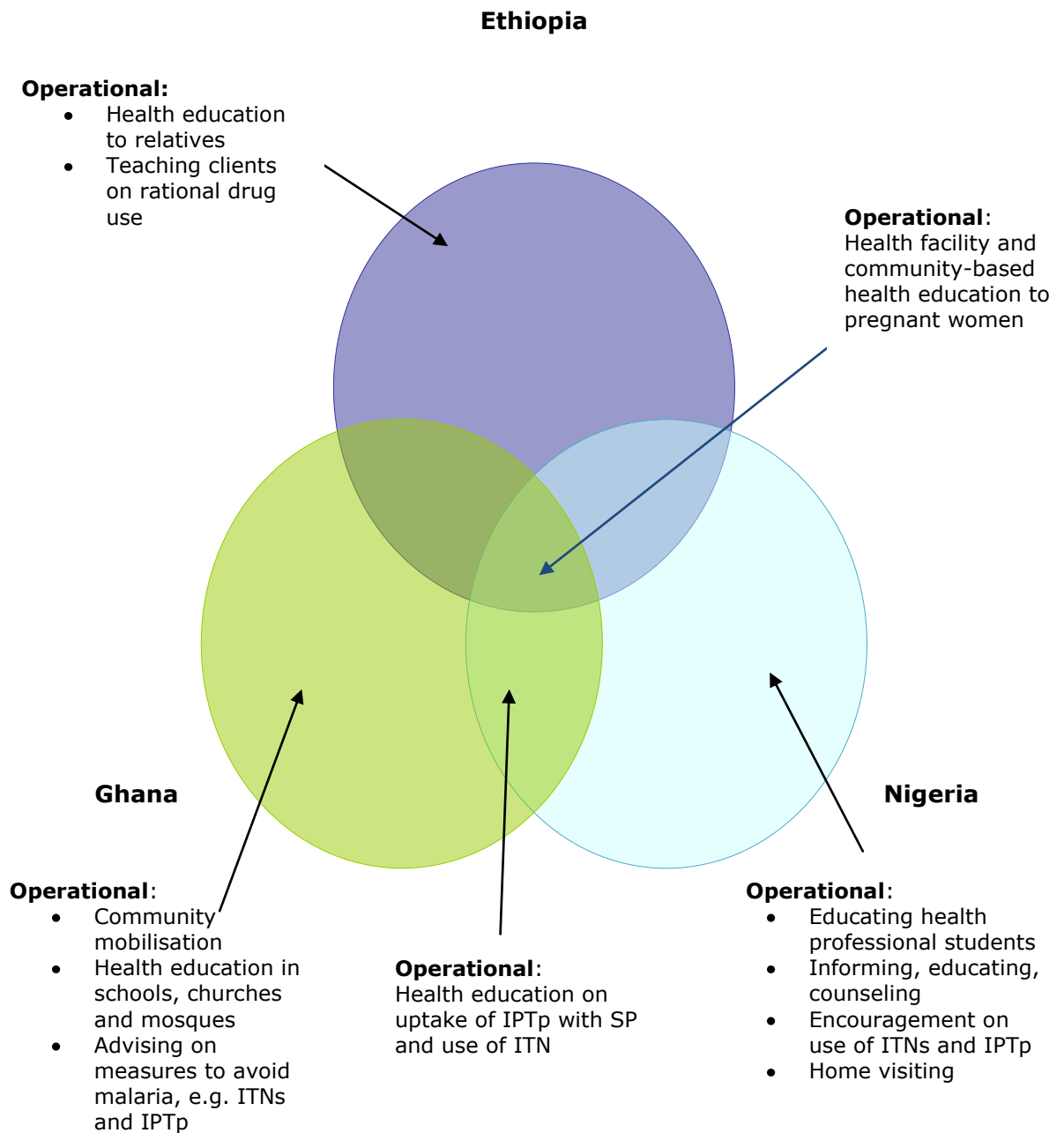
The IEC roles common to all countries involved educating pregnant women either in health facilities or in communities. At health facility level respondents in Ethiopia, Ghana and Nigeria reported having carried out health education among pregnant women as part of routine health care, especially during antenatal care visits. The health education took the form of health talks by informing, advising, encouraging and counselling with regards to malaria, its causes, consequences and measures of prevention and control. These measures largely centred on the use of insecticide-treated nets and rational drug use, including intermittent preventive treatment with sulphadoxine-pyrimethamine (IPTp-SP). Health

education activities were also focused on patients' relatives. It is however, not known whether this was at a health facility or in the community. Health education in the community covered such places as homes, schools, churches and mosques. It also took the form of community mobilisation. Apart from staff, training on malaria prevention and control was also given to students as part of students' professional development.

Figure 5.4 reveals a number of similarities and differences between Ethiopia, Ghana and Nigeria. In terms of similarities, all the respondents in these three countries reported being engaged in health education either in the health facility as part of routine antenatal care or in the community.

Only Ghana and Nigeria specifically cited educating women on uptake of IPTp-SP, suggesting perhaps this was not done in Ethiopia, although in a particular case they mentioned being involved in educating clients on rational drug use. Additionally, only Ghanaian respondents said they were involved in educating the public in schools, churches and mosques. Only Nigerian respondents reported being involved in home visiting and educating students during their professional training. It is however, difficult to tell at this stage whether these differences reflect the larger national or local picture among the participating countries, since the sample was not representative.

Figure 5.4 IEC Roles of Individuals: Similarities and Differences



NB: Figure 5.4 excludes Tanzania

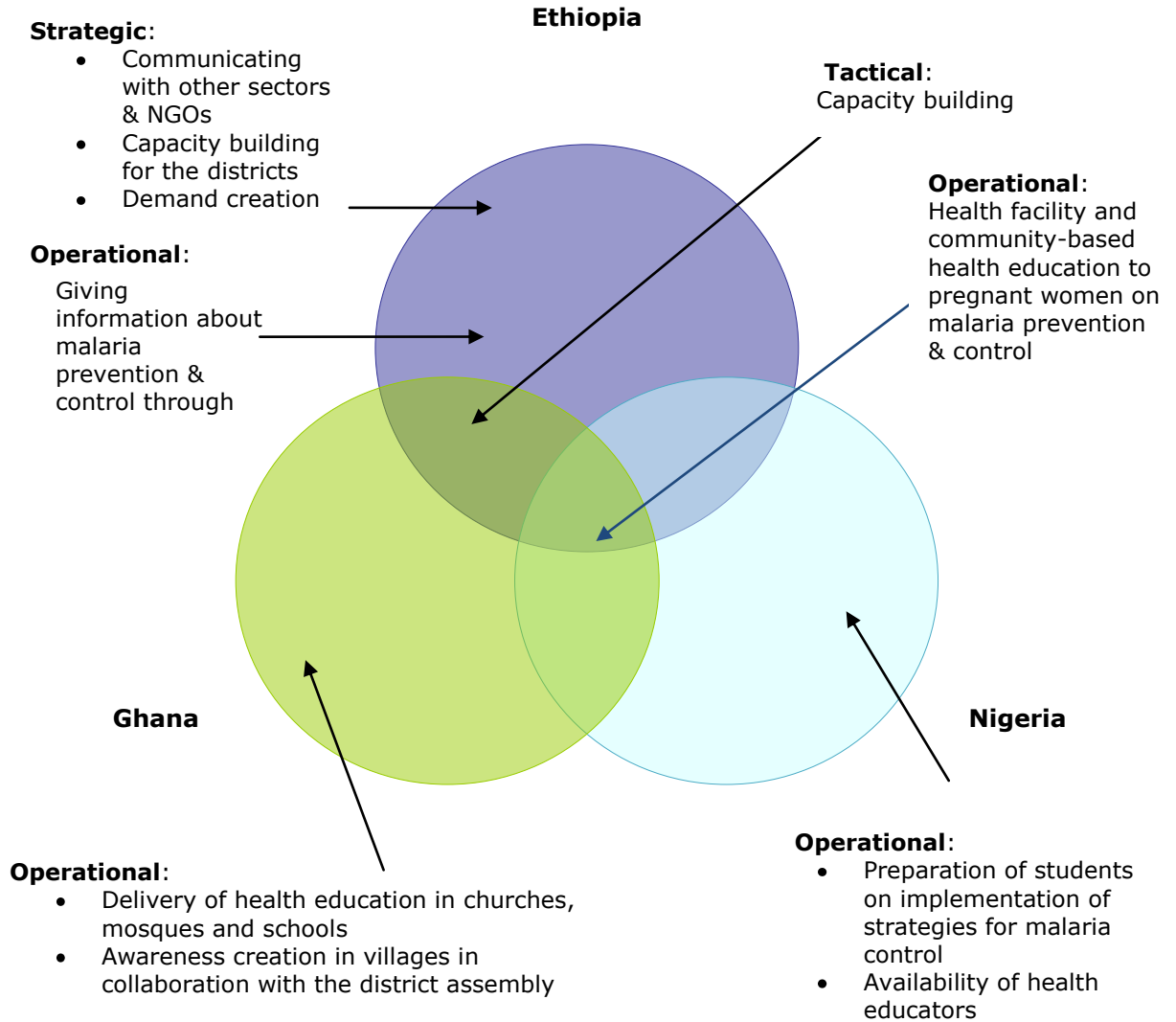
5.2.10 IEC Roles of Organisations in Malaria Prevention and Control

At the organisational level, only Ethiopian respondents reported on IEC roles across strategic, tactical and operational levels. The strategic roles were: communicating with other sectors and NGOs; capacity building through supporting and training of district level staff; and demand creation. At the tactical level, IEC roles reported were mainly: training of health extension workers; updating health professionals; health posts staff training; and supporting IEC activities. The operational roles entailed giving information about malaria prevention and control through health education strategies to pregnant women.

Figure 5.5 identifies some similarities and differences between the participating countries regarding IEC roles. In terms of similarities, all countries reported on operational aspects of IEC activities. These basically centred on educating clients either at health facility or community level. The only tactical role cited in Ghana and Ethiopia was mainly concerned with capacity building of frontline staff. Only Ghanaian respondents cited the provision of health education materials. Additionally, only Ethiopian respondents cited IEC strategic roles which centred mainly on communication with other sectors and NGOs, demand creation (a social marketing concept related to advocacy aimed at attracting clients to utilise health services) and capacity building. Furthermore, most of the roles mentioned by health professionals were both community and health facility- based whereas those from the FBOs were largely community-based. Together, these roles show the extent to which both healthcare organisations and non-health institutions are engaged in IEC programmes. All these are aimed at creating awareness and increasing knowledge about malaria, its causes, consequences, preventive and control measures, not only among pregnant women, but also among all vulnerable groups in society.

Concerning Nigeria, only operational roles were reported by respondents. These could be summarised as: preparation of students on implementation of strategies for malaria control; availability of health educators; giving information on malaria to communities; awareness creation; education about prevention of malaria.

Figure 5.5 IEC Roles of Organisations: Similarities and Differences



NB: Figure 5.5 excludes details of Tanzania because the country had only 1 respondent.

Tanzania reported only on capacity building at the strategic level. This is perhaps due to the fact that the sole respondent was based at the Ministry of Health Headquarters in Dar es Salaam.

It must also be pointed out that all organisational level IEC roles noted by representatives of FBOs were operational in nature. They were:

- educating clients on discharge in health units
- educating the general public
- giving advice to and engaging students in discussions on malaria, its causes, consequences, prevention and control
- taking part in awareness creation in villages in collaboration with the district assembly
- the involvement of some religious leaders in educating, counselling and advising their congregation members during worship in churches and mosques.

With regards to the relationship between such background variables as age, gender, faith, level of education, position in organisation, place of work, profession and fields of specialisation on one hand, and the main issues being investigated on the other, the study did not reveal any direct relationship. For instance, gender did not appear to have had any impact on opinions regarding community women's group meetings. As may be seen later under subgroup analysis, no teacher identified training and orientation as a priority strategy, contrary to what one would have expected teachers' opinion to have been (see Appendix 17). By the same token, there was no difference between the perception of religious leaders about the ratings of visiting places of worship and the other groups of respondents. Comments given by respondents in urban settings also did not differ markedly from those working in rural settings.

5.3 Subgroup Analysis

This section is an interphase between the background of respondents and the main issues being investigated. It sheds light on the key occupational groups of respondents and how they expressed their opinion on the subject of investigation. Specifically, the subgroups analysed involved medical doctors, nurses and midwives, pharmacists, disease control officers, managers, teachers and religious leaders (see Appendix 17). The health professionals cited were considered for this section for two reasons. The first reason pertains to the fact that they serve as mainstream health workers within the public health sector.

They also form the majority of respondents among health professionals. On the other hand, teachers were the largest group of respondents among the faith-based organisations; whilst religious leaders (Muslims and Christians) were included because of the strategic role they play within the community as leaders of large groups of members of faith-based organisations. Therefore, by considering the opinions of all these subgroups, the researcher hopes to identify what most of the respondents think about the main issues being investigated across the study countries. These are: rating of IEC Strategies; ranking of highest and lowest priority strategies; rating of IEC strategy implementation challenges; highest and least priority challenges; comments/recommendations in addressing the challenges; feasibility, appropriateness, meaningfulness and effectiveness of the IEC strategies; and the impact of the IEC strategies in malaria prevention and control among pregnant women in Africa based on country specific experiences.

A critical study of the above-named subgroups shows that there were some similarities and differences with regards to the issues being investigated. In terms of similarities, generally, almost all subgroups gave higher ratings for health education talks, staff training and orientation, community mass education campaigns and symbolism versus message delivery as regards IEC strategies. Most subgroups also gave higher ratings for managing staff shortages and distance problems with regards to the rating of the level of challenge. In considering feasibility of the strategies, almost always the lowest ratings were given to house-to-house sensitisation and audience segmentation versus information delivery, with the former being the lesser of the two. Apart from teachers, all the subgroups identified training and orientation as the highest priority strategy. By the same token, only managers did not identify community mass education campaigns as the highest priority. Medical doctors, disease control officers, managers, teachers and religious leaders agreed that health education talks did not serve as the lowest priority. Moreover, apart from managers and religious leaders, all subgroups had a consensus that addressing issues of staff knowledge was the least priority challenge. Furthermore, apart from doctors all the subgroups agreed that staff attitude was the highest priority

challenge. Finally, there were overlaps with regards to the ranking of highest and lowest priority strategies on one hand, and highest and least challenges on the other.

In relation to differences, health professionals generally had a tendency to give higher scores compared to non-health professionals. In particular, medical doctors, nurses and midwives appeared to be more 'generous' in their ratings. Pharmacists and disease control officers tended to down play ratings on health education talks compared to the other health professionals, and were more inclined to give higher ratings on community-based approaches. Only medical doctors and nurses identified health talks as the highest priority strategy. Again, only doctors ranked integrated health education campaigns and audience segmentation versus information delivery as the highest priorities. House-to-house sensitisation was only ranked as the highest priority by nurses and midwives, disease control officers and managers. Additionally, only one nurse (from among representatives of FBOs) recognised advocacy as one of the highest priority strategies. Moreover, only disease control officers identified visiting places of worship as one of the highest priorities. Furthermore, only doctors and teachers felt advocacy was the lowest priority. Again, only teachers considered community women's group meetings the highest priority.

With regards to the priority challenges, only nurses, midwives and teachers held that managing staff shortage was the highest priority challenge. Only nurses and midwives, medical doctors and teachers identified managing poverty as the highest challenge. In addition, doctors, nurses, midwives, and teachers said the problem of distance was one of the highest challenges. Again, only doctors, nurses, midwives and pharmacists recognised waiting time as one of the highest priority challenges. Moreover, only nurses, midwives and managers identified women empowerment as one of the highest challenges. Furthermore, demystifying cultural beliefs was considered by only nurses and midwives and religious leaders as one of the highest challenges. Only doctors, nurses, midwives, disease control officers and pharmacists agreed that managing

resources was one of the highest challenges. Furthermore, only teachers recognised health seeking behaviour as the highest challenge. Again, only nurses, midwives, disease control officers and religious leaders had in common the fact that addressing issues of staff knowledge was the highest priority challenge. Besides, nobody recognised addressing issues of staff work practices as the highest challenge. Finally, teachers and religious leaders appear to have a lot in common in focusing more on moderate ratings of all variables and below. Comments/recommendations and Impact of IEC strategies have been presented under a separate sub-section later in this chapter (see Section 5.8).

The above analysis shows the complexity surrounding the rating and ranking decisions of respondents. However, the most distinctive features are two-fold: health professionals gave higher ratings than non-health professionals; and while health professionals generally favoured a combination of community and institutionally-based IEC strategies, non-health professionals were more inclined towards community-based strategies in terms of priority.

Having considered the background information of respondents and subgroup analysis, the next step is to look at the rating of identified IEC strategies.

5.4 Rating of IEC Strategies

In this regard, respondents were asked to rate the priority of IEC strategies to address the issue of malaria in pregnancy by circling the most appropriate response in accordance with the 1-5 Likert Scale (described in Chapter 3, sub-section 3.5.3.2).

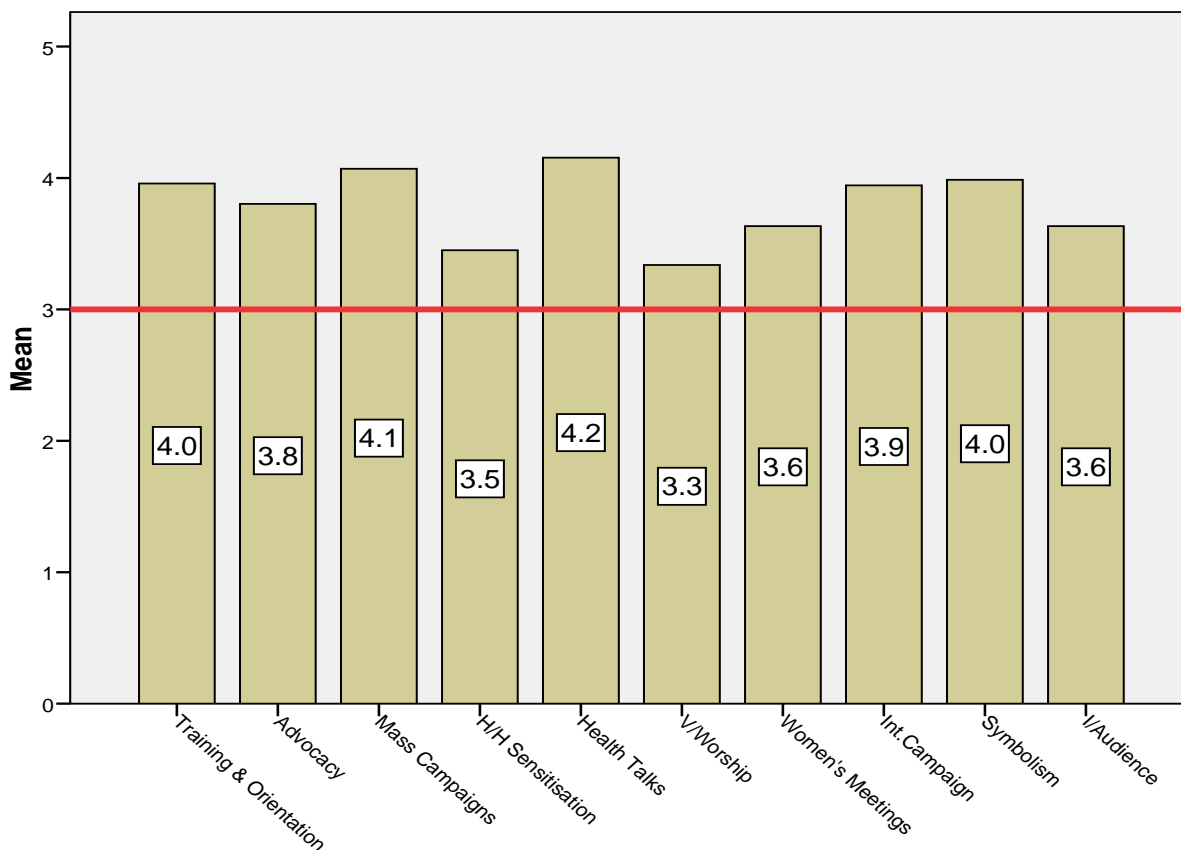
5.4.1 Opinions of Health Professionals

According to Figure 5.6, health education talks strategy was the most highly rated strategy across all the four countries, namely, Ethiopia, Ghana, Nigeria and Tanzania (mean score=4.2). This was followed by community mass education campaigns (mean score=4.1); staff training and orientation and symbolism versus message delivery (mean scores=4.0 each); and integrated health

education campaigns (mean score=3.9) respectively. The rest were: advocacy (mean score=3.8); audience segmentation versus information delivery, and community women’s group meetings (mean scores=3.6); house-to-house sensitisation (mean score 3.5); and visiting places of worship (mean score=3.3) respectively.

In other words there was a consensus across all the countries (with the exclusion of FBOs) that all the strategies were above moderate (mean score=3.0), with visiting places of worship emerging as the least rated strategy.

Figure 5.6 The Most Highly Rated IEC Strategy



Legend:	
Training & Orientation	=Staff training and orientation
Mass Campaign	=Community mass education campaigns
H/H Sensitisation	=House-to-house sensitisation
Health Talks	=Health education talks in health units
V/Worship	=Visiting places of worship
Women's Meetings	=Community women's group meetings
Int. Campaign	=Integrated health education campaigns
Symbolism	=Symbolism versus message delivery
I/Audience	=Audience segmentation versus information delivery

The justification for health education talks in health units being the most highly rated strategy was that the strategy may take advantage of the upward trend in antenatal care attendance. In other words, health education in health units, most especially during antenatal care provide a good forum for information dissemination among pregnant women in the face of increased antenatal care visits. Other reasons given by Ghanaian respondents involved the view that the strategy serves as a continuous reminder; provides a platform for educating clients; creates awareness on malaria prevention; provides attention to malaria in pregnancy; and is therefore considered 'very good'. For example, one respondent from Ghana noted as follows:

"This will continuously remind clients about how to go about with the prevention of malaria during pregnancy"

(Staff Nurse, General Nursing, District Hospital, Ghana)

Community mass education campaigns strategy was rated the second highest strategy by health professionals with a number of reasons. These are summarised as follows:

- it was very important and that it was one of the ways of controlling malaria in pregnancy
- provided an avenue for periodic talks among opinion leaders
- helped reduce malaria prevalence
- the participatory approach was worth it
- communities shared the vision of malaria prevention and control
- very important since mass education and awareness was made at the community level and that pregnant women can be well captured
- information was brought to the door steps of community members
- community members usually share information among themselves and believe in each other
- there was community ownership.

5.4.2 Other IEC Strategies Identified

Apart from the 10 IEC strategies, the only other strategy proposed by a respondent (from Ghana) was a long-term strategy. This entails incorporating health messages into elementary school curriculum as noted below:

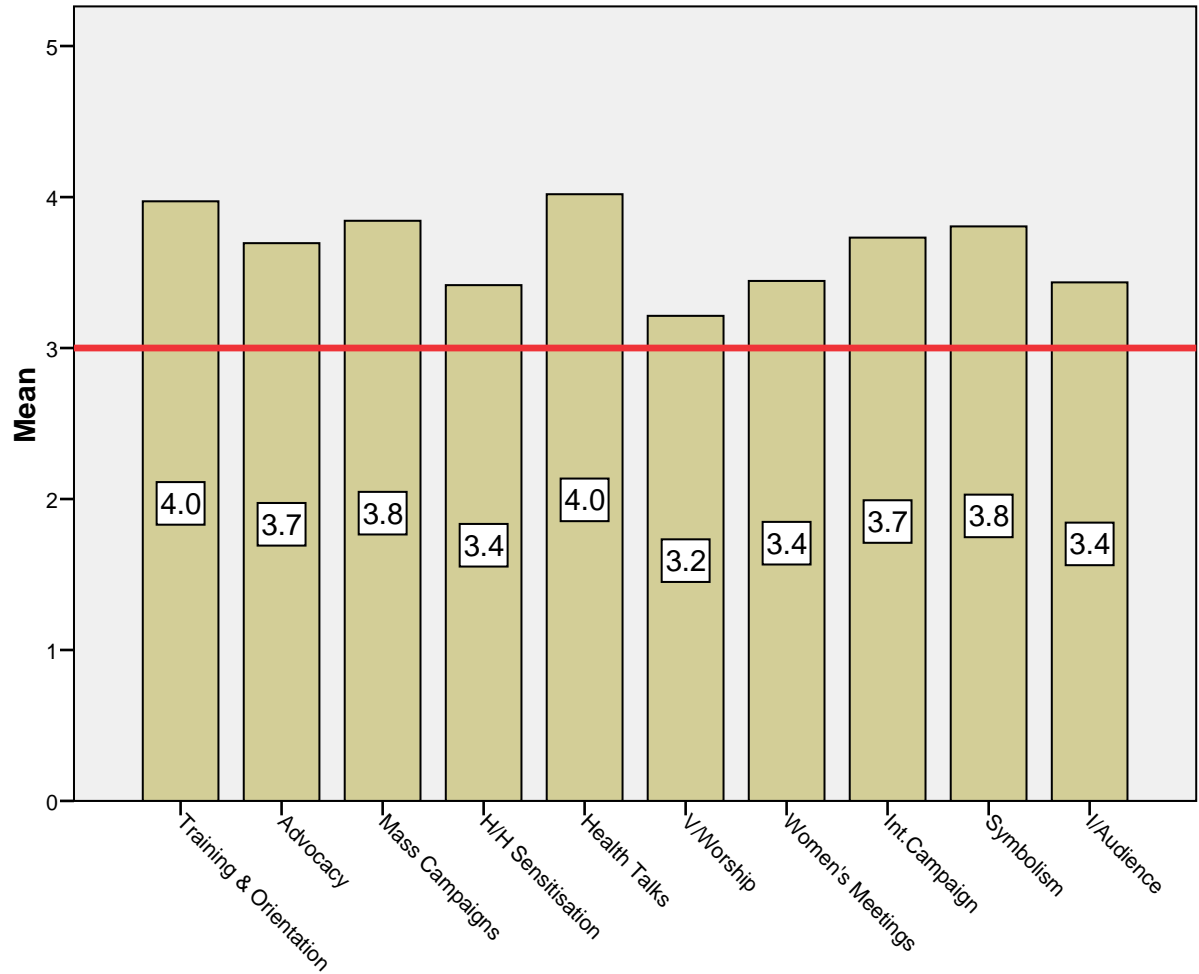
“Long-term strategy, but incorporating health messages in school curricula such that children will grow up into responsible adults.”

(Associate Professor, Public Health/Medical Research, Ghana)

5.4.3 Sensitivity Analysis of Opinions on IEC Strategies

The inclusion of faith-based organisations resulted in a slight shift in the overall rating pattern. Figure 5.7 shows that both staff training and orientation and health education talks in health units jointly emerged as the most highly rated strategies in terms of rating (mean scores=4.0) as opposed to findings in Figure 5.6 which showed the latter as being the most highly rated strategy. Next to these were also, jointly, community mass education campaigns and symbolism versus message delivery (mean scores=3.8). The rest involved: advocacy and integrated health education campaigns (mean scores=3.7); house-to-house sensitisation; community women’s group meetings; and audience segmentation versus information delivery (mean scores=3.4). Visiting place of worship emerged as the lowest rated strategy (mean score=3.2). Thus, all the strategies still saw an overall rating above moderate level (mean score=3.0), whilst the lowest rated strategy remained unchanged following sensitivity analysis.

Figure 5.7 Sensitivity Analysis of Opinions on IEC Strategies



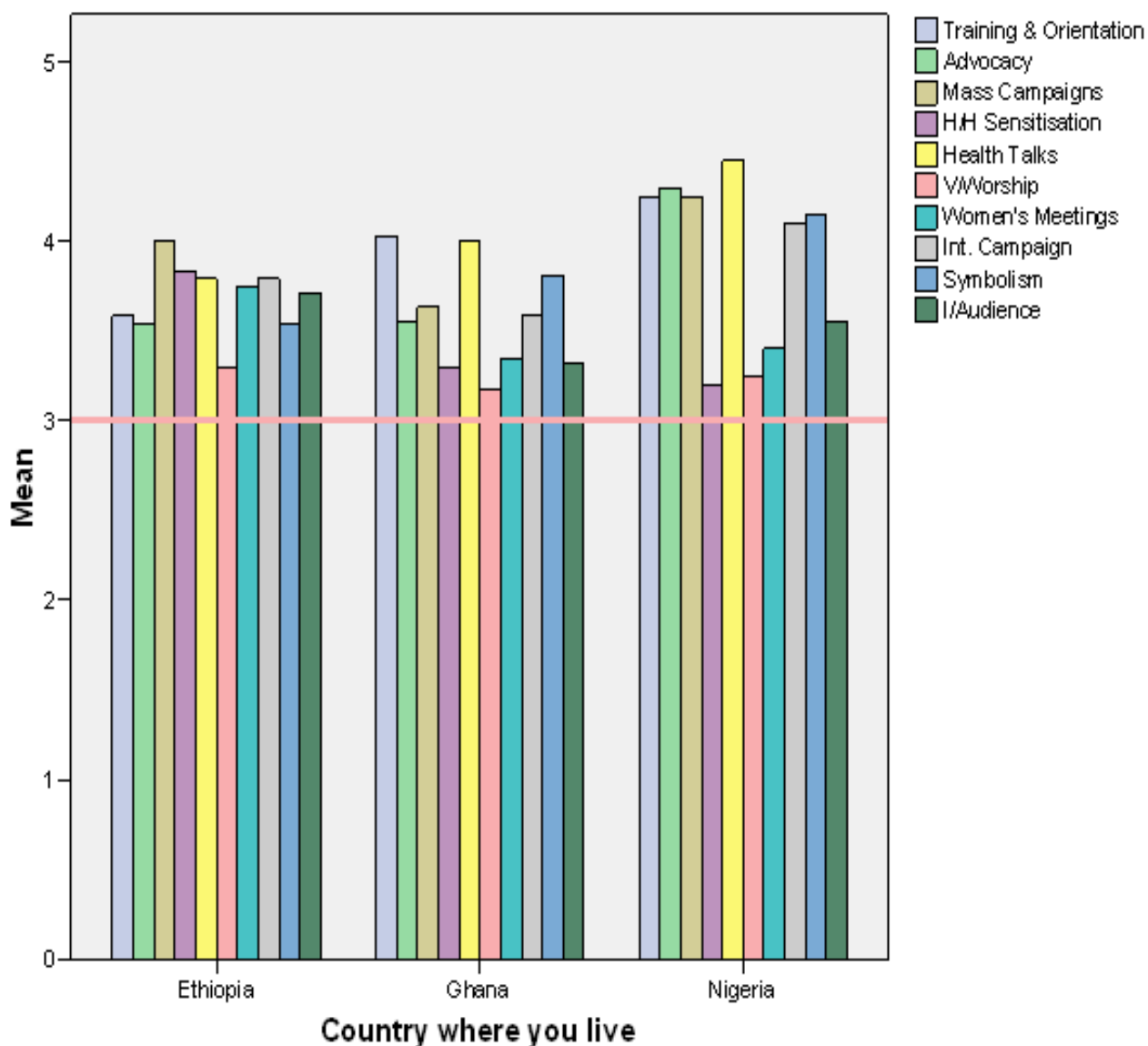
Legend:

- Training & Orientation =Staff training and orientation
- Mass Campaign=Community mass education campaigns
- H/H Sensitisation=House-to-house sensitisation
- Health Talks=Health education talks in health units
- V/Worship=Visiting places of worship
- Women's Meetings=Community women's group meetings
- Int. Campaign=Integrated health education campaigns
- Symbolism=Symbolism versus message delivery
- I/Audience=Audience segmentation versus information delivery

5.4.4 Comparison of Opinions on IEC Strategies by Health Professionals

This section involved only Ethiopia, Ghana and Nigeria, since they were largely represented in the sample. Opinions of the health professionals were compared as shown in Figure 5.8. The level of statistical differences and similarities was determined using Kruskal-Wallis Test (see Appendix 18.1). Figure 5.8 shows that all the strategies were rated above moderate level (mean score=3.0) with the exclusion of FBOs.

Figure 5.8 Comparison of Opinions on IEC Strategies



5.4.5 Inter-Country Comparison on Rating of IEC Strategies

It may be inferred from Figure 5.8 and Table 5.6 that Nigerian health professionals gave the highest ratings with regards to all the identified IEC strategies, except for house-to-house sensitisation; visiting places of worship; symbolism versus message delivery; community women’s group meetings; and audience segmentation versus information delivery. Ethiopians gave the highest rating only for house-to-house sensitisation, while Ghanaians gave the highest rating to the remaining four.

Table 5.6 Kruskal-Wallis Test Results on Rating of IEC Strategies

IEC Strategy	Country	N	Mean Rank
Staff Training and Orientation: Regular training and orientation of staff on new national malaria control guidelines, including malaria in pregnancy (MIP)	Ethiopia	27	30.30
	Ghana	26	39.44
	Nigeria	21	44.36
	Total	74	
Advocacy: Carrying out advocacy among stakeholders in order to influence behaviour, especially at the community level	Ethiopia	27	30.89
	Ghana	26	35.77
	Nigeria	21	48.14
	Total	74	
Community mass education campaigns: Mobilising communities to conduct mass community education campaigns to create awareness on malaria prevention and control in pregnancy	Ethiopia	27	34.78
	Ghana	26	37.19
	Nigeria	21	41.38
	Total	74	
House-to-house sensitisation: Conducting house-to-house sensitisation among pregnant women and households	Ethiopia	26	41.52
	Ghana	26	33.77
	Nigeria	20	33.53
	Total	72	
Health education talks in health units: Promoting and sustaining routine health education talks in health units among pregnant women	Ethiopia	27	26.94
	Ghana	26	42.67
	Nigeria	21	44.67
	Total	74	
Visiting places of worship: Visiting places of religious worship to create awareness on malaria in pregnancy	Ethiopia	27	34.61
	Ghana	26	40.42
	Nigeria	21	37.60
	Total	74	

Table 5.6 Kruskal-Wallis Test Results on Rating of IEC Strategies (Cont'd)

IEC Strategy	Country	N	Mean Rank
Community women's group meetings: Organising and supporting community women's group on malaria in pregnancy	Ethiopia	27	37.20
	Ghana	26	40.52
	Nigeria	21	34.14
	Total	74	
Integrated health education campaigns: Promoting integrated health education campaigns at all levels of health service delivery in order to increase efficiency in IEC programme implementation	Ethiopia	27	33.43
	Ghana	26	38.06
	Nigeria	21	42.05
	Total	74	
Symbolism versus message delivery: Delivering health education messages based on appropriate and meaningful symbols, metaphors and language understood by target audience	Ethiopia	27	25.96
	Ghana	26	45.65
	Nigeria	21	42.24
	Total	74	
Audience segmentation versus information delivery: Packaging and delivering health information to address educational needs of different audience with diverse cultural background at the same time	Ethiopia	25	36.50
	Ghana	26	37.83
	Nigeria	21	34.86
	Total	72	

The Kruskal-Wallis Test also sought to identify the strategies with statistically significant differences. Only 4 strategies were statistically significant across the three countries. In order of their level of significance these were: symbolism versus message delivery ($p=0.001$); health talks ($p=0.003$); advocacy ($p=0.014$); and training and orientation ($p=0.047$) respectively (see Appendix 18.1). With regards to community mass education campaigns; house-to-house sensitisation; visiting places of worship; community women's group meetings; integrated health education campaigns; and audience segmentation versus information delivery, there were no statistically significant differences (see Appendix 18.1).

5.4.6 Sensitivity Analysis for Inter-county Comparison

Following the inclusion of faith-based organisations in the inter-country comparison of opinions on rating of the strategies, a number of changes in the mean ranks were seen (see Table 5.7). However, Nigeria maintained the lead in terms of the rating decisions with regards to seven strategies: staff training and

orientation; advocacy; community mass education campaigns; health education talks; visiting places of worship; integrated health education campaigns; and symbolism versus message delivery. Ethiopians gave the highest ratings with regards to three strategies: house-to-house sensitisation; community women’s group meetings; and audience segmentation versus information delivery. Ghana only came second in terms of rating of staff training and orientation, advocacy, house-to-house sensitisation and health education talks. These differences were due to the inclusion of representatives of the FBOs in the statistical test as they gave lower ratings, thus reducing the mean rank per strategy in the case of Ghana, leading to an increase in the mean ranks of Nigeria and Ethiopia.

Table 5.7 Sensitivity Analysis of IEC Strategies: Kruskal-Wallis Test Results

IEC Strategy	Country	N	Mean Rank
Staff Training and Orientation: Regular training & orientation of staff on new national malaria control guidelines including malaria in pregnancy (MIP)	Ethiopia	27	47.37
	Ghana	69	60.03
	Nigeria	21	70.57
	Total	117	
Advocacy: Carrying out advocacy among stakeholders in order to influence behaviour, especially at the community level	Ethiopia	27	52.63
	Ghana	68	54.54
	Nigeria	21	78.88
	Total	116	
Community mass education campaigns: Mobilising communities to conduct mass community educational campaigns to create awareness on malaria prevention and control in pregnancy	Ethiopia	27	61.46
	Ghana	68	53.63
	Nigeria	21	70.48
	Total	116	
House-to-house sensitisation: Conducting house-to-house sensitisation among pregnant women and households	Ethiopia	26	65.21
	Ghana	68	55.93
	Nigeria	20	52.80
	Total	114	
Health education talks in health units: Promoting and sustaining routine health education talks in health units among pregnant women	Ethiopia	27	47.80
	Ghana	69	58.09
	Nigeria	21	76.40
	Total	117	

Table 5.7 Sensitivity Analysis of IEC Strategies: Kruskal-Wallis Test Results (Cont'd)

IEC Strategy	Country	N	Mean Rank
Visiting places of worship: Visiting places of religious worship to create awareness on malaria in pregnancy	Ethiopia	27	58.48
	Ghana	69	58.02
	Nigeria	21	62.88
	Total	117	
Community women's group meetings: Organising and supporting community women's group on malaria in pregnancy	Ethiopia	27	64.00
	Ghana	69	56.76
	Nigeria	21	59.93
	Total	117	
Integrated health education campaigns: Promoting integrated health education campaigns at all levels of health service delivery in order to increase efficiency in IEC programme implementation	Ethiopia	27	58.20
	Ghana	68	54.64
	Nigeria	21	71.38
	Total	116	
Symbolism versus message delivery: Delivering health educational messages based on appropriate and meaningful symbols, metaphors and language understood by target audience	Ethiopia	27	45.96
	Ghana	67	58.68
	Nigeria	21	71.31
	Total	115	
Audience segmentation versus information delivery: Packaging and delivering health information to address educational needs of different audience with diverse cultural background at the same time	Ethiopia	25	64.80
	Ghana	69	54.30
	Nigeria	21	62.05
	Total	115	

The Kruskal-Wallis Test also showed that after inclusion of representatives of the FBOs the strategies with the statistically significant differences remained unchanged. However, there emerged some differences in terms of the level of significance among the strategies in question. Secondly, the order of level of statistical significance also changed. In order of level of significance these were: advocacy ($p=0.006$); health talks ($p=0.008$); symbolism versus message delivery ($p=0.021$); and staff training and orientation ($p=0.042$) (see Appendix 18.2).

Just like the case of health professionals only, there were no significant differences with regards to opinions on community mass education campaigns; house-to-house sensitisation; visiting places of worship; community women

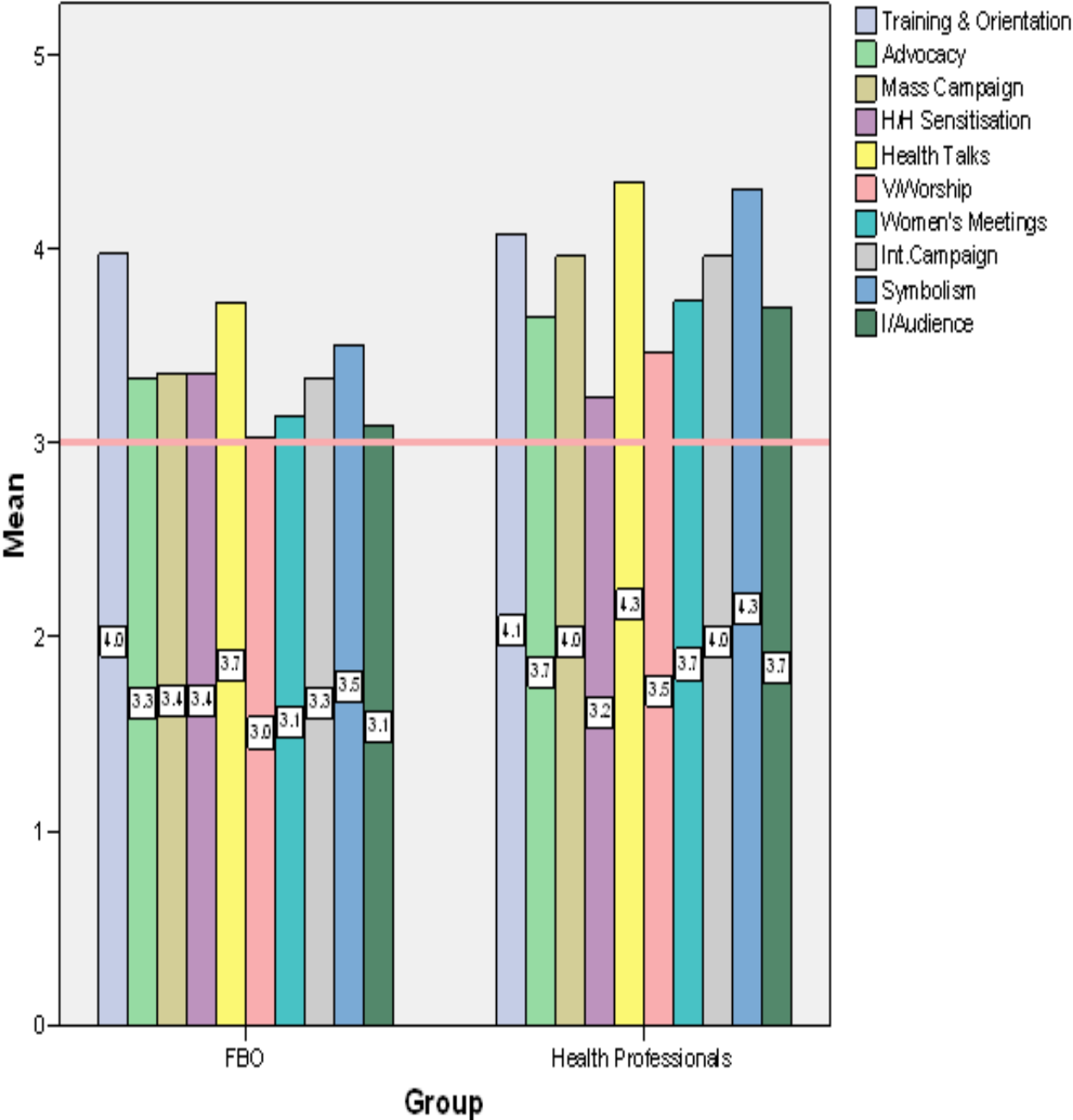
group meetings; integrated health education campaigns; and audience segmentation versus information delivery (see Appendix 18.2). With similarities pertaining to 60% of the IEC strategies among health professionals, it may be suggested that all the health sector ministries across the study countries are perhaps engaged in similar malaria control plans within the framework of the Roll Back Malaria (The Abuja Declaration 2000) (also see Chapter 1, Table 1.1).

5.4.7 Comparative Analysis of IEC Strategies: Ghana

This section has been included because it is concerned with two separate groups within the same country. These involved health professionals and representatives of FBOs in Ghana, unlike the other participating countries. Therefore, there was the need to draw some comparisons between these two independent samples (see Figure 5.9).

The two groups of samples were compared using Mann-Whitney Test to identify any similarities and differences in terms of opinions expressed.

Figure 5.9 Comparative Analysis of Opinions on IEC Strategies: Ghana



5.4.8 Mann-Whitney Test for Inter-Group Comparison

The test shows that apart from house-to-house sensitisation, health professionals gave higher ratings for all the strategies compared to their FBO counterparts, suggesting that health professionals recognised the strategies as part of current IEC interventions in Ghana (see Table 5.8).

Table 5.8 Mann-Whitney Test Results on Rating IEC Strategies

IEC Strategy	Groups	N	Mean Rank	Sum of Ranks
Staff Training and Orientation: Regular training and orientation of staff on new national malaria control guidelines including malaria in pregnancy (MIP)	FBO	43	34.05	1464.00
	Health Professionals	26	36.58	951.00
	Total	69		
Advocacy: Carrying out advocacy among stakeholders in order to influence behaviour, especially at the community level	FBO	42	32.52	1366.00
	Health Professionals	26	37.69	980.00
	Total	68		
Community mass education campaigns: Mobilising communities to conduct mass community education campaigns to create awareness on malaria prevention and control in pregnancy	FBO	42	30.87	1296.50
	Health Professionals	26	40.37	1049.50
	Total	68		
House-to-house sensitisation: Conducting house-to-house sensitisation among pregnant women and households	FBO	42	35.40	1487.00
	Health Professionals	26	33.04	859.00
	Total	68		
Health education talks in health units: Promoting and sustaining routine health education talks in health units among pregnant women	FBO	43	29.60	1273.00
	Health Professionals	26	43.92	1142.00
	Total	69		
Visiting places of worship: Visiting places of religious worship to create awareness on malaria in pregnancy	FBO	43	31.44	1352.00
	Health Professionals	26	40.88	1063.00
	Total	69		

Table 5.8 Mann-Whitney Test Results on Rating IEC Strategies (Cont'd)

IEC Strategy	Groups	N	Mean Rank	Sum of Ranks
Community women's group meetings: Organising and supporting community women's groups on malaria in pregnancy	FBO	43	30.95	1331.00
	Health Professionals	26	41.69	1084.00
	Total	69		
Integrated health education campaigns: Promoting integrated health education campaigns at all levels of health service delivery in order to increase efficiency in IEC programme implementation	FBO	42	29.98	1259.00
	Health Professionals	26	41.81	1087.00
	Total	68		
Symbolism versus message delivery: Delivering health education messages based on appropriate and meaningful symbols, metaphors and language understood by target audience	FBO	41	27.17	1114.00
	Health Professionals	26	44.77	1164.00
	Total	67		
Audience segmentation versus information delivery: Packaging and delivering health information to address educational needs of different audience with diverse cultural background at the same time	FBO	43	30.36	1305.50
	Health Professionals	26	42.67	1109.50
	Total	69		

The Mann-Whitney test also showed that statistically, there were significant differences with regards to opinions on seven IEC strategies (see Appendix 18.3). The strategies with statistical differences were community mass education campaigns ($p=0.047$); health education talks ($p=0.002$); visiting places of worship ($p=0.045$); community women's group meetings ($p=0.027$); integrated health education campaigns ($p=0.012$); symbolism versus message delivery ($p=0.000$); audience segmentation versus information delivery ($p=0.009$). The results show that health education talks had the most statistically significant

difference between the two groups; while symbolism versus information delivery was at the extreme in terms of level of statistical significance.

In terms of similarities, the test revealed that there was no significant difference with regards to staff training and orientation; advocacy; and house-to-house sensitisation (see Appendix 18.3). Thus, in terms of the level of significance, there were more differences than similarities between the two independent samples from Ghana. This could be due to knowledge differences regarding IEC strategies, since only 16% of representatives of FBOs were health professionals (see Section 5.1).

Irrespective of the ratings of the strategies participants were asked to look through the above IEC strategies to identify what they would consider as the highest and lowest priority strategy. This is the focus of the next section.

5.5 Ranking of Highest and Lowest Priority Strategies

This section involved all four of the study countries. In this section, the opinions of health professionals are analysed separately and later compared with those of representatives of FBOs through sensitivity analysis with a view to identifying any change in perspectives. Asked which strategy was considered highest and lowest priority, respondents gave various responses as shown below.

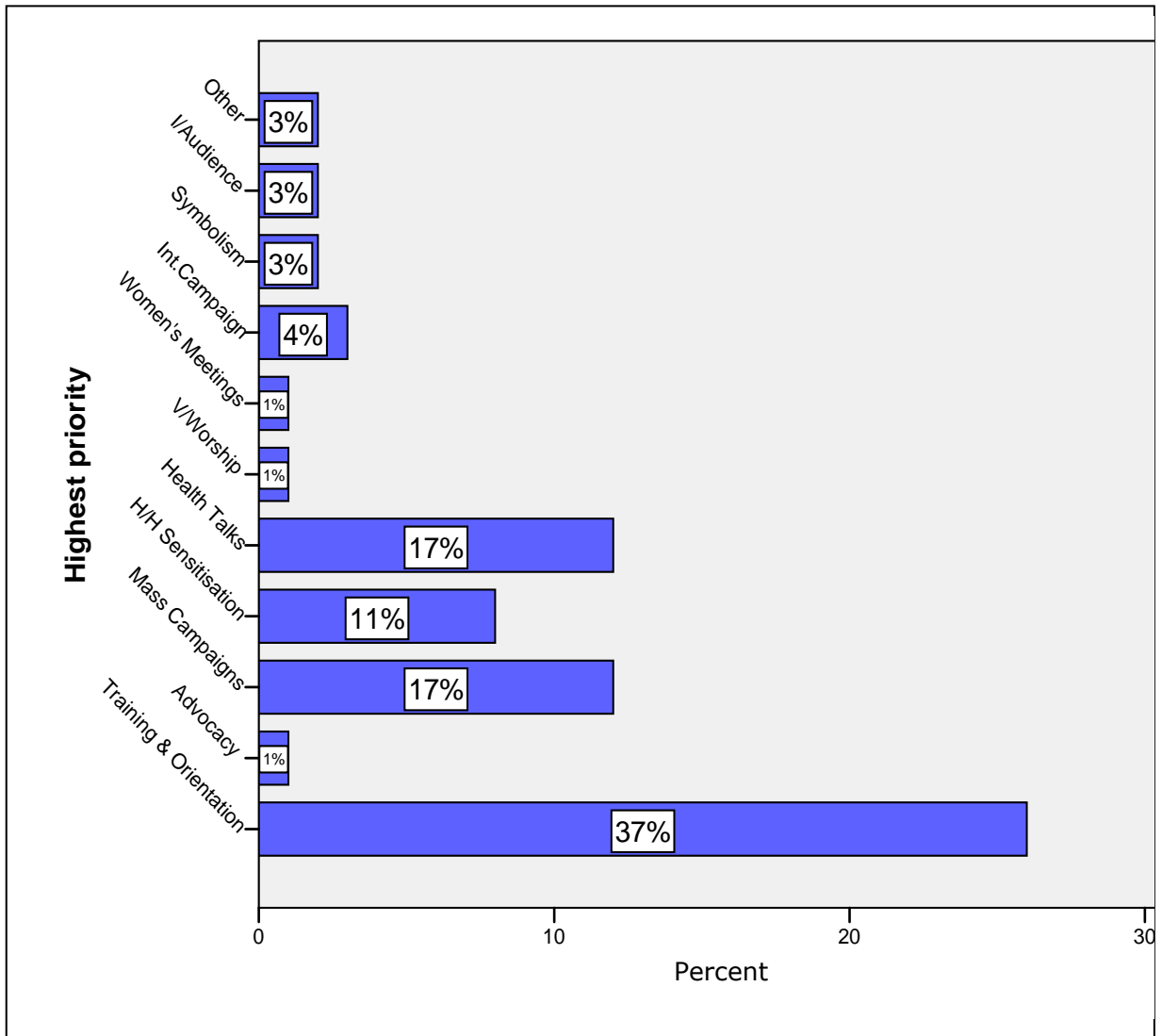
5.5.1 Highest Priority Strategy

Figure 5.10 shows that among health professionals across Ethiopia, Ghana, Nigeria and Tanzania, the highest priority strategy was staff training and orientation. Among the Ethiopian respondents the reasons were: it brought about the needed change if implemented properly; important for future prosperity; the need for new staff to update knowledge on current malaria situation; the need to create awareness for community attention towards pregnant women; to enable staff to know about new malaria drugs. With regards to the Ghanaian respondents, reasons for the strategy being the highest priority involved: the need for knowledge update; staff ability to impart knowledge to clients;

enhancement of staff capacity to manage malaria cases; the need to achieve results; the need to save lives; and ensuring adherence to national malaria control policies. In the case of Nigerians, the reasons were: that trained staff would make greater impact; that the success of IEC strategy depended solely on how informed the personnel implementing the strategy were; that it was what one knew that one passed on to others; that not enough staff were trained; the need to increase level of awareness on malaria control; and the need for staff to be updated frequently, since they were engaged in giving health education to the public.

The key observations about the above statements are the need for more staff to be trained; that health education could only be given to clients based on what staff knew; and the need for the public to recognise that pregnant women needed special attention due to their vulnerability. Thus, the perception is that health educators would be more effective if properly trained to implement IEC programmes.

Figure 5.10 Opinions of Health Professionals on Highest Priority Strategy



Legend:

- Training & Orientation=Staff training and orientation
- Mass Campaign=Community mass education campaigns
- H/H Sensitisation=House-to-house sensitisation
- Health Talks=Health education talks in health units
- V/Worship=Visiting place of worship
- Women's Meetings=Community women's group meetings
- Int. Campaign=Integrated health education campaigns
- Symbolism=Symbolism versus message delivery

5.5.2 Sensitivity Analysis of Highest Priority Strategy

After the inclusion of faith-based organisations, the pattern of opinions remained unchanged (see Figure 5.11). Reasons given by FBOs for training and orientation being the highest priority were: the strategy exposed staff to requisite knowledge so that they could educate their audience; staff with new ideas could help society; and only well informed staff could impart knowledge. Two specific statements were noted as follows:

- (1) "Regular training and orientation of staff gives staff the first hand information and without that what are they going to educate the audience about? I think with that staff will have the requisite knowledge on malaria to give out."

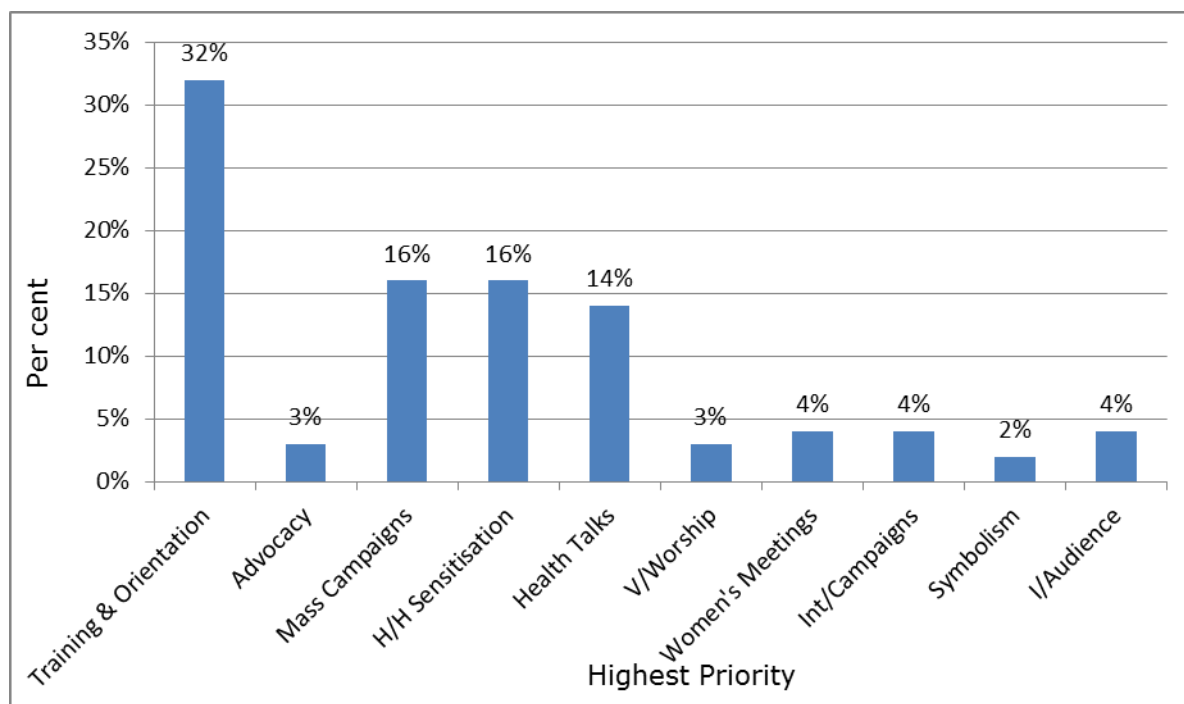
(Nurse, Christian, FBO, Ghana)

- (2) "The choice of 'training & orientation' as 'highest' is due to the fact that it is only well informed personnel who can really impart knowledge to change/solve societal problems."

(Teacher, Muslim, FBO, Ghana)

Thus, overall, both health professionals and FBOs agreed that the underpinning rationale for training and orientation was that only well informed health workers would be able to properly educate pregnant women. Apart from the above, some respondents thought that symbolism versus message delivery was very important and of highest priority since it would benefit the illiterate and those that may be intellectually handicapped. Other respondents were of the view that it would aid understanding and increase the interest of people to participate in malaria prevention.

Figure 5.11 Sensitivity Analysis of Highest Priority Strategy



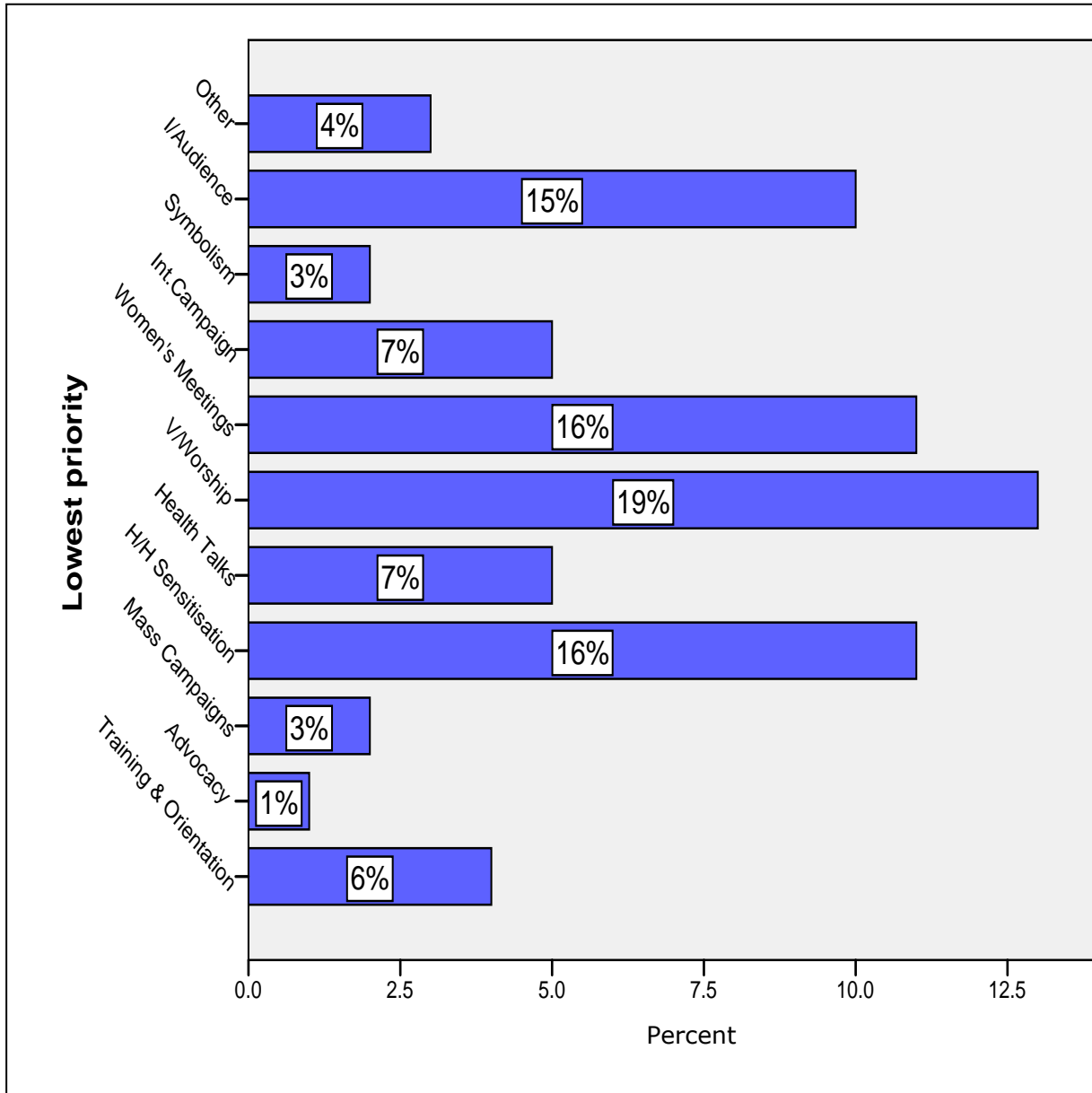
Legend:
Training & Orientation=Staff training and orientation
Mass Campaign=Community mass education campaigns
H/H Sensitisation=House-to-house sensitisation
Health Talks=Health education talks in health units
V/Worship=Visiting place of worship
Women's Meetings=Community women's group meetings
Int. Campaign=Integrated health education campaigns
Symbolism=Symbolism versus message delivery
I/Audience=Audience segmentation versus information delivery

The inclusion of representatives of FBOs did not make much difference in terms of the pattern of opinion on the highest priority. However, unlike the health professionals, scoring by FBO representatives on the highest priority was comparatively lower, while that of house-to-house sensitisation rather increased by 45% (i.e. 16-11/11).

5.5.3 Lowest Priority Strategy

Figure 5.12 indicates that visiting places of worship was the lowest priority strategy among all health professionals across all the countries.

Figure 5.12 Opinions of Health Professionals on Lowest Priority Strategy



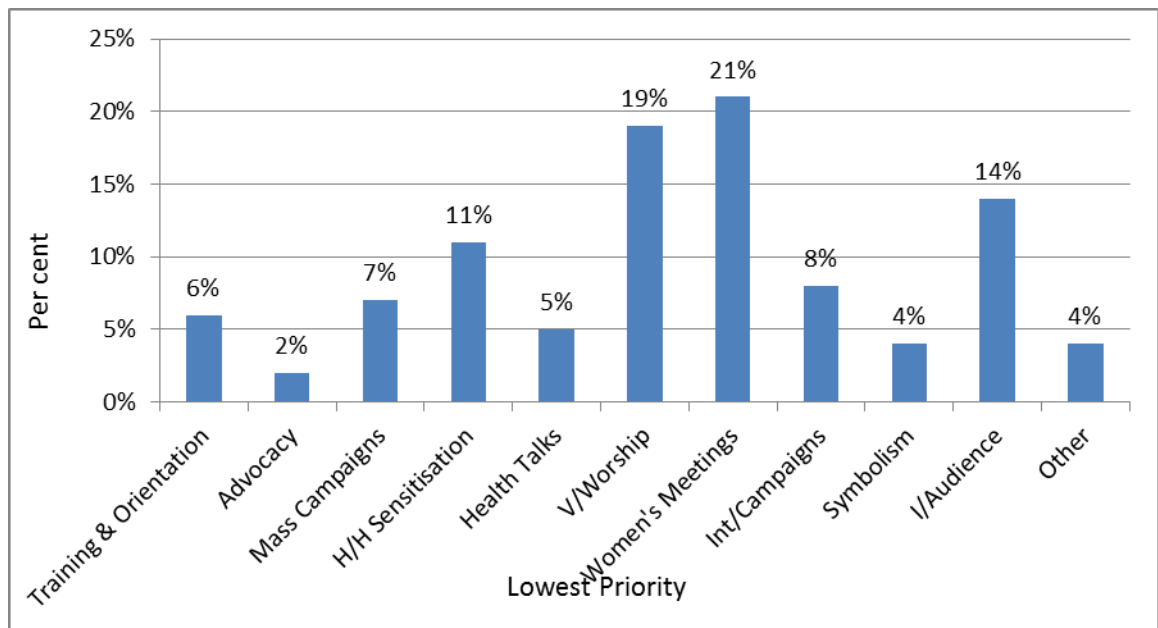
Legend:

- Training & Orientation=Staff training and orientation
- Mass Campaign=Community mass education campaigns
- H/H Sensitisation=House-to-house sensitisation
- Health Talks=Health education talks in health units
- V/Worship=Visiting place of worship
- Women's Meetings=Community women's group meetings
- Int. Campaign=Integrated health education campaigns
- Symbolism=Symbolism versus message delivery
- I/Audience=Audience segmentation versus information delivery

5.5.4 Sensitivity Analysis of Lowest Priority Strategy

The sensitivity analysis shows that community women’s group meetings emerged as the lowest priority strategy following the inclusion of FBOs, followed by visiting places of worship. This implies that lay respondents may recognise visiting places of worship as a more favourable priority to the former (see Figure 5.13).

Figure 5.13 Sensitivity Analysis on Lowest Priority Strategy



Legend:
Training & Orientation=Staff training and orientation
Mass Campaign=Community mass education campaigns
H/H Sensitisation=House-to-house sensitisation
Health Talks=Health education talks in health units
V/Worship=Visiting place of worship
Women's Meetings=Community women's group meetings
Int. Campaign=Integrated health education campaigns
Symbolism=Symbolism versus message delivery
I/Audience=Audience segmentation versus information delivery

Among Nigerians, community women’s group meetings strategy was rated the lowest and also considered the lowest priority strategy. According to these respondents, one key reason for this opinion was that it was not carried out due to staff shortage. It was therefore suggested that health extension workers would be required in the community to complement the effort of health workers in

healthcare facilities in Nigeria. Another reason given was that “the lower group in rural areas are not part of the awareness”. As one respondent put it:

“Rural dwellers do not know what a mosquito net is or what it looks like.”

(Nurse/Midwife, Department of Family Medicine, Nigeria)

This may mean that health education campaigns need to be intensified among rural dwellers in Nigeria.

One other priority strategy cited by respondents involved the need for incorporating health messages in the primary school curriculum so that children may grow up as responsible adults as a form of long-term strategy; and the role of bill boards, flip charts, posters and the media. The last four are, however, related to health talks and community mass education campaigns, and therefore, will not be treated as separate.

Although advocacy was not considered the highest priority strategy, reasons given appear to suggest it deserves recognition. These include the view that advocacy: created awareness through radio or television; helped change attitudes and made environment clean; enhanced the popularity of preventive strategies; and served as a strategy to support the move to controlling malaria in pregnancy.

On the other hand, the data indicated that health professionals considered advocacy of little significance in terms of impact with regards to individual changes in health behaviour as noted below:

“The strategy of depending on stakeholders to influence personal behaviour is not likely to give much return in terms of individual changes in health behaviour.”

(Associate Professor, Public Health/Medical Research, Ghana)

The above statement was supported by another respondent from Nigeria who noted that stakeholders may not always carry the message to their constituencies. This perhaps explains why only one respondent (nurse) considered advocacy the highest priority strategy (see section 5.3 and Appendix 17).

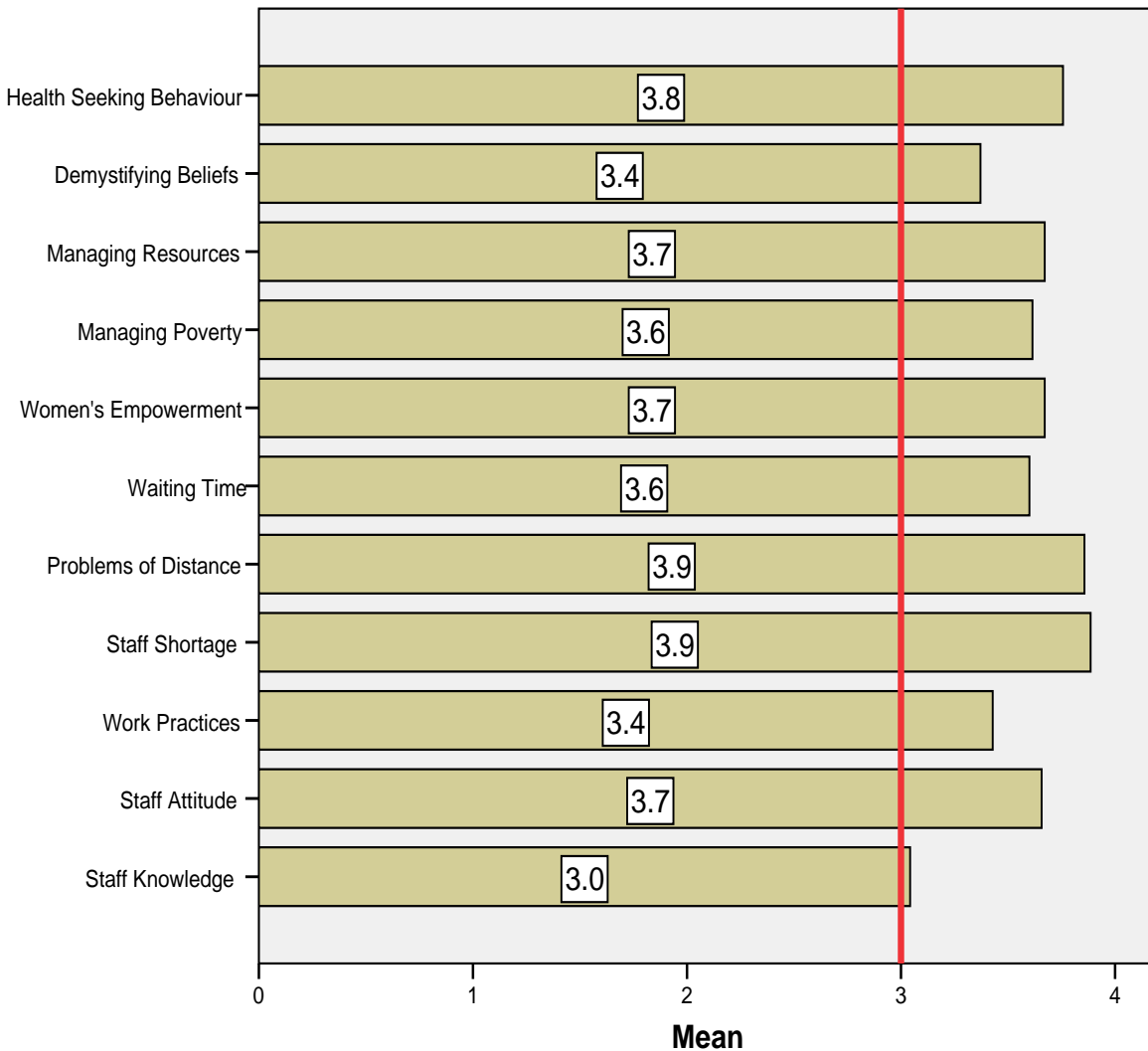
5.6. Rating of Level of IEC Challenge

It was realised that addressing the above strategies required consideration of the challenges they pose. Therefore, respondents were asked to rate the challenges to IEC programme implementation related to malaria prevention and control in pregnant women in Africa.

5.6.1 Opinions of Health Professionals

Figure 5.14 shows that two challenges emerged jointly as the most highly rated across all countries among health professionals. These were managing staff shortage and problems of distance (mean scores=3.9). Next, was health seeking behaviour (mean score=3.8). This was followed by managing resources, staff attitude and women's empowerment (mean scores=3.7); managing waiting time (mean score=3.6); work practices, and demystifying cultural beliefs (mean scores=3.4) respectively. Staff knowledge was rated across all countries by health professionals as the lowest challenge.

Figure 5.14 The Highest Challenge Among Health Professionals

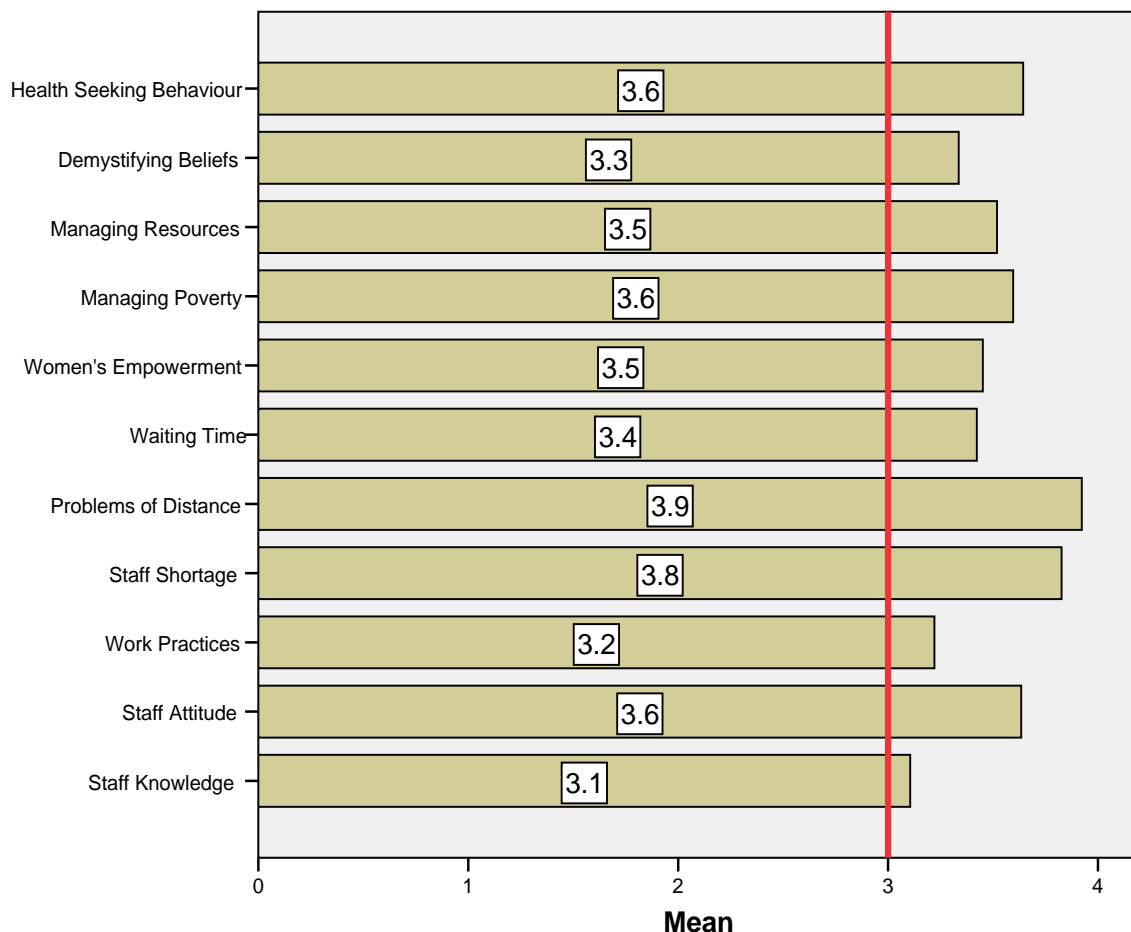


5.6.2 Sensitivity Analysis of Opinions on Challenges

With the inclusion of representatives of FBOs, it emerged that the highest rated challenge was problems of distance (mean score=3.9); followed by managing staff shortage (mean score=3.8); staff attitude, managing poverty and health seeking behaviour (mean scores=3.6); managing resources and women's empowerment (mean scores=3.5) respectively. The rest were: managing waiting time (mean score=3.4); demystifying cultural beliefs (mean score=3.3); work practices (mean score=3.2); and staff knowledge (mean score=3.1). Thus, overall, staff knowledge was rated the lowest challenge by all respondents (see Figure 5.15). In other words, the change in the order of the rating was due to the

inclusion of faith-based organisations from Ghana. This may be considered crucial as it involves the voices of lay people in the community, as opposed to only health professionals (in the case of Figure 5.14), bringing a two-way perspective regarding the perception of challenges confronting the implementation of IEC strategies in Africa.

Figure 5.15 Sensitivity Analysis of Highest Challenge



Reasons given by representatives of FBOs for the problems of distance being the highest challenge involved: lack of health facilities in rural communities; lack of funding for the establishment of health centres; over-urbanisation of health facilities; and inaccessible and bad roads in rural areas. However, not all FBO representatives were in agreement with the above concerns as may be observed as follows:

“Almost every village of about 500+ population has a health care centre.”

(Rev. Minister, Circuit Minister /Agric Extension Agent, FBO, Ghana)

In order to minimise the effects of some of the problems associated with distance it has been suggested that

“Outreach programmes could be arranged.”

(Midwife, Christian, FBO, Ghana)

Another respondent from Ethiopia also argued that health extension workers are being deployed at *kelebe* (village) levels; and therefore, distance should not be considered a problem.

According to one of the health professionals, the problems of distance are being addressed based on the Community-based Health Planning and Services (CHPS) policy.

Although not considered the highest challenge, reasons to justify the need to address health seeking behaviour are worth noting, since they are directly related to pregnant women. These reasons are summarised as follows:

- the need to advise pregnant women to seek early treatment whenever they fell sick
- it was easy to prevent malaria, carry out early diagnosis and treatment, reduce morbidity and mortality, if health seeking behaviour of pregnant women improved
- when women were aware of malaria complications in pregnancy, they would seek better care
- pregnant women were more interested in traditional herbs than orthodox medicine
- some pregnant women would only attend ANC when they were about to deliver

- it would enable pregnant women to cultivate the habit of attending hospital, and make them less superstitious.

5.6.3 Inter-Country Comparison on Level of Challenge

This section pertains to all countries except Tanzania. Table 5.9 indicates that regarding health professionals among the three countries, Nigeria gave the highest ratings on level of challenge with regards to five of the challenges. These were: addressing issues of staff knowledge; managing poverty; managing resources; demystifying cultural beliefs; and managing health seeking behaviour. Similarly, five challenges were rated highest by Ghanaian respondents. These were: staff attitude; managing staff shortage; problems of distance; women’s empowerment; and managing waiting time. Only the challenge of addressing issues of work practices was rated highest by Ethiopian health professionals.

Table 5.9 Kruskal-Wallis Test Results on Rating of Level of Challenge

IEC Challenges	Country	N	Mean Rank
Staff knowledge: Addressing issues of staff knowledge on malaria prevention and control in pregnancy	Ethiopia	27	33.56
	Ghana	26	35.65
	Nigeria	21	44.86
	Total	74	
Staff attitude: Addressing issues of staff attitude towards clients	Ethiopia	27	27.57
	Ghana	26	46.08
	Nigeria	21	39.64
	Total	74	
Work practices: Addressing issues of work practices with regards to plans and procedures	Ethiopia	26	39.67
	Ghana	25	32.20
	Nigeria	20	35.98
	Total	71	
Staff shortage: Managing staff shortage	Ethiopia	27	27.00
	Ghana	26	46.63
	Nigeria	21	39.69
	Total	74	

Table 5.9 Kruskal-Wallis Test Results on Rating of Level of Challenge (Cont'd)

IEC Challenges	Country	N	Mean Rank
Distance problems: Dealing with problems of distance (access to antenatal care facility)	Ethiopia	27	31.39
	Ghana	26	44.77
	Nigeria	21	36.36
	Total	74	
Waiting time: Dealing with issues of waiting time in relation to antenatal care consultations	Ethiopia	27	28.72
	Ghana	25	44.04
	Nigeria	21	39.26
	Total	73	
Women's empowerment: Addressing issues of women's empowerment	Ethiopia	26	30.71
	Ghana	26	42.71
	Nigeria	21	37.71
	Total	73	
Poverty versus cost of ITNs: Managing issues of poverty in relation to cost of mosquito nets (for example, insecticide-treated bed nets) among pregnant women, especially in rural communities	Ethiopia	27	29.13
	Ghana	26	37.31
	Nigeria	21	48.50
	Total	74	
Resource constraints: Managing resources (human, material and financial)	Ethiopia	27	31.78
	Ghana	26	40.35
	Nigeria	21	41.33
	Total	74	
Demystifying cultural beliefs: Demystifying or addressing cultural beliefs in relation to malaria in pregnancy	Ethiopia	27	31.06
	Ghana	26	40.37
	Nigeria	21	42.24
	Total	74	
Health seeking behaviour: Managing health seeking behaviour among pregnant women	Ethiopia	27	34.48
	Ghana	26	38.48
	Nigeria	21	40.17
	Total	74	

In terms of differences and similarities, the Kruskal-Wallis Test showed that there were very few statistically significant differences among the opinions of health professionals from the three countries. In order of level of significance, these were: managing staff shortage ($p=0.002$); addressing issues of staff attitude ($p=0.004$); managing poverty ($p=0.006$); and managing waiting time ($p=0.022$) (see Appendix 18.4).

There were no statistically significant differences among the countries with regards to opinion on seven challenges. These involved: staff knowledge; work practices; distance problems; managing waiting time; women’s empowerment; managing resources; demystifying cultural beliefs and health seeking behaviour (see Appendix 18.4). These similarities imply a high level of consensus, and indicate that health professionals across Ghana, Ethiopia and Nigeria have common views with regards to contextual issues related to the challenges, despite country cultural differences.

5.6.4 Sensitivity Analysis for Inter-country Comparison

Except for managing staff shortage and problems of distance, rated highest by Ghanaian respondents, and work practices by Ethiopians, all other challenges were rated highest by Nigerians (see Table 5.10). Among all the three countries, Ethiopian respondents made the lowest ratings.

Table 5.10 Sensitivity Analysis on Rating of Level of Challenge: Kruskal-Wallis Test Results

IEC Challenges	Country	N	Mean Rank
Staff knowledge: Addressing issues of staff knowledge on malaria prevention and control in pregnancy	Ethiopia	27	50.87
	Ghana	68	58.26
	Nigeria	21	69.07
	Total	116	
Staff attitude: Addressing issues of staff attitude towards clients	Ethiopia	27	44.87
	Ghana	68	61.54
	Nigeria	21	66.19
	Total	116	
Work practices: Addressing issues of work practices with regards to plans and procedures	Ethiopia	26	69.48
	Ghana	67	49.75
	Nigeria	20	65.05
	Total	113	
Staff shortage: Managing staff shortage	Ethiopia	27	40.93
	Ghana	64	61.82
	Nigeria	21	60.31
	Total	112	

Table 5.10 Sensitivity Analysis on Rating of Level of Challenge: Kruskal-Wallis Test Results (Cont'd)

IEC Challenges	Country	N	Mean Rank
Distance problems: Dealing with problems of distance (access to antenatal care facility)	Ethiopia	27	48.09
	Ghana	68	63.49
	Nigeria	21	55.71
	Total	116	
Waiting time: Dealing with issues of waiting time in relation to antenatal care consultations	Ethiopia	27	48.81
	Ghana	65	57.90
	Nigeria	21	64.74
	Total	113	
Women's empowerment: Addressing issues of women's empowerment	Ethiopia	26	52.02
	Ghana	68	58.95
	Nigeria	21	62.33
	Total	115	
Poverty versus cost of ITNs: Managing issues of poverty in relation to cost of mosquito nets (for example, insecticide-treated bed nets) among pregnant women, especially in rural communities	Ethiopia	27	44.70
	Ghana	68	59.00
	Nigeria	21	74.62
	Total	116	
Resource constraints: Managing resources (human, material and financial)	Ethiopia	27	55.24
	Ghana	68	56.26
	Nigeria	21	69.93
	Total	116	
Demystifying cultural beliefs: Demystifying or addressing cultural beliefs in relation to malaria in pregnancy	Ethiopia	27	48.35
	Ghana	66	58.91
	Nigeria	21	64.83
	Total	114	
Health seeking behaviour: Managing health seeking behaviour among pregnant women	Ethiopia	27	56.00
	Ghana	65	54.62
	Nigeria	21	65.64
	Total	113	

Following sensitivity analysis using Kruskal-Wallis, only a few of the challenges emerged with statistically significant differences regarding the opinions of health professionals in the above-named countries. The levels of statistical significance of these challenges were: managing poverty ($p=0.007$); work practices

($p=0.010$); managing staff shortage ($p=0.011$); and staff attitude ($p=0.036$) respectively (see Appendix 18.5).

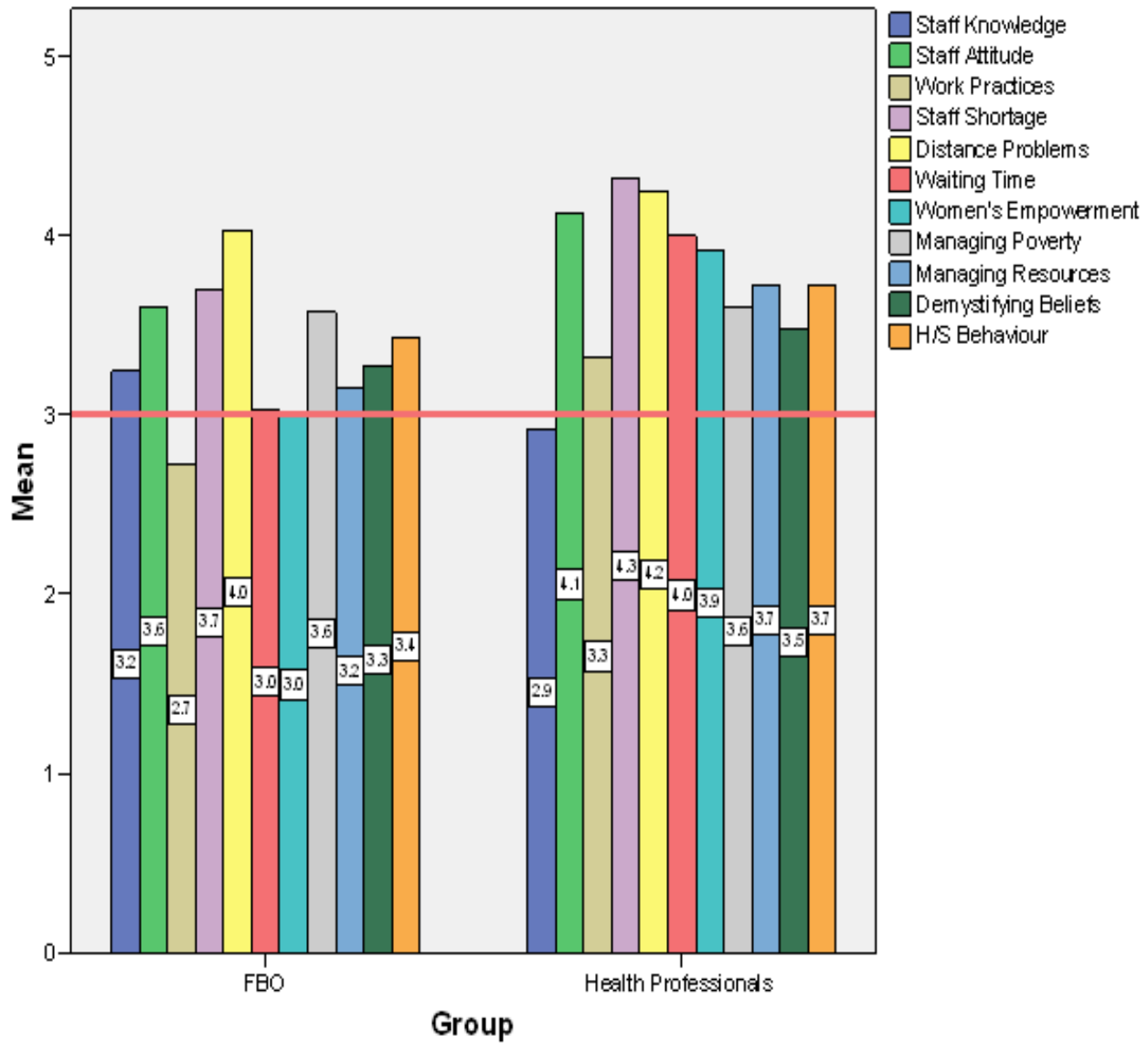
There were no statistically significant differences with regards to the rest of the challenges. These were: managing health seeking behaviour; demystifying cultural beliefs; women's empowerment; distance problems; and managing resources (see Appendix 18.5). On the issue of cultural beliefs, this tends to suggest that all three countries have some common belief systems, although there may be some country specific differences.

It may be observed that the inclusion of representatives of FBOs led to some changes in the number of challenges and the level of significance. For instance, in the absence of FBOs, opinions on staff attitude and work practices were not statistically significant. Their inclusion here is therefore due to the sensitivity analysis involving opinions of representatives of FBOs. Secondly, the level of statistical significance (p values) of managing staff shortage poverty was reduced from 0.002 to 0.011 and 0.006 to 0.007 respectively. Thirdly, waiting time lost its level of statistical significance. All other challenges remained the same (Compare Appendix 18.4 with Appendix 18.5).

5.6.5 Comparative Analysis on Level of Challenge: Ghana

As a result of the two independent samples recruited from Ghana, there was the need to identify any differences and similarities, unlike the other participating countries (see Figure 5.16).

Figure 5.16 Comparative Analysis: Health Professionals versus FBOs on Level of Challenge, Ghana



In order to compare any differences and similarities of opinions of health professionals and FBOs in Ghana on level of challenge, a Mann-Whitney Test was carried out.

5.6.5.1 Mann-Whitney Test for Inter-Group Comparison

In relation to Figure 5.16 above, Table 5.10 shows an outcome of a Mann-Whitney Test to identify similarities and differences in the rating decisions between the two groups from Ghana. According to Table 5.11, health professionals gave higher ratings than representatives of FBOs for all the challenges except for staff knowledge and managing poverty.

Table 5.11 Mann-Whitney Test Results on Rating of Level of Challenge: Ghana

IEC Challenge	Group	N	Mean Rank	Sum of Ranks
Staff knowledge: Addressing issues of staff knowledge on malaria prevention and control in pregnancy	FBO	42	35.79	1503.00
	Health Professionals	26	32.42	843.00
	Total	68		
Staff attitude: Addressing issues of staff attitude towards clients	FBO	42	29.05	1220.00
	Health Professionals	26	43.31	1126.00
	Total	68		
Work practices: Addressing issues of work practices with regards to plans and procedures	FBO	42	31.32	1315.50
	Health Professionals	25	38.50	962.50
	Total	67		
Staff shortage: Managing Staff Shortage	FBO	38	28.75	1092.50
	Health Professionals	26	37.98	987.50
	Total	64		
Distance problems: Dealing with problems of distance (access to antenatal care facility)	FBO	42	32.79	1377.00
	Health Professionals	26	37.27	969.00
	Total	68		
Waiting time: Dealing with issues of waiting time in relation to antenatal care consultations	FBO	40	27.89	1115.50
	Health Professionals	25	41.18	1029.50
	Total	65		
Women's empowerment: Addressing issues of Women's Empowerment	FBO	42	30.69	1289.00
	Health Professionals	26	40.65	1057.00
	Total	68		
Poverty versus cost of ITNs: Managing issues of poverty in relation to cost of mosquito nets (e.g. insecticide-treated bed nets) among pregnant women, especially in rural communities	FBO	42	35.02	1471.00
	Health Professionals	26	33.65	875.00
	Total	68		

Table 5.11 Mann-Whitney Test Results on Rating of Level of Challenge: Ghana (Cont'd)

IEC Challenge	Group	N	Mean Rank	Sum of Ranks
Resource constraints: Managing resources (human, material and financial)	FBO	42	30.79	1293.00
	Health Professionals	26	40.50	1053.00
	Total	68		
Demystifying cultural beliefs: Demystifying or addressing cultural beliefs in relation to malaria in pregnancy	FBO	40	32.45	1298.00
	Health Professionals	26	35.12	913.00
	Total	66		
Health seeking behaviour: Managing Health Seeking Behaviour among Pregnant Women	FBO	39	29.77	1161.00
	Health Professionals	26	37.85	984.00
	Total	65		

The test also showed that, statistically, there were significant differences with regards to opinions of the two groups on five challenges (see Appendix 18.6). The challenges with statistical differences were: staff attitude ($p=0.002$); staff shortage ($p=0.038$); waiting time ($p=0.004$); women’s empowerment (0.037) and managing resources ($p=0.043$). The results showed that staff attitude saw the most statistically significant difference between the two groups, followed by waiting time, women’s empowerment, managing staff shortage, and managing resources respectively.

There was no statistically significant difference with regards to staff knowledge; work practices; problems of distance; managing poverty; demystifying cultural beliefs; and health seeking behaviour (see Appendix 18.6). In effect, there was consensus regarding six of these challenges. This perhaps implies that both groups of respondents equally appreciate the gravity of these challenges. One reason for the similarities may be that 16% of the FBOs was made up of health professionals. However, given that 84% of representatives of FBOs were lay people, the effect of the inclusion of the health professionals in the group may not have made any significant difference.

5.7 Ranking of Highest and Least Priority Challenge

The section reports on all four countries under study. While respondents might have considered all of the above challenges important, it was deemed essential to know which priorities should be addressed first. In the light of this, they were asked to look through the identified challenges above and nominate the highest and least challenges, giving reasons to justify their priority decision.

5.7.1 Highest Priority Challenge

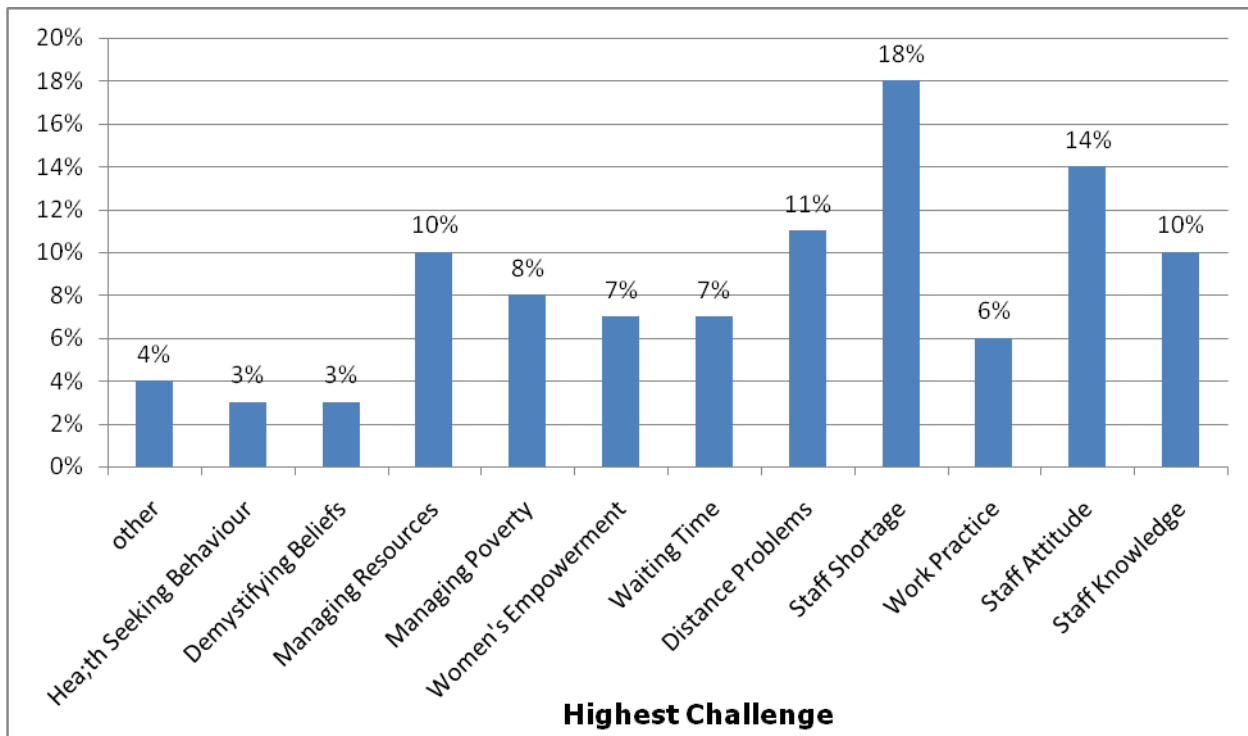
According to Figure 5.17 below staff shortage was considered by health professionals the highest priority challenge across all the study countries.

The reasons why respondents felt staff shortage was the highest priority were:

- the need to embark on focused antenatal care
- staff shortage being beyond the jurisdiction of the health facility
- managing staff shortage required financial availability
- most health posts lacked trained personnel to handle them
- staff occasionally refusal to go to deprived areas in preference for urban centres
- health facility attendance outweighed that of health providers, resulting in some clients not well informed
- effective health care is affected by shortage of staff
- it lengthened waiting time
- human resource was required for health information dissemination
- the need to address IEC strategies properly.

Five challenges were identified as the highest priority by Ethiopia, Ghana and Nigeria. The challenges were: staff attitude; staff knowledge; managing waiting time; managing poverty; and managing resources. Two challenges were perceived as the highest priority by Ghana alone. These were women's empowerment and demystifying cultural beliefs. Health seeking behaviour was described as the highest priority by only Ghana and Nigeria. Finally, only Ghana identified political commitment as an additional priority challenge.

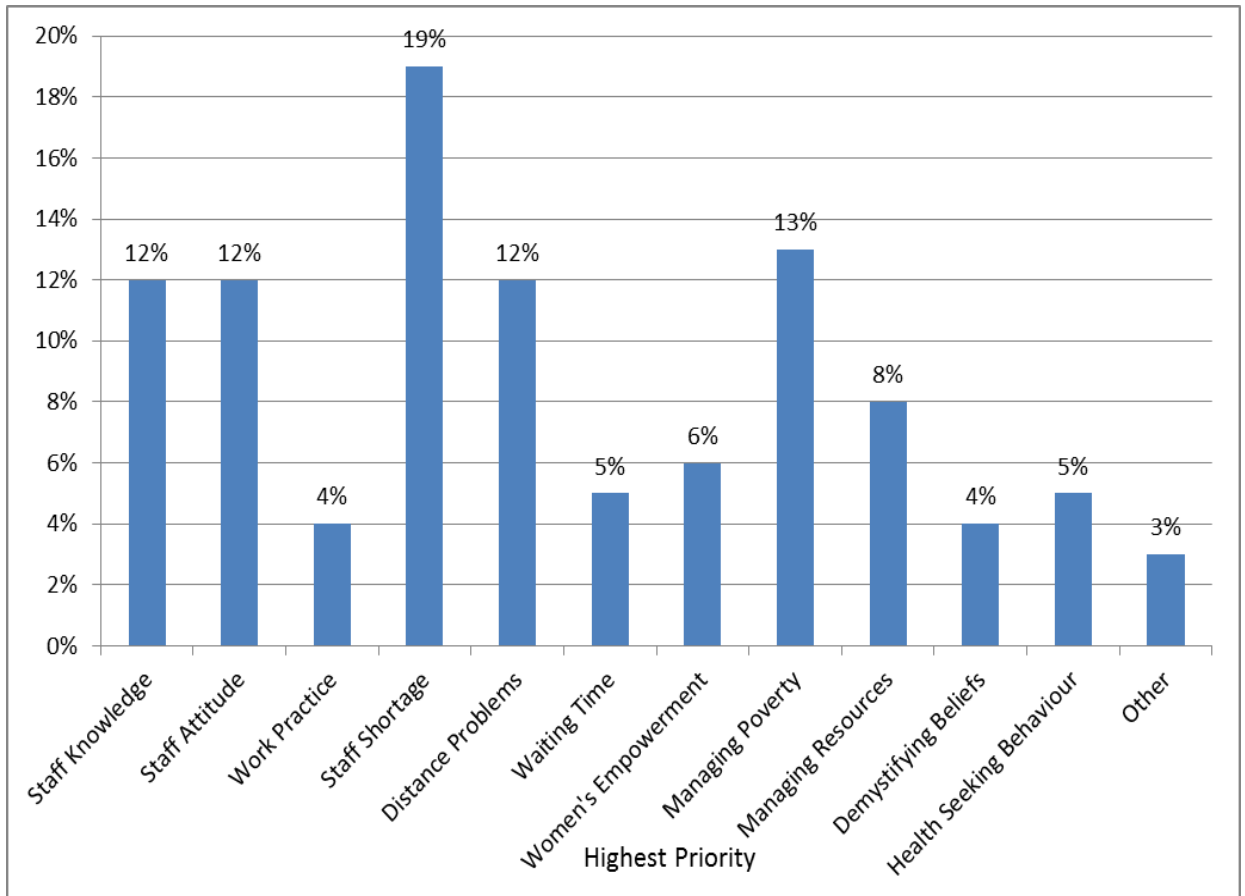
Figure 5.17 Opinions of Health Professionals on Highest Priority Challenge



5.7.2 Sensitivity Analysis of Highest Priority Challenge

Following the inclusion of representatives of FBOs, it emerged that outcomes remained unchanged. In other words, managing staff shortage remained the single most consistent and highest priority challenge (see Figure 5.18).

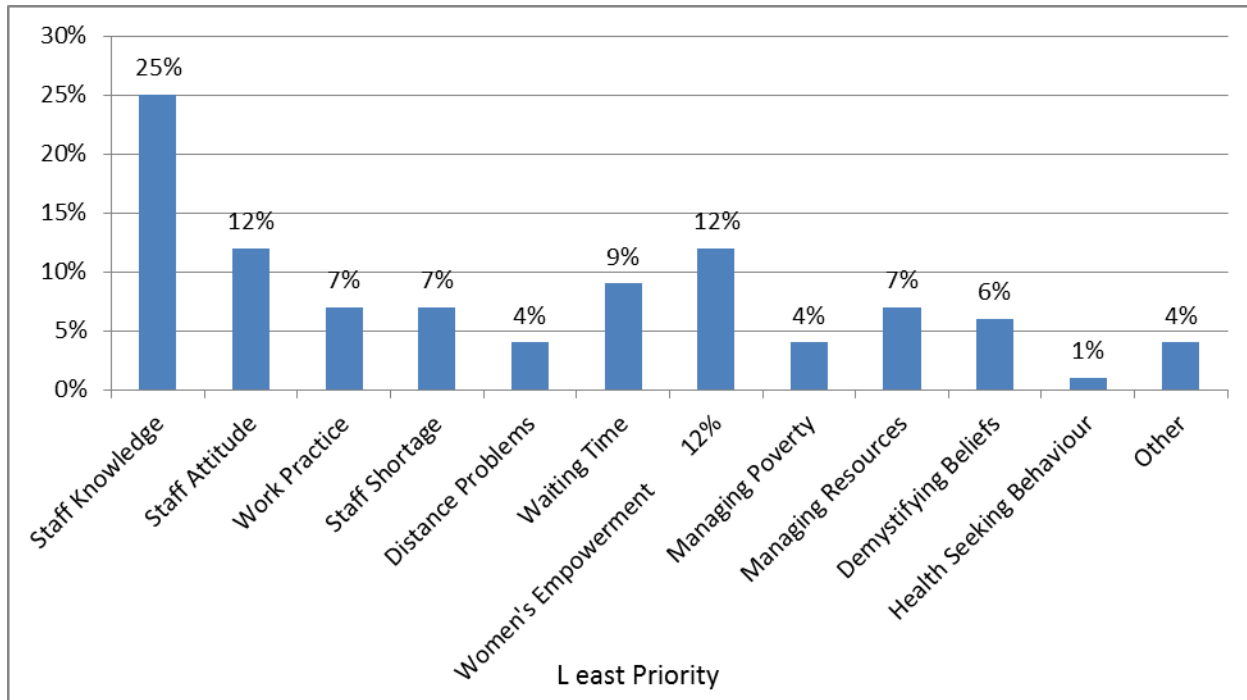
Figure 5.18 Sensitivity Analysis of Highest Priority Challenge



5.7.3 Least Priority Challenge

In terms of priority, there was a consensus across all countries that addressing issues of staff knowledge was the least priority (see Figure 5.19).

Figure 5.19 The Least Priority Challenge Among Health Professionals



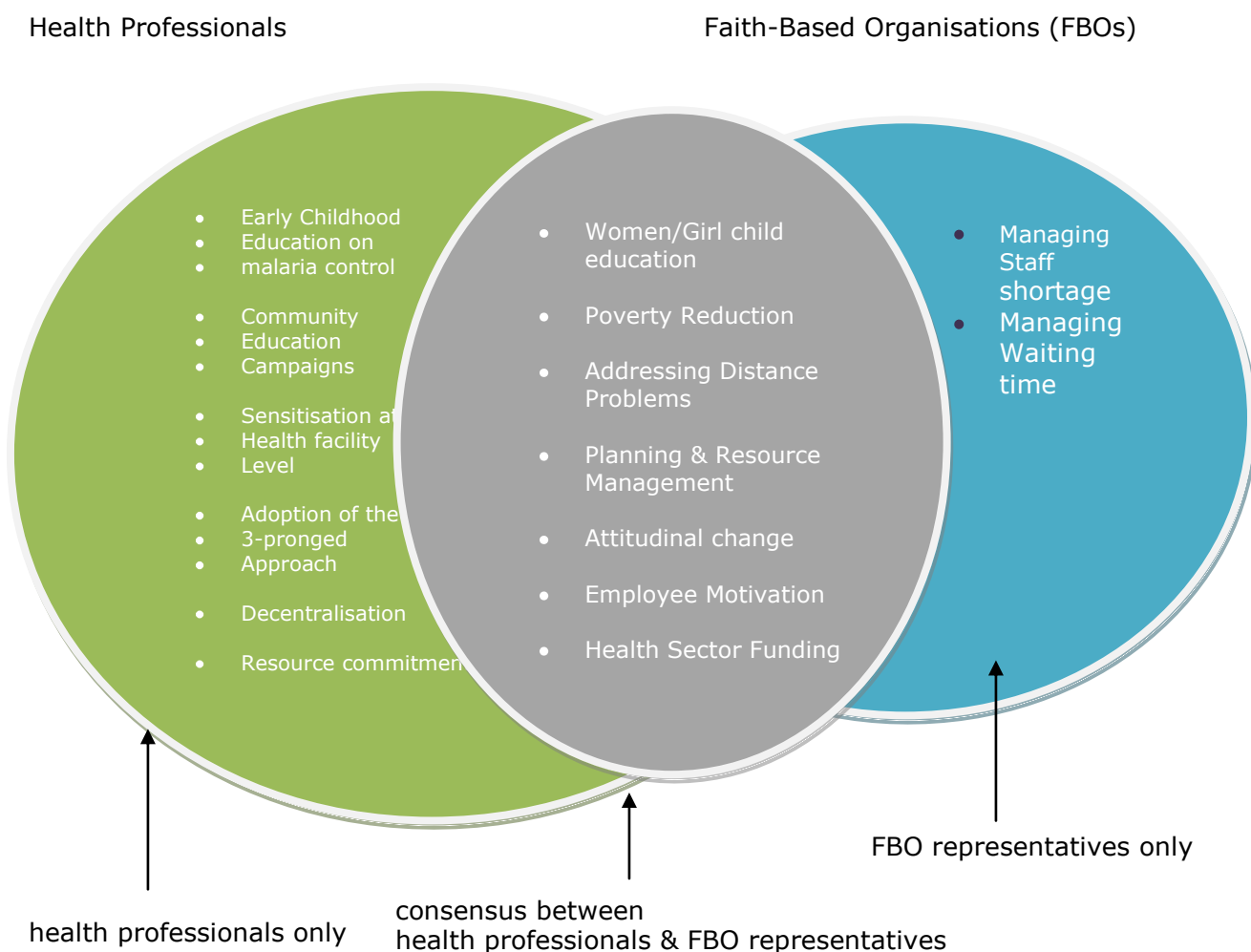
5.8 Comments/Recommendations by Respondents

This section presents the qualitative data from open-ended questions. These pertain to the summary of findings across all study countries. With regards to Ethiopia, Ghana and Nigeria, Venn diagrams were used to show the differences and similarities among them. In isolated cases, however, findings from Tanzania are reported as appropriate. It is worth noting that there were similarities and differences regarding comments and recommendations between health professionals and FBO representatives from Ghana.

The similarities between the two groups of respondents from Ghana relate to planning and resource management; capacity building; employee motivation; attitudinal change; women/girl child education versus empowerment; addressing

issues of distance; managing issues of poverty; and programme monitoring. The study shows that apart from recommendation on waiting time and staff shortage given by FBO representatives only, all the recommendations given by FBO representatives were also given by health professionals. This suggests a high degree of consensus regarding strategies to reduce or prevent malaria in pregnancy. Recommendations given by health professionals only involved: early childhood education on malaria; need for intensification of community education campaigns to change negative cultural practices; adoption of the three-pronged approach in malaria control along with attitudinal change; decentralisation of malaria control programmes; sensitisation at health facility level; and need for commitment of resources (see Figure 5.20).

Figure 5.20 Comments/Recommendations: Similarities and Differences between Health Professionals and FBO representatives, Ghana



Following from the above, there is the need to identify the relationship between the above evidence and that of the other countries. Since Tanzania had only 1 respondent the inter-country comparative analysis focuses only on Ethiopia, Ghana and Nigeria.

According to Figure 5.21 below, there were some similarities and differences with regards to comments and recommendations to address some of the challenges by respondents from Ethiopia, Ghana and Nigeria.

In terms of similarities, the three countries had three issues in common. These were:

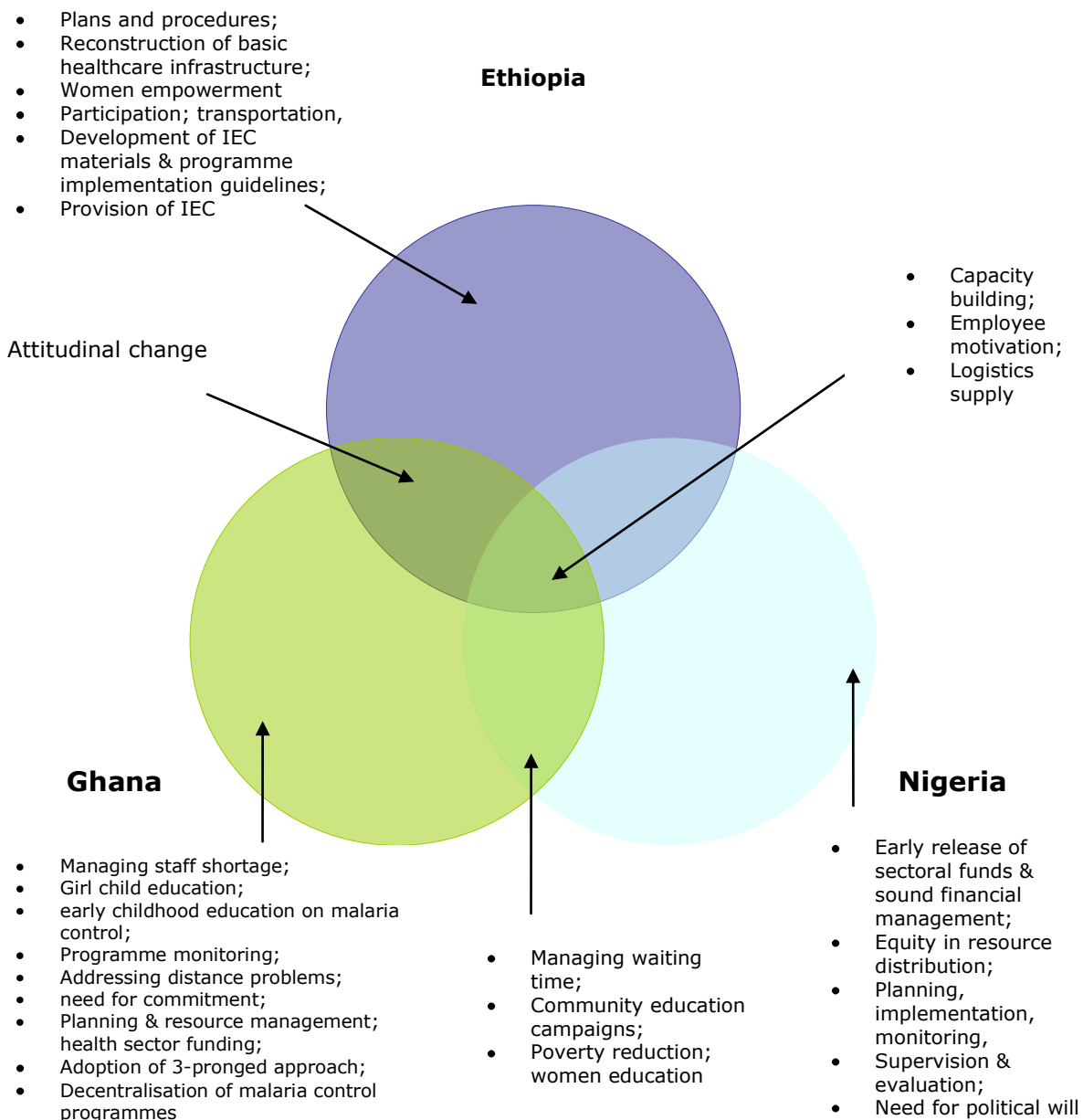
- strengthening capacity building
- encouraging employee motivation
- ensuring prompt supply of logistics

Ethiopia and Ghana alone reported on the need for attitudinal change. By the same token, Ghana and Nigeria alone reported on: managing waiting time; community education campaigns; poverty reduction; and women and girl child education. There was no issue in common between Ethiopia and Nigeria only.

In terms of differences, only Ethiopia cited:

- plans and procedures
- reconstruction of basic healthcare infrastructure
- women empowerment
- participation of all stakeholders
- need for transportation facilities in deprived communities
- development of IEC materials and programme implementation guidelines
- provision of IEC.

Figure 5.21 Comments/Recommendations: Similarities and Differences Amongst Ethiopia, Ghana and Nigeria



Concerning respondents from Ghana only, comments and recommendations cited were:

- managing staff shortage
- girl child education
- early childhood education on malaria control
- programme monitoring

- addressing distance problems
- need for commitment of resources
- planning and resource management
- health sector funding
- adoption of 3-pronged approach along with attitudinal change
- need for decentralisation of malaria control programmes.

With regards to Nigeria, the particular comments and recommendations involved:

- early release of sectoral funds and sound financial management
- equity in resource distribution
- planning, implementation, monitoring, supervision and evaluation
- need for political will.

Apart from the above comments, the respondent from Tanzania gave a number of comments and recommendations which conveyed a wide range of issues of strategic importance, most of which centred on IEC as noted below:

“Change of modalities of commodity delivery. ITNs and SP for IPTp are now to be given at no cost to end user; institutionalisation and making operational the national malaria communication strategy; mobilisation of resources from international partners for implementation of IEC strategy; functional NMCP IEC working group for coordination of partners and national activities for different interventions; and clear guidelines on IEC intervention, including MIP.”

(Malaria Programme Officer, Tanzania)

Finally, it is worth pointing out a statement on attitudinal change made by one disease control officer from Ethiopia. This related to the issue of motivation, characterised by the desire and the belief in oneself to make a difference at work. This statement has implications for health professional practice in a variety of ways (see statement).

"Of course, everything mentioned is valuable; however, unless professionals' motivation and attitude change positively to love their work and belief they will bring change by their attitude and stakeholders endeavours, it becomes very difficult to bring sustainable change. Today, most of us in Africa, particularly in Ethiopia work only when World Health Organisation releases fund for most of the preventable diseases, including malaria. We are not prepared or we are not making ready ourselves for successes because of our efforts and local innovations. I wish we have the potential, and the potential becomes real capacity."

(Communicable Disease Control Officer, Team Leader, Zonal Health, Ethiopia)

The statement points to the need for self motivation among staff; the need for them to change their attitude; and the view that sustainable change may not occur unless these issues are addressed. The main message in the comments and recommendations is related to issues of commitment and political will.

Up to this point, the analysis has shown that health education in health units was rated the highest strategy, while training and orientation was considered the highest priority. On the other hand, visiting places of worship was rated as the lowest strategy, while community women's group meetings strategy was perceived the least priority strategy. With regards to the level of challenge, problems of distance emerged as the highest challenge, while staff shortage was ranked as the highest priority challenge. On the other hand, staff knowledge was rated as the lowest challenge. It also emerged as the least priority challenge. In order to identify the extent of similarities and differences regarding opinions on the strategies and challenges non-parametric test and sensitivity analyses were conducted. Addressing the challenges, a number of comments and recommendations have been given by respondents. Some similarities and differences have been observed in this regard, both within Ghana, between health professionals and FBO representatives, and across all the four study countries. The next section focuses on feasibility, appropriateness, meaningfulness and effectiveness of IEC strategies.

5.9 Feasibility, Appropriateness, Meaningfulness and Effectiveness (FAME)

Having considered the relative importance of the strategies and associated challenges, respondents were asked to rate their feasibility, appropriateness, meaningfulness, and effectiveness on a 1-5 Likert Scale already described in Chapter 3, sub-section 3.5.3.2.

5.9.1 Opinions of Health Professionals

Figure 5.22 shows a clear pattern of opinions of health professionals on feasibility, appropriateness, meaningfulness and effectiveness of IEC strategies across Ethiopia, Ghana, Nigeria and Tanzania. By consensus, mean scores of strategies related to their feasibility emerged with the least scores. On the other hand, meaningfulness was the most highly rated. This was followed by appropriateness and effectiveness respectively. The findings on ratings are presented in turn.

5.9.1.1 Feasibility

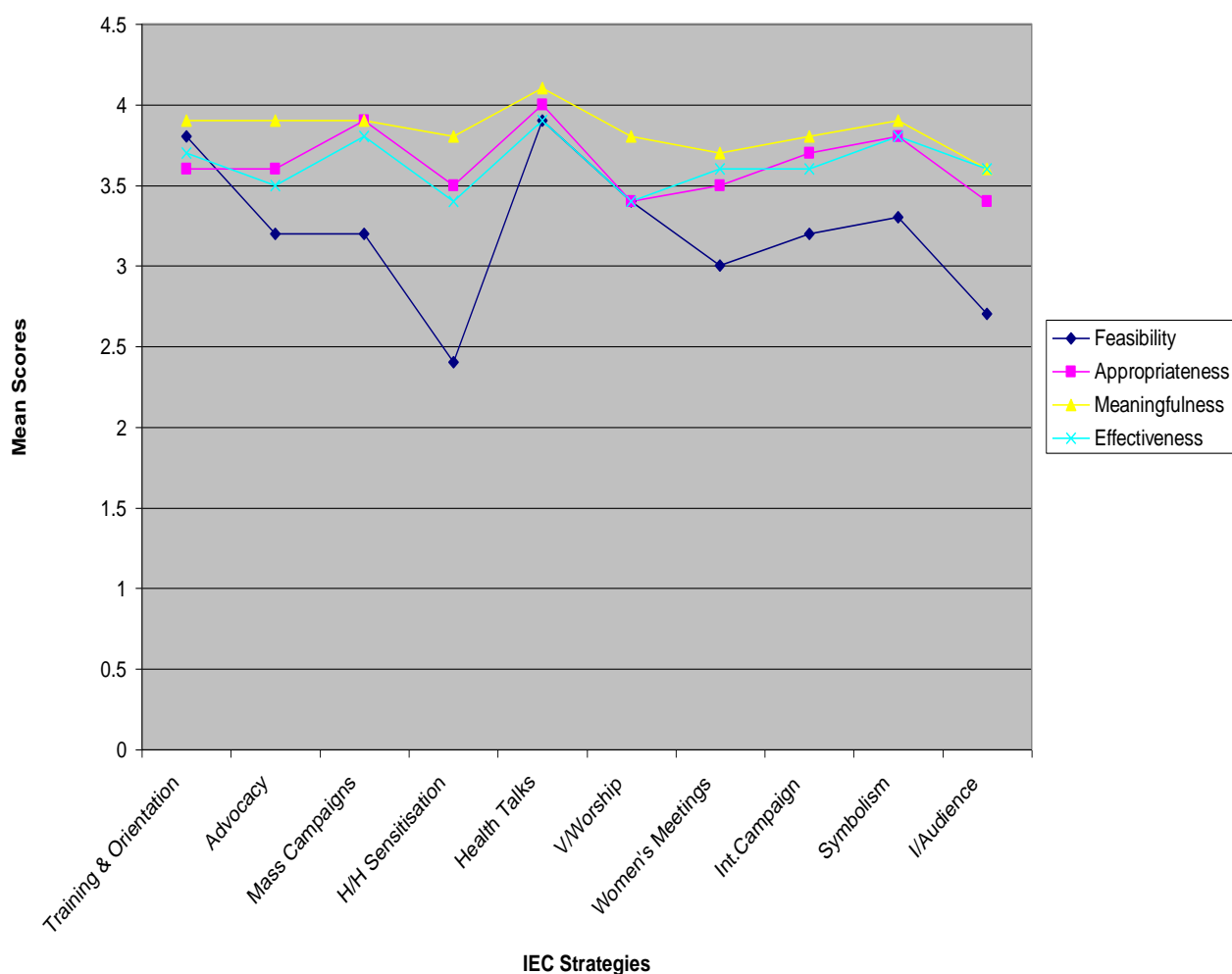
Figure 5.22 reveals that health education talks in health units was rated as the most feasible strategy across all the countries under study by health professionals (mean score=3.9). Next to this strategy in terms of level of feasibility, was staff training and orientation (mean score=3.8). In order of level of feasibility, the other strategies were: visiting places of worship (mean score=3.4); symbolism versus message delivery (mean score=3.3); advocacy; community mass education campaigns; integrated health education campaigns (mean scores=3.2); and community women's group meetings (mean score=3.0). The study also shows that two strategies fell below moderate level (mean score=3.0). These involved audience segmentation versus information delivery (mean score=2.7) and house-to-house sensitisation (mean score=2.4).

5.9.1.2 Appropriateness

In terms of appropriateness, Figure 5.22 shows that health education talks was considered by all health professionals as the most appropriate strategy (mean score=4.0). This was followed by community mass education campaigns and

symbolism versus message delivery (mean scores=3.8); and integrated health education campaigns (mean score=3.7) respectively. Others involved: staff training and orientation and advocacy (mean scores=3.6); house-to-house sensitisation and community women’s group meetings (mean scores=3.5); and visiting places of worship and audience segmentation versus information delivery as least appropriate (mean scores=3.4). Thus, all the strategies were rated above moderate level, implying that they were all regarded appropriate by consensus.

Figure 5.22 Pattern Analysis of Feasibility, Appropriateness, Meaningfulness and Effectiveness: Health Professionals



5.9.1.3 Meaningfulness

Regarding meaningfulness, it may be inferred from Figure 5.22 that the most meaningful IEC strategy, according to the respondents, was health education talks (mean score=4.1). Next, in terms of meaningfulness were jointly, staff training and orientation; advocacy; community mass education campaigns; and symbolism versus message delivery (mean scores=3.9). The rest, in order of level of meaningfulness were: house-to-house sensitisation; visiting places of worship; and integrated health education campaigns (mean scores=3.8); community women's group meetings (mean score=3.7); and audience segmentation versus information delivery (mean score=3.6) respectively. In effect, all the strategies were considered highly meaningful.

5.9.1.4 Effectiveness

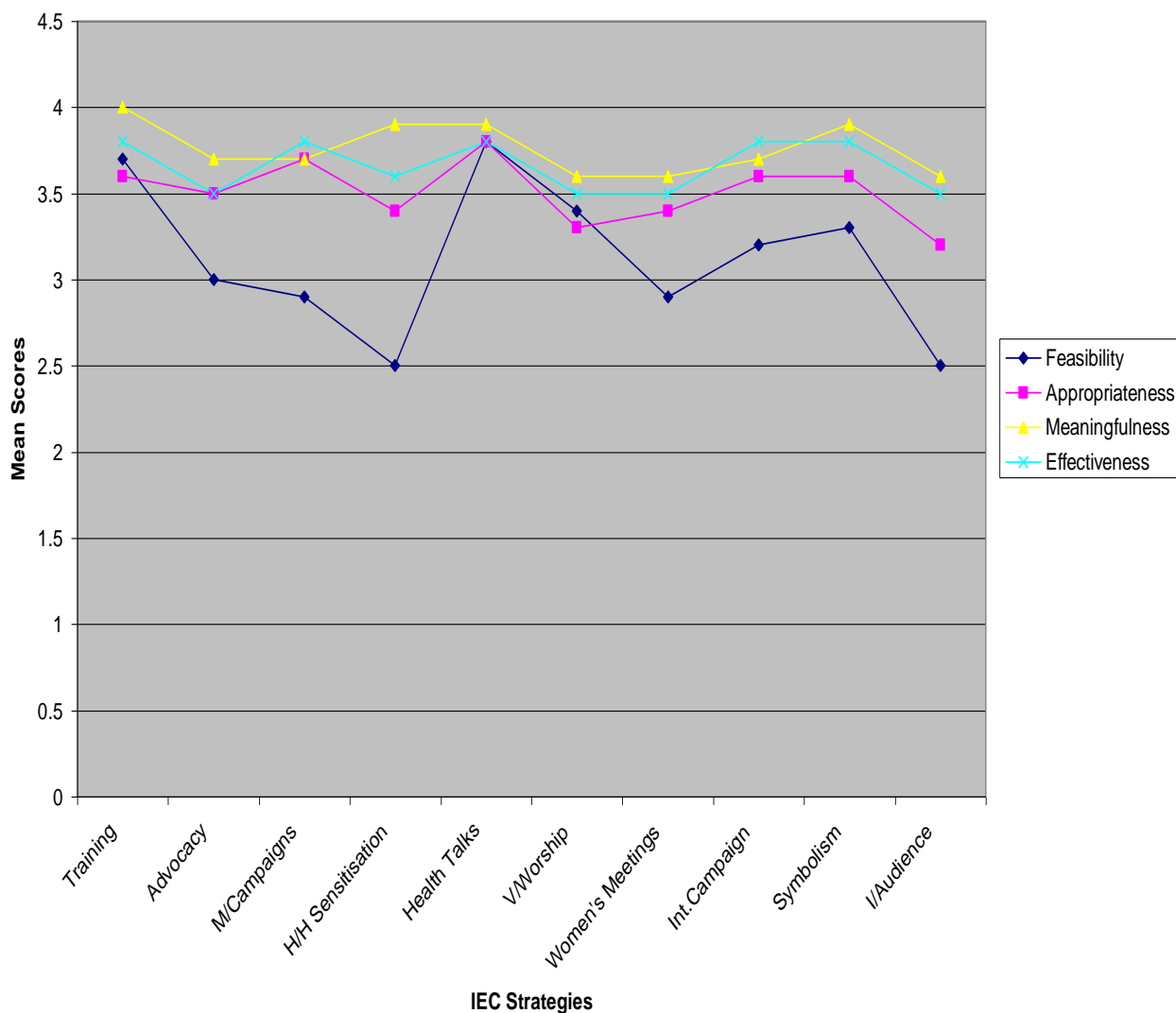
According to Figure 5.22 health education talks also emerged as the most effective (mean score=3.9). The strategy was followed jointly by community mass education campaigns; integrated health education campaigns and symbolism versus message delivery (mean scores=3.8). The rest involved: staff training and orientation (mean score=3.7); visiting places of worship; community women's group meetings; and audience segmentation versus information delivery (mean scores=3.6); and advocacy emerging as the least effective strategy (mean score=3.5). In other words all the strategies were considered by health professionals across all the study countries above moderate.

In short, by consensus, health education talks in health units emerged as the single most consistent strategy in terms of having the highest mean scores related to feasibility, appropriateness, meaningfulness and effectiveness across all the countries based on the opinions of health professionals.

5.9.2 Sensitivity Analysis of Feasibility, Appropriateness, Meaningfulness and Effectiveness

Figure 5.23 shows the outcome of the inclusion of FBOs in the analysis of pattern of opinions regarding feasibility, appropriateness, meaningfulness and effectiveness (FAME).

Figure 5.23 Sensitivity Analysis of Feasibility, Appropriateness, Meaningfulness and Effectiveness



Results of analysis of each of the FAME are presented below.

5.9.2.1 Feasibility

Figure 5.23 shows that the most highly rated strategy in terms of feasibility both by health professionals and FBO representatives was health education talks (mean score=3.8). Next, was staff training and orientation (mean score=3.7); followed by visiting places of worship (mean score=3.4); symbolism versus message delivery (mean score=3.3); integrated health education campaigns (mean score=3.2); and advocacy (mean score=3.0) respectively. All the rest were rated below moderate. These were: community mass education campaigns and community women's group meetings (2.9); house-to-house sensitisation and audience segmentation versus information delivery (mean scores=2.5).

5.9.2.2 Appropriateness

On appropriateness, Figure 5.23 shows that there was a consensus that health education talks was rated the most appropriate strategy (mean score=3.8). Community mass education campaigns strategy emerged as the second most appropriate strategy (mean score=3.7). The rest were: staff training and orientation; integrated health education campaigns; and symbolism versus message delivery (mean scores=3.6); advocacy (mean score=3.5); house-to-house sensitisation and community women's group meetings (mean scores=3.4); visiting places of worship (mean score=3.3); and audience segmentation versus information delivery (mean score=3.2) respectively. Thus, none of the strategies was rated below moderate level. This means that there was a consensus between health professionals and representatives of FBOs that all the strategies were appropriate.

5.9.2.3 Meaningfulness

Unlike the case of health professionals only, the study shows that following the inclusion of the FBO representatives, staff training and orientation came forth as the most meaningful strategy (mean score=3.9). Next, were three strategies, namely, house-to-house sensitisation; health education talks; and symbolism versus message delivery (mean scores=3.9). These were followed by advocacy; community mass education campaigns; and integrated health education

campaigns (mean scores=3.7). The rest were: visiting places of worship; community women's group meetings; and audience segmentation versus information delivery (mean scores=3.6). Like the health professionals only, meaningfulness level remained the highest (see Figure 5.23).

5.9.2.4 Effectiveness

Regarding effectiveness, there was no consensus as to which strategy was the most effective. In this regard, five strategies were jointly rated as the most effective. These were: staff training and orientation; community mass education campaigns; health education talks; integrated health education campaigns; and symbolism versus message delivery (mean scores=3.8). These were followed by house-to-house sensitisation (mean score=3.6); advocacy; visiting places of worship; community women's group meetings; and audience segmentation versus information delivery (mean scores=3.5). It may be observed that all the strategies were rated far above moderate level (see Figure 5.23), thus pointing to the fact that all the strategies were considered effective by consensus.

In short, while health education talks remained the most highly rated strategy in terms of feasibility, appropriateness, meaningfulness, and effectiveness among health professional across all the study countries, the picture appeared slightly different, following the sensitivity analysis. In other words, while both groups of respondents agreed that health education talks was the most feasible and appropriate, this was not the case in terms of meaningfulness and effectiveness. However, the pattern of rating of feasibility, appropriate, meaningfulness and effectiveness remained the same. With regards to low ratings, house-to-house sensitisation consistently remained the least feasible strategy; followed by audience segmentation versus information delivery. Other less feasible strategies were: community mass education campaigns, advocacy, community women's group meetings and visiting places of worship.

At this juncture, it may be worth revisiting some key country specific reasons underlying the low ratings on feasibility of strategies, more importantly with

regards to house-to-house sensitisation and audience segmentation versus information delivery, which saw the least ratings.

5.9.3 Reasons for Low Feasibility

With regards to house-to-house sensitisation, the main reason for the strategy being the least feasible was due to its association with resource constraints in terms of its lack of economic viability, including cost and the lack of competent staff. Apart from this, the implementation of the strategy itself is said to be tedious as a result of the need for wide geographic coverage. One respondent noted as follows:

“Conducting house-to-house sensitisation requires a lot of money which is not done.”

(Staff Nurse, Head of Medical Ward, Ethiopia)

Another statement from a laboratory technologist from Ghana specifically relates to group session education in relation to house-to-house sensitisation:

“This will be very involving since the pregnant women can’t be educated as a group.”

(Laboratory Technologist, Ghana)

Referring to the case of Nigeria, the geographic spread of the country has been cited as a reason making it impracticable to implement house-to-house sensitisation as stated below:

“This might not be easy to carry out considering the number of individual regions and rigour working in from house to house.”

(Hospital Pharmacist, Nigeria)

Despite these limitations, respondents were of the view that house-to-house sensitisation was appropriate, meaningful and effective due to a number of reasons. These are summarised as follows:

- it afforded both pregnant women and their family members with powerful influence an opportunity to be sensitised at the same time
- it allowed face-to-face interaction due to the direct contact
- it created opportunities for questions and answers regarding confused terms
- messages were brought to the door step of the client, thus bringing about intended results, as the target population was reached
- it made pregnant women become aware of the dangers of malaria to their unborn babies and the need to prevent it
- it helped households better than any other method in malaria prevention
- it could be of much success since the pregnant women were seen in their various homes on a one-to-one basis
- it was helpful as most women did not attend antenatal clinics
- it was helpful in educating women, especially at the rural community level, where antenatal visit was still very low.

The reasons for perceived low feasibility of audience segmentation versus information delivery were given by respondents from Ethiopia and Ghana. These involved difficulties in addressing issues of cultural diversity and cultural values while delivering health messages to pregnant women. Apart from these concerns, there was the belief that the strategy had an ability to reach out to meet the needs of different audience with diverse cultural background simultaneously through a variety of channels, and was therefore appropriate.

5.10 The Impact of IEC Strategies

At this juncture, respondents were asked to express their opinion as to whether they were aware of any impact of IEC strategies in malaria prevention and control among pregnant women in Africa. Where respondents were aware of any impact, they were also asked to provide details of their personal experience within the context of their country specific situation.

5.10.1 Level of Awareness

The study shows that 88% (93/106) of respondents of all valid responses indicated they were aware of impact from IEC Strategies in malaria prevention and control among pregnant women. Among those who claimed they were aware of impact, 50 were from Ghana (27 FBO representatives and 23 health professionals); 23 from Ethiopia; 19 from Nigeria; and 1 from Tanzania, totalling 93 respondents. Among those who were not aware of any impact, 7 were from Ghana (4 FBO representatives and 3 health professionals); 4 from Ethiopia; 2 from Nigeria; and none from Tanzania, totalling 13 respondents.

5.10.2 Evidence of IEC Strategy Impact

In Ghana, a distinction was drawn between health professionals and FBO representatives with regards to perceived impact. Apart from this, some similarities were also identified. Figure 5.24 shows the similarities and differences between the two groups.

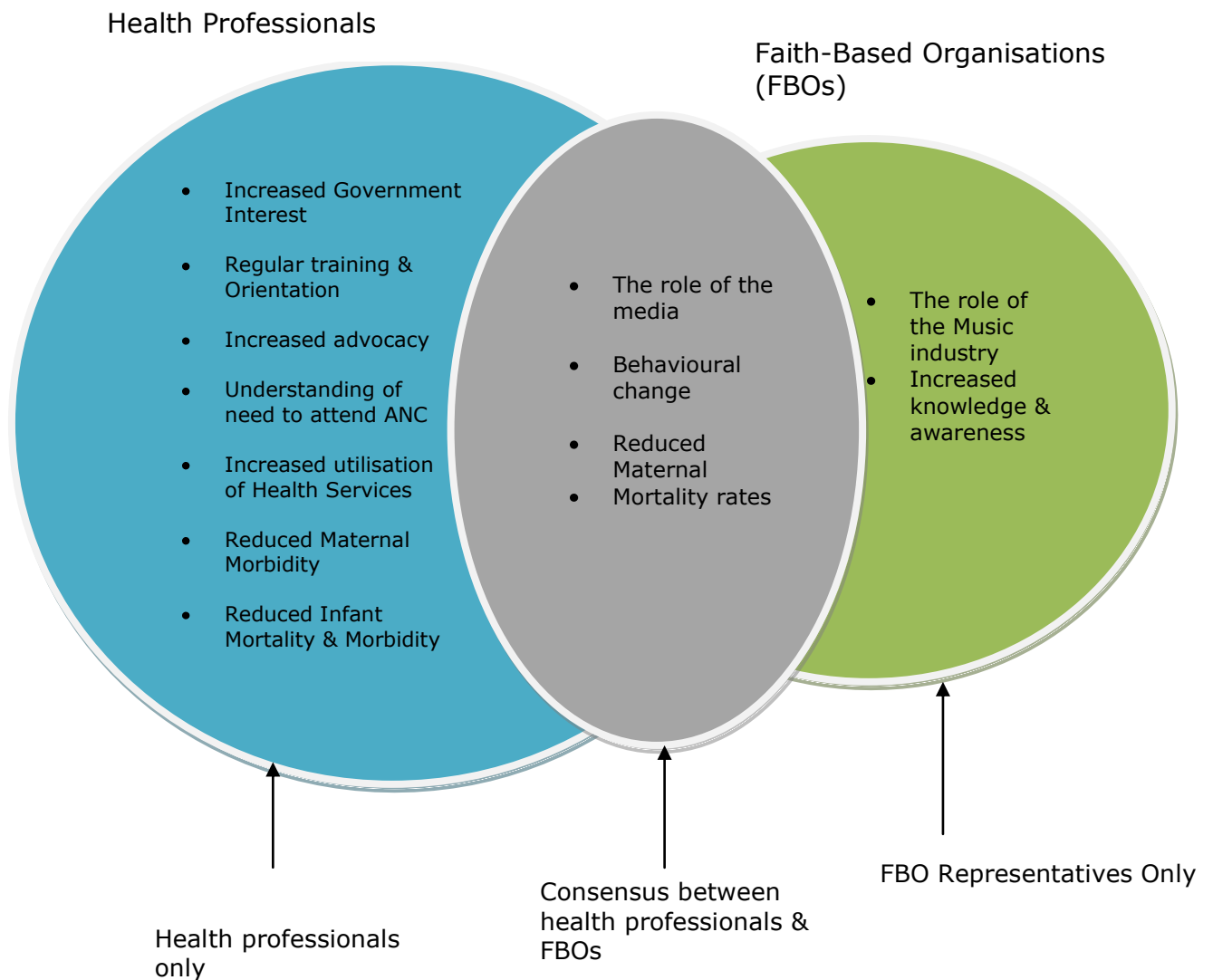
In terms of similarities, both groups agreed on: the role of the media in public education; behavioural change among clients; and a reduction in maternal mortality rates. In terms of differences, health professionals identified the following as evidence of impact of IEC strategies:

- increased government interest
- regular training and orientation of staff
- increased advocacy on removal of mosquito breeding sites
- clients understanding of need to attend antenatal care
- increased utilisation of health services

- a reduction in maternal morbidity rates
- a reduction in infant morbidity and mortality rates.

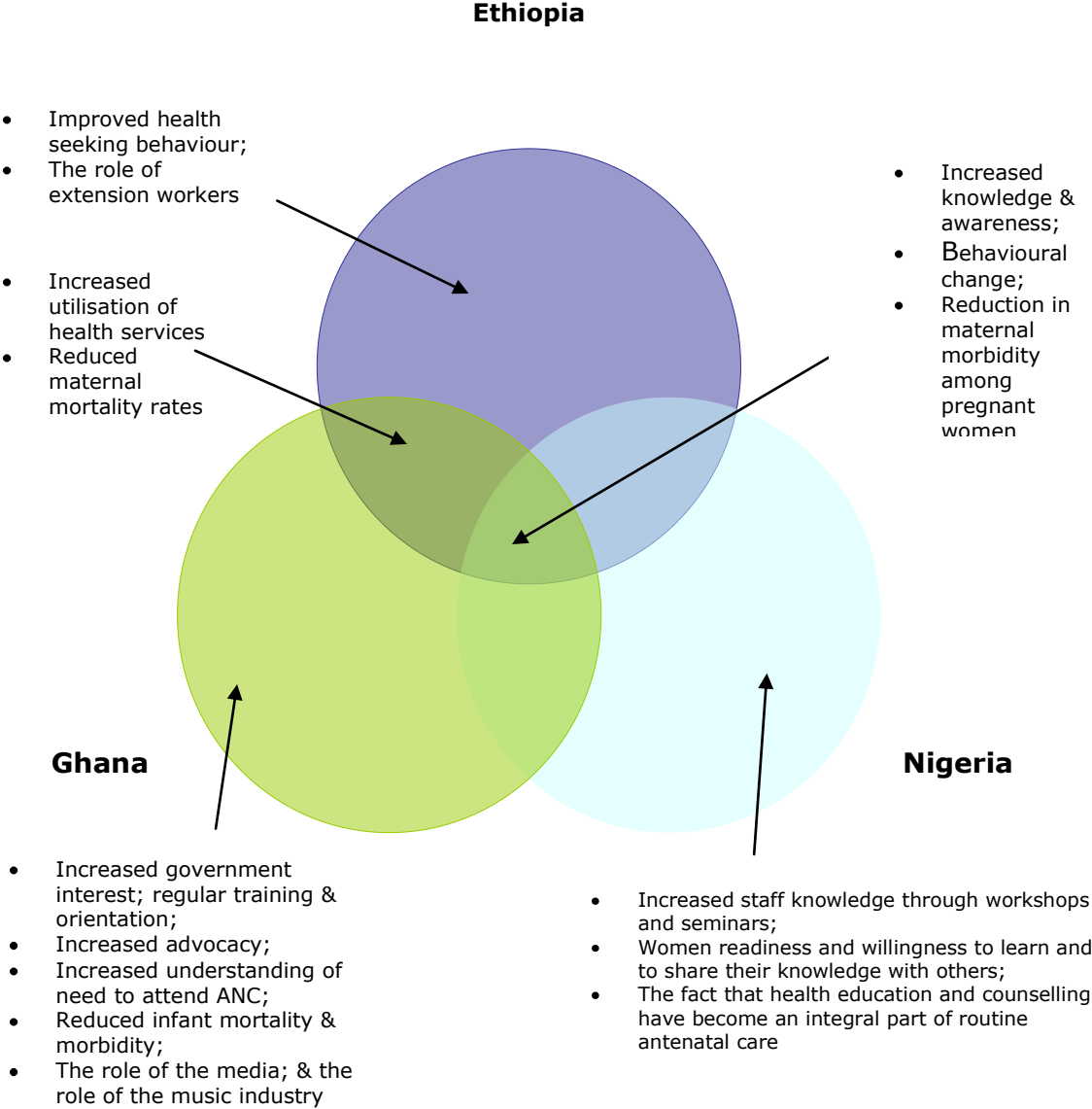
On the other hand, FBO representatives alone identified the role of the music industry in public education; and an increased knowledge and awareness of malaria, its effects, and prevention and control measures.

Figure 5.24 Similarities and Differences on Evidence of IEC Impact: Health Professionals Versus FBOs, Ghana



With the exception of Tanzania, the study showed some similarities and differences in terms of the extent of the impact IEC has made with regards to malaria prevention and control amongst pregnant women in Africa (see Figure 5.25).

Figure 5.25 Evidence of IEC Strategy Impact: Similarities and Differences



In terms of similarities, Figure 5.25 above shows that there was consensus among respondents from Ethiopia, Ghana and Nigeria that IEC had led to increased knowledge and awareness; behavioural change; and a reduction in maternal morbidity among pregnant in their respective countries. There was a consensus between Ethiopia and Ghana that IEC had made an impact as evidenced by increased utilisation of health services and a reduction in the rate of maternal mortality due to malaria. However, Ghana and Nigeria alone did not share any common evidence of perceived impact without Ethiopia. By the same token, Ethiopia and Nigeria did not share anything in common without Ghana.

With regards to differences, each country reported particular evidence of IEC impact. In Ethiopia, the particular evidence involved improved health seeking behaviour; and the role of extension workers in community education campaigns. As regards Ghana alone, the evidence is summarised below:

- increased government interest
- regular staff training and orientation
- increased advocacy
- understanding of need to attend antenatal clinics
- reduced infant morbidity and mortality
- the role of the media public health education campaigns
- the role of the music industry in public health education campaigns.

In the case of Nigeria alone, specific evidence entailed increased staff knowledge through workshops and seminars; women readiness and willingness to learn and share their knowledge with others; and the view that health education and counselling had become an integral part of routine antenatal care.

From the perspective of respondents, the key impacts of IEC strategies on pregnant women and overall impact may be summarised as:

- increased awareness
- increased knowledge
- increased understanding of need to attend ANC

- increased public readiness to give priority to pregnant women and infants (including increased interest of governments, the media and the music industry through artists)
- behavioural change as related to improved health seeking behaviour; increased acquisition of mosquito nets and uptake of IPTp
- increased ANC attendance by women's readiness and willingness to learn and to share their knowledge and experience with others
- decline in maternal and infant morbidity due to malaria
- decline in maternal and infant mortality due to malaria.

Therefore, it might be concluded that IEC is working, and perceived as impacting on malaria in pregnancy.

5.10.3 Evidence of Non-Impact

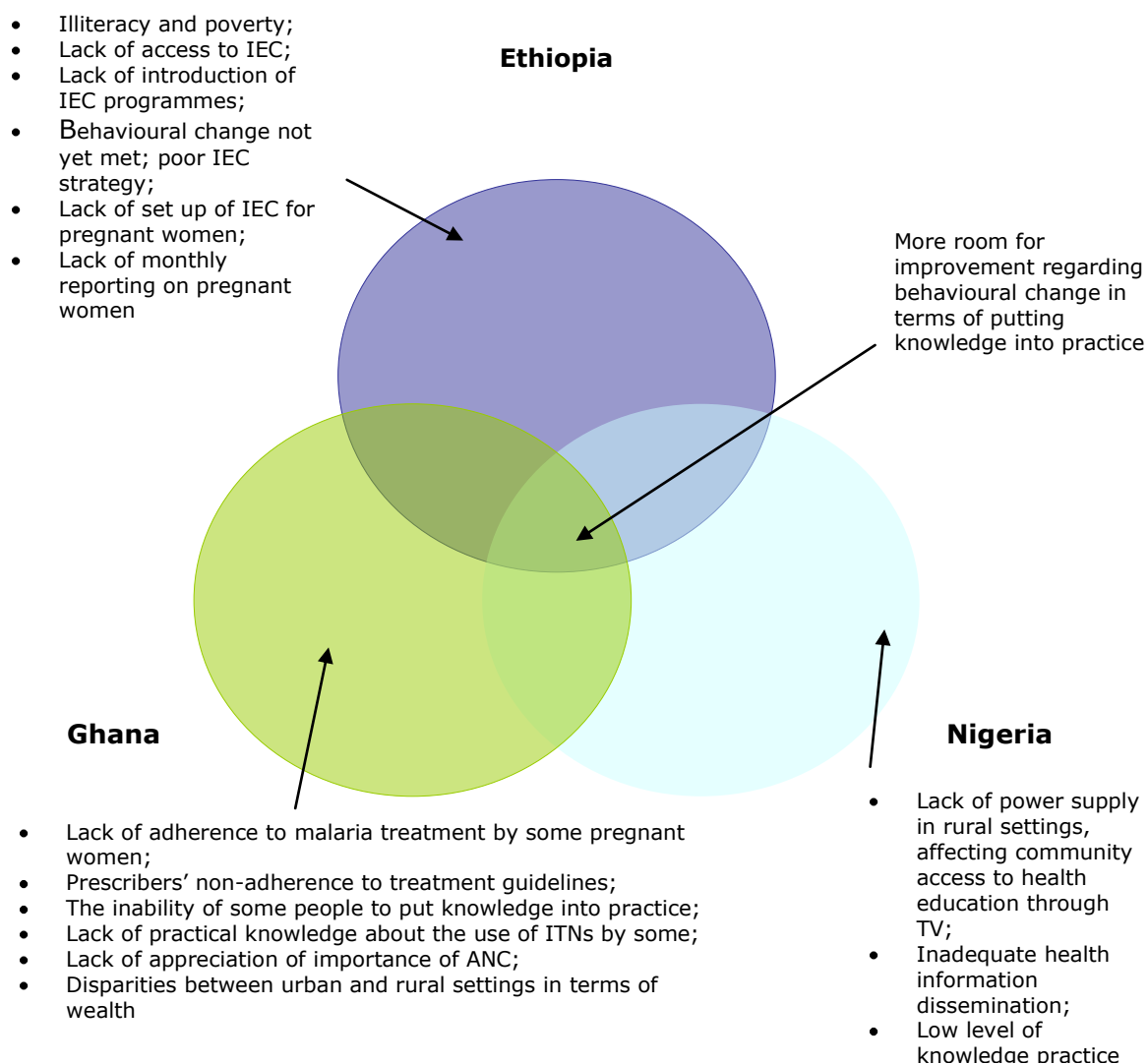
Despite the above positive views, the study reveals some concerns expressed in relation to lack of evidence of impact of IEC strategies. Concerns expressed are summarised in Figure 5.26. The study reveals that the main concern common to Ethiopia, Ghana and Nigeria is that there is room for improvement in behavioural change as far as putting knowledge into practice is concerned. With regards to Ethiopia, particular concerns are summarised as follows:

- illiteracy and poverty
- lack of access to IEC
- lack of introduction of IEC programmes
- poor IEC strategy
- lack of IEC set up for pregnant women
- lack of monthly reporting on issues related to pregnant women.

In the case of Ghana, health professionals expressed concerns about lack of adherence of some pregnant women with regards to malaria treatment; and prescribers' non-adherence to treatment guidelines. FBO representatives expressed concerns about disparities between urban and rural settings in terms of wealth distribution, lack of practical knowledge about the use of insecticide-

treated nets; and a lack of appreciation of importance of ANC by some women. Regarding Nigerian respondents, particular concerns involved lack of power supply in rural settings affecting community access to health education programmes through TV and inadequate health information dissemination (see Figure 5.26).

Figure 5.26 Evidence of Non-Impact: Similarities and Differences



The above concerns about lack of evidence for impact may have been partly underscored by a lack of communication strategy (strategic plan for IEC

programmes) by the study countries. This argument may be supported by the following statement by the respondent from Tanzania:

"As an NMCP program we operated about 8 years without national malaria communication strategy. Community based national surveys on malaria indicators carried out after every 2 years had no raised trend on community interventions. 'Early seeking behaviour' and 'coverage of ITNs to pregnant women & under 5 children' was always low; 30% and below without upward trend. General consensus was to increase commodities and make more efforts on the awareness & attitude of the targeted groups."

(Malaria Programme Officer, Tanzania)

Other respondents from Ethiopia had the following to say:

- (1) "In our country specific situation, shortage of awareness was seen. The strategies of IEC were not introduced in the nation."

(Pharmacist/Druggist, Health Centre, Ethiopia)

- (2) "Not aware of any impact of IEC strategies in malaria. This is because in our country situation or context IEC is a newly emerging strategy in prevention and promotion of health in general - and malaria in particular."

(Staff Nurse, Adult Nursing, University Specialised Hospital, Ethiopia)

In effect, there was a perceived need to have a national communication strategy in place backed by resource availability with the aim of creating awareness and changing attitudes. However, bigger issues such as illiteracy, poverty and inequalities in wealth distribution, including establishment of good healthcare facilities, may require all stakeholders to be on board, with the government in the driving seat.

5.11 Summary and Conclusions

5.11.1 Background Information and Subgroup Analysis

Data were received from a total of 118 respondents from Ethiopia, Ghana, Nigeria and Tanzania. Sixty-nine of them were from Ghana; 27 from Ethiopia; 21 from Nigeria and 1 from Tanzania. Across the countries under study, there were some similarities and differences with regards to professional background, fields of specialisation, places of work and IEC roles of respondents and their organisations in relation to malaria prevention and control. There was no direct relationship between background of respondents and opinions expressed regarding IEC strategies and challenges.

In terms of IEC roles and subgroup analysis, non-health professionals laid more emphasis on community-based approaches compared to health professionals, who favoured a combination of hospital and community-based approaches. IEC roles were generally perceived as operational. Generally, health professionals gave higher ratings than non-health professionals.

5.11.2 Rating and Ranking of IEC Strategies

Among health professionals, health education talks in health units emerged as the most highly rated strategy across all study countries, while visiting places of worship was the least rated, with a mean score above moderate. This implies that generally, the level of ratings was high for all strategies. Following sensitivity analysis, the overall pattern of rating shifted. Both staff training and orientation and health education talks emerged jointly as the most highly rated strategies, while the least strategy remained unchanged. However, in terms of ranking of priority, staff training and orientation emerged as the highest priority, while visiting places of worship remained the least priority in conformity to the level of rating.

Inter-country comparisons revealed that Nigerian respondents generally gave the highest ratings. In terms of consensus, Ethiopia, Ghana and Nigerian respondents had similar ratings with regards to most of the strategies. This probably implies

that the study countries had a lot in common, possibly due to the fact they have common performance indicators on malaria control policies based on World Health Organisation/RBM standards. Sensitivity analysis with the inclusion of representatives of FBOs showed that the strategies with the statistically significant differences remained unchanged.

Analysis of the two independent samples from Ghana (health professions and FBO representatives) showed that there were more differences than similarities with regards to opinions on the rating of the IEC strategies in terms of level of statistical significance. This suggests differences of opinion between those in health services and the lay participants. Although not rated as the highest strategy, it is worth noting that apart from the ten IEC strategies, the main additional strategy proposed by a respondent entails incorporating health messages into elementary school curriculum.

5.11.3 Rating and Ranking of Challenges

Regarding level of challenge, there was no consensus among health professionals as to the single most highly rated challenge. However, managing staff shortage and dealing with distance problems were rated jointly as the highest challenges. Following the inclusion of FBO representatives, it was revealed that dealing with distance problems was the highest challenge, followed by managing staff shortage. Dealing with issues of staff knowledge was rated as the lowest challenge. However, in terms of ranking of priority, staff shortage emerged as the highest priority challenge, while staff knowledge remained the least priority.

Nigerian respondents gave the highest ratings with regards to half of the challenges. In terms of consensus, there were similarities in the ratings of most of the challenges, showing no significant differences. Concerning differences, in order of level of statistical significance, these were: managing staff shortage; staff attitude; managing poverty; and managing waiting time. Sensitivity analysis revealed differences regarding only four strategies, namely managing poverty; work practices; managing staff shortage; and staff attitude.

Unlike opinions on strategies regarding the two independent samples from Ghana, namely health professionals and FBO representatives, there were more similarities than differences with regards to opinions on the rating of level of challenges, suggesting that both groups probably appreciate the extent of the challenges the same way.

Relating strategies to challenges, one wonders why staff training and orientation emerged as the highest priority across the study countries, and yet respondents considered staff knowledge as the least challenge. It thus, seems that the relationship between training and orientation and the challenge of addressing staff knowledge were viewed as separate entities, rather than being perceived as closely related; otherwise the direction of the opinions would have been the same.

5.11.4 Comments/Recommendations

With regards to comments and recommendations by respondents, a number of similarities and differences were identified among respondents from participating countries. One key issue that emerged was related to employee motivation and attitudinal change, which has implications for health professional practice, and therefore, cannot be ignored. It has been suggested that there is the need for self motivation among staff to make a difference. Health professionals were also advised on a need to change their attitude in order to bring about sustainable change in behaviour among pregnant women regarding utilisation of malaria prevention and control interventions. Comments and recommendations in addressing some of the challenges, revealed the complexities surrounding the interrelatedness among challenges, which may call for a more holistic approach. This may require planning, beginning with an identification of key issues of challenges, the level of intervention and the expected benefits thereof (see Table 6.1 in Chapter 6).

5.11.5 Feasibility, Appropriateness, Meaningfulness and Effectiveness (FAME)

The study showed a clear pattern of opinions of health professionals on feasibility, appropriateness, meaningfulness and effectiveness of IEC Strategies across the study countries. In particular, mean scores of the strategies on feasibility emerged as the least rated. On the other hand, meaningfulness had the highest rating. This was followed by appropriateness and effectiveness respectively. Overall, apart from health talks, none of the other strategies was consistently rated high. House-to-house sensitisation emerged as the least feasible, followed by audience segmentation versus information delivery. The main reason for house-to-house sensitisation strategy being the least feasible by respondents from Ethiopia, Ghana and Nigeria, was due to its potential association with resource constraints in terms of cost and the lack of enough competent staff. Apart from these, the implementation of the strategy itself was said to be tedious as a result of the need for wide area coverage. In the case of audience segmentation versus information delivery, difficulties involved addressing issues of cultural diversity and cultural values while delivering health messages to pregnant women.

5.11.6 Impact of IEC Strategies

With regards to impact of IEC Strategies, the study showed that 88% of respondents indicated they were aware of the impact of IEC Strategies in malaria prevention and control among pregnant women in Africa. Such a high level of awareness appears encouraging.

The key impacts of IEC strategies on pregnant women and overall impact across the study countries are summarised as follows:

- Increased awareness
- Increased knowledge
- Understanding of need to attend ANC

- Increased public readiness to give priority to pregnant women and infants (including increased interest of governments, the media and the music industry through artists)
- Behavioural change as related to improved health seeking behaviour
- Increased acquisition of mosquito nets and uptake of IPTp
- Increased ANC attendance
- Women readiness and willingness to learn and share their knowledge and experience with others
- Decline in maternal and infant morbidity due to malaria
- Decline in maternal and infant mortality due to malaria.

It is, however, also worth noting that evidence of non-impact was noted in Ethiopia and Tanzania. This suggests that there is room for improvement with regards to the design and implementation of IEC strategies. Recommendations, given by respondents to address the challenges further confirm this observation. Key among these are: a need to establish a communication strategy (IEC strategic plan); need to develop IEC materials and programme implementation guidelines, and to embark on community-based health education campaigns.

5.11.7 Key Findings

In short, the key findings of the survey are as follows:

- IEC roles are largely perceived as operational in nature.
- Lay respondents put more emphasis on community-based interventions, whereas health professionals gave due recognition to both community and health facility-based interventions.
- Health education talk strategy is seen as the most feasible, appropriate, meaningful and effective IEC strategy. However, training and orientation was perceived as the highest priority.
- House-to-house sensitisation strategy was considered the least feasible.
- While distance emerged as the most highly rated challenge, staff shortage was considered the highest priority challenge.

- Findings show that challenges confronting IEC strategy implementation are complex and therefore require a more holistic approach to address them.
- The level of awareness of impact of IEC strategies among respondents was high.
- Evidence of impact suggests that IEC is working, and perceived as impacting on malaria in pregnancy.
- Despite evidence of impact of IEC strategies, some concerns still remain.
- Key recommendations involved:
 - establishing a communication strategy (IEC strategic plan)
 - developing IEC materials and programme implementation guidelines
 - embarking on community-based health education campaigns
 - attitudinal change on the part of health professionals
 - early childhood education on malaria control, including incorporating malaria issues into elementary school curriculum
 - laying emphasis on female education, women's empowerment and poverty reduction
 - planning, monitoring and evaluation of programmes
 - addressing issues of distance
 - government commitment/political will as evidenced by early release of funds for programme implementation and equity in resource distribution.

Chapter 6

Discussion

6.1 Introduction

In line with the study's aims and objectives, this chapter will discuss evidence of impact of the IEC strategies in relation to feasibility, appropriateness, meaningfulness and effectiveness; IEC challenges; concerns of non-impact; the relationship between evidence and practice; overcoming challenges; the strategic importance of IEC strategies; and the strengths and limitations of methodological approaches. The chapter will then end with summary and conclusions, leading on to Chapter 7 which will consider application of frameworks for implementation, monitoring and evaluation.

6.2 Impact of IEC Strategies

The issue of impact is central to this study for a number of reasons. Firstly, it offers an opportunity to identify the role of IEC strategies in relation to malaria prevention and control among pregnant women in Africa. Secondly, it helps one to understand the relative strengths of each strategy. Thirdly, it provides an opportunity to identify what has not been done and what needs to be done in order to ensure that pregnant women receive accurate and appropriate malaria control messages that can bring about behavioural change, and in turn result in optimum utilisation of appropriate malaria control interventions. This could potentially, lead to a decline in maternal and infant morbidity and mortality.

These considerations were evident in both the systematic review of evidence and findings from the country surveys. The fact that there was a high level of awareness of the impact of IEC strategies related to malaria prevention and control in pregnancy among respondents (see Chapter 5, sub-section 5.10.1) means that some effort has been invested in IEC programme implementation. Evidence of impact suggests that IEC is working, and perceived as impacting on malaria in pregnancy (see Chapter 5, Figures 5.24 and 5.25). However, both the review and the survey revealed that there is room for improvement if any long-

term impact is to be made. The next section involves a discussion of impact related to specific IEC strategies.

Eleven IEC strategies are discussed. These are:

1. Health education talks in health units
2. Staff training and orientation
3. House-to-house sensitisation
4. Advocacy
5. Community mass education campaigns
6. Visiting places of worship
7. Community women's group meetings
8. Integrated health education campaigns
9. Symbolism versus message delivery
10. Audience segmentation versus information delivery
11. Incorporating malaria control messages into elementary school curriculum.

6.2.1 Health Education Talks in Health Units

The impact of this strategy is evident from both the systematic review and the survey. With regards to the systematic review, 58% (29/50) of the papers reviewed reported on this strategy (see Chapter 4, Table 4.2). This indicates the prominence and practical relevance of health education talks. The main reasons why most studies focused on health education talks in health units appear to be four-fold. Firstly, antenatal care (ANC) schedules (of at least 4 visits) make pregnant women readily available for an organised educational session (WHO/UNICEF 2003; WHO 2004). Secondly, attendance at maternal and child health clinics, including family planning services and immunisation provide a good opportunity for frontline health workers to impart knowledge or disseminate messages on malaria in pregnancy. This also points to the appropriateness of this strategy. Thirdly, there is the likelihood that it may be more convenient for researchers to focus on healthcare facilities. Finally, health education talks have been part of routine health service delivery for decades, not only for malaria

prevention and control, but also in relation to knowledge about all issues related to health in developed (for example, see NICE 2003, 2008; BMJ Evidence Centre 2011) and developing nations. The prominence of this strategy over other strategies was also evidenced by the pattern of rating of strategies by respondents in the survey in Ethiopia, Ghana, Nigeria and Tanzania. According to the survey, health education talks, by consensus, emerged as the most highly rated strategy across all the study countries.

As a key IEC strategy, the systematic review has demonstrated a degree of effectiveness of health education talks with regards to malaria prevention and control among pregnant women in Africa. Additionally, in terms of feasibility, appropriateness and meaningfulness this strategy was found to be the most highly rated among respondents (see chapter 5, Figures 5.22 and 5.23). This pattern of rating was supported by a number of reasons. According to respondents in the survey, health education, especially during antenatal care, provides a good forum for information dissemination among pregnant women in the face of increased antenatal care visits. This, it was argued, has an added advantage of affecting the health of children and the family. This is because women would serve as agents of behavioural change once they are well informed. This is comparative with the findings of Kidane and Morrow (2000) (see Chapter 1, sub-section 1.3.2). Therefore, the strategy has a cascading effect on the wider community.

Although the distinction between feasibility, appropriateness and meaningfulness of health education talks was not all that clear from the review, one could point to some glimpses of this. In terms of feasibility, the strategy could be easily adopted by health educators such as nurses and midwives, since it forms part of routine antenatal care. According to Launiala and Honkasalo's (2007) work in Malawi, pregnant women made themselves available for health education related to malaria control interventions, including intermittent preventive treatment using sulphadoxine-pyrimethamine (IPTp-SP). With regards to appropriateness, some concerns were expressed with regards to the methods of message delivery. For

example, nurses and midwives spoke in a language alien to some of the audience. This implies that even within the same culture, there may be subcultures typified by language differences among different ethnic groups. This could pose a challenge in providing transcultural healthcare in the face of cultural diversity (Bryt et al. 2007). However, the survey did not reveal any major transcultural differences regarding opinions expressed, although different terms are used by the study countries to describe malaria and its symptoms (see Chapter 1, sub-section 1.5).

According to Launiala and Honkasalo (2007), the method of delivery by nurses and midwives was one-sided, although it was meant to be a face-to-face interaction. In terms of meaningfulness, the malaria control message did not appear to have been well understood, as feedback showed that some participants in routine health education talks could not provide appropriate answers to questions on the efficacy of sulphadoxine-pyrimethamine (SP). In this regard, some pregnant women still felt that any bitter drug was harmful (Launiala & Honkasalo 2007). These concerns were suggestive of a learning need related to communication skills as well as in depth knowledge about the usefulness of sulphadoxine-pyrimethamine (in malaria prevention in pregnancy) on the part of the health educators. However, there is the need to be cautious when interpreting the findings of these authors. This is because Launiala and Honkasalo (2007) did not interview the health workers to allow for their side of the story to be heard (see Appendix 14.1).

The present study gives a further case to consider the issue of learning needs useful in Launiala and Honkasalo's (2007) study above. It was surprising that lack of knowledge of staff was considered by respondents as the least priority challenge when staff training and orientation emerged as the highest priority (see sub-section 6.2.2). However, a review of a study conducted in Tanzania, showed that most (two-thirds) respondents identified health workers as repositories of knowledge (Mbonye et al. 2006b). In other words, participants had trust in information from health workers, especially with regards to their ability to provide

face-to-face explanations of health issues (Mbonye et al. 2006b). In line with this, Mubyazi et al. (2005) observed a high level of staff awareness regarding IPTp policy. Therefore, training is required for communication style rather than for knowledge of malaria.

The perceived knowledge of staff was, however, marred by the alleged negative attitude of some staff (Mubyazi et al. 2005). This has an implication for attitudinal change by health professionals regarding professional practice (see Section 6.5 [iv]), an issue identified by Ghanaian and Ethiopian respondents in the survey (see Chapter 5, Figure 5.21). This confirms that the issue of staff attitude in practice settings could be a major concern, and therefore, needs to be explored further. Staff attitude should not be measured only at an individual level, but also as organisational and wider cultural and geographic contexts within which health workers operate (for example, a rural health worker). This is because organisational and other environmental factors may affect staff morale, which can affect staff performance (Dieleman & Harnmeijer 2006).

The systematic review showed that the effectiveness of health education talks was evidenced by a reduction in placental parasitaemia, anaemia and low birthweight which were noted following health education talks among pregnant women in Burkina Faso (Gies et al. 2008). The author holds the view that this randomised controlled trial needs to be replicated in different contexts in similar malaria endemic countries in Africa, in order to identify its wider applicability.

A key feature in antenatal care is routine health education talks. The work of Nganda et al. (2004) on effectiveness of this strategy reported in Chapter 4 on this subject requires closer scrutiny. This study implies that the more clients attend these education sessions the more they are likely to adhere to the uptake of IPTp-SP (see Chapter 4, sub-section 4.6.3.1). This is in agreement with comments by respondents in the survey that health education talks provide a platform for educating clients (see Chapter 5, sub-section 5.4.1). Although routine antenatal care could provide a platform for educating pregnant women, a

two-way communication is essential to make the most desirable impact (Chung 1987; Boddy 2002). Also, since antenatal clinics are not regularly attended by all pregnant women (RBM Secretariat/FMOH, Nigeria 2004; Akinleye et al. 2009), it is difficult to ensure a high degree of certainty that all clinic attendees will fully benefit from health education talks (see sub-section 6.3.1 and Section 6.4) Therefore, there is the need to consider other types of strategies.

According to Nganda et al. (2004), knowledge of malaria predicts use of ITNs, so that the more pregnant women get to know of malaria and its consequences to their health and the foetus, the more they are likely to use the net as a means of personal protection. However, knowledge of ITNs alone may not necessarily result in use for the prevention of malaria, if users are unable to connect the relationship between malaria and ITN use (Adongo et al. 2005), as well as awareness of susceptibility to malaria (Ribera et al. 2007). According to the health belief model, the more people realise they are susceptible to a health problem the more they are likely to take appropriate action for their health and wellbeing (Sheeran & Abraham 1996; Furnham 1999).

The effectiveness of health education is further revealed by the evidence of increased knowledge and high recall of over 90% among respondents about information on malaria (van Eijk et al. 2004; van Geetruyden et al 2005; Owusu-Adjei et al. 2007). However, it may be difficult to attribute increased knowledge solely to health education sessions organised in health units, since knowledge may be acquired through other channels such as radio talk shows, TV soap opera, road shows, house-to-house sensitisation by community health workers, peer mobilisers and volunteers (Somalia Aid Coordinating Body 2006; Mbonye et al. 2008). In the survey, respondents reported increased knowledge and awareness as evidence of impact of IEC strategies (see Chapter 5, Figures 5.24 and 5.25). However, the evidence of increased knowledge was not linked to any particular strategy. Therefore, one cannot say for certain that this had to do directly with health talks in health units, since knowledge may be acquired through several other IEC strategies.

In conclusion, it is worth noting that the systematic review of evidence and the empirical evidence have demonstrated the prominent role of health education talks as an IEC strategy. This relates to issues of feasibility, appropriateness, meaningfulness and effectiveness. This also demonstrates the overall impact the intervention offers regarding malaria prevention and control. However, the benefits derived from this strategy are only directly enjoyed by pregnant women who utilise routine health services in healthcare units. Group sessions that often characterise health education in health units (IHRDC 2005) imply that some pregnant women may not feel comfortable to engage in discussions. This is because some participants may be more domineering during discussions. Current emphasis on focused antenatal care, which requires goal-oriented and individualised care of pregnant women (Birungi & Onyango-Ouma 2006; Population Council 2007; USAID Access 2007) demands that pregnant women be given one-on-one attention regarding health education. Consequently, given the problem of staff shortage at the moment in healthcare institutions in Africa, as evidenced through the review and the survey, overreliance on health education talks as a priority intervention may not be ideal (see sub-section 6.3.2). Therefore, there is the need to pay equal attention to community-based health interventions, such as house-to-house sensitisation and community mass education campaigns, expensive as they may be in terms of their implementation (see Chapter 5, sub-sections 5.9.1.1 and 5.9.2.1).

Although it is understandable that researchers focus more attention on health education talks due in part to ease of access, it may be argued at this juncture, that it is not fair to focus solely on this strategy, since health units are not the only sources of health information and for that matter the only unit of analysis. According to Mboera et al. (2007) a focus on the same population often leads to lack of knowledge of the epidemiology of malaria in neglected areas. Researchers also need to focus on other interventions to inform healthcare practitioners what alternative benefits exist regarding community-based approaches. Also, researchers need to consider conducting randomised controlled trials on health education talks, while at the same time exploring effects of cultural differences in

relation to the delivery of malaria control messages to pregnant women. This will help to identify best practices based on quantitative evidence that may be unequivocal, as current evidence in the systematic review of evidence does not suggest a high level of effectiveness of this IEC strategy.

6.2.2 Staff Training and Orientation

The systematic review showed that staff training and orientation emerged with the second highest number of studies (17/50) (see Chapter 4, Table 4.2). The review showed that poor staff knowledge may result in delivery of conflicting and inaccurate messages in terms of content (Hill & Kazembe 2006; Mbonye et al. 2006) and style of delivery to clients (Launiala & Honkasalo 2007). The survey also revealed that this strategy was considered the highest priority by respondents (see Chapter 5, Figures 5.10 and 5.11). With regards to feasibility, it was rated second after health education talks by all groups; and rated as the most meaningful strategy and coming jointly as one of the most effective strategies (see Chapter 5, Figure 5.23). These signify the importance of staff training and orientation.

With regards to the systematic review, there is evidence that training and orientation can make a positive impact on health seeking behaviour. For instance, through a cascading approach to staff training on malaria in pregnancy, countries such as Tanzania, Uganda, Kenya, Ghana, Burkina Faso and Madagascar made significant success in capacity development, which resulted in increased IPTp coverage exceeding 90% (Roman et al. 2008; WHO/USAID/ACCESS 2008; JHPIEGO 2008b). For those benefitting from this training approach for the first time, the feasibility and appropriateness of training was evident in the view that it had helped them to do things they could not do previously, especially equipping staff to give women the care needed during ANC visits (see International Federation of Red Cross and Crescent Societies/JHPIEGO 2006, p.3).

The training of traditional birth attendants (TBAs) could be described as appropriate, as their training has provided backup to support existing trained

staff strengths, most especially in rural communities (Hill & Kazembe 2006; Roman et al. 2008; WHO/USAID/ACCESS 2008). Such training programmes need to incorporate cultural awareness related to malaria prevention and control, since different terms may be used to describe malaria in different communities, and also need to acknowledge diversity among subcultures within a given community (see Chapter 1, Section 1.5). Although their role is crucial, ministries of health need to, however, guard against overreliance on TBAs, and rather make efforts to motivate qualified healthcare professionals to take up posts in hard-to-reach communities.

Reasons given in the findings of the survey further demonstrate the appropriateness and meaningfulness of this IEC strategy (see Chapter 5, subsection 5.5.1). However, the low rating on staff knowledge seems to contradict the arguments for training and orientation, which may need further investigation. The review showed that increased staff knowledge does not necessarily result in behavioural change among pregnant women (Hill & Kazembe 2006). This could be due to poor communication of knowledge as well as the attitude of both health educators and recipients (see Section 6.5 for further discussion on attitude).

In conclusion, the findings show that training and orientation of staff is beneficial regarding malaria prevention and control among pregnant women in Africa, as it serves as a starting point for knowledge acquisition and information dissemination to target audience. With well informed health professionals comes accuracy of malaria control messages. However, it is not enough for staff to be knowledgeable with the right attitude. They also need to be competent to perform, most especially in rural communities, where staff shortage is a major challenge (Dieleman & Hammeijer 2006). Such a competence needs to involve an ability to communicate the knowledge in such a way as to make the needed impact (Kiwuwa & Mufubenga 2008). The review suggests false dissemination of malaria control messages (Mubyazi et al. 2005), which seem to suggest two things: either those staff were not knowledgeable or they did not know how to effectively communicate the messages. Thus, leading to 'leakage' of evidence

along the 'pipeline' of evidence translation to practice (Glasziou 2005; Wimpenny et al. 2008), to the disadvantage of pregnant women who are the target of the message being delivered. At this juncture, the author wishes to suggest that training and orientation programmes should incorporate effective methods of communication with the full knowledge of target audience in the appropriate context. The review of evidence reveals limited evidence of impact of staff training and orientation. There is therefore the need to further explore the relationship between training and orientation and its impact on behavioural change regarding malaria in pregnancy.

6.2.3 House-to-House Sensitisation

House-to-house sensitisation is an extension of the community mass education campaign strategy which focuses on pregnant women, their families and the entire household¹. The appropriateness, meaningfulness and effectiveness of this intervention lie in the view that the strategy encourages face-to-face interaction between health educators and their audience. Educators are part of the communities, and therefore, know the communities in which they operate (refer to the role of TBAs in sub-section 6.2.2). The work of Mbonye et al. (2008) indicates the effectiveness of house-to-house visiting by community health workers and peer mobilisers. These include increased IPTp uptake resulting in such positive pregnancy related outcomes as reduction of malaria episodes, placental parasitaemia, anaemia and LBW. Further studies are, however, required to ascertain the extent of impact, where feasible.

The survey shows that while appropriateness, meaningfulness and effectiveness of house-to-house sensitisation were rated above moderate, the same could not be said about its feasibility (see Chapter 5, Figures 5.22 and 5.23). According to respondents, the main reasons for low level of feasibility include financial, human, material and time constraints. While acknowledging its benefits, some respondents also described the implementation of the strategy as tedious, as vast populations needed to be covered, especially in the case of Ethiopia and Nigeria

1. In most African societies households may include other tenants

(see Chapter 5, sub-section 5.9.2.5) (for example, see Uneke et al. 2008). In the case of its benefits, reasons for appropriateness, meaningfulness and effectiveness are mainly based on the view that the strategy provides direct contact as it involves face-to-face interaction between the health educator and pregnant women, allowing the latter an opportunity to have concerns addressed. Pregnant women are also educated in the comfort of their own homes (see Chapter 5, sub-section 5.9.3).

If house-to-house sensitisation is the highest priority strategy due to its benefits, resources may need to be mobilised to see to its implementation in the face of other commitments. As the survey suggests, the strategy was one of the second highest priorities among respondents (see Chapter 5, Figure 5.11). The data confirm the findings of Nganda et al. (2004) that not all women attend antenatal clinics, and therefore may miss out the benefits of antenatal health education, implying the need for alternative ways to disseminate messages on malaria in pregnancy other than routine health education talks in health units. In this case, house-to-house sensitisation offers a good alternative as it affords pregnant women an opportunity to receive messages in the comfort of their homes in the company of other family members, who need to be aware and understand issues related to malaria in pregnancy. This may also help pregnant women receive appropriate support and co-operation from family members, most especially the spouse and in-laws who may determine the fate of women regarding matters of health (Olson 2003; Mbonye et al. 2005; The Johns Hopkins Bloomberg University School of Public Health 2008b). This evidence is consistent with findings of work done in Nepal (see Senanayake et al. 2010). Following face-to-face interaction with pregnant women in their homes, characterised by opportunity to seek answers to questions, among other things, this may partly explain why respondents reporting on impact of IEC strategies also reported on increased knowledge and awareness among pregnant women (see Chapter 5, sub-section 5.10.2).

Since its primary focus is the home, it may be argued that house-to-house sensitisation is consistent with the concept of primary health care, which seeks to promote health and prevent disease at the door step of the population at risk (Magnussen et al. 2004). However, this may not necessarily be the case in western contexts. In any case, personal experience in Scotland shows that home visiting by health visitors is a common practice regarding health promotion in family and child related issues (also see Jack et al. 2005; Lowe 2007). Such a practice could be modified within the African context as part of house-to-house sensitisation strategy. The establishment and implementation of the Community-Based Health Planning and Services (CHPS) policy in Ghana constitutes a step in this direction (GHS 2005). This is because malaria control is one of the key components of this policy, which depends on community extension workers such as community health nurses, community health workers; traditional birth attendants (TBAs); peer mobilisers and volunteers who are readily available to clients (GHS 2005; WHO/USAID/ACCESS 2008). Other studies conducted in Mali, Ethiopia and Mozambique, have shown that given appropriate training and logistic or material support, community health workers are able to influence health seeking behaviour through direct home visits (GCS 2003a,b,c).

To conclude, the author holds the view that house-to-house sensitisation is beneficial as far as health service delivery at the community level is concerned. This became evident in both the review and the survey in a number of ways. Through this strategy, pregnant women were able to benefit from the services of community health workers. The views of respondents also point to the relevance of house-to-house sensitisation. The strategy provides an opportunity for pregnant women and their families to benefit from face-to-face interaction, resulting in increased knowledge and awareness, positive health seeking behaviour, evidenced by increased uptake of IPTp-SP, which resulted in positive pregnancy related outcomes. The ability of this strategy to create awareness and increase knowledge was also confirmed by respondents. WHO annual report on Ethiopia shows that a health extension programme that allowed extension workers to embark on house-to-house sensitisation has resulted in

“accelerated expansion of primary health service coverage towards universal health service coverage.”

(WHO 2009, p.12)

Therefore, the strategy could be included in a broader strategy related to health, due to its role in primary health service coverage. Thus, while it is challenging to embark on house-to-house sensitisation, its beneficial effects need to be considered for its implementation. Therefore, the author wishes to suggest that future researchers could focus on the cost-benefit analysis of this strategy in order to identify its relative importance in a given context. This may require clinical data to serve as basis of analysis.

6.2.4 Advocacy

The systematic review identified nine studies on advocacy (see Chapter 4, Table 4.2). The survey showed an above moderate rating. The survey shows that advocacy is appropriate, meaningful and effective, but generally perceived as less feasible (see Chapter 5, Figures 5.22 and 5.23). According to the systematic review, Baum and Marin (2008) in their nationwide survey of Nigeria, Senegal, Uganda and Zambia report the effectiveness of advocacy. In this study, Baum and Marin (2008) reported that educational campaigners prevailed upon governments to reduce or waive taxes and tariffs on the importation of insecticide-treated materials and chemicals. Since this approach was successful, campaigners may need to replicate this effort in calling upon governments to support programmes related to malaria in pregnancy.

It is worth noting that evidence of effectiveness of advocacy cannot be wholly attributed to advocacy because other educational campaigns such as community mass education campaigns were also being employed. Despite these gains, it is evident that none of the countries under study could achieve the Abuja target of 60% between 2004 and 2006. Since Baum and Marin (2008) did not isolate the effect of advocacy from the effects of other interventions, it makes it difficult to

fully assess the extent of effectiveness of this strategy based on available evidence. However, other evidence suggests the criticality of the impact of this strategy as a part of developing best practice.

The survey indicated media involvement regarding advocacy. In this regard, some respondents cited increased advocacy and involvement of the media in the dissemination of health information to the public as an evidence of impact (see Chapter 5, Figures 5.24 and 5.25). However, media involvement needs to be considered with caution. This assertion is supported by findings of the systematic review (see WHO/USAID/ACCESS 2008). Providing evidence of feasibility, appropriateness and meaningfulness of advocacy, WHO/USAID/ACCESS (2008), report a number of lessons and best practices. This study noted that a meeting was convened to bring together all stakeholders, including policymakers, ministry of health managers, partners, organisations and the media with a view to addressing widespread fears and concerns about IPTp-SP fuelled by the Tanzanian media. This advocacy meeting resulted in a positive perception of the IPTp-SP by the public, as the media eventually came out to defuse an earlier scare, based on wrong information. Thus, with good collaboration between government and the media, appropriate means of health information dissemination could be ensured.

Despite this impact of advocacy, much remains to be done at the community level. For instance, according to WHO/USAID/ACCESS (2008), advocacy effort that can influence attitude, perceptions and behaviours at the community level has been rudimentary in such eastern and southern African countries as Tanzania, Malawi, Zambia, Kenya and Uganda. Explaining this, the survey indicates that advocacy is perceived by some health professionals as of little significance in terms of impact related to individual changes in health behaviour. According to one Ghanaian respondent, the strategy had little influence regarding behavioural change. This argument was supported by another respondent from Nigeria who noted that advocates may not always carry the message to their constituencies (see Chapter 5, sub-section 5.5.4). However, these arguments

have been refuted by other respondents. According to these respondents, advocacy plays a key role in IEC programme implementation related to malaria control in pregnancy by creating awareness through radio (see sub-section 6.2.5) or TV among others (see Chapter 5 sub-section 5.5.4). However, the use of TV may be limited to only those who have access to electricity, as the study suggests that in Nigeria, lack of power supply deprived some communities from getting access to health information through electricity (see Chapter 5, Figure 5.26). Therefore, in order to enhance the impact of advocacy, two factors may be considered. Firstly, since community leaders have influence in their communities of jurisdiction, health sector ministries need to utilise this to ensure the former understands and champions the cause of women in pregnancy. Secondly, since ownership of TV is not always widespread in rural African communities, advocacy strategy should be implemented alongside face-to-face community women's group meetings. In this case, organising and supporting community women's group meetings could be of immense benefit. This would, however, require resource commitment.

As earlier noted, most African women in rural settings live in poverty (WHO/UNICEF 2006; The World Bank 2008). Thus, poor access to health information due to lack of electricity, may exacerbate their ability to utilise health services. However, the use of radio has been found to be the most convenient way of getting access to health information in rural communities since most people are able to afford it (Mubyazi et al. 2005; Somalia Aid Coordinating Body 2006). In places where there are no health facilities, as in the fields, among nomads and internally displaced persons, radio has been found to be most useful (Somalia Aid Coordinating Body 2006). To this end, there is the need to step up advocacy at community level using appropriate media in order to influence attitudes, perceptions and behaviours among community leaders so as to enable them influence pregnant women within their communities. Due to the perceived subservient role of women still in vogue in the African society (see Heggenhougen et al. 2003; Apusigah 2007; Okerinde 2008), it may be argued that there is a potential for community leaders, who are predominantly men, to use advocacy as

a means of influencing women in the utilisation of health services. However, this is not to say that community women leaders have no influence. There appears to be an increasing number and influence of women in management and leadership positions, including politics, as in the case of the Presidents of Guinea Bissau (1984); Burundi (1993-1994); Liberia (2006 to date); and Malawi (2012) (Guide To Women Leaders 2012).

Uganda and Somalia have developed comprehensive five-year communication strategy documents. One of the goals of the documents is to create awareness among stakeholders (who can influence attitudes and behaviours) in decision making positions on malaria in pregnancy and the need to channel resources to support MIP programmes (MOH, Uganda 2005; Somalia Aid Coordinating Body 2006). The Ghana Malaria Advocacy Guide also serves as a tool for IEC programme managers and health educators in IEC programme implementation from national to community level (GMAG 2007). In this regard, the author wishes to suggest that other countries follow suit by developing communication strategies, incorporating advocacy plans. This is because the documents highlight the essence of information dissemination to people in positions of influence with an ultimate aim of reaching the population at risk.

It may be concluded that since community leaders and the media have influence in health information dissemination, IEC programme managers need to utilise this to ensure that the former gets the message right in order to influence behaviour among women in their respective communities. This could be achieved through collaborative work. Furthermore, health sector ministries need to be proactive in updating staff and community leaders with any malaria control policy change in order to avoid dissemination of conflicting messages to target groups.

6.2.5 Community Mass Education Campaigns

The systematic review had 24% (12/50) of papers concerned with community mass education campaigns (see Chapter 4, Table 4.2). It emerged as the second most highly rated strategy by health professionals (see Chapter 5, Figure 5.6). The strategy was perceived as appropriate, meaningful and effective, but generally less feasible in the survey (see Chapter 5, Figures 5.22 and 5.23). Concerning this strategy, there is evidence that malaria control messages are being disseminated through different channels of communication. This evidence points to its appropriateness and meaningfulness, since health educators could adopt the appropriate channel to disseminate a malaria control message in an appropriate context.

As noted in sub-section 6.2.4, the most preferred channel by community members, including pregnant women, was radio (see Chapter 4, sub-section 4.6.3.1 and sub-section 6.2.4). The reason for radio preference is unclear. This may be based either on economic reasons, or reasons of convenience. Economically, more people appear to be able to afford radios compared, for instance, to TV in practice. By convenience, people such as nomads and internally displaced persons may be easily reached through radio rather than other channels such as health facilities and TV. The use of a combination of channels seems to be more appropriate since these combinations give pregnant women a number of avenues to gain access to information related to malaria in pregnancy. These efforts led to increased use of ITNs (Tilson 2007; Baum & Marin 2008); and increased uptake of IPTp-SP following improved health seeking behaviour. This also resulted in positive pregnancy related outcomes (see Mbonye et al. 2008). Some respondents also confirmed the impact being made by media and the music industry regarding public health education campaigns (see Chapter 5, Figure 5.24). If properly managed and co-ordinated, these have a potential of making impact on a larger scale, subject to resource availability.

Apart from these, respondents in the survey gave other reasons to suggest the appropriateness and meaningfulness of the strategy. In this regard, the strategy

has been considered very important as far as the control of malaria in pregnancy is concerned. It also promotes community ownership since members of the community share a common vision with their leaders, and are actively involved in educational campaign activities. In particular, the strategy is able to reach pregnant women within their communities.

However, it is noted that 'open air' mass education campaigns such as mobilising the general public to gather at common places (for example, football park and public lectures on platforms in the street) may not always be appropriate for pregnant women since they may be engaged in household activities, and therefore may not have time to participate in such activities (IHRDC 2005). Thus, it is difficult to assess the impact of mass education campaigns based on evidence from the systematic review alone. However, through community mobilisation and sensitisation among women, health services may be used more fully. This may also facilitate the process of health education during ANC visits, since pregnant women may have acquired knowledge through mass education campaigns prior to these ANC visits. A report by the Kenyan Ministry of Health shows that Africa Malaria Day celebrations (used as platforms for mass education campaigns) have made some impact, although the report did not isolate pregnant women (MOH, Kenya 2005). Therefore, community mass education campaigns could make an impact in general terms.

The author is of the view that since pregnant women are part of the community, messages may be meaningful and appropriate to them. Therefore, they could be influenced by community mass education campaigns in their communities alongside house-to-house sensitisation, women group meetings, and visiting antenatal clinics where they are exposed to malaria control messages through routine health education. The latter may act as a background to facilitating the above. Therefore, multiple strategies may be most appropriate.

6.2.6 Visiting Places of Worship

This strategy was rated above moderate (see Chapter 5, Figures 5.6 and 5.7), although considered the lowest priority among health professionals (see Chapter 5, Figure 5.12). Overall, it emerged as the second lowest priority, following sensitivity analysis (see Chapter 5, Figure 5.13). Visiting places of worship as an IEC strategy appears to have limited evidence as far as its impact is concerned. However, the strategy is appropriate as it affords members of the church and the Muslim community, who otherwise would not have attended ANC clinics an opportunity to be exposed to relevant health messages through religious leaders based on trust; and occasional visits by health workers (Ali 2006). The survey reveals that apart from their religious functions, imams and ministers of the gospel are also involved in educating members on malaria prevention and control (see Chapter 5, Figures 5.4 and 5.5).

In conclusion, apart from visiting mosques, visiting churches may also be viewed as appropriate. With the ever increasing Christian activities in most African countries, health educators could take advantage of these. The critical role played by religious leaders regarding this strategy, has been supported by Exchange (2005). Since African women are generally pronatal, with a significant number of people engaged in religious observances in Africa (see Chapter 1, Section 1.5), this could serve as a good opportunity to disseminate malaria control messages to pregnant women.

6.2.7 Community Women's Group Meetings

Community women's group meetings strategy was rated above moderate (see Chapter 5, Figure 5.6 and 5.7). The survey showed that, overall, the strategy was ranked the lowest priority (see Chapter 5, Figure 5.13). The main reasons were staff shortage and alienation of rural communities from awareness creation (see Chapter 5, sub-section 5.5.4). Therefore, more attention may need to be given to rural settings where awareness level seems to be the lowest (for example, see Adongo et al. 2005).

Like visiting places of worship, the impact of community women's group meetings is rare in the literature. With the majority of respondents being males, it is possible that the perception about community women's group meetings has been influenced by gender. With the evolving role of women as a group in Africa, being engendered by gradual increase in literacy and empowerment (Okerinde 2008), despite the slow pace (Heggenhougen et al. 2003; Apusigah 2007), one cannot rule out the possibility that this type of group could achieve change in the near future. The potential of this strategy needs to be further explored.

The strategy has, however, been described as feasible, appropriate and meaningful since women stand to benefit from the experiences of others during group education sessions (IHRDC 2005), who perhaps must have experienced or benefited from malaria interventions, either in the community or at a health facility. In support of this, the survey indicated that some pregnant women express their readiness and willingness to learn and share their knowledge and experiences with others (see Chapter 5, Figure 5.25), thus making them agents of change (Kidane & Morrow 2000).

6.2.8 Integrated Health Education Campaigns

This strategy was rated above moderate level (see Chapter 5, Figure 5.6 and 5.7). It was considered feasible, appropriate, meaningful and effective (see Chapter 5, Figures 5.22 and 5.23), although not considered the highest priority (see Chapter 5 Figure 5.11). The systematic review showed that by using a combination of educational campaign strategies, a lot can be achieved (see Lettenmair 2003; RBM Partnership 2005; WHO/UNICEF 2006).

Relating to the impact of integrated health education campaigns, Lettenmair (2003), on his part suggests that there is the need to balance an integration of malaria communication with other health education and communication programmes (for example, integrating malaria control programmes with reproductive health programmes). Emphasising the role of different channels in integrated health education campaigns, Lettenmair argues that, electronic and

print media can make IPTp during pregnancy a normal and safe practice, as well as convince the public that ITNs are safe for pregnant women. However, both electronic and print media need to guard against excesses as far as information dissemination is concerned (see sub-section 6.2.4).

The strategy may be viewed from a conceptual level as it could be applied in both health facility-based education sessions and community-based education campaigns. Its major strength seems to lie in its efficiency as it can be applied to address different issues at the same time in different contexts, and thereby saving cost.

6.2.9 Symbolism Versus Message Delivery

Rated above moderate level (see Chapter 5, Figures 5.6 and 5.7), symbolism versus message delivery was also considered feasible and appropriate, and as one of the most meaningful and effective IEC strategies in the survey. In terms of its impact, the systematic review shows that inappropriate use of language can result in poor outcomes in health education (Launiala & Honkasalo 2007); and that using simple terms rather than medical terminology can enhance understanding, particularly with an illiterate audience (Launiala & Kulmala 2006).

In relation to this in the review, Miafo et al. (2004) note that self-reported compliance matched well with oral instruction given by health workers during ANC visits, and that oral information was effective in bringing about behavioural change, even in the presence of high illiteracy rate. Therefore, it is possible for a given strategy to make an impact if it is implemented appropriately. In line with this, some respondents in the survey held that the strategy was very important and of highest priority since this would benefit the illiterate and those that may be intellectually handicapped. Others also felt that it would aid understanding and increase the interest of people to participate in malaria prevention (see Chapter 5, sub-section 5.5.2). This may not be possible if IEC programme implementers have no knowledge about which symbols, metaphors and language are appropriate and meaningful to the target audience. However, with an

understanding of the culture, language and intellectual background of the group of pregnant women in mind, impact could be made in malaria information dissemination.

Therefore, there is a need to identify staff who are not only knowledgeable about malaria in pregnancy, but also understand the culture and symbols of the audience, and are able to communicate effectively (Johns Hopkins Bloomberg School of Public Health 2008b).

6.2.10 Audience Segmentation Versus Information Delivery

As this strategy suggests, the target population is segmented in such a way that the needs of different audiences are addressed during its design and implementation. The strategy was rated above moderate (see Chapter 5, Figures 5.6 and 5.7), and perceived as appropriate and effective, but generally less feasible (see Chapter 5, Figures 5.22 and 5.23). Some respondents in the survey were of the opinion that this was a difficult strategy to pursue (see Chapter 5, sub-section 5.9.3. However, the systematic review showed that the strategy has an ability to address the needs of people of diverse cultures using appropriate channels, including interpersonal communication, community mobilisation and mass media (RBM Secretariat/FMOH, Nigeria 2004; IHRDC 2005; Somalia Aid Coordinating Body 2006; Tilson 2007).

The underlying assumption is that different groups of pregnant women may have different health needs. They may also have to be reached by different means at the same time. The different groups may include nomads, internally displaced persons, youth and older adults. Evidence from the review showed that the audience may also be categorised as either rural or urban (Somalia Aid Coordinating Body 2006). In terms of antenatal clinic attendance, the review showed that using this approach, the information needs of different groups of pregnant women (see Chapter 4, sub-section 4.6.2.3[ii]) can be met (RBM Secretariat/FMOH, Nigeria 2004). Knowledge of these categories of pregnant women is important as it may help IEC programme managers to fashion out

appropriate strategies for meeting their needs. For example, IEC programme managers may need to find out which communities do not regularly attend ANC, and why people register for ANC too late. Also, regard for geopolitical differences in terms of language, locally available resources, customs, traditions and religion, as in the case of north and south-east Nigeria could enhance information dissemination strategies (see Chapter 1 sub-section 1.5.6.3 [ii]). The outcome of this enquiry could determine which options are most appropriate to which category of audience. However, for this to be done there should be completeness and timeliness in the monthly reporting on pregnant women by health units. This is based on the survey results which showed that in Ethiopia, this is one of the issues of concern (see Chapter 5, Figure 5.26). A full knowledge of the number of pregnant women attending a health facility could serve as basis for segmentation.

Although the study focused on pregnant women as the main target group, the survey revealed that other groups such as school children are reached by teachers as part of routine classroom teaching. As will be seen, in the next section, disseminating malaria control messages in schools may produce beneficial impact in the long-term.

6.2.11 Incorporating Malaria Control Messages into Elementary School Curriculum

Apart from the 10 IEC strategies originally identified through the systematic review, the survey identified the need to incorporate malaria control messages into the elementary school curriculum (see Chapter 5, sub-section 5.4.2). For this reason, this strategy was considered for discussion. Although an IEC strategy, this was not identified in the review because the evidence did not fit into the inclusion criteria (see Chapter 3, sub-section 3.2.5.3). As will be seen later in this chapter, this strategy is consistent with early female education, women's empowerment and potentially a reduction in poverty among pregnant women. There appears to have been little research with this strategy. Therefore, the author suggests that this should be an avenue for future studies. Some of these studies may be longitudinal (retrospective and prospective) to establish

whether incorporating malaria control programmes into elementary school curriculum could be beneficial to pregnant women in their adult life (long after they had been exposed to the messages in school).

According to the World Health Organisation

“malaria can be prevented by simple interventions and schools can serve as a gateway to teaching prevention measures that can be carried with the student for life and shared with the community”

(WHO 2007, p.12)

The aim of this strategy, according to the survey, is that as a long-term strategy, it would enable children to grow up into responsible adults (see Chapter 5, sub-section 5.4.2). Therefore, children would acquire knowledge about malaria, its prevention and control at an early age in order to develop positive health seeking behaviour later in adult life. In this regard, the author is of the opinion that for female children, this may serve as a preparatory ground for future roles as women in fertility age. For their male counterparts, it may prepare them to appreciate the cause of women with malaria in pregnancy, and therefore become supportive in their spousal relationship later in adult life. Given that malaria kills a child every 30 seconds (Webster 2000; WHO 2007), and that of the 300 million people infected with malaria globally (Murphy et al. 2001; The World Bank 2001; WHO 2007), at least 1 million of them die, of which most deaths occur among African children under 5 years (Murphy et al. 2001; United Nations Children Fund 2004; WHO 2007), it could be a valuable long-term strategy to redesign interventions for malaria in pregnancy.

In developing the document '*WHO Information Series on School Health*' by the World Health Organisation in collaboration with RBM Partnership Secretariat, other reasons for incorporating malaria control messages into the school curriculum have been highlighted (see WHO 2007). These include the fact that malaria and its health complications are responsible for high rates of absenteeism in schools; and that there is a tremendous socio-economic impact in the

community, impacting on child survival and long-term development (Brooker et al. 2000; Bundy et al. 2000; Barat et al. 2004; Jones & Williams 2004; WHO 2007). In line with this, the World Health Organisation recommends that any potentially useful school policy should include malaria prevention activities (see WHO 2007, p.18).

The survey indicated that, already some teachers in Ghana seem to be knowledgeable in malaria control, and are engaged in educational campaigns in their schools (see Chapter 5, Figures 5.4 and 5.5). The need to incorporate a school-based malaria control programme into elementary school curriculum with key success factors have been identified in a number of developing countries such as Thailand (Okabayashi et al. 2005) and Ghana (Ayi et al. 2010). The study by Okabayashi et al. (2005) involving school principals, teachers and children, concluded that key success factors involved use of good teaching materials and a participatory approach that made use of the well-established Thailand's school health system. In the case of Ghana, Ayi et al. (2010) show that engaging children as health messengers can result in a significant improvement in the misperception that malaria has multiple causes. Ayi et al. suggest that a participatory health education intervention contributes to decreased malaria prevalence among children. Therefore, the strategy should be encouraged as a long-term strategy towards malaria prevention and control among pregnant women in Africa.

For the strategy to be sustained in the long-term, there is the need for partnership working between key stakeholders, notably the ministry of health and the ministry of education, as well as any agency other than these two directly involved in early childhood growth and development. As a laudable idea, this strategy needs to go hand in hand with early female education which has the potential to ensure that knowledge acquired about malaria in pregnancy is translated into action later in adult life through enhanced education, empowerment and poverty reduction (see sub-section 6.4.4).

Up to this point, it is evident that each of the above IEC strategies is relevant in addressing different learning needs of pregnant women regarding malaria in pregnancy in different African contexts. However, on the whole, none of these strategies seems to be in the position to address all learning needs. Therefore, use of a combination of strategies may be ideal. Both the systematic review and the survey identified a number of challenges confronting implementation of IEC strategies (see next section).

6.3 Challenges to IEC Programme Implementation

Both the systematic review (see Chapter 4, sub-sections 4.5.2 and 4.6.3) and the survey (see Chapter 5, Sections 5.6 and 5.7) identified a number of challenges confronting the implementation of IEC strategies. For the purpose of this section six of these challenges are discussed. These are:

1. addressing distance problems
2. managing staff shortage
3. managing poverty
4. health seeking behaviour
5. women's empowerment
6. government commitment/political will.

However, for the purpose of convenience poverty and women's empowerment will be discussed together in relation to female education; while distance or access will be discussed in relation to health seeking behaviour and utilisation of health services for the same reason. The reasons for limiting discussions to these challenges are three-fold. Firstly, distance problems, staff shortage, managing poverty, and health seeking behaviour were among the first four highly rated challenges. Secondly, women's empowerment together with poverty and female education, appear to be interconnected, which need to be examined from that perspective, as they appear to be critical in relation to pregnant women in Africa. Thirdly, although not originally identified in the systematic review, the inclusion of government commitment/political stems from the fact that government plays a central role in the control of resources required for IEC programme

implementation and policy formulation that shapes the direction of health service delivery.

6.3.1 Distance/Access, Health Seeking Behaviour and Utilisation of Health Services

Issues of distance and health seeking behaviour were recognised as challenges to IEC programme implementation in the systematic review (see Chapter 4, sub-sections 4.6.3.3 and 4.6.3.8). These were confirmed by the survey (see Chapter 5 Figures 5.14 and 5.15). Indeed, the survey showed that across all the study countries distance was rated as the highest challenge (see Chapter 5, Figure 5.15). Routine scheduled antenatal care services may be viewed as a good platform for delivering health education, since pregnant mothers need to understand all issues affecting their health, including malaria in pregnancy (WHO/UNICEF 2003; WHO 2004; Nganda et al. 2004 ; Mubyazi et al. 2005; WHO 2006; WHO/UNICEF 2006). Emphasising the importance of access to and utilisation of antenatal clinics during malaria in pregnancy, Hamel et al. (2001, p.1014) suggest that

“high levels of utilisation of antenatal clinics afford the opportunity to achieve good coverage with presumptive intermittent malaria treatments during pregnancy, and to reach the goal of widespread bednet use by pregnant women and children by distributing nets during antenatal clinic visits.”

The level of utilisation of ANC services by pregnant women has been quite encouraging in some African countries recently (WHO 2004; Mubyazi et al. 2005; GHS 2007). However, wide disparities among African countries exist regarding the extent of utilisation (Hill & Kazembe 2006; Ribera et al. 2007; WHO 2009), and in a number of cases low utilisation has been reported as a major barrier to antenatal care (Akinleye et al. 2009; WHO 2009). The survey indicated a number of reasons related to health seeking behaviour which may impact on low utilisation of antenatal services (see chapter 5, sub-section 5.6.2). The key issues cited in the survey were three-fold: avoiding late ANC attendance and seeking early treatment when sick; when women were made aware of malaria

complications while pregnant, they would seek better care and eschew superstition; and that it would be easy to carry out early diagnosis, prevent malaria and reduce its morbidity and mortality should health seeking behaviour be improved.

In relation to the above, there is evidence of late enrolment to ANC services by pregnant women in Nigeria (Brieger et al. 1994; Akinleye et al. 2009); Uganda (Ndyomugenyi et al. 1998); and Kenya (Hamel et al. 2001). Such late enrolments have been witnessed as far as the third trimester stage of pregnancy (Brieger et al. 1994; Ndyomugenyi et al. 1998; Hamel et al. 2001). To this end, Nganda et al. (2004) note that this situation has resulted in missed opportunities regarding access to health education sessions and the uptake of IPTp among pregnant women. The issues of superstition as noted by some respondents (see Chapter 5, sub-section 5.6.2) affecting utilisation of health services among pregnant women appear to be related to cultural beliefs. These were confirmed by review of evidence (Mbonye et al. 2005; The Johns Hopkins Bloomberg University School of Public Health 2008b) (see Chapter 4, sub-section 4.6.4.7). This also shows that cultural beliefs and practices related to malaria prevention and control are still present in Africa (see Chapter 1, Table 1.1). Since malaria is preventable and its treatment effective (see Chapter 1, sub-section 1.3.2), pregnant women could benefit from available interventions if they are ready to utilise them.

It has been observed that one reason why pregnant women are not utilising health services is due to the problem of distance or access to healthcare facilities (Mufubenga 2003; Mubyazi et al. 2005). The factors exacerbating the distance problem, as noted by respondents are outlined (see Chapter 5, sub-section 5.6.2). One of the key factors is a poor road network.

The issue of a poor road network has also been echoed by Ribera et al. (2007). According to these authors, rural women may be compelled to work and live in fields remote from health centres, and that during rainy seasons, roads may be

inaccessible, thus affecting access to health centres. These arguments have also been supported by Somalia Aid Coordinating Body (2006), who observed that the nomadic mode of life of some peasant farmers and internally displaced people in Somalia means that people live far away from healthcare facilities. Referring to Nigeria, Uneke et al. (2008) has cited inadequate healthcare infrastructure as a contributory factor. However, these arguments have been refuted by Akinleye et al. (2009), who argue that even where pregnant women live close to primary healthcare facilities, enrolment was low. In line with Akinleye et al.'s (2009) position, it may be recalled that not all respondents agreed that there was lack of health facilities, even among the same population in the case of FBOs in Ghana (see Chapter 5, sub-section 5.6.2). In consensus analysis, this is what Caulkins and Hyatt (1999, p.7) referred to as contested domain, which states that

“some individuals take a perspective opposite to that expressed by others in the same population.”

Therefore, whether pregnant women utilise health facilities or not is debatable and may be context specific.

Thus, there is no guarantee that health facilities will be utilised if clients do not see the need to utilise the services. As, observed by one respondent, it is not possible to locate health facilities close to every pregnant woman (see Chapter 5, sub-section 5.6.2). Therefore, there is the need for more awareness creation for pregnant women to utilise the few available health facilities. Although it can be argued that people may be aware of benefits of health programmes, not all can afford to travel long distances to access them (see sub-section 6.3.4.2). Whereas distance may be a problem in one context, in another, this may not always be the case. In this regard, although distance was a high priority challenge, respondents from Ethiopia argued that health extension workers were being deployed at village levels, and therefore distance should not be considered as a problem (see Chapter 5, sub-section 5.6.2). The challenge here is staffing (Uneke et al. 2008), since this may not be practicable or sustained at all times due to resource constraints (see sub-sub-section 6.3.2).

6.3.2 Managing Staff Shortage

The systematic review recognised staff shortage as one of the major challenges affecting the implementation of IEC strategies (see Chapter 4, sub-section 4.5.2 and 4.6.3). In terms of rating, staff shortage was considered by health professionals as one of the highest challenges (see Chapter 5, Figure 5.14). With regard to priority, it was identified by consensus among all respondents as the highest priority challenge (see Chapter 5, Figure 5.17), which suggests that this challenge needs attention. Some respondents said that reasons why staff shortage is of priority include staff occasionally refusing to go to deprived areas, and preferring to be in urban centres (see Chapter 5, sub-section 5.7.1). Some health workers may prefer to stay in the cities where they have access to modern social amenities due to lack of equity in resource distribution between rural and urban settings (see Chapter 5, sub-section 5.10.3).

Since health workers are considered the backbone of all health systems (Kinfu et al. 2006), it is acknowledged that shortage of health workers is the most critical issue facing health care systems, as it is these people who make these systems work (WHO 2003). Referring to sub-Saharan Africa, Kinfu et al. (2009, p.1)) reiterate that

“the problem is so serious that in many instances there is simply not enough human capacity even to absorb, deploy and efficiently use the substantial additional funds that are considered necessary to improve health in these countries.”

The shortage of health professionals, including nurses, midwives and other reproductive health workers in Africa is both an international and a global phenomenon (Simeons, Villeneuve & Hurst 2005; Dal Poz et al. 2006; Wildschut & Mqolozana 2008; African Press 2009). There is a wide disparity between staff-patient ratio in western and African countries, with the latter being the worse of the two (College of Nurses 2004; Bigdee 2007; Zondagh 2010). Staff-patient ratio in Africa has been widely reported (Buchanan & Calman 2004; Kinfu et al. 2006, 2009; GHS 2007, GHS Facts and Figures 2009; Anyangu-Amu 2010).

Available evidence suggests that the low level of progress in IEC programme implementation in Tanzania is partly due to staff shortage (PMI Tanzania 2011) (see Chapter 1, sub-section 1.5.6.4[ii]). The high maternal and infant mortality in Africa (see Chapter 1, Table 1.1), justifiably calls for increased number of trained midwives and other reproductive health professionals. Cognisant of this, the systematic review showed that TBAs are being trained to support midwives in areas of acute shortage (WHO/USAID/ACCESS 2008) (see sub-section 6.2.2). Acknowledging the shortage of midwives in the recent National Conference of District Directors of Health Services, its Chairman suggested the need to introduce direct midwifery entry training and reintroduce midwifery training for community health nurses in Ghana (Ghana News Agency 2010).

According to recent estimates, sub-Saharan Africa has a shortfall of over 600,000 nurses required to meet the Millennium Development Goals of improving the health and wellbeing of the African population (Buchanan & Calman 2004). Migration is a significant factor affecting staff shortage in African countries (Massay, Taylor & Edward 1993; Hagopian et al. 2004). Therefore, there is the need to motivate staff both at organisational level and national level by the provision of appropriate incentives (Uneke et al. 2008), especially to staff willing to work in deprived and remote communities, since the need for employee motivation was identified as a means of addressing challenges (see Chapter 5, Figures 5.20 and 5.21)

Addressing these problems, in addition to the problems of distance or access, the Ghana Health Service in 2005 implemented a policy on community-based planning and services (CHPS). Among other things, the policy sought to recruit and train community-based health workers and volunteers to provide health care in areas where professional health workers like nurses, midwives and doctors may be lacking, or unwilling to work. One of the purposes of this was to bring health services to the door step of the population at risk, thus addressing problems of distance from nearest healthcare facilities, while addressing issues of staff shortage (GHS 2005). It may also address problems of waiting time (which

some doctors, nurses, midwives and pharmacists identified as the highest priority [see Chapter 5, Section 5.3]), since patients may not need to wait for hours to take their turns. Thus, access, staffing and waiting time may be seen as closely related, and one of the ways these could be addressed would be appropriate policies.

To conclude, the author wishes to note that the refusal of staff to work in rural areas, as well as the general shortage of staff, especially in deprived areas of Africa, has implications for the care of pregnant women in the affected communities. This is because an insufficient number of staff implies less attention to individual needs of pregnant women, including one-to-one health education. While acknowledging the fact that it is the responsibility of health directors and managers to ensure that these problems are addressed with implementation of appropriate health policies, the formulation of these policies and the issue of resource provision for the health sector require political commitment, since these are government responsibilities.

6.3.3 Government Commitment/Political Will

This challenge was identified by respondents based on the assumption that the ultimate responsibility of resource allocation and approval for programmes comes from those in positions of political power, and that regardless of how effective a programme may be, they cannot be implemented locally without the support of local policymakers (even if funding comes from an external source) (see Chapter 5, sub-section 5.7.1). The commitment of African leaders to malaria prevention and control is evidenced by the establishment of the Roll Back Malaria (The Abuja Declaration 2000) (see Chapter 1, sub-section 1.3.1).

However, in terms of commitment to this pledge, there have been regional variations based on country specific situations, including political climate, availability of state resources in relation to competing demands; geographical factors; and the extent of disease burden (WHO/UNICEF 2003; WHO 2006; WHO/UNICEF 2006; Yartey 2006; Mboera et al. 2007; WHO 2009) (also refer to

Chapter 1, Table 1.1). These factors have been reflected in the level of performance with regards to malaria prevention and control. While some countries are making steady progress, others are still lagging behind (RBM Partnership 2007; WHO 2009).

Nevertheless, recent efforts by the African Union resulted in the formation of an African Leaders' Malaria Alliance (ALMA) to end malaria-related deaths, and this could be viewed as one manifestation of political commitment (ALMA 2009). The establishment of exemption policies in favour of vulnerable groups such as pregnant women and children under the age of five regarding intermittent preventive treatment (IPTp and IPTi); free net distribution and subsidies; and the waiving of tax and tariffs on the importation of mosquito nets and related chemical products in some African countries, further illustrates the extent by which political will can strongly influence health outcomes (WHO 2006; Hill & Kazembe 2006; GHS 2007; Baum & Marin 2008; Akinleye et al. 2009).

African leaders need to show strong political commitment by ensuring political stability among member states, fight poverty, hunger and illiteracy especially among women in deprived communities, while seeking innovative ways of making resources available. This involves collaborative efforts with the health sector, including malaria prevention and control among pregnant women. A number of countries are still struggling to implement malaria control planned programmes in the midst of scarcity of resources as in the case of Uganda (WHO 2009). In others, there has been stagnation in health indicators compared to African and developing countries average as in the case of Nigeria (Gustafsson-Wright & van der Gaag 2008). In Ghana, Nigeria, Ethiopia and Tanzania, the maternal mortality rate is still on the increase (WHO World Health Statistics 2006, 2011; GHS 2007, 2009); while in Malawi there has not been any recent improvement regarding the trend of morbidity and mortality rates due to malaria (WHO 2009) after a progressive decline in morbidity and mortality trends a few years ago (RBM Partnership 2007). Financial allocation to IEC programmes is still low compared to other malaria prevention and control interventions in Eastern and Southern

African countries (WHO 2009). Therefore, as evidence of commitment to malaria IEC programme implementation, governments, through health sector ministries need to consider this as one of the key budgetary components, not to be relegated to the background.

In short, there is still room for improvement and need to engage political groups in IEC programme acceptance. However, with the perceived increase in government interest in malaria in pregnancy (see Chapter 5, Figures 5.24 and 5.25). This may be a step in the right direction. To this end, some respondents suggested that funds meant for the health sector programmes be released on time in order to enable planned programmes to be carried out on schedule. Increased funding of the health sector has also been recommended as a way to address consequences of staff shortage and inadequate healthcare infrastructure (Uneke et al. 2008). The next section focuses on some of the planned programmes, or challenges; in particular, female education, poverty and empowerment, that require political commitment on the part of African leaders, which when addressed, could enhance IEC programme impact.

6.3.4 Education, Poverty and Women's Empowerment

6.3.4.1 Female Education

Related to the issue of incorporating malaria control messages into the elementary school curriculum is the need to lay emphasis on early female education so as to empower children with knowledge and understanding when they grow into men and women of reproductive age. The survey suggests that one way of addressing IEC challenges is to give due regard to the education of young girls (early female education) (see Chapter 5, Figure 5.20 and 5.21). This was not included in the review as no evidence made a direct link between early female education and malaria in pregnancy. However, early female education appears to be a long-term approach to addressing poverty and women empowerment, as these challenges seem to affect utilisation of health services and, for that matter, malaria control in pregnancy. This is an interesting

suggestion since it is established that there is a direct correlation between level of education and health (Grossman & Kaestner 1997; Kennedy 2003).

The survey indicated that one of the reasons for lack of impact of IEC strategies is illiteracy (see Chapter 5, Figure 5.26). If that is the case among pregnant women in Africa, then it is important to take a critical look at what this implies. Overbosch et al. (2004, p.277) in their paper on investigating determinants of antenatal care use in Ghana, suggest that

“...pregnant women with more schooling have a higher propensity to seek sufficient antenatal care from all providers...”

According to Grossman and Kaestner (1997), education in general improves health and that the reverse is also true. The relationship between educational background of an individual and health has been extensively explained theoretically by Kendel (1991); Grossman and Kraesman (1997); and Kennedy (2003).

Kennedy (2003) suggests that not only are more educated people healthier, they also consistently choose better health behaviours. This implies that, if more pregnant women are less educated or illiterate, there is the likelihood that they may not be in the position to choose better health behaviours regarding malaria in pregnancy, thus limiting the impact of IEC strategies, if not addressed. However, some less educated individuals may invest the little they have in their health. Moreover, there are those who may be willing to become literate, but are not privileged enough to have access to formal education, as is the case in some rural African societies (see levels of literacy in Ethiopia, Ghana, Nigeria and Tanzania in Chapter 1, sub-section 1.5.4). With strong political will, this could be addressed in order to ensure equity in education, and thereby promoting better health for pregnant women. It may however, be unrealistic to assume that this will be completely achieved given the context, as both the review and the survey identified resource constraints as one of the challenges (see Chapter 4, sub-section 4.6.3.6 and Chapter 5, Sections 5.6 and 5.7).

Kennedy (2003) suggests that individuals may invest in their health based on ability. If Kennedy's (2003) view is anything to go by, then the ability of pregnant women to make their own choices regarding their decision to seek appropriate health in relation to malaria prevention and control may be undermined, if they are less educated. If women's ability is defined in terms of decision making, it is important to gauge this against the dominance of their male spouses (Heggenhougen et al. 2003; Mbonye et al. 2005; Apusigah 2007; Okerinde 2008; UN Women 2011). In the light of the present study, it may be argued that, all of the evidence of the systematic review and the survey results on the IEC strategies would have been meaningless in such a context. However, it is not true that all women are unable to take their own decisions (see sub-section 6.2.7).

If more pregnant women are educated, they would be able to make better choices to enhance their own health and that of the foetus (Heggenhougen et al. 2003). Using the case of Ghana, Overbosch et al. (2004, p.277) suggest that

"adequate antenatal care use in Ghana can be promoted effectively by extending the supply of antenatal care services in the rural area, by general education policies and by specific policies that increase reproductive health knowledge".

Therefore, by enhancing their education status, this could result in increased reproductive health knowledge, leading to increased health benefits for pregnant women.

6.3.4.2 Managing Poverty

The systematic review identified poverty in relation to pregnant women's ability to acquire mosquito nets (see Chapter 4, sub-sections 4.5.2 and 4.6.3). This was confirmed by the survey which showed that managing poverty was rated above moderate level as a challenge across the study countries (see Chapter 5, Figures 5.14 and 5.15). The issue of poverty is a common feature in most countries in

sub-Saharan Africa (for example, see Chapter 1, Table 1.1). Therefore, it may be inappropriate to be concerned with IEC strategies if not addressed.

Recent World Bank and the United Nations reports support these findings (The World Bank 2008; UN Women 2011). This means that the issue of poverty still persists in Africa and may impact on pregnant women's ability to access health information. According to the RBM Partnership (2010), at the moment, malaria is understood to be both a disease of poverty and a cause of poverty in Africa. It is also shown that malaria serves as a major constraint to economic development, affecting nations' Gross Domestic Product (GDP), and hence needs not to be overlooked (RBM Partnership 2010). For example, Mboera et al. (2007, p.1) reports that in Tanzania

"the socio-economic impact of malaria is so high that it contributes to poverty and underdevelopment."

This has been considered one of the differentiating factors between malarious and non-malarious economies, so that the more a country is overburdened with malaria, the more its economic growth is affected and vice versa (WHO 2007; RBM Partnership 2010). A simple illustration is a situation where the breadwinner is stricken down by malaria. It means, low productivity, which may systematically result in poverty, if this pattern continues due to break from work (Panvisavas 2001). Thus, there is a relationship between malaria and poverty. In order to break this cycle, respondents suggested a need for women's empowerment, equity in resource distribution and political will (see Chapter 5, Figure 5.21).

In his study on poverty and malaria in a Thai-Myanmar Border in South-east Asia, Panvisavas (2001) notes that poverty has the ability to deprive people of antimalarial resources, and thus, further exposing them to malaria. Panvisavas (2001) suggests that on one hand, people are deprived of malaria knowledge, bednets, access to health care and food, and that on the other hand, they are forced by poverty to be exposed to malaria.

Low level of education among pregnant women may also be exacerbated by poverty levels, often common among populations in Africa, where social amenities and healthcare facilities are inadequate (Heggenhougen et al. 2003; Mubyazi et al. 2005; Uneke et al. 2008). This may also affect the ability of women to have access to relevant health information. Commenting on how some of the challenges could be addressed, some Nigerian respondents cited the case of lack of electricity in some rural communities, which affect their ability to watch TV through which they could have access to health information. Some respondents indicated that poverty is still an issue alongside illiteracy in Africa (see Chapter 5, Figure 5.26) (also see Chapter 1, sub-sections 1.5.2 and 1.5.4). If pregnant women could get support from their spouses or government through engagement in small and medium scale enterprises (for example, trading and farming), this may help address their financial problems (Okerinde 2008). In some cases, interventions to address women's poverty may require constitutional reforms as in the case of recent UN intervention efforts through collaboration with the government of Kenya (UN Women 2011).

The survey suggests a need for introduction of exemption policies that provide free ITNs and SP for IPTp pregnant women (see comments by the Tanzanian respondent in Chapter 5, Section 5.8). This is confirmed by WHO Regional Report on use of nets (see WHO/UNICEF 2006). In the case of private sector involvement, subsidy is given (WHO/UNICEF 2006). The suggestion of introduction of exemption policies implies that the policies are either not in place in some countries, or not working where they already exist. Nevertheless, it has been reported in a study in Tanzania that even where nets were provided free of charge, only 30% used them (Mboera et al. 2007). Thus, there is no guarantee that mosquito nets will be used even if they are free. However, this is not to say that all pregnant women will behave the same way. Besides, not all pregnant women are so poor that they cannot afford the cost of mosquito nets. It may be suggested that for exemption policies to be sustainable and yield maximum benefits, policymakers need to assess the socio-economic background of pregnant women. This will help isolate the poor from the rich and thereby ensure

cost-saving. Regarding the poor, the cost argument is not confined to the purchase of mosquito nets; there is also the need to look at other issues such as cost of transport (see Chapter 5, Figure 5.21) and daily living, which may be beyond the means of health care providers on the ground, thus calling for political commitment to address as suggested by other respondents (see subsection 6.3.3).

6.3.4.3 Women's Empowerment

Related to the arguments on managing poverty is the issue of women's empowerment. This challenge was identified in the review (see Chapter 4, subsections 4.5.2 and 4.6.3) and the survey. In the survey, women's empowerment was rated above moderate level (see Chapter 5, Figures 5.14 and 5.15). It was also perceived as a means of overcoming challenges (see Chapter 5, Figure 5.21). Although it has been noted that women are gradually being empowered in Africa, the pace of empowerment still needs to be addressed, including decisions to manage malaria in pregnancy (see Heggenhougen et al. 2003; Apusigah 2007; UN Women 2011).

One major concern identified in the survey was women's overreliance on their spouses. Commenting on the issue of reliance on spouses for support, evidence from the systematic review shows that male dominance still persists in some African societies, preventing women taking their own decisions (Mbonye et al. 2005). This is also supported by Heggenhougen et al. (2003) and Apusigah (2007).

The relationship between poverty and women's empowerment as well as the pace of progress to the cause of women in Africa, has been comprehensively articulated in the works of Apusigah in the area of gender and equity in Ghana (see Apusigah 2007). According to Apusigah (2007), issues of women's empowerment and poverty reduction have been raised at different fora over the years at both national and global levels with the engagement of development planners and policymakers. However, Apusigah notes that much of what has

been achieved regarding women's empowerment is due to the work of women through activism and advocacy. Despite all these efforts, she reiterates that more and more women have been victims rather than being beneficiaries of development and poverty reduction plans, thus undermining their empowerment.

6.4 Concerns of Non-Impact

Related to the challenges were issues of concerns of non-impact of IEC strategies in terms of knowledge of use of malaria control interventions and adherence. The systematic review did not reveal high level of impact, and not all respondents agreed that IEC strategies had made any impact (see Chapter 5, sub-section 5.10.3).

Pointing to the evidence of non-impact, some of the respondents claimed there was lack of practical knowledge in relation to use of insecticide-treated nets (ITNs). This observation was confirmed by Panther-Bricks et al. (2006) in their study on repair of nets by communities in The Gambia. As an evidence of non-impact, the study by Launiala and Honkasalo (2007) indicates the inability of some pregnant women to provide accurate information of intermittent preventive treatment with sulphadoxine-pyrimethamine (IPTp-SP) following routine health education during antenatal care (see sub-section 6.2.1). A recent cross-sectional study in Nigeria about knowledge of IPTp-SP also suggests low level of awareness among pregnant women (Akinleye et al. 2009). These authors' study contrasts with the claim by respondents in the survey that health seeking behaviour had improved (see Chapter 5, Figure 5.25). In their study, Akinleye et al. (2009) report that, although pregnant women lived a very short distance away from the primary health care facility, early enrolment was low. In the survey, it was noted that some women lacked the appreciation of the importance of ANC (see Chapter 5, Figure 5.26) through which routine health education talks are commonly delivered to pregnant women in health units in Africa (see for example, Nganda et al. 2004; WHO/UNICEF 2006). Perhaps, this partly explains the findings of Akinleye et al. on enrolment.

Other key concerns expressed by respondents in the survey are reported, including lack of adherence of some pregnant women regarding malaria treatment (see Chapter 5, Figure 5.26). Therefore, even if something was effective, it might not get done. In relation to the question of non-adherence, Akinleye et al. (2009) identified similar problems in her recent study in Nigeria. These included poor adherence to the directly observed therapy (DOT), which requires that pregnant women take their medication under the supervision of a health worker (WHO/UNICEF 2003; Hill & Kazembe 2006); and lack of supervision by health workers (Akinleye et al. 2009). The evidence of non-impact by respondents in the survey also point to the view that IEC programmes are either newly emerging or not yet established in some countries as in the case of evidence from Ethiopia and Tanzania. This implies that there is room for improvement with regards to the design and implementation of IEC strategies. This has been confirmed by a WHO (2009) report on East and Southern Africa.

In order to address the IEC component of the problem, Akinleye et al. (2009) suggest that plausible interventions should include developing a health promotion package to explain the benefits of SP as an agent of intermittent preventive treatment, and to counteract the perception that SP was harmful both to the pregnant woman and the foetus. The authors also recommend the need for continuing education and training of health workers to improve their knowledge on malaria in pregnancy, particularly regarding the IPTp strategy and the DOT scheme. Furthermore, they suggest that activities of health workers in charge of ANC clinics should be supervised. Moreover, they suggest the need for provision of a special IEC package aimed at creating awareness of the general public on the use and safety of SP in pregnancy with emphasis on pregnant women and adolescents. The author wishes to add that, from evidence in this study, an ideal package of IEC messages should also include information on the use of ITNs, indoor residual spraying, and all relevant messages related to malaria in pregnancy that take into consideration areas with stable and unstable malaria (WHO/UNICEF 2003; WHO/UNICEF 2006; Yartey 2006). Finally, this package needs to have a strategic focus in the form of a national communication strategy

(strategic plan) developed and implemented within the overall framework of the national health sector strategy, and not as an isolated document. There is therefore the need to take a closer look at the various ways of overcoming IEC challenges as identified by respondents in the survey. This takes the discussion to the next section.

6.5 Overcoming Challenges

While Sections 6.3 and 6.4 focused on key IEC programme implementation challenges and concerns of non-impact, this section focuses on the perspectives of respondents regarding how some of the challenges could be addressed. As has been seen, the relationship among challenges may be varied and complex, and may need a more holistic approach to addressing them. To this end, respondents gave a number of ways of overcoming some of the challenges (see Chapter 5, Figure 5.21). For the purpose of this discussion, the key ones are: developing an IEC communication strategy; developing IEC materials and programme implementation guidelines; embarking on community-based health education campaigns; the need for attitudinal change; strengthening capacity building; commitment and participation; the need for political will; and IEC programme monitoring and evaluation.

These proposed ways of overcoming challenges require actions to be taken at different levels with some expected benefits (see Table 6.1). Each of these is discussed in turn.

Table 6.1 Dimensions of Key Issues, Level of Action and Expected Benefits

No	Key Issue	Level of Action	Expected Benefit
1	Developing communication strategy	The Ministry of Health in collaboration with other key stakeholders	Increased awareness and attitudinal change leading to improved health seeking behaviour and increased utilisation of health service
2	Developing IEC materials and programme implementation guidelines	The National Malaria Control Unit in collaboration with other public health sector departments such as the National Reproductive Health Unit.	It may facilitate a successful implementation of IEC programmes to bring about the desirable impact on malaria in pregnancy (MIP)
3	Community-based health education campaigns	All stakeholders: the National Health Service; women in reproductive age; opinion leaders, NGOs, FBOs, CBOs and other relevant organisations	Increased awareness of malaria in pregnancy, malaria prevention and control measures; changed negative cultural beliefs; improved health seeking behaviour.
4	Strengthening capacity building	The National Health Service and intersectoral collaboration	Increased manpower requirements at all levels with particular emphasis on rural settings
5	Attitudinal change	The National Health Service; NGOs; FBOs; CBOs, directors; managers, frontline health workers and pregnant women	Improved client/staff relationship resulting in increased positive health seeking behaviour and increased utilisation of health services
6	Commitment and participation	Individual staff, pregnant women, household, community, government and all relevant sectors	Holistic approach to healthcare leading to community ownership, pregnant women becoming agents of behavioural change resulting in improved health seeking behaviour and utilisation of health services, including malaria control interventions
7	Need for political will	The government in partnership with the private sector and the donor community	Appropriate policy formulation and resource commitment to malaria prevention and control, including malaria in pregnancy
8	IEC Programme monitoring and evaluation	The National Health Service; directors, managers and field supervisors of both public and private sector organisations.	Facilitates implementation of IEC Programmes in accordance with predetermined aims and objectives

6.5.1 Developing Communication Strategy

From Table 6.1, it may be noted that one of the ways of addressing the challenges is to develop a more holistic communication strategy (IEC strategic plan). The need to address this issue has also been recognised by the Global RBM Malaria Partnership in the Global Malaria Action Plan (2010) and Akinleye et al. (2009). This is crucial as it gives a strategic direction of IEC programme implementation. Findings of the survey (see Chapter 5, sub-section 5.10.3) presupposed that, as at the time of data collection, the Ministry of Health of Tanzania had not yet institutionalised her communication strategy to guide operationality of IEC programmes, and that a communication strategy was yet to be institutionalised. Evidence suggests that although a communication strategy has been developed in Tanzania, it is yet to be disseminated, and that current efforts are weak and fragmented (PMI Tanzania 2011) (see Chapter 1, sub-section 1.5.6.4[ii]). In line with this, the need to set up a functional group to coordinate IEC programmes by the National Malaria Control Programme Unit (NMCP) was recommended (see Chapter 5, Section 5.8). This may be seen as a laudable idea, if the above issue was the case in Tanzania. However, this may come at a financial cost.

It was also suggested that resources should be mobilised from international donor partners in order to enhance IEC programme implementation. The author considers this to be a step in the right direction. However, for resource mobilisation to be sustainable, relying on international partners alone may not be advisable, since the withdrawal of support of the proposed partners as a result of unforeseen circumstances in future (as in the case of global economic crisis) may jeopardise sustainability of IEC programme development and implementation.

For malaria endemic countries such as Ethiopia and Tanzania who had not yet developed a communication strategy, this is the right time to get it done, if the Roll Back Malaria strategic objectives for pregnant women were to be achieved. This is the responsibility of the Ministries of Health through National Malaria Control Units, in collaboration with other key stakeholders such as community-

based organisations, opinion leaders, faith-based organisations, non-governmental organisations and the donor community, in order to encourage a shared ownership of the plan.

6.5.2 Developing IEC materials and Programme Implementation

In line with the above is the issue of developing IEC materials and implementation guidelines. It is the responsibility of National Malaria Control Units that appropriate IEC materials and guidelines are developed to facilitate IEC programme implementation. Without these, it may not be possible to implement IEC programmes, since health educators need guidelines to guide them in message delivery to pregnant women. This brings into focus the suggestion that community health education campaigns should be pursued (see Chapter 5, Figure 5.20 and 5.21). It became evident from the review and the survey that most of the attention appears to have been given to health facility-based education programmes. By paying equal attention to community-based interventions, as well, this may increase the impact of IEC strategies.

6.5.3 Strengthening Capacity Building Versus Community-Based Health Education Campaigns

Achieving the above may not be possible if there is insufficient number of staff (see sub-section 6.3.2) (also see PMI Tanzania 2011, as discussed in Chapter 1, sub-section 1.5.6.4 [ii]). Therefore, strengthening the capacity building effort has also been proposed, as the survey suggests that staff shortage was a big challenge, confirmed by existing literature. In order to embark on both health facility-based and community-based education campaigns, more staff need to be trained, including training in communication skills, cultural awareness and attitudinal change (see next sub-section on attitudinal change). This relates particularly to deprived communities, where access to health education messages is also noted to be an issue, as in the case of lack of access to power supply, and for that matter access to TV (see Chapter 5, Figure 5.26). Strengthening capacity building effort at the community level could lead to an increased number of competent staff. As a result, pregnant women could have access to health

information, and thereby be in a position to make informed decisions regarding their health.

6.5.4 Attitudinal Change

Inasmuch as there may be long held cultural beliefs and practices (see Chapter 1, Section 1.5), which may take time to change, the issue of attitudinal change may also be considered critical in relation to malaria prevention and control. The need for attitudinal change was recognised as one of the ways of addressing some of the challenges. As discussed earlier, the perceived negative attitudes of some staff may serve as impediment to utilisation of health services by pregnant women (see Chapter 4, sub-section 4.6.4.1 and sub-section 6.2.1). Health professionals should not expect their clients to comply and adhere to advice if they themselves are not prepared to change negative attitudes (which may discourage clients). However, attitudinal change may also be required from pregnant women if health services are to be sufficiently utilised. Therefore, the issue of attitudinal change should involve both healthcare professionals and pregnant women in this context. This brings into focus the need for commitment and participation.

6.5.5 Commitment and Participation

Healthcare professionals need to recognise the fact that pregnant women are not passive recipients of packaged malaria control messages. Rather, they should be seen as active participants, who have some form of knowledge and experience as adult learners (Merriam & Caffarella, 1991; Daines et al. 1992, 1993; Smith 1999; Rogers 2002, 2003; Merriam et al. 2007). By encouraging client and community participation, ownership of the message is transferred to the pregnant woman, who may in turn feel committed to share their knowledge and experience to others (see chapter 5, Figure 5.25) through appropriate social networks (for example, community women's group meetings, and religious group meetings), and thereby promoting information dissemination in a cascading fashion. This has proved to be useful in western cultures (McPherson et al. 2010) and Africa, as in the case of Ethiopia (Kidane & Morrow 2000). Such a commitment does not only

rest with the healthcare professional and the pregnant woman, but also the wider public, with the government as the major driving force. This leads to the issue of need for political will.

6.5.6 Need for Political Will

Addressing the challenges may require all 'hands on deck' with the involvement of all stakeholders, including governments in the driving seat. As has been discussed earlier (see sub-section 6.3.3), the role of the government is crucial in terms of policy formulation and implementation through resource mobilisation and distribution. Therefore, this recommendation was considered appropriate, as human, financial and material resources are required for a successful implementation of IEC strategies among pregnant women.

6.5.7 IEC Programme Monitoring and Evaluation

Last, but not the least, programme monitoring and evaluation was proposed by respondents. This is crucial as one needs to know whether IEC programmes goals are being achieved in accordance with the IEC strategic plan (see Chapter 7, Section 7.7 for further discussions).

6.6 The Strategic Importance of IEC Strategies

Evidence from the systematic review shows that IEC is perceived by some medical professionals as unstrategic, and that it is often associated with activities of frontline health workers (Lettenmair 2003). This evidence was supported by the fact that most respondents perceived IEC roles as operational (see Chapter 5, Figures 5.4 and 5.5). Recent evidence supports the view that IEC has not been considered strategic (WHO 2009; Global Malaria Action Plan 2010). According to WHO (2009), the use of evidence-based planning and development of IEC materials is limited, as are funds allocated to IEC programmes. Also, IEC programmes have not been given the same attention as other malaria control interventions (WHO 2009) (see sub-section 6.3.3). Addressing these problems could go a long way to ensure optimum impact. This calls for rethinking of the current image accorded IEC programmes. Thus, IEC programmes need to be

strategically placed within any health sector strategy, if a significant impact is to be made. Thanks to Global RBM Partnership, this gap has been identified with plans underway to ensure that IEC programmes are accorded due attention (Global Malaria Action Plan 2010). In this regard, the document suggests that

“communication activities should be integrated into National Strategic Health Plans, malaria business plans, and education programmes from the very beginning...”

(Global Malaria Action Plan 2010, p.2)

Recognising the strategic importance of IEC programmes, Mboera et al. (2007) note that health communication constitutes one of the key components in malaria prevention and control. They reiterate that lack of effective health communication serves as one of the serious obstacles of most disease control strategies. Furthermore, they note that

“for individuals and households, effective health communication can help raise awareness of health risks and solutions to provide the motivation and skill needed to reduce these risks, help them find support from people in similar situations, and affect or reinforce attitudes.”

(Mboera et al. 2007, p.115)

However, this is not to say that IEC is always considered unstrategic. For instance, the systematic review reveals that Somalia and Uganda have developed strategic plans related to IEC (MOH, Uganda 2005; Somalia Aid Coordinating Body 2006).

Nevertheless, IEC programmes deserve equal attention among the list of interventions pursued by any health sector ministry and its agencies, if malaria control policies are to be successfully implemented in anticipation of any meaningful impact. In this regard, there is the need to define the roles and responsibilities of IEC programme officers (within the organisational structure of the ministry of health or its accredited agency) from national to community level in order to facilitate the implementation process. For those countries already

taking strategic decisions on IEC, this is considered appropriate. Such strategic decisions could reflect on the various IEC strategies identified in the study and their relative impact. For example, depending upon the nature of educational needs of pregnant women in a particular healthcare system, the Ministry of Health may either identify a particular IEC strategy or a combination of strategies.

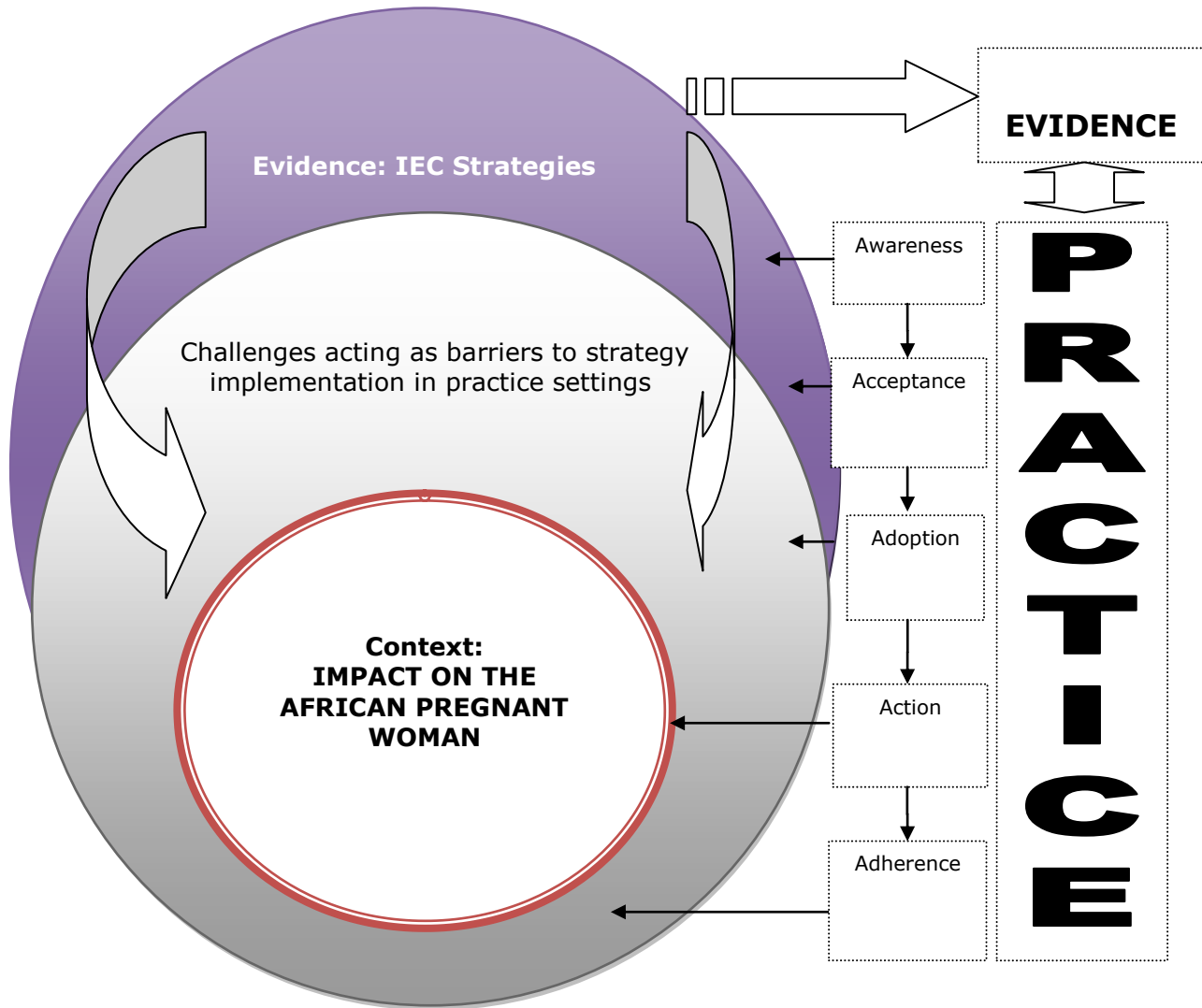
6.7 Relationship Between Evidence and Practice

In order to draw this discussion to a conclusion, this section focuses on the relationship between evidence and practice. This includes the relationship between the process of IEC strategy implementation and challenges in relation to malaria in pregnancy. It may be suggested that the extent to which positive impact can be made on the health of pregnant women with malaria depends upon the number of challenges confronting the implementation of IEC strategies. Different colours have been used in Figure 6.1 for the purpose of illustration. The grey portion between the strategies and impact on pregnant women in the diagram thus, shows the extent to which challenges can serve as barriers in practice settings. The pink colour² points to pregnant women and their environment.

For the purpose of discussions, Glasziou's (2004, 2005) Pipeline Model will be used to illustrate how evidence may relate to practice using IEC strategies and challenges. Figure 6.1 suggests that there may be a 'pipeline' along which evidence flows into practice. Using Glasziou's (2004) Pipeline Model (see Chapter 3, section 3.4) the relationship between evidence and practice may be explained in terms of how IEC strategies could be implemented in such a way as to ensure that positive impact is made among pregnant women in Africa in the face of any actual or perceived challenge. It has been shown in this study that there was awareness of the evidence, not only by healthcare practitioners (health professionals), as Glasziou suggested, but also by clients.²

2. Clients here refers to FBO Representatives

Figure 6.1 Relationship Between Evidence and Practice



Source: Adapted from Glasziou’s (2005) Pipeline Model

As evidenced in the survey (see Chapter 5, sub-section 5.10.2) and the systematic review (Miafo et al. 2004; Nganda et al. 2004; van Eijk et al. 2004; IHRDC 2005; van Geetruyden 2005; and Owusu-Adjei et al. 2007), the translation of knowledge to practice begins with increased awareness and knowledge through implementation of IEC strategies, resulting in positive health seeking behaviour. At the acceptance stage, the current study demonstrates that respondents accepted the evidence as relevant and that the IEC strategies were applicable to their country specific context, as no respondent regarded any of the

evidence as irrelevant. In terms of availability of resources (specified in the Glasziou's model) required to carry out IEC strategies, health professionals and representatives of FBOs confirmed challenges of staff shortage and addressing managing resources (see Chapter 5, Figures 5.14 and 5.15) as some of the issues they were confronted with in their respective countries.

The evidence of impact suggests that IEC strategies were working in practice settings (see Chapter 5, Figures 5.24 and 5.25). This presupposes that, not only were health professionals putting their knowledge into practice, but also pregnant women were accepting, adopting and adhering to malaria control messages being disseminated. However, the survey shows that not all prescribers were adhering to malaria treatment guidelines. On the part of pregnant women, the study reveals that some women were unable to put their knowledge into practice as evidenced by lack of adherence of some with regards to malaria treatment. This shows that there was room for improvement with respect to behavioural change involving both health professionals and pregnant women (see Chapter 5, Figure 5.26).

The Pipeline Model suggests that pregnant women's only role is to adhere at the end of the pipeline. As shown above, this study, has however, demonstrated that Glasziou's pipeline model is as relevant to pregnant women's own action learning as much as to healthcare practitioners'. For IEC strategies to make an impact, pregnant women need to have both awareness and knowledge, be ready to accept the message, adopt the message within their country specific contexts, and to take the necessary action to utilise the relevant malaria control interventions by adherence to the advice of the appropriate health professional. In effect, although the pipeline model was originally designed for health professionals regarding the translation of evidence into practice, the model could also be used to show how awareness could result in adherence by pregnant women. Thus, the model can serve the purpose of both health professionals and pregnant women in terms of considering translation of evidence into practice.

Another key element of Glasziou's (2005) Pipeline model applicable to the study is the issue of 'leakage' of evidence. It may be argued that if there is increased level of awareness and knowledge among pregnant women, it probably means that there was minimal leakage in the pipeline along which malaria control messages were disseminated to pregnant women. The 'leakage' factors in the current study could be referred to as challenges confronting IEC programme implementation, which Wimpenny et al. (2008) refers to as barriers. These challenges or barriers may be addressed by the way in which the strategies are implemented in the appropriate context (see Section 6.6) in order to increase adherence and for that matter impact of IEC strategies among pregnant women.

6.8 Strengths and Limitations of Methodological Approaches

As noted earlier in Chapter 3 (see Section 3.1), the study design involved a mixed method approach. Within this design the study was conducted in two phases – a systematic review of evidence and a survey of Ethiopia, Ghana, Nigeria and Tanzania. The benefits of adopting this approach are manifold. The systematic review used different protocols for the review process which helped to identify different dimensions of evidence in accordance with the Rycroft-Malone et al.'s (2004) idea of what counts as evidence in evidence-based practice. This included the use of different appraisal tools for the appraisal of various types of evidence (see Appendices 4-6); using different data extraction sheets for the extraction of different types of evidence (see Appendices 7-8); and triangulation of the various types of evidence as part of a narrative synthesis (see Chapter 4, Figure 4.4). This could be described as a within-method approach of mixed methods or triangulation (see Chapter 3, sub-section 3.1.3) (Denzin 1970; Mitchell 1986; Kimchi et al. 1991; Boyd 2000; Tashakkori & Teddlie 2003).

The inclusion of a survey of the participating countries helped to complement outcomes of the systematic review. The findings suggest that there is a relationship between evidence and practice (see Figure 6.1), as respondents identified with all the evidence during rating and ranking. By consensus, no evidence was considered irrelevant. However, this does not mean that the study

did not identify any new knowledge. Available evidence suggests that this is the first time evidence of IEC strategies has been systematically examined, evaluated, and structured in this way in the area of malaria in pregnancy within the African context. Existing evidence appeared ad-hoc and scattered. Bringing together all this evidence therefore, could help health policy planners, directors and managers of health to develop IEC strategic plans on malaria in pregnancy, and on malaria control in general in Africa. By complementing the evidence of the systematic review, the survey provided external validity, since the findings of both phases of the study, together, have relevance to all malaria endemic countries, despite cultural differences across different African countries.

In analysing the survey data, within-method triangulation was also used (see Chapter 3, Table 3.1). This was evidenced in the use of non-parametric tests and sensitivity analysis involving FBO representatives. This was applied to both IEC strategies and implementation challenges. By applying these techniques, different dimensions of the findings were identified. For instance, when data on health professionals were analysed with the exclusion of FBO representatives, it was possible to compare the opinion of respondents across the study countries. However, there was the need to ascertain whether an inclusion of FBO representatives would make any change in outcomes of findings. Following an inclusion of representatives of FBOs the author was able to determine whether there were differences in outcomes or not (see Chapter 5, Figures 5.6; 5.7; 5.14; 5.15; 5.22 and 5.23). However, this raised questions regarding representativeness of the sample. For example, the convenience and snowball type of sampling brought in difficulty in accepting the opinions as representative of an African response and one between FBO representatives and health professionals.

As such, the collective sample cannot be described as representative of the whole population. However, given the fact that the sampling technique was non-probabilistic, it could be argued that the number of respondents was adequate for the study. Secondly, the fact that the survey was preceded by a systematic

review of evidence which cut across Africa, suggests that any gap resulting from low number of respondents would be offset by effect of the latter, thereby enhancing external validity.

In designing the questionnaire, the author anticipated the possibility that some respondents might assign the same scores to a number of questions, making it difficult to observe any differences among the questions regarding opinion expression. Therefore, other questions were posed. These required respondents to rank their highest and lowest IEC strategies and challenges. In this way, the author was able to ensure discrimination and gauge relative priorities of responses. Thus, internal validity within analysis of the primary data was enhanced through triangulation.

In effect, the strongest benefit for designing the study based on a mixed method approach was that it helped to achieve a strong internal and external validity and reliability, as well as a comprehensive multiperspective view (Boyd 2000; Thurmond 2001; Perone & Tucker 2003). It is worth noting that using this mixed method approach did not come with ease; and with strengths came challenges and limitations. There were challenges as the process was tedious and time consuming, given the fact that different types of findings had to be integrated or synthesised in such a way as to arrive at meaningful conclusions (Owens 1989; Morse 1991; Rees & Bath 2001; Creswell & Clark 2007; Creswell 2009). Another limitation resulted from lack of uniformity in the sampling frames for the survey. For instance, FBO representatives were only recruited from Ghana, without a corresponding recruitment of same sample group in the other countries due to lack of resources in terms of finance and time. This created a challenge in terms of comparative analysis across the study countries. To this end, future researchers are called upon to ensure that any attempt to replicate this study takes this gap into consideration.

Another related limitation posed by lack of resources, involved the engagement of the services of focal persons to co-ordinate recruitment and data collection in the

various study countries, without the author's direct involvement in the data collection process. The issue here was the possibility that some focal persons might have been selective in determining who to recruit. However, in addition to a close monitoring of the data collection process, the author provided guidelines to the focal persons (see Appendix 12).

In Chapter 3 (see sub-section 3.2.5.3) one of the inclusion/exclusion criteria for the systematic review was language. In this regard, the systematic review involved only English. This means that some relevant evidence may have been excluded from the study. However, this limitation was warranted because of the complexity and cost of translation of text from different languages into English. Furthermore, by limiting the systematic review to 2000-2008, some additional relevant evidence may have been missed, either before 2000 or after 2008. However, there was the need to define the period of the study in order to contextualise it. For instance, by starting the review from 2000, one could relate the issues being investigated to the introduction of Roll Back Malaria in Africa, which gave impetus to current malaria prevention and control interventions, including IEC interventions (The Abuja Declaration 2000).

Moreover, the fact that the systematic review was carried out solely by the author, contrary to the normal practice of two or more reviewers (see for example, Pearson et al. 2005; JBI Reviewers' Manual 2008), means that some amount of subjectivity could arise. However, this was unavoidable as the study required that only the author should be involved. Nevertheless, since the review was closely supervised, the tendency to be overly subjective was curtailed.

Despite these limitations, it was worth pursuing the mixed method approach since the combined evidence of the systematic review and the survey contributed to enhancing the credibility of findings, adding to the robustness of the data gathered in the field (see Owens 1989). This argument has been amply supported by Owens (1989, p.4 as follows:

“Once a proposition has been confirmed by two or more measurement processes, the uncertainty of its interpretation is greatly reduced. The most persuasive evidence comes through a triangulation of measurement processes. If a proposition can survive the onslaught of a series of imperfect measures... confidence should be placed in it.”

Finally, the mixed method approach was considered beneficial as it made a contribution to the feasibility, appropriateness, meaningfulness and effectiveness (FAME) scale, by identifying and evaluating IEC programme challenges. It may be noted that in developing the FAME scale, the JBI Reviewer’s manual (2008) fell short of considering the issue of challenge. Perhaps this is implicit in the *feasibility* dimension, as there appears to be an inverse relationship between feasibility and level of challenge; that is, as the level of challenge of adopting a strategy decreases the more feasible it becomes to implement it. This issue will be discussed in the next chapter where theoretical frameworks and their application are considered (see Chapter 7, Table 7.1 and Figure 7.1).

6.9 Summary and Conclusions

The aim of this chapter was to discuss the key issues identified in both phases of the study, namely the systematic review of evidence and the country surveys in relation to other sources of literature, in order to draw appropriate conclusions. In doing so, the researcher has addressed: impact of IEC strategies; implementation challenges; concerns of non-impact; overcoming challenges; the strategic importance of IEC strategies; the relationship between evidence and practice; and strengths and limitations of the mixed method approach. In triangulating the findings, a key feature was a combination of responses from both health professionals and representatives of faith-based organisations. This blend of results, it is hoped, has enriched the outcome of the study through the diverse perspectives presented.

While discussing the impact of IEC strategies and their implementation challenges, attention was also drawn to the strategic importance of the IEC strategies. The central focus of the study was to identify evidence of impact of

the strategies in relation to feasibility, appropriateness, meaningfulness and effectiveness. By tagging evidence of impact to specific strategies, the impact of each strategy and their relative importance has been illuminated.

Given the discussion of evidence, one is tempted to assume that the strategy which is most feasible, appropriate, meaningful and effective is health education talks in health units. If that is the case, what happens to pregnant women not attending clinics? This is a clear evidence of the weakness of focusing attention solely on health education talks in health units. A closer look at the evidence suggests that different IEC strategies may be designed to address different learning needs of pregnant women living in malaria endemic countries in Africa. These learning needs may be context specific. However, overall, no single IEC strategy can claim to hold the key to the educational needs of all pregnant women, given the complexities of the issues discussed so far. Therefore, the key approach seems to lie in the use of a combination of all the strategies. Put simply, researchers, policymakers, IEC programme managers and implementers need to pay equal attention to both institutional and community-based education campaign strategies if substantial and meaningful impact is to be made.

It may be said that evidence from the systematic review was confirmed by the survey as some perspectives corresponded to the review categories. Where there were gaps in the literature, these were addressed by the survey with an inclusion of latest evidence in the international literature. By reviewing IEC strategies and challenges, and carrying out the survey in this study, baseline data were generated, upon which future researchers could build their research agenda in the area of information, education and communication as applied to malaria prevention and control among pregnant women in Africa. Evidence of impact suggests that IEC is working, and perceived as impacting on malaria in pregnancy. However, there is room for improvement. Doing one thing alone will not work; more evidence of impact is required to know what works and in what context.

Chapter 7

Applying Frameworks for Implementation, Monitoring and Evaluation

7.1 Introduction

Based on the systematic review of evidence across malaria endemic countries in Africa and the survey in Ethiopia, Ghana, Nigeria and Tanzania, this chapter focuses on application of an IEC strategy implementation equation aimed at enhancing the understanding of issues related to implementation of IEC strategies. It seeks to assist those in relevant positions, to make decisions about which IEC strategy to employ at any given point in time, by making comparisons between strategies in relation to associated challenges. The equation also aims at demonstrating the relationship between feasibility and level of challenge of IEC strategies. Following this, an IEC programme monitoring and evaluation plan has been proposed to demonstrate the need to sustain and improve upon the implementation of IEC programmes.

7.2 IEC Strategy Implementation Equation

This equation is built on the relationship among feasibility, appropriateness, meaningfulness and effectiveness regarding implementation of IEC strategies and for that matter impact of the strategies. This equation was tentatively presented in chapter 3 (see Chapter 3, sub-section 3.3). In this chapter, it is further developed and applied in the light of the study findings. The equation states that the success of implementation of an IEC strategy is equivalent to the positive impact that strategy makes regarding malaria prevention and control among pregnant women. This implies that the lower the level of success of implementation the lower the impact of the strategy in question. This is represented by the following equation:

$IECsip = IEC \text{ Impact}$, where impact is defined as $f(a+m+e)-c$, where $IECsip$ is a function of appropriateness, meaningfulness and effectiveness, subject to challenges, where:

IECsip=IEC Strategy Implementation Success among Pregnant Women

F=Feasibility

A=Appropriateness

M=Meaningfulness

E=Effectiveness

C=Level of IEC strategy implementation challenge

Using the same Likert Scale (1-5) in the rating of IEC strategies, level of challenge, and feasibility, appropriateness, meaningfulness and effectiveness of IEC strategies, a number of interpretations have been made. The assumption of using the Likert Scale is based on the view that one needs to take into account the opinions of stakeholders based on what they perceive as impact of the strategy. The author wishes to suggest that where this is not taken into account such a project or programme has less chance of success. The judgement of the consuming public of the service may therefore be very crucial as much as that of the programme managers and implementers. In order to ensure consistency, the same equation needs to be used to gauge the opinions of programme managers and implementers. This explains why the survey involved both health professionals and lay persons, where health professionals represented programme managers and implementers; and representatives of FBOs representing clients (the consuming public, including pregnant women).

The equation is designed using findings of the survey to demonstrate the relationship between implementation success and perceived impact of IEC strategies. In order to observe differences in outcomes using the equation, two different scenarios (notably health professionals only and health professionals and FBO representatives combined) are presented. For the purpose of this chapter, the two scenarios will be based on mean scores of health education talks in health units and house-to-house sensitisation since these two provided opposite results in certain respects based on the survey. In showing how the

equation works, a number of assumptions are made in mathematical terms as follows:

Let us assume a scenario of the highest possible level of success or impact of an IEC strategy, where:

Feasibility =5 (very easy to adopt)

Appropriateness=5 (very high)

Meaningfulness=5 (very high)

Effectiveness=5 (very high)

Level of Challenge=1 (very low)

IECsip=impact of IEC strategies

$$= f (a+m+e)-c$$

Therefore, IECsip=5(5+5+5)-1

$$= (25+25+25)-1$$

$$=75-1$$

$$=74$$

By this scenario, for an optimum level of impact to be made in the implementation of an IEC strategy, the level of success should be equalled to **74**. The level of challenge equated to **1** implies that there needs to be some human endeavour to overcome the challenge, but that this should be relatively easy. Equating level of challenge to 0 would have been unrealistic (and inconsistent with the 5-point Likert Scale) since no human endeavour is devoid of any iota of challenge.

7.2.1 Examples Based on Survey Findings Using Mean Scores: Health Professionals Only

Applying the above equation to some of the primary data, the following examples are presented.

7.2.1.1 Health Education Talks

Taking the example of health education talks in health units (see Chapter 5, sub-sections 5.9.1.1 to 5.9.1.4), the following equation would be created:

$$\text{Feasibility}=3.9$$

$$\text{Appropriateness}=4.0$$

$$\text{Meaningfulness}=4.1$$

$$\text{Effectiveness}=3.9$$

Assuming the priority challenge is problem of distance (chapter 5, sub-section 5.6.1) from the nearest healthcare facility, the level of challenge based on empirical evidence =3.9

$$\text{IECsip}=f(a+m+e)-c$$

Therefore, the level of success of implementing a health education strategy in health units = 3.9 (4.0+4.1+3.9)-3.9

$$=3.9 (12)-3.9$$

$$=46.8-3.9$$

$$=41.9, \text{ approx. } 42$$

Assuming the highest possible level of success on a scale of 1-5 is **74** as shown in the hypothetical case, by expressing 42 as a percentage of 74, the probability that the strategy will be successful is 57% (i.e. $42/74 \times 100$).

7.2.1.2 House-to-House Sensitisation

Taking the example of house-to-house sensitisation (see Chapter 5, sub-sections 5.9.1.1 to 5.9.1.4), the following equation would be created:

$$\text{Feasibility}=2.4$$

$$\text{Appropriateness}=3.5$$

$$\text{Meaningfulness}=3.8$$

$$\text{Effectiveness}=3.6$$

Assuming the priority challenge is staff shortage (see Chapter 5, sub-section 5.6.1),

$$\text{Level of challenge}=3.9$$

$$\text{IECsip}=f (a+m+e)-c$$

Therefore, the level of success of implementing house-to-house sensitisation

$$= 2.4 (3.5+3.8+3.6)-3.9$$

$$= 2.4 (10.9)-3.9$$

$$= 22.16-3.9$$

$$= \mathbf{18.26, approx. 18}$$

Assuming the highest possible level of success on a scale of 1-5 is **74** as shown in the hypothetical case, by expressing 18 as a percentage of 74, the probability that the strategy will be successful is 24% (i.e. $18/74 \times 100$).

Comparing health education talks and house-to-house sensitization, an IEC programme manager may now decide to choose the former case based on the results. However, since the above calculations are only based on health professionals, it would not be a good idea to proceed. This is because of the lack of input from clients. Therefore, a second phase of calculation has to be considered based on the sensitivity analysis as reported in chapter 5.

7.2.2 Examples Based on Survey Findings Using Mean Scores: Health Professionals and FBO representatives Combined

Applying the equation to some of the primary data involving both health professionals and FBO representatives combined, the following examples are presented.

7.2.2.1 Health Education Talks

Taking the example of health education talks in health units (see Chapter 5, sub-sections 5.9.2.1 to 5.9.2.4), the following equation would be created:

$$\text{Feasibility}=3.8$$

Appropriateness=3.8

Meaningfulness=3.9

Effectiveness=3.8

Assuming the priority challenge is problem of distance (see chapter 5, sub-section 5.6.2) from the nearest healthcare facility, the level of challenge based on empirical evidence =3.9

$$IECsip=f(a+m+e)-c$$

Therefore, the level of success of implementing a health education strategy in health units

$$\begin{aligned} &= 3.8(3.8+3.9+3.8)-3.9 \\ &= 3.8 (11.5)-3.9 \\ &= 43.70, \text{ **approx. 44**} \end{aligned}$$

Assuming the highest possible level of success on a scale of 1-5 is **74** as shown in the hypothetical case, by expressing 44 as a percentage of 74, the probability that the strategy will be successful is 59% ($44 / 74 \times 100$).

7.2.2.2 House-to-House sensitisation

Taking the example of house-to-house sensitisation (see Chapter 5, sub-sections 5.9.2.1 to 5.9.2.4), the following equation would be created:

Feasibility=2.5

Appropriateness=3.4

Meaningfulness=3.9

Effectiveness=3.6

Assuming the priority challenge was staff shortage based on empirical evidence (see Chapter 5, sub-section 5.6.2), the level of challenge=3.8

$$IECsip=f(a+m+e)-c$$

Therefore, the level of success of implementing a house-to-house sensitisation

$$= 2.5 (3.4+3.9+3.6)-3.8$$

$$= 2.5(10.9)-3.8$$

$$= 27.25-3.8$$

$$= 23.45, \text{ approx. } 23$$

Assuming the highest possible level of success on a scale of 1-5 is **74** as shown in the hypothetical case, by expressing 23 as a percentage of 74, the probability that the strategy will be successful is 31% ($23 / 74 \times 100$).

7.2.3 Comparing the Two Scenarios

Comparing the two case examples of health education talks and house-to-house sensitisation, it would now be advisable for the IEC programme manager to choose health education talks since it has the higher level of probability of success. Although there was no significant difference between the two case examples, at least opinion consultation has been considered based on both health service providers and clients. Evidence shows that stakeholder involvement in programme implementation has several benefits. These include:

- quality input leads to quality decision making
- greater stakeholder satisfaction with the final product come from their involvement in shaping it
- the chances of successful implementation increase as more stakeholders feel committed to the plan or project's goals and take ownership of the plan's design, operations and management (Logan 2004; Global Malaria Action Plan 2010; Shoobridge & Kapila 2010).

By definition a stakeholder is

"any person, group or institution that has an interest in aid activity, project or programme"

(ODA 1995, p.1)

Stakeholder is also

“the name given to those individuals or groups likely to be either directly or indirectly affected by any part of a proposed project development”

(Shoobridge & Kapila 2010, p.4)

In this case the activity, project or programme is an IEC programme that may be implemented following stakeholder consultation through opinion survey. In this study, the primary stakeholders (primary audience) are pregnant women likely to be influenced by implementation of a given IEC strategy such as health education talks or house-to-house sensitisation. A survey is one of the ways through which opinion of stakeholders may be sought as a means of ensuring their participation (Logan 2004; Stokes 2005). By using questionnaires to seek opinion of respondents from representatives of FBOs in addition to health professionals, one could say that this is a step in the right direction, as participants may feel part of the programme and its design. This could ensure programme success when implemented (Logan 2004).

A stakeholder consideration in the implementation therefore has two spectrums. On one hand is the need for commitment on the part of IEC programme officers (facilitators), and on the other the recipients of the educational message (pregnant women). This is consistent with the PARIHS model that suggests that evidence, facilitation and context should be given equal weight (Kitson et al. 1998; Kitson et al. 2008) earlier discussed (see Chapter 3, Section 3.4). It is suggested here that it is when both health professionals (implementing evidence through facilitation) and pregnant women in Africa (context) consider their part that a meaningful success or impact can be made.

For IEC programme officers, there is need for commitment to staff training and orientation not only in terms of context of malaria prevention and control messages, but also the method for communicating the messages in such a way (avoiding potential 'leakage' as suggested by Glasziou [2005] in his Pipeline

model) as to ensure effectiveness. This is based on the assumption that knowledgeable staff are not necessarily knowledgeable educators, since there is no guarantee that knowledge can be transferred successfully to the target audience (Hill & Kazembe 2006; Launiala & Honkasalo 2007). There is also a second provider factor in terms of resource provision for successful implementation of an IEC programme. This is because the fact that staff are well trained and orientated, does not necessarily mean that they will be committed to educate the public, if resources are not available to implement the educational campaign. On the other hand, health professionals may be able to do little if clients are not prepared to embrace new knowledge. Panter-Bricks et al. (2006) suggest that in such circumstances, it may be advisable to focus on those receptive to change in order to achieve results. Therefore, true impact may only thrive when both the health service provider and the service user are prepared to play their part on an equal measure in a collaborative fashion to make things work. In this case, health professionals need to acknowledge the essence of client involvement and community participation right from the design of the strategy to its implementation. This, according to the Global Malaria Action Plan (2010), will lead to success and for that matter a positive impact, with the reverse being a recipe for failure as noted below:

“Community involvement and participation during the design and implementation will ensure the activities are successful. Lessons learned in health promotion have demonstrated that neglecting community involvement in all stages of the program design and implementation will decrease the chances of the program succeeding.”

(Global Malaria Action Plan 2010, p.2)

In line with the above argument, Minja et al. (2001) in their IEC campaign for insecticide-treated nets (ITNs) in Tanzania sought to integrate public health perspectives (for example, input from pregnant women) and community perspective (for example, input from the local community) into a coherent promotional strategy in the form of community mass education campaign.

According to the authors, this approach may become especially important if ITNs are to be introduced under trial conditions. Although the authors did not directly evaluate the impact of the implementation of the strategy, they noticed a sharp rise in the ownership and use of nets by the population, ranging from 10% to more than 50%. In their study, Minja et al. (2001) also notice a major health impact. Finally, Minja et al. (2001, p.619) report that

“these activities contributed significantly to the success of the programme.” .

Stokes (2005) in a study to identify appropriate malaria prevention strategy for a community in Zimbabwe involving mothers/caregivers, concludes that knowledge, attitudes, beliefs and practices of the community strongly affect co-operation in malaria prevention interventions, and that it was both critical and possible to involve the community in the planning of appropriate strategies, including health education to prevent malaria incidents. Therefore, involving pregnant women and the community in the design and implementation of IEC strategies could result in increased impact.

7.3 Relationship Between Feasibility and Level of Challenge

There appears to be an inverse relationship between feasibility and level of challenge. In this case, as the level of challenge decreases, the feasibility of implementing a given strategy increases. Conversely, as feasibility increases, the level of challenge decreases (see Table 7.1 and Figure 7.1). This means that the higher the level of challenge the lower the feasibility. This makes sense, because if a given strategy is not feasible to implement, it means that the challenge to implement it may be overwhelming. The author also wishes to suggest that the level of challenge reaches its maximum point where feasibility is the lowest. At the point of equilibrium (moderate level) both feasibility and level of challenge are equal in measure. The overall relationship between feasibility and level of challenge is represented in Figure 7.1. This may be suggestive of an optimum (where feasibility is high and level of challenge is low) or a minimum level of impact (where level of challenge is high and feasibility is low). Using Table 7.1

(derived from a 5-point Likert Scale for rating of the IEC strategies) the hypothetical relationship between feasibility and level of challenge could be established.

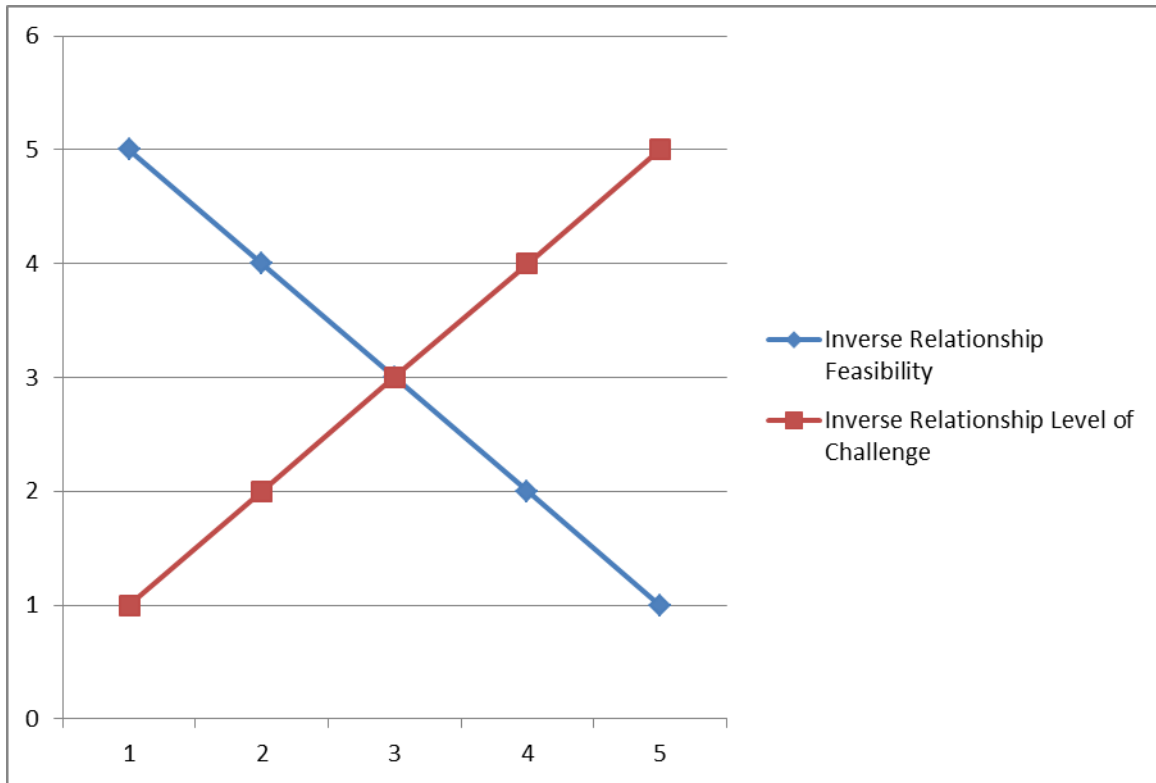
Table 7.1 Relationship Between Feasibility and Level of Challenge

Level of Challenge	Feasibility
1	5
2	4
3 [equilibrium point]	3 [equilibrium point]
4	2
5	1

Table 7.1 is represented graphically in Figure 7.1. It may be observed that as the level of challenge increases (x-axis) from 1 to 5, feasibility (y-axis) decreases from 5 to 1 and vice versa, showing an inverse relationship. At 3 (equilibrium point) both feasibility and level of challenge are equal as earlier explained.

To illustrate Table 7.1 and Figure 7.1, let us assume that the identified strategy is house-to-house sensitisation, while the challenge is managing staff shortage as illustrated in the two equations earlier on (see sub-sections 7.2.1 and 7.2.2). If for some reasons (for example, lack of finance), a health institution is not able to recruit an adequate number of staff (for example, health extension workers), this may impede efforts to embark upon a house-to-house sensitisation campaign, which is said to be labour intensive. Later, if government honours its commitment by providing funding aimed at recruiting more staff, it may be feasible to implement the house-to-house sensitisation programme, given that the priority challenge confronting its implementation is staff shortage. This may therefore, minimise the level of challenge of managing staff shortage and increase the likelihood of implementing the educational campaign strategy in question.

Figure 7.1 Relationship Between Feasibility and Level of Challenge



At this juncture, it is suggested that in order to guarantee programme success, the level of success must not fall below 50% chances of success, herein defined as the equilibrium point. It must, however, be pointed out that being less feasible does not necessarily mean that a given strategy may not be implemented. If there is sufficient evidence to show that a given intervention (though less feasible), is the most appropriate, meaningful and effective, the government or the institution in question may find it prudent to commit a substantial amount of resources to ensure that such an intervention is implemented in the face of other competing demands. For example, the government's intervention could be based on the outcome of an option appraisal and the criticality of the intervention in question as follows:

- in emergency situations, such as the need to embark on a rapid and massive house-to-house education campaign about the use of

intermittent preventive treatment based on sulphadoxine-pyrimethamine as against use of chloroquine; or

- the need for mass education campaign on indoor residual spraying to prevent malaria epidemics in epidemic prone areas.

7.4 Limitations of the Equation

The equation appears to be overly simplistic as it assumes that only one single challenge is associated with implementation of a given strategy. The equation assumes that the mean score of a challenge associated with a given IEC strategy is known along with the knowledge of the measure of feasibility, appropriateness, meaningfulness and effectiveness of the strategy. In reality, there may be a combination of challenges related to implementation of a single strategy. For example, according to the country survey, more than one challenge was identified by respondents in relation to house-to-house sensitisation. These involved staff shortage, financial constraints and the view that the strategy itself was difficult to pursue (see data analysis in Chapter 5, sub-section 5.9.3 for reasons of low feasibility of house-to-house sensitisation).

The equation assumes a linear type of relationship; whereas this may not always be the case in reality, since issues surrounding implementation of the strategies may be dynamic, depending on prevailing conditions at the time of implementation. Its usage may also need to be explored through testing, as the equation is yet to be tested for its potential and wider applicability.

7.5 Strengths of the Equation

Theoretically, the equation shows that there is a direct relationship between implementation success and impact. Additionally, there is a relationship among feasibility, appropriateness, meaningfulness and effectiveness. For instance, if an educational campaign is appropriate, meaningful and effective and yet not feasible to implement there may be no point wasting time with it, unless one is able to provide the needed resources. On the other hand, an intervention must be appropriate in order to be effective (JBI 2008a). Moreover, an intervention

needs to be meaningful if clients are to be considered, since meaningfulness is only relevant from the perspective of the client and not the service provider (JBI 2008a). Together, these relationships are supposed to define the extent of impact of an IEC strategy in relation to any identifiable challenge, so that if the intervention is not feasible, appropriate, meaningful and effective, there is no way a positive impact can be made, unless resources are committed to address the challenge in question.

The equation depicts an inverse relationship between feasibility and challenge. It also takes into account user perspectives and the context within which IEC programmes are implemented. Using the survey as an example, respondents were asked to identify impact based on their specific experiences. These experiences were country specific (see Chapter 5, sub-section 5.10.2) and therefore contextual. The equation may serve as a guide to IEC programme designers and implementers as it takes account of both service providers and clients (represented here by health professional and representatives of faith-based organisations). Since the equation assumes that the opinion of stakeholders is critical, it implies that before implementing any IEC programme, there is the need to seek their opinion in order to promote community ownership for the purpose of sustainability.

Therefore, the equation has a potential of helping decision makers, investors and programme managers to determine which strategy has the greatest potential of being successful, irrespective of the cultural context. To that effect, it may be concluded that the equation has a universal appeal since it may be applied as a conceptual or heuristic framework in all cases of project or programme implementation other than just IEC programmes among pregnant women in malaria prevention and control.

Finally, the equation helps to understand the relationship between implementation success and IEC strategy impact, by defining the component parts in quantitative terms using mean scores based on opinions. With an

illustration of different scenarios, the reader is called upon to make an independent judgement about the equation.

7.6 Minimising Limitations of the Equation

In order to minimise the limitations associated with the equation, emphasis should be placed on a balance between what clients, IEC programme managers and health educators collectively perceive as the highest priority challenge associated with implementation of a given IEC strategy for pregnant women within a given cultural context. Thus, while identifying which strategy has the highest priority, this could be matched with the highest challenge associated with it. The equation needs to be tested in different contexts in order to identify the extent of its applicability, and what needs to be incorporated to make it more suitable in practice.

7.7 IEC Programme Monitoring and Evaluation

This section focuses on the application of IEC programme monitoring and evaluation model reviewed in Chapter 2, Section 2.6. One of the key recommendations given by respondents reported in the survey was the need for programme monitoring and evaluation (see Chapter 6, Figure 6.1). According to Panter-Bricks et al. (2006, p.1)

“behaviour change is notoriously difficult to initiate and sustain, even where communities are well informed about simple means of health promotion or harm reduction.”

This view is said to be applicable to a wider range of behavioural interventions, including IEC (Curtis et al. 2001; Hardeman et al. 2000; Adams & White 2003; Glasgow et al. 2004; Panter-Bricks et al. 2006). Therefore, there is the need for continuous monitoring and evaluation of IEC programmes as they are implemented (see Graham & Logan 2003; MERG 2005; WHO 2005a; Graham 2007; RBM Partnership 2009). It is possible that, in some African countries, even the design stage of IEC programmes for pregnant women and malaria has not been conceived, prior to implementation, as in the case of perception of Ethiopian

respondents. To others, the journey to design strategy has just begun, as in the case of Tanzania (see Chapter 5, sub-section 5.10.3). Nevertheless, it may be crucial to recognise the need for regular monitoring and evaluation of IEC programmes to ascertain whether they have been implemented according to predetermined objectives, and to determine the extent to which impact has been made for pregnant women.

Relating to their balanced scorecard, Kaplan and Norton (1992, 1996a,b) suggest that organisations need to continuously learn and be innovative if they are to survive. In a similar vein, IEC programme managers need to hold learning and innovation in high esteem if they are to make a difference. One way of learning and becoming innovative is by drawing lessons from the experience of programmes that have been implemented. This involves assessing programme impact, while recognising the challenges involved, and feeding back into the design of subsequent programmes in order to achieve desirable impact (WHO 2009). In line with this, Panter-Bricks et al. (2006, p.1) suggest that

“to be successful health interventions should build on existing practices, skills and priorities, recognise the constraints on human behaviour...”

In all learning organisations, knowledge of outcomes or impact of organisational performance may be an opportunity to learn new and better ways of doing things (Kaplan & Norton 1992). In relation to malaria prevention and control, this argument has been re-echoed by Mboera et al. (2007) and in the Malaria Forum Final Report of Bill Gates and Melinda Gates as follows:

“Malaria has plagued humankind for millennia. Every time malaria has been managed by a drug or insecticide, it has evolved to survive and even thrive. Getting and staying ahead of malaria will require innovation: new tools, new ways of thinking about the problem, and new strategies. With even larger control goals, the problems to be solved may lead to prioritisation of additional approaches to ensure that in the long-term malaria will not be a public health threat.”

(Malaria Forum Final Report 2007, p.2)

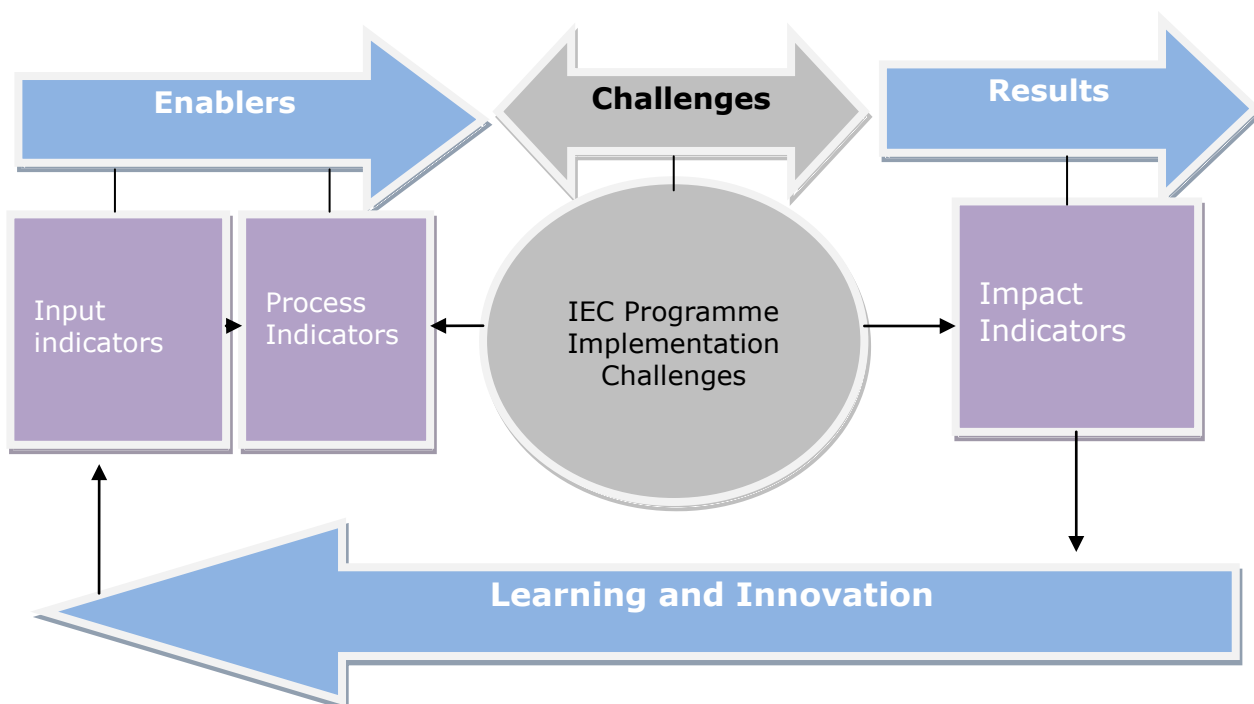
As shown in Figure 7.2, the reverse side of the monitoring and evaluation plan showing the subject of learning and innovation means that the management process is cyclical. With the knowledge of what has been achieved against what has not been achieved, and what works against what does not, organisations are in the position of re-strategising in order to make a better impact. Thus, learning and innovation may be considered an important component of the IEC programme monitoring and evaluation plan in scaling-up for impact.

In designing the monitoring and evaluation programme, three key elements may be required if programme quality is to be maintained (The EFQM Excellence Model 1999, 2005). These are enablers, results and learning and innovation. According to the EFQM Model the enablers are the factors necessary for the implementation of a strategy, while the results are the outcomes of the enablers. For the purpose of this study, the enablers involve inputs or resources that need to be deployed, while the processes are the factors required for a smooth implementation of a given IEC strategy (see Chapter 2, Figure 2.2). In this study, examples of input indicators include knowledge of the context (WHO 2009); availability of a communication strategy (MOH, Uganda 2005; MOH, Kenya 2005; Somalia Aid Coordinating Body 2006); number of staff required (WHO 2005a); logistics requirement (for example, educational materials) (WHO 2005a); financial requirement (WHO 2009); healthcare infrastructural requirement (Mubyazi et al. 2005); and the suitability of the learning environment (context) (Rogers 2003).

However, the last example may be difficult to determine, since this may depend on the knowledge of programme managers and implementers about the context within which a strategy is implemented. This may be addressed based on situational analysis as the starting point of the planning process (WHO 2009). In some cases, this may require study of the culture, including the language of the population under study, or may require the involvement of local researchers as field assistants (GCS 2003a,b,c). On the other hand, the process indicators include development and review of the IEC strategic plan based on situational

analysis and objective setting (MOH, Uganda 2005; Somalia Aid Coordinating Body 2006); recruitment of appropriate staff; how to secure funding for the project; how to promptly deploy appropriate logistics; and the overall mechanism of programme co-ordination (GCS 2003a,b,c).

Figure 7.2 IEC Programme Monitoring and Evaluation Plan



Source: Adapted from EFQM Excellence Model (1999, 2005)

The challenge component may be defined as the intervening factors that may affect a successful implementation of the IEC strategies. In the current study these include: staff knowledge; staff attitude; managing staff shortage; managing poverty; managing resources/resource constraints; managing distance problems; managing waiting time; demystifying negative cultural beliefs; and managing health seeking behaviour (chapter 4, sub-section 4.6.3; and chapter 5, sections 5.6 and 5.7) (see Figure 7.2).

7.8 Summary and Conclusion

This chapter covers two propositions, namely the IEC strategy implementation equation and an IEC programme monitoring and evaluation plan. The key components of each of these have been discussed. It is hoped that adopting these two frameworks will serve as a guide to IEC programme managers and implementers in malaria prevention and control among pregnant women and other population groups. They could also serve as tools for project managers in other fields of endeavour since they both appear to have universal appeal.

For the purpose of this study, the author wishes to conclude that the two frameworks serve as a contribution to the enhancement of understanding of issues related to implementation of IEC strategies, irrespective of the context. It is suggested that care must be taken to avoid the temptation of assuming that feasibility, appropriateness, meaningfulness and effectiveness measures are either equal or unequal. Whether or not they are equal may depend upon the intervention in question and what one considers as a priority at any given point in time during the process of implementation. Secondly, where an implementation effort has been made, conscious effort needs to be made to ensure sustainability. This may in turn, call for regular monitoring and evaluation of work progress and the outcome is fed back into subsequent programme design and implementation. The programme design may require identification and deployment of appropriate input (resources), and a clear definition of process and impact indicators, while anticipating potential challenges that may affect IEC programme implementation, without neglecting input of beneficiary clients or communities.

Chapter 8

Conclusions, Implications, Limitations and Recommendations

8.1 Introduction

This chapter explores the implications of the research findings for the academic community, governments, policymakers, directors and managers of health, frontline health practitioners and health educators at both institutional and community levels. While acknowledging the limitations of the study, this chapter also outlines the contributions of the study to the body of knowledge in the areas of health service management and public health. Limitations and recommendations for future research as well as the dissemination strategies of the findings are also outlined. The first section of the chapter revisits the research aims and objectives as they relate to the findings to determine whether the aims and objectives set from the onset have been achieved. The chapter then takes a look at the implications and recommendations for practice; the research limitations, recommendations for future research and the strategies for the dissemination of findings, and conclusion. The chapter is designed in this way to ensure consistency between the research aims and objectives, methodology, results, discussion and conclusions. Using some of the lessons and best practices, the chapter constructs potential IEC roles and responsibilities for health professionals for malaria endemic countries in Africa within the overall framework of a national health sector strategy, as an extension of the implication for professional practice related to IEC programme implementation.

8.2 Aims and Objectives Revisited

Based on a mixed method approach involving systematic review of evidence and a contextually based country survey, the aims and objectives of the study were to identify evidence of impact of information, education and communication (IEC) strategies in malaria prevention and control for pregnant women in Africa; identify evidence of feasibility, appropriateness, meaningfulness and effectiveness of these strategies, while considering the challenges confronting these strategies. Based on the evidence, it was intended that key lessons and best practices would

be identified in order to inform appropriate stakeholders. Finally, based on the evidence, the author sought to develop a theoretical framework and its application in order to enhance understanding of issues related to implementation of IEC strategies in Africa on malaria in pregnancy.

With regards to the impact, the study succeeded in identifying both general impact and specific impacts of the IEC strategies. The general impacts were those that broadly related to all the IEC strategies, but which could not be assigned directly to any specific strategy, while the specific impact could be tagged to each strategy, thereby helping to identify the relative impact and importance of each strategy (see Chapters 4, 5 and 6).

8.2.1 Specific Objectives:

- i. To identify IEC strategies in malaria prevention and control among pregnant women in Africa*

Through the systematic review of evidence, 10 IEC strategies were identified namely staff training and orientation; advocacy; community mass education campaigns; house-to-house sensitisation; health education talks in health units; visiting places of worship; community women's group meetings; integrated health education campaigns; symbolism versus message delivery; and audience segmentation versus information delivery.

As a result of the follow-up survey in Ethiopia, Ghana, Nigeria and Tanzania, the understanding of these strategies was illuminated. This emerged through rating and ranking of the strategies as well as comments/recommendations by health professionals and representatives of faith-based organisations (FBOs) (most of whom were lay people), thereby providing balanced perspectives of the understanding of the strategies. The differences and similarities of opinion between health professionals and representatives of FBOs were identified based on non-parametric tests (Mann-Whitney and Kruskal-Wallis Tests) and sensitivity analysis. Apart from these strategies, the main additional strategy identified

involved incorporating malaria control messages into elementary school curriculum.

- ii. To identify evidence of feasibility, appropriateness, meaningfulness and effectiveness of Information, Education and Communication (IEC) strategies*

Although this objective was achieved to some extent after the systematic review, the dividing line among feasibility, appropriateness and meaningfulness except for effectiveness was not very clear, as there were overlaps among them in terms of the way the evidence was reported by authors. However, following the survey, a clear distinction was drawn among feasibility, appropriateness and meaningfulness based on the opinion of respondents through ratings. This is one of the ways by which the survey was crucial (see illustration of the IEC implementation equation in Chapter 7). In terms of rating of the strategies, meaningfulness emerged as the highest, followed by appropriateness, effectiveness and feasibility respectively. This was observed through pattern analysis, including sensitivity analyses. After conducting a sensitivity analysis by the inclusion of representatives of FBOs the outcome remained unchanged, confirming a consistency in the overall pattern of ratings by respondents across all study countries.

These indicators became the basis for developing a theoretical framework with the view to enhancing understanding of issues related to implementation of IEC strategies.

- iii. To identify evidence of challenges confronting the implementation of the IEC strategies*

Based on narrative synthesis of the IEC strategies, the main associated challenges were identified as resource constraints; staff shortage; knowledge, attitude and practices; cultural beliefs, health seeking behaviour; distance and waiting time; poverty versus cost of ITNs and women's empowerment. Based on

the survey, these challenges were further explored and identified as problems of managing resources; managing staff shortage; addressing issues of staff knowledge; addressing issues of attitude; dealing with issues of work practices in relation to plans and procedures; managing distance problems; managing waiting time; managing poverty; demystifying cultural beliefs; and managing health seeking behaviour. In analysing these challenges, the similarities and differences of opinions among respondents from the study countries were also considered based on non-parametric test and sensitivity analysis.

Apart from these, an additional challenge was identified by respondents as government commitment/political will. This was perceived by the author as very critical, as the government controls resources, formulates malaria control policies and implements them through the health ministry and its agencies. In identifying these challenges, recommendations to address them from respondents were also taken into consideration.

iv. To develop a theoretical framework and illustrate its application in order to enhance the understanding of issues related to implementation of IEC Strategies

Based on the findings on feasibility, appropriateness, meaningfulness and effectiveness; along with findings on challenges and impact, two IEC strategy implementation theoretical frameworks were developed, namely IEC strategy implementation equation, and IEC programme monitoring and evaluation plan, with a view to enhancing the understanding of issues related to implementation of IEC strategies. In interpreting the equation, two case examples were given based on health education talks and house-to-house sensitisation in relation to two challenges, namely distance problems and staff shortage as these were the most highly rated challenges. Following this, an inverse relationship between feasibility and the level of challenge of an IEC strategy was identified with illustrations. The strengths and limitations of the equation were outlined; and so also were the ways of minimising the limitations. On the other hand, the essence of developing an IEC programme monitoring and evaluation plan was also

brought to the fore, with an illustration of a proposed plan. The key elements of this plan were inputs, process (classified as enablers) and impact indicators (classified as results) based on the EFQM Excellent Model for quality management.

In short, on one hand, the equation established the relationship between an IEC strategy implementation success and its impact. The author came to the conclusion that the equation may be useful in designing an IEC strategy in such a way as to ensure an achievement of desirable impact. On the other hand, the IEC programme monitoring and evaluation plan would serve as a tool for the purpose of sustainability and redesign of an IEC implementation strategy. Thus, both frameworks serve as two sides of a coin.

- vi. To identify best practices and key lessons in order to inform governments, policymakers, health partners, the academic community, health directors, health managers, frontline health professionals, health educators at health facility and community levels on IEC programme development and implementation aimed at achieving desirable impact.*

The study brought to the fore a number of key lessons and best practices (see chapters 6 and 7).

Evidence of impact of IEC strategies suggests that IEC is working, and is perceived as impacting on malaria in pregnancy. However, there is room for improvement, as some concerns still remain. Indeed, the study suggests that different IEC strategies may be designed to address different learning needs of pregnant women that may be context specific. However, the key message of this study is that, no one single strategy is ideal if the most desirable impact is to be made. Therefore, there is a need to pay equal attention to both institutional and community-based strategies. The study also shows that implementation of IEC strategies is associated with challenges, and that this should be considered during the design of any IEC programme. By developing an IEC strategy implementation equation, this research has contributed to enhancing the

understanding of issues related to implementation of IEC strategies. The implications of these and recommendations for practice are outlined in the next section.

8.3 Implications and Recommendations for Practice

Irrespective of the cultural context of any malaria endemic country in Africa, the following implications and recommendations for practice apply.

8.3.1 Implications for Professional Practice

Firstly, although it was reported that there was a high level of awareness of health professionals such as medical doctors, nurses and midwives about malaria control policies, their knowledge did not always translate into positive outcomes. In this regard, it is suggested that health professionals improve upon their communication skills.

Secondly, it was observed that perceived negative attitudes of some nurses and midwives tend to affect the utilisation of health services by pregnant women. Nurses and midwives need to see themselves as the pivot of frontline implementation of IEC strategies since they form the majority of health workers in contact with pregnant women on daily basis. In order to ensure that they are able to fulfil the mission of their professional calling, nurses and midwives need to present themselves as custodians of good conduct in terms of their attitude towards clients, and respect language, customs, traditions and religious beliefs of their audience. In this way, they would be able to encourage positive health seeking behaviour, leading to adherence to measures to prevent and control malaria at individual, household and community levels. Thus, the extent to which health professionals may bring about the needed behavioural change may depend upon their own attitude and commitment.

Thirdly, in order to ensure that health messages are understood, health educators such as nurses, midwives and extension workers need to take into consideration cultural and language differences of pregnant women when

delivering malaria control messages; and to encourage feedback, while at the same time, making themselves approachable and accessible accordingly. In line with this, they also need to be familiar with the meaning of local symbols, metaphors and languages understood by pregnant women.

Finally, in order to encourage good feedback health educators need to be effective communicators.

8.3.2 Implications for Strategic Importance of IEC Programmes

Firstly, the systematic review of evidence showed that some medical personnel perceived IEC programmes as less strategic. Secondly, it appears that very few African countries have a communication strategy (strategic plans) for IEC programmes with regards to malaria prevention and control. To some countries, IEC is a new concept or an emerging concept. Even in some cases the idea of developing a national communication strategy for malaria control is yet to be conceived. It is quite understandable that most of the IEC roles are operational in nature, since the frontline health workers are those in direct contact with pregnant women on the ground. However, for IEC programmes to make maximum impact there may be the need to strategically position IEC roles. In this regard, there is the need for all malaria endemic countries to have strategic plans for IEC programmes. This could result in appropriate allocation of resources to facilitate IEC programme implementation.

Moreover, directors, managers, medical doctors, nurses, midwives, pharmacists, disease control officers and other health professionals in high positions need to recognise the strategic relevance of IEC programmes, and not to relegate them to the background under other routine activities of frontline operatives. In line with this strategic recognition, there is the need to establish the positions of national/federal IEC programme managers; regional/state/provincial IEC programme managers; zonal/and or district health education officers; and community health extension officers, peer mobilisers and volunteers who may work closely with non-governmental organisations (NGOs); faith-based

organisations (FBOs); community-based organisations (CBOs) and maternity homes, whether public or private. Accordingly, a number of roles and responsibilities of IEC programme officers at different levels are proposed.

8.3.2.1 Proposed IEC Roles and Responsibilities of IEC Programme officers

The proposed roles and responsibilities may include but not limited to the following:

i. National/Federal IEC Programme Manager

- Serves as a member of the National Malaria Control Team and the National Reproductive Health Unit Team
- Conducts nationwide situational analysis for IEC programme implementation in consultation with the National Malaria Programme Manager
- Initiates policy decisions on IEC in consultation with the National Malaria Programme Manager and Head of National Reproductive Health Unit
- Develops National Communication Strategy for Malaria Prevention and Control in consultation with the National Malaria Programme Manager and Head of National Reproductive Health Unit
- Co-ordinates all national IEC programmes in consultation with the National Malaria Control Manager and National Head of Reproductive Health Unit
- Develops an IEC Programme Monitoring and Evaluation Plan
- Develops National IEC Training Manual in consultation with the National Malaria Programme Manager and Head of National Reproductive Health Unit for the training of IEC Programme Officers.

ii. Regional/State/Provincial IEC Programme Manager

For the purpose of convenience the term 'region' will be used to mean state or province for the remainder of this study. The proposed roles and responsibilities of the regional IEC programme manager are as follows:

- Serves as a member of the Regional Health Management Team
- Conducts regional situational analysis for IEC programme implementation in consultation with the Regional Senior Medical Officer in charge of Public Health, the Regional Malaria control Officer (if any)¹, and the Regional Public Health Nurse
- Implements National Communication Strategy at the regional level
- Oversees all regional level IEC activities
- Develops regional IEC operational plans in accordance with national communication strategy
- Co-ordinates all regional IEC programmes in collaboration with the Regional Senior Medical Officer in charge of Public Health, the Regional Malaria Control Officer (if any) and the Regional Public Health Nurse
- Provides training and orientation for Zonal and/or District Health Education Officers based on the national IEC training manual in collaboration with the Regional Training Officer (if any)
- Develops a regional IEC programme monitoring and evaluation plan.

iii. Zonal Health Education Officer

This position is only applicable in countries like Ethiopia where the zonal level comes between regional and district level. The proposed IEC roles and responsibilities may include, but not limited to the following:

- Serves as a member of the Zonal Health Management Team
- Conducts zonal situational analysis in consultation with the zonal health officer and Zonal Malaria Programme Manager (if any)

¹ The availability of a regional malaria programme officer may depend on regional capacity to recruit an officer for this position. In the absence of this post, the regional disease control officer may be in charge of all matters related to malaria control at the regional level.

- Implements regional IEC operational plans in consultation with the Zonal Malaria Programme Manager (if any), and the Zonal Health Officer in charge of disease control
- Develops zonal IEC operational plans in accordance with regional operational plans
- Co-ordinates all zonal IEC programmes in collaboration with the Zonal Malaria Programme Officer (if any), and the Zonal Health Officer in charge of disease control
- Oversees all district level IEC activities
- Conducts training and orientation programmes for district health education officers in collaboration with the Zonal Malaria Programme Officer (if any), and the Zonal Health Officer in charge of disease control
- Co-ordinates all zonal IEC programmes in collaboration with the Zonal Malaria Programme Officer (if any), and the Zonal Health Officer² in charge of disease control
- Oversees all district level IEC activities
- Conducts training and orientation programmes for district health education officers in collaboration with the Zonal Malaria Programme Officer (if any), and the Zonal Health Officer in charge of disease control
- Develops a zonal IEC programme monitoring and evaluation plan in collaboration with the Zonal Malaria Programme Officer (if any), and the Zonal Health Officer in charge of disease control.

iv. District Health Education Co-ordinator

- Serves as a member of the District and Hospital management Teams
- Conducts district situational analysis in accordance with the District Director of Health Services and the Senior Medical Officer in charge of the district hospital

² Only a few African countries such as Ethiopia have zonal levels of administration (PMI 2010). Most African countries have district levels of administration reporting to regional levels. In such situations zonal level IEC roles and responsibilities are not relevant.

- Implements zonal/regional IEC operational plans
- Develops district IEC operational plans
- Co-ordinates all district IEC programmes
- Oversees all district and hospital-based IEC activities
- Conducts training and orientation programmes for health extension officers and peer mobilisers in consultation with the District Director of Health Services, the Senior Medical Officer in charge of the district hospital, the District Hospital Matron; the District Malaria Programme Officer (if any)³ and the District Public Health Nurse
- Develops a district IEC programme monitoring and evaluation plan
- Provides feedback to the Zonal Health Officer⁴, and or the Regional IEC Programme Manager, the District Director of Health Services and the Senior Medical Officer in charge of the district hospital.

v. Community Health Extension officer/Peer Mobiliser

- Implements district IEC operational plans in consultation with health centres, health posts, maternity homes, community-based organisations (CBOs), non-governmental organisations (NGOs), faith-based organisations and other voluntary groups,
- conducts community health education campaigns and house-to-house sensitisation in accordance with district IEC operational plans
- Writes field report
- Provides feedback to the District Health Education Officer and/or the District Director of Health Services or the District Health Management Team.

³ Depending upon local capacity, there may or may not be a district malaria programme officer. In the absence of this post, the district disease control officer is directly in charge of malaria control programmes.

⁴ In a situation where there is a zonal level of health, the district health education officer will provide direct feedback to the zonal health educational officer. On the other hand, where the position of the zonal health education officer is not applicable, the district health educational officer will provide direct feedback to his or her regional superior.

8.3.3 Implications for Client and Community Participation

Most of the evidence assumes that pregnant women are passive recipients of knowledge, depending on health professionals for health messages. This trend needs to be reversed. In order to encourage community ownership and engaging women as agents of behavioural change, clients need to be actively involved in health education campaigns in their communities. This could be achieved by encouraging them to learn to share their knowledge and experiences to others through existing social networks as in the case of community women's group meetings, church gatherings and during mosque attendance.

8.3.4 Implications for IEC Programme Implementation

In the first place, IEC programme managers need to focus on IEC strategies for pregnant women and malaria that are feasible, appropriate, meaningful and effective, given the resource constraints confronting the public health sector. However, where a given strategy proves to be less feasible but most appropriate, meaningful and effective, resources need to be mobilised to give it a top priority where practicable.

Secondly, since staff training and orientation was perceived as the highest priority strategy, conscious effort needs to be taken to ensure this strategy is pursued on a continuous basis as a matter of organisational policy. This may help update staff on current malaria control policies and effective ways of communication, and thus enable them to give accurate and up-to-date messages to pregnant women effectively.

Thirdly, since the review showed the prominence of health education in health units over other strategies, coupled with the fact that the strategy emerged as the most consistent and the most highly rated strategy in terms of feasibility, appropriateness, meaningfulness and effectiveness, current efforts of implementing this strategy need to be intensified and sustained in health care settings so as to ensure that all women attending antenatal clinics and maternal and child welfare clinics benefit. Programme managers need not worry about

financial considerations since this strategy is traditionally part of routine health service delivery. However, in order to ensure that health education in health units is given a high priority, its budgetary allocation must be clearly spelt out as far as the hospital budgetary plans are concerned.

Fourthly, since some women do not attend hospital whilst pregnant, they may miss health education messages given in the hospital settings. Therefore, the need to encourage community-based education campaigns to capture this segment of vulnerable population may be crucial; hence the need for such interventions as community mass education campaigns; house-to-house sensitisation; community women's group meetings; and visiting places of worship and other community groups.

Finally, in order to guarantee the involvement of opinion leaders, the media and the entertainment industry to become catalysts of information dissemination, advocacy efforts need to be intensified since current levels are described as rudimentary, most especially at the community level, where sources of relevant health information may be limited to pregnant women.

8.3.5 Implications for IEC Programme Monitoring and Evaluation

In order to ascertain whether IEC programmes for malaria in pregnancy are being implemented according to plan, there is the need to embark on periodic monitoring and evaluation. Regular supervision of staff may provide an opportunity for mentorship to ensure that staff have the necessary skills and competence to effectively implement the strategies. By carrying out regular monitoring and evaluation, programme managers may be able to identify priority challenges such as resource constraints and emerging negative health seeking behaviour, and how these could be addressed. This would ensure that future programme design and implementation efforts are able to help achieve the most desirable impact. Thus, the outcome of the monitoring and evaluation may serve as a feedback to redesigning the implementation strategy for subsequent IEC programme implementation.

8.3.6 Implications for the Media and the Entertainment Industry

There is the need to engage the media and the entertainment industry in mass communication campaigns at all levels. While the media may be good at disseminating health messages to large number of people, the health ministry needs to ensure that accurate health information is given to the public, in order to avoid conflict in information spread and media scare. In the case of the entertainment industry, musicians, comedians, and drama groups and individual artists may be deployed to present health messages in a manner that may be appealing to the consuming public.

8.3.7 Implications for Government, Policymakers and Other Key Stakeholders

Since state resources are controlled by the government, coupled with its central role in the formulation and implementation of malaria control policies, there is the need for political commitment on the part of governments regarding IEC programmes for malaria in pregnancy. This needs to be translated into actions evidenced by:

- equity in resource distribution between urban and rural settings, so that for example, people can have access to excellent healthcare and good sources of health information
- early release of funds to ensure that programmes are implemented according to plan
- establishment of exemption policies/schemes (including access to free acquisition of mosquito nets and uptake of intermittent preventive treatment) for vulnerable groups such as pregnant women and infants where they are non-existent; while ensuring that existing schemes are working to increase access to healthcare among vulnerable groups such as pregnant women and infants.

While government assumes the driving seat, it needs to galvanise the support of other stakeholders due to limited government budget. This may be achieved through the promotion of intersectoral collaboration and partnership. Specific

stakeholders may include beneficiary clients and communities; frontline health workers; managers, directors, policymakers; the private sector, NGOs, FBOs, CBOs and the international and local donor community. Any government policy seeking to promote general education of females of any age should also incorporate issues of malaria control. Such increased literacy could also result in increased reproductive health knowledge, including malaria in pregnancy.

8.3.8 Implications for Community-Based Health Planning and Services (CHPS)

The Ghana Community-Based Health Planning and Services (CHPS) policy, which seeks to strengthen local capacity, especially at the community level needs to be encouraged in other malaria endemic countries in Africa. This may be achieved through recruitment and use of health extension workers, peer mobilisers and community volunteers, reintroduction of training of community nurse midwives in order to increase service coverage, while at the same time minimising costs, and thereby encouraging efficiency.

The CHPS policy also needs to be incorporated into IEC programmes in order to enhance the effectiveness of community-based health education programmes as a backup to routine health talks in health units. Related to this, is the need to encourage more health workers in deprived community settings, where managing staff shortage poses the greatest challenge. In this regard, staff willing to go to deprived communities need to be given better conditions of service. This may also increase access to good health care without clients having to worry about travelling long distances to seek health care.

8.3.9 Implications for Education and Programme Sustainability

Firstly, as a long-term measure for pregnant women and malaria control, early female education needs to be encouraged and supported through strategic policy initiatives and follow-ups by various ministries of education and other stakeholders within various malaria endemic countries. Secondly, in order to influence positive health seeking behaviour later in adult life, there is the need to

incorporate malaria control education messages into elementary and secondary school curriculum, so that children are exposed to malaria control messages from an early age. This requires collaboration between the ministries of health, the ministry of education and other relevant agencies.

8.3.10 Implications for the Academic Community

From academic point of view it may be concluded that the study has contributed to the building of the body of knowledge in the areas of health service management and public health related to malaria prevention and control in general and pregnant women in particular by:

- Identifying evidence of IEC strategies and their impact with regards to malaria prevention and control among pregnant women in Africa
- Identifying evidence of feasibility, appropriateness, meaningfulness and effectiveness of IEC strategies aimed at malaria prevention and control during pregnancy
- Identifying evidence of challenges confronting the implementation of IEC strategies in malaria prevention and control, most especially in relation to uptake of intermittent preventive treatment and use of insecticide-treated nets
- Identifying key lessons and best practices to inform governments, policymakers, health researchers, health partners, public health directors, managers, frontline health workers, and health educators at both institutional and community levels
- Designing an appropriate framework to enhance the understanding of issues surrounding the implementation of IEC strategies in malaria prevention and control among pregnant women in Africa
- Identifying areas for further research in information, education and communication in malaria prevention and control in general and malaria in pregnancy (MIP) in particular.

8.4 Limitations of the Study

The main methodological limitations of this two-phase mixed method study have been explained in Chapter 6 (see sub-section 6.8) and acknowledged. However, it is appropriate to acknowledge some further limitations relating to the nature and scope of this study. With the systematic review, due to the limited number of studies on effectiveness, it was difficult to fully appreciate the extent of effectiveness and for that matter, the overall impact of IEC strategies in malaria prevention and control among pregnant women in Africa. This led the author to proceed with a follow-up contextually based survey in four African countries where malaria is endemic, in order to complement the outcome of the systematic review. However, it must be noted that a lot needs to be done by future researchers in building the body of knowledge in this area.

Due to time and financial constraints, it was not possible for the author to be in all the study countries at the same time. As a result, with the provision of data collection guidelines, the author had to rely on the goodwill of focal persons in the study countries who volunteered to assist with data collection. Finally, different sampling frames were designed for data collection, resulting in less than optimal uniformity. This did not permit a comparative analysis of FBOs across all the study countries. This creates an avenue for future research. With the evolving nature of malaria prevention and control in Africa, including the study of malaria control vaccines and their future potential in eradicating malaria, the present study cannot predict all the IEC lessons that may be required by pregnant women. These remain to be seen as future interventions unfold.

Overall, the use of a mixed method approach was complex and time consuming. However, the study suggests that there is a relationship between evidence and practice with respondents confirming evidence of the review. Secondly, it helped to ensure internal and external validity, as well as a comprehensive multiperspective view of findings. Thus, the mixed method approach proved to be the most appropriate way of addressing the research questions in hand.

8.5 Recommendations for Further Research

It is recommended by the author that:

- Academic institutions, specialising in reproductive health and midwifery training and research collaborate to validate the IEC strategy implementation equation
- Health institutions collaborate to develop a generic communication strategy for malaria prevention and control
- The World Health Organisation/African Regional Office and selected ministries of health collaborate to test the applicability of the IEC programme monitoring and evaluation plan in Africa based on country specific evidence
- A comparative study of health professionals and lay people is carried out across selected African countries. Where feasible, this should be replicated in other developing countries such as countries from South-east Asia and South America where malaria is endemic in order to ascertain whether the findings have global application.
- Randomised control trials should be conducted with regards to the effectiveness of selected priority strategies, thereby identifying further impact of these strategies in quantitative terms. This may also pave the way for meta-analysis to be carried out by reviewers in order to identify further best practices.
- A study should be carried out to find out whether incorporating malaria control programmes into elementary school curriculum would be beneficial to pregnant women later in their adult life (long after they had been exposed to these messages in school).
- There is the need to explore the effects of cultural differences in relation to the delivery of malaria control messages to pregnant women.
- Future researchers should focus on the cost-benefit analysis of house-to-house sensitisation in order to identify its relative importance in a given context. This may require clinical data to serve as a basis of analysis.

8.6 Dissemination Strategies

“The ultimate purpose of the evidence-based health movement is to improve patient care through the appropriate, timely and effective and personalised use of evidence by practitioners.”

(JBI 2008b, p.1)

Therefore, there is the need to disseminate results of the study, so that healthcare practitioners such as health managers, medical doctors, nurses, midwives and disease control officers can make use of them. For this reason, a number of strategies have been considered. It is proposed that the research findings will be disseminated by:

- Publishing articles in public health, health service management, midwifery, gynaecological and obstetrics, nursing, and malaria journals
- Presenting conference papers at appropriate fora
- Making summary of the research findings available to colleagues, governments, policymakers, health institutions, IEC programme managers, frontline health professionals, including health educators.

8.7 Conclusion

The key message regarding the implementation of IEC strategies is that, no one single strategy is ideal if the most desirable impact is to be made. Therefore, there is the need to pay equal attention to both institutional and community-based strategies. The study shows that no project implementation process is without any challenge. Therefore, in designing an implementation plan of any IEC strategy, one needs to involve relevant stakeholders, without overlooking language, customs, traditions and religious beliefs of pregnant women, in order to minimise the effect of any potential challenge. This also calls for monitoring and evaluation at regular intervals in order to ensure that predetermined objectives are achieved. Evidence of impact of IEC strategies suggests that IEC is working, and perceived as impacting on malaria in pregnancy. However, there is room for improvement as some concerns still remain. It is clear that doing one

thing alone will not work; more evidence of impact is required to know what works and in what context.

By reviewing and evaluating IEC strategies in this study, useful baseline data have been generated, upon which future researchers can build their research agenda in the area of information, education and communication as applied to malaria prevention and control among pregnant women in Africa. Another lesson is the development of an IEC strategy implementation equation designed to enhance the understanding of issues related to implementation of IEC strategies. The implications, including the proposed roles and responsibilities of key actors, also seek to provide insight into how IEC programmes could be effectively implemented. As such, this study makes a distinctive original contribution to the body of knowledge. Given the scale of the problem of malaria in pregnancy detailed at the start of the thesis, it is the author's earnest conviction and hope that this contribution will also be an important and valuable one.

REFERENCES

- Ackon, E.K., 2001. *Management of Healthcare Organisations*. 1st Ed. Accra: BelTeam Publications.
- ABRAHAMSON, J.H. and ABRAHAMSON, Z.H., 1999. *Survey methods in community medicine: Epidemiological research programme evaluation clinical Trials*. 5th Ed. Edinburgh: Churchill Livingstone.
- ADAMS, J. and WHITE, M., 2003. Are activity promotion interventions based on the transtheoretical model effective? A critical review. *British Journal of Sports Medicine*, 37(2), pp.106-114.
- ADONGO, P.B., KIRKWOOD, B. and KENDALL, C., 2005. How local community knowledge about malaria affects insecticide-treated net use in northern Ghana. *Tropical Medicine and International Health*, 10(4), pp366-378.
- ADUGNA, A., 2010. *Malaria in Ethiopia*. Addis Ababa, Ethiopia. [Online]. Available from: www.EthiopiaDemographyAndHealth.org [Accessed 5 February 2010].
- AFRICAN PRESS, 2009. Global: Shortage of midwives "deadly" – women die during childbirth. *A News Bulletin*, May 8 [Online]. Available from: <http://www.africanpress.wordpress.com/2009/05/08/global-shortage-of-midwives-deadly-w-> [Accessed 21 December 2010].
- AGYEPONG, I.A., 1992. Malaria: ethnomedical perceptions and practice in an Adangbe farming community and implications for control. *Social Science Medicine*, 35(2), pp.131-137.
- AHORLU, C.K., DUNYO, S.K., KORAM, K.A. and NKRUMAH, F.K., 1997. Malaria-related beliefs and behaviour in southern Ghana: Implications for treatment, prevention and control. *Tropical Medicine International Health*, 2(5), pp. 488-99.
- AIKINS, M., L., PICKERING, H. and GREENWOOD, B.M., 1994. Attitudes to malaria, traditional practices and bednets (mosquito nets) as vector control measures: a comparative study in five West African countries. *Journal of Tropical Medicine and Hygiene*, 97(2), pp. 81-86.
- AKINLEYE, S., FALADE, C.O. and AJAYI, I.O., 2009. Knowledge and utilisation of intermittent preventive treatment for malaria among pregnant women attending antenatal clinics in primary health care centres in rural southwest, Nigeria: a cross-sectional study. *BMC Pregnancy and Childbirth*, 9(28), pp.1-9.

AKOGUN, O.B. and JOHN, K.K., 2005. Illness-related practices for the management of childhood malaria among the Bwatiye people of north-eastern Nigeria. *BMC Malaria Journal*, 4(13), pp. 1-6.

ALI, A., 2006. *Winning the Fight against Malaria – Tanzania: Education key to Zanzibar’s successful fight*. Programme on malaria/Johns Hopkins Bloomberg School of Public Health, Centre for Communication Programmes/USAID/ANDnetwork.com [Online]. Available from: http://www.malariafree.org./news/successful/tanzania_education.pdf Global [Accessed 10 July 2008].

ALLEN, S. and MEASHAM, F., 1991. In defense of home and hearth? families, friendship and feminine in mining communities. *Paper presented at the Coal, Culture and Community Conference*, Sheffield Polytechnique, September 1991.

ALMA, 2009. *African Leaders’ Malaria Alliance Meeting*. September 2009. [Online]. Available from: ALMA2015.org/African [Accessed 21 August 2010].

ALONSO, P.L, LINDSAY, S.W., ARMSTRONG, J.M.S.R., KEITA, K., GOMEZ, P., SHENTON, F.C., HILL, A.G., DAVID, P.H., FEGAN, G., CHAM, K. and GREENWOOD, M.M., 1993. A malaria control trial using insecticide-treated bed nets and targeted chemoprophylaxis in a rural area of The Gambia, West Africa: The impact of the interventions on mortality and morbidity from malaria. *Royal Society of Tropical Medicine and Hygiene*, 87(2), pp.37-44.

ALTER, S., 2001. *Information systems: The foundation of business*. 4th ed. New Jersey, NJ: Prentice Hall, Pearson Education International.

ALWIN, D. and KROSNICK, J., 1985. The measurement of values in surveys: A comparison of ratings and rankings. *Public Opinion Quarterly*, 49(4), pp. 535-552.

AMUKOYE, E., WINSTANLEY, P.A. and WATKINS, W.M., 1997. Chlor-proguanil-dapsone: effective treatment for uncomplicated falciparum malaria. *Antimicrobial Agents and Chemotherapy* 41, pp. 2261-2264.

ANTMAN, E.M., LAU, J., KUPELNICK, B., MOSTELLER, F. and CHALMERS, T.C. 1992. Comparison of results of meta-analyses of randomised controlled trials. *The Journal of the American Medical Association*, 268(2), pp.240-248.

ANTWI, G.D., 2010. *Factors influencing the uptake of intermittent preventive treatment of malaria in the Bosomtvi district of Ghana*. French Embassy Small Grants programme in the humanities and social sciences. Department of Community Health, School of Medical Sciences, K.N.U.S.T, Kumasi, Ghana.

ANYANGU-AMU, S., 2010. *AFRICA: Shortage of skills for reproductive health*. Print news- IPS Inter Press Service [Online]. Available from: <http://www.ipsnews.net/print.asp...> [Accessed 21 December 2010].

APUSIGAH, A.A., 2007. Gender mainstreaming: The Ghana Poverty Reduction Strategy or is it? *A doctoral thesis submitted in partial fulfilment of the degree of Doctor of Philosophy in Cultural Study*, Queen's University, Kingston.

ASSIEGMANN, K.A. and BLIN, M., 2006. *The best of two worlds: Between-methods triangulation in feminist economic research*. Department of Oriental and African Studies, University of London [online]. Available from: <http://www.soas.ac.uk/departments/depart-info.cfm?navid=437> [Accessed 14 April 2011].

AYI, I., NONAKA, D., ADJOVU, J.K., HANAFUSA, S., JIMBA, M., BOSOMPEM, K.M., MIZOUE, T., TAKEUCHI, T., BOAKYE, D.A. and KOBAYASHI, J., 2010. School-based participatory health education for malaria control in Ghana: Engaging children as health messengers. *BMC Malaria Journal*, 9(58), pp.1-11.

ADDAI, E. and GAERE, L., 2001. *Capacity-building and systems development for sector-wide approaches (SWAs): The experience of the Ghana Health Sector*. Accra, MOH, Ghana [Online]. Available from: www.swisstph.ch/fileadmin/user_upload/pdfs/swap/swap154.pdf [Accessed 11 September 2012].

BABBIE, E., 1990. *Survey research methods*. 2nd ed. Belmont, CA: Wadworth Publishing.

BALABANOVA, D., MCKEE, M. and MILLS, A., eds., 2011. 'Good health at low cost' 25 years on what makes an effective health system. London: London School of Hygiene and Tropical Medicine [Online]. Available from: <http://gh/c.lshtm.ac.uk> [Accessed 20 September 2012].

BANNIGAN, K., DROOGAN, J. and ENTWISTLE, V., 1997. Systematic reviews: What do they involve? *Nursing Times*, 93(18), pp.52-54.

BARAT, L.M., PALMER, N., BASU, S., WORRALL, E., HANSON, K. and MILLS, A., 2004. Do malaria control interventions reach the poor? A view through the equity lens. *American Journal of Tropical Medicine and Hygiene*, 71(Suppl 2), pp.174-178.

BARBOUR, R.S., 1998. Applying triangulation in nursing research. *Applied Nursing Research*, 6(1), pp.47-52.

BARLING, J., 1990. *Employment, Stress and family functioning*. Kingston, Ontario: John Wiley and Sons.

BATEGA, D.W., 2004. Knowledge, attitudes and practices about malaria treatment and prevention in Uganda: A Literature review. *Final Report*, Ministry of Health, Uganda, Kampala, pp.20-24.

BAUM, C.A. and MARIN, C., 2008. Gains in awareness, ownership and use of insecticide-treated nets in Nigeria, Senegal, Uganda and Zambia. *BMC Malaria Journal*, 7(153), pp. 1-10.

BAUWENS, A., 2010. The use of method triangulation in probation research. *European Journal of probation*, 2(2), pp. 39-52.

BERA, 2011. *Mixed methods research: Theoretical arguments for mixed methods research* [Online]. Available from: <http://www.bera.ac.uk/mixed-methods-research/theoretical-arguments-for-mixed-me> [Accessed 14 April 2011].

BERRY, L.V., ed., 1994. *A country study*. Washington: GPO for Library Congress.

BIESTA, G.J.J. and BURBULES, N., 2003. *Pragmatism and educational research*. Lanham, MD: Rowman and Littlefield, Inc.

BIGBEE, J.L., 2007. The relationship between nurse to population ratio and population density: A pilot study in a rural/frontier state. *Journal of Rural Nursing and Health Care*, 7(2), pp. 36-43.

BINKA, F., KUBAJE, A., ADJUIK, M., WILLIAMS, L., LENGELER, C., MAUDE, G., ARMAH, G., KAJIHARA, B., ADIAMAH, J. and SMITH, P., 1996. Impact of permethrin impregnated bednets on child mortality in Kassena-Nankana district, Ghana: a randomised control trial. *Tropical Medicine and International Health*, 1(2), pp.147-154.

BIRUNGI, H. and ONYAANGO-OUMA, W., 2006. *Acceptability and sustainability of the World Health Organisation focused antenatal care package in Kenya*. [online]. Frontiers in Reproductive Health Programme, Population Council Institute of African Studies, University of Nairobi. Available from: http://www.popcouncil.org/pdfs/frontiers/FR_FinalReports/Kenya ANC.pdf [Accessed 15 December 2010].

BLOLAND, P.B. and ETTLING, M., 1999. Making malaria-treatment policy in the face of drug resistance. *Annals of Tropical Medicine and Parasitology*, 93, pp. 5-23.

BMJ EVIDENCE CENTRE, 2011. Best practice: Routine antenatal care. *Monograph* [online]. Available from: <http://bestpractice.bmj.com/monograph/493.html> [Accessed 10 March 2012].

BODDY, D., 2002. *Management: An introduction*. 2nd ed. London: FT/Prentice Hall, Pearson Education.

BORGATTI, S., 1997. *Consensus analysis*. Geneva97 Home Page. [Online]. Available from: <http://www.analytictech.com/borgatti/consensus.htm> [Accessed 15 March 2011].

BOUCHAUD, O., MONLUN, E., MUANZA, K. FONTANET, A., SCOTT, T., GOETSCHER, A, CHULAY, J.D., LE BRAS, L., DANIS, M., LE BRAS, M., COULAUD, J.P. and GENTILINI, M., 2000. Atovaquone plus proguanil versus halofantrine for the treatment of imported acute uncomplicated *Plasmodium falciparum* malaria in non-immune adults: a randomised comparative trial. *American Journal of Tropical Medicine and Hygiene*, 63, pp. 274-279.

BOWLING, A., 1999. *Research methods in health: Investigating health and health services*. 3rd ed. Philadelphia: Open University Press.

BOWLING, A., 2000. *Research methods in health: Investigating health and health services*. 4th ed. Philadelphia: Open University Press.

BOWLING, A. and EBRAHIM, S., 2005. *Handbook of health research methods: Investigation, measurement and analysis*. 1st ed. Maidenhead: Open University Press.

BOYD, C.O., 2000. Combining qualitative and quantitative approaches. In: P.I. MUNHALLI and C.O. BOYD, eds. *Nursing Research: A qualitative perspective*. 2nd ed. Boston: Jones and Bartlett, pp.454-475.

BRANNEN, J., 2005. *Mixed Methods: A discussion paper*. ESRC National Centre for Research Methods; NCRM Methods Review papers: NCRM/005.

BREITMAYER, B.J., AYRES, L. and KNAFL, 1993. Triangulation in qualitative research: Evaluation of completeness and confirmation purposes. *Image: Journal of Nursing Scholarship*, 25, pp.237-243.

BRIAND, V., COTTRELL, G., MASSOUGBODJI and COT, M., 2007. Intermittent preventive treatment for the prevention of malaria during pregnancy in high transmission areas. *BMC Malaria Journal*, 6(160), pp.1-7.

BRIEN, E.S., LORENZETTI, D.L., KENNEDY, J. and GHALI, A.W., 2010. Overview of a formal scoping review on health system report cards. *Implementation Science*, 5(2), pp.1-12.

BRIEGER, W.R., LUCHOK, J., ENG, E. and EARP, J.A., 1994. Use of maternity services by pregnant women in a small Nigerian community. *Health Care Women International*, 15(2), pp.101-110.

BROOKER, S., GUYATT, H., OMUMBO, J., SHRETTA, R., DRAKE, L. and OUMA, J., 2000. Situation Analysis of Malaria in School-aged Children in Kenya – What Can Be Done? *Parasitology Today*, 16(5), pp.183-186.

BROWN, J.E., 2008. The development and evaluation of a holistic approach to obesity management for primary care nurses. *A doctoral thesis submitted in partial fulfilment of the degree of Doctor of Philosophy*. School of Nursing and

Midwifery, Faculty of Health and Social Care, The Robert Gordon University, Aberdeen.

BRYMAN, A., 2006. Integrating quantitative and qualitative research: How is it done? *Qualitative Research*, 6(1), pp. 97-113.

BRYT, R., AIYE, G., BUSIA, A., HORDIE, T. and ADDO, M., 2007. Culture and diversity Issues. In: NATIONAL FORENSIC NURSES' RESEARCH AND DEVELOPMENT GROUP, ed. *Forensic mental health nursing: Forensic aspects of acute care*. London: Quay Books, pp.219-33.

BUCHANAN, J. and CALMAN, L., 2004. The global shortage of registered nurses: An overview of issues and actions. *Report on global nursing workforce*. International Council of Nurses, Geneva, Switzerland [online]. Available from: www.icn.ch/global/shortage.pdf [Accessed 14 June 2009].

BUCKMANN, W.F., 1997. Adherence: a matter of self-efficacy and power. *Journal of Health and Social Behaviour*, 18, pp. 348-366.

BUNDY, D.A., LWIN, S., OSIKA, J.S., MCLAUGHLIN, J. and PANNENBORG, C.O., 2000. What should schools do about malaria? *Parasitology Today*; 16, pp.181-182.

CARE, 2012. *Ethiopia country profile* [Online]. Available from: www.care.org/carework/country/profiles/56.asp [Accessed 4 October 2012].

CARLSON, R.G., WANG, J., SI EGAL, H.A., FALEK, R.S. and GUO, J. 1994. An ethnographic approach to targeted sampling: Problems and solutions in AIDS prevention among injection drug and crack-cocain users. *Human Organisation*, 53(3), pp.279-286.

CAULKINS, D. and HYATT, S.B., 1999. Using consensus analysis to measure cultural diversity in organisations and social movements. *Field Methods*, 11 (5), pp.5-26.

C-CHANGE. 2012. *Malaria prevention campaign tools* [Online]. Available from: www.c-changeprogram.org/where-we-work/ethiopia/malaria-campaign-tools [Accessed 1 October 2012].

CDC-MALARIA WORLDWIDE, 2012. *CDC malaria worldwide activities* [Online]. Available from: www.cdc.gov/malariacdc/activities/tanzania.html [Accessed 7 October 2012]

CHAG, 2010. *CHAG and partners in development of Ghana* [Online]. Available from: chagghana.org/chag/index.php?id=46 [Accessed 1 October 2012].

CHALLIS, K., OSMAN, N.B., COTIRO, M., NORDAHL, G. DGEDGE, M. and BERGSTRÖM, S., 2004. Impact of a double dose of sulphadoxine-pyrimethamine

to reduce prevalence of pregnancy malaria in southern Mozambique. *Tropical Medicine and International Health*, 9(10), pp. 1066-1073.

CHALMERS, I. and ALTMAN, D.G., eds., 1995. *Systematic reviews*. London: British Medical Journal Publishing.

CHANGING MINDS, 2011. *Likert Scale* [online]. Available from: <http://changingminds.org/explanations/research/measurement/likertscale.htm> [Accessed 28 March 2011].

CHIMA, R.I., GOODMAN, C.A. and MILLS, A., 2003. The economic impact of malaria in Africa: a critical review of the evidence. *Health policy*, 63(1), pp.17-36.

CHITTY, K.K. and BLACK, B.P., 2007. *Practical nursing concepts and challenges*. 5th ed. Texas: Saunders, Inc.

CHOMEYA, R., 2010. Quality of psychology test between Likert Scale 5 and 6 points. *Journal of Social Sciences*, 6(3), pp. 399-403.

CHUNG, K.H., 1987. *Management: Critical success factors*. Newton, Massachusetts: Allyn and Bacon, Inc.

CIA WORLD FACTBOOK, 2012. *Facts and figures* [Online]. Available from: <https://www.cia.gov/library/publications/the-world-factbook/fields/2059.html> [Accessed 12 September 2012]

CLEGG, S., 2005. Evidence-based practice in educational research: a critical realist critique of systematic review. *British Journal of Sociology of Education*, 26(3), pp. 415-428.

CLIFF, D. and DEER, R., 1997. Too much like school: social class, age, marital status and attendance/non-attendance at antenatal classes. *Midwifery*, 13(3), pp.139-145.

COCHRANE HANDBOOK, 2007. Reasons for systematic review. *Cochrane Handbook for Systematic Review*. London: Cochrane.

COLLEGE OF NURSES, 2004. *The global shortage of registered nurses: An overview of issues and actions*. Aotearoa (NZ), Inc. [Online]. Available from: http://www.nurse.org.nz/leadership/Is_global_shortage.htm [Accessed 21 August 2010].

COMORO, C., NSIMBA, S.E.D., WARSAME, M. and TOMSON, G., 2003. Local understanding, perception and reported practices of mothers/guardians and health workers on childhood malaria in Tanzania district – implications for malaria control. *Acta Tropica*, 87(3), pp.305-313.

CONTINENTS 2010. *Ghana at a glance*. Accra, Ghana. [online]. Available from: <http://continents.com/images/maps/ghanamap.gif> [Accessed 10 March 2010].

CONNER, M. and NORMAN, P., 2005. *Predicting health behaviour*. 2nd ed. Maitland: Open University Press, McGraw-Hill Education.

CRESWELL J.W. and CLARK, P.V., 2007. *Designing and conducting mixed methods research*. Thousand Oaks, California, CA: Sage Publications.

CRESWELL, J.W., 2009. *Research design: Qualitative, quantitative, and mixed methods approaches*. 3rd ed. Thousand Oaks, London: Sage Publications.

CROMBIE, I.K. and DAVIES, H.T.O., 1996. *Research in healthcare: Design, conduct and interpretation of health services research*. New York: John Wiley and Sons.

CROWLEY, J., HILL, J., YARTEY, J., ROBALO, M., SERUFILIRA, A., BA-NGUZ, A., ROMAN, E., PALMER, A., ASAMOA, K. and STEKETEE, R. 2007. From evidence to action? Challenges to policy change and programme delivery. *The Lancet Infectious Diseases*, 7(2), pp.145-155.

CROYLE, R.T., 2005. *Theory at a glance: A guide for health promotion practice*. 2nd ed. U.S. Department of Health and Human Services, National Institute of Health, Bethesda: NIH Publication No. 05-3896.

CRS, 2012. *Health Partnership* [Online]. Available from: crs.org/Ethiopia/partners.cfm [Accessed 15 September 2012]

CRUMBLE, A. and LAWRENCE, J., 2002. *Living with a chronic condition: a practitioner's guide to providing care*. Oxford: Butterworth Heinemann.

CRUSE, D.A., 1986. *Lexical semantics*. Cambridge: English University Press.

CULTURAL CROSSING, 2012. *A community built guide to cross-cultural etiquette and understanding* [Online]. Available from: www.culturalcrossing.net/basics_business_student.php?id=202 [Accessed 1 October 2012].

CURTIS, V., KANKI, B., COUSENS, S., DIALLO, I., KPOZEHOUEN, A., SANGARE, M. and NIKIEMA, M., 2001. Evidence of behaviour change following a hygiene promotion programme in Burkina Faso. *Bulletin of the World Health Organisation*, 79(6), pp. 518-527.

DAINES, J., DAINES, C. and GRAHAM, B., 1992. *Adult learning, adult teaching*. 2nd ed. Nottingham: Department of Adult Education, University of Nottingham.

DAINES, J., DAINES, C. and GRAHAM, B., 1993. *Adult learning, adult teaching*. 3rd ed. Nottingham: Department of Adult Education, University of Nottingham.

D'ALESSANDRO, U., OLALEYE, B., MCGUIRE, W., LANGEROCK, P., BENNETT, S., AIKENS, M., THOMSON, M., CHAM, M. and GREENWOOD, B.M., 1995. Mortality and morbidity from malaria in Gambia children after introduction of an impregnated bednet programme. *Lancet*, 345(8948), pp. 479-483.

DAL POZ, M.R., KINFU, Y., DRAGER, S. and KUNJUMEN, T., 2006. Counting health workers: definitions, data, methods and global results. *Background paper for World Health Report 2006: working together for health*. World Health Organisation, Geneva, Switzerland [Online]. Available from: <http://www.who.int/hrt/documents/en> [Accessed 22 January 2009].

DAVEY, B., GRAY, A. and SEALE, C., eds., 1995. *Health and disease*. Buckingham: Open University Press.

DENZIN, N.K., 1970. *The research act: A theoretical introduction to sociological methods*. Chicago: Aldine.

DENZIN, N.K., 1978. *The Research act*. 2nd ed. New York, NY: McGraw-Hill.

DERESA, W., ALI, A. and BERHANE, Y., 2007. Maternal responses to childhood febrile illnesses in an area of seasonal malaria transmission in rural Ethiopia. *Acta Tropical*, 102, pp. 1-9.

DIELEMAN, M. and HARNMEIJER, J.W., 2006. *Improving health worker performance: In search of promising practices*. Evidence and Information for Policy, Department of Human Resources for Health, World Health Organisation, Geneva.

DILLMAN, D.A., 2007. *Mail and internet survey: the tailored design method*. 2nd ed. New Jersey: John Wiley and Sons, Inc.

DIXON, R., 2002. *The Management Task*. 3rd ed. Oxford: Butterworth-Heinemann.

DOLPHYNE, F.A., 1996. *A comprehensive course in twi (Asante) for the non-twi lecturer*. Accra: Ghana University Press.

DUNCAN, W.J., GINTER, P.M. and SWAYNE, L.E., 1995. *Strategic management of health care organisations*. 2nd Ed. Cambridge: Blackwell Business.

ELDER, J.P., AYALA, G.X., HARRIS, S., 1999. Theories and intervention approaches to health-behaviour change in primary care. *American Journal of Preventive Medicine*, 17 (4), pp. 275-289.

ENE, A.C., ATAWODI, S.E., AMEH, D.A., KWANASHIE, H.O. and AGOMO, P.U., 2010. Locally used plants for malaria therapy amongst the Hausa, Yoruba and Ibo communities in Maiguguri, Northeastern Nigeria. *Indian Journal of Traditional Knowledge*, 9(3), pp.486-90.

ERAUT, M.R., 2000. Non-formal learning and tacit knowledge in professional work. *British Journal of Educational Psychology*, 70(1), pp. 113-136.

ERICKSON, B.H., 1979. Some problems of inference from chain data. *Sociological Methodology*, 10, pp.276-302.

EXCHANGE, 2005. *Participatory communication in malaria control: why does it matter?* Findings No. 4, October 2005. London [Online]. Available from:http://www.healthlink.org.uk/PDFs/findings_malaria.pdf [Accessed 7 September 2008].

FABIAN, H.M., INGELA, J.R. and WALDENSTRÖM, U., 2004. Characteristics of Swedish women who do not attend childbirth and parenthood education classes during pregnancy. *Midwifery*, 20(3), pp.226-235.

FALADE, C.O., OGUNDIRAN, M.O., BOLAJI, M.O. AJAYI, I.O., AKINBOYE, D.O., OLADEPO, O., ADENEYI, J.D. and ODUOLA, A.M.J., 2006. The influence of cultural perception of causation, complications, and severity of childhood malaria on determinants of treatment and preventive pathways. *International Quarterly of Community Health Education*, 24(4), pp.347-63.

FAPOHUNDA , O.P. and FAPOHUNDA, E.R., 1977. The working mothers of Lagos. *A report submitted to the interdisciplinary communications committee of the Smithsonian Institution*, Washington, D.C.

FEDERAL NIGERIA NMCP, 2013. The Global Fund Nigeria [Online]. Available from:<http://www.nmcpnigeria/?p=gfatm> [Accessed 1 February 2013].

FIELDING, N.G. and FIELDING, J.L., 1986. *Linking data. Qualitative Research Methodology, No. 4*. Beverly Hills, California: Sage Publications.

FISHBEIN, M., 2000. The role of theory in HIV prevention. *AIDS Care*, 12 (3), pp.273-278.

FLICK, V., 1998. *An introduction to qualitative research*. Thousand Oaks, California: Sage Publications.

FMOH, ETHIOPIA, 2006. *National five-year strategic plan for malaria prevention and control in Ethiopia 2006-2010*. FMOH, Ethiopia, Addis Ababa.

FMOH, ETHIOPIA, 2008. Ethiopia national malaria indicator survey 2007. *Technical Summary*. Federal Democratic Republic of Ethiopia, Ministry of Health, Addis Ababa, Ethiopia.

FMOH, NIGERIA, 2008. *National malaria strategic plan 2009-2013*; National Malaria Control Programme, Nigeria, Abuja.

FOREIGN AND COMMONWEALTH OFFICE, 2012. *Sub-Saharan Africa: Nigeria* [Online]. Available from: www.fco.gov.uk/en/travel-and-living-abroad/travel-advice-by-country/country-profile/sub-saharan-africa/nigeria/?profile [Accessed 3 October 2012].

FOSTER, R.L., 1997. Addressing epistemologic and practical issues in multimethod research: A procedure for conceptual triangulation. *Advances in Nursing Science*, 20(2), pp.1-12.

FURNHAM, A., 1999. Overcoming the obstacles – the outsider's view. *Science Direct*, 147(1 suppl), pp.1-10.

GAMBLE, C.L., EKWARU, J.P. and TER KUILE, F.O., 2009. Insecticide-treated nets for preventing malaria in pregnancy. *Cochrane Database of Systematic Review*. Issue 2.

GARDNER, G., GARDNER, A., MacLellan, L. and Osborne, S., 2003. Reconceptualising the objectives of a pilot study for clinical research. *International Journal of Nursing Studies*, 40(7), pp. 719-724.

GARLAND, R., 1991. The Mid-Point on a Rating Scale: Is it desirable? *Marketing Bulletin*, (Research Note 3) 2, pp.66-70.

GCS, 2003a. Analytical report of country case study on management and mechanism of malaria control programmes in Mali. *A final draft report submitted to the Office of the Regional Director, WHO/AFRO, Zimbabwe, Harare.*

GCS, 2003b. Analytical report of country case study on management and mechanism of malaria control programmes in Mozambique. *A final draft report submitted to the Office of the Regional Director, WHO/AFRO, Zimbabwe, Harare.*

GCS, 2003c. Analytical report of country case study on management and mechanism of malaria control programmes in Ethiopia. *A final draft report submitted to the Office of the Regional Director, WHO/AFRO, Zimbabwe, Harare.*

GHANA COUNTRY STUDIES, 2012. *Country studies* [Online]. Available from: <http://countrystudies.us/ghana/50.htm> [Accessed 11 October 2012].

GHANA NEWS AGENCY, 2010. Government to maintain political momentum towards MDG Goals. *Ghana News article*, Accra, Ghana [online]. Available from: <http://www.ghanaweb.com/GhanaHomePage/NewsArchives/artikel.php...-> Accessed [21 December 2010].

GHANA TO GHANA, 2012. *Ghana languages* [Online]. Available from: www.ghanatoghana.com/Ghanahomepage/languages-ghana [Accessed 5 October 2012]

GHANA WEBPAGE, 2010. *Ghana population and demography* [Online]

<http://www.ghanaweb.com/GhanaHomePage/population/php> [Accessed 20 December 2010].

GHANA WEBPAGE, 2012. *Government/politics* [Online]. Available from: www.ghanaweb.com/GhanaHomePage/country_information/ [Accessed 25 October 2012].

GHOSH, S.K., PATIL, R.R., TIWARE, S. and DASH, A.P., 2006. Community-based health education programme for bio-environmental control of malaria through folk theatre (*Kalajatha*) in rural India. *BioMed Central Malaria Journal*, 5(123), pp.1-7.

GHS, 2005. Community-based Planning and Services (CHIPS): The Operational Policy. *Ghana Health Service Policy Document No. 20*. Ghana Health Service, Ghana, Accra.

GHS, 2006. *Annual Report*. Brong -Ahafo Regional Health Services, Ghana Health Service, Sunyani., Ghana. [Online]. Available from: <http://www.ghanahealthservice.org/region.php?dd=6®ion=Brong%20Ahafo%20Region> [Accessed 5 January 2010].

GHS, 2007. *The Health Sector in Ghana: Facts and Figures*. Ghana Health Service, PPME Division, Ghana, Accra.

GHS, 2009. Trends in Health Sector Indicators. *2009 GHS Annual Report*, Ghana Health Service, Accra, Ghana.

GHS, 2010. *Ghana Country Profile*. Ghana Health Service, Accra, Ghana [Online]. Available from: www.ghanahealthservice.org/ [Accessed 12 April 2010].

GHS, 2012. *Roll Back Malaria/National Malaria Control Programme* [Online]. Available from: www.ghanahealthservice.org/malaria_control.php [Accessed 10 October 2012].

GHS FACTS AND FIGURES, 2009. *Health Sector in Ghana: Facts and Figures* [Online]. Available from: www.ghanahealthservice.org/includes/upload/publications/factsandfigures2009.pdf [Accessed 22 October 2012].

GIES, S., COULIBALY, S.O., OUATTARA, F.T., KY, C., BRABIN, B.J. and D'ALESSANDRO, U., 2008. A community effectiveness trial of strategies promoting intermittent preventive treatment with sulphadoxine-pyrimethamine in pregnant women in rural Burkina Faso. *BioMed Central Malaria Journal*, 7(180), pp. 1-14.

GIKANDI, P.W., NOOR, A.M., GITONGA, C.W., Ajanga, A.A. and SNOW, R.W., 2008. Access and barriers to measures targeted to prevent malaria in pregnancy in rural Kenya. *Tropical Medicine and International Health*, 13(2), pp. 208-217.

GLASGOW, R., KLESGES, L., DZEWALLOWSKI, D., BULL, S. and ESTABROOKS, P., 2004. The future of health behaviour change research: what is needed to improve translation of research into health promotion practice? *Annals of Behavioural Medicine*, 27 (1), pp. 3-12.

GLASZIOU, P., 2004. The Evidence-Practice Pipeline: improving practice informed by research. National electronic library for health, phone-in learning session. In: P. Wimpenny, N. JOHNSON, I. WALTER and J.E. WILKINSON, eds. Tracing and Identifying the Impact of Evidence – Use of a Modified Pipeline Model. *Worldviews on Evidence-Based Nursing*, 1st Quarter, p.5.

GLASZIOU, P., 2005. The paths from research to improved health outcomes [Editorial]. *American College of Physicians Journal Club*, 23(3), pp.140-147.

GLOBAL MALARIA ACTION PLAN (GMAP), 2010. *Part IV: The Role of the RBM Partnership – Communication and Behaviour Change Methodologies* [Online]. Available from: <http://www.rollbackmalaria.org/group/4-8.html> [Accessed 2 September 2010].

GOODMAN, L.A., 1961. Snowball Sampling. *Annals of Mathematical Statistics*, 32, pp.148-170.

GO TO AFRICA, 2012. *African Safari Travel* [Online]. Available from: <http://www.go2africa.com/> [Accessed 11 September 2012]

GMAG, 2007. Voices for malaria-free future. *A guide to the promotion of advocacy for malaria control programmes in Ghana*, Accra.

GRAHAM, H., 1992. *Health and Welfare*. Nelson, Watson-on-Thames.

GRAHAM, I.D., 2007. *Ottawa Model of Research Use*. Canadian Institute of Health Research, School of Nursing, University of Ottawa, Ottawa.

GRAHAM, I.D. and LOGAN, J., 2003. Ottawa Model of Research Use. In: K. GRAHAM and GRAHAM I., eds. *Managing risk: senior friendly hospitals and the Ottawa Model for Research Utilisation as a Framework for Change*. Queensway Carleton Hospital; and University of Ottawa and Ottawa Health Research, Ottawa.

GREENBERG, A.E., NSA, W., RYDER, R.W. MVULA, M.M.D., MATADI, N., NSIMBA, K., MATELA, B.M.D., NSUAMI, M.M.D., FARZIN, D. and HASSIG, S.E., 1991. Plasmodium falciparum malaria and perinatally acquired human immunodeficiency virus type 1 infection in Kinshasha, Zaire. *New England Journal of Medicine*, 325, pp.105-109.

GREENHALGH, T., ROBERT, G., MACFARLANE, F., BATE, P. and KYRIAKIDOU, O., 2004. Diffusion of innovations in service organisations: Systematic review and recommendations, *Milbank Quarterly*, 82(4), pp. 581-629.

GREENE, J.C. and CARACELLI, V.J., eds., 1997. *Advances in mixed method evaluation: The challenges and benefits of integrating diverse paradigms*. San Francisco, CA: Jossey-Bass.

GREENWOOD, A.M., ARMSTRONG, J.R., BYASS, P., SNOW, R.W. and GREENWOOD, B.M., 1992. Malaria chemoprophylaxis, birth weight and child survival. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 86, pp. 483-485.

GREENWOOD, A.E., NSA, W., RYDER, R.W., MEDI, M., NZEZA, M., KITADI, N., BAANGI, M., MALANDA, N., DAVACHI, F. and HASSIG, S.E., 1991. Plasmodium falciparum malaria mid perinatally acquired human immunodeficiency virus type-1 infection in Kinshasa, Zaire. A prospective, longitudinal cohort study of 587 children. *The New England Journal of Medicine*, 325, pp.105-109.

GROSSMAN, M. and KAESTER, R., 1997. Effects of education and health. In: J. BEHRMAN and N. STACEY, eds. *The social benefits of education*. Michigan: University of Michigan Press., pp.11-112.

GUBA, E.G., 1987. What have we learned about naturalistic evaluation? *Evaluation Practice*, 8, pp. 23-43.

GUIDE TO WOMEN LEADERS, 2012. *Female presidents* [Online]. Available from: www.Guide2womenleaders.com/presidents.htm [Accessed 27 September 2012].

GUSTAFSSON-WRIGHT, E. and VAN DER GAAG, 2008. *An analysis of Nigeria's health sector by state: Recommendations for the expansion of the Hygeia community health plan*. Amsterdam Institute for International Development, Amsterdam. [Online]. Available from: [Http://s3amazonaws.com/zanran_storage/aiid.org/ContentPages/43468915.pdf](http://s3amazonaws.com/zanran_storage/aiid.org/ContentPages/43468915.pdf) [Accessed 11 September 2010].

GUYATT, H.L., NOOR, A.M., OCHOLA, S.A. and SNOW, R.W., 2004. Use of intermittent presumptive treatment and insecticide-treated bed nets by pregnant women in four Kenyan districts. *The European Journal of Tropical Medicine and International Health*, 9(2), pp.255-26.

HAGOPIAN, A., THOMPSON, M.J., FORDYCE, M., JOHNSON, K.E. and GARY, L., 2004. The migration of physicians from Sub-Saharan Africa to the United States of America: Measures of the African brain drain. *Human Resources for Health*, 2(17), pp. 1-10.

HAMEL, M.J., ODHACHA, A., ROBERTS, J.M. and DEMING, M.S., 2001. Malaria control in Bugona District, Kenya: A survey of home treatment of children with fever, bednet use and attendance at antenatal clinics. *Bulletin of the World Health Organisation*, 79(11), pp. 1014-1023.

HARDEMAN, W., GRIFFIN, S., JOHNSTON, M., KINMONTH, A. and WAREHAM, N., 2000. Interventions to prevent weight gain: A systematic review of psychological models and behaviour change methods. *International Journal of Obesity*, 24(2), pp.131-143.

HARRISON, J., MULLEN, D.P. and GREEN, L.W., 1992. A meta-analysis of studies of the health belief model with adults. *Health Education Research, Theory and Practice*, 7(1), pp.107-116.

HAWLEY, W.A., TER KUILE, F., STEKETEE, R.S., NAHLEN, B.L., TERLOUW, D.J., GIMPNI, J.E., SHI, Y.P., VULULE, J.M., ALAII, J.A., HIGHTOWER, A.W., KOLCZAK, M.S., KARIUKI, A.K. and PHILLIS-HOWARD, P.A., 2003. Implications of the western Kenya permethrin-treated bed net study for policy, programme implementation, and future research. *American Journal of Tropical Medicine and Hygiene*, 68 (4 suppl), pp.168-173.

HAYNES, R.B., DEVEREAUX, P. and GUYATT, G.H., 2002. Clinical expertise in the era of evidence-based medicine and patient choice. *ACP Journal Club*, 136, pp. A11-A14.

HECKATHORN, D.D., 1997. Respondent-driven sampling: A new approach to the study of hidden populations. *Social Problems*, 44(2), pp.174-199.

HEGGENHOUGEN, H.K., HACKETHAL, V. and VIVEK, P., 2003. The behavioural and social aspects of malaria and its control: An introduction and annotated bibliography. *UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR)*, TDR/STR/SEB/VOL/03.1: UNDP/World Bank/WHO Special Programme.

HELMAN, C.G., 2000. *Culture, health and illness*. 4th ed. Oxford: Butterworth-Heinemann.

HELMAN, C.G., 2007. *Culture, Health and Illness*. 5th ed, London: Hodder Arnold.

HEMINGWAY, P. and BRERETON, N., 2009. *What is a systematic review? Evidence-based medicine*. 2nd Ed. Sheffield: Hayward Medical Communication.

HETZEL, M.W., ITEBA, N., MAKEMBA, A., MSHANA, C., LENGELER, C., OBRIST, B., SCHULZE, A., NATHAN, R., DILLIP, A., ALBA, S., MAYUMANA, I., KHATIB, R.A., NJAU, J.D. and MSHINDA, H., 2007. Understanding and improving access to prompt and effective malaria treatment and care in rural Tanzania: the ACCESS Programme. *BMC Malaria Journal*, 6(83), pp.1-15.

HEYEN-PERSCHON, J., 2005. *Report on current situation in the health sector of Ghana and possible roles for appropriate transport technology and transport related communication interventions*. Institute for Transportation and Development Policy (ITDP), USAID, New York.

HIGGS, J. and Titchen, A., 1995. The nature, generation and verification of knowledge. *Physiotherapy*, 81(9), pp.521-530.

HIGGS, J. and TITCHEN, A. , 2000. Knowledge and reasoning. In: J. HIGGS and M. JONES, eds. *Clinical reasoning in the health professions*. 2nd ed. Oxford and Boston: Butterworth-Heinemann, pp.24-32.

HILL, J. and KAZEMBE, P., 2006. Reaching the Abuja target for intermittent preventive treatment of malaria in pregnancy in African women: a review of progress and operational challenges. *Tropical Medicine and International Health*, 11(4), pp. 409-418.

HINCHLIFFE, K., 2002. Public expenditure on education in Nigeria: Issues, estimates and some implications. *Africa Region Human Development Working Paper Series*. Africa Region: The World Bank [Online]. Available from: siteresources.worldbank.org/AFRICAEXT/Resources/no_29.pdf [Accessed 21 January 2013].

HOCHBAUM, G.M., 1958. Public participation in medical screening programmes: A socio-psychological study. *Public Health Service Publication No.572*, Washington DC: United States Government Printing Office.

HOMMERICH, L., VON OERTZEN, C., BEDU-ADDO, G., HOLMBERG, V., ACQUAH, A.P. and EGGELTE. A.T., 2007. Decline of placental malaria in southern Ghana after the implementation of intermittent. *BMC Malaria Journal*, 6(144), pp. 1-8.

HOWE, K.R., 1988. Against the qualitative-quantitative incompatibility thesis or dogmas die hard. *Educational Researcher*, 17(8), pp. 10-16.

HUAILU, C., WEN, Y., WUANMIN, K. and CHONGYI, L., 1995. Large-scale spraying of bednets to control mosquito vectors and malaria in Sichuan, China. *Bull World Health Organisation*, 73, pp. 321-328.

IHRDC, 2005. *ACCESS programme annual report 2005*. IHRDC/Swiss Tropical Institute/Norvartis Foundation for Sustainable Development, Dar es Salaam, Tanzania.

INDEX MUNDI, 2008. Literacy rate-Index Mundi – Country Facts [Online]. Available from: www.indexmundi/facts/Ethiopia/literacy-rate [Accessed 20 January 2013].

INDEX MUNDI, 2009. Literacy rate-Index Mundi – Country Facts [Online]. Available from: www.indexmundi/facts/country/literacy-rate [Accessed 20 January 2013].

INDEX MUNDI, 2010. *Facts and figures* [Online]. Available from: www.indexmundi/facts/country [Accessed 10 October 2012].

INDEX MUNDI, 2012. *Facts and figures* [Online]. Available from: www.indexmundi/facts/ghana/pregnant-women-receiving-prenatal-care [Accessed 10 October 2012].

INTERNATIONAL FEDERATION OF RED CROSS AND CRESCENT SOCIETIES/JHPIEGO, 2006. Malaria control policy. *A briefing paper presented to the US Congress*. Washington DC, June 9, 2006.

JACK, S.M., DICENSO, A. and LOHFELD, L. 2005. Nursing theory and concept development or analysis: A theory of maternal engagement with public health nurses and family visitors. *Journal of Advanced Nursing*, 49(2), pp.182-190.

JAMAN NORTH DISTRICT PROFILE REPORT, 2010. *District Health Services*, Sampa, Jaman North, Ghana (Unpublished).

JANESICK, V.J., 1994. The dance of qualitative research design: Metaphor, methodolatry and meaning. In: N.K. DENZIN and Y.S. LINCOLN, eds. *Handbook of qualitative research*. London: Sage. Pp. 209-219.

JARVIS, P., 2006. *The theory and practice of teaching*. 2nd ed. London: Routledge Taylor and Francis.

JB I REVIEWERS' MANUAL, 2008. Promoting and supporting best practice. *Joanna Briggs Institute Reviewers' Manual, 2008 Edition*. Royal Adelaide Hospital, South Australia, Adelaide.

JB I, 2008a. *Feasibility, appropriateness, meaningfulness and effectiveness*. Royal Adelaide Hospital, Adelaide, South Australia. [Online] Available from: www.joannabriggs.edu.au;http://www.jbiconnect.org...jbi approach to EBP [Accessed 10 September 2008].

JB I, 2008b. The uncertainty and incongruity of evidence-based healthcare: Editorial. *International Journal of Evidence-based Healthcare*, 6(1), pp. 1-2.

JB I, 2008c. *JB I Collaborating Centres in Africa* [online]. Available from: <http://www.joannabriggs.edu.au/esg/...php> [Accessed 17 August 2009].

JHPIEGO, 2008a. *Malaria in Pregnancy*. [online]. JHPIEGO, An Affiliate of Johns Hopkins University. Available from: http://www.jhpiego.org/resources/pubs/malalip/malaria_training.htm [Accessed 26 November 2008].

JHPIEGO, 2008b. *What we do - malaria prevention and treatment*. JHPIEGO, An Affiliate of Johns Hopkins University. [Online]. Available from: <http://www.jhpiego/what we do/malaria.html> [Accessed 23 December 2008].

JICK, T.D., 1979. Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly*, 24(4), pp. 602-611.

JOHNSON, R.B. and TURNER, L.A., 2003. Data collection strategies in mixed methods research. In: A. TASHAKKORI and C. TEDDLIE, eds. *Handbook of mixed methods in social and behavioural research*. Thousand Oaks, California: Sage Publications, pp.297-319.

JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH, 2008a. *Mali - arresting malaria with Insecticide Treated Nets*. Centre for Communication Programmes, Johns Hopkins University. [Online]. Available from: <http://www.jhuccp.org/africa/mali/malaria.shtml> [Accessed 5 August 2008].

JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH, 2008b. *Illustrative communication strategy for prevention and control of malaria during pregnancy*. Centre for Communication Programmes, Johns Hopkins University [Online]. Available from: www.jhpiego.org/resources/pubs/malarialrp/english/programResources/communicationStrategyIECMaterials.html [Accessed 5 September 2008].

JOHNSON, R.B. ONWUEGBUZIE, A. and TURNER, L., 2007. Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), pp.112-133.

JONES, C.O. and WILLIAMS, H.A., 2004. The social burden of malaria: What are we measuring?. *American Journal of Tropical Medicine and Hygiene*, 71(Suppl 2), pp.156-161.

KABANYWANYI, A.M., MACARTHUR, J.R., STOLK, W.A., HABBEMA, J.D.F., MSHINDA, H., B., BLOLAND, P.B., ABDULLA, S. and KACHUR, S.P., 2008. Malaria in pregnant women in an area with sustained high coverage of insecticide-treated bed nets. *BMC Malaria Journal*, 7(133), pp. 1-7.

KAPLAN, R.S. and NORTON, D.P. 1992. The balanced scorecard as a strategic management system. *Harvard Business Review*, Boston: Harvard Business Press.

KAPLAN, R.S. and NORTON, D.P. 1996a. *The balanced scorecard – translating strategy into action*. Boston: Harvard Business School Press.

KAPLAN, R.S. and NORTON, D.P. 1996b. Linking the balanced scorecard to a strategy. *California Management Review*, 4(1), pp.53-79.

KAYENTAO, K., KODIO, M., NEWMAN, R., MAIGA, H., DOUMTABE, D., ONGOIBA, A., COULIBALY, D., KEITA, A., MAIGA, B., MUGAI, M., PARISE, M. and DOUMBO, O., 2005. Comparison of intermittent preventive treatment with chemoprophylaxis for the prevention of malaria during pregnancy in Mali. *Journal of Infectious Diseases*, 191(1), pp. 106-116.

KENNEDY, S., 2003. SEDAP: A programme on social and economic dimensions of an aging population. *SEDAP research paper No. 93* [online]. Available from: <http://www.socserv2.mcmaster.ca/sedap-accessed> [20 May 2010].

KENDEL, D.S., 1991. *Health behaviour, health knowledge, and schooling*. Chicago, IL: University of Chicago Press.

KEUNING, D., 1998. *Management: A contemporary approach*. London: Pitman Publishing.

KIDANE, G. and MORROW, R.H., 2000. Teaching mothers to provide home treatment of malaria in Tigray, Ethiopia: a randomised trial. *The Lancet*, 356, pp. 550-555.

KIMCHI, J., POLIVKA, B. and STEVENSON, J.S., 1991. Triangulation: operational definitions. *Nursing Research*, 40(6), pp. 364-366.

KINFU, Y., MERCER, H.S., DAL POZ, M.R. and EVANS, D.B., 2006. Estimating inflows and outflows of health service providers in sub-Saharan Africa. *Background paper prepared for the World Health Report 2006: Working together for health*. World Health Organisation, Geneva, Switzerland.

KINFU, Y., DAL POZ, M.R., MERCER, H. and EVANS, D.B., 2009. The health worker shortage in Africa: are enough physicians and nurses being trained? *Bulletin of the World Health Organisation*, 87(3), pp.225-230.

KITSON, A., 2002. Recognising relationships: reflections on evidence-based practice. *Nursing Inquiry* 9(3), pp. 179-186.

KITSON, A., HARVEY, G. and MCCORMACK, B., 1998. Enabling the implementation of evidence based practice: a conceptual framework. *Quality Healthcare*, 7(3), pp. 149-158.

KITSON, A., RYCROFT-MALONE, J., HARVEY, G. and MCCORMACK, B., SEERS, K. and TITCHEN, A., 2008. Evaluating the successful implementation of evidence into practice using the PARISHS framework: theoretical and practical challenges. *Implementation Science*, 3(1), pp.1-12.

KIWUWA, M.S. and MUFUBENGA, P., 2008. Use of antenatal care, maternity services, intermittent presumptive treatment and insecticide treated bed nets by pregnant women in Luwero district, Uganda. *BMC Malaria Journal*, 7(44), pp. 1-6.

KROSNICK, J.A. and ALWIN, D.F., 1988. A test of the form-resistant correlation hypothesis ratings, ranking and the measurement of values. *Public Opinion Quarterly*, 52(4), pp. 526-538.

KUHN, T., 1962. *The structures of scientific revolutions*. Chicago, IL: University of Chicago Press.

KUHN, T., 1970. *The structures of scientific revolutions*. Chicago, IL: University of Chicago Press.

KUHN, T., 1996. *The structures of scientific revolutions*. Chicago, IL: University of Chicago Press.

LAGERBERG, R.E., 2008. Malaria in Pregnancy: A literature review. *Journal of Midwifery and Women's Health*, 53(3), pp.209-215.

LAUNIALA, A. and HONKASALO, M., 2007. Ethnographic study of factors influencing compliance to intermittent preventive treatment of malaria during pregnancy among Yao women in rural Malawi. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 101(10), pp.980-989.

LAUNIALA, A. and KULMALA, T., 2006. The importance of understanding the local context: Women's perceptions and knowledge concerning malaria in pregnancy in rural Malawi. *Acta Tropica*, 98(2), pp. 111-117.

LEININGER, M.M., ed., 1985. *Qualitative research methods in nursing*. Orlando, FL: Grune and Stratton.

LEININGER, M.M., 1991. *Culture care diversity and universality: A theory for nursing*. New York, NY: National League for Nursing.

LEON, A.C., DAVIS, L.L. and KRAEMER, H.C., 2010. The role and interpretation of pilot studies in clinical research. *Journal of Psychiatric Research*, 45(5), pp. 626-629.

LESTER, H. and GLASBY, J., 2006. *Mental health: policy and practice*. Basingstoke: Palgrave, Mcmillan.

LETTENMAIR, C., 2003. The role of communication in malaria control in Africa. *A concept paper to the RBM conference in 2000*, New York.

LIKERT, R., 1932. A technique for the measurement of attitudes. *Archives of Psychology*; No. 140.

LIN, K., AUNG, S., LWIN, S., MIN, H., AYE, N.N. and WEBBER, R., 2000. Promotion of insecticide-treated mosquito nets in Myanmar. *Southeast Asian Journal of Tropical Medicine Public Health*, (3), pp.444-447.

LOGAN, J., 2004. *Stakeholder consultations*. [online]. The Canadian Association ezine, Association Xpertise Inc. Available from: http://www.axi.ca/tca/nov/2004/associationarticle_2.shtml [Accessed 10 April 2010].

LOWE, R., 2007. *Facing the future: A review of the role of health visitors*. [online]. Queen's Nursing Institute, United Kingdom. Available from: www.dh.gov.uk [Accessed 12 October 2011].

LUKE, P., MAXINE, R., Kamal, M. and David, D. (2004) Networking and innovation: A systematic review of the evidence. *Lancaster University*

Management School working paper 2004/016. Lancaster: Institute of Entrepreneurship and Enterprise Development, Lancaster School of Management.

MACALESTER, 2012. *Seaports of Tanzania* [Online]. Available from: www.macalester.edu/Academia/geography/agr/journals/1967_5_9.pdf [Accessed 2 October 2012]

MACDUFF, C., 2007. An analysis of the development of family health nursing in Scotland through policy and practice 1998-2006. *A doctoral thesis submitted in partial fulfillment of the requirements of The Robert Gordon University for the degree of Doctor of Philosophy*. School of Nursing and Midwifery of the Faculty of Health and Social Care, The Robert Gordon University, Aberdeen.

MACINNES, K., 2005. Effectiveness of strategies in the prevention and management of methicillin resistant staphylococcus aureus (MRSA): A systematic literature review. *A Dissertation submitted in Partial fulfillment of BSc/Hons in Nursing*. School of Nursing and Midwifery of the Faculty of Health and Social Care, The Robert Gordon University, Aberdeen (Unpublished).

MAGNUSSEN, L., EHIRI, J. and JOLLY, P., 2004. Comprehensive versus selective primary health care: Lessons for global health policy. *Health Affairs*, 23(3), pp.167-176.

MAKEMBA, A.M., WINCH, V.M., MEHL, G.L., PREMJI, Z., MINJAS, J.N. and SHIFF, C.J., 1996. Treatment practices for degedege, a locally recognised febrile illness, and implications for strategies to decrease mortality from severe malaria in Bagamoyo District, Tanzania. *Tropical Medicine International Health*, 1(3), pp. 305-313.

MAKUNDI, E.A., MALEBO, H.M., MHAME, P., KITUA, A.Y. and WASAME, M., 2006. Role of traditional healers in the management of severe malaria among children below five years of age: the case of Kilosa and Handeni Districts, Tanzania. *BMC Malaria Journal*, 5(58), pp. 1-9.

MAKUNDI, E.A., MBOERA, L.E.G., MALEBO, G.M. and KITUA, A.Y., 2007. Priority setting on malaria interventions in Tanzania: Strategies and challenges to mitigate against the intolerable burden. *American journal of Tropical Medicine and Hygiene*, 77(6 suppl), pp. 106-111.

MALARIA FORUM FINAL REPORT, 2007. *Malaria forum: Collaboration, innovation, impact: Final report*. Bill and Melinda Gates Foundation, October 16-18, 2007 [Online]. Available from: <http://www.gatesfoundation.org/globalhealth/documents/MalariaForumReport.pdf> [Accessed 30 August 2010].

MALOREH-NYAMEKYE, T., 2005. A critical analysis of past and current purchasing strategies of Ministry of Health, Ghana: A focus on sector-wide approaches and purchasing product portfolio models. *A dissertation submitted in partial fulfilment of the requirements of Master of Science in purchasing and supply chain management*. Aberdeen Business School, The Robert Gordon University, Aberdeen.

MA-NI, 2011. *Culture of Nigeria – traditional, history, people, clothing, traditions, women and beliefs* [Online]. Available from: <http://www.everyculture.com/Ma-Ni/Nigeria.html> [Accessed 9 March 2011].

MARKUSIC, M., 2009. *Simplifying the Likert Scale* [Online]. Available from: <http://www.brighthub.com/education/special/articles/13507.aspx> [Accessed 28 March 2011].

MARSELLA, A., 2009. Exploring the literature surrounding the transition into palliative care: a scoping review. *International Journal of Palliative Nursing*, 15(4), pp.186-189.

MARKWEI, L., 2012. News: Malaria prevention among pregnant women progresses. *The Ghanaian Times*, Monday, November 26, 2012.

MASLOVE, D.M., MNYUSIWALLA, A., MILLS, E.J., MCGOWAN, J., ATTARAN, A. and WILSON, K., 2009. A systematic review of qualitative studies. *BMC International Health and Human Rights*, 9(26), pp.1-10.

MASSEY, D., TAYLOR, S. and EDWARD, J. 1993. Theories of international migration: A review and appraisal. *Population and Development Review*, 19(3), pp.431-466.

MASSEY RATINGS, 2011. What is the difference between rating and ranking? [online]. Available from: <http://www.expert123.com/9/whats-the-differencebetweenratingandranking> [Accessed 30 December 2011].

MAXCY, S.J., 2003. Pragmatic threads in mixed methods research in the social sciences: The search for multiple modes of inquiry and the end of the philosophy of formalism. In: Tashakkori A. and Teddlie C., eds., *Handbook of mixed methods in social and behavioural research*. Sage Publications, pp. 51-89.

MAYS, N., ROBERTS, E. and POPAY, J., 2001. Synthesising research evidence. In: Fulop N., Allen, P. Clarke A. and Black N., eds., *Studying the organisation and delivery of health services: Research methods*. London: Routledge, pp.188-220.

MBOERA, L.E.G; MAKUNDI, E.A.; and KITUA, A.Y., 2007. Uncertainty in malaria control in Tanzania: Crossroads and challenges for future interventions. *The American Journal of Tropical Medicine and Hygiene*, 77(6), pp. 112-118.

- MBONYE, A.K., NEEMA, S. and MAGNUSSEN, P., 2006a. Perceptions on use of sulfadoxine-pyrimethamine in pregnancy and the policy implications for malaria control in Uganda. *Health Policy*, 77(3), pp. 279-89.
- MBONYE, A.K., NEEMA, S. and MAGNUSSEN, P., 2006b. Preventing malaria in pregnancy: A study of perceptions and policy implications in Mukono district, Uganda. *Health Policy and Planning*, 21(1), pp.17-26.
- MBONYE, A.K., BYGBJERG, I.C., and MAGNUSSEN, P., 2008. Intermittent preventive treatment of malaria in pregnancy: A new delivery system and its effect on maternal health and pregnancy outcomes in Uganda. *Bulletin of the World Health Organisation (BLT)*, 86(2), pp. 81-160.
- MCCORMACK, B., KITSON, A., HARVEY, G., RYCROFT-MALONE, J., TITCHEN, A. and SEERS, K., 2002. Getting evidence into practice: the meaning of "context". *Nursing*, 38(1), pp. 94-104.
- MCPHERSON, R.A., TAMANG, J., HODGINS, S., PATHAK, L.R., BAQUI, A.H., and WINCH, P.J., 2010. Process evaluation of a community-based intervention promoting multiple maternal and neonatal care practices in rural Nepal. *BMC Pregnancy and Childbirth*, 10(31), pp. 1-15.
- MELNYK, B.M., FINEOUT-OVERHOLT, E., STONE, P. and ACKERMAN, M., 2000. Evidence-based practice: The past, the present, and recommendations for the millenium. *Paediatric Nursing*, 26(1), pp. 77-80.
- MERG, 2005. *Building capacity in monitoring and evaluating Roll Back Malaria in Africa: A Conceptual framework for the Roll Back Malaria Partnership*. [online]. RBM Malaria Monitoring and Evaluation Reference Group. Available from: http://www.rbm.who.org/partnership/wg_monitoring/docs/merg_conceptualframework.pdf [Accessed 25 February 2010].
- MERRIAM, S. and CAFFARELLA, R., 1991. *Learning in adulthood*. San Francisco, CA: Jossey Bass.
- MERRIAM, S., CAFFARELLA, R. and BAUMGARTNER, L.M., 2007. *Learning in adulthood. A comprehensive guide*. 3rd ed. San Francisco: Jossey Bass.
- MERTENS, D., 2003. Mixed methods and the politics of human research: The transformative-emancipatory perspective. In: Tashakkori A. and Teddlie C., eds., *Handbook of Mixed Methods in Social and Behavioural Research*. Sage Publications, pp. 135-164.
- MIAFFO, C., SOME, F., KOUYATE, B., JAHN, A. and MUELLER, O., 2004. Malaria and anaemia prevention in pregnant women of rural Burkina Faso. *BMC Pregnancy and Childbirth*, 4(18), pp.1-7.

MITCHELL, E.S., 1986. Multiple Triangulation: A methodology for nursing science. *Advances in Nursing Science*, 8(3), pp.18-26.

MILES, M. and HUBERMAN, M., 1994. *Qualitative data analysis: An expanded source-book*. 2nd ed. Thousand Oaks, California, CA: Sage Publications.

MINISTRY OF HEALTH AND CHILD WELFARE/ZIMBABWE NATIONAL FAMILY PLANNING COUNCIL, 1998. *Information, education, and communication*. IEC reference manual for health programme managers. 2nd ed. Harare: IEC Family Planning and Health Education Project.

MINJA, H., SCHELLENGBERG, J.A., MUKASA, O., NATHAN, R., ABDULLA, S., MPONDA, H., TANNER, M., LENGELLER, C. and OBRIST, B., 2001. Introducing insecticide-treated nets in the Kilombero valley, Tanzania: the relevance of local knowledge and practice for an information, education and communication (IEC) campaign. *Tropical Medicine and International Health*, 6(8), pp. 614-623.

MOH, KENYA, 2005. *Malaria communication strategy*. Division of Malaria Control, Ministry of Health Kenya, Nairobi.

MOH, TANZANIA, 2003. *National Malaria Control Programme; National Malaria Medium-Term Strategic Plan, 2003-2007*. Ministry of Health, Tanzania, Dar es Salaam.

MOH, TANZANIA, 2012. *The health sector in Tanzania* [Online]. Available from: <http://www.tanzania.go.tz/health.html> [Accessed 11 October 2012].

MOH, UGANDA, 2005. *Uganda communication strategy for malaria 2005-2010*. [Online]. Malaria control programme, health promotion and education Division, Kampala. Available from: <http://www.rollbackmalaria.org/countryaction/uganda/communicationstrategy2005-2010draft3> [Accessed 10 July 2008].

MOREL, C.N, LAUER, A. and EVANS, D.B., 2005. Achieving the millennium development goals for health: Cost effectiveness analysis of strategies to combat malaria in developing countries. *British Medical Journal*, 331, pp. 1299-1302.

MORGAN, D., 2007. Paradigm lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, 1, pp. 48-76.

MORSE, J.M., 1991. Approaches to qualitative-quantitative methodological triangulation. *Nursing Research*, 40, pp.120-122.

MUBYAZI, G., BLOCH, P., KAMUGISHA, M., KITUA, A. and IJUMBA, J., 2005. Intermittent preventive treatment of malaria during pregnancy: a qualitative study of knowledge, attitudes and practices of district health managers, antenatal

care staff and pregnant women in Korogwe District, North-Eastern Tanzania. *BMC Malaria Journal*, 4(31), pp.1-15.

MUBYAZI, G., BYGBJERG, I.C., MAGNUSSEN, P., OLSEN, O., BYSKOV, J., MANSEN, K.S. and BLOCH, P., 2008. Prospects, achievements, challenges and opportunities for scaling up malaria chemoprevention in pregnancy in Tanzania: the perspectives of national level officers. *BMC Malaria Journal*, 7(135), pp.1-16.

MUELA, S.H., RUBERA, J.M. and TANNER, E., 1998. Fake malaria and hidden parasites – the ambiguity of malaria. *Anthropological Medicine*, 5(1), pp. 43-61.

MUELA, S., RIBERA, J.M., MUSHI, A.K. and TANNER, M., 2002. Medical syncretism with reference to malaria in a Tanzanian community. *Social Science Medicine*, 55(3), pp. 403-13.

MUFUBENGA, P., 2003. Pregnancy and anaemia in malaria. *PREMA-EU Newsletter*, Issue 2.

MULROW, C.D., 1994. Systematic reviews: Rational for systematic reviews. *British Medical Journal*, 309(6954), pp. 597-599.

MUNSON, J.N. and MCINTYRE, S.H., 1979. Developing practical procedures for the measurement of personal values in cross-cultural marketing. *Journal of Marketing Research*, 16(1), pp. 48-52.

MURPHY, S.C. and BREMAN, J.G., 2001. Gaps in the childhood malaria burden in Africa: cerebral malaria, neurological sequelae, anaemia, respiratory distress, hypoglycaemia and complication of pregnancy. *American Journal of Tropical Medicine and Hygiene*, 64, pp. 57-67.

MWENESI, H., HARPHAM, T. and SNOW, R.W., 1995. Child malaria treatment practices among mothers in Kenya. *Social Science and Medicine*, 40(9), pp. 1271-1277.

NAIROBI, 1966. East African railways and harbours. *Annual Report*, 1965, pp.56.

NDYOMUGYENYI, R., NEEMA, S. and MAGNUSSEN, P., 1998. The use of formal and informal services for antenatal care and malaria treatment in rural Uganda. *Health Policy Planning*, 13(1), pp.94-102.

NEGASH, K., KEBEDE, A., MEDHIN, A., ARGAW, D., BABANIYI, O., GUINTRAN, J.O. and DELACOLLETTE, C. 2005. Malaria epidemics in the highlands of Ethiopia. *East African Medical Journal*, 82(4), pp.186-192.

NELSON, E.A., 1998. The value of systematic reviews in research. *Professional Nurse*, 14(1), pp.24-28.

NEWMAN, R.D., PARISE, M.E., SLUSKER, L., NAHLEN, B. and STEKETEE, R.W., 2003. Safety, efficacy and determinants of antimalarial drugs during pregnancy: implications for prevention programmes in plasmodium-endemic sub-Saharan Africa. *Tropical Medicine and Parasitology*, 8(6), pp. 488-506.

NEWS FROM AFRICA, 2012. *News from Africa* [Online]. Available from: http://www.newsfromafrica.org/newsfromafrica/articles/art_7902.html [Accessed 9 September 2012].

NEVILL, C., SOME, E., MUNG'ALA, V., MUTEMI, W., NEW, L., MARSH, K., LENGELER, C. and SNOW, R., 1996. Insecticide-treated bednets reduce mortality and severe morbidity from severe malaria among children on the Kenyan coast. *Tropical Medicine and International Health*, 1(2), pp.139-146.

NGANDA, R.Y., DRAKELEY, C., REYBURN, H. and MARCHANT, T., 2004. Knowledge of malaria influences the use of insecticide-treated nets but not intermittent presumptive treatment by pregnant women in Tanzania. *BMC Malaria Journal*, 3(42), pp. 1-7.

NHS CENTRE FOR REVIEWS AND DISSEMINATION (CDR), 2001. *Understanding systematic reviews of research on effectiveness: CDR's guidance for those carrying out or commissioning reviews. CDR report No. 4, 2nd ed.* York: The University Press of York.

NICE , 2003. Antenatal Care Education in the United Kingdom. *Clinical guideline 6. National Collaborating Centre for Women's Health, NHS, London* [Online]. Available from: <http://www.nice.org.uk> [Accessed 3 October 2010].

NICE, 2008. Antenatal care: Routine care for the healthy pregnant woman. *NICE NHS, London*. Available from: <http://www.nice.org.uk/nicemedia/pdf/CG062NICEguideline.pdf>

NICKLIN, P. J. and KENWORTHY, N., 2000. *Teaching and assessing in nursing practice*. 3rd ed. London: Baillière Tindall Publishing in association with the Royal College of Nursing.

NIGERIA DEMOGRAPHIC AND HEALTH SURVEY, 2003. *Demographic and health survey report* [Online]. Available from: www.measuredhs.com/pubs/pdf/FR1148/00FrontMatters.pdf [Accessed 3 October 2012].

NIGERIA DEMOGRAPHIC AND HEALTH SURVEY, 2009. *The 2008 Nigeria Demographic and health survey* . National Population Commission, Federal Republic of Nigeria, Abuja.

NJAGI, K., WERE, E.; OTIENO, F. and OPIYO, F., 2004. *Kenya demographic and health survey 2003: Malaria control and prevention strategies in Kenya*. Authors in association with Central Bureau of Statistics, Ministry of Health, Kenya Medical

Research Institute, National Council for Population and Development, Centres for Disease Control, Nairobi Kenya; and ORC Macro, Calverton, Maryland.

NYIRABA, M., 2002. The multiparty reform process in Tanzania. *The Dominance of Political Science*, 7(2), pp.1027-0353.

ODA, 1995. *Guidance note on how to do stakeholder analysis of aid projects and programmes*. Overseas Development Administration (ODA), Social Development Department, London.

OKABAYASHI, H., THONGTHIEN, P., SINGHASVANON, P., WAIKAGUL, J., LOOAREESUWAN, S., JIMBA, M., KANO, S., KOJIMA, S., TAKEUCHI, T., KOBAYASHI, J. and TATENO, S., 2005. Keys to success for a school-based malaria control programme in primary schools in Thailand. *Scopus preview - Parasitology Internation*; Doi: 10.1016/j.parint.2005.11.056.

OKERINDE, O., 2008. An interpretative phenomenological analysis of work/home role conflict: A case study of West African women. *MSc Dissertation in Occupational and Organisational Psychology*, Univerisity of East London.

OKRAH, J., TRAORE, C., PALE, A., SOMMERFELD, J. and MULLER, O., 2002. Community factors associated with malaria prevention by mosquito nets: an exploratory study in rural Burkina Faso. *Tropical Medicine and International Health*, 17(3), pp. 240-248.

OLSON, D., 2003. *Raising awareness and changing attitudes about ITNs*. Population Services International Region: Africa, Global Health Council, HealthLink: Issue 122 [Online]. Available from: <http://www.globalhealth.org/publication/article.php?id=1017> [Accessed 12 July 2008].

ONLINE NIGERIA, 2012. *Traditions and customs* [Online]. Available from: www.onlinenigeria.com/traditions_customs.asp [Accessed 12 September 2012].

ONWUJEKWE, O., AKPALA, C., GHASI, S., SHU, E. and OKONKWO, P., 2000. How do rural households perceive and prioritise malaria and mosquito nets? A study in five communities of Nigeria. *Public Health*, 114, pp. 407-410.

OPOKU, K., 2012. The role of National Health Insurance Scheme (NHIS) in health care financing in Ghana: A case study of the Ridge Regional Hospital, Accra. *A dissertation submitted in partial fulfillment of the requirements of Master of Science in Logistics Management*. Ghana Telecom University College Graduate School/Coventry University Graduate School of Business, Accra.

OTOLORIN, E.O., 2008a. *Malaria during pregnancy*. [online]. Available from: http://www.reproline.jh.edulenglish/2mnh/2ppts/malaria_preg/malaria_preg.ppt [Accessed 10 November 2008].

OTOLORIN, E.O., 2008b. *Malaria during pregnancy: Malaria in pregnancy 4* [Online]. Available from: www.scribd.com/doc/658639/Malaria-in-pregnancy-4-83k [Accessed 20 October 2008].

ORTON, L.C. and OMARI, A.A.A., 2008. Drugs for treating uncomplicated malaria in pregnant women. *Cochrane Database of Systematic Reviews*. Issue 4.

OSHANA, D., 2006. *Evidence-based practice literature review*. Prevent Child Abuse America: Chicago, IL.

OUMAL, P.O., VAN EIJK, A.M., HAMELLI, M.J., SIKUKU, E., ODHIAMBO, F., MUNGUTI, K., AYISI, J.G., KAGER, P.A. and SLUTSKER, L., 2007. The effect of health care worker training on the use of intermittent preventive treatment for malaria in pregnancy in rural western Kenya. *Tropical Medicine and International Health*, 12(8), pp. 953-961.

OVADIA, S., 2004. Ratings and rankings: Reconsidering the structure of values and their measurement. *International Journal of Social Research Methodology*, 7(5), pp. 403-414.

OVERBOSCH, G.B, NSOWAH-NUAMAH, N.N.N. and VAN DEN BOOM, G.J.M., 2004. Determinants of antenatal care use in Ghana. *Journal of African Economies*, 13(2), pp. 277-301.

OWENS, R.G., STEINHOFF, C.R. and ROSENBAUM, S.M., 1989. A triangulation methodology in research on school cultures. *A paper presented at the Annual Meeting of the American Educational Research Association, San Francisco: CA, March 27-31*.

OWUSU-ADJEI, S., AWINI, E., ANTO, F., MENSAH-AFFUL, T., ADJUIK, M., HODGSON, A., AFARI, E. and BINKA, F., 2007. Assessing malaria control in the Kassena-Nankana District of northern Ghana through repeated surveys using the RBM tools. *BMC Malaria Journal*, 6(103), pp.1-9.

OXMAN, A.D. and GUYATT, G.H., 1993. The science of reviewing research. *Annals of the New York Academy of Sciences*, 703(1), pp.125-134.

PANTHER-BRICKS, C., CLARKE, S.E., LOMAS, H., PINTER, M. and LINSAY, S.W., 2006. Culturally compelling strategies for behaviour change. A social ecology model and case study in malaria prevention. *Social Science and Medicine*; 62(11), pp. 2810-2825.

PANVISAVAS, S., 2001. Poverty and malaria: A study in a Thai-Myanmar border area. *Poverty and Malaria* 32(3), pp.608-614.

PARAHO, K., 2006. *Nursing research: principles, process and issues*. 2nd ed. Houndsmill: Palgrave.

PARISE, M.E., AYISI, J.G., NAHLEN, B.L., SCHULTZ, L.J., ROBERTS, J.M., MISORE, A., MUGA, R., OLOO, A.J., STEKETEE, R.W., 1998. Efficacy of sulfadoxine-pyrimethamine for prevention of placental malaria in an area of Kenya with a high prevalence of malaria and human immunodeficiency virus infection. *American Journal of Medicine and Hygiene*, 59(5), pp. 813-822.

PATHMAN, D.E., KONRAD, T.R., FREED, G.I., FREEMAN, V.A. and KOCH, C.G., 1996. The awareness to adherence model of the steps to clinical guideline compliance. The case of paediatric vaccine recommendations. *Medical Care*, 34(9), pp. 873-879.

PEACE FM, 2012. *Politics in Ghana* [Online]. Available from: www.peacefmonline/politics -in- Ghana/PeacFmOnline/Ghana- News [Accessed 5 October 2012].

PEARSON, A., WIECHULA, R., COURT, A. and LOCKWOOD, C., 2005. The JBI model of evidence-based healthcare. *International Journal of Evidence-Based Healthcare*, 3(8), pp. 207-215.

PELL, C., STRAUS, L., ANDREW, E.V.W., MENACA, A. and POOL, R, 2011. Social and cultural factors affecting uptake of interventions for malaria in pregnancy in Africa: A systematic review of the qualitative research. *PLoS ONE*, 6(7), pp. e22452.

PERONE, J. and TUCKER, L., 2003. An exploration of triangulation of methodologies: Quantitative and qualitative methodology fusion in an investigation of perceptions of transit safety. *Summary of Final Report*. University of South Florida: BC 137-22.

PEW RESEARCH CENTRE, 2010. Tolerance and tension: Islam and Christianity in sub-Saharan Africa. *Pew Forum on religion and public life* [Online]. Available from: www.pewforum.org/newassets/images/reports/sub-saharanafrica/sub-saharan-africa-full-report.pdf [Accessed 12 October 2012].

PFIZER, 2010. *Mobilise against malaria: Lessons learned from Ghana* [Online]. Available from: www.pfizer.com/malaria [Accessed 11 September 2012].

PHOTIUS, 2012. *Geography* [Online]. Available from: www.photius.com/wfb1999/tanzania_geography.html [Accessed 10 October 2012].

PMI ETHIOPIA, 2010. *Malaria Operational Plan (MOP)*, Ethiopia FY2010, Addis Ababa, Ethiopia [Online]. Available from: <http://www.pmi.gov/countries/profiles/Ethiopia.html> [Accessed 10 November 2011].

PMI ETHIOPIA 2011. *Malaria Operational Plan (MOP)*, Ethiopia FY2012, Addis Ababa, Ethiopia [Online]. Available from: <http://www.pmi.gov/countries/profiles/Ethiopia.html> [Accessed 1 October 2012]

PMI GHANA, 2010. *Malaria operational plan (MOP)*, Ghana FY2011, Accra, Ghana [Online]. Available from: <http://www.pmi.gov/countries/profiles/Ghana.html> [Accessed 10 November 2011].

PMI GHANA, 2011. *Malaria operational plan (MOP)*, Ghana FY2012, Accra, Ghana [Online]. Available from: <http://www.pmi.gov/countries/profiles/Ghana.html> [Accessed 1 October 2012].

PMI NIGERIA, 2011. *Malaria Operational Plan (MOP)*, Ethiopia FY2012, Abuja, Nigeria [Online]. Available from: <http://www.pmi.gov/countries/profiles/Nigeria.html> [Accessed 1 October 2012]

PMI TANZANIA, 2011. *Malaria Operational Plan (MOP)*, Ethiopia FY2012, Dar es Salaam, Tanzania [Online]. Available from: <http://www.pmi.gov/countries/profiles/Tanzania.html> [Accessed 1 October 2012]

POLIT, D.E. and HUNGLER, B.P., 1995. *Nursing research: Principles and methods*. 2nd ed. Philadelphia: Lippincott.

POLIT, D.F. and BECK, C.T., 2004. *Nursing research: Principles and methods*. 7th ed. Philadelphia: Lippincott Williams and Wilkins.

POOL, R., MONTGOMERY, C.M., MORAR, N.S., MWEEMBA, O., SSALI, A., GAFOS, M., LEES, S., STADLER, J., CROOK, A., NUNN, A., HAYES, R. and MCCORMACK, S., 2010. A mixed methods and triangulation model for increasing the accuracy of adherence and sexual behaviour data: The microbicides development programme. *PLoS*, 5(7), pp.1-10.

POPULATION COUNCIL, 2007. *Focused antenatal care acceptable, tricky to implement* [online] available from: http://www.popcouncil.org/pdfs/factsheets/RHFocusedAntenatalCare_letter.pdf [Accessed 14 November 2011].

QUINN, F.M. and HUGHES, S.J., 2007. *Quinn's principles and practice of nurse education*. 5th Ed. Cheltenham: Nelson Thornes.

RBM PARTNERSHIP, 2005. *World malaria Report 2005: Malaria control by Region, Section II*. [online]. Geneva, Switzerland. Available from: <http://www.rollbackmalaria.org/wmr2005/htm//2-1.htm> [Accessed 4 November 2008].

RBM PARTNERSHIP, 2007. *Malaria landscape report 2007*. 13th RBM Partnership Board Meeting [unspecified location], 28-29 November 2007 [Online]. Available from:

http://www.rollbackmalaria.org/partnership/board/meetings/docs/Malaria_Landscape_Report_2007.pdf [Accessed 11 August 2008].

RBM PARTNERSHIP, 2009. Guidelines for core population-based indicators. *RBM technical paper Series No 1*, January Edition. [online]. Geneva, Switzerland. Available from:

http://www.rbm.who.int/partnership/wg_monitoring...GuidelinesForCorPopulationFINAL9.20_malaria.pdf [Accessed 23 December 2010].

RBM PARTNERSHIP, 2010. *Malaria in pregnancy*. Geneva, Switzerland [Online]. Available from:

<http://www.rollbackmalaria.org.rbm.who.int/cgi-bin/rbm/rbmportal/custom/rbm/home.do> [Accessed 11 August 2010].

RBM SECRETARIAT/FMOH, NIGERIA, 2004. *Malaria Control in Nigeria: A Strategy for Behaviour Change Communication 2004-2005*, Roll Back Malaria Secretariat/Malaria Control Programme/Department of Health/Federal Ministry of Health, Abuja, Nigeria.

REES, C.E. and BATH, P.A., 2001. The use of between-methods triangulation in cancer nursing research: A case study examining information sources for partners of women with breast cancer. *Cancer Nursing*, 24(2), pp. 104-111.

RHEE, M., SISSOKO, M., PERRY, S., MCFARLAND, W., PARSONNET, E. and DOUMBO, O., 2005. Use of insecticide-treated nets (ITNs) following a malaria education intervention in Piron, Mali: a control trial with systematic allocation of households. *Malaria Journal*, 4(35), pp.1-11.

RIBERA, J.M., HAUSMANN-MUELA, S., D'ALESSANDRO, U. and GRIETENS, K.P., 2007. Malaria in pregnancy: What can the social sciences contribute? *Policy Forum*, 4(4), pp. 631-635.

ROGERS, A., 2002. *Teaching adults*. 3rd ed, Maidenhead: Open University Press, McGraw-Hill Education.

ROGERS, A., 2003. *What is the difference? A new critique of adult learning and teaching*. Leister: NIACE.

ROGERSON, S., CHALULUKA, E., KANJALA, M., MKUNDIKA, P., MHANGO, C. and MOLYNEUX, M., 2000. Intermittent sulfadoxine-pyrimethamine in pregnancy: effectiveness against malaria morbidity in Blantyre, Malawi, in 1997-99. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 94(5), pp. 549-553.

ROMAN, E., RAWLINS, B., GOMEZ, P., DINEEN, R., DICKERSON, A. and BRIEGER, B., 2008. *Scaling up Malaria in Pregnancy Programmes: What it takes! The Jhpiego Experience*. Jhpiego [Online]. Available from: <http://www.comminit.com/?q=africa/node/310734> [Accessed 8 September 2008].

ROMNEY, A.K., WELLER, S.C. and BATCHELDER, W.H., 1986. Culture as consensus: A theory of culture and informant accuracy. *American Anthropologist*, 88(2), pp. 313-338.

ROSENSTOCK, I.M., 1966. Why people use health services. *Milbank Memorial Fund Quarterly*, 44, pp. 94-124.

ROSENSTOCK, I.M., 1974. Historical origins of the health belief model. *Health Education Monographs*, 2, pp. 1-8.

RYCROFT-MALONE, J., SEERS, K., TITCHEN, A., HARVEY, G., KITSON, A., and MCCORMACK, B., 2004. What counts as evidence in evidence-based practice? *Journal of Advanced Nursing*, 47 (1), pp. 81-90.

SACHS, J. and MALANEY, P., 2002. The economic and social burden of malaria. *Nature*, 415(6872), pp. 680-685.

SACKETT, D.L., ROSENBERG, W.M.C., GRAY, M.J.A., HAYNES, R.B. and RICHARDSON, W.S., 1996. Evidence-based medicine: what it is and what it isn't. *British Medical Journal*, 312(7023), pp. 71-72.

SALE, J.E.M., LOHFELD, L.H. and BRAZIL, K., 2002. Revisiting the quantitative-qualitative debate: Implications for mixed methods research. *Quality and Quantity*, 36, pp.43-53.

SATTERFIELD, J.M., SPRING, B., BROWNSON, R.C., MULLEN, E.J., WALKER, B.B. and WHITLOCK, E.P., 2009. Towards a transdisciplinary model of evidence-based practice. *The Milbank Quarterly*, 87(2), pp.368-390.

SCHANTZ, J. and NOUR, N.M., 2009. Malaria and Pregnancy: A global health perspective. *Reviews in Obstetrics and Gynaecology*, 2(3), pp.186-192.

SEARATES/ZANZIBAR, 2012. *Seaports of Zanzibar* [Online]. Available from: <http://www.searates.com/maritime/zanzibar.html> [Accessed 7 October 2012].

SELLITZ, C., JAHODA, M., DEUTSCH, M. and COOK, S., 1964. *Research methods in social relations*. New York: Holt, Rinehart & Winston.

SENANAYAKE, H.M., SAMANTHI, P.P., PALIHAWADANA, T. and WIJERATNE, S., 2010. Simple educational Intervention will improve the efficacy of routine antenatal iron supplementation. *Journal of Obstetrics and Gynaecology Research*, 36 (3), pp.646-650.

SENEY, G. and VIRDIN, J., 2005. Developing a malaria early warning system for Ethiopia. *25th Annual ESRI International User Conference Paper No. UC2409*. July 25-29 2005, San Diego.

SHEERAN, P. and ABRAHAM, C., 1996. The Health Belief Model. In: M CONNER and NORMAN P. eds. *Predicting health behaviour*. Buckingham: Open University Press, pp.23-61.

SHELDON, K., 2008. *Women's History – Africa bibliography pages 8161*. [online]. Available from: http://science.jrank.org/pages/8161/women_s_History_Africa.html [Accessed 4 May 2008].

SHOOBRIDGE, D. and KAPILA, S., 2010. *Environmental impact assessment of the Camisea Gas Project: the importance of consultation and local participation-EIA_Wiki* [Online]. Available from: <http://www.euforic.org/gb/stake2.htm> [Accessed 15 August 2010].

SHUFFELL, S. and LETTENMAIER, C., 2008. *RBM Communications assessment: Challenges and opportunities in Ghana, Mali, Senegal, Tanzania and Uganda*. Johns Hopkins Bloomberg School of Public Health, Centre for Communication Programmes. World Health Organisation Cabinet Project CH-1211 [Online]. http://www.rbm.who.int/partnership/wg/wg_communication/docs/CWG-shuffell.doc. [12 December 2008].

SIL INTERNATIONAL, 2004. *What is rank?* [Online]. Available from: <http://www.sil.org/linguistics/GlossaryOfLinguisticTermsWhatIsRank.html> [Accessed 26 December 2011]

SILVERMAN, D., 1993. *Interpreting qualitative data: Methods for analysing talk, text and interaction*. Thousand Oaks, London: Sage Publications.

SIMEONS, S., VILLENEUVE, M. and HURST, J., 2005. Tackling nurse shortages in OECD countries. *Organisation for Economic Co-operation and Development: Health working papers No. 19, DELSA/ELSAWD/HEA (2005) 1* [online]. Available from: <http://www.oecd.org/dataoecd/11/10/34571.pdf> [Accessed 20 June 2010].

SMITH, H.W., 1975. *Strategies of social research: The methodological imagination*. Englewood Cliffs, New Jersey: Prentice Hall.

SMITH, J.K. and HESHUSIUS, L., 1986. Closing down the conversation: The end of the quantitative-qualitative debate among educational researchers. *Educational Researcher*, 15, pp. 4-12.

SMITH, M.K., 1999. Learning theory. *The encyclopaedia of informal education*. [online]. Available from: www.infed.org/biblio/b-learn.htm [Accessed 10 May 2009].

SIGN, 2008. *SIGN 50: A guideline developer's handbook: NHS Quality Improvement Scotland, Scottish Intercollegiate Guidelines*. January Revised Edition, No: ISBN 197819058.

SOMALIA AID COORDINATING BODY, 2006. *Malaria communication strategy for Somalia 2006-2010*. Somalia Aid Coordinating Body / Health Sector Committee, Ministry of Health, Somalia.

STEKETEE, R.W., NAHLEN, B.L., PARISE, M.E. and MENENDEZ, C., 2001. The burden of malaria in pregnancy in malaria-endemic areas. *American Journal of Tropical Medicine and Hygiene*, 64(1-2 Suppl), pp. 28-35.

STEKETEE, R.W., WIRIMA, J.J., BLOLAND, P.B., CHILIMA, B., MERMIN, J.H., CHITSULO, L., and BREMAN, J.G., 1996. Impairment of a pregnant woman's acquired ability to limit Plasmodium falciparum by infection with human immunodeficiency virus type-1. *American Journal of Tropical Medicine Hygiene*, 55(1 Suppl), pp. 42-49.

STOKES, C.C., 2005. Identifying an appropriate malaria prevention strategy for Mucheni village in the Binga District of Northwest Zimbabwe. *A Dissertation submitted for the award of a Master's degree in Development Studies*; University of the Free State, Harare, Zimbabwe.

STRAUSS, S.E., RICHARDSON, W.S., GLASZIOU, P. and HAYNES, R.B., 2005. *Evidence-based medicine: How to practice and teach EBM*. 3rd ed. New York, NJ: Elsevier.

STREINER, D.L. and NORMAN, G.R., 2003. *Health measurement scales and use*. 3rd ed., Oxford: Oxford University Press.

TABI, M., 1994. Nursing in Ghana. *Journal of Nursing Administration*, 24(9), pp. 17-18.

TABI, M.M., POWELL, M. and HODNICKI, D., 2006. Use of traditional healers and modern medicine in Ghana. *International Nursing Review*, 53, pp. 52-58.

TASHAKKORI, A. and CRESWELL, J., 2007. Exploring the nature of research questions in mixed method research. *Journal of Mixed Methods Research*, 1(3), pp.207-211.

TASHAKKORI, A. and TEDDLIE, C., 1998. Mixed methodology: Combining the qualitative and quantitative approaches. *Applied Social Research Methods*, No. 46. Thousand Oaks, California: Sage Publications.

TASHAKKORI, A. and TEDDLIE, C., eds., 2003. *Handbook of mixed methods in social and behavioural research*. Thousand Oaks, London: Sage Publications.

TEDDLIE, C. and TASHAKKORI, A., 2009. *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioural sciences*. Thousand Oaks, California: Sage Publications.

THE ABUJA DECLARATION, 2000. *Africa summit on Roll Back Malaria document*. Abuja, Nigeria.

THE AMERICAN HERITAGE DICTIONARY, 2000. *The American dictionary of the English language*. 4th ed. Houghton: Mifflin Company.

THE EFQM EXCELLENCE MODEL, 1999. *A procurement pilot project document based on the EFQM excellence model: Hand-out on strategic purchasing*, Aberdeen Business School, The Robert Gordon University, Aberdeen.

THE EFQM EXCELLENCE MODEL ,2005. *European foundation for quality management excellence model* [Online]. Available from: http://www.business-excellence.org.uk/efqm_model.htm- [Accessed 11 March 2005].

THE WORLD BANK, 2001. *Malaria at a glance* [online]. Available from: http://www.rbm.who.int/cmc_upload/0/000/0141813/malaria_at_a_glance.pdf [Accessed 15 September 2010]

THE WORLD BANK, 2004. *Ethiopia: A country status report on health and poverty*. Draft Report No28963-ET.

THE WORLD BANK, 2008. *Rural poverty. World Bank development report 2008: Agriculture for Development* [Online]. Available from: <http://econ.worldbank.org/...EXTWDR2008/> [Accessed 9 July 2010].

THE WORLD BANK, 2010a. *Malaria endemic distribution in Africa* [Online]. Available from: <http://siteresources.worldbank.org/NEWS/Images-map.jp> [Accessed 9 July 2010].

THE WORLD BANK, 2010b. *Facts and figures* [Online]. Available from: <http://www.worldbank.org/WBSITE/EXTERN> [10 [October 2012].

THE WORLD BANK,2010c. *Government expenditure on public education* [Online]. Available from: data.worldbank.org/indicator/SE.XPD.TOTL.GD.25 [Accessed 21 January 2013].

THE WORLD BANK, 2011. *Country population* [Online]. Available from: <http://www.worldbank.org/en/country> [Accessed 4 October 2012]

THE WORLD HEALTH ORGANISATION/IDA, 2009. *IDA at work: Nigeria's coordinated campaign against malaria* [Online]. Available from:

web.worldbank.org/WBSITE/EXTERNAL/EXTRABOUTUS/IDA/0 [Accessed 4 September 2012].

THOMAS, B.H., CILISKA, D., DOBBINS, M. and MICUCCI, S., 2004. A process for systematically retrieving the literature: providing the research evidence for public health nursing. *Worldviews Evidence-based Nursing*, 1(3), pp. 176-84.

THOMPSON, N., 2003. *Promoting equality: Challenging discrimination and oppression*. 2nd ed. Basingstoke: Palgrave.

THURMOND, V.A., 2001. The point of triangulation. *Journal of Nursing Scholarship*, 33 (3), pp. 253-258.

TIGHE, M.S., 2010. An exploration of the attitudes of attenders and non-attenders towards antenatal education. *Midwifery*, 26, pp.294-303.

TILSON, D., 2007. *The social marketing of insecticide-treated nets (ITNs) in Kenya*. Population Services International (PSI), Nairobi [Online]. Available from: http://www.casesjournal.org/volume1/commissioned/cases_1_12.cfm [Accessed 5 September 2008].

TITLER, M.G., 1997. Research utilisation: Necessity or luxury? In: McCloskey J. and Grace H., eds., *Current issues in nursing*. 5th ed. St. Louis: Mosby, pp.104-117.

TOWNSEND, P., DAVIDSON, N. and WHITEHEAD, M., 1990. *The Black report and the health divide*. 2nd ed. Harmondsworth: Penguin Books.

TRAVEL BLOG, 2012. *Geographic coordinates* [Online]. Available from: <http://www.travelblog.org/world/gh.html> [Accessed 7 October 2012].

TRAYNOR, M., 2002. The oil crisis, risk and evidence-based practice. *Nursing*, 9(3), pp.162-169.

TROCHIM, W.M.K., 2006. *Likert scaling* [online]. Available from: <http://www.socialresearchmethods.net/kb/scallik.php> [Accessed 28 March 2011].

TURNER, J.R., 2004. The role of pilot studies in reducing risk on projects and programmes. *International Journal of Project Management*, 23(1), pp. 1-6.

UNEKE, C., OGBONNA, A., EZECHA, A., OYIOBO, P., ONWE, F. and NGWU, B., 2008. The Nigeria health sector and human resource challenges. *The Internet Journal of Health*, 8(1), DOI:10.5580/d5a.

UNESCO, 2001. United Nations Economic Commission for Africa. *Report of the workshop discussions on the topic: Assessing women and education*. Sixth African regional conference on women, Ethiopia, Addis Ababa.

UNICEF, 2010. *Malaria transmission in Ethiopia* [Online]. Ethiopia. Available from: <http://www.unicef.org/ethiopia/malaria.html> [Accessed 10 March 2010].

UNICEF ZAMBIA/THE MALARIA CONSORTIUM/YOUNG, 2000. *Report on Malaria Consultancy: Support to the Zambia National Roll Back Malaria Programme*. Lusaka, Zambia.

UN WOMEN, 2011. *UN women take action: Women, poverty and economics* [Online]. Available from: <http://www.unifem.org/worldwide/africa/> [Accessed 31 October 2011].

UN, 2009. *United Nations development report on poverty in Africa* [Online]. Available from: <http://www.undp.org/hdr2009.shtml> [Accessed 11 December 2010].

UNSWORTH, J., 2002. *Make or break: Factors influencing the development of nursing practice within the UK National Health Service. A thesis submitted in partial fulfilment of the requirements of the Robert Gordon University, for the degree of Doctor of Philosophy*. The Robert Gordon University, Aberdeen and Northumbria NHS Trust.

USAID ACCESS, 2007. *Focused antenatal care: Providing integrated care: during pregnancy* [Online]. Available from: http://www.accesstohealth.org/tool/res/pdfs/Accessstechbrief_FANC.pdf [Accessed 11 October 2010].

USAID ETHIOPIA, 2012. *Communication for change (C-Change)* [Online] Available from: ethiopia.usaid.gov/programs/global-health-initiative/projects/communication-change-c-change-0 [Accessed 10 September 2012].

USAID/GHANA, 2003. *USAID/Ghana countrys strategic plan 2004-2010: Empowering Ghanaians through partnerships to build a prosperous nation*. Accra, Ghana [Online]. Available from: www.usaid.gov [Accessed 10 June 2010].

USEEM, M., 1973. *Conscription, protest and social conflict*. New York, NY: Wiley Publications.

VAN EIJK, A.M., AYISI, J.G., TER KUILE, F.O., MISORE, A., OTIENO, J.A., KOLCZAK, M.S., KAGER, P.A., STEKETEE, R.W. and NAHLEN, B.L., 2001. Human immunodeficiency virus seropositivity and malaria as risk factors for third-trimester anemia in asymptomatic pregnant women in western Kenya. *American Journal of Tropical Medicine and Hygiene*, 65(5), pp.623-630.

VAN EIJK, A.M., AYISI, J.G., TER KUILE, F.O., SLUTSKER, L., OTIENO, J.A., MISORE, A.O., ODONDI, J.O., ROSEN, D.H., KAGER, P.A., STEKETEE, R.W. and NAHLEN, B.L., 2004. Implementation of intermittent preventive treatment with

sulfadoxine pyrimethamine for control of malaria in Kisumu, western Kenya. *European Journal of Tropical Medicine and International Health*, 9(5), pp. 630-637.

VAN EIJK, A.M, BLOKLAND, I.E., ODHIAMBO, F., AYISI, J.G., BLESS, H.M., ROSEN, D.H., ADAZU, K. and LINBLADE, K.A., 2005. Use of intermittent preventive treatment for malaria in pregnancy in a rural area of western Kenya with high coverage of insecticide-treated bed nets. *The European Journal of Tropical Medicine and International Health*, 10(11), pp.1134-1140.

VAN GEERTRUYDEN, J.P., NTAKIRUTIMANA, D., ERHART, A., RWAGACONDO, C. KABANO, A. and D'ALESSANDRO, U., 2005. Malaria infection among pregnant women attending antenatal clinics in six Rwandan districts. *Tropical medicine and International Health*, 10(7), pp. 681-688.

VAN TEIJLINGEN, E.R., RENNIE, A., HUNDLEY, V. and GRAHAM, W. 2001. The importance of conducting and reporting pilot studies: The example of the Scottish births survey. *Journal of Advanced Nursing*, 34(3), 289-295.

VAN TEIJLINGEN, E. and HUNDLEY, V. 2002. The importance of pilot studies. *Nursing Standard*, 16(40), pp.33-36.

VERHOEF, F.H., BRABIN, B.J., CHIMSUKU, L., KASEMBE, P. RUSSEL, W.B. and BROADHEAD, R.L., 1998. An evaluation of the effects of intermittent sulfadoxine-pyrimethamine treatment in pregnancy on parasite clearance and risk of low birth weight in rural Malawi. *Annals of Tropical Medicine and Parasitology*, 92(2), pp.141-150.

VERHOEF, F.H., BRABIN, B.J., HART, C.A., CHIMSUKU, L., KASEMBE, P. and BROADHEAD, R.L., 1999. Increased prevalence of malaria in HIV-infected pregnant women and its implications for malaria control. *Tropical Medicine and International Health*, 4(1), pp.5-12.

VOVICI CORPORATION, 2011. *Ranking question versus rating questions* [online]. Vovici Corporation. Available from: [Httpblog.vovici.com/blog/bid/1822/Ranking-Q](http://blog.vovici.com/blog/bid/1822/Ranking-Q) [Accessed 9 January 2012].

WEBSTER, D., 2000. Malaria kills one child every 30 seconds: a new pandemic imperils half the world. Scientists think they know what has to be done, but the disease continues to outsmart them. *Smithsonian*, 9, pp.32-37.

WEEKS, L. C. and STRUDSHOLM, T., 2008. A scoping review of research on complementary and alternative medicine (CAM) and the mass media: Looking back, moving forward. *BMC Complementary and Alternative Medicine*, 8(43), pp.1-9.

WENGER, E. 1999. *Communities of practice. Learning, meaning and identity*. Cambridge: Cambridge University Press.

WHITEHEAD, M. and TONES, K., 1991. *Avoiding the pitfalls*. London: HEA.

WHITWORTH, M and DOWSWELL, 2009. Routine pre-pregnancy health promotion for improving pregnancy outcomes. *Cochrane Database of Systematic Reviews*. Issue 3.

WHO, 2002. Consequences of malaria in pregnancy. In: JHPIEGO, ed. *Malaria in Pregnancy*. Johns Hopkins University. [online]. Available from: http://www.jhpiego.org/resources/pubs/malalip/malaria_training.htm [Accessed 26 November 2008].

WHO, 2003. *World Health Report*. [Online]. World Health Organisation: Geneva, Switzerland [Online]. Available from: www.who.int/whr/2003/en/whor03_en.pdf [Accessed 10 March 2009].

WHO 2004. *A strategic framework for malaria prevention and control during pregnancy in the African Region*. World Health Organisation Regional Office for Africa, Brazzaville, AFR/MAL/04/01.

WHO, 2005a. *The Roll Back Malaria Strategy for improving access to treatment through home management of malaria*, World Health Organisation, Geneva, Switzerland, WHO/HTM/MAL/2005.1101.

WHO, 2005b. *Malaria Control in the WHO African Region - Turning the Corner on Malaria Control: Scaling up interventions to reach the most vulnerable*, Annual Report 2004, Harare, Zimbabwe.

WHO, 2006. *The Africa Malaria Report 2006*. [online]. The World Health Organisation, Regional Offices for Africa and Eastern Mediterranean. Harare, Zimbabwe. Available from: http://www.afro.who.int/malaria/publications/annual_reports/africa_malaria_report_2006.pdf [Accessed 15 August 2008].

WHO, 2007. Malaria Prevention and Control: An important responsibility of a Health-Promoting School. *WHO Information Series on School Health*, Document 13, Geneva, Switzerland.

WHO, 2009. East and Southern Africa Annual Review and Planning Meeting Report: "BCC for improved community uptake of malaria interventions" "promote community malaria control awareness and acceptance". Jointly Organised by the World Health Organisation's Inter-Country Support Team for East and Southern Africa for Malaria and RBM networks within the subregion; Harare, Zimbabwe.

WHO, 2010. *Millennium Development Goals: progress towards the health-related Millennium Development Goals*. Fact Sheet No.290, May Edition.

WHO, 2011. *Traditional Medicine, Ethiopia* [Online]. Available from: http://www.who.int/mediacentre/multimedia/2002/eth_traditionalmedicine/en/index.html. [Accessed 13 May 2011].

WHO, 2012. *WHO African Countries* [Online]. Available from: www.int/pmnch/countries/ethiopia/en/index/html [Accessed 15 September 2012]

WHO/AFRO 2000. Draft Roll Back Malaria initiative in the African Region monitoring and evaluation guidelines, Zimbabwe, Harare.

WHO/UNICEF, 2003. *The Africa Malaria Report 2003*. [online]. World Health Organisation African Office, Brazzaville, Congo; WHO/CDS/MAL/2003.1093 . Available from: <http://www.unicef.org.uk/campaigns/publications/pdf/amr2003.pdf> [Accessed 15 August 2008].

WHO/UNICEF, 2006. *Report on programme implementation and use of Insecticide-treated nets in the WHO African Region*. Vector Biology and Control Unit, WHO Regional Office for Africa and UNICEF Eastern and Southern Africa Regional Office, Harare, Zimbabwe [Online]. Available from: http://www.afro.who.int/vbc/reports/itn_report_06.pdf [Accessed 15 August 2008].

WHO/USAID/ACCESS, 2008. *Assessment of MIPESSA Country Experiences in the Adoption and Implementation of Malaria in Pregnancy Policies*. World Health Organisation/USAID/ACCESS Programme, The Malaria in Pregnancy Eastern and Southern Africa Coalition, World Health Organisation/USAID/ACCESS, WHO/AFRO, Harare, Zimbabwe.

WHO WORLD HEALTH STATISTICS, 2006. *Health Status: Mortality*. World Health Information System, Geneva, Switzerland [Online]. Available from: <http://www.who.int/whosis/whostat/2009/en/index.html> [Accessed 10 March 2011]

WHO WORLD HEALTH STATISTICS, 2011. *Health workforce, infrastructure, essential medicines*. World Health Information System, Geneva, Switzerland [Online]. Available from: <http://www.who.int/whosis/whostat/2011/en/index.html> [Accessed 5 July 2011].

WHO WORD MALARIA REPORT, 2010. *WHO Global Malaria Programme*. Geneva, Switzerland [Online]. Available from: http://www.who.int/malaria/world_malaria_report [Accessed 2 August 2011].

WILDSCHUT, A. and MQOLOZANA, T., 2008. *Shortage of Nurses or Absolute? Case study report, forming part of the HSRC study: A multiple source identification and verification of scarce and critical skills in the South African labour market*. Department of Labour, South Africa [Online]. Available from:

http://www.labour.gov.za/downloads/document/research_documents/nursesshortage.pdf [Accessed 5 November 2010].

WILKINSON, R., eds., 1986. *Class and health research and longitudinal data*. London: Tavistock.

WILKINSON, S.A., MILLER, Y.D. and WATSON, B., 2010. The Effects of a Woman-Focused, Woman-Held Resource on Preventive Health Behaviours During Pregnancy: The Pregnancy Pocketbook. *Woman and Health*, 50(4), pp. 342-358.

WIMPENNY, P., JOHNSON, N., WALTER, I. and WILKINSON, J.E., 2008. Tracing and Identifying the Impact of Evidence – Use of a Modified Pipeline Model. *Worldviews on Evidence-Based Nursing*, 1st Quarter, pp.3-12.

WINCH, P.J., MAKEMBA, A.M., KAMAZIMA, S.R., LURIE, M., LWIHULA, G.K., PREMJI, Z., MINJAS, J.N. and SHIFF, C.J., 1996. Local terminology for febrile illnesses in Bagamoyo District, Tanzania, and its impact on the design of a community based malaria control programme. *Social Science and Medicine*, 42(7), pp.1057-1067.

WRIGHT, K., HAYCOX, A. and LEEDHAM, I., 1994. *Evaluating Community Care: Services for people with learning difficulties*. Buckingham: Open University Press.

WRIGHT, K., JONES, L. and HOGAN, V., 2010. A Roadmap for authentic community/academic engagement for developing effective community preterm birth education. *Ethnicity and Disease*, 20, pp.S2-77.

YARTEY, J.E., 2006. Malaria in pregnancy: Access to effective interventions in Africa. *International Journal of Gynaecology and Obstetrics*, 94, pp. 364-373.

ZANZIBAR PORT CORPORATION, 2012. *Seaport* [Online]. Available from: <http://www.seaport.homestead.com/files/zanzibar.html> [Accessed 7 October 2012].

ZIBA, C., SLUTSKER, L., CHITSULO, L. and STEKETEE, R., 1994. Use of malaria prevention measures in Malawian households. *Tropical Medicine and Parasitology*, 45, pp. 70-73.

ZONDAGH, C., 2010. *Impact of Migration on Southern Africa*. National Private Hospital Coordinating Unit, Trade Union of South Africa: HOSPERSA, Johannesburg.

Appendices

Appendix 1: Findings of Data Search of Systematic Review

Appendix 1.1: Databases

Table 1: Database Findings [A]

Serve terms used in combinations	Results										
	Pre-CINAHL	CINAHL	Medline	Health Communication	Coch-Rane	PSSMC	ERIC	Psch-Info	MIDIR: Maternity & Infant Care	Info-Health	Health Education Research
Malaria, pregnancy	1	0	2,455	0	2	139	0	0	101	2	0
Malaria in pregnancy in Africa	0	0	397	0	0	0	0	0	0	0	0
Malaria prevention, pregnant women, Africa	0	0	141	0	0	0	0	0	0	0	0
Malaria control, pregnant women, Africa	0	0	39	0	0	0	0	0	0	0	0
Role, IEC strategies, malaria, pregnant mother, scaling up for impact, Africa	0	0	0	0	0	0	0	0	0	0	0
IEC, Pregnant women, ITN, IPT, Africa	0	0	0	0	0	0	0	0	0	0	0

Table 1: Database Findings [A] (Cont'd)

Serve terms used in combinations	Results										
	Pre-CINAHL	CINAHL	Medline	Health Communication	Coch-Rane	PSSMC	ERIC	Psch-Info	MIDIR: Maternity & Infant Care	Info-Health	Health Education Research
Promotional campaigns during pregnancy, malaria prevention, Africa	0	0	0	0	0	0	0	0	0	0	0
Malaria awareness campaigns, pregnant women, ITN, Africa	0	0	0	0	0	0	0	0	0	0	0
Malaria promotional campaign, pregnant women, IPT, Africa	0	0	0	0	0	0	0	0	0	0	0
Malaria Educational campaign, pregnant women, IPT, Africa	0	0	0	0	0	0	0	0	0	0	0
Media campaigns, IPTp, Africa	0	0	0	0	0	0	0	0	0	0	0
Behaviour change communication , IPTp, Africa	0	0	0	0	0	0	0	0	0	0	0

Table 1: Database Findings [A]

Serve terms used in combinations	Results										
	Pre-CINAHL	CINAHL	Medline	Health Commu- nication	Coch- Rane	PSSMC	ERIC	Psch- Info	MIDIR: Maternity & Infant Care	Info- Health	Health Education Research
Feasibility, appropriateness, meaningfulness, effectiveness, IEC strategies, pregnant women, malaria, Africa	0	0	0	0	0	0	0	0	0	0	0
Pregnant mothers, health educators' role, malaria prevention, Africa	0	0	0	0	0	0	0	0	0	0	0
Effects, IEC, malaria prevention and control, pregnancy, Africa	0	0	0	0	0	139	0	0	0	0	0
Health education, counselling, malaria, pregnancy, Africa	0	0	0	0	0	0	0	0	0	0	0
Sub-total	1	0	3,032	0	2	278	0	0	101	2	0
TOTAL	3,416 CITATIONS										

Appendix 1.2: Web-based search

The results of web-based search are as follows:

Table 2: Websites Findings [B]

No	Website	Results
1	World Health Organisation/RBM Partnership	8
2	JHPIEGO	5
3	John Hopkins University School of Public Health	3
4	Global Health Council	1
5	George Washington University School of Public Health	1
6	PREMA-EU	1
7	Malaria International Foundation	0
8	Gate Foundation	0
9	Malaria Matters	0
	Total	19

Appendix 1.3: Reference Search [C]

4 papers were obtained through reference search

Appendix 1.4: Contacts [D]

1 paper was obtained via electronic media from an author from Uganda.

Appendix 1.5: Total No. of Studies found

The overall number of citations found was calculated by adding all the above sources of data (i.e A+B+C+D) Three Thousand, Four Hundred and Forty (**3,440**) citations.

Appendix 2: Assessment of Methodological Quality of Qualitative and Quantitative studies

Code/Article:

Type:

Assessment of Methodological Quality of Qualitative and Quantitative research papers

Assessment for:

Author:

Date/volume of Publication:

User:

Primary Reviewer:

Secondary Reviewer:

Quality Assessment Criteria		
Level	Element 1: Theory Robustness	Tick [√] as Appropriate
0-absence	This article does not provide enough information to assess this criteria	
1-low	<ul style="list-style-type: none"> • Poor awareness of existing literature and debates • Under or over reference • Low validity theory 	
2-medium	<ul style="list-style-type: none"> • Basic understanding of the issues around the topic being discussed • The theory is weakly related to data 	
3-high	<ul style="list-style-type: none"> • Deep and broad knowledge of relevant literature for addressing literature and theory relevant for addressing the research • Good relation theory-data 	
Level	Element 2: Methodology. Data supporting arguments	
0-absence	The article does not provide enough information to assess this criteria	
1-low	<ul style="list-style-type: none"> • Data inaccuracy and not related to theory • Flawed research design 	
2-medium	<ul style="list-style-type: none"> • Data is related to the arguments, though there are some gaps • Research design may be improved 	

3-high	<ul style="list-style-type: none"> Data strongly supports arguments The research design is robust: sampling, data gathering, data analysis is rigorous 	
Level	Element 3: Applicability/Implication for practice	
0-absence	This article does not provide enough information to assess this criteria	
1-low	<ul style="list-style-type: none"> Very difficult to implement the concepts and ideas presented Not relevant for practitioners or professionals 	
2-medium	There is a potential for implementing the proposed ideas, with minor revisions or adjustments	
3-high	Significant benefit may be obtained if the ideas being discussed are put into practice	
Level	Element 4: Generalisability	
0-absence	This article does not provide enough information to assess this criteria	
1-low	Generalisable only to the population studied	
2-medium	Generalisable to organisations of similar characteristics	
3-high	High level of generalizability	
Level	Element 5: Ethical Acceptability	
0-absence	This article does not provide any information to assess this criteria	
1-low	This article does not provide enough information to assess this criteria	
2-medium	This article provides some information to assess this criteria	
3-high	This article provides enough information to assess this criteria	
4- N/A	This is not applicable	

Reviewer's Comments:

Primary:

Include: Yes No

Secondary Reviewer:

Include: Yes No

Reasons:

Appendix 3: Quality Assessment Instrument: Notes, Texts, Opinions and Discourses

Code/ Article:

Type:

Quality Assessment Instrument: Notes, Texts, Opinions and Discourses

Assessment for:

Author:

Date/volume of Publication:

User:

Primary Reviewer:

Secondary Reviewer:

No	Criteria	Yes	No	Unclear
1	Is the source of the opinion clearly identified?			
2	Does the source of the opinion have standing in the field of malaria control expertise?			
3	Are the interests of population the central focus of the opinion?			
4	Is the opinion's basis in logic/experience clearly argued?			
5	Are the arguments consistent with the World Health Organisation malaria control programme agenda?			
6	Is the argument developed analytical?			
7	Is there reference to the existing literature/evidence and any incongruence with it logically defended?			
8	Is the opinion supported by peers?			

Reviewer's Comments:

Primary Reviewer:

Include:

 Yes

 No

Secondary Reviewer:

Include:

 Yes

 No

Reasons:

**Appendix 4: Quality Assessment Instrument for Policy documents:
Standard Guidelines/Strategic Plans/Tactical Plans/Operational
Plans/Monitoring and Evaluation Reports**

Code/Article:

Type:

Quality Assessment Instrument for Policy documents: standard guideline/strategic plans/tactical plans/operational plans/monitoring and evaluation reports

Assessment for:

Author:

Date/volume of Publication:

User:

Primary Reviewer:

Secondary Reviewer:

No	Criteria	Yes	No	unclear
1	Is the source of the document clearly identified?			
2	Does the source of the document have standing in the field of malaria control?			
3	Is the document consistent with WHO Malaria Control Programme/RBM standard? (i.e. process, outcome and impact indicators)			
4	Are the document consistent with the World Health Organisation malaria control programme/RBM agenda?			
5	Are the interests of the population the central focus of the document?			
6	Is the scope of the document consistent with the inclusion criteria of the current study?			
7	Is the content clear and detailed enough?			
8	Has the document been peer reviewed?			

Reviewer's Comments:

Primary Reviewer:

Include:

 Yes No

Secondary Reviewer:

Include:

 Yes No

Reasons:

Appendix 5: Data Extraction Sheet for Qualitative and Quantitative Studies

Code:

A. Background Characteristics

Study:

Method (s):

Population/participants:

Intervention:

Outcome measure:

Notes:

- Location:

- Conclusions:

B. Main Findings

- Feasibility:

- Appropriateness:

- Meaningfulness:

- Effectiveness:

Appendix 6: Data Extraction Sheet for Notes, Texts, Opinions and Discourse

Code:

A. Background Characteristics

Study :

Type:

Aim/Objective:

Context:

Context Relevance:

Focal Relevance:

Intervention:

Notes:

- Location:
- Conclusion:

B. Main Findings

- **Feasibility:**
- **Appropriateness**
- **Meaningfulness**
- **Effectiveness**

Appendix 7: Data Extraction Sheet for Policy Documents: Standard Guidelines/Strategic Plans/Operational Plans/Monitoring and Evaluation Reports

Code:

A. Background Characteristics

Study :

Type:

Aim/Objective:

Context:

Context Relevance:

Focal Relevance:

Intervention:

Notes:

- Location:
- Conclusion:

B. Main Findings

- **Feasibility:**
- **Appropriateness**
- **Meaningfulness**
- **Effectiveness**

Appendix 8: Letters of Introduction

Appendix 8.1: Letter to the JBI African Regional Director, Headquarters, Adelaide, Australia

Dear Sarahlouise,

Research Project: The Role of Information, Education and Communication Strategies in Malaria Prevention and Control during Pregnancy in Africa

Thanks for your previous emails and help with the second phase of the above project. I am attaching a letter that I hope you will forward to all the African Centre Directors. I have addressed each one personally to the 14 Centres I want to contact: Ghana, Nigeria (both centres), Malawi, Tanzania, Swaziland (Maternal Health), Zimbabwe, South Africa, Ethiopia, Uganda, Kenya, Cameroon, Botswana and Rwanda.

Could you also introduce me in your email? Perhaps something like this:

Dear.....

Theophilus Maloreh-Nyamekye has asked me if I would forward this letter to you as a means of introduction. Theo, although Ghanaian, is a PhD student in our Aberdeen (Scotland) Centre and has been undertaking work on pregnancy and malaria prevention. He is seeking your help with the second phase of his work and has detailed this in the attached letter. If you could assist him he would be most grateful. Please direct any questions or replies directly to Theo at prs.maloreh-nyamekye@rgu.ac.uk or by telephone 0044 1224 263517.

Best regards
Sarahlouise

Appendix 8.2: Letter to Father's House Church, Aberdeen, Scotland for Pilot Study among People of African Origin



THE JOANNA BRIGGS INSTITUTE



**ROBERT GORDON
UNIVERSITY•ABERDEEN**

Joanna Briggs Collaborating Centre
Faculty of Health and Social Care
School of Nursing and Midwifery
The Robert Gordon University
Garthdee Road
AB10 7QG

Tel: 0044(1224) 663390 44(0) 7960010396
Fax: 0044(1224) 262630
Email: prs.maloreh-nyamekye@rgu.ac.uk/
tnyamekye@yahoo.com

The Head Minister/Presiding Elder
Father's House
Aberdeen
Scotland

6th August 2009

Dear Minister/Elder,

Research Project: The Role of Information, Education and Communication Strategies in Malaria Prevention and Control during Pregnancy in Africa

I am Theophilus Maloreh-Nyamekye, a Ghanaian, and a PhD Student based at the Joanna Briggs Collaborating Centre at the Robert Gordon University in Aberdeen, Scotland. I am conducting a Delphi Study on the above-named project to seek contextually based opinion and group consensus to complement a systematic review of the evidence I had undertaken over the last year.

I am hoping that you will be able to assist me with this pilot study as an initial part of the data collection process in order to test the quality of the questionnaire with regards to understanding, clarity, ambiguity, language, style of presentation, readability and time spent on completion of the questionnaire.

Your organisation has been selected as a pilot sample for this project because of the knowledge and experience of some of your members with regards to Malaria, its prevention and control in Africa. To that effect I would like to send ten (10) sample questionnaires to selected members of your congregation. Participants will have to identify themselves by providing their names and contact addresses for the purpose of follow-up should this become necessary. However, please be assured that the data will remain confidential and no names or details will appear in the analysis. The study has been considered by the School of Nursing and Midwifery Research Ethics Committee here at the Robert Gordon University.

Any response the participants provide will remain confidential. Further information can be found in the enclosed information leaflet and I would be delighted to answer any queries you may have.

Thank you in anticipation of kind gesture.

Yours faithfully

Theophilus Maloreh-Nyamekye
PhD Student
Tel: 01224 263157/01224 871740
Email: prs.maloreh-nyamekye@rgu.ac.uk

Appendix 8.3: Sample of letters to Conveners of JBI Centres, Africa



**ROBERT GORDON
UNIVERSITY • ABERDEEN**

Joanna Briggs Collaborating Centre
Faculty of Health and Social Care
School of Nursing and Midwifery
The Robert Gordon University
Garthdee Road
AB10 7QG

Tel: 0044(1224) 663390 44(0) 7960010396
Fax: 0044(1224) 262630
Email: prs.maloreh-nyamekye@rgu.ac.uk/
tnyamekye@yahoo.com

5th of August 2009

[Name and Full Address]

Dear

Research Project: The Role of Information, Education and Communication Strategies in Malaria Prevention and Control during Pregnancy in Africa

I am Theophilus Maloreh-Nyamekye, a Ghanaian, and a PhD Student based at the Joanna Briggs Collaborating Centre at the Robert Gordon University in Aberdeen, Scotland. I am conducting a Delphi Study on the above-named project to seek contextually based opinion and group consensus to complement a systematic review of the evidence I had undertaken over the last year.

I am hoping that you will be able to assist me with this as part of the JBI collaboration and will have an understanding of malaria within this context. The Delphi process in this case will seek to ascertain the views of a group of practitioners, educators and researchers who are based in Africa in an attempt to establish consensus against the available evidence. The study may involve two rounds of data collection to achieve this.

To that effect I would like to send you a small number of questionnaires (6) for you to distribute to appropriate practitioners, educators and researchers. Participants may be within the University or Health Services and could also include those in District Health Management Teams, Regional Health Management Teams and Hospital Management Teams who you consider have the requisite knowledge and experience in malaria prevention and control and especially with regards to pregnant women.

Participants will have to identify themselves so that if a second round of the Delphi process is undertaken I will be able to contact them directly and also match responses for analysis purposes. However, please be assured that the data will remain confidential and no names or details will appear in the analysis. The study has been considered by the School of Nursing and Midwifery Research Ethics Committee here at the Robert Gordon University.

I also need to know what you consider would be the best means by which the questionnaires should be made available to you and the potential participants connected to your Centre. It is possible to send these:

1. as hard copy by post,
2. by email as a word document so that you (or the participants) could complete on screen and return via email or print and return by post or
3. provide a web link to the questionnaire so that it is completed on-line

In addition I have a small budget to cater for any cost you may incur for postage of the returned questionnaires or other administrative expenses. Therefore, please let me know what costs will be incurred so that I can arrange suitable reimbursement.

Thank you in anticipation of your kind gesture.

Yours sincerely,

Theophilus Maloreh-Nyamekye
PhD Student
Tel.: 0044 (0) 1224 263157
Email: prs.maloreh-nyamekye@rgu.ac.uk

Appendix 8.4: Sample of Letters to Gatekeepers of Faith-Based Organisations in the Sampa Community, Ghana



**ROBERT GORDON
UNIVERSITY • ABERDEEN**

Joanna Briggs Collaborating Centre
Faculty of Health and Social Care
School of Nursing and Midwifery
The Robert Gordon University
Garthdee Road
AB10 7QG
Tel: 0044(1224) 263157
Fax: 0044(1224) 262630

30th September 2009

[Recipient' Name and Address]

Ghana

Dear Minister/Elder/Imam,

Research Project: The Role of Information, Education and Communication Strategies in Malaria Prevention and Control during Pregnancy in Africa

I am Theophilus Maloreh-Nyamekye, a Ghanaian, and a PhD Student based at the Joanna Briggs Collaborating Centre at the Robert Gordon University in Aberdeen, Scotland. I am conducting an evaluation on the above-named project to seek contextually based opinion and group consensus to complement a systematic review of the evidence I had undertaken over the last year.

Your organisation has been selected as part of the sample for this project because of the knowledge and experience of members of your church at Sampa with regards to Malaria prevention and control.

Any response the participants provide will remain confidential.

Further information can be found in the enclosed information leaflet and I would be delighted to answer any queries you may have.

Thank you in anticipation of reply.

Yours faithfully

Theophilus Maloreh-Nyamekye

Appendix 8.5: Letters to Ghana Health Service

Appendix 8.5a: Sample of Letters sent to selected Regional Directors of Health Services, Ghana Health Service



**ROBERT GORDON
UNIVERSITY • ABERDEEN**

Joanna Briggs Collaborating Centre
Faculty of Health and Social Care
School of Nursing and Midwifery
The Robert Gordon University
Garthdee Road
AB10 7QG
Tel: 0044(1224) 663390/0044(1224)
07960010396
Fax: 0044(1224) 262630
Email: prs.maloreh-nyamekye@rgu.ac.uk/
tnyamekye@yahoo.com

22nd October 2009

[Name and Address]

Dear,

PhD Research Project: The Role of Information, Education and Communication Strategies in Malaria Prevention and Control during Pregnancy in Africa

I am Theophilus Maloreh-Nyamekye, a Ghanaian, and a PhD Student based at the Joanna Briggs Collaborating Centre at the Robert Gordon University in Aberdeen, Scotland. I was formerly a Health Services Administrator at Effia-Nkwanta Regional Hospital and Tarkwa Government Hospital between 1999 and 2002. I am conducting an evaluation on the above-named project to seek contextually based opinion and group consensus to complement a systematic review of the evidence I had undertaken over the last year for the first part of the study.

Brong Ahafo and the Western Regions have been selected as part of this study as I am familiar with the context of these areas. In particular, Sampa District Hospital Management and Tarkwa Government Hospital Management Teams; Sampa and Tarkwa District Health Management Teams; and the Regional Health Management Teams of both regions, the National Malaria Control Unit and the Reproductive Health Unit of the Ghana Health Service have been targeted as samples for this project because of their knowledge and experience of **Malaria, its prevention and control in Africa.**

Anonymity of participants will be guaranteed. Please be assured that the data will remain confidential as they will be stored in a secured place in the School of Nursing and Midwifery of the Robert Gordon University. Meanwhile, the study has been considered by the School of Nursing and Midwifery Research Ethics Committee here at the Robert Gordon University, Aberdeen in the United Kingdom.

By this letter, I wish to ask for your permission to administer questionnaires to selected health professionals at the Western Regional Health Directorate and Wasswa West District Health Management Team and the Tarkwa Hospital Management Team. Mr Allen Anku, the Tarkwa Hospital Administrator, has been identified as the focal person for the data collection process in the region (please list of proposed participants attached).

Further information can be found in the enclosed information leaflet and I would be delighted to answer any queries you may have. Also attached are a sample questionnaire and an approval letter from the Research Ethics Committee of the School of Nursing and Midwifery at the Robert Gordon University, Aberdeen in the United Kingdom.

Thank you.

Yours faithfully,

Theophilus Maloreh-Nyamekye

Appendix 8.5b: Letter to the Director of Public Health, Ghana Health Service



**ROBERT GORDON
UNIVERSITY•ABERDEEN**

Joanna Briggs Collaborating Centre
Faculty of Health and Social Care
School of Nursing and Midwifery
The Robert Gordon University
Garthdee Road
AB10 7QG

Tel: 0044(1224) 663390 44(0) 7960010396
Fax: 0044(1224) 262630
Email: prs.maloreh-nyamekye@rgu.ac.uk/
tnyamekye@yahoo.com

22nd October 2009

The Director of Public Health
Ghana Health Service
Headquarters, Accra
Ghana

Dear Sir/Madam,

Research Project: The Role of Information, Education and Communication Strategies in Malaria Prevention and Control during Pregnancy in Africa

I am Theophilus Maloreh-Nyamekye, a Ghanaian, and a PhD Student based at the Joanna Briggs Collaborating Centre at the Robert Gordon University in Aberdeen, Scotland. I was formerly a Health Services Administrator at Effia-Nkwanta Regional Hospital and Tarkwa Government Hospital between 1999 and 2002. I am conducting an evaluation on the above-named project to seek contextually based opinion and group consensus to complement a systematic review of the evidence I had undertaken over the last year for the first part of the study.

Brong Ahafo and the Western Regions have been selected as part of this study as I am familiar with the context of these areas. In particular, Sampa District Hospital Management and Tarkwa Government Hospital Management Teams; Sampa and Tarkwa District Health Management Teams; the Regional Health Management Teams of both regions; the National Malaria Control Unit and the National Reproductive Health Unit have been targeted as samples for this project because of the knowledge and experience of **Malaria, its prevention and control in Africa**. To that effect I would like to send questionnaires to at least 40 selected personnel to express their expert opinion. The data will be collected between October and December 2009 by post through selected focal persons living in Ghana.

Anonymity of participants will be guaranteed and consent forms completed. Please be assured that the data will remain confidential as they will be stored in a secured place

in the School of Nursing and Midwifery of the Robert Gordon University. Meanwhile, the study has been considered by the School of Nursing and Midwifery Research Ethics Committee here at the Robert Gordon University.

Further information can be found in the enclosed information leaflet and I would be delighted to answer any queries you may have. Also attached are a sample of information leaflet, questionnaire, and an approval letter from the Research Ethics Committee of the School of Nursing and Midwifery at the Robert Gordon University, Aberdeen in the United Kingdom.

Thank you.

Yours faithfully,

Theophilus Maloreh-Nyamekye
PhD Student

Appendix 9: Information Sheet for Respondents and Focal Persons



**ROBERT GORDON
UNIVERSITY•ABERDEEN**

30th September 2009

TO WHOM IT MAY CONCERN

Dear Sir/Rev./Madam/Ms/Mrs

**'THE ROLE OF INFORMATION, EDUCATION AND COMMUNICATION
STRATEGIES IN MALARIA PREVENTION AND CONTROL DURING PREGNANCY
IN AFRICA'**

INFORMATION LEAFLET FOR PARTICIPANTS:

I am Theophilus Maloreh-Nyamekye, a Ghanaian, and a former health services administrator at district and regional levels within the Ghana Health Service (GHS). I am currently, a PhD Student based at the Joanna Briggs Collaborating Centre at the Robert Gordon University in Aberdeen, Scotland. I am conducting an evaluation on the above-named project to seek contextually based opinion and group consensus to complement a systematic review of the evidence I had undertaken over the last year for the first part of the study.

You have been selected as part of the study sample for this project because of your knowledge and experience with regard to malaria, its prevention and control in Africa.

Thank you

Please read the following before completing the questionnaire

Listed in the attached questionnaire are messages on the role of information, education and communication (IEC) strategies in malaria prevention and control among pregnant women in Africa which were developed from a systematic review of available evidence. I am seeking your views on which of these strategies you would consider most appropriate, in your context, to address the prevention of malaria in pregnant women and also which are the biggest challenges. Please score both the strategies and the challenges. A corresponding comment column has also been provided to provide justification or comment for your opinion.

Three additional questions seek your opinions on the impact the IEC strategies and how challenges may be addressed in the light of your country specific context.

The review was based on the following working definition of IEC with which you may be familiar.

Working Definition of IEC

“Information, Education and Communication (IEC) in health programmes aims to increase awareness, change attitudes and bring about a change in specific behaviours. IEC means sharing information and ideas in a way that is culturally sensitive and acceptable to the community, using appropriate channels, messages and methods. It is therefore broader than developing health education materials, because it includes the process of communication and building social networks for communicating information.

IEC interventions should involve the active participation of the target audience and adopt channels, methods and techniques that are familiar to their world view.

Information, education and communication is an important tool in health promotion for creating supportive environments and strengthening community action, in addition to playing an important role in changing behaviour”

(Ministry of Health and Child Welfare/Zimbabwe National Family Planning Council 1998,p.5).

Some Specific Information for Participants

The Researcher: Theophilus Maloreh-Nyamekye

Background: A PhD Student from Ghana, studying at the Robert Gordon University, Aberdeen, Scotland, UK

Project: The Role of Information, Education and Communication Strategies in Malaria Prevention and Control during pregnancy in Africa

Aims & Objectives of Study

- To gather the opinion of malaria control experts on the feasibility, appropriateness, meaningfulness and effectiveness of Information, Education and Communication (IEC) strategies
- To gather expert opinion on the rating/scoring of IEC strategies and IEC implementation challenges
- To identify the impact of the IEC strategies with regards to malaria prevention and control among pregnant women
- To identify differences and similarities with regards expert opinion
- To develop a theoretical framework in order to enhance the understanding of issues related to the implementation of IEC Strategies
- To identify best practices and lessons of IEC interventions in malaria prevention and control in pregnancy in order to inform governments, policy makers, directors, health managers, health researchers, frontline health workers and health educators at community and health facility levels

The Research Design

This stage of the study involves an evaluation that draws on the ideas of Delphi study principles and techniques by focusing on identifying opinions and experiences of participants in relation to the issue being investigated.

Instructions on completion of Questionnaire

- Brief instructions are provided in the questionnaire in order to enable you complete it.
- Please do not hesitate to send me query should you find some part (s) of the questionnaire ambiguous

Ethical Considerations

- The information you provide will be held in the strictest confidence
- Individuals will not be identified in reporting data, but countries, regions, districts and organisations may be identified in reporting.
- Return of completed questionnaires will imply a consent to participate in the study
- Data will be stored in a secured place at the School of Nursing and Midwifery, Faculty of Health and Social Care, The Robert Gordon University, Aberdeen and destroyed 1yr from completion of the thesis

- All data will be used only for academic purposes
- You are at liberty to withdraw from the study whenever you please

Acknowledgement

Thank you for all your help!

Contact Address if you require further information:

Theophilus Maloreh-nyamekye
PhD Student (Principal Investigator)

Joanna Briggs Collaborating Centre
School of Nursing and Midwifery
Faculty of Health and Social Care
The Robert Gordon University, Aberdeen
Scotland, United Kingdom
Email: prs.maloreh-nyamekye@rgu.ac.uk
Tel: 0044 (0) 7960010396/0044 (1224)263157
Fax: 0044 1224 262630

If you have any concerns about the study please contact my supervisor:

Dr Peter Wimpenny
Joanna Briggs Collaborating Centre
School of Nursing and Midwifery
Faculty of Health and Social Care
The Robert Gordon University, Aberdeen
Scotland, United Kingdom
e.mail p.wimpenny@rgu.ac.uk
Tel 0(044)1224 262650



**ROBERT GORDON
UNIVERSITY•ABERDEEN**

**The Role of Information, Education and Communication Strategies in Malaria
Prevention and Control during Pregnancy in Africa**

Theophilus Maloreh-Nyamekye

**PhD Student (Principal Investigator)
The Robert Gordon University, Aberdeen
Scotland, United Kingdom
Email: prs.maloreh-nyamekye@rgu.ac.uk
Tel: 0044 (1224) 263157 / 0044 (0) 7960010396**

September 2009

SECTION A: INSTRUCTIONS FOR COMPLETION OF QUESTIONNAIRE

1. Please ensure you have read the attached information sheet before completing this questionnaire
2. When completing the questionnaire, you are expected to use your experience of malaria control in Africa, most especially with regards to malaria prevention and control during pregnancy
3. If you feel you do not have the appropriate experience, please identify another person (if possible) to complete the survey giving him or her the same instruction given in this page
4. Wherever possible, write your justification or add your comments for the scoring for purposes of clarification
5. You may add any additional message that you feel equally important with scoring and justifications or comments
6. Upon completion of the survey, please return it (in the enclosed stamp addressed envelope provided?)

Any information provided will be **confidential** and aggregated so that individuals cannot be identified. Returning the questionnaire assumes your consent.

For further Information Contact:

Theophilus Maloreh-nyamekye
PhD Student (Principal Investigator)
Joanna Briggs Collaborating Centre
School of Nursing and Midwifery
Faculty of Health and Social Care
The Robert Gordon University, Aberdeen
Scotland, United Kingdom
Email: prs.maloreh-nyamekye@rgu.ac.uk
Tel: 0044 (0)7960010396/0044 (1224)263157
Fax: 0044 1224 262630

Dr Peter Wimpenny
Associate Director (Principal Supervisor)
Joanna Briggs Collaborating Centre
School of Nursing and Midwifery
Faculty of Health and Social Care
The Robert Gordon University, Aberdeen
Scotland, United Kingdom
Email: p.wimpenny@rgu.ac.uk
Tel: 0044 1224 262650
Fax: 0044 1224 262630

SECTION B: QUESTIONS 1-11

Qu 1 Background Information. Please provide some background information about yourself:

1.1

Age:

- 15-19
- 20-24
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50 and above

1.2

Gender:

- Male
- Female

1.3

Level of education (please tick [√] the highest level attained):

- PhD
- Masters
- First Degree
- Diploma
- Other (please specify).....

1.4 Profession/Occupation:

- Doctor
- Nurse
- Midwife
- Nurse/Midwife
- Pharmacist

- Disease Control Officer
- Manager
- Community health worker
- Teacher
- Other (please specify).....

1.5 Faith:

- Christianity
- Islam
- Traditional Religion
- Other (please specify).....

1.6 Field (s) of specialisation/expertise (if applicable):

1.7 Place of Work (if applicable):

1.8 Position in Organisation (if applicable):

1.9 Your Role in Malaria Prevention and Control (if applicable):

1.10 Role of your Organisation in Malaria Prevention and Control (if applicable):

1.11 Country where you live:

1.12 Region where you live:

1.13 District where you live:

1.14 Your country of origin:

Qu 2. Strategies for Malaria Prevention in pregnant Women

The following IEC strategies, derived from a systematic review of evidence, have been identified to prevent malaria in pregnancy. Could you rate the priority of these strategies by circling your response, with **1= very low priority, 2= low priority, 3=moderate, 4 =high priority, 5 =very high priority**. There is no right or wrong score. Please add, where possible justification for your rating

IEC Strategy	Rating	Justification/Comment
2.1 Regular training and orientation of staff on new national malaria control guidelines including malaria in pregnancy (MIP)	1 2 3 4 5	
2.2 Carrying out advocacy among stakeholders in order to influence behaviour, especially at the community level	1 2 3 4 5	
2.3 Mobilising communities to conduct mass community education campaigns to create awareness on malaria prevention and control in pregnancy	1 2 3 4 5	
2.4 Conducting house-to-house sensitisation among pregnant women and households	1 2 3 4 5	
2.5 Promoting and sustaining routine health education talks in health units among pregnant women	1 2 3 4 5	
2.6 Visiting places of religious worship to create awareness on malaria in pregnancy	1 2 3 4 5	
2.7 Organising and supporting community women's group meeting on malaria in pregnancy	1 2 3 4 5	
2.8 Promoting integrated health education campaigns at all levels of health service delivery in order to increase efficiency in IEC programme implementation	1 2 3 4 5	
IEC Strategy	Rating	Justification/Comment
2.9 Delivering educational messages based on appropriate and meaningful symbols, metaphors and language understood by target audience	1 2 3 4 5	
2.10 Packaging and delivering health information to address educational needs of different audience with diverse cultural background at the same time	1 2 3 4 5	
2.11 Other strategies that are not included above please describe this and allocate a score (please specify):	1 2 3 4 5	

Qu 3. Irrespective of your scoring above, please look through the strategies in Question 2 above and nominate the top 3 and the least priority strategy by inserting the **number of the strategy** in the appropriate box below:

For example	
3.1 Highest Priority	<input type="text" value="1.6"/>
3.2 Second Priority	<input type="text" value="2.3"/>
3.3 Third Priority	<input type="text" value="1.9"/>
3.4 Least Priority	<input type="text" value="1.7"/>

- 3.1 Highest priority:
- 3.2 Second highest:
- 3.3 Third highest:
- 3.4 Lowest priority:

Qu 4. Referring to question 3, can you comment on your choice of HIGHEST and LOWEST priority strategy?

Qu 5. Challenges to Malaria Prevention in Pregnant Women

Addressing the above IEC strategies requires consideration of the challenges they pose. Please score the following statements on challenges with regards to malaria prevention and control in pregnant women. Please **CIRCLE** your response with respect to the **LEVEL of CHALLENGE**, with **1= being very low, 2= low, 3=moderate, 4 =high, 5 =very high**. There is no right or wrong score. Please add, where possible, justification for your rating.

IEC Strategy Implementation Challenges	Rating	Comments
5.1 Addressing issues of staff knowledge on malaria prevention and control in pregnancy	1 2 3 4 5	
5.2 Addressing issues of staff attitude towards clients	1 2 3 4 5	
5.3 Addressing issues of work practices with regards to plans and procedures	1 2 3 4 5	
5.4 Managing staff shortage	1 2 3 4 5	
5.5 Dealing with problems of distance (access to antenatal care facility)	1 2 3 4 5	
5.6 Dealing with issues of waiting time in relation to antenatal care consultations	1 2 3 4 5	
5.7 Addressing issues of women's empowerment	1 2 3 4 5	
5.8 Managing issues of poverty in relation to cost of mosquito nets (e.g. insecticide-treated bed nets) among pregnant women, especially in rural communities	1 2 3 4 5	

IEC Strategy Implementation Challenges	Rating	Comments
5.9 Managing resources (human, material and financial)	1 2 3 4 5	
5.10 Demystifying or addressing cultural beliefs in relation to malaria in pregnancy	1 2 3 4 5	
5.11 Managing health seeking behaviour among pregnant women	1 2 3 4 5	
5.12 Other challenges that are not included above please describe this and allocate a score (please specify):	1 2 3 4 5	

Qu 6. Whilst you may consider all of the above challenges important, it is essential to know which priorities should be addressed first. In the light of this, please look through the challenges in Question 5 above and nominate the highest 3 challenges and the least challenge by inserting the response in the boxes shown below:

For example	
3.1 Highest challenge	<input type="text" value="5.5"/>
3.2 Second highest challenge	<input type="text" value="5.2"/>
3.3 Third highest challenge	<input type="text" value="5.12"/>
3.4 Least challenges	<input type="text" value="5.6"/>

6.1 Highest challenge:

6.2 Second highest challenge:

6.3 Third highest challenge:

6.4 Least challenge:

Qu 7. Referring to Question 5, can you comment on your choice of **HIGHEST** and **LEAST CHALLENGE?**

Qu 8. What in your opinion has been the impact of IEC strategies in malaria prevention and control among pregnant women in Africa? Please indicate your opinion below:

Not aware of any impact of IEC strategies (please tick [√] the box)

Aware of impact (please tick [√] the box)

Qu 9. In the light of your response to Question 8, please provide details of your personal experience within the context of your country specific situation in the box below:

Qu 10. Please any additional comment (s) or recommendation (s) with regards to how some of the **CHALLENGES** mentioned above may be **ADDRESSED?**

Qu 11. Having considered the relative importance of the strategies and challenges, please could you now score their feasibility, appropriateness, meaningfulness, and effectiveness (see description of each below) on the scale 1-5 where **1=very difficult; 2=difficult; 3=moderate; 4=easy; and 5=very easy** for **FEASIBILITY**; and 1-5 where **1=very low; 2=low; 3=moderate; 4=high; and 5=very high** in the case of **APPROPRIATENESS, MEANINGFULNESS** and **EFFECTIVENESS** by ticking [✓] the appropriate response.

- **Feasibility:** The extent to which you believe a given intervention can be adopted
- **Appropriateness:** The extent to which you consider a given intervention finds expression within a given cultural context
- **Meaningfulness:** The extent to which you believe an intervention message makes sense to the target audience
- **Effectiveness:** The extent to which you believe an intervention meets its intended purpose

For Example

No	IEC Strategy	Feasibility	Appropriateness	Meaningfulness	Effectiveness
11.1	Regular training and orientation of staff on new national malaria control guidelines including malaria in pregnancy (MIP)	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy ✓	1- very low ✓ 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate ✓ 4-high 5-very high	1- very low 2-low ✓ 3-moderate 4-high 5-very high

- **Feasibility:** The extent to which you believe a given intervention can be adopted
- **Appropriateness:** The extent to which you consider a given intervention finds expression within a given cultural context
- **Meaningfulness:** The extent to which you believe an intervention message makes sense to the target audience
- **Effectiveness:** The extent to which you believe an intervention meets its intended purpose

No	IEC Strategy	Feasibility	Appropriateness	Meaningfulness	Effectiveness
11.1	Regular training and orientation of staff on new national malaria control guidelines including malaria in pregnancy (MIP)	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high
11.2	Carrying out advocacy among stakeholders in order to influence behaviour, especially at the community level	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high
11.3	Mobilising communities to conduct mass community education campaigns to create awareness on malaria prevention and control in pregnancy	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high
11.4	Conducting house-to-house sensitisation among pregnant women and households	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high
11.5	Promoting and sustaining routine health education talks in health units among pregnant women	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high

- **Feasibility:** The extent to which you believe a given intervention can be adopted
- **Appropriateness:** The extent to which you consider a given intervention finds expression within a given cultural context
- **Meaningfulness:** The extent to which you believe an intervention message makes sense to the target audience
- **Effectiveness:** The extent to which you believe an intervention meets its intended purpose

11.6	Visiting places of religious worship to create awareness on malaria in pregnancy	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high
11.7	Organising and supporting community women's group meeting on malaria in pregnancy	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high
11.8	Promoting integrated health education campaigns at all levels of health service delivery in order to increase efficiency in IEC programme implementation	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high
11.9	Delivering educational messages based on appropriate and meaningful symbols, metaphors and language understood by target audience	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high
11.10	Packaging and delivering health information to address educational needs of different audience with diverse cultural background at the same time	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high
11.11	Other strategies that are not included above please describe this and allocate a rank (please specify):	1-very difficult 2-difficult 3-moderate 4-easy 5-very easy	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high	1- very low 2-low 3-moderate 4-high 5-very high

Appendix 11: Approval Letters

Appendix 11.1: Ethical Approval from the Robert Gordon University Research Degrees Ethics Committee



ROBERT GORDON
UNIVERSITY • ABERDEEN

SCHOOL OF NURSING AND MIDWIFERY

Faculty of Health & Social Care
Robert Gordon University

Carthdee Road
Aberdeen

AB10 7QG
United Kingdom

Tel: 01224 262000 Ext:

Fax: 01224 262630

www.rgu.ac.uk

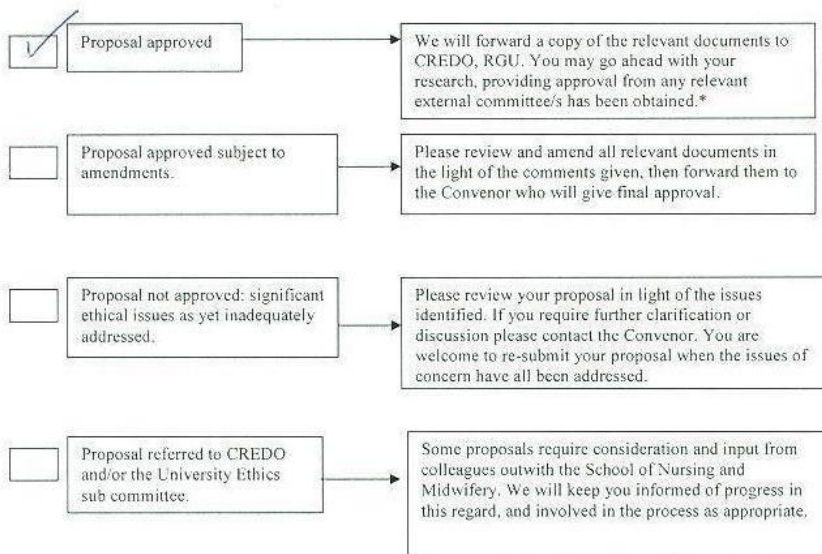
13/10/09

Research proposal number: 09/24

Research proposal title: The role of information, education and communication strategies in malaria prevention and control during pregnancy in Africa

Dear Theo Maloreh-Nyamekye

The School of Nursing and Midwifery Ethics Review Panel has now reviewed the above research proposal. Please find details of the outcome and recommended actions below.



* Where research involves NHS staff or patients, approval through the NRES system must be obtained. Members of the School Panel can advise on this process if necessary.



Robert Gordon University, a Scottish charity registered under charity number SC013781

Comments: Proposal 09/24

Thank you for your clarification and amendments in regard to the points raised from initial ethical review. We are satisfied that these requirements have been met and consequently the study is now approved by the School Ethics Review Panel.

Paula Kutejowski
13/10/09
Andrew McKie

Signature of Panel members

Position held: Reviewers

If you require further information please contact the Panel Convenor, Dr Colin Macduff on 01224 262935

When you have completed your research project, please send a copy of your final report to:

Colin N. Macduff
Dr Colin Macduff
Reader
School of Nursing and Midwifery
Robert Gordon University
Garthdee Road
Aberdeen
AB10 7QG

**Appendix 11.2: Email from JBI African Regional Director,
Headquarters, Adelaide, Australia**

Monday, 6 July, 2009 2:05

From:

"Sarah Louise Jones" <Sarahlouise.Jones@adelaide.edu.au>

To:

"Theophilus Nyamekye" <tnyamekye@yahoo.com>

Dear Theo

I think your project sounds really interesting and fits well with the interests of some of the JBI centres – good luck!

Sarah Louise

Dr Sarah Louise Jones BSc (Hons) , PhD

Research Fellow, Collaboration Support Unit

The Joanna Briggs Institute

Royal Adelaide Hospital

North Terrace

Adelaide

South Australia 5000

p: +61 8 8303 8095

f: +61 8 8303 4881

sarahlouise.jones@adelaide.edu.au

<http://www.joannabriggs.edu>

Appendix 11.3: Email from Ghana JBI Centre Convener

From: Yeetey Enuameh <yeetey@gmail.com>
Subject: RE: PhD Research Project
To: "'Theophilus Nyamekye'" <tnyamekye@yahoo.com>
Date: Tuesday, 1 September, 2009, 6:37 AM

Hello Theo,

That's cool. From the dateline you are providing and the volume of questionnaires (6) you are giving out, I will make a few contacts back home and make the options of responding to the questionnaires known to them. I will get you informed of the potential respondents as soon as I hear from them. Hope that is good enough. Cheers, wish you well and will get back to you soon.

Yeetey

Appendix 11.4: Email from Tanzania JBI Centre Convener

Re: PhD Research Project

Saturday, 5 December, 2009 14:35

From: "Rugola mtandu" <rugorugo@yahoo.com>

To: mkundemlay@gmail.com, "Leonard Subi" <subileon@yahoo.com>

Cc: "Theophilus Maloreh" <prs.maloreh-nyamekye@rgu.ac.uk>, tnyamekye@yahoo.com

Dear Colleagues,

I would like to introduce to you a colleague of mine, Theophilus who is doing a PhD in UK, entitled "THE ROLE OF INFORMATION, EDUCATION AND COMMUNICATION STRATEGIES IN MALARIA PREVENTION AND CONTROL DURING PREGNANCY IN AFRICA".

Due to your experience in Malaria, I would like to invite you to take part in the Delphi Survey for this study. You may also invite two more colleagues from your team preferably by e-mail.

Attached herewith please find the information sheet and the questionnaire. Please send directly the filled questionnaire to Theo (at the e-mail given on the front page of the questionnaire) and you may cc me.

Kind regards

Rugola

Dr. Rugola Mtandu
Medical Officer
Central TB Reference Laboratory
National TB and Leprosy Control Program
Ministry of Health and Social Welfare
P.O Box 9083
Dar es Salaam
Tanzania
E-mail: rugorugo@yahoo.com
Alternate: rugorugo@gmail.com
Tel: +255 713 312294
Fax: +255 22 2124500

Appendix 12.5: Letters from FBO Gatekeepers

Appendix 12.5a: The Head of the Roman Catholic Church, Sampa

THE ROMAN CATHOLIC CHURCH
POST OFFICE BOX 2
SAMPA – B/A

THEOPHILOUS NYAMEKYE
JOANNA BRIGGS COLLABORATING CENTRE
SCHOOL OF NURSING
THE ROBERT GORDON UNIVERSITY
GARTHDEE ROAD
AB 107 QG

REQUEST GRANTED

The Roman Catholic Churches within the Jaman North District of Brong Ahafo Region Ghana, hereby expressed our consent for your research work among the congregation.

Thank you.

Yours faithfully,



.....
REV. FATHER BOAKY DJAN
(SAMPA PARISH)

Appendix 12.5b: The Head of Methodist Church, Sampa

THE METHODIST CHURCH
POST OFFICE BOX 4
SAMPA – B/A

THEOPHILOUS NYAMEKYE
JOANNA BRIGGS COLLABORATING CENTRE
SCHOOL OF NURSING
THE ROBERT GORDON UNIVERSITY
GARTHDEE ROAD
AB 107 QG

REQUEST GRANTED

The Methodist church of Sampa hereby allows you to undertake your research work within the church's area of Jurisdiction.

Thank you.

Yours faithfully,



.....
REV. AMPOFO YEBOAH
SAMPA DISTRICT PASTOR

Appendix 11.5c: The Head of Presbyterian Church of Ghana, Sampa

THE PRESBY CHURCH
POST OFFICE BOX 3
SAMPA – B/A

THEOPHILOUS NYAMEKYE
JOANNA BRIGGS COLLABORATING CENTRE
SCHOOL OF NURSING
THE ROBERT GORDON UNIVERSITY
GARTHDEE ROAD
AB 107 QG

GRANT OF REQUEST

The Presbyterian Church of Ghana Sampa District hereby permits you to conduct your research work among the congregation in our area of operation.

You are therefore to note that the catechists in the various local churches remains your gatekeepers.

Thank you.

Yours faithfully,



.....
REV. AMANKWAH KUSI
(SAMPA DISTRICT PASTOR)

Appendix 11.5d: The Head of Church of Pentecost, Sampa

THE CHURCH OF PENTECOST
POST OFFICE BOX 101
SAMPA -B/A
GHANA

THEOPHILOUS NYAMEKYE
JOANNA BRIGGS COLLABORATING CENTRE
SCHOOL OF NURSING
THE ROBERT GORDON UNIVERSITY
GARTHDEE ROAD
AB 107 QG

PERMISSION GRANTED

In reference to your letter dated 26th October, 2009 on the subject "Permission to undertake a research on the topic: The Role of information, Education, and Communication strategies in Malaria Prevention and Control during pregnancy in Africa" in our organization.

I am happy to inform you that our doors are opened to you for your intended purpose.

Thank you.

Yours faithfully,


.....
REV. EFFAH KUNTOR
(THE DISTRICT PASTOR)

Appendix 11.5e: The Head of Tulo Muslim Community, Sampa

C/O SAMPA TRADITIONAL
POST OFFICE BOX 1
SAMPA

THEOPHILOUS NYAMEKYE
JOANNA BRIGGS COLLABORATING CENTRE
SCHOOL OF NURSING
THE ROBERT GORDON UNIVERSITY
GARTHDEE ROAD
AB 107 QG

GRANT OF REQUEST

The Nananom, and elders of Tulo-Katoo sampa, having considered the content of your letter dated 26th October, 2009 deemed it necessary to offer you the opportunity to enter the community and conduct your research.

I will be grateful if copies of your findings could be made available for our study and action.

Thank you.

Yours faithfully,


.....
NANA SAH KOFI
(THE HEAD OF FAMILY)

Appendix 11.5f: The Chief Imam of the Muslim Community, Sampa

THE MUSLIM COMMUNITY
POST OFFICE BOX 70
SAMPA-B/A

THEOPHILOUS NYAMEKYE
JOANNA BRIGGS COLLABORATING CENTRE
SCHOOL OF NURSING
THE ROBERT GORDON UNIVERSITY
GARTHDEE ROAD
AB 107 QG

PERMISSION ALLOWED

The Muslim Community of Sampa here by endorsed your intention to undertake a research on the role of information Education and Communication strategies in Malaria Prevention and Control during pregnancy in Africa. Within the Community.

You are welcome.

Thank you.

Yours faithfully,



.....
ALHAJI MAHAMA
(CHIEF IMAN)

Appendix 11.5g: The Head of Shiekomblo Muslim Community, Sampa

C/O SAMPA TRADITIONAL
POST OFFICE BOX 1
SAMPÀ

THEOPHILOUS NYAMEKYE
JOANNA BRIGGS COLLABORATING CENTRE
SCHOOL OF NURSING
THE ROBERT GORDON UNIVERSITY
GARTHDEE ROAD
AB 107 QG

GRANT OF REQUEST

The Nananom, elders and the entire people of Shie Komblo – Sampa have opened our doors to you to carry out your research. We have promised to offer you the needed assistance to make you achieve your aim.

Thank you.

Yours faithfully,



TOLEE SAMOUR –DUAH
(CHIEF)

Appendix 12: Data Collection Guidelines for Focal Persons

A. Background Information

- i. Aims and Objectives of the Study:** Please refer to the Information Leaflet.
- ii. Research Design:** Please refer to the Information Leaflet.
- iii. Ethical Considerations:** Please refer to the Information Leaflet.
- iv. Correspondence:** Completed questionnaires to be posted to my School Address shown on the front cover of questionnaire (also see last page of information leaflet).
- v. Expenses:** receipts to accompany returned questionnaires with exchange rates for reimbursement
- vi. Acknowledgement:** Thank you very much for your help!

B. JBI Centres in Africa

All JBI Centre members with knowledge on malaria, its prevention and control should be included. Apart from this, questionnaires should be distributed to at least 6 other people outside the JBI Centre. The underlisted groups should be considered in this regard:

i. District Health Management Teams (DHMTs)

- The District Director of Health Services
- The District Public Health Nurse
- The Disease Control Officer
- The District Pharmacist
- The District Biostatistician/Health Information Officer

ii. The Hospital Management Team (HMTs)–District Hospital

- The Senior Medical Officer In-Charge
- The Hospital Clinical Coordinator (if any)
- The Hospital Matron/Head of Nursing Unit/Principal Nursing Officer In-Charge
- The Training Officer (if different from the Head of Nursing)
- The Head of Pharmacy Unit
- The Head of Medical Ward
- The Head of Maternity Unit
- The Head of Maternal and Child Health
- And any other Medical Officer working at the Hospital

Although the Senior Medical Officer In-Charge and the Hospital Matron are normally members of the DHMT, they will be considered under HMT for the purpose of the study. Where the District Pharmacist is the same as Head of the Hospital Pharmacy Unit, the officer will be considered under the HMT for the same reason. This is to avoid duplication of counting. Where the Lay Administrator has a nursing background he or she should be recruited. Where the District Director of Health Services is the same as the Senior Medical Officer In-Charge of the District Hospital he or she should be

countered under DHMT. However, he or she is supposed to indicate on the questionnaire both positions held in order to avoid double counting.

iii. The Hospital Management Team –Regional Hospital

- The Medical Director/Medical Superintendent
- The Clinical Coordinator (if any)
- The Head of Nursing/Principal Nursing Officer In-Charge
- The Deputy Principal Nursing Officer In-Charge
- The Head of Pharmacy Unit
- The Training Coordinator
- The Head of Maternal and Child Health
- The Head of the Medical Ward
- The Head of Maternity Unit
- And any other Medical Officer working in the Hospital

Where the Lay Administrator has a nursing background he should be recruited.

iv. The Regional Health Management Team (RHMT)

- The Regional Director of Health Services
- The Senior Medical Officer In-Charge, Public Health
- The Deputy Director of Nursing Services (DDNS), Regional
- The Deputy Director of Nursing Services (DDNS), Regional Hospital
- The Medical Director/Superintendent, Regional Hospital
- The Regional Public Health Nurse
- The Regional Disease Control Officer
- The Regional Clinical Officer
- The Regional Training Officer
- The Metropolitan Director of Health Services

C. Sampa Faith Based Organisations

- i. Identifying participants from churches and mosques in the sampa community
- ii. Names of churches to be identified: - (1) The Presbyterian church of Ghana; (2) Roman Catholic; (3) Methodist Church; (4) Assemblies of God; and (5) the Church of Pentecost.
- iii. At least 6 people per church denomination will be involved, 4 of whom will be expected to be women of childbearing age of 15-49 years (ordinary members), and the other 2 being church leaders
- iv. Where possible at least 4 Muslim groups will be identified, namely (1) Zongo, (2) Jimini, (3) Tulo, (4) Jara (Shiekomblo). At least 5 people per Muslim group will be involved, 3 of whom will be expected to be women of childbearing age of 15-49 years (ordinary members), and the other 2 being Muslim leaders

Total No of Participants = 50 (30 Christians+20 Muslims)

D. Ghana Health Service

i. District Health Management Teams (DHMTs)

- The District Director of Health Services
- The District Public Health Nurse
- The Disease Control Officer
- The District Pharmacist
- The District Biostatistician/Health Information Officer
- Any other officer whose role may be considered relevant to malaria prevention and control

ii. The Hospital Management Team (HMTs)–District Hospital

- The Senior Medical Officer In-Charge
- The Hospital Clinical Coordinator (if any)
- The Hospital Matron/Head of Nursing Unit/Principal Nursing Officer In-Charge
- The Training Officer (if different from the Head of Nursing)
- The Head of Pharmacy Unit
- The Head of Medical Ward
- The Head of Maternity Unit
- The Head of Maternal and Child Health
- And any other Medical Officer working at the Hospital

Although the Senior Medical Officer In-Charge and the Hospital Matron are normally members of the DHMT, they will be considered under HMT for the purpose of the study. Where the District Pharmacist is the same as Head of the Hospital Pharmacy Unit, the officer will be considered under the HMT, but he or she should indicate on the questionnaire both positions held. This is to avoid duplication of counting. Where the Lay Administrator has a nursing background he or she should be recruited. Where the District Director of Health Services is the same as the Senior Medical Officer In-Charge of the District Hospital he or she should be countered under DHMT. However, he or she is supposed to indicate on the questionnaire both positions held in order to avoid double counting.

iii. The Regional Health Management Team (RHMT)

- The Regional Director of Health Services
- The Senior Medical Officer In-Charge, Public Health
- The Deputy Director of Nursing Services (DDNS), Regional
- The Deputy Director of Nursing Services (DDNS), Regional Hospital
- The Medical Director/Superintendent, Regional Hospital
- The Regional Public Health Nurse
- The Regional Disease Control Officer
- The Regional Clinical Officer
- The Regional Training Officer
- The Metropolitan Director of Health Services

iv. The National Malaria Control Unit

- The Malaria Control Manager
- The Deputy Malaria Control Manager
- The Malaria Control Nurse
- The Parasitologist/Entomologist
- The Epidemiologist (if different from the deputy malaria control manager)
- The Laboratory Technologist/Technician

- The Health Information Officer/Biostatistician
- Any other officer whose role may be considered critical

v. The National Reproductive Health Unit

- The Medical Director
- The Maternal and Child Health Officer In-Charge
- Any other officer whose role may be considered critical

Appendix 13: Template for Extraction of Qualitative Data

1. Background Information

1.1 The Role of Respondents and Organisations in Malaria Prevention and control

IEC Roles of Respondents	IEC Roles of Organisations
Country:	Country:

2. IEC Strategies

2.1 Comments on IEC strategies (see Question 2)

Country:

IEC Strategy	Rating	Justification/Comment	Interpretation

2.2. Comments on Highest and Lowest IEC strategies (see Questions 3 and 4)

Country:

IEC strategy	Comments on Priority		Interpretation
	Highest	Lowest	

3. IEC Strategy Implementation Challenges

Country:

3.1 Comments on Rating of Challenges (see Question 5)

Country:

IEC Strategy	Rating	Justification/Comment	Interpretation

3.2 Comments on highest and Lowest priority Challenge

IEC strategy implementation challenge	Comments on Priority challenge		Interpretation
	Highest	Lowest	

4. The Impact of IEC Strategies in malaria prevention and control during pregnancy (see Question 8)

Country:

Impact	Interpretation

5. Comments/Recommendations

5.1 Additional Comments/Recommendations by Respondents (see Question10)

Country:

--

Appendix 14: Samples of Data Extraction Summary Report

Appendix 14.1: Qualitative Data

Code: 001

Study: Launiala & Honkasalo (2007)

Method (s):

- Ethnographic study (FGDs, interviews; participant observations)
 - Cross-sectional KAP Surveys using questionnaires
-

Population: Pregnant women (8 FGDs; 34 individual interviews; 234 KAP surveys)

Intervention: Intermittent preventive treatment with Sulfadoxine-pyrimethamine (SP)

Outcome measure:

- Women's knowledge and perceptions about use of medication in pregnancy;
 - The timing and motivation concerning use of ANC services
 - Description of circumstances and interactions at the ANC and the IPT implementation process
-

Notes:

- Location: Rural Lungwena, Mangochi District, Malawi
 - Main Ethnic Group: Yao (Language: Chiyao)
 - Conclusion: It is difficult to tell the actual number of participants targeted from the study. For example, although 8 FGDs were conducted, the number of participants per group was not specified. The study failed to include the perspectives of nurses/midwives conducting health education. The study reveals that communication during health education was one-sided dominated by the health educator. Secondly, the language used was that of the educators and not the audience, thus affecting the extent of understanding of the message given. There was also the possibility of a Horton effect, since the educators were being observed by the researchers during the process of health education.
-

Appendix 14.2: Quantitative Data

Code: 015

Study: Gies et al. (2008)

Method (s):

- Community effectiveness trial
 - Monthly village visits using screening questionnaire
 - Questionnaire on demographic and household characteristics
 - Data analysis:
 - i. Epi Info 2000 (version 3.2.2, Centre for Disease Control and Prevention, USA)
 - ii. Criteria for statistical significance set at alpha: 0.05; CI 95%
-

Population: 6,339 pregnant women

Intervention (s):

Intervention A

- IPTp with SP (2 observed doses at the beginning of 2nd and 3rd trimester) introduced through ANC clinic in selected HC & promotional activities conducted at village level.
- 4/26 peripheral Health centres (HCs) in BHD strategically assigned to community promotion + IPTp-SP
- Communities informed on the dangers of malaria for pregnant women and babies, early and regular ANC attendance promoted to ensure timely IPT-SP uptake

Intervention B

8 HCs randomly allocated to either IPTp-SP in ANC clinics without enhanced promotional activities

Intervention C (Control Group)

Continue with weekly CQ according to the national guidelines

Outcome measure:

Effectiveness of strategies for promoting IPT-SP as reflected in (i) increased IPT-SP coverage; (ii) Low Birth Weight; and (iii) Reduced prevalence of anaemia

Notes:

- Location: Boromo Health district, Burkina Faso
- Conclusion: SP uptake (≥ 2 doses) was higher with Intervention A (70%) than without promotion (Intervention B: 49%). Peripheral (33.3%) and placental (30.3%) parasite rates were significantly higher in the control group compared to intervention B (peripheral: 20.1%; placental: 20.5%) but did not differ between A (17.4%; 18.1%) and Intervention B (20.1; 20.5%). Mean PCV and birth weight and prevalence of anaemia and low birth weight did not differ between study arms. It was concluded that 'the promotional campaign resulted in a major increase in IPTp coverage, with two thirds of women at delivery having received ≥ 2 SP. Despite lower prevalence of malaria infection, this did not translate into a significant difference in maternal anaemia or birth weight...' (p.1).

Appendix 14.3: Notes, Texts, Opinions and Discourse**Code:** 033

Study: JHPIEGO (2008)

Type: Notes

Aim/Objective:

- Focused antenatal care with health education about malaria
- Use of ITNs
- Uptake of IPT
- Case management of women with symptoms and signs of malaria

Context: International

Context Relevance:

- 300 million cases of malaria year worldwide
- 9/10 cases occur in Africa
- A person in Africa dies of malaria every 10 seconds
- Young women and children are most at risk
- Malaria affects five times as many as AIDS, leprosy, measles, and tuberculosis
- 30 million African women are pregnant annually
- Malaria is more frequent and complicated during pregnancy
- Malaria in pregnancy in endemic counties may account for:
 - i. Up to 15% of maternal anaemia
 - ii. 5-14% of low birth weight (LBW)
 - iii. 30% of "preventable" LBW
- 60% of pregnant women to be sleeping under ITNs and getting IPT by 2015

Focal Relevance:

Focuses on the role of health educators during antenatal care

Intervention: Antenatal care and health education

Notes:

- Location: Across sub-Saharan Africa
- Conclusion: In educating pregnant women, the author notes that health workers should inform and educate women with health messages appropriate to individual needs, concerns and circumstances. They should also consider gestational age, and most prevalent health issues. Health workers are expected to support the women with regards to decision making, and solving actual or potential problems, without neglecting the involvement of partners and family. With regards to interpersonal skills necessary for effective health education, educators are required to speak in a quiet, gentle tone. They should also listen to women or family and respond appropriately. Furthermore, staff should encourage their audience to ask questions and express concerns, allowed to demonstrate understanding of information provided; and explain all procedures/actions and obtain permission before proceeding. At the same time staff should have respect for client cultural beliefs and social norms, be empathic and non-judgmental, and avoid distractions during the visit. On the part of the pregnant woman key points to note include their risk status, knowledge of malaria transmission, the fact that there may not be symptoms despite malaria infection, consequences of malaria in pregnancy to the mother and the unborn baby, and the importance of ITNs and IPT.

Appendix 14.4: Policy Documents**Code:** 044

Study: WHO/UNICEF (2003)

Type: Monitoring and Evaluation Report

Aim/Objective:

To take 'stock of the malaria situation and of the continuing efforts to tackle the disease in Africa, based on an overview of the best information available to WHO and UNICEF, from sample and routine report, at the end of 2002' (p.9)

Context: International

Context Relevance:

'Malaria continues to be a major impediment to health in Africa south of the Sahara, where it frequently takes its greatest toll on young children and pregnant women' (p.9)

Focal Relevance:

Prevention and control of malaria during pregnancy through health education

Intervention: Health education

Notes:

- Location: Across sub-Saharan Africa with a special emphasis on Malawi
- Conclusion: Improved health education through multidisciplinary approach on the benefits of IPT and modified recommendations for the scheduled ANC visits resulted in rapid increased IPT coverage in the Blantyre district of Malawi. In this case, 75% of 2 doses of IPT-SP coverage in pregnant women was achieved. The team focused on addressing barriers to complete coverage with

IPT from mid 2001 through 2002. However, the report failed to expatiate on the process of the educational intervention.

Appendix 15: Summary of studies excluded with Reasons

Code	Author (s)/Study	Title	Type of study	Reasons
007	OKRAH, J., TRAORE, C., PALE, A., SOMMERFELD, J. and MULLER, O., 2002. Community factors associated with malaria prevention by mosquito nets: an exploratory study in rural Burkina Faso. <i>Tropical Medicine and International Health</i> , 17(3), pp. 240-248.	Community factors associated with malaria prevention by mosquito nets: an exploratory study in rural Burkina Faso.	Exploratory study	The relationship between the role of IEC and malaria prevention and control in pregnancy is not clear
026	Minja, H., Schellengberg, J.A., Mukasa, O., Nathan, R., Abdulla, S., Mponda, H., Tanner, M., Lengeller, C. & Obrist, B. (2001) 'Introducing insecticide-treated nets in the Kilombero Valley, Tanzania: the relevance of local knowledge and practice for an Information, Education and Communication (IEC) campaign', <i>Tropical Medicine and International Health</i> , Aug. 6 (8), pp. 614-623	Introducing insecticide-treated nets in the Kilombero Valley, Tanzania, Tanzania: the relevance of local knowledge and practice for an Information, Education and Communication (IEC) Campaign	Ethnographic study/survey study	The interest of pregnant is excluded. Focuses only on the general population
036	Hawley, W.A., ter Kuile, F., Steketee, R.S., Nahlen, B.L., Terlouw, D.J., Gimnig, J.E., Shi, Y.P., Vulule, J.M., Alaii, J.A., Hightower, A.W., Kolczak, M.S., Kariuki, A.K. & Phillis-Howard, P.A., 2003. Implications of the western Kenya Permethrin-treated bed net study for policy, programme implementation, and future research. <i>American Journal of Tropical Medicine & Hygiene.</i> , 68 (4 suppl), pp. 168-173.	Implications of the western Kenya permethrin-treated bed net study for policy, programme implementation, and future research	Opinion	There is no clear relationship between health educational messages and the interest of pregnant women

Code	Author (s)/Study	Title	Type of study	Reasons
043	Exchange (2005) <i>Participatory Communication in malaria control: why does it matter?</i> Findings No. 4, October.	Participatory Communication in malaria control: why does it matter?	Opinion	The role of IEC in relation to pregnancy related outcomes is not made clear. Case examples focus on the general population.
044	Shuffell, S. & Lettenmaier, C. (2008, unpublished) <i>RBM Communications Assessment: Challenges and Opportunities in Ghana, Mali, Senegal, Tanzania and Uganda</i> , Johns Hopkins Bloomberg School of Public Health, Centre for Communication Programmes.	RBM Communication Assessment: Challenges and Opportunities in Ghana, Mali, Senegal, Tanzania and Uganda	Policy	Issues raised were too broad and not clearly connected or particularly focused on pregnant women
048	Roll Back Malaria Partnership (2007) <i>Malaria Landscape Report 2007</i> , 13 th RBM Partnership Board Meeting 28-29 November 2007, pp.1-14.	Malaria Landscape Report 2007	Policy	There is no clear linkage between educational campaigns and pregnancy related outcomes
057	WHO (2004) <i>A Strategic Framework for Malaria Prevention and Control during Pregnancy in the African Region</i> , World Health Organisation African Office, Brazzaville, AFR/MAL/04/01.	A Strategic Framework for Malaria Prevention and Control During Pregnancy in the African Region	Policy	Although the document serves as a standard guideline on malaria prevention and control in pregnancy, it is silent on the role of IEC during pregnancy

Appendix 16: References of Included Studies of Systematic Review

1. ALI, A., 2006. *Winning the Fight against Malaria – Tanzania: Education Key to Zanzibar’s Successful Fight*. Programme on Malaria/Johns Hopkins Bloomberg School of Public Health, Centre for Communication Programmes/USAID/ANDnetwork.com, August [Online]. Available from: http://www.malariafree.org./news/successful/tanzania_education.pdf Global [Accessed 10 July 2008].
2. BATEGA, D.W., 2004. Knowledge, Attitudes and Practices about malaria treatment and prevention in Uganda: A Literature Review. *Final Report*; Ministry of Health, Uganda, Kampala, pp.20-24.
3. BAUM, C.A. and MARIN, C., 2008. Gains in awareness, ownership and use of insecticide-treated nets in Nigeria, Senegal, Uganda and Zambia. *BMC Malaria Journal*, 7(153), pp. 1-10.
4. GIES, S., COULIBALY, S.O., OUATTARA, F.T., KY, C., BRABIN, B.J. and D’ALESSANDRO, U., 2008. A community effectiveness trial of strategies promoting intermittent preventive treatment with sulphadoxine-pyrimethamine in pregnant women in rural Burkina Faso. *BioMed Central Malaria Journal*, 7(180), pp. 1-14.
5. GIKANDI, P.W., NOOR, A.M., GITONGA, C.W., Ajanga, A.A. and SNOW, R.W., 2008. Access and barriers to measures targeted to prevent malaria in pregnancy in rural Kenya. *Tropical Medicine and International Health*, 13(2), pp. 208-217.
6. GUYATT, H.L., NOOR, A.M., OCHOLA, S.A. and SNOW, R.W., 2004. Use of intermittent presumptive treatment and Insecticide treated bed nets by pregnant women in four Kenyan districts. *The European Journal of Tropical Medicine and International Health*, 9(2), pp.255-26.
7. HETZEL, M.W., ITEBA, N., MAKEMBA, A., MSHANA, C., LENGELER, C., OBRIST, B., SCHULZE, A., NATHAN, R., DILLIP, A., ALBA, S., MAYUMANA, I., KHATIB, R.A., NJAU, J.D. and MSHINDA, H., 2007. Understanding and improving access to prompt and effective malaria treatment and care in rural Tanzania: the ACCESS Programme. *BMC Malaria Journal*, 6(83), pp.1-15.
8. HILL, J. and KAZEMBE, P., 2006. Reaching the Abuja target for intermittent preventive treatment of malaria in pregnancy in African women: a review of progress and operational challenges. *Tropical Medicine and International Health*, 11(4), pp. 409-418.
9. HOMMERICH, L., VON OERTZEN, C., BEDU-ADDO, G., HOLMBERG, V., ACQUAH, A.P. and EGGELTE, A.T., 2007. Decline of placental malaria in southern Ghana after the implementation of intermittent. *BMC Malaria Journal*, 6(144), pp. 1-8.
10. IHRDC, 2005. *ACCESS Programme Annual Report 2005*. IHRDC/Swiss Tropical Institute/Norvartis Foundation for Sustainable Development, Dar es Salaam, Tanzania
11. INTERNATIONAL FEDERATION OF RED CROSS AND CRESCENT SOCIETIES/JHPIEGO, 2006. Malaria Control Policy. *A briefing paper* presented to the US Congress, Washington DC, June 9, 2006.

12. JHPIEGO, 2008a. *Malaria in Pregnancy*. [online]. JHPIEGO, An Affiliate of Johns Hopkins University [Online]. Available from: http://www.jhpiego.org/resources/pubs/malalip/malaria_training.htm [Accessed 26 November 2008].
13. JHPIEGO, 2008b. *What we do - malaria prevention and treatment*. JHPIEGO, An Affiliate of Johns Hopkins University [Online]. Available from: [http://www.jhpiego/what we do/malaria.html](http://www.jhpiego/what%20we%20do/malaria.html) [Accessed 23 December 2008].
14. KABANYWANYI, A.M., MACARTHUR, J.R., STOLK, W.A., HABBEMA, J.D.F., MSHINDA, H., B., BLOLAND, P.B., ABDULLA, S. and KACHUR, S.P., 2008. Malaria in Pregnant women in an area with sustained high coverage of insecticide-treated bed nets. *BMC Malaria Journal*, 7(133), pp. 1-7.
15. KIWUWA, M.S. and MUFUBENGA, P., 2008. Use of antenatal care, maternity services, intermittent presumptive treatment and insecticide treated bed nets by pregnant women in Luwero district, Uganda. *BMC Malaria Journal*, 7(44), pp. 1-6.
16. LAGERBERG, R.E., 2008. Malaria in Pregnancy: A Literature Review. *Journal of Midwifery and Women's Health*, 53(3), pp.209-215.
17. LETTENMAIR, C., 2003. The Role of Communication in Malaria Control in Africa. *A concept paper to the RBM conference in 2000*, New York.
18. LAUNIALA, A. and HONKASALO, M., 2007. Ethnographic study of factors influencing compliance to intermittent preventive treatment of malaria during pregnancy among Yao women in rural Malawi. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 101(10), pp.980-989.
19. LAUNIALA, A. and KULMALA, T., 2006. The importance of understanding the local context: Women's perceptions and knowledge concerning malaria in pregnancy in rural Malawi. *Acta Tropica*, 98(2), pp. 111-117.
20. MBONYE, A.K., BYGBJERG, I.C., and MAGNUSSEN, P., 2008. Intermittent preventive treatment of malaria in pregnancy: A new delivery system and its effect on maternal health and pregnancy outcomes in Uganda. *Bulletin of the World Health Organisation (BLT)*, 86(2), pp. 81-160.
21. MBONYE, A.K., NEEMA, S. and MAGNUSSEN, P., 2006a. Perceptions on use of sulfadoxine-pyrimethamine in pregnancy and the policy implications for malaria control in Uganda. *Health Policy*, 77(3), pp, 279-89.
22. MBONYE, A.K., NEEMA, S. and MAGNUSSEN, P., 2006b. Preventing malaria in pregnancy: a study of perceptions and policy implications in Mukono district, Uganda. *Health Policy and Planning*, 21(1), pp.17-26.
23. MIAFFO, C., SOME, F., KOUYATE, B., JAHN, A. and MUELLER, O., 2004. Malaria and anaemia prevention in pregnant women of rural Burkina Faso. *BMC Pregnancy and Childbirth*, 4(18), pp.1-7.

24. MOH, UGANDA, 2005. *Uganda Communication strategy for Malaria 2005-2010*. Malaria Control Programme; Health Promotion and Education, Division, Kampala [Online]. Available from: <http://www.rollbackmalaria.org/countryaction/ugandacommunicationstrategy2005-2010draft3> [Accessed 10 July 2008].
25. MUBYAZI, G., BYGBJERG, I.C., MAGNUSSEN, P., OLSEN, O., BYSKOV, J., MANSEN, K.S. and BLOCH, P., 2008. Prospects, achievements, challenges and opportunities for scaling up malaria chemoprevention in pregnancy in Tanzania: the perspectives of national level officers. *Malaria Journal*, 7(135), pp.1-16.
26. MUBYAZI, G., BLOCH, P., KAMUGISHA, M., KITUA, A. and IJUMBA, J., 2005. Intermittent preventive treatment of malaria during pregnancy: a qualitative study of knowledge, attitudes and practices of district health managers, antenatal care staff and pregnant women in Korogwe District, North-Eastern Tanzania. *BMC Malaria Journal*, 4(31), pp.1-15.
27. MUFUBENGA, P., 2003. Pregnancy and Anaemia in Malaria. *PREMA-EU Newsletter*, Issue 2.
28. NGANDA, R.Y., DRAKELEY, C., REYBURN, H. and MARCHANT, T., 2004. Knowledge of malaria influences the use of insecticide treated nets but not intermittent presumptive treatment by pregnant women in Tanzania. *Malaria Journal*, 3(42), pp. 1-7.
29. OLSON, D., 2003. *Raising Awareness and Changing Attitudes about ITNs*. Population Services International Region: Africa, Global Health Council, HealthLink: Issue 122 [Online]. Available from: <http://www.globalhealth.org/publication/article.php?id=1017> [Accessed 12 July 2008].
30. OTOLORIN, E.O., 2008a. *Malaria during Pregnancy* [online]. Available from: http://www.reproline.jh.edulenglish/2mnh/2ppts/malaria_preg/malaria_preg.ppt [Accessed 10 November 2008].
31. OTOLORIN, E.O., 2008b. *Malaria during pregnancy: Malaria in Pregnancy 4* [Online]. Available from: www.scribd.com/doc/658639/Malaria-in-pregnancy-4-83k [Accessed 20 October 2008].
32. OUMAL, P.O., VAN EIJK, A.M., HAMELLI, M.J., SIKUKU, E., ODHIAMBO, F., MUNGUTI, K., AYISI, J.G., KAGER, P.A. and SLUTSKER, L., 2007. The effect of health care worker training on the use of intermittent preventive treatment for malaria in pregnancy in rural western Kenya. *Tropical Medicine and International Health*, 12(8), pp. 953-961.
33. OWUSU-ADJEI, S., AWINI, E., ANTO, F., MENSAH-AFFUL, T., ADJUIK, M., HODGSON, A., AFARI, E. and BINKA, F., 2007. Assessing malaria control in the Kassena-Nankana district of northern Ghana through repeated surveys using the RBM tools. *Malaria Journal*, 6(103), pp.1-9.
34. RBM PARTNERSHIP, 2005. *World malaria Report 2005: Malaria control by Region, Section II*. Geneva, Switzerland [Online]. Available from: <http://www.rollbackmalaria.org/wmr2005/html/2-1.htm> [Accessed 4 November 2008].
35. ROLLBACK MALARIA SECRETARIAT/MINISTRY OF HEALTH, NIGERIA, 2004. *Malaria Control in Nigeria: A Strategy for Behaviour Change Communication 2004-2005*, Roll Back

Malaria Secretariat/Malaria Control Programme/Department of Health/Federal Ministry of Health, Abuja, Nigeria.

36. ROMAN, E., RAWLINS, B., GOMEZ, P., DINEEN, R., DICKERSON, A. and BRIEGER, B., 2008. *Scaling up Malaria in Pregnancy Programmes: What it takes! The Jhpiego Experience*, Jhpiego [Online]. Available from: <http://www.comminit.com/?q=africa/node/310734> [Accessed 8 September 2008].

37. SOMALIA AID COORDINATING BODY (SACB), 2006. *Malaria Communication Strategy for Somalia 2006-2010*. Somalia Aid Coordinating Body / Health Sector Committee, Ministry of Health, Somalia.

38. JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH, 2008a. *Mali - Arresting Malaria with Insecticide Treated Nets*. Centre for Communication Programmes, Johns Hopkins University [Online]. Available from: <http://www.jhuccp.org/africa/mali/malaria.shtml> [Accessed 5 August 2008].

39. JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH, 2008b. *Illustrative Communication Strategy for Prevention and Control of Malaria during Pregnancy* [online]. Centre for Communication Programmes, Johns Hopkins University. Available from: www.jhpiego.org/resources/pubs/malialrp/english/programResources/communicationStrategyIECMaterials.html [Accessed 5 September 2008].

40. TILSON, D., 2007. *The social marketing of insecticide-treated nets (ITNs) in Kenya*. Population Services International (PSI), Nairobi [Online]. Available from: http://www.casesjournal.org/volume1/commissioned/cases_1_12.cfm [Accessed 5 September 2008].

41. VAN EIJK, A.M, BLOKLAND, I.E., ODHIAMBO, F., AYISI, J.G., BLESS, H.M., ROSEN, D.H., ADAZU, K. and LINBLADE, K.A., 2005. Use of intermittent preventive treatment for malaria in pregnancy in a rural area of western Kenya with high coverage of insecticide-treated bed nets. *The European Journal of Tropical Medicine and International Health*, 10(11), pp.1134-1140.

42. VAN EIJK, A.M., AYISI, J.G., TER KUILE, F.O., SLUTSKER, L., OTIENO, J.A, MISORE, A.O., ODONDI, J.O., ROSEN, D.H., KAGER, P.A., STEKETEE, R.W. and NAHLEN, B.L., 2004. Implementation of intermittent preventive treatment with sulfadoxine pyrimethamine for control of malaria in Kisumu, western Kenya. *European Journal of Tropical Medicine and International Health*, 9(5), pp. 630-637.

43. VAN GEERTRUYDEN, J.P., NTAKIRUTIMANA, D., ERHART, A., RWAGACONDO, C. KABANO, A. and D'ALESSANDRO, U., 2005. Malaria infection among pregnant women attending antenatal clinics in six Rwandan districts. *Tropical medicine and International Health*, 10(7), pp. 681-688.

44. WHO, 2006. *The Africa Malaria Report 2006*. The World Health Organisation, Regional Offices for Africa and Eastern Mediterranean. Harare, Zimbabwe. [Online]. Available from: http://www.afro.who.int/malaria/publications/annual_reports/africa_malaria_report_2006.pdf [Accessed 15 August 2008].

45. WHO/UNICEF, 2006. *Report on programme implementation and use of Insecticide-treated nets in the WHO African Region*. Vector Biology and Control Unit, WHO Regional Office for Africa and UNICEF Eastern and Southern Africa Regional Office, Harare,

Zimbabwe [Online]. Available from: http://www.afro.who.int/vbc/reports/itn_report_06.pdf [Accessed 15 August 2008].

46. WHO/UNICEF, 2003. *The Africa Malaria Report 2003*. World Health Organisation African Office, Brazzaville, Congo; WHO/CDS/MAL/2003.1093 [Online]. Available from: <http://www.unicef.org.uk/campaigns/publications/pdf/amr2003.pdf> [Accessed 15 August 2008].

47. UNICEF Zambia/the Malaria Consortium/Young, 2000. *Report on Malaria Consultancy: Support to the Zambia National Roll Back Malaria Programme*, September 21 – October 6, 2000.

48. WHO, 2005a. *The Roll Back Malaria Strategy for improving access to treatment through home management of malaria*, World Health Organisation, Geneva, Switzerland, WHO/HTM/MAL/2005.1101.

49. WHO, 2005b. *Malaria Control in the WHO African Region - Turing the Corner on Malaria Control: Scaling up interventions to reach the most vulnerable*, Annual Report 2004, pp.16.

50. WHO/USAID/ACCESS, 2008. *Assessment of MIPESSA Country Experiences in the Adoption and Implementation of Malaria in Pregnancy Policies*. World Health Organisation/USAID/ACCESS Programme, The Malaria in Pregnancy Eastern and Southern Africa Coalition, World Health Organisation/USAID/ACCESS, WHO/AFRO, Harare, Zimbabwe.

Appendix 17: Subgroup Analysis

Appendix 17.1 Rating of IEC Strategies by Sub-groups

No	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Training and Orientation	Very high (5) High (2) Moderate (4) Very low (2)	Very high (17) High (8) Moderate (10)	Very high (4) Very low (1)	Very high (4) High (2) Moderate (5) Low (1)	Very high (1) High (2)	Very high (3) High (6) Moderate (3) Low (1)	Very high (2) Moderate (1) Low (1)
2	Advocacy	Very high (6) High (3) Moderate (2) Very low (2)	Very high (8) High (15) Moderate (8) Low (3)	Very high (2) High (1) Moderate (1) Low (1)	Very high (4) High (3) Moderate (4)	Very high (1) Low (2)	Very high (2) High (5) Moderate (3) Low (3)	Moderate (4) Low (1)
3	Community Mass Educational Campaigns	Very high (5) High (5) Moderate (2) Low (1)	Very high (12) High (15) Moderate (5) Low (3)	Very high (4) Moderate (1)	Very high (3) High (6) Moderate (3)	Very high (1) Low (2)	Very high (4) High (2) Moderate (2) Low (2) Very low (2)	High (1) Moderate (2) Low (1)
4	House-to-house sensitization	Very high (5) High (2) Moderate (2) Low (3) Very low (1)	Very high (7) High (8) Moderate (7) Low (4) Very low (6)	Very high (2) High (1) Moderate (2)	Very high (3) High (3) Moderate (6)	Very high (1) Low (2)	Very high (5) High (3) Moderate (1) Low (1) Very low (3)	High (2) Moderate (1) Low (1) Very low (1)
5	Health Education Talks in Health Units	Very high (5) High (5) Low (3)	Very high (18) High (13) Moderate (3) Low (1)	Very high (1) High (3) Very low (1)	Very high (2) High (5) Moderate (4) Low (1)	Very high (2) High (1)	Very high (2) High (5) Moderate (4) Low (2)	High (4) Moderate (1)
6	Visiting Places of Religious Worship	Very high (2) High (4) Moderate (5) Low (1) Very low (1)	Very high (5) High (7) Moderate (14) Low (4) Very low (5)	Very high (1) High (4) Moderate (4) Low (1) Very low (2)	Very high (1) High (4) Moderate (4) Low (1) Very low (2)	Very high (1) Very low (2)	High (2) Moderate (8) Low (1) Very low (2)	High (1) Moderate (3) Low (1)

No	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
7	Organising and Supporting Community Women Groups	Very high (3) High (4) Moderate (6)	Very high (8) High (11) Moderate (6) Low (7) Very low (3)	Very high (1) High (3) Very low (1)	Very high (3) High (2) Moderate (3) Low (3) Very low (1)	Very high (1) Low (2)	Very high (3) High (2) Moderate (2) Low (4) Very low (2)	Very high (1) Moderate (1) Low (1) Very low (1)
8	Integrated Health Educational Campaigns	Very high (5) High (4) Moderate (3) Low (1)	Very high (11) High (13) Moderate (9) Low (2) Very low (1)	Very high (3) High (1) Moderate (1)	Very high (2) High (3) Moderate (5) Low (2)	High (1) Moderate (2)	Very high (2) High (2) Moderate (7) Low (1) Very low (1)	High (1) Moderate (3) Very low (1)
9	Delivering educational messages based on appropriate and meaningful symbols, metaphors and language	Very high (4) High (5) Moderate (3) Low (1)	Very high (13) High (13) Moderate (8) Low (1)	High (4) Low (1)	Very high (1) High (4) Moderate (4) Low (3)	Very high (1) Moderate (2)	Very high (3) High (3) Moderate (5) Low (1)	High (4) Moderate (1)
10	Information delivery to meet the needs of different target audience with diverse cultural background at the same time	Very high (3) High (4) Moderate (3) Low (3)	Very high (3) High (20) Moderate (7) Low (3) Very low (2)	Moderate (3) Low (1)	Very high (1) High (4) Moderate (4) Low (3)	High (1) Moderate (2)	High (2) Moderate (7) Low (4)	High (2) Moderate (2) Low (1)

Appendix 17.2 Ranking of Highest and Lowest Priority Strategy by Sub-group

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Highest Priority	Training & Orientation (2) M/Campaigns (3) H/H Sensitisation (2) Health Talks (3) Int. Campaign (1) I/Audience (1)	Training & Orientation (15) Advocacy (1) M/Campaigns (4) H/H Sensitisation (3) Health Talks (6) Symbolism (1)	Training & Orientation (4) M/Campaigns (1)	Training & Orientation (3) M/Campaigns (4) H/H Sensitisation (2) V/Worship (1)	Training & Orientation (2) H/H Sensitisation (1)	Advocacy (1) M/Campaigns (2) Women's Meetings (2)	Training & Orientation (1) M/Campaigns (1)
2	Lowest Priority	Training & Orientation (1) Advocacy (1) M/Campaigns (1) Symbolism (1) I/Audience (2)	Training & Orientation (1) H/Sensitisation (2) Health Talks (1) V/Worship (10) Women's Meetings (7) Symbolism (1) I/Audience (3)	H/H Sensitisation (1) Health Talks(1) Women's Meetings Int. Campaign (1) I/Audience (1)	Training & Orientation (2) H/Sensitisation(2) V/Worship (1) Women's Meetings (3) I/Audience (3)	Int. Campaign (3)	M/Campaigns (1) Advocacy (1) Women's Meetings (4) Int. Campaign (1)	M/Campaigns (1) H/H Sensitisation (1)

Appendix 17.3: Rating of IEC Strategy Implementation Challenges by Sub-groups

No	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Staff knowledge	Very high (1) High (3) Moderate (7) Very low (2)	Very high (11) High (8) Moderate (11) Low (2) Very low (3)	Moderate (3) Low (1) Very low (1)	Very high (1) High (1) Moderate (4) Low (2) Very low (4)	Moderate (2) Very low (1)	High (2) Moderate (4) Low (6) Very low (1)	Very high (1) High (2) Moderate (1) Low (1)
2	Staff Attitude	Very high (3) High (5) Moderate (3) Very low (2)	Very high (9) High (13) Moderate (10) Low (3)	Very high (1) High (3) Moderate (1)	Very high (3) High (2) Moderate (3) Low (3) Very low (1)	Very high (1) High (2)	Very high (3) High (5) Moderate (4) Low (1) Very low (3)	Moderate (3) Low (2)
3	Work Practices	Very high (1) High (4) Moderate (7) Low (1)	Very high (5) High (11) Moderate (15) Low (2) Very low (1)	Very high (2) High (1) Moderate (2)	Very high (2) High (4) Moderate (3) Low (1)	Very high (1) Moderate (2)	Very high (1) High (5) Moderate (2) Low (4) Very low (1)	Moderate (1) Low (4)
4	Managing Staff Shortage	Very high (7) High (3) Moderate (2) Low (1)	Very high (15) High (10) Moderate (5) Low (4)	Very high (4) Moderate (1)	Very high (2) High (5) Moderate (4) Very low (1)	Very high (2) High (1)	Very high (4) High (5) Moderate (2) Low (2)	Very low (2)
5	Problems of Distance	Very high (3) High (3) Moderate (5) Low (2)	Very high (6) High (10) Moderate (14) Low (4) Very low (1)	Very high (3) High (2)	Very high (2) High (5) Moderate (1) Low (3)	Very high (2) High (1)	Very high (8) High (3) Moderate (3) Low (1) Very low (1)	Very high (1) Moderate (2) Low (1) Very low (1)
6	Managing Waiting Time	Very high (3) High (3) Moderate (5) Low (2)	Very high (6) High (10) Moderate (14) Low (4) Very low (1)	Very high (3) High (2)	Very high (2) High (5) Moderate (1) Low (3)	Very high (3)	Very high (2) High (5) Moderate (3) Low (2) Very low (1)	Very high (1) Moderate (2) Low (1) Very low (1)

Appendix 17.3: Rating of IEC Strategy Implementation Challenges by Sub-groups (Cont'd)

No	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
7	Women's Empowerment	Very high (2) High (8) Moderate (3)	Very high (13) High (8) Moderate (7) Low (5) Very low (1)	Very high (2) Moderate (2) Low (1)	Very high (3) High (2) Moderate (6) Low (1)	Very high (1) High (2)	Very high (3) High (1) Moderate (3) Low (4) Very low (2)	High (1) Moderate (2) Low (2)
8	Managing Poverty	Very high (6) High (5) Low (2)	Very high (17) High (4) Moderate (9) Low (3) Very low (2)	Very high (2) High (2) Low (1)	Very high (2) Moderate (6) Low (3) Very low (1)	Moderate (1) Low (2)	Very high (6) High (4) Low (2) Very low (1)	High (2) Moderate (1) Low (1)
9	Managing Resources	Very high (5) High (4) Moderate (2) Low (2)	Very high (8) High (14) Moderate (8) Low (2) Very low (3)	Very high (3) Moderate (1) Low (1)	Very high (6) High (3) Moderate (1) Low (2)	High (1) Low (2)	Very high (1) High (4) Moderate (3) Low (4) Very low (1)	High (1) Moderate (2) Low (1) Very low (1)
10	Demystifying Cultural Beliefs	Very high (1) High (5) Moderate (5) Low (1) Very low (1)	Very high (4) High (20) Moderate (8) Low (3)	High (1) Moderate (2) Very low (2)	High (4) Moderate (5) Low (1) Very low (1)	High (1) Moderate (2)	Very high (4) High (2) Moderate (3) Low (1) Very low (3)	High (2) Moderate (2) Very low (1)
11	Health Seeking Behaviour	Very high (2) High (5) Moderate (5) Very low (1)	Very high (11) High (12) Moderate (11) Low (1)	Very high (2) Moderate (1) Very low (1)	Very high (2) High (2) Moderate (4) Low (3)	Very high (1) High (2)	Very high (2) High (3) Moderate (6)	Moderate (5)

Appendix 17.4: Ranking of Highest and Lowest Priority Challenge by Sub-group

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Highest Priority Challenge	Managing Poverty (4) Distance problems (1) Managing Waiting Time (2) Managing Resources (1)	Staff Knowledge (6) Staff Attitude (3) Managing Staff Shortage (9) Distance Problems (2) Waiting Time (2) Women's Empowerment (2) Managing Poverty (6) Managing Resources (2) Demystifying Beliefs (2)	Staff Knowledge (1) Staff Attitude (1) Waiting Time (1) Managing Resources (1)	Staff Knowledge (1) Staff Attitude (2) Managing Resources (3)	Staff Attitude (2) Women's empowerment (1)	Staff Attitude (2) Managing Staff Shortage (2) Distance Problems (3) Managing Poverty (2) Health Seeking Behaviour (3)	Staff Knowledge (2) Demystifying Beliefs
2	Least Priority Challenge	Staff Knowledge (1) Staff Attitude (3) Work Practices (1) Managing Staff Shortage (1) Distance Problems (2) Waiting Time (1) Managing resources (1) Demystifying Beliefs (1)	Staff Knowledge (6) Staff Attitude (1) Work Practices (4) Distance Problems (2) Waiting Time (3) Women's Empowerment (4) Managing Poverty (2) Managing Resources (5) Demystifying Beliefs (1) Health seeking Behaviour (1)	Staff Knowledge (1) Staff Attitude (1) Managing Staff Shortage (2) Women's Empowerment (1)	Staff Knowledge (4) Staff Attitude (1) Managing Staff Shortage (2) Distance Problems (1) Waiting Time (1) Women's Empowerment (1) Managing Poverty (1) Demystifying Beliefs	Managing Poverty (1) Waiting Time (1)	Staff Knowledge (5) Work Practices (1) Women's Empowerment (1) Demystifying Beliefs (3)	Staff Attitude (1) Work Practices (1) Health Seeking Behaviour (1)

Appendix 17.5: Opinions on Feasibility, Appropriateness, Meaningfulness and Effectiveness of IEC Strategies by Sub-group

(i) Training and Orientation of Staff

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Feasibility	Very easy (2) Easy (4) Moderate (4)	Easy (13) Moderate (7) Difficult (2)	Very easy (4) Moderate (1)	Easy (2) Moderate (7) Difficult (1)	Easy (2) Moderate (1)	Very easy (1) Easy (4) Difficult (2) Very difficult (1)	Very easy (1) Easy (2) Moderate (1)
2	Appropriateness	Very high (1) High (5) Moderate (3) Low (1)	Very high (4) High (16) Moderate (9) Low (5)	Very high (3) High (1) Very low (1)	Very high (2) High (5) Moderate (4) Low (1)	Very high (3)	Very high (2) High (4) Moderate (5) Low (1)	Very high (1) High (2) Low (1)
3	Meaningfulness	High (8) Moderate (1) Low (1)	Very high (10) High (14) Moderate (7) Low 1)	Very high (3) High (1) Very low (1)	Very high (2) High (5) Moderate (4) Low (1)	Very high (3)	Very high (4) High (5) Moderate (2)	Very high (1) High (3)
4	Effectiveness	Very high (1) High (4) Moderate (2) Low (3)	Very high (9) High (12) Moderate (8) Low (1) Very low (1)	Very high (5)	Very high (2) High (4) Moderate (5) Low (1)	Very high (3)	Very high (3) High (3) Moderate (5)	Very high (3) Moderate (1)

(ii) Advocacy

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Feasibility	Very easy (3) Easy (2) Moderate (4) Difficult (1)	Very easy (1) Easy (8) Moderate (15) Difficult (6) Very difficult (2)	Very easy (3) Moderate (2)	Easy (4) Moderate (4) Difficult (4)	Difficult (1)	Very easy (1) Easy (2) Moderate (3) Difficult (4) Very difficult (1)	Easy (2) Moderate (1) Difficult (1)
2	Appropriateness	Very high (1) High (5) Moderate (3) Low (1)	Very high (3) High (16) Moderate (9) Low (2)	Very high (2) High (3)	Very high (3) High (4) Moderate (3) Low (2)	Very high (1)	Very high (2) High (5) Moderate (3) Low (2) Very low (1)	Very high (1) Moderate (2) Low (1)
3	Meaningfulness	Very high (2) High (6) Low (2) Very low (1)	Very high (4) High (14) Moderate (12) Low (3)	Very high (2) High (2) Moderate (1)	Very high (5) High (5) Moderate (1) Low (1)	Very high (1)	Very high (1) High (6) Moderate (2) Low (3)	Very high (1) High (2) Moderate (1)
4	Effectiveness	Very high (1) High (6) Low (2) Very low (1)	Very high (5) High (10) Moderate (14) Low (3) Very low (1)	Very high (3) High (2)	Very high (4) High (3) Moderate (4) Low (1)	Very high (1)	Very high (2) High (3) Moderate (3) Low (3)	Very high (3) Moderate (1)

(iii) Community Mass Education Campaigns

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Feasibility	Very easy (2) Easy (3) Moderate (3) Difficult (2)	Very easy (1) Easy (7) Moderate (12) Difficult (9) Very difficult (2)	Very easy (1) Moderate (3) Difficult (1)	Very easy (2) Easy (4) Moderate (4) Difficult (1) Very difficult (1)	Difficult (2) Very difficult (1)	Very easy (2) Moderate (3) Difficult (3) Very difficult (3)	Moderate (1) Difficult (1) Very difficult (1)
2	Appropriateness	Very high (3) High (5) Moderate (2)	Very high (4) High (11) Moderate (13) Low (3)	Very high (5)	Very high (5) High (5) Moderate (1) Low (1)	Very high (1) Moderate (2)	Very high (2) High (5) Moderate (3) Low (2) Very low (1)	Moderate (2) Low (1)
3	Meaningfulness	Very high (3) High (4) Low (1)	Very high (8) High (13) Moderate (11) Low (1)	Very high (3) High (2)	Very high (4) High (6) Low (2)	Very high (1) High (1) Moderate (1)	Very high (4) High (3) Moderate (2) Low (3)	Very high (1) High (2) Moderate (1)
4	Effectiveness	Very high (3) High (5) Low (2)	Very high (6) High (6) Moderate (3) Low (4) Very low (1)	Very high (4) High (1)	Very high (4) High (5) Moderate (2) Low (1)	High (3)	Very high (2) High (5) Moderate (4) Low (1)	High (2) Moderate (2)

(iv) House-to-house Sensitisation

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Feasibility	Moderate (2) Difficult (6) Very difficult (2)	Very easy (2) Easy (2) Moderate (6) Difficult (11) Very difficult (11)	Very easy (1) Moderate (2) Difficult (2)	Moderate (5) Difficult (4) Very difficult (2)	Difficult (2) Very difficult (1)	Easy (4) Moderate (1) Difficult (4) Very difficult (3)	Easy (2) Very difficult (2)
2	Appropriateness	Very high (1) High (4) Moderate (3) Low (2)	Very high (9) High (8) Moderate (13) Low (4) Very low (2)	Very high (2) High (2) Moderate (1)	Very high (3) High (6) Moderate (1) Low (2) Very low (1)	Very high (1) Low (2)	Very high (2) High (6) Moderate (2) Low (1)	High (1) Moderate (2) Low (1)
3	Meaningfulness	Very high (2) High (4) Moderate (2) Low (2)	Very high (9) High (7) Moderate (12) Low (3)	Very high (2) High (1) Moderate (1) Low (1)	Very high (3) High (6) Moderate (2) Low (1)	Very high (1) High (2)	Very high (4) High (6) Moderate (2)	High (3)
4	Effectiveness	Very high (1) High (4) Moderate (3) Low (1) Very low (1)	Very high (5) High (4) Moderate (15) Low (3) Very low (4)	Very high (2) High (2) Moderate (1)	Very high (4) High (1) Moderate (5) Low (2)	Very high (3)	Very high (5) High (3) Moderate (2) Low (1)	Very high (3) High (1)

(v) Health Education Talks in Health Units

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Feasibility	Very easy (2) Easy (5) Moderate (2) Difficult (1)	Very easy (11) Easy (12) Moderate (5) Difficult (2)	Very easy (3) Moderate (1) Difficult (1)	Very easy (1) Easy (7) Moderate (2) Difficult (2)	Easy (3)	Very easy (1) Easy (5) Moderate (4) Difficult (2) Very difficult (1)	Easy (1) Moderate (1) Difficult (2)
2	Appropriateness	Very high (1) High (5) Moderate (3) Low (1)	Very high (10) High (12) Moderate (8)	Very high (1) High (3) Moderate (1)	Very high (1) High (7) Moderate (4)	Very high (3)	Very high (1) High (4) Moderate (4) Low (2)	High (1) Moderate (2) Low (1)
3	Meaningfulness	Very high (2) High (5) Low (1)	Very high (9) High (13) Moderate (8)	Very high (1) High (3) Moderate (1)	Very high (1) High (7) Moderate (4)	Very high (1) High (2)	Very high (2) High (4) Moderate (3) Low (1) Very low (1)	High (1) Moderate (2)
4	Effectiveness	High (7) Low (1) Very low (1)	Very high (9) High (10) Moderate (8) Very low (1)	Very high (2) High (3)	Very high (2) High (4) Moderate (6)	Very high (1) High (1)	Very high (2) High (6) Moderate (3)	Very high (1) Moderate (2) Low (1)

(vi) Visiting Places of Worship

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Feasibility	Easy (4) Moderate (4) Difficult (2)	Very easy (2) Easy (16) Moderate (6) Difficult (5) Very difficult (2)	Very easy (3) Moderate (1) Difficult (1) Very difficult (1)	Easy (6) Moderate (4) Difficult (1) Very difficult (1)	Easy (1) Moderate (2)	Very easy (3) Easy (7) Moderate (3)	Easy (2) Moderate (1) Very difficult (1)
2	Appropriateness	High (4) Moderate (5) Low (1)	Very high (4) High (10) Moderate (14) Low (3) Very low (1)	Very high (2) High (1) Low (2)	Very high (1) High (6) Moderate (4) Low (1)	High (1) Low (1)	Very high (2) High (3) Moderate (4) Low (2)	Moderate (3) Low (1)
3	Meaningfulness	Very high (1) High (4) Low (1)	Very high (3) High (14) Moderate (7) Low (4)	Very high (2) High (1) Moderate (1) Low (1)	Very high (5) High (5) Moderate (1) Low (1)	Very high (2) High (1)	Very high (3) High (3) Moderate (5)	High (1) Moderate (3)
4	Effectiveness	Very high (3) High (3) Low (3) Very Low (1)	Very high (2) High (12) Moderate (10) Low (5) Very low (1)	Very high (2) High (1) Low (2)	High (7) Moderate (5)	Very high (3)	Very high (2) High (2) Moderate (6) Low (1)	High (2) Moderate (2)

(vii) Organising and Supporting Community Women's Group Meetings

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Feasibility	Easy (2) Moderate (5) Difficult (3)	Very easy (1) Easy (9) Moderate (8) Difficult (14)	Very easy (3) Easy (1)	Very easy (1) Easy (5) Moderate (2) Difficult (4)	Easy (1) Moderate (1)	Easy (4) Moderate (4) Difficult (4)	Very easy (1) Easy (2) Moderate (1) Very difficult (1)
2	Appropriateness	High (8) Moderate (2)	High (10) Moderate (11) Low (5)	Very high (2) High (3)	Very high (1) High (6) Moderate (4) Low (1)	Very high (2) Very low (1)	Very high (1) High (3) Moderate (5) Low (3)	High (2) Low (2)
3	Meaningfulness	High (7) Moderate (2) Low (1)	Very high (3) High (11) Moderate (13) Low (2)	Very high (2) High (2)	Very high (2) High (6) Moderate (3) Low (1)	Very high (2) Very low (1)	Very high (2) High (7) Moderate (1) Low (1)	High (3) Low (1)
4	Effectiveness	Very high (2) High (5) Moderate (3)	Very high (2) High (12) Moderate (13) Low (4) Very low (1)	Very high (2) High (1) Moderate (1)	Very high (2) High (5) Moderate (4) Low (1)	Very high (3)	Very high (3) High (4) Moderate (2) Very low (1)	Very high (1) High (1) Moderate (2)

(viii) Integrated Health Education Campaigns

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Feasibility	Easy (1) Moderate (5) Difficult (2) Very difficult (1)	Very easy (2) Easy (11) Moderate (8) Difficult (8) Very difficult (2)	Very easy (1) Easy (2) Moderate (1)	Very easy (1) Easy (4) Moderate (5) Difficult (2)	Moderate (3)	Easy (2) Moderate (4) Difficult (3) Very difficult (1)	Easy (2) Difficult (1)
2	Appropriateness	High (4) Moderate (5)	Very high (5) High (13) Moderate (10) Low (3)	Very high (1) High (2) Moderate (1)	Very high (1) High (6) Moderate (4) Low (1)	Very high (3)	Very high (3) High (3) Moderate (5) Low (1)	High (2) Moderate (2)
3	Meaningfulness	Very high (1) High (5) Moderate (1) Low (2)	Very high (6) High (12) Moderate (11) Low (2)	Very high (1) High (3)	Very high (2) High (5) Moderate (4) Low (1)	Very high (1) High (1)	Very high (1) High (7) Moderate (4)	Very high (1) High (1) Moderate (1)
4	Effectiveness	Very high (1) High (5) Moderate (3) Low (1)	Very high (3) High (16) Moderate (10) Low (2)	Very high (2) High (1)	Very high (1) High (4) Moderate (6) Low (1)	Very high (2) High (1)	Very high (4) High (5) Moderate (2)	Very high (1) High (1) Moderate (2)

(ix) Delivering Educational Messages based on Appropriate and Meaningful Messages, Metaphors and Language

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Feasibility	Easy (1) Moderate (5) Difficult (3) Very difficult (1)	Very easy (8) Easy (9) Moderate (8) Difficult (6)	Very easy (3) Moderate (1)	Very easy (2) Easy (2) Moderate (3) Difficult (3) Very difficult (1)	Moderate (1) Difficult (2)	Very easy (2) Easy (3) Moderate (1) Difficult (3) Very difficult (1)	Easy (1) Moderate (2) Difficult (1)
2	Appropriateness	High (9) Moderate (1)	Very high (3) High (5) Moderate (10) Low (3)	Very high (2) High (1) Moderate (1)	Very high (2) High (1) Moderate (1)	Very high (1) Moderate (2)	Very high (1) High (6) Moderate (1) Low (3)	High (3) Moderate (1)
3	Meaningfulness	Very high (1) High (8) Moderate (1)	Very high (7) High (12) Moderate (9) Low (2)	Very high (2) High (1) Moderate (1)	Very high (1) High (6) Moderate (5)	Very high (1) Moderate (1)	Very high (4) High (3) Moderate (4) Very low (1)	Very high (1) High (2) Moderate (1)
4	Effectiveness	Very high (2) High (7) Moderate (1)	Very high (9) High (11) Moderate (10) Low (3) Very low (1)	Very high (2) High (2)	Very high (1) High (6) Moderate (5)	Very high (1) Low (2)	Very high (3) High (4) Moderate (4) Low (1)	Very high (1) High (3)

(x) Packaging and delivering health information to address the educational needs of different audience with diverse cultural background at the same time

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Feasibility	Easy (1) Moderate (1) Difficult (6) Very difficult (2)	Easy (7) Moderate (3) Difficult (14) Very difficult (2)	Very easy (1) Moderate (1) Difficult (1)	Easy (4) Moderate (2) Difficult (3) Very difficult (3)	Difficult (3)	Easy (4) Moderate (4) Difficult (4)	Easy (1) Difficult (1) Very difficult (1)
2	Appropriateness	Very high (2) High (4) Moderate (3) Low (1)	Very high (3) High (9) Moderate (12) Low (6) Very low (1)	Very high (1) High (2) Moderate (1)	High (8) Moderate (1) Low (2) Very low (1)	Very high (1) Moderate (2)	High (4) Moderate (5) Low (1) Very low (2)	High (1) Low (2)
3	Meaningfulness	Very high (1) High (7) Moderate (2)	Very high (2) High (10) Moderate (12) Low (4) Very low (1)	Very high (1) High (2) Moderate (1)	Very high (1) High (6) Moderate (3) Low (1) Very low (1)	Very high (1) High (2)	Very high (1) High (7) Moderate (2) Low (1)	High (1) Moderate (2)
4	Effectiveness	Very high (1) High (7) Moderate (2)	Very high (3) High (9) Moderate (13) Low (4) Very low (1)	Very high (1) High (2) Moderate (1)	High (3) Moderate (4) Low (1) Very low (2)	Very high (3)	Very high (2) High (4) Moderate (3) Low (2)	Very high (1) High (1) Moderate (1)

Appendix 17.6: The Level of Awareness of Impact of IEC Strategies by Sub-group

NO	Variable	Doctors	Nurses & Midwives	Pharmacists	Disease Control Officers	*Managers	Teachers	Religious Leaders
1	Aware	11	29	5	11	3	10	1
2	Not Aware	2	4	0	1	0	2	0
Total		13	33	5	12	3	12	1

* 1 Health Services Administrator (Business Manager of a hospital in Ghana) failed to indicate his inclusion for the profession of a manager. This was corrected increasing the original number of managers from 2 to 3 as shown in the Appendices

Appendix 18: Non-parametric Test Results on IEC Strategies and Challenges

Appendix 18.1: Kruska Wallis Test for Inter-country Comparison of Rating of IEC Strategies by Health Professionals excluding FBOs

(Test Statistics [a,b])

	Training & Orientation	Advocacy	Mass Campaigns	House-to-House Sensitisation	Health Education Talks	Visiting Places of Worship	Women's Meetings	Integrated Campaign	Symbolism	I/Audience
Chi-Square	6.112	8.564	1.254	2.486	11.876	1.056	1.099	2.118	14.236	.266
Df	2	2	2	2	2	2	2	2	2	2
Asymp. Sig.	.047	.014	.534	.289	.003	.590	.577	.347	.001	.876

a. Kruskal Wallis Test (**p≤0.05**)

b. Grouping Variable: Country where you live

Appendix 18.2: Sensitivity Analysis of Kruska Wallis Test for Inter-country Comparison of Rating of IEC Strategies by Health Professionals and FBOs (Test Statistics [a,b])

Test	Training & Orientation	Advocacy	Mass Campaigns	House-to-House Sensitisation	Health Talks	Visiting Places of Worship	Women's Meetings	Integrated camapign	symbolism	I/Audience
Chi-Square	6.362	10.326	4.668	2.084	9.658	.373	.954	4.339	7.759	2.455
Df	2	2	2	2	2	2	2	2	2	2
Asymp. Sig.	.042	.006	.097	.353	.008	.830	.621	.114	.021	.293

- a. Kruskal Wallis Test (**p≤0.05**)
- b. Grouping Variable: Country where you live

Appendix 18.3: Testing the Level of Significance of Differences between Health Professions and FBOs on IEC Strategies

(Test Statistics [a])

Test	Training & Orientation	Advocacy	Mass Campaigns	House-to-house Sensitisation	Health Education Talks	Visiting Places of Worship	Women Group Meetings	Integrated Campaign	Symbolism Versus Information Delivery	I/Audience
Mann-Whitney U	518.000	463.000	393.500	508.000	327.000	406.000	385.000	356.000	253.000	359.500
Wilcoxon W	1464.000	1366.000	1296.500	859.000	1273.000	1352.000	1331.000	1259.000	1114.000	1305.500
Z	-.536	-1.096	-1.986	-.492	-3.064	-2.003	-2.209	-2.526	-3.829	-2.612
Asymp. Sig. (2-tailed)	.592	.273	.047	.623	.002	.045	.027	.012	.000	.009

- a. Grouping Variable: Group (Health Professions Versus FBOs) (**p≤0.05**)

Appendix 18.4: Kruska Wallis Test for Inter-country Comparison of Rating of Level Challenges by Health Professionals: Ethiopia, Ghana and Nigeria (Test Statistics [a,b])

	Staff Knowledge	Staff Attitude	Work Practices	Staff Shortage	Distance Problems	Waiting Time	Women's Empowerment	Managing Poverty	Managing Resources	Demystifying Beliefs	Health Seeking Behaviour
Chi-Square	3.831	10.873	1.871	12.396	5.883	7.620	4.519	10.275	3.257	4.390	1.004
df	2	2	2	2	2	2	2	2	2	2	2
Asymp. Sig.	.147	.004	.392	.002	.053	.022	.104	.006	.196	.111	.605

a Kruskal Wallis Test (**$p \leq 0.05$**)

b Grouping Variable: Country where you

Appendix 18.5: Sensitivity Analysis of Kruska Wallis Test for Inter-country Comparison of Rating of Level Challenges by Health Professionals and FBOs (Test Statistics [a,b])

	Staff Knowledge	Staff Attitude	Work Practices	Staff Shortage	Distance Problems	Waiting Time	Women's Empowerment	Managing Poverty	Managing Resources	Demystifying Beliefs	Health Seeking Behaviour
Chi-Square	3.595	6.085	8.229	9.089	5.681	3.420	1.164	9.591	3.512	3.295	2.045
df	2	2	2	2	2	2	2	2	2	2	2
Asymp. Sig.	.159	.036	.010	.011	.095	.211	.514	.007	.206	.171	.353

a Kruskal Wallis Test (**$p \leq 0.05$**)

b Grouping Variable: Country where you live

Appendix 18.6: Testing the level of Significance of Differences between health professionals and FBOs on Challenges (Test Statistics [a])

Test	Staff Knowledge	Staff Attitude	Work Practices	Staff Shortage	Distance Problems	Waiting Time	Women's Empowerment	Managing Poverty	Managing Resources	Demystifying Beliefs	Health Seeking Behaviour
Mann-Whitney U	492.000	317.000	412.500	351.500	474.000	295.500	386.000	524.000	390.000	478.000	381.000
Wilcoxon W	843.000	1220.000	1315.500	1092.500	1377.000	1115.500	1289.000	875.000	1293.000	1298.000	1161.000
Z	-.701	-3.032	-1.533	-2.072	-.968	-2.850	-2.089	-.288	-2.020	-.575	-1.825
Asymp. Sig. (2-tailed)	.483	.002	.125	.038	.333	.004	.037	.773	.043	.566	.068

a. Grouping Variable: Group (Health Professionals Versus FBOs) ($p \leq 0.05$)