

**INFLUENCE OF HOUSEHOLD BEHAVIOUR AND PERCEPTION ON
MALARIA CONTROL AND PREVENTION IN ZAMFARA STATE NORTH
WEST NIGERIA**

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WEST NIGERIA**

AHMAD YAHAYA MAIGEMU (95084)

**A Thesis submitted to the Ghazali Shafie Graduate School of Government
in fulfilment of the requirements for the Doctor of Philosophy
Universiti Utara Malaysia**

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ABSTRAK

Tingkah laku isi rumah telah dibangunkan sebagai elemen asas dalam amalan pencegahan kesihatan. Paradigma pengawalan penyakit malaria kebanyakannya memberikan tumpuan kepada pendekatan perubatan dan kesihatan, sebahagian besarnya didapati tidak mengambil kira tingkah laku isi rumah. Tingkah laku isi rumah bukan sahaja memainkan peranan penting dalam mempengaruhi penularan malaria, tetapi tingkah laku dan sikap juga boleh memainkan peranan dalam pengawalan dan pengurusannya. Objektif kajian ini adalah untuk menyiasat pengaruh tingkah laku dan persepsi isi rumah terhadap kawalan malaria dan penularannya di negeri Zamfara, barat laut Nigeria. Kajian ini menggabungkan penyelidikan kuantitatif dan kualitatif. Bagi kaedah kuantitatif, seramai 409 responden telah mengambil bahagian dan analisis dibuat dengan menggunakan Pakej Statistik Untuk Sains Sosial (SPSS) serta PLS 2.0 pintar (*smart PLS 2.0*). Bagi kaedah kualitatif pula, 20 orang telah mengambil bahagian sebagai responden, dan analisis tematik digunakan. Keputusan daripada analisis PLS menyokong ketiga-tiga andaian hipotesis. Secara khusus, dapatan kajian dari hipotesis pertama menunjukkan bahawa terdapat hubungan yang signifikan antara tingkah laku terhadap pengasapan dan kawalan malaria. Tambahan pula, dapatan kajian dari hipotesis kedua menunjukkan terdapat hubungan antara tingkah laku isi rumah ke atas pelupusan sisa dan kawalan malaria. Hasil analisis hipotesis ketiga juga menyokong hubungan antara persepsi isi rumah dan kawalan malaria. Penemuan daripada kajian kualitatif menunjukkan bahawa tingkah laku isi rumah mempunyai pengaruh terhadap langkah-langkah kawalan malaria sedia ada dan tahap keberkesanannya di Nigeria. Sebahagian daripada hasil kajian juga menunjukkan bahawa langkah-langkah pengawalan sedia ada dan kawalan yang efektif mempengaruhi tingkah laku isi rumah. Dapatan kajian ini disokong oleh literatur dan teori. Secara umumnya kajian ini memberikan bukti lanjut mengenai pengaruh tingkah laku isi rumah terhadap kawalan dan pencegahan malaria dengan rujukan khusus di negeri Zamfara, barat laut Nigeria. Tingkah laku isi rumah harus dianggap sebagai suatu konsep yang penting bagi kawalan dan pencegahan malaria.

Kata kunci: Langkah-langkah kawalan, Tingkah laku isi rumah, Persepsi isi rumah, Kawalan malaria, Pencegahan malaria.

ABSTRACT

Household behaviour has been established as a fundamental element in health preventive practices. Malaria control paradigm focuses mostly on the medical and health approach. Household behaviour has been to a large extent do not take into account. Household behaviour, not only plays a critical role in the influence of malaria prevalence, but these behaviours and attitudes can also play a role in its control and management. The objective of this study is to investigate the influence of household behaviour and perception on malaria control and prevalence in Zamfara state North West Nigeria. The study used a mixed methodology of quantitative and qualitative research. For the quantitative, a total of 409 respondents participated in the study. Statistical Package for Social Science (SPSS) and smart PLS 2.0 is use for the quantitative analysis. For the qualitative, 20 people participated as respondents. Thematic analysis was used for qualitative analysis. Result from the PLS analysis supported the entire three hypothesis. Specifically, the finding from hypothesis one shows that there is a significant relationship between behaviour on fumigation and malaria control. Furthermore, results from hypothesis two indicate that there is a connection between household behaviour on waste disposal and malaria control. The result from the hypothesis three reveals that there is a relationship between household malaria perception and malaria control. A finding from the qualitative study reveals that household behaviour has the influence to available and effective malaria control measures in Nigeria. Part of the result also shows that available and effective control measures influence household behaviour. The findings of the study were supported by the literature and theories. In general the study provides further proofs on the influence of household behaviour on malaria control and prevention with particular reference to Zamfara state in North West Nigeria. Household behaviour should be considered as an important concept for malaria control and prevention.

Keywords: Control Measures, Household Behaviour, Household Perception, Malaria Control, Malaria Prevention.

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LIST OF ABBREVIATION

ACM	Available Control Measures
ACT	<i>Artemisinin</i> -based Combination Therapies
AEA	American Educational Association
ANC	Antenatal Care
APA	American Psychological Association
AVE	Average Variance Extracted
BF	Behaviour on Fumigation
BW	Behaviour on Waste Disposal
CMV	Common Method Variance
DDIC	Direct Delivery and Information Captured
DDT	<i>Dichlorodiphenyl Trichloroethane</i>
ECM	Effective Control Measures
F ²	Effect Size
FGN	Federal Government of Nigeria
FMH	Federal Ministry of Health
LGAs	Local Government Areas
LLIN	Long Lasting Insecticide Net
MAPS	Malaria Action Plan for States
MC	Malaria Control
MDG	Millennium Development Goals
NGOs	Non-Governmental Organizations
NMCP	National Malaria Control Program in Nigeria
NPC	National Population Commission
NCME	National Council on Measurement in Education

PM	Perception on Malaria
Q ²	Predictive Relevance
R ²	Assessment of Variance
SFH	Society for Family Health
SMOH	State Ministry of Health
SMCP	State Malaria Control Program
SP	Sulphadoxine-pyrimethamine
SPSS	Statistical Package in Social Sciences
PRRINN-MNCH	Partnership for Reviving Routine Immunization in Northern Nigeria; Maternal Newborn and Child Health Initiative
UNICEF	United Nation International Children Emergency Fund
WHO	World Health Organization
ZESA	Zamfara Environmental Sanitation Agency

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Household behaviour has been established as a fundamental element in health preventive practices. Household behaviour is expected to play a critical role in the management and prevention of malaria disease. This study bordered within the context and frame of medical sociology, whereby the emphasis is on social and behavioural factors in managing and preventing malaria problem. Thus, this study uses sociological explanation of the social and behavioural dimension of malaria control and prevalence.

Malaria is a threat to more than 40% of the world's population. More than 300 to 500 million acute cases are diagnosed annually (WHO, 2013; WHO, 2012; WB, 2009) and malaria is estimated to cause between 1.1 and 2.7 million deaths annually (Ameh et al., 2015; WHO, 2013; RBM, 2010). That is why the disease is described as a major public health problem, and its consequences roots go deep within human societies. The vast majority of malaria cases (90%) are found in sub-Saharan Africa, where malaria adds up the total disease prevalence (WHO, 2013 & 2012). Malaria contributes almost 25% of all childhood deaths in Africa (WHO, 2012). According to Roll Back Malaria (RBM), malaria causes economic losses, estimated at more than \$2 billion per annum in Africa alone (WHO, 2013). In Nigeria, the prevalence of malaria causes frequent suffering to human society and places enormous burdens on the human population (FMH, 2007, & 2005).

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Appendix A: Quantitative Instruments (Questionnaire)

QUESTIONNAIRE



Influence of Household Behaviour on Malaria Control in Zamfara State North West Nigeria

Dear Respondents,

I am a research assistant to Doctor of Philosophy (PhD) candidate of School of Government (SOG), College of Law Government and International Studies (COLGIS), Universiti Utara Malaysia. The candidate is undergoing a research work on Influence of Household Behaviour on Malaria Control in Zamfara State North West Nigeria. My function is to help the researcher in conducting the survey and therefore request for your cooperation. It is hope that the outcome of the research will be of immense benefit to policy makers, researchers and general members of the society regarding malaria control and prevention. Your effort in responding to the questions is highly appreciated as it assists the researcher to achieve the objective of the study. Be assured that the information gathered will be solely for the purpose of this academic research and confidentiality is highly guaranteed.

In anticipation of your positive response, on behalf of the researcher I am very grateful for your time in filling this questionnaire.

Yours Sincerely

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Please decide how true the following statement is in describing you and your feeling. Kindly response to the questions that best represent your view and opinion based on the below 5 likert scale

1 – Strongly Disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly Agree

SECTION A: Behaviour on Fumigation

S/NO	Statement	SD	D	N	A	SA
BF1	Fumigation as measures of malaria control is not use by household to control malaria	1	2	3	4	5
BF2	Fumigation of environment is not use by household because it is too expensive	1	2	3	4	5
BF3	Fumigation of environment is difficult to household because resources required is not available	1	2	3	4	5
BF4	Fumigation is not utilized by household because it is new which require starting new behaviour	1	2	3	4	5
BF5	Members of the household is not comfortable with fumigation	1	2	3	4	5
BF6	Household does not undertake fumigation services because they are full of other activity	1	2	3	4	5
BF7	Household have other choice important than fumigation	1	2	3	4	5
BF8	Household does not fumigate because of ignorance of where and how to do it	1	2	3	4	5
BF9	Time consuming is what make household to not make use of fumigation services	1	2	3	4	5
BF10	Lack of information about importance of fumigation is what make it less use by household	1	2	3	4	5
BF11	Household environmental condition is not conducive for fumigation	1	2	3	4	5
BF12	Household belief about not developing malaria is what make them to not make use of fumigation	1	2	3	4	5
BF13	Feeling not at risk of malaria is what make household to not adopt fumigation	1	2	3	4	5
BF14	Fumigation is not necessary because of the believe that it does not prevent household members from future malaria occurrence	1	2	3	4	5
BF15	Household not understand the importance of fumigation with regard to malaria control	1	2	3	4	5
BF16	Household does not concern with fumigation	1	2	3	4	5

BF17	Ineffectiveness of fumigation is what affect it use by household	1	2	3	4	5
BF18	Household members does not regularly fumigate their environment	1	2	3	4	5
BF19	Believe about not dying as a result of malaria is what make household to not engage in fumigation services	1	2	3	4	5
BF20	Fumigation services/activities is very dangerous to household members	1	2	3	4	5
BF21	Fumigation of environment is not affordable to household members	1	2	3	4	5

SECTION B: Behaviour on Waste Disposal

S/NO	Statement	SD	D	N	A	SA
BW1	Waste disposal facilities is not available	1	2	3	4	5
BW2	There is no place reserved for dumping waste and discarded materials	1	2	3	4	5
BW3	Refuse in my house is carried out by water and filled the waterway passage	1	2	3	4	5
BW4	Refuse is dump on the street	1	2	3	4	5
BW5	Refuse is dump inside the waterway	1	2	3	4	5
BW6	Household members dump refuse anywhere they like	1	2	3	4	5
BW7	There is no provision for household to gather garbage from houses	1	2	3	4	5
BW8	Household lack purchasing power to own waste disposal vans	1	2	3	4	5
BW9	There is no concern by household members on where to dump refuse	1	2	3	4	5
BW10	It is costly to dump refuse properly	1	2	3	4	5
BW11	Proper sanitation and dumping of refuse is time consuming	1	2	3	4	5
BW12	Busy nature of household doing other activities is the reason for not dumping waste properly	1	2	3	4	5
BW13	There is other thing important than disposing waste properly	1	2	3	4	5
BW14	Household members lack the resources to dispose waste properly	1	2	3	4	5
BW15	My financial status will be in danger if I use the little I have for disposing waste	1	2	3	4	5
BW16	Doing waste disposal to gather garbage is a new behaviour to me which required a new starting point	1	2	3	4	5

BW17	There is no community concerned to make sure waste is dispose properly	1	2	3	4	5
BW18	I am forgetting to dispose waste properly	1	2	3	4	5
BW19	There is no action to gather and dispose waste regularly	1	2	3	4	5
BW20	There is no household involvement in any activity regarding waste disposal	1	2	3	4	5
BW21	The level of disposing waste generally is very poor	1	2	3	4	5
BW22	There is shortage of proper waterway system which serve as conducive environment for breeding mosquitoes	1	2	3	4	5
BW23	The waterway system available is open gutters very easy to be filled with discarded materials	1	2	3	4	5
BW24	There is no proper way for waste gushing water from toilet/bath rooms	1	2	3	4	5
BW25	The type of bathrooms/toilets use by household members does not have facilities for proper waste water passage	1	2	3	4	5
BW26	Waterway system not properly manage by household members	1	2	3	4	5
BW27	Household members filled waterway passage with discarded materials	1	2	3	4	5
BW28	Behaviour and practices to make waterway clean and proper sanitation is low	1	2	3	4	5
BW29	There is carelessness by the household in the provision of proper water for water passage	1	2	3	4	5
BW30	Household members does not clean waterway passage because it is time consuming	1	2	3	4	5
BW31	Lack of facilities is what makes household to clear stagnant water	1	2	3	4	5
BW32	There is no stagnant water clearance because of the busy nature of household	1	2	3	4	5
BW33	The system of toilet/bathrooms is traditional conducive for holding waste water	1	2	3	4	5
BW34	There is presence of old building structures with poor network of water passage in my area	1	2	3	4	5
BW35	I do not clear stagnant water because to me it is not cause any harm	1	2	3	4	5
BW36	Household members fails to remember the situation of waterway in the area	1	2	3	4	5

BW37	There is no activity in the area in charge of clearing stagnant water	1	2	3	4	5
BW38	There is no community commitment to ensure proper passage of water to avoid presence of stagnant water in the area	1	2	3	4	5

SECTION C: Perception on Malaria

SN	Statement	SD	D	N	A	SA
PM1	There is no chance of developing malaria in life time	1	2	3	4	5
PM2	There is no feeling at risk as a result of malaria in life time	1	2	3	4	5
PM3	Malaria is not a serious disease	1	2	3	4	5
PM4	Malaria is serious just if compare to other disease	1	2	3	4	5
PM5	It is not possible to contact malaria easily	1	2	3	4	5
PM6	The high risk of malaria is not encouraging behaviour to adopt preventive measures	1	2	3	4	5
PM7	Perception about susceptibility to malaria does not prompt me to seek for treatment	1	2	3	4	5
PM8	There is no change on household career as a result of malaria	1	2	3	4	5
PM9	There is no shock when thought of malaria	1	2	3	4	5
PM10	There is no feeling of life change as a result of malaria	1	2	3	4	5
PM11	Malaria is not a severe disease as far as I am concern	1	2	3	4	5
PM12	Malaria has no major consequences in life	1	2	3	4	5
PM13	Malaria is not causes difficulties to me and those close to me	1	2	3	4	5
PM14	Malaria control activities does not prevent me from future problems	1	2	3	4	5
PM15	I have nothing to gain by doing malaria control activities	1	2	3	4	5
PM16	Malaria control services is not effective	1	2	3	4	5
PM17	The price of control services is not affordable	1	2	3	4	5
PM18	Malaria control services does not decreases the chances of people dying from the disease	1	2	3	4	5

SECTION D: Malaria Control

SN	Statement	SD	D	N	A	SA
MC1	There is a major environmental concern in the area	1	2	3	4	5
MC2	Poor behaviour on environmental issues increases the prevalence of malaria	1	2	3	4	5
MC3	Level of knowledge does not influence household behaviour on malaria control	1	2	3	4	5
MC4	Household cultural values influence their behaviour on malaria control	1	2	3	4	5
MC5	There is no household commitment on fumigation	1	2	3	4	5
MC6	There is no motivation for household members on bad water treatment	1	2	3	4	5
MC7	The general behaviour of household members on waste disposal is poor	1	2	3	4	5
MC8	There is no cooperation by household to control malaria	1	2	3	4	5
MC9	There is no team work by household members to control malaria	1	2	3	4	5
MC10	There is no assistance by household members to control malaria	1	2	3	4	5

SECTION E: Demographic Characteristic of the Respondents

- GENDER: Male Female
- AGE: [30-40] [41-50] [51-60] [61 above]
- INCOME (in '000 naira'): [10-20] [20-30] [30-40] [40 above]
- EDUCATION STATUS: Non formal education Primary education Secondary education Tertiary education Others
- OCCUPATION: Civil service Business Farming Others
- RELIGION: Islam Christianity Traditional Others
- TRIBE: Hausa Yoruba Igbo Others

Table of Determining Sample Size

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Source: Krejcie, Robert V., Morgan, Daryle W. Determining Sample Size for Research Activities

Note: N= Population size S= Sample size.

Appendix B: Qualitative Instrument (Interview Guide)

INTERVIEW GUIDE



Section A: Personal Profile of the Respondents

- A. age
- B. Gender
- C. Educational Qualification
- D. Religious Affiliation
- E. Occupation

Interview Date [] Time [] Code []

SECTION A: Interview on Availability and Effectiveness of Preventive Measures and Influence of Household Behaviour on Malaria Control

1. How did you define a seriousness and health problem of malaria in your household? Kindly elaborate more on how these affect household behaviour in terms of health seeking behaviour.
2. Is the seriousness as a result of availability of the preventive measures? How?
3. Are preventive measures of malaria control available?
4. Can you explain how you respond to the issue of available control measures?
5. Do you have any issue with those control measures?
6. Is available control measures encourages you to protect yourself from malaria?
- 7.

8. Is it available to all household (elaborate)
9. Is it available at any time
10. In any location
11. How the above influence household on care seeking behaviour to control malaria
12. Does this issue of availability in general influence household behaviour to use those preventive measures?

SECTION B: Effectiveness

1. Does preventive measures of malaria control effective?
2. Does it influence household choices on preventive measure? Elaborate
3. Does effectiveness of preventive measure contribute to the seriousness of malaria?
4. Does the issue of effectiveness of the control measures influence household behaviour?
5. When malaria strike in one of the household member, do you usually start treatment from home by taking certain preventive measures.
6. Please share with me the method you prefer in the management and prevention of malaria in your household.
7. Do you think the issue of effectiveness is a challenge facing household in treating malaria which also influence their behaviour on treatment seeking behaviour
8. Is the issue of effective influence household behaviour on type of treatment preferred?
9. Please share with me any other issue related to effectiveness of malaria control measures and household behaviour on malaria control?

SECTION B: General Behaviour Interview

1. How do you explain the prevalence of malaria in Zamfara state
2. How complicated do you consider the prevalence
3. What do think are the factors contributing to malaria prevalence
4. How does household members response to those curative measures
5. What of the affordability of those curative measures
6. How does household behaviour in terms of their cultural values and beliefs affect malaria control
7. Does household level of education influence their behaviour on malaria control
8. What of household religious beliefs and practices. Does it influence their behaviour on available malaria control measures
9. How does household economic status and background influence their behaviour on malaria control
10. What of their skills, does it have any influence on their behaviour?
11. In general how do you consider the influence of availability and effectiveness of malaria control measures on malaria control

Appendix C: Consent Form

**SCHOOL OF GOVERNMENT
COLLEGE OF LAW GOVERNMENT AND INTERNATIONAL STUDIES
UNIVERSITI UTARA MALAYSIA
SINTOK,
KEDAH DARUL AMAN**

Date

RESEARCH TOPIC: INFLUENCE OF HOUSEHOLD BEHAVIOUR ON MALARIA IN
ZAMFARA STATE NORTH WEST NIGERIA.

RESEARCH INTERVIEW CONSENT FORM

I wish to freely without any coercion, intimidation or compulsion to partake and contributed my knowledge and understanding on this research topic without any fear, panic or favor. My participation on this research is on the agreement that this research work is mean for academic purposes only, and there is nothing like political relevance will allow taking advantage of the information provided during and after the study. I will not expect any return benefit from the researcher being me participant of this interview.

Participant Signature

Researcher's Signature

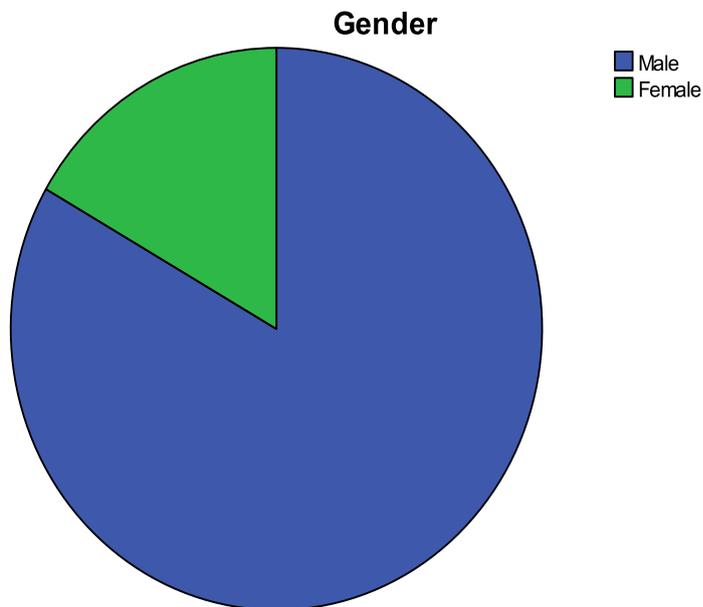
Appendix D: Statistics of Demographic Information of Respondents

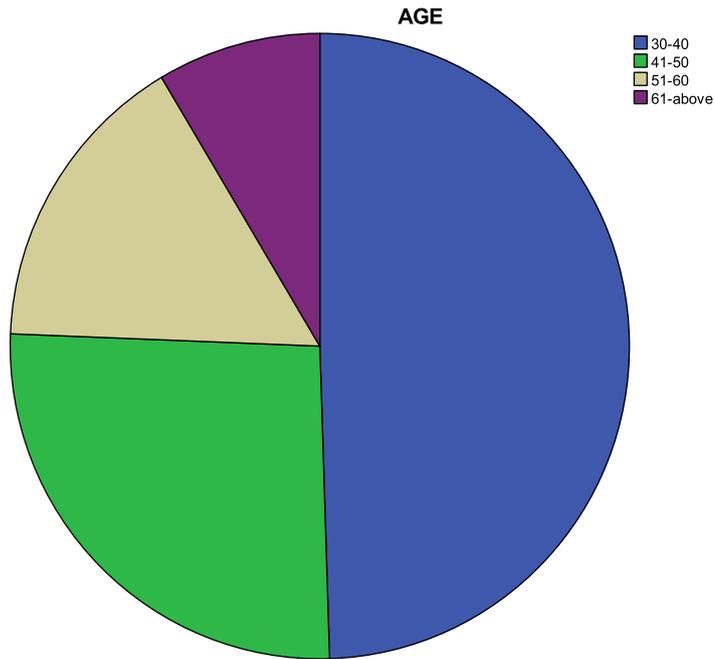
RESPONDENTS STATISTICS

	Gender	Age	Income	Education Status	Occupation	Religion	Tribe
Valid	401	398	365	386	397	402	399
Missing	1	4	37	16	5	0	3

Gender

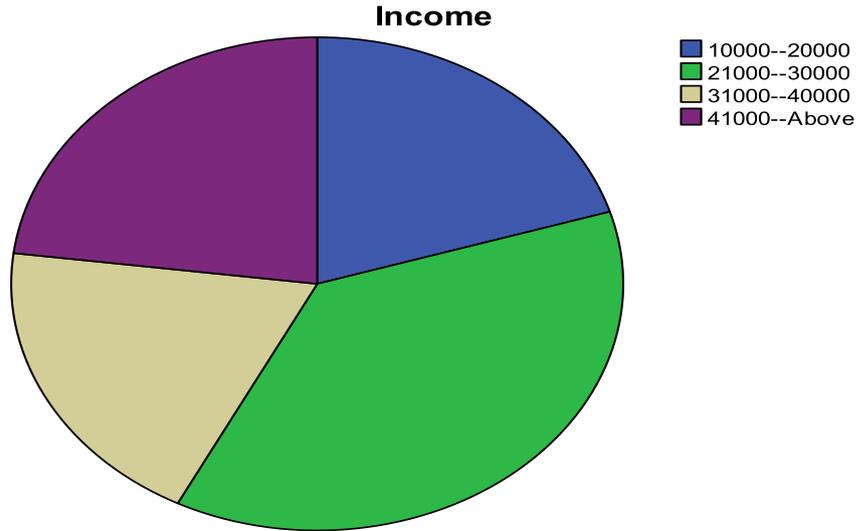
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	334	83.1	83.3	83.3
	Female	67	16.7	16.7	100.0
	Total	401	99.8	100.0	
Missing	System	1	.2		
Total		402	100.0		





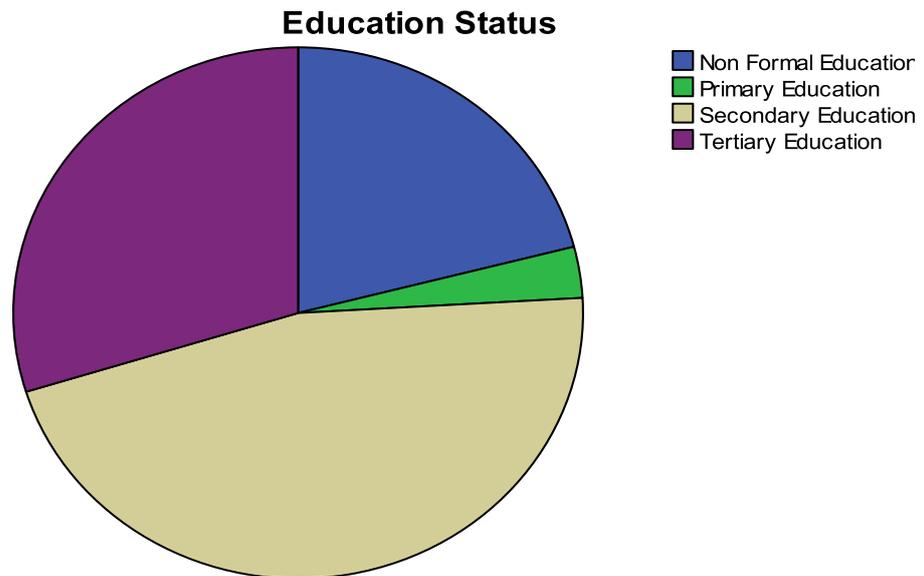
AGE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	30-40	197	49.0	49.5	49.5
	41-50	104	25.9	26.1	75.6
	51-60	63	15.7	15.8	91.5
	61-above	34	8.5	8.5	100.0
	Total	398	99.0	100.0	
Missing	System	4	1.0		
Total		402	100.0		

Income					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10000--20000	74	18.4	20.3	20.3
	21000--30000	136	33.8	37.3	57.5
	31000--40000	71	17.7	19.5	77.0
	41000--Above	84	20.9	23.0	100.0
	Total	365	90.8	100.0	
Missing	System	37	9.2		
Total		402	100.0		



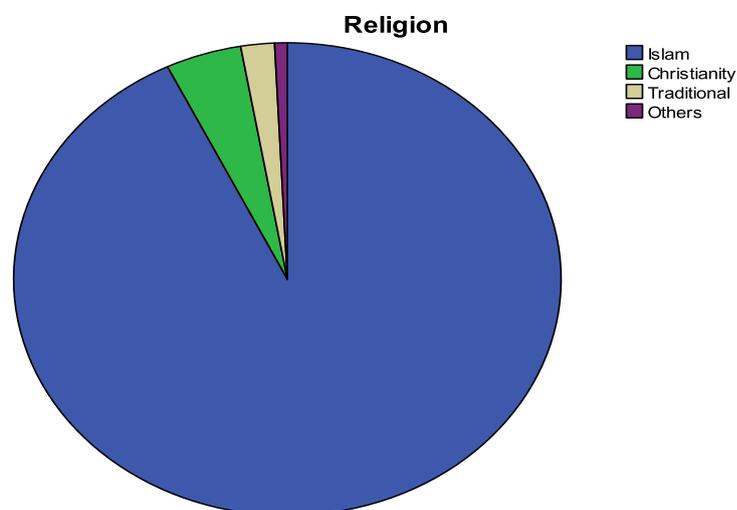
Education Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non Formal Education	81	20.1	21.0	21.0
	Primary Education	12	3.0	3.1	24.1
	Secondary Education	178	44.3	46.1	70.2
	Tertiary Education	115	28.6	29.8	100.0
	Others	0	0	0	0
	Total	386	96.0	100.0	
Missing	System	16	4.0		
Total		402	100.0		

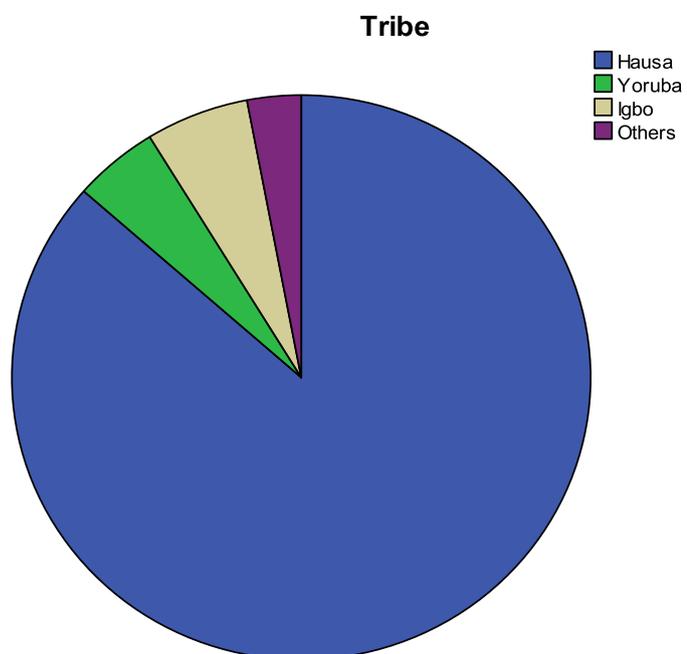


Occupation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Civil Service	85	21.1	21.4	21.4
	Business	184	45.8	46.3	67.8
	Farming	87	21.6	21.9	89.7
	Unemployed	41	10.2	10.3	100.0
	Others	0	0	0	0
	Total	397	98.8	100.0	
Missing	System	5	1.2		
Total		402	100.0		

Religion					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Islam	373	92.8	92.8	92.8
	Christianity	18	4.5	4.5	97.3
	Traditional	8	2.0	2.0	99.3
	Others	3	.7	.7	100.0
	Total	402	100.0	100.0	



		Tribe			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hausa	345	85.8	86.5	86.5
	Yoruba	19	4.7	4.8	91.2
	Igbo	23	5.7	5.8	97.0
	Others	12	3.0	3.0	100.0
	Total	399	99.3	100.0	
Missing	System	3	.7		
Total		402	100.0		



APPENDIX D: RELIABILITY AND VALIDITY TEST RESULTS

RELIABILITY TEST FOR BF ITEMS

Case Processing Summary

		N	%
Cases	Valid	39	97.5
	Excluded ^a	1	2.5
	Total	40	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.898	.900	21

Item Statistics

	Mean	Std. Deviation	N
BF1	3.8718	1.19603	39
BF2	3.8462	.96077	39
BF3	3.8462	1.03970	39
BF4	3.8974	1.04617	39
BF5	3.8462	.81235	39
BF6	3.6923	1.17325	39
BF7	3.7436	1.09347	39
BF8	4.1795	.85446	39
BF9	4.2051	.86388	39
BF10	4.1282	1.05580	39
BF11	3.6923	1.15060	39
BF12	3.8718	1.26032	39
BF13	3.7692	1.08728	39
BF14	3.8974	1.16517	39
BF15	3.4872	1.23271	39
BF16	3.0513	.88700	39
BF17	2.2821	1.25549	39
BF18	3.8205	1.27469	39
BF19	3.3846	1.53238	39
BF20	3.8974	1.18754	39
BF21	3.7949	1.28103	39

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.724	2.282	4.205	1.923	1.843	.175	21

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
78.2051	184.220	13.57277	21

RELIABILITY TEST FOR BW ITEMS**Case Processing Summary**

		N	%
Cases	Valid	40	100.0
	Excluded ^a	0	.0
	Total	40	100.0

a. List wise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.834	.832	38

Item Statistics

	Mean	Std. Deviation	N
BW1	3.8000	1.06699	40
BW2	3.9000	1.05733	40
BW3	3.9750	1.04973	40
BW4	3.8250	.93060	40
BW5	3.5000	1.32045	40
BW6	3.7750	1.16548	40
BW7	4.0500	.98580	40
BW8	4.1250	.99195	40
BW9	4.0750	1.16327	40
BW10	3.6500	1.23101	40
BW11	3.7750	1.32988	40
BW12	3.6250	1.23387	40
BW13	3.8000	1.20256	40

BW14	3.5000	1.19829	40
BW15	2.9500	.95943	40
BW16	2.4000	1.31656	40
BW17	3.7500	1.33493	40
BW18	3.4250	1.53402	40
BW19	3.8750	1.22344	40
BW20	2.8750	1.15886	40
BW21	2.8500	1.36907	40
BW22	3.3000	1.30482	40
BW23	3.6500	1.02657	40
BW24	3.6750	.99711	40
BW25	3.4000	1.10477	40
BW26	3.1500	1.33109	40
BW27	3.1750	.84391	40
BW28	3.4750	1.01242	40
BW29	3.4750	.98677	40
BW30	3.1750	1.03497	40
BW31	2.5750	1.03497	40
BW32	2.8500	1.31168	40
BW33	3.0000	1.30089	40
BW34	3.2500	1.40967	40
BW35	3.8500	1.05125	40
BW36	4.0500	.95943	40
BW37	3.7500	1.31559	40
BW38	3.8500	1.29199	40

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.504	2.400	4.125	1.725	1.719	.191	38

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
133.1500	277.515	16.65879	38

RELIABILITY TEST FOR PM ITEMS

Case Processing Summary

		N	%
Cases	Valid	40	100.0
	Excluded ^a	0	.0
	Total	40	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.845	.845	18

Item Statistics

	Mean	Std. Deviation	N
PM1	3.8000	1.06699	40
PM2	3.7500	1.10361	40
PM3	3.9750	1.04973	40
PM4	3.9750	.86194	40
PM5	3.5750	1.31826	40
PM6	3.7500	1.21423	40
PM7	4.0500	.98580	40
PM8	4.1500	1.00128	40
PM9	4.1500	1.18862	40
PM10	3.7750	1.20868	40
PM11	3.7250	1.30064	40
PM12	3.1750	1.15220	40
PM13	2.6500	1.02657	40
PM14	2.9250	1.34712	40
PM15	3.0500	1.29990	40
PM16	3.3500	1.38767	40
PM17	4.0000	.98710	40
PM18	4.0750	.97106	40

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.661	2.650	4.150	1.500	1.566	.203	18

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
65.9000	117.374	10.83394	18

RELIABILITY TEST FOR MALARIA CONTROL ITEMS**Case Processing Summary**

		N	%
Cases	Valid	39	97.5
	Excluded ^a	1	2.5
	Total	40	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.895	.894	10

Item Statistics

	Mean	Std. Deviation	N
MC1	3.7949	1.28103	39
MC2	3.9744	1.13525	39
MC3	3.7949	1.03057	39
MC4	3.8974	1.04617	39
MC5	4.0000	1.05131	39
MC6	3.8718	.95089	39
MC7	3.6410	1.26672	39
MC8	3.6923	1.19547	39
MC9	4.1026	1.02070	39
MC10	4.1538	1.01407	39

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.892	3.641	4.154	.513	1.141	.028	10

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
------	----------	----------------	------------

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
38.9231	62.757	7.92194	10

ALL ITEMS: Reliability**Case Processing Summary**

		N	%
Cases	Valid	38	95.0
	Excluded ^a	2	5.0
	Total	40	100.0

a. List wise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.921	.921	87

Item Statistics

	Mean	Std. Deviation	N
BF1	3.8947	1.20336	38
BF2	3.8947	.92384	38
BF3	3.8947	1.00779	38
BF4	3.8684	1.04419	38
BF5	3.8684	.81111	38
BF6	3.7368	1.15511	38
BF7	3.7895	1.06943	38
BF8	4.2632	.68514	38
BF9	4.2632	.79472	38
BF10	4.1842	1.00956	38
BF11	3.7368	1.13147	38
BF12	3.9211	1.23860	38
BF13	3.7895	1.09441	38
BF14	3.8684	1.16645	38
BF15	3.5000	1.24662	38
BF16	3.0526	.89887	38
BF17	2.3158	1.25430	38
BF18	3.8684	1.25571	38
BF19	3.4474	1.50130	38
BF20	3.9474	1.16125	38
BF21	3.8158	1.29145	38
BW1	3.8421	1.05334	38

BW2	3.9737	1.02632	38
BW3	3.9474	1.06409	38
BW4	3.8158	.92577	38
BW5	3.5263	1.33025	38
BW6	3.7895	1.14273	38
BW7	4.1579	.85507	38
BW8	4.1842	.95451	38
BW9	4.1053	1.13398	38
BW10	3.6579	1.21425	38
BW11	3.8421	1.32596	38
BW12	3.6316	1.26108	38
BW13	3.7895	1.21161	38
BW14	3.5263	1.22445	38
BW15	2.9211	.96930	38
BW16	2.3684	1.26108	38
BW17	3.7895	1.33878	38
BW18	3.4737	1.51990	38
BW19	3.9211	1.21659	38
BW20	2.8421	1.17465	38
BW21	2.8947	1.39089	38
BW22	3.4211	1.22213	38
BW23	3.7105	1.01096	38
BW24	3.6579	1.02077	38
BW25	3.3158	1.06809	38
BW26	3.1316	1.31870	38
BW27	3.1579	.85507	38
BW28	3.4737	1.03289	38
BW29	3.4211	.97625	38
BW30	3.1579	1.00071	38
BW31	2.5526	.95003	38
BW32	2.8421	1.26334	38
BW33	2.9474	1.29338	38
BW34	3.2632	1.36924	38
BW35	3.8947	.95265	38
BW36	4.1053	.83146	38
BW37	3.7895	1.25543	38
BW38	3.8947	1.22562	38
PM1	3.8421	.97333	38
PM2	3.7895	1.01763	38
PM3	3.9211	1.04962	38
PM4	3.9211	.85049	38
PM5	3.6053	1.26362	38
PM6	3.7895	1.14273	38

PM7	4.1053	.86335	38
PM8	4.2105	.87481	38
PM9	4.2105	1.09441	38
PM10	3.8158	1.13555	38
PM11	3.8684	1.16645	38
PM12	3.2632	1.10733	38
PM13	2.6316	1.02459	38
PM14	2.9211	1.30242	38
PM15	3.0526	1.25089	38
PM16	3.4474	1.34962	38
PM17	4.0263	.99964	38
PM18	4.0263	.97223	38
GB1	3.8421	1.26334	38
MC2	4.0000	1.13899	38
MC3	3.8421	1.00071	38
MC4	3.9474	1.01202	38
MC5	3.9737	1.05233	38
MC6	3.8947	.95265	38
MC7	3.6842	1.25430	38
MC8	3.7368	1.17828	38
MC9	4.1842	.89610	38
MC10	4.2105	.96304	38

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
318.4211	1212.250	34.81739	87

Appendix E: Regression Statistics Output

REGRESSION OUTPUT

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.551 ^a	.304	.111	111.743

a. Predictors: (Constant), BF, BW, PM

b. Dependent Variable: MC

ANOVA^b

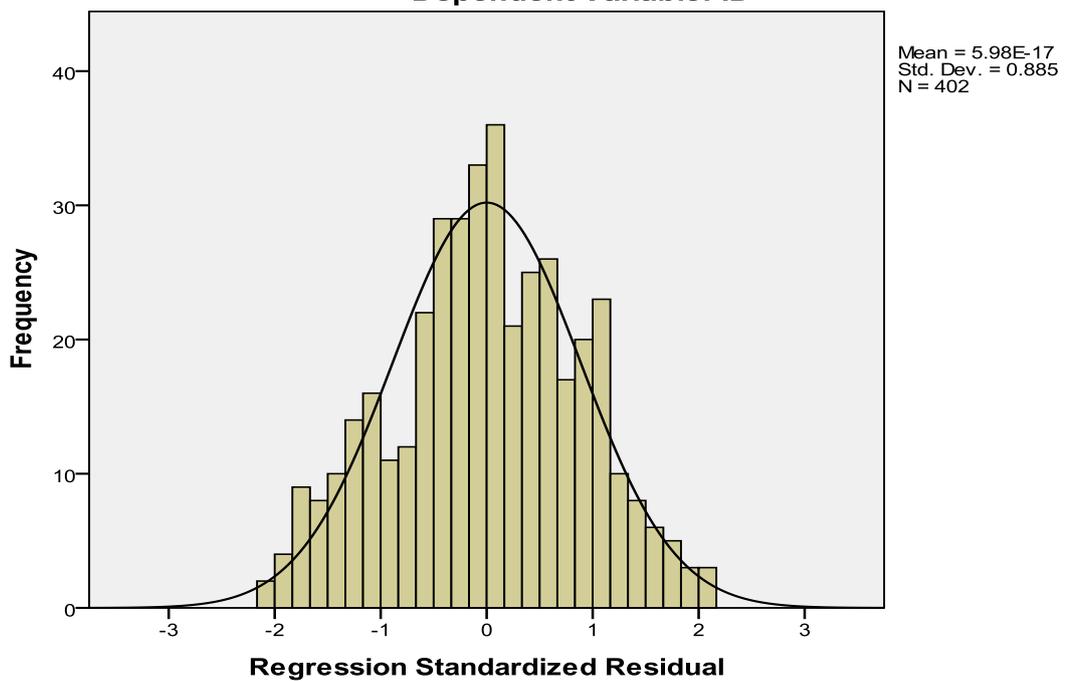
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1710139.530	87	19656.776	1.574	.003 ^a
	Residual	3920783.975	314	12486.573		
	Total	5630923.505	401			

a. Predictors: (Constant), BF, BW, PM

b. Dependent Variable: MC

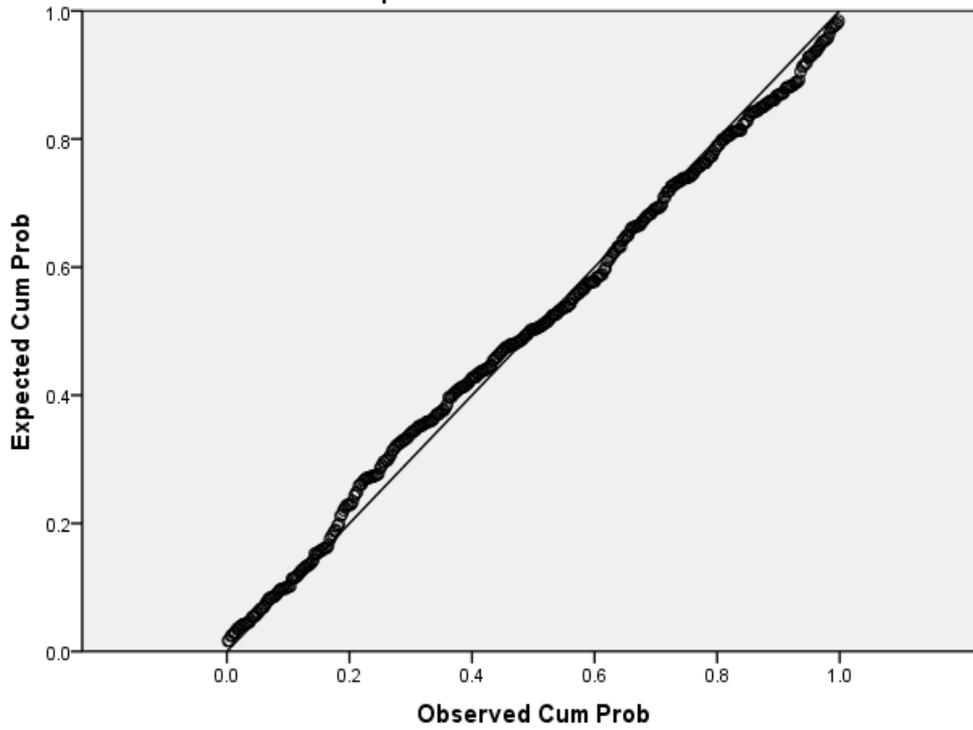
Histogram

Dependent Variable: ID



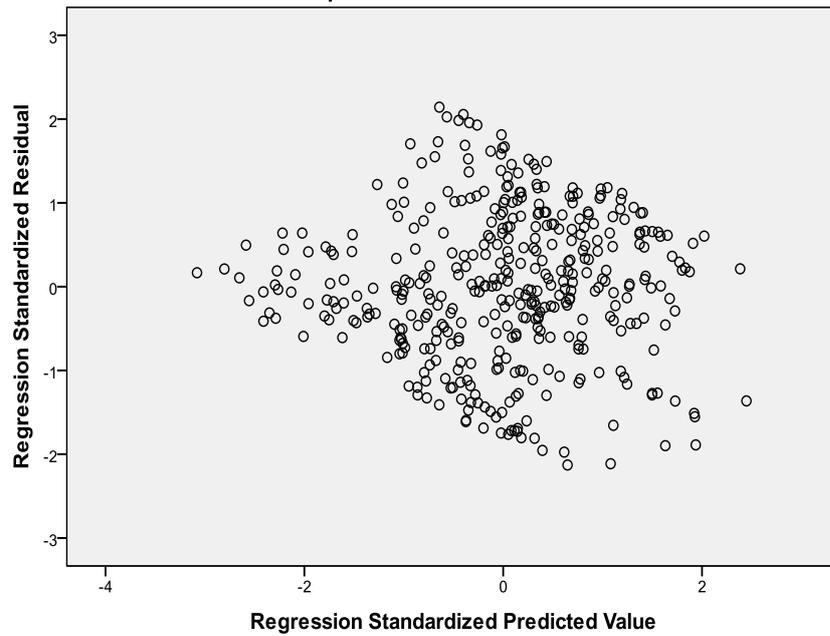
Normal P-P Plot of Regression Standardized Residual

Dependent Variable: ID



Scatterplot

Dependent Variable: ID



Variables Entered/Removed^b

ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	218.445	2	109.223	463.228	.000 ^a
Residual	94.079	399	.236		
Total	312.524	401			

a. Predictors: (Constant), PM, BW

b. Dependent Variable: BF

Model	Variables Entered	Variables Removed	Method
1	PM, BW ^a	.	Enter

a. All requested variables entered.

b. Dependent Variable: BF

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.836 ^a	.699	.697	.4855778

a. Predictors: (Constant), PM, BW

Coefficients^a

Model	Unstandardized		Standardized		Collinearity		
	Coefficients		Coefficients		Statistics		
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	.425	.121	3.507	.001			
BW	.246	.035	.236	7.035	.000	.671	1.490
PM	.650	.032	.678	20.223	.000	.671	1.490

a. Dependent Variable: BF

Collinearity Diagnostics^a

Model	Dimension	Variance Proportions				
		Eigenvalue	Condition Index	(Constant)	BW	PM
		2.950	1.000	.00	.00	.00
		.030	9.935	.68	.00	.65
		.020	12.106	.31	1.00	.35

a. Dependent Variable: BF

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.818 ^a	.669	.667	.5312861

a. Predictors: (Constant), BF, BW

ANOVA^b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	227.249	2	113.624	402.545	.000 ^a
	Residual	112.624	399	.282		
	Total	339.873	401			

a. Predictors: (Constant), BF, BW

b. Dependent Variable: PM

Collinearity Diagnostics^a

Model	Dimension	Variance Proportions				
		Eigenvalue	Condition Index	(Constant)	BW	BF
		2.955	1.000	.00	.00	.00
		.027	10.459	.92	.06	.36
		.018	12.903	.07	.94	.64

a. Dependent Variable: PM

Model Summary

Model	R		Adjusted R	Std. Error of the
	R	R Square	Square	Estimate
1	.635 ^a	.403	.400	.6566849

a. Predictors: (Constant), PM, BF

ANOVA^b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	116.164	2	58.082	134.688	.000 ^a
	Residual	172.063	399	.431		
	Total	288.227	401			

a. Predictors: (Constant), PM, BF

b. Dependent Variable: BW

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	1.555	.147		10.590	.000		
BF	.449	.064	.468	7.035	.000	.338	2.955
PM	.178	.061	.193	2.903	.004	.338	2.955

a. Dependent Variable: BW

Collinearity Diagnostics^a

Model	Dimension	Variance Proportions				
		Eigenvalue	Condition Index	(Constant)	BF	PM
		2.956	1.000	.01	.00	.00
		.034	9.310	.97	.06	.13
		.010	16.997	.03	.94	.87

a. Dependent Variable: BW

Appendix F: PLS Statistics Output

PLS STATISTICS OUTPUT

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (O/STERR)
BF -> MC	0.230484	0.230429	0.064472	0.064472	3.574950
BW -> MC	0.342678	0.343255	0.047253	0.047253	7.251992
PM -> MC	0.278935	0.282374	0.060937	0.060937	4.577425

Items	BF	BW	MC	PM
BF1	0.428	0.312	0.303	0.415
BF10	0.601	0.485	0.409	0.512
BF11	0.641	0.525	0.490	0.545
BF12	0.623	0.517	0.458	0.527
BF13	0.630	0.563	0.573	0.620
BF14	0.665	0.535	0.549	0.604
BF15	0.522	0.440	0.442	0.472
BF16	0.632	0.514	0.495	0.546
BF17	0.492	0.442	0.413	0.440
BF18	0.518	0.501	0.437	0.445
BF19	0.608	0.485	0.503	0.536
BF2	0.595	0.539	0.515	0.482
BF20	0.597	0.452	0.478	0.464
BF21	0.578	0.561	0.471	0.477
BF3	0.665	0.580	0.547	0.561
BF4	0.545	0.512	0.516	0.481
BF5	0.522	0.490	0.500	0.506
BF6	0.478	0.450	0.467	0.486
BF7	0.562	0.515	0.488	0.456
BF8	0.610	0.461	0.440	0.535
BF9	0.476	0.462	0.372	0.432
BW1	0.500	0.621	0.550	0.447
BW10	0.365	0.400	0.365	0.396
BW11	0.368	0.442	0.384	0.377

BW12	0.478	0.488	0.445	0.466
BW13	0.223	0.348	0.298	0.256
BW14	0.403	0.417	0.366	0.426
BW15	0.283	0.360	0.314	0.305
BW16	0.497	0.493	0.455	0.496
BW17	0.498	0.579	0.446	0.496
BW18	0.276	0.341	0.243	0.290
BW19	0.379	0.421	0.330	0.359
BW2	0.533	0.640	0.559	0.481
BW20	0.417	0.408	0.364	0.423
BW21	0.402	0.501	0.363	0.367
BW22	0.390	0.522	0.413	0.335
BW23	0.541	0.571	0.496	0.515
BW24	0.531	0.623	0.526	0.500
BW25	0.483	0.614	0.513	0.463
BW26	0.489	0.599	0.486	0.459
BW27	0.523	0.612	0.486	0.455
BW28	0.504	0.605	0.523	0.492
BW29	0.530	0.602	0.550	0.481
BW3	0.489	0.569	0.518	0.443
BW30	0.449	0.470	0.407	0.460
BW31	0.466	0.509	0.429	0.456
BW32	0.497	0.500	0.474	0.496
BW33	0.558	0.616	0.551	0.519
BW34	0.482	0.636	0.526	0.473
BW35	0.315	0.471	0.386	0.351
BW36	0.455	0.496	0.449	0.446
BW37	0.433	0.416	0.367	0.479
BW38	0.492	0.555	0.504	0.475
BW4	0.512	0.608	0.526	0.483
BW5	0.433	0.554	0.482	0.432
BW6	0.558	0.614	0.543	0.503
BW7	0.541	0.623	0.500	0.495
BW8	0.519	0.647	0.576	0.501
BW9	0.474	0.500	0.403	0.425
MC1	0.404	0.481	0.573	0.436
MC10	0.533	0.538	0.565	0.456
MC2	0.406	0.493	0.576	0.425
MC3	0.391	0.372	0.455	0.441
MC4	0.413	0.458	0.532	0.395

MC5	0.513	0.503	0.629	0.489
MC6	0.549	0.556	0.630	0.531
MC7	0.479	0.538	0.639	0.453
MC8	0.623	0.545	0.626	0.627
MC9	0.530	0.565	0.662	0.514
PM1	0.381	0.398	0.396	0.447
PM10	0.561	0.498	0.472	0.658
PM11	0.381	0.431	0.392	0.482
PM12	0.536	0.428	0.424	0.597
PM13	0.332	0.427	0.383	0.432
PM14	0.514	0.442	0.498	0.598
PM15	0.340	0.428	0.394	0.435
PM16	0.674	0.620	0.637	0.739
PM17	0.630	0.574	0.542	0.705
PM18	0.477	0.481	0.464	0.561
PM2	0.642	0.516	0.517	0.690
PM3	0.512	0.566	0.499	0.560
PM4	0.261	0.222	0.204	0.289
PM5	0.331	0.375	0.332	0.423
PM6	0.601	0.514	0.509	0.647
PM7	0.593	0.493	0.525	0.648
PM8	0.460	0.473	0.475	0.553
PM9	0.536	0.471	0.465	0.562

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (O/STERR)
BF11 <- BF	0.209501	0.209418	0.019963	0.019963	10.494306
BF12 <- BF	0.216755	0.216435	0.019889	0.019889	10.897976
BF13 <- BF	0.242735	0.242604	0.016757	0.016757	14.485380
BF14 <- BF	0.261637	0.261481	0.016581	0.016581	15.779035
BF16 <- BF	0.225778	0.224906	0.018194	0.018194	12.409151
BF19 <- BF	0.247084	0.247327	0.018222	0.018222	13.559515
BW1 <- BW	0.232924	0.232443	0.018724	0.018724	12.439579

BW2 <- BW	0.233217	0.232770	0.017474	0.017474	13.346620
BW28 <- BW	0.221846	0.221919	0.020889	0.020889	10.619978
BW29 <- BW	0.237536	0.237096	0.019330	0.019330	12.288217
BW4 <- BW	0.243292	0.243628	0.019023	0.019023	12.789165
BW6 <- BW	0.229946	0.230530	0.016605	0.016605	13.847652
MC5 <- MC	0.351282	0.350415	0.021191	0.021191	16.576990
MC7 <- MC	0.306357	0.306997	0.021459	0.021459	14.276353
MC8 <- MC	0.376634	0.375596	0.023921	0.023921	15.745195
MC9 <- MC	0.355121	0.355854	0.018705	0.018705	18.985052
PM10 <- PM	0.140200	0.140244	0.012306	0.012306	11.393032
PM12 <- PM	0.124588	0.124311	0.013295	0.013295	9.370744
PM14 <- PM	0.163614	0.163156	0.013363	0.013363	12.244149
PM16 <- PM	0.185975	0.186183	0.011727	0.011727	15.858397
PM17 <- PM	0.159008	0.159146	0.010972	0.010972	14.492062
PM2 <- PM	0.156099	0.155909	0.011859	0.011859	13.163440
PM6 <- PM	0.160856	0.160893	0.013693	0.013693	11.746979
PM7 <- PM	0.171971	0.171539	0.013724	0.013724	12.531084
PM9 <- PM	0.146443	0.145872	0.013141	0.013141	11.144237

APPENDIX G: Nvivo Models and Pictures during Observation

