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Effects of participation and sense of community on change agents in an Indonesian sanitation behaviour change communications program

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<i>Ing ngarso sung tulodo</i>	Setting an example from in front
<i>Ing madyo mangun karso</i>	Inspiring from being among the people
<i>Tut wuri handayani</i>	Acting as a guide from behind

Ki Hadjar Dewantara

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Nicholas J. Goodwin
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GLOSSARY

Abate	Brand of mosquito larvicide used to treat water
ADD	Village Allocation Fund (<i>Alokasi Dana Desa</i>)
Air Rahmat	Sacred Water (brand of chlorine-based water purifier)
AMPL	Drinking Water and Environmental Improvement (<i>Air Minum dan Penyehatan Lingkungan</i>)
APBD	Regional government budget (<i>Anggaran Pendapatan dan Belanja Daerah</i>)
APBN	National government budget (<i>Anggaran Pendapatan dan Belanja Negara</i>)
APPSANI	Indonesian Sanitation Developer and Empowerment Association (<i>Asosiasi Pengelola dan Pemberdayaan Sanitasi Indonesia</i>)
<i>arisan</i>	Social microfinance gathering (usually of women)
BAPPENAS	National Development Planning Agency (<i>Badan Perencanaan Pembangunan Nasional</i>)
BKM	Community Self-Reliance Agency (<i>Badan Keswadayaan Masyarakat</i>)
CB(T)S	Community Based (Total) Sanitation
CLTS	Community Led Total Sanitation
DFAT	Department of Foreign Affairs and Trade (Australia)
FGD	Focus Group Discussion
<i>foging</i>	Fogging (of mosquitoes)
ISSDP	Indonesia Sanitation Sector Development Program
<i>jumantik</i>	(Mosquito) Larvae Monitors (<i>Juru Pemantau Jentik</i>)
<i>kader</i>	Corps (of community volunteers)
<i>karang taruna</i>	Youth club
<i>kelurahan</i>	Urban village unit of local government (lowest level)
<i>Kepmenkes</i>	Ministerial Decree
<i>majelis ta'lim</i>	Koran reading groups
MCK/MCK+	Communal shower and toilets (<i>Mandi Cuci Kakus</i>)/MCK+ adds the primary treatment system
MDGs	Millennium Development Goals
Nazava	A brand of water filter
NTB	West Nusa Tenggara Province (<i>Nusa Tenggara Barat</i>)
NTT	East Nusa Tenggara Province (<i>Nusa Tenggara Timur</i>)
ODF	Open Defecation Free
PAMSIMAS	Community Based Water Supply and Sanitation Project (<i>Penyediaan Air Minum dan Sanitasi Berbasis Masyarakat</i>)
PDAM	Regional Drinking Water Enterprise (<i>Perusahaan Daerah Air Minum</i>)
PDK	(Primary School) Junior Doctor Training (<i>Pelatihan Dokter Kecil</i>)
<i>pengajian</i>	Recitation (of the Koran)
Permenkes	Regulation of the Ministry of Health (<i>Peraturan Menteri Kesehatan</i>)
<i>perwitan</i>	Local Islamic community service group
PJB	Periodic Larvae Survey (<i>Pemeriksaan Jentik Berkala</i>)
PHBS	Clean and Healthy Lifestyle (<i>Perilaku Hidup Bersih dan Sehat</i>)
PKK	(Women's) Empowerment of Family Welfare (<i>Pemberdayaan Kesejahteraan Keluarga</i>) organisation
<i>pokja</i>	working group (<i>kelompok kerja</i>) unit of the High Five program
POL	Popular Opinion Leader model
<i>posyandu</i>	Integrated Health Service Post (<i>Pos Pelayanan Terpadu</i>)
PPSP	Road Map for Acceleration of Urban Sanitation Development (<i>Percepatan Pembangunan Sanitasi Perkotaan</i>)
PSN	Mosquito Nest Eradication (<i>Pemberantasan Sarang Nyamuk</i>)

PUSH	Program of Urban Sanitation and Hygiene Promotion (Mercy Corps)
<i>puskesmas</i>	Community Health Centre (<i>Pusat Kesehatan Masyarakat</i>)
RT	Neighbourhood Association (<i>Rukun Tetangga</i>)
RW	Community Association (<i>Rukun Warga</i>)
SCI	Sense of Community Index
SOC	Sense of Community
SSK	City Sanitation Strategy (<i>Strategi Sanitasi Kota</i>)
STBM	Community Based Total Sanitation (<i>Sanitasi Total Berbasis Masyarakat</i>)
TTSM	Total Sanitation and Sanitation Marketing project (World Bank)
UKBM	Community Based Health Program (<i>Upaya Kesehatan Bersumberdaya Masyarakat</i>)
UKS	School Health Unit (<i>Unit Kesehatan Sekolah</i>)
USAID	United States Agency for International Development
WASPOLA	Water and Sanitation Sector Policy Formulation and Action Planning Project (World Bank)
WSLIC-2	Water and Sanitation for Low Income Communities project
YCCP	Cipta Cara Padu Foundation (the partner for this study)

CHAPTER 1. INTRODUCTION

Motivation for this study

Why do millions of children aged under five years continue to die needlessly each year when tools and funds are available to save them? This question serves as the motivation and starting point for this study of a community based sanitation project in Indonesia. Most child deaths occur in communities with a high incidence of poverty, where poor infrastructure, lack of services and under-resourced households are common. Nevertheless, evidence suggests that higher child mortality rates and other effects associated with poor sanitation can be reduced by about two-thirds with sustainable, low-cost solutions (Darmstadt & Munar, 2013). These solutions are based on a combination of individual behaviour change, community capacity building and limited outside support. This study examined aspects of participation and community in one intervention that sought to apply these solutions in three cities in Indonesia. It is hoped the new evidence produced by this analysis will contribute to more effective interventions in Indonesia and beyond.

Health and sanitation in Indonesia

During the 32-year regime of Indonesia's President Soeharto, public funding for health was low and limited services were tightly controlled by the central government. Following the downfall of Soeharto in 1998 there were sweeping political, economic and administrative reforms. This included fiscal decentralisation, which saw the delivery of public services increasingly become the responsibility of district governments. Public funding for health services more than doubled between 2001 and 2006; and it was widely hoped that health would improve as district governments benefitted from increased funding and autonomy (Heywood & Harahap, 2009). In 2015 Indonesia is progressing confidently although it faces persistent development challenges. The nation has emerged from the Asian Financial Crisis and the ensuing social and political turmoil of the late 1990s and early 2000s. Observers point to Indonesia's recent run of consistently high rates of economic growth, a stable political system and its involvement in international forums, such as the G20 group of nations, as signs of its progress.

Despite these gains, Indonesia faces significant problems, including health issues, which require government and international donor investment in order for the country to continue to lift as many as possible of its 245 million people out of poverty. This includes reducing infant mortality rates. In 2011 Indonesia ranked 71 in the world, with 32 children for every 1,000 born (135,000 in total) dying before their fifth birthday (UNICEF, 2012). Diarrhea is the second most common cause of death among children under the age of five – upper respiratory tract disease is first – and remains a major public health problem with the national prevalence at 11 per cent. It is also one of the two main causes of undernourished children across the country (YCCP, 2012).

Almost half of Indonesia's people live in urban areas and their need for safe wastewater management services are increasing rapidly. Most urban households and businesses in Indonesia use septic tanks to dispose of their wastewater, and the use of water-flush toilets is widespread. However, around 14 per cent of people in urban areas still practice open defecation. In 2010, the World Health Organization (WHO) reported access to improved sanitation was around 73 per cent, however this only measures against the basic criteria of access to a facility, as defined by the WHO, and not the safe collection and disposal of wastewater and sewerage, which is only 1 per cent and 4 per cent, respectively (Kearton, 2013). Poor sanitation has also had significant economic impacts in Indonesia. A study carried out by the World Bank's Water and Sanitation Program estimated that Indonesia lost IDR56 trillion (USD6.3 billion) in 2007 due to poor sanitation and hygiene. This is the equivalent of about 2.3 per cent of the country's Gross Domestic Product (WSP, 2008).

The difficulty with diarrhea

In the minds of Indonesia's citizens, the association between hygiene and sanitation behaviours with the incidence and prevention of diarrhea has been slow to develop. This is one reason for the limited practice of hand washing with soap and use of sanitary services (Rimbatmaja et al., 2007). People's safe water practices, including its treatment and storage, are also limited in Indonesia. Studies conducted in various areas found that more than 90 per cent of Indonesian households boil their drinking water. However, up to 65 per cent of

treated water was contaminated with bacteria such as *E. coli* (USAID, 2005; YCCP, 2011). Unsafe storage and poor water handling practices are suspected to be the causes of the recontamination of boiled water. For solid waste and wastewater management, limited infrastructure is one crucial barrier to the improvement of hygiene practices. As for the use of toilets, while common, more than 60 per cent of toilets in urban areas channelled faeces to poor sanitary facilities or to public spaces, including rivers, or even unsafe (leaking) septic tanks (YCCP, 2011).

In response to this, in 2010 the Government of Indonesia launched the STBM (Community-based Total Sanitation) strategy with an integrated approach to dealing with five key behaviours: 1) eliminating open defecation; 2) hand washing with soap; 3) household water treatment and storage; 4) solid waste management; and 5) waste water management. In keeping with the decentralised health system, the government also developed a City Sanitation Strategy (SSK) approach to water, sanitation and hygiene at the municipality level. International donors, including USAID, have provided support to these initiatives, including those delivered through local non-profit organisations. One of these projects will be the subject of this study.

Across many social and behaviour change issues, increasingly the evidence shows traditional, top-down solutions alone have limited success (Baum, 2007; Csutora, 2012). This has led to demand for context-appropriate, evidence-based strategies that can be implemented in credible and effective ways (Grace, Moore, & Northcote, 2009). As a contribution, this research project will examine the interaction between individual behaviours and community dynamics of a sanitation program in Indonesia. This will include the nature of the target communities as the context, as well as understanding the role of people deployed as change agents to help facilitate social and behaviour change.

Research approach

This study, in addition to the program that forms its primary focus, takes methodological inspiration from practitioners of research principles based on partnership, participation and

action. At its most fundamental, the interpretation of these principles as part of this PhD study is that its work, as well as those of the partner organisation, YCCP, should be grounded to the greatest extent possible in the needs and priorities of the communities with which the research is to be conducted. The chosen participatory research methods include active roles for community members in defining their own needs, setting priorities, and evaluating efforts of the community to make improvements. These methods are consistent with community participation, shared decision-making, and the facilitation of ownership of change strategies and the action plans to bring them to life. In this way, the study contributes to the notion that community-based participatory research is an integrative approach to intervention and evaluation (Glanz, Rimer, & Viswanath, 2008; Minkler & Wallerstein, 2010). Community based participatory research requires a balance of scientific rigour with ethical concerns in dynamic community environments (Glanz et al., 2008). Partnership research models are not strict nor pure, several variations form a continuum with different degrees of community and scientist participation and control (Wallerstein, 2006). At one end of the spectrum are those interventions that can be characterised as “community-placed”, i.e. with more scientist control and less community participation. At the other end of the spectrum are the community-driven and community-owned approaches. The methods and timing for their use reflects varied value-based and philosophical positions, as well as practical considerations, including the community’s needs and the available resources (Glanz et al., 2008).

The partner: Cipta Cara Padu Foundation (YCCP)

The Cipta Cara Padu Foundation (YCCP) was established as a foundation (*yayasan*) in 2008 in Jakarta, Indonesia. It was founded by some of Indonesia’s most experienced and skilled researchers and practitioners, following more than 15 years of work on donor-assisted programs in Indonesia on strategic communications and behaviour change programs implemented by the US-based Johns Hopkins Bloomberg School of Public Health Center for Communication Programs (JHU-CCP). YCCP’s vision is to improve Indonesians’ quality of life through strategic communications for social development, focusing on health communication and capacity-building for better clinical training (YCCP, 2015).

YCCP's team is experienced in strategic communications and behaviour change communication design and implementation, and the development of capacity in local institutions. YCCP has expertise in a wide range of health and environmental issues including water, sanitation and hygiene, HIV & AIDS, safe motherhood, child survival, family planning, reproductive health, infectious disease, and environmental conservation. YCCP fosters partnerships with government, private sector and state-owned companies in Indonesia to create greater opportunities to accelerate the achievement of national development program goals. To do this, YCCP implements pilot programs and works on replication and scaling up, to be funded by government agencies from national and local budgets, as well as funds from Indonesia's private sector and state-owned companies (YCCP, 2015). Current and recent projects that YCCP manages include the Advance Family Planning initiative, funded by the Gates Institute for Population and Reproductive Health; the Improving Contraceptive Method Mix (ICMM) project, funded by USAID and Australia's DFAT; and the High Five sanitation project, funded by USAID (YCCP, 2011).

YCCP's 'High Five' Project: improving sanitation in Indonesia

YCCP developed the High Five Kelurahan Project in 2010 with technical assistance from Johns Hopkins CCP and funding from USAID, the United States Government's overseas aid program. The goal of the High Five program was to improve hygiene and sanitation practices at the household and community levels, and at the same time to contribute to the achievement of the national community based total sanitation (STBM) strategy. Commencing in 2012, this project was expected to benefit 12,000 households or 48,000 people living in urban areas within three years. YCCP's High Five Project applied the STBM strategy as an approach toward community ownership of behaviour change in urban areas. To do this, High Five facilitated collaborative efforts with government at all levels, with working groups (*pokja*), private sector, academic institutions and NGOs taking part in developing, planning, implementing, monitoring and evaluating the program. For YCCP, the inclusion of the High Five strategic approach in government policy and action plans was necessary to ensure the successful and sustainable application of the STBM model. The High

Five program also partnered with the media and produced marketing and other communications materials to catalyse behaviour change.

To improve access to, and practice of, sanitation and hygiene at the community level, High Five emphasised the use of a participatory approach. This approach was designed to ensure greater ownership, and therefore success, of the program by the people targeted for the intervention. To that end, High Five facilitated a series of dialogues to provide the opportunity for communities in target areas to discuss and trigger self-learning and self-directed initiatives for improvement in water supply and sanitation as well as hygiene practices. Using the resources of the three types of partners (public, private and community), a package of technology options and materials was selected to fit the requirements of each community and each issue.

The High Five program operated in three cities with high diarrhea prevalence: Medan (North Sumatra), Surabaya (East Java) and Makassar (South Sulawesi). In these three provinces the diarrhea prevalence percentages are higher than the national average – 15.8 per cent in North Sumatra, 13.3 per cent in East Java and 11.7 per cent in South Sulawesi. Implementation focused on two *kelurahan* (urban villages) in each city. The criteria for selecting the *kelurahan* were diarrhea incidence, readiness for community dialogue and collective action, active and committed community-based networks (including *posyandu* health posts and the volunteers of the Family Welfare Movement – PKK), and active schools willing to participate (YCCP, 2012).

Medan (North Sumatra)

Medan, which is the capital of North Sumatra province, has one of three districts selected for the High Five intervention. According to YCCP (2011), Medan's population is around two million people, many of whom rely on the city's seven rivers for channelling wastewater and disposal of solid waste. In 2007, there were less than six individual water connections for every ten households. Others rely on well water, with a small number using open surface water sources such as untreated river water, which often leads to increased incidence of

infections. Like many other cities in Indonesia, illegal dumping of municipal solid waste is also a major issue in Medan, leading to poor environmental conditions and additional influx of contaminants into the river systems. According to a USAID survey referred to by YCCP (2011), 39.3 per cent of mothers practiced healthy hygiene behaviours, while the majority (60.7 per cent) was practicing some or few of the behaviours. Understanding that this small survey was conducted in a USAID intervention program area, the situation in the majority of Medan's 148 villages was likely to be at or below these levels (YCCP, 2012).

Surabaya (East Java)

Surabaya, the capital of East Java province, has the largest population among the three sites at more than 2.8 million people living in 163 villages. The number of households with a piped water connection is 278,382 or around 40 per cent. The rest, like in Medan, rely on well water and surface water sources that contain a variety of organic and non-organic contaminants. Deteriorating or poorly installed sanitation systems, such as septic tanks or toilet effluent pipes, often lead to leakage in areas that can expose human waste to groundwater, other drinking water sources or even edible crops. In other areas, human waste was often be channelled directly to gutters or river systems in and around the city. Municipal solid waste is also a serious issue for the city where the daily volume was estimated to be around 8,700 cubic metres, despite Surabaya's management capacity of 6,700 cubic metres, which leaves some 2,000 cubic metres (25 per cent) of waste unattended. While some portion of this waste is reused or recycled, the remaining uncollected waste tends to comprise mostly organic content that can lead to contamination of water sources. With regards to hygiene and sanitation behaviours, approximately 57 per cent of households in three villages from a previous USAID-program practice proper behaviours, and it can be presumed that the remaining 160 *kelurahan* in Surabaya would have similar or lower levels (YCCP, 2012).

Makassar (South Sulawesi)

Makassar, the capital of South Sulawesi province and home to more than 1.2 million people living in 163 villages, also struggles with hygiene problems. Household water connection coverage is estimated to be at 40 per cent, 50 per cent of which contain some level of leakage. While the leakage from wastewater distribution systems presents an obvious hygiene risk to human and environmental health, weak connections in drinking water systems are no less concerning due to the risk of organic or inorganic pollution being vacuumed into the distribution lines during electricity outages. Similarly, leaking drinking water systems can diminish chlorine levels (leftover from water treatment plants) due to the influx of soil particulates, which also alters the taste and clarity of household drinking water. As was the case in the other two cities, many households in Makassar rely on well water with a smaller number of them depending on groundwater. Since leaking septic tanks are common and there is generally no primary waste treatment of toilet effluent, groundwater is at risk of further contamination, which poses a threat to those drinking directly from this supply. In terms of hygiene and sanitation behaviours, including proper practices of hand washing, safe water storage, water treatment and waste disposal, are still low among mothers with children under the age of five years (YCCP, 2012).

YCCP officially launched the three-year High Five Program in Jakarta on 26th September 2011 and commenced activities in six *kelurahan*, two in each of the three cities of Medan, Makassar and Surabaya. The six *kelurahan* cover a total population of 154,189 people (including 21,059 children aged under five years) living in 30,696 households. The two Surabaya *kelurahan* are Petemon and Wonorejo. Petemon has a population of 41,435 people living in 6,255 households. Wonorejo has a population of 25,132 people living in 7,979 households. The two Makassar *kelurahan* are Lembo and Tallo. Lembo has a population of 12,209 people living in 2,077 households; Tallo has a similar population size. The two Medan *kelurahan* are Tegal Sari Mandala III (TSM3) and Kota Bangun. TSM3 has a population of 47,888 people living in 9,525 households. Kota Bangun has a population of 15,316 people living in 2,860 households (YCCP, 2012).

Participatory approach to community based sanitation

An important aspect of YCCP's approach to community based sanitation is the use of participatory methods, combining general theories of positive deviance, appreciative inquiry and problem-focused methods, which were applied by the local High Five teams based on their analysis of the needs and characteristics of the community in relation to the priority sanitation issues. YCCP's participatory approach encourages communities to rank locally identified sanitation issues in order of importance, meaning that the starting point for implementation will vary from city to city, based on the sanitation issue the community decides should be addressed first.

Following this decision by each of the communities, High Five teams in the three cities initiated the intervention in the community. After introduction of the program at *kelurahan* and RW level, High Five teams implemented a four-step participatory assessment (social mapping, transect walk, F-diagram¹ discussion and community dialogue) assisting the community to analyse their situation and sanitation practices. Maps produced from the social mapping were reviewed and revised after the transect walk and then discussed in F-diagram sessions. High Five facilitated community dialogues to develop action plans based on the participatory assessment results, carried out with community members and leaders representing all RWs in each *kelurahan*. Based on previous experience, common initial activities across the three cities included: neighbourhood-cleaning actions, community working group (*pokja*) formation and facilitation skills training. High Five emphasised the use of participatory approaches in working with partner communities on the implementation of the plans. This approach focused on creating space for community members to determine problems, facilitate capacity building and support to plan and act. High Five expects active participation from various groups in each of the intervention communities, regardless of their gender, age or other characteristics (PollingCentre, 2014; YCCP, 2014).

¹ The F-Diagram is a tool that helps professionals vividly describe in detail the faecal oral transmission route.

Study objectives and structure

This aim of this study is to produce a body of evidence to support an innovative approach to social and behaviour change interventions that will advance knowledge as well as provide useful tools to help in the design and implementation of more effective interventions. The author's experience managing the 'Fantastic Mom' handwashing with soap project in Indonesia and engagement in work across the Asia Pacific region on issues including HIV/AIDS and Avian Influenza, gave rise to questions on the role of the community in influencing individual behaviour change (Goodwin, 2010). These questions included: how do governments, researchers, community based organisations and target populations define the communities they aim to serve? How can these programs identify and utilise change agents, such as community health workers, peer educators, religious leaders, celebrities and counsellors, to communicate information and mobilise communities? Do change agents feel differently about different communities and different programs? Does their sense of community affect the success of interventions, including social and behaviour change programs? Does their previous participation determine how different change agents will perform in future projects? And which tools are useful for increasing our understanding of these dynamics in order to improve the effectiveness of interventions?

To contribute to the evidence base on these issues, this thesis will identify, examine and test the role of change agents – a common element in many social and behaviour change programs. The overall research question for this study, therefore, is: "What are the relationships between change agents' participation and their sense of community with the individual behaviour change and community health impact of the High Five community based sanitation program in Indonesia?" Following this introductory chapter, the following Chapter 2 will review the evidence relating to behaviour change, with a particular focus on the intersection of diffusion theory, change agents and community capacity building. It will also outline the hypotheses to be tested in this study. Chapter 3 will examine in greater depth the issues surrounding the implementation of Indonesia's STBM approach to sanitation, based on the widely acclaimed Community-Led Total Sanitation methodology. Following this, Chapter 4 will describe the methodology for testing the above hypotheses in

a quasi field experiment conducted in partnership with YCCP's High Five program. The subsequent chapters (5) and (6) will respectively report on the results and discuss these in depth. Finally, Chapter 7 will draw conclusions on the findings from the study, produce recommendations for future research and describe the applications for future social and behaviour change interventions.

CHAPTER 2. LITERATURE REVIEW

The challenge of human behaviour change

The literature on human behaviour change has been described as “enormous” and “bordering on the unmanageable” (Maio et al., 2007). Yet this variety and depth of research into the drivers of, and barriers to, human behaviour change also provides a rich source of ideas, methods and tools drawn from diverse disciplines, including psychology, sociology, anthropology and economics. Historically, many interventions and studies have focused on the triggers, influences and explanations for individual human behaviour, many based on theories from psychology using rational cognitive models. Scientists are now beginning to understand the primacy of non-cognitive, affective influences on human behaviour (Kahneman, 2011). Others have emphasised the role of macro influences and determinants in seeking to explain why humans do what they do. More recently there has also been a move toward multi-level (or ecological) models based on evidence from interventions dealing with issues such as HIV/AIDS, sanitation, smoking, reproductive health and water.

A 2010 meta-analysis of mediated health campaigns in the United States found small measurable effects on behaviour change (Snyder et al., 2004). A systematic review conducted by Grilli and colleagues in 2002 found there is evidence that mass media interventions may have an important role in influencing the use of health care services (Grilli, Ramsay, & Minozzi, 2002). Some research has found that behaviour change is difficult to achieve and that there is little evidence to support the effectiveness of behavioural approaches (Cave, 1999). However the same work acknowledges that poor results often stem from a failure in conception, execution, or measurement. A 2014 review of evidence for sanitation social marketing programs by W. D. Evans et al. (2014) found that evaluations show consistent improvements in behavioural mediators but mixed results in behaviour change. In 2014 Population Services International published a systematic review of social marketing for HIV, reproductive health, malaria, child survival, and tuberculosis in developing countries (Modi & Firestone, 2014). The results of the review included 18 studies on HIV/AIDS programs with up to 100 per cent increase in HIV condom use; 49 per cent reduction in needle sharing; and increases in HIV testing. They found 13 studies on

reproductive health with up to 55 per cent increase in modern contraceptive use; and improvements in service utilisation and quality of care. PSI also found 21 studies on malaria programs, with 15-40 per cent increases for infant use of bed nets. The evidence base for the effectiveness of behaviour change approaches is growing and will likely be even stronger as intervention and evaluation designs are improved.

The research problem and interdisciplinary context

Frustration with traditional approaches to social and behaviour change, including poor targeting and limited success, has driven change leaders – governments, researchers, non-profits, multilateral agencies and the private sector – to turn to new approaches (Duhaime, McTavish, & Ross, 1985). Some suggest that public policy interventions have been significantly limited by the ways in which “the problem”, such as sanitation or alcohol harm, has been conceptualised and addressed (Moore & Rhodes, 2004). Many strategies and models see “target populations” and their behaviours largely as homogeneous and rational objects of research and intervention. This limited perspective means that public interventions often do not engage with the dynamics that the target or participant populations themselves experience, including the interactions of the actors within the various communities. These dynamics – and their actors – influence behaviours and affect the success of the public programs (Measham & Brain, 2005).

Some of these social and behavioural issues have been transformed into national public concerns, such as HIV/AIDS in sub-Saharan Africa, alcohol harm in Australia, and sanitation in Indonesia. The traditional response implemented by governments and other change leaders has been to deploy top-down approaches, often through legislation. This approach to public policy and social change reflects what Foucault described as “governmentality”, where power is de-centred and citizens are expected to play an active role in their own self-government. According to Foucault, the concept of power embraces not only the hierarchical, top-down power of the state, it includes forms of social control in institutions, e.g. schools, hospitals, etc., as well as forms of knowledge (Foucault, Burchell, Gordon, & Miller, 1991). Power produces knowledge and certain discourses that are internalised by

individuals and guide the behaviour of populations. In turn, this produces more efficient forms of social control, as knowledge enables individuals to govern themselves. “The strategy of rendering individual subjects “responsible” entails shifting the responsibility for social risks such as illness, unemployment, poverty, etc., and for life in society into the domain for which the individual is responsible and transforming it into a problem of self-care” (Lemke, 2001, p. 201). However, legislation, policy and other top-down structural approaches are no longer sufficient on their own to produce the impact and sustainability of change needed and hoped for by those investing in public services (Baum, 2007; Csutora, 2012). This has led to demand for context-appropriate, evidence-based strategies that can be implemented in credible and effective ways (Grace et al., 2009). These innovative approaches to social and behaviour change will advance knowledge and understanding to improve the design of more effective interventions.

A common thread in discussions around how to achieve greater effectiveness has been the importance of better understanding the interaction between individual behaviour and the environment, as well as collective or community dynamics. Therefore, this chapter will first examine human behaviour change as the overall frame for the research. It will compare and contrast the major behaviour change theories and models that form the foundation for many public policy interventions, drawing on examples from a variety of sectors and issues from different parts of the world. This will include an examination of the individual, interpersonal and collective theories of human behaviour change. The chapter will then examine multilevel approaches that seek to take into account all of these different influences on behaviour change. This will show that common to individual, interpersonal and collective theories is the presence of change agents (opinion leaders, peer educators, sales agents, community health workers etc.) who help facilitate adoption of new behaviours and supportive social norms. This project will examine this role of change agents using a quasi-experimental approach so the next part of the chapter will examine the various intervention models as the frameworks for effecting social and behaviour change in communities. And finally this chapter will make the case for the use of two conceptions – one is the community psychology concept of a “sense of community” (SOC); the other is participation – as the foundations for the study’s methodology to better understand the

role of change agents in social and behaviour change interventions. The chapter will conclude with the hypotheses to be tested for this study.

The science of human behaviour change

Studies in human behaviour change comprise a transtheoretical field of research and practice that draw on many aspects of what can be referred to as the behavioural sciences. Its models and approaches utilise numerous theories from across the social sciences, including psychology, sociology, anthropology and economics. The evolution of behaviour change theories and models has seen a move away from a major focus on either individual or collective concepts toward broader, multi-level social and behaviour change approaches. The limited impact of many of the largest individual health behaviour interventions, based on theories drawing on intrapersonal and interpersonal determinants, demonstrated that a focus on the individual would be insufficient to achieve the desired public policy outcomes. These shortcomings led to a significant shift in our understanding of who and what the targets of this type of intervention needed to be – not just individuals, but the wider settings and frameworks in which they live and work. This change fuelled the rise of multilevel or ecological models of social and behaviour change that have guided the development of powerful interventions to deal with public health and other public policy issues, such as smoking cessation (Glanz et al., 2008). These interventions have also opened up new questions around where, when and how to target programs that seek to take into account the interrelated dynamics of social and behaviour change.

Information and awareness campaigns

Most programs aiming to facilitate behaviour change are information intensive and focused on raising awareness. In these campaigns, media advertising and the distribution of printed materials are used to promote behaviour change. Information-intensive campaigns are usually based on one of two perspectives on behaviour change. With the first, program planners assume that by enhancing awareness or knowledge of an issue, such as global warming, and encouraging the development of attitudes that are supportive of an activity,

such as using public transport, behaviour will change. Unfortunately, as McKenzie-Mohr (2000) demonstrates, a variety of studies have established that improving knowledge and raising awareness often has little or no impact upon behaviour. The examples he cites include:

- Householders who were interested in enhancing the energy efficiency of their homes participated in a comprehensive workshop on residential energy conservation. Despite significant changes in knowledge and attitudes, behaviour did not change (Geller, 1981).
- Householders who volunteered to participate in a 10-week study of water conservation received a booklet that described the relationship between water use and energy use, and methods were described that could conserve water. Even though great attention was given to preparing the booklet, it had no impact upon water consumption (Geller, Erickson, & Buttram, 1983).
- Two surveys of Swiss respondents found that environmental attitudes and knowledge were poorly associated with environmental behaviour (Finger, 1994).
- When 500 people were interviewed regarding their personal responsibility for picking up litter, 94 per cent acknowledged responsibility. When leaving the interview, however, only 2 per cent picked up litter that had been “planted” by the researcher (Bickman, 1972).

Economics: rational choice and utility

Classical economic theory represents a starting point for modelling many aspects of human behaviour, using the concepts of “rational choice” and “utility”. Rational choice theory assumes decisions are based on a calculation of the expected costs and benefits. Utility can be referred to as levels of personal satisfaction, happiness or benefit. It can also include the welfare of others as part of one’s own utility. Another assumption is that information acquisition is a cost and that individuals will acquire information optimally, as they do with any decision. Although the rational choice model is useful in certain circumstances, other

theories have emerged in order to account for decisions and behaviours that rational choice fails to predict (Darnton, 2008).

In an attempt to systematically explain deviations from rational choice, bridges have been built between economic theory and psychology, creating an interdisciplinary subgroup called “behavioural economics”. Behavioural economics provides numerous examples of instances where the principle of rationality appears “violated” as a result of innate but subconscious cognitive biases and heuristics in judgement and decision-making. Heuristics are mental shortcuts that humans use to reach decisions, but which also lead to systematic errors, or biases, in judgement and decision-making (Kahneman, 2011). Heuristics can thus be used to explain the idiosyncrasies in our apparently rational decision making for which “rational theory” cannot account. These approaches have been made popular by the books, *Thinking Fast and Slow* (Kahneman, 2011), *Predictably Irrational* (Ariely & Jones, 2008) and *Nudge* (Thaler & Sunstein, 2008), and mainstreamed into public policy by “behavioural insights” teams in governments and other agencies globally (Goodwin et al., 2014).

Values, attitudes and beliefs

Social-psychological models build on rational theory and utility by mapping the relationships between a range of determinants that influence behaviour. In Expectancy Value (EV) Theory – rational choice approached from the discipline of psychology – a person balances their beliefs about a behaviour with the value they attach to its attributes. The focus on attitude-formation and deliberation is a common factor in many social-psychological models. Historically, many interventions across a wide variety of sectors have been based on rational cognitive models of behaviour. Understanding the primacy of non-cognitive, affective influences on human behaviour is increasingly taking the attention of researchers and practitioners. With this the limitations of traditional rational models are being revealed. Accordingly, theories of behaviour that have dominated psychological and economic research to date are now being updated to account for these influences (Kahneman, 2011; Loewenstein, Weber, Hsee, & Welch, 2001).

From a 2008 review of theory use in published health research between 2000 and 2005, there emerged ten theories or models most often used (Painter, Borba, Hynes, Mays, & Glanz, 2008). From the 104 studies reviewed, the top three were Social Cognitive Theory (SCT), Transtheoretical Model (TTM)/Stages of Change and Health Belief Model (HBM). The remainder of the top theories and models were social support and social networks, patient-provider communication, the Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB), stress and coping, community organisation, ecological models (including social ecology), social marketing and diffusion of innovation (Glanz et al., 2008). To understand why these have been popular and how they have been used, we should examine the nature of individual behaviour focused theories.

Individual behaviour change

Individuals are essential units of behaviour theory, research and practice that have been documented in numerous studies and explained in many textbooks (Glanz et al., 2008). Of course the individual is not the only element of an intervention, nor is it necessarily the most important. However all other elements, whether they are groups, organisations, communities or even nations, are comprised of individuals. A wide range of research, programs and policy is now focused on understanding and changing the behaviours of individuals. One of the earliest and most comprehensive theories of human behaviour was Lewin's field theory (Lewin, 1935) and most modern theories of behaviour change can be traced back to Lewin. These include methods and theories that account for barriers and enablers to change and those that describe and track stages and stepwise processes. During the 1940s and 1950s, scientists learned more about what determines individual behaviours and how people make choices about resources and decisions for their lives. In the 1950s, Rosenstock, Hochbaum, and others, through their assignments at the U.S. Public Health Service, began their pioneering work to understand why people did or did not choose to participate in screening programs for tuberculosis (I. M. Rosenstock, 1974). This and related work led to the approach we know today as the Health Belief Model (HBM). More recently, significant advancement has been made in understanding the determinants of people's behaviours and ways to motivate change in their lives. Value expectancy theories, which

include both the HBM and the Theory of Reasoned Action (TRA) and its close companion, the Theory of Planned Behavior (TPB), developed during this time (Glanz et al., 2008). This review will examine these theories more closely as a way to understand the foundations for this study, which draw on a number of leading behaviour change models that use or acknowledge the role of change agents. Much of this section draws on Glanz et al. (2008) as a comprehensive reference source for health behaviour change models and research.

Stages of Change - Transtheoretical Model

The Transtheoretical Model (TTM) was developed to bring together concepts and processes of change taken from various leading theories of psychology and behaviour. The core unit of the model is the stage of change, which was identified during research on smokers trying to quit without medical assistance. The stage aspect defines behaviour change as a process that evolves over time and involves advancement through a series of steps: pre-contemplation, contemplation, action, maintenance, and termination. Traditional action theory regarded behaviour change as more of an event, with the previous example it was smokers suddenly stopping smoking and immediately becoming non-smokers. Medical decisions that are more like procedures, such as giving a patient an influenza vaccination, require little behaviour change by the patients. TTM research focuses more on medical decisions that initiate a behaviour change process, such as prescribing a drug for lowering cholesterol that requires patients to learn the behaviour of daily adherence. The TTM is particularly useful for application with people in the early stages of change who have previously been labelled noncompliant, unmotivated, resistant, or not ready for change. To better understand the success and failures of health decisions, such as the Indonesian sanitation program to be examined in this study, it is useful to review the proposed stages of change through which people proceed, taken from Prochaska (2008):

Pre-contemplation: during this stage a person does not intend to take action in the immediate future, often measured as the next six months. The person may be at this stage because s/he is unaware or under-informed about the consequences of a particular behaviour. S/he may have attempted to change a number of times before and become

discouraged about their ability to do so. People in both groups tend to avoid learning about, discussing, or thinking about their high-risk behaviours. In other models, these people are often described as being noncompliant, resistant, unmotivated, or not ready for change. Traditional medical interventions were not prepared for these people and were not interested in matching their needs. For example, recommending condoms to young people in pre-contemplation is likely to fail, as they may not yet feel that they need them.

Contemplation: during this stage people intend to take action in the immediate future, often measured as the next six months. This stage features considerable inconsistency, an example is the on-and-off-again relationship that addicts can have with their substance. The heuristic can be captured as “when in doubt, don’t act.” As an example, without professional intervention, less than 50 per cent of smokers who contemplate quitting in the next six months will quit for 24 hours in the next 12 months.

Preparation: during this stage an individual intends to take action in the immediate future, most commonly measured as the coming month. This person often has taken some significant action during the previous year. S/he might have a plan of action, such as participating in a support group, seeing a counsellor, talking to a doctor, buying a self-help book, or relying on a self-change approach. These individuals are often selected for participation in action-oriented programs, such as buying a new toilet in the Indonesian sanitation program to be examined in this study.

Action: during this stage the person has made particular, evident changes to his or her behaviour within the previous six months. Behaviour change has often been likened to action because it is observable. But with the TTM approach, action is only one of six stages and not all adjustments to behaviour count as action. A person must reach a threshold that professionals agree is sufficient to reduce the risk of disease. With sanitation, for example, handwashing must include soap. With alcohol misuse, many scientists and medical professionals assert that only total abstinence will be effective, whereas others accept limited drinking as an effective action.

Maintenance: during this stage a person works to prevent a return to the old, risky behaviour but does not need to engage in change processes as intensely as someone currently in the action stage would need to do. This person is considered less tempted to relapse and demonstrates increasing confidence that s/he can sustain the changes made. Based on various studies, it is estimated that the maintenance stage lasts between six months to around five years.

Termination: during this stage a person experiences no temptation and enjoys 100 per cent self-efficacy. They are confident of both their ability and motivation to continue with their healthy behaviour and not to revert to the old unhealthy alternatives. In its ideal state, these people's healthy behaviours have become automatic, such as always taking their medication at the same time and same place. This can be compared to daily, automatic habits such as brushing one's teeth. Although the ideal is said to be a "cure" or total recovery, it is important to recognise that, for some people, a more realistic expectation might be a lifetime of maintenance.

The stages of change are dynamic variables that are both constant and changeable, just as certain health behaviours, such as handwashing with soap, are both stable and changeable. We consider the earlier stages, such as pre-contemplation and contemplation, and the later stages, such as maintenance and termination, to be the most stable. The middle stages of preparation and action are regarded as the most changeable, in which people are most likely to progress or regress, depending in large part on the help and support they receive. Decision-making ability is regarded as an important determinant of how people can progress through the stages of change, influenced by the psychological and social influences around them (Prochaska, 2008). Also important is understanding the processes developed for use in interventions designed to move people through these stages.

Processes of Change

To help people progress through the stages described above, practitioners use a series of activities known as processes of change. These processes of change provide important

guides for interventions, such as this study's sanitation program in Indonesia, as processes are the treatment that people need to apply to move target populations from one stage to another. Glanz et al. (2008) describe ten processes which have received the most support in terms of available evidence, these are summarised below:

1. *Awareness raising*: this involves increased knowledge and understanding of the causes, consequences, and solutions for a particular problem behaviour. Programs that are considered to lead to increased awareness include feedback, confrontations, interpretations and media campaigns.

2. *Dramatic relief*: these activities produce increased emotional experiences of a program, followed by reduced affect or anticipated relief if appropriate action is taken. Activities such as role-playing, testimonies, personal risk feedback, and media campaigns are examples of techniques that can move people emotionally.

3. *Self re-evaluation*: this combines both cognitive and affective assessments of a person's self-image with and without a particular behaviour, such as one's image as an open defecator and then as a person who uses a toilet. Values clarification, healthy role models, and imagery are techniques that can motivate people to move towards evaluation of their behaviours.

4. *Environmental re-evaluation*: this combines both an individual's affective and cognitive assessments of how the presence or absence of a personal behaviour affects their social environment, such as the impact of open defecation on others. It can also include awareness that a person can act as a positive or negative role model for other people. Activities to produce these re-evaluations include empathy training, documentaries, testimonials, and family interventions.

5. *Willpower*: this type of activity involves both the confidence that one can change their behaviour and the commitment and re-commitment to act on that belief. These activities include New Year's resolutions and public testimonies, to enable what is often referred to as self-liberation.

6. *Social liberation*: this type of activity requires an increase in the availability of social opportunities or alternatives, especially for people who have previously not had access to them. The activities utilised often include advocacy and empowerment

procedures, to produce increased opportunities for minority groups. These same activities can help all people change, as is the case with building public toilets, making salad bars in school lunchrooms available, and providing easy access to condoms and other contraceptives.

7. *Counterconditioning*: this type of activity requires people to learn better or healthier behaviours that can substitute for problem or risky behaviours. These strategies for safer alternatives include relaxation, assertion, desensitisation and nicotine replacement therapy.

8. *Stimulus control*: these activities often involve removing cues for unhealthy habits and adding prompts for healthier substitutes. Examples include avoidance, environmental re-engineering, and self-help groups, which can all provide the impetus that supports change and reduce risks for relapse.

9. *Contingency management*: this type of activity provides varying degrees of positive and negative consequences for taking steps in a particular direction. Contingency management usually includes the use of penalties, however we know that self-changers rely on rewards to a greater degree than punishment. Reinforcements of positive behaviour are emphasised, since an underpinning concept for the stage model is to work as much as possible in concert with how people change naturally. The activities include the use of incentives, contingency contracts, overt and covert reinforcements, and social recognition as ways to increase reinforcement and the probability that positive responses will be continued.

10. *Helping relationships*: these combine trust, openness, caring and acceptance, as well as support for positive and healthy changes in behaviour. Activities include relationship building, counsellor visits, and buddy systems, which are considered to be sources of social support.

The TTM is based on important assumptions about the nature of behaviour change and interventions that can best facilitate such change. The five stages of change and ten processes have highlighted issues relating to barriers, self-efficacy, and enabling environments. All of these will be relevant for this study's examination of the role of change agents as part of a behaviour change program. The following set of assumptions

summarised by Glanz et al. (2008) underpin the theory as well as years of research and practice related to the TTM:

- 1. No single theory can account for all complexities of behaviour change. A more comprehensive model is most likely to emerge from integration across major theories.*
- 2. Behaviour change is a process that unfolds over time through a sequence of stages.*
- 3. Stages are both stable and open to change, just as chronic behavioural risk factors are stable and open to change.*
- 4. The majority of at-risk populations are not prepared for action and will not be served effectively by traditional action-oriented behaviour change programs.*
- 5. Specific processes and principles of change should be emphasised at specific stages to maximise efficacy.*

TTM/Stages of Change quickly became one of the most widely adopted models of behaviour change, due in part to its intuitive appeal and straightforward structure. However several reviews of the evidence have not found sufficient support for stage-based interventions as an effective method to change people's behaviours (Bridle et al., 2005; Riemsma et al., 2003; van Sluijs, van Poppel, & van Mechelen, 2004). One interesting study that is often cited deliberately matched the "wrong" interventions for smokers, finding that matching did not increase the probability of quitting, and smokers who received the treatment were most likely to quit, regardless of which stage that was judged to be theirs (Quinlan & McCaul, 2000). The mixed evidence reported in these reviews suggest that TTM-guided interventions do not always change health behaviours, but readers should also carefully analyse each review for its results and context. TTM has also been criticised for being just another method of characterising behavioural intentions. When people measure of stages of change, they place the individuals in categories ranging from inaction to action, and these measures share considerable similarity with intention measures that measure whether one is unlikely or likely to act (Sutton, 2001). Put another way, the results of TTM and behavioural intentions research are often highly correlated, suggesting a statistically significant overlap

in the two constructs (De Vet, De Nooijer, De Vries, & Brug, 2007). As we will see in the next chapter's examination of sanitation programs, moving people from one early non-behavioural stage to another is not equivalent to behaviour change. Programs that alter stages of change (or even intentions) may or may not produce behaviour change in the target communities. Another issue arises around whether people need to move through all the stages, and whether they can move between them as part of an iterative process (Glanz et al., 2008). This review will now examine another longstanding and popular model that seeks to capture the concept of expectation and explore the cognitive forces that drive behaviour change. This will become important for this study on sanitation, which involves the target population understanding their current health situation and the possibilities that changing their behaviour could bring.

Health Belief Model

The initial work on this model began in the early 1950s, when psychologists developed an approach to behaviour that stemmed from two major learning theories. One was the Stimulus-Response (S-R) Theory (Watson, 1998); the other was Cognitive Theory (Lewin, 1951; Tolman, 1951). S-R theorists believed that learning results from events, known as reinforcements, that reduce biological drives that determine behaviour. Skinner (1938) developed the widely recognised hypothesis that the frequency and intensity of a behaviour is determined by the consequences attached to it. For Skinner, just the chronological association between a behaviour and a reward that followed immediately was regarded as enough to increase the probability that the behaviour would be repeated and maintained. According to this interpretation, influences such as reasoning, emotional reactions or even thinking do not play a role in explaining an individual's behaviours (Glanz et al., 2008).

The cognitive theorists – the other school of thinkers that informed the development of the HBM theory – instead emphasised the role of people's subjective assumptions and expectations. They asserted that a person's behaviour is a function of the subjective value of a result and of the subjective probability, or expectation, that a particular action will achieve that result. This type of framing is generally referred to as value-expectancy. The major

elements of cognitive theories are mental processes such as thinking, reasoning, or expecting. Proponents of cognitive theory believe that reinforcements operate by affecting expectations about a given situation rather than by influencing behaviour directly. The concepts of value-expectancy, in the context of programs such as this study's sanitation intervention, assume that people: (1) value avoiding disease/becoming healthy, and (2) expect that a specific action may prevent disease or improve their wellbeing. The expectancy can be further described in terms of the individual's consideration of their personal susceptibility to and perceived severity of a disease, and of the probability of their ability to moderate that threat through personal action (Glanz et al., 2008).

Bringing these two schools of thought together, the HBM contains several primary concepts that help predict why people will take action to prevent, or control the conditions that create disease, such as diarrhea that is the primary health impact for this study's sanitation program. These actions include susceptibility, seriousness, benefits and barriers, cues to action, and self-efficacy. As one of the earliest researchers to apply HBM principles, Hochbaum (1958) studied perceptions of whether people believed they were likely to catch tuberculosis and their beliefs about the personal benefits of early detection. He reported that among those people who showed that they believed both in their own susceptibility to tuberculosis as well as the benefits of early detection, 82 per cent undertook at least one voluntary chest X-ray. Of those demonstrating neither of these beliefs, only 21 per cent had sought voluntary X-rays during the intervention period. This study shows that people who regard themselves as vulnerable to a disease; believe that disease would have potentially serious consequences, believe that a course of action presented to them would be beneficial in reducing either their vulnerability to or the severity of the disease, and believe the expected benefits of taking action help them overcome the barriers to action, they are likely to take action that they believe will reduce their risks. Champion and Skinner have provided the following general definitions of the major HBM concepts (Glanz et al., 2008).

Perceived Susceptibility: beliefs about the likelihood of getting a disease or condition. For example, a woman must believe there is a possibility of getting breast cancer before she will be interested in obtaining a mammogram.

Perceived Severity: feelings about the seriousness of contracting a disease or of leaving it untreated include evaluations of medical consequences (for example, death, disability, and pain) and possible social consequences (such as effects of the conditions on work, family life, and social relations). The combination of susceptibility and severity has been labelled as perceived threat.

Perceived Benefits: whether perception of personal susceptibility leads to behaviour change will be influenced by the person's beliefs regarding the perceived benefits of the various available actions for reducing the disease threat. Other non-health-related perceptions, such as the financial savings related to quitting smoking or pleasing a family member by having a mammogram, may also influence behavioural decisions. Thus, individuals exhibiting optimal beliefs in susceptibility and severity are not expected to accept any recommended health action unless they also perceive the action as potentially beneficial by reducing the threat.

Perceived Barriers: the potential negative aspects of a particular health action – perceived barriers – may act as impediments to undertaking recommended behaviours. Cost-benefit analysis occurs where individuals weigh the action's expected benefits with perceived barriers, "It could help me, but it may be expensive, have negative side effects, be unpleasant, inconvenient, or time-consuming." Thus, "combined levels of susceptibility and severity provide the energy or force to act and the perception of benefits (minus barriers) provide a preferred path of action"(I. M. Rosenstock, 1974).

Cues to Action: Hochbaum (1958) thought that readiness to take action (perceived susceptibility and perceived benefits) could only be instigated by other factors, particularly by cues to instigate action, such as bodily events, or by environmental events, such as media coverage of an issue. Although the concept of cues as triggering mechanisms is appealing, cues to action are difficult to study in

explanatory surveys; a cue can be as fleeting as a sneeze or the barely conscious perception of a poster.

Self-Efficacy: defined as “the conviction that one can successfully execute the behaviour required to produce the outcomes” (Bandura, 1997). Bandura distinguished self-efficacy expectations from outcome expectations, defined as a person’s estimate that a given behaviour will lead to certain outcomes. Outcome expectations are similar to but distinct from the HBM concept of perceived benefits. I.M. Rosenstock, Strecher, and Becker (1988) suggested that self-efficacy be added to the HBM as a separate construct, while including original concepts of susceptibility, severity, benefits and barriers. Evidence in the literature supports the importance of self-efficacy in initiation and maintenance of behaviour change (Bandura, 1997). For behaviour change to succeed, people must feel threatened by their current behavioural patterns (perceived susceptibility and severity) and believe that change of a specific kind will result in a valued outcome at an acceptable cost (perceived benefit). They also must feel themselves competent (self-efficacious) to overcome perceived barriers to take action.

In the case of this study’s sanitation program, these HBM concepts can be tailored to include acceptance of the problems caused by diarrheal disease, personal estimates of susceptibility to diarrheal disease, and susceptibility to disease in general. To understand the concept of self-efficacy as it is applied to another social and behaviour change program, we will briefly examine an example from NSW Health, an Australian state government health agency, in response to the issue of alcohol harm.

NSW Health: ‘What are you doing to yourself?’ alcohol harm campaign

In January 2009, the New South Wales state government launched a campaign that aimed to educate young people about the harm associated with alcohol use. The geographic focus for the campaign included six key areas of NSW – the Sydney CBD, Manly, Eastern Suburbs, Parramatta, Newcastle and Orange. The creative approach to the campaign centred on the

idea that by engaging in excessive or binge drinking, young people in NSW were, in effect, causing a variety of harms to themselves. This included wasting money, getting involved in violence and engaging in risky sexual behaviours. The visuals for the campaign included posters that portrayed two versions of a young person. One, the “drunk” self, was seen to be carrying out harmful acts towards the “normal” self, resulting in negative consequences. Initial evaluation of the campaign found it prompted recall of its messages among 67 per cent of respondents. Overall 31.2 per cent of respondents stated that the ads, “make you think about your drinking” (King & Richards, 2003).

Closer analysis of the campaign materials and advertising evaluation identified several issues that could be a barrier or facilitator to the program’s success. First, the appeal to young people’s self-efficacy appears to be limited (GfK-blumoon, 2010). Second, the campaign does not offer a more attractive alternative that fits with current beliefs. It criticises current behaviour and does not reinforce new positive ones. The negative messages mean young people do not have the opportunity to validate new behaviours nor access solutions. Finally, young people have difficulty relating to these materials, with the 2010 evaluation reporting the highest score of only seven per cent of respondents who rated the poster “very relevant” with the lowest at five per cent (GfK-blumoon, 2010). In short, seen through the lens of the HBM, this NSW campaign would likely not build on, nor engage with, young people’s sense of self-efficacy, which would mean that success was less likely to result.

The HBM has been one of the most widely adopted conceptual frameworks in behaviour change research and practice, both to review past behaviour change programs and as a guiding framework for planning new interventions. Since its emergence, the HBM has been considerably expanded, compared to other approaches, and used to develop programs to change health behaviour. Inevitably with a model that seeks to explain a wide variety of phenomena, there have been significant criticisms. These have centred on the variety of expectations among people within groups, as well as within entire populations. Glanz et al. (2008) state, “Diverse social, psychological, and structural variables may influence perceptions and indirectly affect behaviour. For example, socio-demographic factors,

particularly educational achievement, are believed to have an indirect effect on behaviour by influencing the perception of susceptibility, severity, benefits and barriers.” As we will see in the examination of other theory, influences from a person’s community and broader social network will emerge as additionally important factors in social and behaviour change. This chapter will first examine two theories that centralise the concept of behavioural intention and explore the idea of control.

Theory of Reasoned Action and Theory of Planned Behaviour

The Theory of Reasoned Action (TRA) is also a cognitive theory, asserting that the most significant determinant of behaviour is intention. In turn, the immediate determinants of people’s behavioural intentions are their attitudes and subjective norms. In essence, the more positively an individual regards a certain behaviour or action and the more they perceive the behaviour as being important to their friends, family, colleagues or society, the more likely they are to form intentions to perform the behaviour. TRA focuses on cognitive factors (beliefs and values) that determine motivation (intention). The theory has been widely used to explain behaviours, particularly those considered to be under an individual’s control. As an extension of TRA, the Theory of Planned Behaviour (TPB) adds the element of perceived control, which focuses on facilitating or limiting factors that affect intention and the related behaviour. This is considered significant for behaviours over which people have less personal influence. Both TRA and TPB assume a causal relationship that links all of these factors – behavioural beliefs, normative beliefs, and control beliefs – to intentions and behaviours via attitudes, subjective norms, and perceived control (Glanz et al., 2008).

Looking first at attitude, this is determined by an individual’s beliefs about the direct results or experience of adopting the behaviour (behavioural beliefs), with its intensity and character affected by personal review of those outcomes or experience. An individual who holds very strong beliefs that results they consider positive will occur from adopting the behaviour are themselves more likely to hold a positive attitude toward the behaviour. Equally, an individual who possesses strong beliefs that results they consider negative will flow from the behaviour will adopt a negative attitude. Likewise, an individual’s subjective

norm is formed by their normative beliefs around whether people important to them approve or disapprove of the behaviour, which is in turn influenced by his or her level of motivation to conform with those influencers. In this way, an individual who believes that influencers hold the opinion that s/he should adopt a behaviour and is motivated to meet the expectations of those influencers will hold what is referred to as a positive subjective norm. On the other hand, an individual who holds the view that these influencers think s/he should not adopt the behaviour will hold a negative subjective norm. And an individual with less motivation to comply with those influencers will hold a comparatively neutral subjective norm (Glanz et al., 2008). An example of this related to this study's sanitation program in Indonesia is that if the target community do not regard the change agents recruited for the program as influencers worthy to be followed, it is less likely they will adopt the practices they promote.

Over the years, the success of TRA in explaining behaviour came to be viewed as dependent on the degree to which that behaviour was considered to be under personal control (Glanz et al., 2008). TRA components were not considered sufficient to predict behaviours in situations where personal control is affected. Ajzen and colleagues created the Theory of Planned Behaviour (TPB) by adding perceived control to TRA to take into account factors they considered to be outside a person's control (Ajzen, 1991; Ajzen & Driver, 1991). Perceived control is determined by a person's beliefs relating to control regarding the presence or absence of facilitators and barriers to the adoption of behaviours, influenced by the individual's perceived power or the impact of each control factor to affect the behaviour. Ajzen's addition of perceived control was based in part on the notion that the adoption of a behaviour is determined both by motivation (intention) as well as ability (control). A person's perception of their control, together with their intention, is expected to have a direct impact on their behaviour, especially when perceived control is considered to be an accurate calculation of actual control over the behaviour and when personal control is not significant. Madden, Ellen, and Ajzen (1992) state that the impact of perceived control diminishes, and intention is an adequate predictor of behaviour in contexts in which personal control over the behaviour is high. Experience with TRA/TPB and other theories of behaviour change has led many to seek to combine the most effective and tested elements

into models that provide a comprehensive frame for behaviour change. One of the most widely discussed is the Integrated Behavioural Model.

Integrated Behavioural Model

The Integrated Behavioural Model (IBM) includes components from the TPB and TRA, as well as elements of other, largely cognitive, theories of behaviour change. According to the IBM, the most important determinant of behaviour is the person's intention to perform the behaviour, as without motivation they are unlikely to perform the prescribed behaviour. According to Jaccard, Dodge, and Dittus (2002), there are four other elements they consider to have a direct effect on behaviour. Three of these are significant in establishing whether behavioural intentions can result in behavioural adoption. First, an individual needs the knowledge and skill required to perform the behaviour. Second, there should be zero or very few environmental limits that make performance difficult or impossible. Third, the behaviour itself should be relevant to the individual's life. Finally, the experience of practicing the behaviour may make it habitual, so that intention becomes less important in determining performance for that person (Glanz et al., 2008; Triandis, 1979).

These factors will also form part of the theoretical foundations for this sanitation study, especially the role of previous participation in determining future action by change agents. The nature and interaction of the components of the IBM are considered important when designing interventions to facilitate behaviour change. The IBM provides a theoretical foundation from which to understand behaviour and identify particular beliefs to target in an intervention. Other communication and behaviour change theories are then used to guide strategies and activities to change those beliefs and the related behaviours (Glanz et al., 2008). Thus, the IBM is a behavioural framework but stops short of providing ways to design implementation of an intervention. Another shortcoming reported for the IBM is that it tends to concentrate on the individual and environmental dynamics of behaviour change, missing out on the interpersonal effects on a person's decisions and choices. These interpersonal relationships and impact will be the subject of the following section.

Interpersonal approaches to behaviour change

One significant source of influence on a person's behaviours is the web of interactions people have with others within their social networks. This "web of influence" on behaviours is the subject of one major theory and three models to explain how interpersonal interactions may influence a person's cognitions, beliefs, and behaviours. There are different ways in which social networks influence people: providing intimacy and friendship, resources to cope with threats and problems, and the use of new information. Of course, social networks may have both a positive and negative impact in promoting behaviours, sometimes simultaneously. It is important to understand how theories of behaviour change at the interpersonal level can provide a useful link between the macro and micro levels to improve life for people living in poverty, such as those targeted for this study's sanitation program in Indonesia. One of these, Social Cognitive Theory (SCT), addresses the fundamental tension between two frameworks that have provided the basis for explanations of human behaviours: individuals versus the environment. SCT deals with this tension by arguing that individuals and their environments both interact and influence each other, resulting in individual and social change. SCT offers a number of concepts that have been adopted widely in work utilising behaviour change theories and models, including modelling, observational learning and self-efficacy, among others (Glanz et al., 2008).

Social Cognitive Theory

Social Cognitive Theory (SCT) was first known as social learning theory, building on research by N. E. Miller and Dollard (1941), as it was based on an established process of learning within the human social context (Bandura, 1977). It was retitled Social Cognitive Theory when researchers integrated cognitive elements from psychology to integrate the growing understanding of the capacities and biases inherent when people process information, which influence learning from experience, observation, and symbolic communication. SCT has been further developed to include concepts from sociology and political science in order to advance the understanding of functioning and adaptive capacities of people in their groups and communities. SCT has also integrated and further developed additional concepts

from psychology by taking into account the processes that underlie unselfishness, self-determination and moral behaviour (Bandura, 1986, 1997, 1999; Glanz et al., 2008).

SCT emphasises reciprocal determinism in the interaction between individuals and their environments. Most theories focus on individual, social, and environmental factors that determine individual or group behaviour, for example barriers, rewards and punishments, and social norms. SCT asserts that a person's behaviour is the product of the dynamic interaction of personal, behavioural and environmental factors. Taking into account how environments shape human behaviour, this theory emphasises people's potential capacities to change and develop environments to suit the purposes they create. In addition to an individual's ability to interact with their environment, SCT emphasises the human capacity for collective action. This ability enables people to work together in groups, organisations and social systems to achieve changes that benefit the entire group. An example of this from the Indonesian program used as the focus for this study is the local working groups (*pokja*) set up to facilitate improved sanitation. Bandura (1997) states that planned protection and promotion of public health is an illustration of this kind of reciprocal determinism, as communities seek to control the environmental and social factors that influence health behaviours and the corresponding health outcomes (Glanz et al., 2008).

According to Glanz et al. (2008), the key concepts of SCT can be arranged into five categories. First is referred to as the psychological determinants of behaviour. One important determinant is outcome expectations, defined as "beliefs about the likelihood of various outcomes that might result from the behaviours that a person might choose to perform, and the perceived value of those outcomes." Another determinant is social outcome expectations, which correspond to the concept of social norms in the Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB). Linked to this is self-efficacy belief (Bandura, 1997), for which SCT is most widely known and which has since been integrated into other theories. A person's beliefs are concerned with their individual ability to influence quality of life as well as the events that affect how they function. Bandura extended this concept to include collective efficacy, demonstrating its effects on how people work in groups and organisations (Bandura, 1986; Bandura & Bryant, 2002).

The second SCT category is known as observational learning, which can be divided into four processes: (1) attention; (2) retention; (3) production; and (4) motivation. It is important to highlight that different factors influence different processes. For example, the perceived functional value of the results expected from the modelled behaviour determines to what they choose to devote attention. In turn, access that people have to sources of learning, in particular family, peer, and media models, determines what behaviours a person is able to observe. Production, i.e. the adoption of the modelled behaviour, depends on physical skills, such as communication, and on self-efficacy for adopting the observed behaviour. Motivation is influenced by outcome expectations around the relative costs and benefits of the observed behaviour. Maintenance of an observed behaviour depends on intellectual capabilities such as reading ability (Glanz et al., 2008).

The third SCT category is known as environmental determinants of behaviour. One method of environmental change to shift behaviour is through incentive motivation by providing rewards or punishments for desired or undesired behaviours. A second approach to shifting behaviour through environmental change is facilitation, by providing structures or resources that enable certain behaviours or make them easier to adopt (Bandura, 1998). Motivation seeks to manipulate behaviour through external influence, whereas facilitation is considered empowering (Glanz et al., 2008). One example of how behaviour can be influenced by facilitation taken from this study's sanitation program is education about safe water storage combined with the distribution of storage equipment, which made it more readily available to those who were at the greatest risk of diarrheal disease.

The fourth SCT category is self-regulation. In this context, self-control does not depend on an individual's personal determination but instead on their ability to acquire useful skills for managing themselves. Individuals can influence their own behaviour in many of the same ways they would influence another person, especially through providing rewards and facilitating environmental changes that are planned and organised. Bandura (1997) identified six ways in which self-regulation is achieved: "(1) self-monitoring is a person's systematic observation of her own behaviour; (2) goal-setting is the identification of

incremental and long-term changes that can be obtained; (3) feedback is information about the quality of performance and how it might be improved; (4) self-reward is a person's provision of tangible or intangible rewards for himself; (5) self-instruction occurs when people talk to themselves before and during the performance of a complex behaviour, and (6) enlistment of social support is achieved when a person finds people who encourage her efforts to exert self-control. Instruction in self-regulation techniques is a widely used application of SCT" (Glanz et al., 2008).

The fifth and final SCT category can be referred to as "moral disengagement" (Bandura, 1999), where standards for self-regulation can help individuals to avoid violence, injustice and cruelty to others. Examples of moral disengagement include "euphemistic labelling", which reduce the impact of violent acts by using terms that make them appear less offensive. Another is dehumanisation of victims and attribution of blame to them through perception of them as racially or ethnically different and, therefore, at fault for the punishment they are to receive. Also used is the shift of responsibility by assigning decisions to a group or to persons of influence, and therefore justifying damaging actions by portraying them as both beneficial and necessary (Bandura, Caprara, & Zsolnai, 2000; Glanz et al., 2008). An example from this study's sanitation program is that seemingly objectionable acts, such as open defecation, had been justified in the minds of the individuals practicing that behaviour through their recall of other members of their communities who also engaged in the same practice.

Social Cognitive Theory (SCT) argues that reciprocal determinism results in individual and social change. This addresses the tension between two frameworks that have characterised the explanations of human behaviours: individuals versus their environment. However, in attempting to provide explanations for virtually all human phenomena, SCT is considered to be very ambitious and expansive (Bandura, 1986). Because of its expansive nature, it has not been tested systematically in the same way that other theories have been examined (Glanz et al., 2008). More specific methods for tracking and explaining social and individual behaviour changes through personal environments have been developed using Social Network Theory.

Social Network Theory

Social Network Theory (SNT) examines the different pathways through which social networks influence personal wellbeing and prosperity – providing intimacy and companionship, resources to cope with threats, new information, and mobilisation of resources to protect individuals from harm. However, we also know that social networks may play both a positive and negative role in social and behaviour change. Social network analysis (SNA) explores how the structure of linkages (or ties or relationships) between individuals in groups influences the diffusion of information. SNA at the individual level provides information on each person in the network based on the relationships reported by the members of the network, i.e. centrality and bridges; weak and strong ties. Most people and communities do not have control over their position in a network and their ability to shift roles and positions is affected by a variety of factors. Milgram (1967) performed one of the most well-known social network experiments by asking people to transport a package across the United States of America through personal connections, in doing so he calculated that the average number of connections that provide a direct link between two people was six. This became known as ‘Six Degrees of Separation’ or the ‘Small World’ theory. Once behaviours are included in the analysis, individual exposures can be calculated (T.W. Valente, Gallaher, & Mouttapa, 2004; Watts & Strogatz, 1998).

SNA at the network (or macro) level provides information (indicators) about the overall properties of the network, e.g., density, transitivity and reciprocity. Network bridges provide pathways critical to information, ideas, threats (such as disease) and the spread of their associated behaviours. How information travels through a social network depends on the network’s performance (productivity) and density. Weak ties at the macro level enable penetration of new ideas and behaviours, with homophily (strong ties) at the macro level, enabling diffusion within networks (Axsen & Kurani, 2010). The structure of social networks have been explained in terms of their dyadic characteristics – the traits of relationships between the focal individual and other people in the network. They have also been described in terms of the features of the network as a whole (House, Umberson, & Landis,

1988; Israel, 1982). Examples of dyadic characteristics include the resources and support both given and received (reciprocity); the emotional closeness of a relationship (intensity); the formal organisational or institutional structure (formality), and the variety of functions (complexity). Examples of characteristics that describe a whole network include the similarity of network members in terms of demographic traits (homogeneity); the proximity of network members to the focal person (geographic dispersion); and members' interaction with each other (density). Describing these helps us understand the factors influencing the various forms of social functions enabled by social networks (Glanz et al., 2008).

Social networks provide the impetus for a range of social functions: influence, control, undermining, comparison, companionship, and support. This section focuses on the provision of social support as this is a major element of the approach taken with the sanitation program that is the subject of this study. The term social support has been defined and measured in many ways and it is useful to examine these in order to understand the complexity of its role. Glanz et al. (2008) describes social support as the functional content of relationships that can be grouped into four types of actions:

1. *Emotional support* involves the provision of empathy, love, trust, and caring.
2. *Instrumental support* involves the provision of tangible aid and services that directly assist a person in need.
3. *Informational support* is the provision of advice, suggestions, and information that a person can use to address problems.
4. *Appraisal support* involves the provision of information that is useful for self-evaluation purposes – in other words, constructive feedback and affirmation.

These social support actions have been adopted by a wide range of programs and studies, much of which has drawn on the work of social epidemiologist John Cassel (1976). Drawing from his animal and human work, Cassel theorised that social support served as a significant psychosocial “protective” factor that reduced individuals' vulnerability to the damaging effects of stress on wellbeing. He also explained that psychosocial factors such as social support were likely to play a role in the cause and spread of disease. This means that social

support may influence the incidence and prevalence of a variety of health outcomes. Social networks – and the social support provided through them – can improve a person’s ability to gain access to new connections and information as well as to identify and solve problems. If this support can help to reduce uncertainty or help to produce desired outcomes, then a sense of personal control will also be enhanced, including changing behaviours. It is these interpersonal exchanges within a social network that support and influence individuals around such health behaviours as adherence to medication (DiMatteo, 2004), help-seeking behaviour (McKinlay, 1981; Starrett, Bresler, Decker, Walters, & Rogers, 1990), smoking cessation (Palmer, Baucom, & McBride, 2000), and weight loss (Wing & Jeffery, 1999).

Drawing on this experience, several typologies of social network and social support interventions have been described (B. H. Gottlieb, 2000; N. Gottlieb & McLeroy, 1994; Israel, 1982). Glanz et al. (2008) identify four categories of interventions: (1) improving existing social network relationships, (2) developing new social network relationships, (3) enhancing networks through the use of change agents, and (4) enhancing networks through participatory problem-solving approaches. Another category could potentially be described that is comprised of programs that use a combination of these intervention types. Social network and social support interventions are considered most likely to be effective if developed and implemented within an ecological framework that considers multiple levels of influence (O'Donnell, 2001). Through impact on targeted behaviours, social networks and social support may affect the incidence of, and recovery from, disease as well as the corresponding health and social outcomes (Glanz et al., 2008).

One element that has been consistently present in many of the theories of individual behaviour change, as well as those based on interpersonal and or community approaches, has been the role of change agents. The presence of change agents in many, if not all, of the major theories and models may mean that they play a role at all levels of influence and in all aspects of social and behaviour change.

Change Agents

Gaps in a community's structure can restrict the dissemination of information. These gaps can be bridged with relationship building, effectively enlarging the network. Change agents, eg. opinion leaders, peer educators, community facilitators, counsellors, outreach workers etc, can assist in building and strengthening these influence relationships and can also shape behavioural norms (Kempe, Kleinberg, & Tardos, 2003). Change agents can also be leaders, as approximately 15 per cent of the members of a community are early adopters of an innovation. However, leaders won't always pass on new information – their choice of a “protect or propagate” response depends on what they determine is important for the group. The success of change agents in dissemination of information can be influenced by several factors – education, financial incentives, social norms, skills training, power, age and others. The two-step model posits that opinion leaders use the mass media for information more than opinion followers, and that these leaders pass on their opinions to their followers (Thomas W. Valente & Saba, 1998).

Many programs make use of change agents – e.g. peer educators, counsellors, opinion leaders and community health workers – to disseminate messages within target communities. These change agents can be remunerated or voluntary. There is significant evidence that this interpersonal communication is necessary for social and behaviour change programs to be successful (Nikolaou, Gouras, Vakola, & Bourantas, 2007). Several hundred diffusion studies conducted in the 1950s and early 1960s supported the idea that interpersonal communications was an important influence on behaviour change (Thomas W. Valente & Saba, 1998). One form is the concept of peer education, which is based on the assumption that some individuals will act as role models and opinion leaders within their communities and can be important determinants of rapid and sustained behaviour change (Rogers, 2003). This assumption has been tested as part of interventions, with opinion leaders shown to be effective at decreasing the rate of unsafe sexual practices (T.W. Valente & Davis, 1999) and at decreasing the rate of caesarean births (J.A. Kelly et al., 1991). These findings imply that maximising the effectiveness of change agents can accelerate the rate of diffusion of behaviour change within a community (Lomas et al., 1991).

There is a related body of work that refers to a change agent as a “natural helper”, which is a member of a social network to whom other network members naturally turn for advice, support, and other forms of help (Israel, 1985). Natural helpers are trusted members of the community who are considered responsive to the needs of others. They can link community members to each other and to resources outside the community as well as provide support directly to network members. Interventions utilising natural helpers have been conducted in a number of different communities around the world, including urban neighbourhoods, rural areas, indigenous communities, migrant groups, and churches (Kegler & Malcoe, 2004; Love, Gardner, & Legion, 1997; McQuiston & Flaskerud, 2003; Schulz et al., 2002). A conceptualisation for a natural helper specific to health is the lay health adviser (LHA). Governments and other providers of health services have utilised LHAs to deliver support in various promotion and prevention efforts to reach vulnerable communities. Engaging trained community members to undertake effective promotion and prevention activities has the potential to increase local control of resources as well as to empower individuals and their communities.

One experiment to prevent lead poisoning among Native American children evaluated a community-based lay health advisor intervention in a former mining area (Kegler & Malcoe, 2004). The authors conducted cross-sectional population-based blood-lead testing on Native American and White children aged 1 to 6 years and interviews with caregivers before (n=331) and after (n=387) a 2-year intervention. The results from the experiment were mean childhood blood lead levels decreased and selected preventive behaviours improved for both Native American and White (comparison) communities. Their findings provide support for the effectiveness of interventions using change agents.

In a similar study, researchers at the University of North Carolina developed the LHA program *Protegiendo Nuestra Comunidad* (Protecting Our Community) (McQuiston & Flaskerud, 2003). This program was based on the idea that members of the recently immigrated Mexican community can develop the capabilities to provide their neighbours, friends, and co-workers with culturally appropriate support to improve the sexual health of

individuals and the community and therefore to reduce exposure to HIV. The program engaged the LHAs as change agents who were capable of helping their communities increase access to HIV/AIDS services. The LHA model can be effective as it engages natural helpers as people who have the status of cultural insiders and who are already informally providing help in their own social networks of family, friends, neighbours, and co-workers. However, the primary strength of this approach makes the independent evaluation of LHA activities problematic. The unprompted nature of natural helping does not lend itself to the meticulous record keeping often needed for empirical studies, including use of data collection methods and instruments (Earp et al., 1997). In addition, formal record keeping may not be appropriate for LHAs' functioning as helpers (Glanz et al., 2008).

Acknowledging these challenges, a number of LHA interventions have reported the findings from program evaluations (Swider, 2002). These are limited to programs that identified natural helpers as volunteers, i.e. those who were not paid for helping activities. There is some debate around the role of payment and other incentives in the recruitment of change agents, however this falls outside the focus of this study. Several evaluations have focused on the development of community members for roles as LHAs. The way to evaluate the effectiveness of change agents takes various forms and was a major preoccupation in the development of the methodology for this study. These methods have included quantitative assessments of knowledge before and after the learning activity; summaries of helping interactions or reports of the number of helping activities delivered during a specific time period; the impacts of helping activities on the recipients, and community members' health outcomes or use of services. The need for qualitative evaluations is frequently mentioned, and some qualitative data from interviews of LHAs have been included in several studies, however a limited number of qualitative evaluations of lay health adviser programs have been identified. Earp et al. (1997) examined LHA activity levels as reported by the LHA activity coordinators, not by the LHAs themselves. Schulz et al. (2002) examined the unique qualities the LHAs brought to the project, the importance of their social networks, and how their roles as natural helpers related to their roles as LHAs. Although these studies do suggest that LHAs provide social support that is needed in their communities, more qualitative studies are needed to better understand what motivates change agents, how

they develop and function and the nature of their interactions with the members of the communities they serve (Glanz et al., 2008).

Similarly, community health workers (CHWs) are members of the target community, who are recruited to provide health services and outreach. CHWs are often employed by the formal government health system, especially in poorer countries, to provide a link between members of the community and these formal health services (Love et al., 1997). Peer education interventions have also been used with a number of target populations in developing countries, including young people (Agha & Van Rossem, 2004; Brieger, Delano, Lane, Oladepo, & Oyediran, 2001; Merati, Ekstrand, Hudes, Suarmiartha, & Mandel, 1997), commercial sex workers (Basu et al., 2004; Ford, Wirawan, Suastina, Reed, & Muliawan, 2000; Morisky, Stein, Chiao, Ksobiech, & Malow, 2006), and injecting drug users (Broadhead et al., 2006; Hammett et al., 2006; Li, Luo, & Yang, 2001). A systematic evaluation of the effectiveness of 30 HIV/AIDS interventions found peer education interventions were significantly associated with increased HIV knowledge and behaviour change (Medley, Kennedy, O'Reilly, & Sweat, 2009).

It is clear from this evidence that change agents, whether in the form of LHAs, CHWs or peer educators, have been shown to be effective in evangelising and facilitating change. This evidence leads us toward two further questions. One is how can we identify and select change agents? The second is how to choose the change agents who are more likely to be more effective in influencing change in the community in which they are active or to which they have been assigned? One of the first tasks reported in natural helper interventions is to identify the people who currently fill these helping roles (Eng & Young, 1992). People in the community are asked to name individuals who demonstrate the characteristics of natural helpers. The participation of community members in the identification process is considered critical. The individuals whose names are repeatedly mentioned by the community can be contacted and recruited. After the natural helpers are recruited, the authorities provide information on specific topics, resources available in the community, and community problem-solving strategies, and can engage in a consultative relationship with the natural helpers. T.W. Valente and Pumpuang (2007) spent many years researching, testing and

refining approaches to the role of change agents in programs as diverse as sanitation, HIV/AIDS prevention and tobacco prevention in schools. They have collected and reviewed the ten most common techniques for identifying opinion leaders as well as the advantages and disadvantages of each one. These are summarised in the table below.

Table 1. Methods, Techniques, Advantages, Disadvantages and Instruments Used for Identifying Opinion Leaders

Method	Technique	Advantages	Disadvantages	Instruments
1. Celebrities	Recruit well-known people who are national, regional, or local celebrities	Easy to implement; Pre-existing opinion leaders; High visibility	Contradictory personal behaviour	Media or individuals identify
2. Self-selection	Volunteers are recruited through solicitation	Easy to implement; Low cost	Difficult to recruit; Selection bias	Individuals volunteer for leadership roles
3. Self-identification	Surveys use a leadership scale and those scoring above some threshold are considered leaders	Easy to implement; Pre-existing opinion leaders	Uncertain ability; Selection bias; Validity of self-reporting	When you interact with colleagues, do you give or receive advice?
4. Staff selected	Leaders selected based on community observation	Easy to implement	Staff misperceptions; Leaders may lack motivation	Staff determines which persons appear to be opinion leaders
5. Positional approach	Persons who occupy leadership positions such as clergy, elected officials, media, and business elites	Easy to implement; Pre-existing opinion leaders	May not be leaders for the community; Lack of motivation; Lack of relevance	1. Do you hold an elected office or position of leadership? 2. Are you a member of any community organisations? Which ones?
6. Judge's ratings	Knowledgeable community members identify leaders	Easy to implement; trusted by community	Dependent on the selection of raters and their ability to rate	Persons who are knowledgeable identify leaders to be selected and rate all community members on leadership ability
7. Expert identification	Trained ethnographers study communities to identify leaders	Implementation can be done in many settings	Dependent on experts' ability	Participant observers watch interaction within the community and determine who people go to for advice
8. Snowball method	Index cases provide nominations of leaders who are	Implementation can be done in many settings; Provides some measure of	Validity may depend on index case selection. It can take	Randomly or conveniently selected index cases are asked who they

	in turn interviewed until no new leaders are identified	the social network	considerable time to trace individuals who are nominated	go to for advice. Those nominated or a random selection of those nominated are also asked this question
9. Sample sociometric	Randomly selected respondents nominate leaders and those receiving frequent nominations are selected	Implementation can be done in many settings; Provides some measure of the network	Results are dependent on the representativeness of the sample. May be restricted to communities with less than 5,000 members	Randomly selected sample or cases are asked who they go to for advice
10. Sociometric	All (or most) respondents are interviewed and those receiving frequent nominations are selected	Entire community network can be mapped; May have high validity and reliability	Time-consuming and expensive to interview everyone. May be limited to small communities (i.e., less than 1,000 members)	All respondents are asked who they go to for advice

Taken from: T.W. Valente and Pumpuang (2007)

Change agents are commonly selected based on their individual attributes, but this method can be problematic (Schneider, Zhou, & Laumann, 2014). In contrast to similarities in training approaches, change agent recruitment is often undertaken via a heterogeneous assembly of methods: self-selection, peer-nomination, key informants, ethnographic observation, surveys, and other approaches (T.W. Valente & Pumpuang, 2007). This heterogeneity in change agent selection reflects a diversity of selection criteria that focuses primarily upon a given individual's attributes. For example, change agents may be selected because they share common traits or behaviours with the target population, e.g., race and drug-use (Colon, Deren, Guarino, Mino, & Kang, 2010; Fritz et al., 2011; R. L. Miller, Klotz, & Eckholdt, 1998; Outlaw et al., 2010); they may have superior communication skills (J. A. Kelly, 2004; NIMH, 2010); are considered popular or leaders within a community (J. A. Kelly, 2004); are charismatic (Cupples, Zukoski, & Dierwechter, 2010) or attractive (Starkey, Audrey, Holliday, Moore, & Campbell, 2009); are particularly motivated to impact their community (Kegeles, Hays, & Coates, 1996); or they have connections to specific target individuals within a personal network of interest (Schneider et al., 2012). These attributes are sought independently or in combination, though the rationale behind each approach is often poorly characterised. The heterogeneity in attributes and referral approaches upon

which change agents are selected may explain why these interventions have had only modest potency and mixed efficacy when tested in resource poor settings (Latkin et al., 2009; NIMH, 2010; Schneider & Laumann, 2011).

The methods of identifying change agents compared by T.W. Valente and Pumpuang (2007) focus on who they are connected to and how the community feels about them. This research project will instead examine how the change agents feel about their communities and how this affects their participation in outreach activities, which in turn leads to changes in behaviours and, ultimately, impact on health outcomes. This ubiquity of change agents means that they should be considered for inclusion as part of any intervention model, especially those that adopt a multilevel approach. While a number of the major theories described so far focus on the role of an individual in changing their own behaviour, as well as those around them through interpersonal effects, these are criticised for failing to adequately take into account the influence of groups of people on behaviour, especially in relation to the environments in which those behaviours take place. We will now examine the role of community in order to understand these dynamics and provide the final element in the theoretical foundations for this study and its methodology.

The role of community in social and behaviour change

It is equally valid to state that there is a collective aspect to almost every part of an individual's life. The author's experience managing social marketing and other social and behaviour change programs for government, multilateral, private sector and non-profit organisations, including the Fantastic Mom handwashing with soap project in Indonesia (Goodwin, 2010), gave rise to questions on the role of community in influencing individual behaviour change. These questions included: how do governments, researchers, community based organisations and target populations define the communities they aim to serve? How do change leaders use change agents, such as community health workers, peer educators, religious leaders, celebrities and counsellors, to communicate information and mobilise communities? Do change agents feel differently about different communities? Does the way they feel about their different communities affect the success of interventions, including

social and behaviour change programs? The answers to these questions help form the basis of the methodology for this study and to examine them we will now review concepts of community and the linkages with social and behaviour change.

Community

Understanding the nature of a community – its structure, dynamics and history – is essential to the success of programs designed to change it. Many social and behaviour change programs and associated communication campaigns are designed to change an individual or community by delivering messages to mass or local audiences with little regard for the landscape of that community (T.W. Valente & Davis, 1999). Ideas of community can be found in a wide variety of fields, including psychology, sociology and anthropology. The intellectual history of the concept of community is lengthy and abundant. A 1953 study by George Hillery (1955) identified 94 definitions of community in which the only common element was people. A sprint through the history of community would encounter German sociologist Ferdinand Tönnies and his two forms of human association: *gemeinschaft* (community) and *gesellschaft* (society) (Tönnies & Loomis, 1957). Max Weber gave us his concept of social action (Weber & Runciman, 1978). Georg Simmel referred to sociability and social boundaries (Simmel, 2007). John Dewey wrote about groups of citizens “created” by communication (Dewey, 1927). Emile Durkheim’s “collective conscience” sat in opposition to the notion that a society was nothing more than an assembly of individuals (Durkheim & Halls, 1984; Durkheim, Solovay, Mueller, & Catlin, 1982). Robert Park conceived of notions of group solidarity in crowds and publics (Park, 1972). Louis Wirth undertook work on urban social lives (Wirth, 1938). And Benedict Anderson revealed the concept of “imagined communities”, where “in the minds of each lives the image of their communion” (Anderson, 2006). The research of Jon Cruz and Justin Lewis provided insight into media audiences and culture (Cruz & Lewis, 1994). Marshall McLuhan (1994), demonstrated that it is the masses which mediate individual and social change, by affecting both the medium and the message.

Theories of audience reception and media effects, often referred to as part of the cultural studies family of theory, cover concepts relating to the production of media and its consumption by individuals and their communities. These theoretical traditions have yielded a rich variety of communication strategies designed to influence behaviour change among intended audiences, principally through use of the mass media (Slater, 1999). A body of research into behaviour change processes has focused on how media coverage leads to interpersonal discussion and community mobilisation (E Katz, 1957; Tichenor, Donohue, Olien, & Clarke, 1980; Wakefield, Loken, & Hornik, 2010). Early studies on the effects of communication campaigns provided results of both successes (Cartwright, 1949; Mendelsohn, 1973; Rogers & Storey, 1987) and failures (Hyman & Sheatsley, 1947; Udry, Clark, Chase, & Levy, 1972). Other studies focused on the impact of the media and personal influence, including on voting behaviour during US elections. One such effort was the famous Elmira study of 1948 which found voting is affected by social class, religious background, family loyalties, on-the-job relationships, local pressure groups, mass communication media, and other factors (Berelson, Lazarsfeld, & McPhee, 1986), others looked at the effectiveness of personal influence (Eulau, 1980; Katz & Lazarsfeld, 2009); and voter behaviour (Lazarsfeld, Berelson, & Gaudet, 1948). Media campaigns are a form of socialised education of the community.

The concept of “publics” further contributed to this understanding of collective influence on social and behaviour change. The “public sphere”, as well as their “counter publics” or “fragmented publics”, have played a significant role in our understanding of the social dynamics of behaviour change. The foundations were developed and articulated by Habermas (1989), including that the public sphere was an ideal place between the private sphere of individuals and that controlled by government authorities, where people could meet and discuss issues of public concern. Subsequent analysis by Fraser (1990) and others identified the how excluded or marginalised groups formed their own public spheres, described as “counter publics” or “fragmented publics”. Applied to social issues, researchers have identified the need for “social spaces”, where information and ideas are evaluated in terms of the meaning they have for citizens participating in a public program (Campbell,

2009). This is especially relevant for an issue such as sanitation where the physical and social public space is affected and contested.

Community psychology

Community psychology is useful here as it has historically been focused on understanding individual behaviour in its sociocultural context and working in and with communities to improve their capabilities. As analysed by Trickett (2009) and others, research and intervention domains that describe current work include research on the ecology of lives, the assessment of social settings and their impact on behaviour, culture and diversity during the process of research and intervention. Starting with some of the earliest work in the 1960s, community psychology has been guided by two objectives (Bennett, 1966). The first has been to understand people in their context; the second is to try to change those aspects of the community that restrict the opportunities for people to control their own lives and contribute to an improvement in their community. Community psychology can be described as an ecological perspective with the individual-environment dynamic as the focus of research and action to address a personal or social issue. It examines the social and cultural contexts of communities and the community life of individuals (J. G. Kelly, 1969). In this way it differs from other efforts to change either the individual or the environment to address a problem. Community psychology provides a framework for understanding people in their community context as well as the community context itself. It takes into account a coping and adaptation perspective on a person's behaviour in their community context and assumes that people are active responders to their environments. It takes particular note of the relationships between people with a different cultural histories, skills, resources and personal situations as well as the opportunities, resources, and limitations of the social contexts that affect them (Trickett, 2009).

Looking more closely at the community context, an ecological perspective helps explain social settings and their effects on individuals. Important to this is how we view and assess the community context across multiple ecological levels. This necessarily incorporates an historical perspective on the community context, focusing on the role of cultural and

community history in understanding current community functioning (J. G. Kelly, 1969). Also important is how culture is expressed across the different groups in the community and the role of community resources, social structures, traditions, and norms in influencing individual and group life. Integrating the traditional psychological emphasis on individual differences, an ecological perspective directs attention not only to what is referred to as “main effects”, but also to the interactive effects of social contexts and people representing different social roles, cultural identities and coping styles (Trickett, 2009).

Understanding the ecology of the community and the lives of people within it then affects how interventions are designed and implemented. The general aims of these types of interventions are to increase local ownership and resources in an effort to increase community capacity to improve their quality of life (Trickett, 2009). Understanding the local community is an important prerequisite to decisions about what kinds and intensities of actions serve community goals and interests, and which people, groups, and social settings are most essential to the successful achievement of the action goal. Successful action is grounded in the development of collaborative and empowering relationships with community groups and organisations involved in the intervention process. Determining local attitudes, identifying local resources, defining problems or issues, and aspirations for change are central to this mission. There is a wide range of activities to serve this purpose, from the development and sustained presence of a locally valued program to the development of local skills and networks, including citizen participation mechanisms to advocate for resources. A variety of tools and methods from community psychology have been adapted for use in the field to measure and better understand the impact a community has on its members and vice versa (T.W. Valente & Pumpuang, 2007). One such method is based on the notion of a “Sense of Community”.

Sense of Community

The concept of a psychological “Sense of Community” (SOC) was formally developed by Rappaport (1977) based on his work in mental health. It was further developed by Sarason (1974) and more fully defined by Doolittle and MacDonald (1978); Glynn (1981). The SOC, as

defined by McMillan and Chavis (1986), aimed to “strengthen and preserve the community.” It was based on work done in community psychology and sociology, building on definitions of community advanced by McMillan and Chavis (1986) and others. The McMillan and Chavis definition of SOC has four interrelated elements:

1. Membership: a feeling of belonging and sharing relatedness;
2. Influence: of the individual over the group and vice versa;
3. Needs: fulfilment of the individual’s needs by the resources of the group; and
4. Connection: the belief that group members share personal experiences and emotional associations.

The concept of sense of community brings a psychological perspective to focus on the reciprocal relationship between individuals and the community to which they belong. There is considerable discussion in the literature on how limited or extensive this definition should be (Xu, Perkins, & Chow, 2010). The greatest extent of consensus on what a sense of community means revolves around strong feelings of membership or belongingness to a group, in particular the emotional connections or bonds among individuals based on their shared history, interests or concerns (Fisher, Sonn, & Bishop, 2002; Long & Perkins, 2003; Manzo & Perkins, 2006). The focus has often been on residents in geographic communities. Here the understanding is that such shared emotional connections to one’s community motivate residents to participate in a range of activity, from informal neighbouring behaviour to formally organised neighbourhood development and planning efforts (Putnam, 2007). Evidence of the connection between sense of community and participation has been generally consistent across countries and cultures (Brodsky & Marx, 2001; Fisher et al., 2002; A. Q. Liu & Besser, 2003; Prezza, Amici, Roberti, & Tedeschi, 2001).

The connection between participation and sense of community can be seen to be so close as participation relates not only to membership and shared emotional connection, but also influence and needs fulfilment as the four dimensions of sense of community (McMillan & Chavis, 1986). Whether one prefers a narrow or broader definition of sense of community, the construct clearly relates closely to participation, which in turn influences community

members' shared expectations of the effectiveness of collective action and their feelings of community control (Fisher et al., 2002; Kingston, Mitchell, Florin, & Stevenson, 1999; Sampson, Raudenbush, & Earls, 1997). The evidence indicates that without collective efficacy people are not likely to play an active role in community decision-making; and this participation is key to community empowerment and development (Colombo, Mosso, & De Piccoli, 2001; Long & Perkins, 2003; Ohmer, 2007).

The author has chosen a framework incorporating participation and sense of community as these concepts enable a mixed method approach to analysing the empirical, subjective and relative measurement of a member's attitude or perception of their communities, rather than attempt to measure the objective strengths or characteristics of the community itself. In the case of this study's sanitation program, the members will be the change agents, not the broader community they were tasked to serve. The Sense of Community Index (SCI) has been used as a quantitative measure of sense of community in North and South America, Asia, the Middle East, as well as many contexts, e.g. urban, suburban, rural, tribal, workplaces, schools, universities, recreational clubs and online communities. The latest version, 'Sense of Community 2' (SCI2), has been demonstrated in previous studies to be a strong predictor of behaviours (such as participation) and a valid measurement instrument (Chavis, Lee, & Acosta, 2008; Xu et al., 2010). The SCI will be further examined in Chapter 4 on the methodology developed for this study. With the role of community in mind, this review will now examine multilevel approaches to social and behaviour change to shed light on how approaches combining the individual, community and other elements operate to produce social and behaviour change.

Multilevel approaches to social and behaviour change

As the limited scope of individual-only or community-only focused interventions became apparent, practitioners and policy makers turned their attention to those that enhance individuals' motivation, opportunity and capability for performing desired behaviours while also improving social networks. This was partly encouraged by our growing understanding of how larger social forces (for example, crime rates, healthcare access and income inequality)

influence the structure and function of social networks (Berkman & Glass, 2000). Interventions that seek to harness enhanced social networks within the context of community-based problem-solving efforts hold great promise. One example is the Community led Total Sanitation (CLTS) approach, which underpins the intervention used as the focus for this study. An important consideration in all social and behaviour change interventions is for the strategies to reach across multiple units of practice, for example the individual, family and community (Glanz et al., 2008). The core understanding that supports multilevel or ecological models is that individual and group behaviours have numerous levels of influences, often including intrapersonal (biological, psychological), interpersonal (social, cultural and economic), organisational, community, physical environmental, and policy. Ecological models hold great promise to provide comprehensive frameworks for understanding and acting upon the multiple and interacting determinants of behaviour change.

Social Ecological Model

The social ecological model proposes that individual, interpersonal, community, organisational, and societal factors should be incorporated into the design and delivery of interventions, because they have a variety of direct and indirect influences on behaviour (Israel, Checkoway, Schulz, & Zimmerman, 1994; McLeroy, Bibeau, Steckler, & Glanz, 1988; Stokols, 1996). Ecological models can be used to develop comprehensive interventions that methodically target the various mechanisms of change at each level of influence. These interventions are to be directed at multiple levels but tend to focus on organisational factors, such as policies and practices, and the structure of programs and services, including their coverage, coordination, and linkages across organisations. Four core principles of ecological models are proposed (Glanz et al., 2008):

1. Multiple influences on behaviours include factors at the intrapersonal, interpersonal, organisational, community, and public policy levels.
2. Influences on behaviours interact across these different levels.

3. Ecological models should be behaviour-centred, identifying the most relevant potential influences at each level.
4. Multi-level interventions should be most effective in changing behaviour.

Behaviour change is expected to be maximised when individuals are motivated and educated to make good decisions; environments and organisational policies support positive choices; and when social norms and social support for positive choices are strong (Glanz et al., 2008). One example is with this study's focus on a sanitation program in Indonesia. Influences on sanitation practices range from the physical reaction people have to the presence of faeces, to peer pressure not to defecate in the open, restrictions on waste disposal, and water quality policy – the following Chapter 3 on sanitation in Indonesia will cover this in more detail. These ecological principles reveal in great detail the complex interactions of personal, social, and community elements that are difficult to control in a field experiment. The central goal of experimental approaches—to isolate the effects of an intervention from the effects of its context—may be in conflict with the ecological emphasis on studying how intervention elements are influenced by their context. The real-world challenges of implementing ecological interventions should not be underestimated. The resources (time, funds, people etc.) required to change policies and environments are significant obstacles to program managers tasked to bring about changes to meet government schedules or donor grant timelines. These public policy professionals do not control most environmental, policy and organisational variables and change often requires a political process (Glanz et al., 2008). The following section will move from the theoretical approaches to examine the various intervention models for putting these into action, with a particular focus on participatory approaches to social and behaviour change.

Intervention models for social and behaviour change

Drawing on this range of theories and models developed to account for the role of individual, collective and multilevel influences on social and behaviour change, this review now turns to the different approaches to public policy interventions. This will enable an understanding of the factors that affect the application of social and behaviour change

theories, including participation, competition from exiting behaviours, a lack of community capacity to effect change and the different role of the various actors in the community.

Diffusion of Innovation

The concept of community, or social setting, is one of the key elements examined as part of the large body of work known as diffusion studies, led by the renowned social scientist, Everett Rogers (2003). This evidence is useful as it provides not only a clear and distinct framework for the dissemination of an innovation, e.g. technology or behaviour, but it also provides considerable analysis based on fieldwork that informs the real life implementation of the diffusion model and lays open its strengths and weaknesses. Diffusion is the process through which an innovation is communicated through various channels over time among the members of a social group or community. Diffusion is a type of communication concerned with the spread of messages perceived as new ideas and information. The Diffusion of Innovation (DOI) theory consists of four elements (Rogers, 2003):

1. Innovation: the thing, idea, product, behaviour or service that is 'new';
2. Communication: the process by which information about this new idea is disseminated;
3. Social system: the group of individuals who together adopt an innovation; and
4. Time: the period it takes for those individuals to adopt the new idea.

This research project will focus on the social system as one of its key elements. DOI is based on the idea that people do not just adopt an innovation because it is new, or because someone tells them to. People are influenced by a range of actions and opinions of those around them and embrace new ideas in a time that suits them (Axsen & Kurani, 2010). Processes of interpersonal influence are often absent in behavioural models and research. When they are addressed, these processes are most often conceptualised according to DOI which positions influence as the effect of the flow of functional information among homogenised groups of consumers categorised according to their "innovativeness" (Rogers, 2003). Diffusions of news (awareness-knowledge) differ from the adoption of technological

innovations (knowledge, persuasion, decision and implementation). News diffusion is more rapid than those of technologies associated with medicine, agriculture and education. The Internet and mobile communications are bridging the gap between news and technological diffusion, enabling faster and wider adoption of technologies (Castells, 2007).

DOI is also utilised to add social factors to economic choice models. Several recent studies have empirically measured behaviour changes resulting from increasing technology adoption (Axsen & Kurani, 2010; Mau, Eyzaguirre, Jaccard, Collins-Dodd, & Tiedemann, 2008), word-of-mouth effects (Struben & Sterman, 2008), and information search channels (van Rijnsoever, Farla, & Dijst, 2009). However, some researchers argue that the DOI perspective and its applications can oversimplify and mischaracterise processes of interpersonal influence, particularly in cases of products and services providing social benefits (Axsen & Kurani, 2010). DOI approaches can be strengthened with other theories, especially those that deepen understanding of how processes of influence occur when people are actively engaged in groups.

Participatory approaches

In the context of this study, the concept of participation encompasses a series of approaches to public policy “designed to consult, involve, and inform the public to allow those affected by a decision to have an input in that decision” (L. G. Smith, 1983). NGOs, governments and international donor agencies have adopted a variety of participatory methods in the field of health, agriculture and sanitation, as a result of dissatisfaction with “one-size-fits-all” approaches characterised by top-down interventions. Three modes of participation can be identified from the literature – consultative, collaborative and community-led (Binswanger & Aiyar, 2003; Cornwall & Jewkes, 1995). In consultative participation, beneficiaries of a service or program are consulted in interventions which are managed by the providers, one example is Rapid Participatory Assessment (RPA). Next is “collaborative participation”, which comprises teamwork between beneficiaries and providers in programs designed and managed by the latter, for example Participatory Action Research (PAR). Finally, “community-led participation” aims to develop or improve

recipients' assets and capabilities to control decisional and financial processes of a project, for example Community Driven Development (CDD). These approaches are not mutually exclusive but can coexist in the same intervention (Roma & Jeffrey, 2010). The sanitation project selected for this study can be described as community-led participation, although it draws on additional elements.

The benefits of participation to beneficiaries and program managers alike has been well established (Kolawole, 1982; Narayan, 1994). These include the efficient allocation of resources; the improved knowledge and understanding gained directly from the people who will use the services; improvement of the technology design; greater system sustainability through agreed ownership; and the potential for flow on to other programs and services (Murphy, McBean, & Farahbakhsh, 2009; Roma & Jeffrey, 2010). Criticism of participation stems from experiences where a participatory label has been applied to processes already decided by authorities, where users are treated as passive objects (Cooke & Kothari, 2001; Leeuwis, 2000). Participatory approaches have also been tailored to fit a wide range of issues or sectors, from engaging people living with HIV/AIDS to community based sanitation, which will be further explored in Chapter 3 (Roma & Jeffrey, 2010). How to achieve behaviour change with participation is the subject of the next section.

Social marketing

Social marketing is an interdisciplinary approach, tracing its intellectual lineage through a number of intersecting fields of study. The trajectory includes commercial marketing; diffusion of innovations; the concepts of audience and media effects; social network theory; community psychology and sociology. Social marketing rose to prominence as the formerly distinct roles of the government, private and the community sectors were breaking down and being reconfigured. Some of the drivers were increasing competition for resources and the professionalisation of the public service, as well as recognition that different organisations brought different strengths and resources that could be applied to the pressing public policy issues of the day. Part of this move towards efficiency, partnerships and collaboration from government included a testing, appropriation and mainstreaming of

concepts, models and techniques from the private sector. The success of global companies such as Unilever and Coca Cola as well as advertising and public relations agencies such as Ogilvy and McCann, attracted many to the power of marketing and its theoretical and practical applications to social and behaviour change (W.D. Evans & Hastings, 2008; Jeff French, 2010; Lefebvre, 2013).

Marketing itself is a “social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others” (Kotler, Roberto, & Lee, 2002). Prominent in the models and practice of commercial marketing are the theories of value exchange (cost-benefit) and those of the behavioural sciences (Bagozzi, 1975). The aim of marketing is to build a relationship between the consumer and a brand, which may include a product, service or experience. Practitioners often refer to the marketing mix, which is the set of variables that can be manipulated to achieve the marketer’s aims. These are also referred to as the "Four Ps" – product, place, price and promotion (McCarthy, 1960). A prominent element of both commercial and social marketing is segmentation. A market segment is a grouping of people or organisations with one or more similar characteristics, including behaviours, age, education and gender (Dickson & Ginter, 1987; W. R. Smith, 1956). Since 1952, when G. D. Wiebe asked the question, “Why can’t you sell brotherhood...like you sell soap?” (Wiebe, 1952), social marketers have attempted to answer it by developing and testing commercial marketing models and applying them to social issues.

Social marketing has enjoyed an expanded application in rich countries, including Australia, North America and Europe on issues such as alcohol use, smoking, littering, heart disease, recycling, youth development and elections (Jeff French, 2010). This apparent success in rich countries gave rise to questions about its applicability in other part of the world in the hope that it could hold the key to major advances on complex issues relating to poverty, injustice and disadvantage. Since 1965, when a report to India’s Central Family Planning Board recommended how existing marketing resources of the private sector could be marshalled behind family planning drives (Chandy et al., 1965), poor and emerging countries have applied social marketing to micro-credit, infectious disease, climate change, human rights

and education. According to Walsh and associates (1993), “early health applications of social marketing emerged as part of the international development efforts and were implemented in the third world during the 1960s and 1970s. Programs promoting immunisation, family planning, various agricultural reforms, and nutrition were conducted in numerous countries in Africa, Asia and South America during the 1970s...The first nationwide contraceptive program social marketing program, the Nirodh condom project in India, began in 1967 with funding from the Ford Foundation” (Waisbord, 2001).

However, the evidence for the success of social marketing, in both rich and poor countries, is mixed and raises questions around its cultural, economic and sociological relevance in different communities in a variety of socio-economic settings (Andreasen, 2006). Some researchers dismiss marketing and believe it contributes to underdevelopment of communities and associated problems (Thorelli & Sentell, 1982). Other analysts of social marketing point to an insufficient emphasis on the influence of local and cultural factors in success with target communities (Minja et al., 2001). An example of this in practice is Indonesia’s ‘Fantastic Mom’ project, which aimed to reduce the incidence of diarrhoea through promoting hand washing with soap. The campaign appeared to work better in some communities than others, despite these communities having similar socio-economic characteristics (Goodwin, 2010).

Discussion of these campaigns within the literature often revolves around what makes one campaign more effective than another – and how to measure this impact. Some studies show a positive impact of mass media campaigns. Neighbors, Larimer, Lostutter, and Woods (2006) and others show that peer education approaches are an effective method (Flynn et al., 1994). The notion that campaigns need to be tailored to the intended audience is much debated, including that, “there is an urgent need for culturally appropriate, evidence-based strategies that can be communicated in credible and effective ways” (Bleeker et al., 2009). Particular attention is focused on the role that certain behaviours and associated products play in the lives of young people, “Not only do young people form their identities through consumption but the psychology of consumption is centred on the search for gratification, integration and identity formation” (Grace et al., 2009). Other research has shown that

social marketing campaigns should use as a starting point the strategies already employed by people to manage and avoid their own risk (Measham & Brain, 2005). Two key elements of successful community based campaigns identified by (Borlagdan et al., 2010) are ownership of the initiative by the target audience and tailoring approaches to the community. This approach is in line with the World Health Organization's Commission on the Social Determinants of Health requirements for the combination of people's consensual participation in health promoting practices, and the provision of social and economic environments to support it (WHO, 2014).

Leading models include that developed by Andreasen (2002) with his six points for effective social marketing and the UK's National Social Marketing Centre's eight benchmark criteria, led by J. French and Blair-Stevens (2006). Several key elements for effective social marketing can be distilled from these models:

1. The importance of **customer orientation**, rather than top-down approaches, putting the individual at the centre of the intervention;
2. **Insight** based on formative and behavioural research, using proven theoretical approaches;
3. Clear and measurable **behavioural goals** for an intervention, not broad policy priorities or political statements;
4. An understanding of the consumer's **barriers and benefits** to the change, leading to creation of intrinsic and extrinsic value, often through the creation of **brands**, for which the intended recipient is willing to **exchange** resources (money, time etc);
5. A **mix of methods** for communications activities, e.g. media and traditional forms of communication, as well as adjustments to price and promotion of products, services and behaviours; and
6. Accounting for **competition** from current and opposed interests and behaviours as well as from other public issues.

One of the major criticisms of social marketing has been the absence of the role of community in facilitating behaviour change. This has been addressed to a degree by the work of Doug McKenzie-Mohr and his Community Based Social Marketing (CBSM) model

(McKenzie-Mohr, 2000, 2011); as well as Carol Bryant and her Community Based Prevention Marketing (CBPM) model (Bryant, Forthofer, Brown, & McDermott, 1999). Community-based social marketing is composed of four steps: 1) uncovering barriers to behaviours and then, based upon this information, selecting which behaviour to promote; 2) designing a program to overcome the barriers to the selected behaviour; 3) piloting the program; and 4) evaluating it once it is broadly implemented (McKenzie-Mohr, 2000, 2011). These models refer to community in a similar way to participatory approaches to public policy, others focus on how to organise and build the community's capabilities to impact social and behaviour change.

Community organising and community building

Community organisation is considered important in behaviour change and especially in community development, because it reflects one of the most commonly referenced principles, that of "starting where the people are" (Nyswander, 1956). Community organising is an approach through which community groups are engaged to identify common problems or priorities, mobilise resources, and design and deliver plans to reach goals they have set together (Minkler, 2005). The use of the related concept of community building has arisen as a way to highlight the methods by which members of a community work together to bring about change (Blackwell & Colmenar, 2000; Minkler, 2005). Common to both community organising and community building is the concept of empowerment, which can be seen as an enabling process through which people or communities assume greater control over their lives and environments (Rappaport, 1984). Zimmerman (2000) has described the key elements of empowerment as consisting of, "participation, control and critical awareness", and including both the processes of social change and outcomes of transformed conditions (Glanz et al., 2008; Wallerstein, 2006).

The evidence shows the designers and deliverers of interventions who begin with the community's expressed needs is more likely to be successful in the change process and in fostering true community ownership of programs and actions (Eng, Briscoe, & Cunningham, 1990; Link & Phelan, 2000; Rappaport & Seidman, 2000; Wallerstein, 2006). From this work

it can also be seen that involvement and participation can themselves be significant factors in improving perceived control, empowerment, individual coping capacity, behaviours, and social wellbeing. The increasing emphasis on community partnerships and investment in community-based interventions by government agencies and other organisations suggests the need for further refining theory, methods, and measurement techniques (Glanz et al., 2008). This study will look at the role of change agents as part of community building efforts that aim to address the complex issue of sanitation, drawing on a related concept of community capacity building.

Social capital and community capacity building

Interventions that engage community members to identify and address common problems may also contribute to the strengthening of existing social networks and other capabilities (Boutilier, Cleverly, & Labonte, 2000; Rothman, 2001). This type of intervention uses a variety of community organising and community building techniques with the aims of: (1) improving a community's capability to address its own problems; (2) increasing the community's role in decision making that affects community life; and (3) addressing particular issues. Through participating in shared problem-solving processes, community members develop new relationships and strengthen existing ones (Rothman, 2001). For example, the NSW Health alcohol harm prevention campaign, 'What are you doing to yourself?', mentioned earlier, is supported by Community Drug Action Teams (CDATs). The CDATs are coalitions of representatives from government and non-government agencies, community, volunteers and local business and welfare organisations set up to respond to the impact of alcohol and other drugs in their community. CDATs work to reduce the local impact of alcohol and other drug problems by identifying gaps in services and working with organisations and other community groups on local projects. Common types of activities include research, community consultation, media outreach, information sessions, events and partnerships (NSWHealth, 2011). These CDATs are designed to build community capacity through the development and deployment of social capital and other resources.

Linked to the concept of empowerment is the idea of community capacity (or capability), defined as “the characteristics of communities that affect their ability to identify, mobilise, and address social and public health problems” (Goodman et al., 1998). Several key elements can be identified for community capacity: participation, support networks, skills and resources, leadership, sense of community, values, critical reflection and access to power. These elements of community capacity have been drawn from similar concepts, such as “social capital” and “community competence.” Community competence was defined by Cottrell (1976) as “the various component parts of the community being able to collaborate effectively on identifying the problems and needs of the community; to achieve a working consensus on goals and priorities; to agree on ways and means to implement the agreed upon goals; to collaborate effectively in the required actions.” Social capital, which can be traced back to studies in political science, has been defined as the characteristics of social organisation that facilitate coordination and cooperation for mutual social and individual benefit (Putnam, 1995, 1996, 2007). Similarly in sociology, social capital is regarded as a resource produced by the structure of social relationships that enables achievement of particular goals (Coleman, 1988).

Lack of social capital in some communities has been correlated with poor health status and quality of life (Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997; Kim & Kawachi, 2007). When it comes to designing and implementing interventions, early work on understanding and developing social capital had been predominantly viewed as a more-or-less equal relationship between neighbours or other members of a community, with key variables including trust, reciprocity, and civic participation such as in voluntary organisations, soccer leagues and parent-teacher organisations (Kawachi et al., 1997; Kim & Kawachi, 2007). More recent work has explored the importance of linking sources of social capital, connecting people across social boundaries and across levels of power and within hierarchies (Szreter & Woolcock, 2004). Another key feature of strong community capacity and one of the keys to building group capacity and effectiveness is leadership. Gutierrez, Lewis, and Minkler (2012) asserted leadership development may be especially significant where “a unidirectional outreach approach” often regards such communities as “targets of change rather than active participants and collaborators.” Social and behaviour change programs must take into

account the long-term capabilities of the beneficiary community, in particular key members who act as change agents, in order to sustain individual behaviour change as well as strengthen supportive social norms.

Change agents as the primary focus

As discussed earlier, social networks and social support are important to consider in the context of community capacity building. Social network techniques may be used to identify change agents or leaders within a community, as well as high-risk groups, and may involve network members in undertaking the community assessment and actions necessary to strengthen networks within the community. This work on community capacity building and social capital, combined with the earlier discussion on individual and collective approaches to behaviour change, reveal a consistent element. That element is the change agent. The influences on the participation of change agents in social and behaviour change programs are critical to understanding how to engage them. Examining the evidence on the participation of change agents will shed light on a gap in the literature that provides the impetus for this study.

The intersection of concepts and models of sense of community, diffusion, capacity building and participation have been described as follows by A. Q. Liu and Besser (2003). At the juncture of these concepts are cross cutting networks of relationships between people, groups and organisations. The networks facilitate people interacting with each other and developing relationships. If these relationships are to be sustained over the long term, the people involved must come to understand and trust that others in the same group will help them out if the need arises, and will not take advantage of them. During this process, norms of cooperation and reciprocity, as well as expectations about appropriate individual and group behaviours, will evolve. The group supports an exchange of information about each individual member's compliance with the norms, and disciplines those who deviate too far from expectations. In those communities with high social capital, members develop a higher sense of community. They are also expected to contribute to the common good of the community, and can trust that over the long term the costs and benefits of participation will

even out. This type of community often develops monitoring systems which encourage participation and discourage destructive elements or those who benefit without contributing something themselves (A. Q. Liu & Besser, 2003).

These close ties, trust, and norms of reciprocity within a community may be related to participation for that particular group or individuals in that group, but may be unrelated to or even hinder participation for the rest of the community (A. Q. Liu & Besser, 2003; Paxton, 1999; Portes, 1998). While sense of community might be valuable in facilitating certain kinds of participation, it may be useless or even harmful for others. It is useful, therefore, to examine whether findings about one kind of participation can be generalised to all kinds of participation. This research project, therefore, proposes to examine the nature of the relationship between sense of community and the participation of change agents in a social and behaviour change project. A framework based on the analysis will assist researchers and managers of social and behaviour change programs to tailor their programs to suit different communities, thereby augmenting their effectiveness and increasing their impact. The following are the proposed hypotheses to be tested in this study.

Hypotheses

This study will focus on a specific sub-group within a community, i.e. the change agents selected to evangelise and facilitate change. Research has established the important role of change agents in the success of programs designed to achieve behaviour, social and organisational change (Finlayson, 2007; Graham, 2011; Hystad & Carpiano, 2012; Xu et al., 2010). Additionally, extensive work has been done to develop approaches and methodologies to identify and select change agents and opinion leaders (Axsen & Kurani, 2010; Hamilton, 1988; Kempe et al., 2003; Kohler & Strain, 1990; Tichy, 1974). A consistently strong theme in the community participation literature has been efforts to identify characteristics most likely to be associated with people who are active in their community. Some of these results consistently show that members of a community with higher incomes and levels of education are more likely to participate (Hayghe, 1991; Hodgkinson, 1995; A. Q. Liu & Besser, 2003; Verba, Schlozman, & Brady, 1995). How long someone has lived in a

neighbourhood is another factor that has been positively associated with community participation (Schiff, 1990; Steggert, 1975; Verba et al., 1995).

Much of this work has focused on understanding the demographic, socio-cultural and cognitive factors that influence the success of change agents. This project will focus instead on the psychological responses that change agents have towards the communities in which they are active. It will examine whether their psychological sense of community has a relationship with their impact on behaviour change programs. Earlier work has established the Sense of Community Index (SCI) as a robust measure of the psychological sense of community of a member towards a nominated group (Glynn, 1981; McMillan & Chavis, 1986; Sarason, 1974). Recent work has shown that a sense of community is a predictor of social and behaviour change (Chavis et al., 2008; Fisher et al., 2002; Tartaglia, 2006).

Taking as the starting point this evidence on change agents, participation, sense of community as well as behaviour change and health impact, the following were developed as the hypotheses to be tested in this study. The purpose in using multiple hypotheses is to provide the direction for collection of data on a variety of variables that may provide the material for insight into the effects on a change agent's effectiveness.

H1. There will be a significant variance in the Sense of Community Index scores of change agents across different project locations.

The study first tested whether there is a significant variation in the SCI scores for the change agents across the three High Five project locations – Surabaya, Makassar and Medan. This was intended to confirm the SCI as a valid measure of SOC as well as reveal the nature of the variation in each project location.

H2. Change agents with a higher sense of community will participate in more community outreach activities.

H3. Change agents with higher previous levels of participation in community outreach activities will have higher participation rates in the future.

Hypotheses #2 and #3 were tested to analyse the role of previous participation and Sense of Community as predictors of participation in the High Five outreach activities. These hypotheses were tested through a mix of quantitative and qualitative methods to enable a triangulation of the results.

H4. There will be higher rates of behaviour change in communities in which change agents with a higher sense of community are active.

H5. There will be greater health impact in communities in which change agents with a higher sense of community are active.

Hypotheses #4 and #5 were tested to determine whether those change agents with higher SCI scores in the three project areas corresponded with the areas experiencing higher rates of individual and household behaviour change as well as health impact. It was not possible to analyse the direct effects of the change agents' participation in outreach on behaviour change and health impact.

This study sought to produce new understanding of the experience and impact of change agents based on the results of testing the hypotheses. The nature of experimental approaches to research is that general theories are applied to specific, "real life" situations in order to test proposed hypotheses and answer research questions. Given this study's focus on a sanitation behaviour change program in Indonesia, the following Chapter 3 will review sanitation and related programs in Indonesia. This will provide the context for the study to be conducted, but also set the scene in terms of the key debates and issues around sanitation, behaviour change, participation and community development.

CHAPTER 3. SANITATION IN INDONESIA

Sanitation Worldwide

Despite many years and many billions of dollars spent by governments, international agencies, businesses and local organisations, in 2014 the World Health Organization (WHO) reported that 2.5 billion people, less than 1 in 3, still lack access to adequate sanitation worldwide. One billion people practice open defecation, nine out of ten in rural areas. 748 million people lack access to adequate drinking water and it is estimated that 1.8 billion people use a source of drinking water that is contaminated by faecal matter. Hundreds of millions of people have no access to soap and water to wash their hands, which prevents them from blocking the spread of disease. In July 2010 the United Nations recognised the human right to sanitation (U.N. Resolution 64/292), however achieving that has presented serious challenges. One of the starkest illustrations is that the international community will fail to achieve the Millennium Development Goal to halve the proportion of people without access to sanitation between 1990 and 2015 (WHO/UNICEF, 2014). The good news is the number of children dying from diarrheal diseases, which is strongly associated with unsafe water, inadequate sanitation and hygiene, has fallen over the two last decades from approximately 1.5 million deaths in 1990 to just above 600,000 in 2012 (WHO, 2014).

Sanitation in Indonesia

Indonesia's population of more than 245 million people makes it the world's fourth most populous country. Just under half of this population lives in urban areas, which in 2011 was growing at an annual average of 3.3 per cent. Therefore, the proportion of people in urban areas, and their need for sanitation services, is growing rapidly. In Indonesia, more than 72.5 million people still live in unhealthy hygienic conditions, with 18.2 per cent in urban areas and 40 per cent in rural areas. Historically in Indonesia, wastewater management has been viewed as the responsibility of the household or private sector. As a consequence, public investment in sanitation infrastructure or services has been limited (YCCP, 2014). Following independence in 1945, the main focus of the new Government of Indonesia was on building the nation and achieving economic growth, while providing basic services was not a priority

for public expenditure. Concerns about health and welfare impacts on economic development increased in the 1970s, leading to increased investment in health programs, including limited investment in sanitation infrastructure projects (Kearton, 2013).

For middle-income countries with large populations living in poverty, like Indonesia, economic losses from poor sanitation practices are an important negative impact to consider. In 2007 alone the annual estimated expenses in Indonesia related to waterborne disease was IDR58 trillion (AUD5.8 billion). This amount is equivalent to 2.3 per cent of the country's GDP (Gross Domestic Product), spent on treatment of the diseases as a result of poor water and sanitation. In urban areas people can pay as much as IDR275,000 (AUD2.75) a year for health treatment; in rural areas IDR224,000 (AUD2.24) per year. With a total average annual per capita expenditure of IDR10,837,020 (AUD4,300) in urban areas in Indonesia, this represents a significant part of household expenditure (BPS, 2013). In 2008 the total economic impact of water pollution due to poor sanitation infrastructure and practices reached IDR14.9 trillion (AUD1.4 billion) (WSP, 2008). When hygiene and health behaviours are changed and sanitation improved, these resources can be diverted into more productive economic activities to improve the wellbeing of the poor (YCCP, 2014).

Despite increasing interest in sanitation and the benefits it brings to health, the economy and environment, public investment in coverage of sanitation infrastructure and services in urban centres in Indonesia is still very low. Between 1970 and 2000, national government spending on sanitation averaged just IDR200/person/year (AUD0.02). Before 1980, only four cities had centralised sewerage systems that were constructed during the Dutch colonial period. By 2012 still only twelve cities out of Indonesia's 98 municipalities had centralised systems. Most of these cover only a small part of the urban areas and are under-used by the local communities, often due to expense and location. For example, in Jakarta, the nation's capital and largest city, with an official population exceeding 10 million inhabitants (the larger Metro Jakarta is over 28 million people), the city's sewerage system covers only about 2 per cent of the city population with a focus on commercial connections to hotels, apartments and offices in the central business district (Kearton, 2013).

Diarrhea is a major public health problem in Indonesia and its prevalence is linked directly to sanitation infrastructure, services and behaviours. Indonesia's national prevalence rate of diarrhea is 11 per cent, and it is one of the top three killers of children under five (YCCP, 2014). The evidence suggests that personal hygiene and sanitation practices are important factors in reducing illness from diarrhea. The key behaviours and practices associated with diarrhea prevention include use of proper toilets, handwashing with soap, safe drinking water and proper management of wastewater and solid waste from households. Importantly, caregivers who do not practice these behaviours also place their children at risk (Fewtrell et al., 2005).

While toilet use is common in many urban areas of Indonesia, more than 60 per cent of toilets dispose of the faeces through poor plumbing systems or to open spaces (e.g. rivers, drains or streams) or to unsafe (leaking) septic tanks (ISSDP, 2007). Because of the high prevalence of toilets that discharge directly into water courses and to household septic tanks that are never properly emptied, local groundwater pollution has contributed to Indonesia having an infant mortality rate in low-income areas nearly double that of other low- and middle-income countries in the Asia Pacific region (121 per 1,000 versus 59 per 1,000). The country also suffers from disproportionately high incidence of typhoid, also linked to poor sanitation, for its region and income level (WSP, 2009).

According to the World Bank's ISSDP program, septic tank emptying businesses are common in Indonesia's urban areas, but many of them dump sludge directly into rivers without it being treated. All six municipalities that participated in the ISSDP program had a sludge treatment plant, but these operated below capacity or not at all, for a variety of reasons including low demand and difficulties with access by vehicles (ISSDP, 2007). Some of the treatment plants were provided at waste disposal sites and where these are some distance from the centre of populations, transport costs could be an additional barrier to users. Widespread in Indonesia is the informal collection of household waste on payment but at least one third of urban households do not receive this service. In those places where waste is collected, large amounts of it are burnt (often in residential or communal areas), or dumped randomly at unofficial sites not serviced by the municipality. There are too few

formal secondary collection points and final disposal sites. While sanitary landfill has taken place, it is not normally practiced in Indonesia (WSP, 2009).

The lack of public investments means that households and small businesses have provided most of the infrastructure and services. The use of water-based toilets is common in urban areas, with a toilet found in around three-quarters of urban households. However, very few households dispose of wastewater safely, partly due to weak local government management and regulation. Many toilets in Indonesia are connected to pits known as *cubluk*, or to septic tanks that are badly constructed, rarely emptied, and allow untreated or partially treated wastewater to seep and flow into groundwater sources or into open drains and canals. Other households have toilets that use a waste pipe to discharge directly into drains and canals, or are basic 'overhung' toilets whereby a simple screen or shelter is built inside which people defecate directly into the water (WSP, 2009).

Regular handwashing with soap is quite rare in Indonesia, although soap is available in nearly every home. ISSDP surveys found that around 44 per cent of respondents in six cities never wash their hands with soap (WSP, 2009). In another major study it was reported that more than 95 per cent of mothers in South Sulawesi, East Java and North Sumatera washed their hands before preparing meals, but it was not clear if soap was used (BPS, BKKBN, Kemenkes, & ICF, 2013). Other sources of data showed that while the majority wash their hands at critical times, they do not use soap, thus missing out on the full protective effect of hand washing. Some evidence shows this to be based on social norms of not using soap, other have shown that the lack of visible dirtiness (in effect: "my hands look clean") leads to reluctance to use soap. Negative beliefs around the value of hygiene are another reason proposed for the limited practices of hand washing with soap and use of sanitation services (Rimbatmaja et al., 2007).

According to YCCP, safe water practices in Indonesia, including water treatment and proper storage, are also limited. As mentioned previously, studies conducted in various areas of Indonesia found that more than 90 per cent of Indonesian households boil their drinking water. However, in 45-65 per cent of the households, the treated water was contaminated

with the bacteria *E. coli*. Unsafe storage and poor practices for water handling were suspected to be the causes of the recontamination of boiled water. Limited infrastructure is one crucial barrier to the improvement of hygiene practices related to solid waste and waste water management in Indonesia (YCCP, 2014). One USAID-funded survey found that the poor households in urban areas were buying water from private sellers at 15 to 30 times the tariffs of the public utility. Many of them were unable to connect to the public supply due to a lack of formal land tenure and the high up-front cash costs (WSP, 2009).

A major constraint in Indonesia's urban areas is the limited space available in dense settlement areas for proper infrastructure and services, especially septic tanks. For example, in Jakarta the great majority of shallow wells (90 per cent) are contaminated with *eColi* bacteria due to their close proximity to leaking septic tanks. Some NGOs, such as Mercy Corps and Borda, have pioneered the development of collective septic tanks and latrines with improved designs. These organisations have also supported the development of small collection vehicles and carts, which can enter the small alleys that the larger trucks cannot (YCCP, 2014). Additionally, many urban areas in Indonesia do not have proper drainage, and in some areas there is regular and extensive flooding. Significant amounts of sewage and uncollected garbage worsen the problems of already struggling drainage systems. Poor sanitation in both rural and urban areas has had major impacts on health in Indonesia, these consequences are most acute for the poor, who can least afford to allocate additional resources to make up for the lack of government investments in basic infrastructure and services.

Since Indonesia's regional autonomy laws were enacted in 2001 (particularly Law No. 32 on Regional Autonomy), sanitation was no longer a matter for the central government, but became the responsibility of local government in each district and municipality. However in reality many district and municipal governments did not have the capabilities or the resources to manage and solve sanitation and hygiene issues on their own. In addition, often sanitation and hygiene issue were not a priority in the development program of those districts and municipalities. As a result, solving the sanitation problem is becoming urgent in order to liberate poor urban people from waterborne disease and thus eliminate threats to

their economic productivity and prosperity. Usually the treatment of and recovery from waterborne disease requires considerable financial and human resources, leading Indonesia to shift its emphasis from a curative to a preventive behaviour approach (YCCP, 2014).

Sanitation programs in Indonesia

A number of sanitation and hygiene programs have been implemented in recent years in Indonesia, including STBM programs in both urban and rural areas. These have focused on a range of intervention areas, including infrastructure, policy, governance, behaviour change and community mobilisation. STBM programs implemented by the Indonesian Ministry of Health and other national and local government agencies include: Community Water Services and Health Project (CWSHP), Water Supply and Sanitation for Low Income Communities (WSSLIC), PPSP (Road Map for Acceleration of Urban Sanitation Development), and PAMSIMAS (Community Based Water Supply and Sanitation Project). The World Bank's Water and Sanitation Program (WSP) has funded a number of sanitation projects including the TSSM (Total Sanitation and Sanitation Marketing) and WASPOLA (Water and Sanitation Sector Policy Formulation and Action Planning Project). International non-profit programs include World Vision Indonesia (WVI) with their sanitation program in West Aceh regency; PLAN International with their projects in East Java and NTT provinces, and Mercy Corps with their PUSH (Program of Urban Sanitation and Hygiene Promotion) in Jakarta.

As mentioned earlier, the Indonesia Sanitation Sector Development Program (ISSDP) was designed as a response to the growing sanitation crisis in Indonesia. Funded by the Dutch Government and the Swedish Agency for International Development (SIDA), ISSDP is a partnership between the Government of Indonesia and the World Bank Water and Sanitation Program (WSP). Rather than funding new investments directly, it aims to help build an enabling environment for sustainable progress in the sanitation sector, including emphasis on planning, capacity building and institutional arrangements at the city and provincial levels; policy and strategy at the national level; plus advocacy and awareness-raising at all levels. These activities are all focused on achieving local ownership of sanitation challenges and solutions (WSP, 2009).

Is Community Led Total Sanitation (CLTS) the answer?

International organisations and national governments have spent many years trying to solve these sanitation challenges, especially open defecation, by providing and funding toilet building and extensive education programs. By and large, these have failed to achieve the desired results and impact. These programs therefore, as well as their funders, have been heavily criticised for pouring funds into the sanitation hardware, with poor participation by communities and little, if any, change in the corresponding health statistics. A series of failed projects, combined with continuing underfunding and lack of political commitment on the part of many governments, resulted in state of desperation. This gave rise to an enthusiasm for new, bold approaches that can deliver results and make a real difference to people's access to sanitation (Galvin, 2015).

As one of the most promising responses to this situation, Community Led Total Sanitation (CLTS), was presented as the embodiment of the ideal that communities should, and want, to be in the driving seat of their own development. The CLTS approach attempts to remove outsiders from the process, other than as facilitators who 'trigger' community responses. Instead, full responsibility for sanitation is in the hands of communities where CLTS interventions are to be implemented. To play this role, the community needs to ensure that households are prepared and mobilised to build their own toilets using their own resources, and that accepted leaders, both formal and informal, emerge to mobilise, monitor and help sustain progress. CLTS utilises established participatory techniques, such as transect walks and community mapping. A transect walk is a systematic walk along a defined path (transect) through the targeted area together with the local people to explore and understand the water and sanitation conditions by observing, asking, listening, looking and, finally, producing a transect diagram which acts as a map for the intervention (Chambers, 2009). As part of this process, CLTS facilitators 'trigger' communities to recognise and acknowledge the links between sanitation and disease. The community then uses the information gathered to develop a plan for each household to build a toilet, so that eradication of open defecation is 'total'. One of the unique cornerstones of this approach is

that no subsidies are provided and no external expertise is used – community members design, lead and manage their work together (Galvin, 2015).

CLTS was developed according to a set of principles that challenge how development organisations have operated for many decades. Galvin (2015) has synthesised numerous sources to provide a summary of the required changes in attitudes, behaviours, policies, and practices that underpin these CLTS principles:

Outsiders neither ‘persuade and motivate’ nor do they teach/educate or tell people what to do. Instead their role is one of ‘facilitating, empowering and enabling communities to reach their own conclusions’. The message is ‘it’s up to you and you decide’.

Outside solutions and standards are not imposed in a top–down or standardized way. Instead, the focus is on bottom–up diversity that produces ‘local solutions’, ‘people design’, and ‘context-appropriate innovations’.

The approach moves from ‘we must help/subsidise the poor’ by building latrines to ‘communities can do it’. Spending is on facilitators and processes, with low budgets, rather than bigger budgets for hardware to meet disbursement targets.

Instead of counting latrines or focusing on individual behaviour change, the approach is one of ‘social solidarity, co-operation, and collective action’. It is Open Defecation Free (ODF) communities that are counted.

The shift from ‘sanitised words to crude ones’ is immediately apparent; CLTS uses local translations of ‘shit’ rather than polite euphemisms.

Finally, instead of ‘being sensitive to cultural norms and taboos’, it is up to communities to ‘deal with them’.

Galvin (2015, p. 11)

Put together, these principles underpin an approach that emphasises a person's or household's rights and responsibilities around living in a totally clean environment. CLTS is therefore fundamentally participatory in nature and facilitates communities to take a strong role in ensuring every member understands and owns the implications of poor sanitation practices. The CLTS methods aims to unify the community to publicly commit to using proper toilets and adopting healthy behaviours. Underlying this is the community's understanding that this process is a shift towards a zero subsidy/grant approach rather than one that provides them with the money to construct toilets and septic tanks etc. Once 'triggered', the aim is for adults and children to become personally and enthusiastically involved in the management of their own sanitary wellbeing. Through their participation, all community members jointly undertaken the process of planning for an open defecation community, which is facilitated by CLTS implementers (Galvin, 2015).

Triggering is the unique contribution of CLTS, catalysing community action that results in quick construction of toilets and septic tanks etc. that enable them to achieve ODF status. The facilitator decides how to trigger the community, however the key elements of triggering are standard. At the start, there may be a discussion of the health status of the community, including relating to defecation practices. The facilitator requires that participants use the local equivalent of the word 'shit', despite any of their concerns around taboos or reference to social norms. S/he then uses participatory tools to raise the people's awareness of the community's faecal status. Galvin (2015) provides a useful summary of the triggering process:

- 1. Participants take the facilitators on the 'walk of shame', a transect walk to the areas where people defecate openly. Instead of a quick glance, the facilitator pauses to have a discussion there, which forces people to see and smell their shit. The upsurge of embarrassment often drives people to want to stop open defecation immediately.*
- 2. Participants draw a map that locates where people openly defecate.*
- 3. Having gathered a bit of shit surreptitiously during the transect walk, the facilitator illustrates fecal–oral contamination visually by silently placing an object with a small*

amount of shit in water and near food, allowing flies to dart between the two. There is nothing more simple and clear to convey the implications of open defecation for everyone's health.

- 4. Facilitated with humour, participants calculate the amount of shit that the community produces annually.*

Galvin (2015, p. 11)

Kar and others consider this process to have the power of a “sanitary mirror” that enables people to see their own unhealthy lifestyle and spark an ignition process that leads to individual behaviour change and change in social norms (Kar & Chambers, 2008; Mehta, 2008). It is believed to cause a surge of various emotions in those participating in the exercise, including feelings of embarrassment and disgust. The people present are intended to individually and collectively realise the terrible impact of open defecation on their health and that of their families, friends and the wider community. The consciousness that they are literally consuming one another's *shit* mobilises them into initiating collective local action to improve the sanitation situation in their community. When it is clear that the community, represented by a number of the accepted leaders, is committed to taking steps to eliminate open defecation, and the harm it brings, the facilitator then leaves the group to develop its own plans to construct toilets using available resources. In its purest form, aside from safety information on basic toilet location, no external resources or expertise are provided, e.g., training on construction, building materials or subsidies.

The role of community and change agents in CLTS

The original premise of CLTS is that it is ‘community-led’. Yet the catalyst of CLTS, the idea and the spark in a community, comes from the outside. It is therefore more accurately described as outsider-driven but community-led (Galvin, 2015). In its purest form, CLTS tends to assume an ideal state of the ‘community’ and treat it as a homogenous blank slate that can be triggered to take up the sanitation challenge. This notion of an ideal community is one that helps its poor, aged and disadvantaged and will find local knowledge and resources to build toilets, championed by natural leaders who emerge due to a sense of

duty to those around them. In reality CLTS must engage with the entire complexity of the concept of 'community', its heterogeneity, elitism, and messiness. Indeed, the impact of CLTS interventions is highly dependent on the nature of individual communities and the people who constitute them, include trusted change agents.

The emphasis of the CLTS approach is on community engagement to ensure that households begin to build toilets. To achieve this, it is expected that leaders (change agents), who are acceptable to the community, will emerge to assume the tasks of monitoring progress and promoting maintenance of the toilets. These change agents are ideally passionate, trusted and dedicated to achieving and maintaining ODF status in their community. Typically, such leaders develop a relationship with outsiders from government and other agencies who rely on them for progress reports and often include them in trainings. This provides the change agents with a direct benefit in terms of qualifications, experience, and networks that can assist them to improve their income and standing in the community. This benefit muddies the water in terms of the idea that the pure CLTS approach has neither external interference nor incentives of any kind. For some this may not be a direct enough benefit and they may lose interest as they are not paid. Additionally, a change agent's initial enthusiasm and commitment may decrease over time, especially as demands on their time and other resources arise from existing and new opportunities and commitments (Galvin, 2015). There are also other challenges that arise from the deliberate and decisive decision to preserve the community-led nature of this approach to sanitation.

Galvin (2010) showed that this type of community-led intervention can exacerbate and reinforce existing cultural and socio-political dynamics at the local level. Community-led interventions can inadvertently cause harmful consequences such as damaging the very social capital that development organisations claim to support. Or it may reinforce class divisions or result in stigmatisation. Community-led interventions have impacts on relationships between young people and elders, men and women, and rich and poor. Naturally, unintended consequences may also be positive, strengthening community leaders' sense of agency or increasing the sense of community around a positive experience of working together, which could lead to other individual or community benefits. One way

of addressing this is by introducing CLTS in areas with socio-political dynamics that will more likely permit its positive use. Another is by having an independent group monitor developments to avoid possible human rights violations and to intervene in support of the community if needed. Both of these suggestions affect the original position of CLTS that having outsiders playing a mediating or moderating role compromises its community-led nature (Galvin, 2010).

While outside facilitators and a few community leaders need to be convinced that CLTS can improve the community's wellbeing, its actual impact will depend on how local conditions, cultures and contexts affect the translation of the general model for local application. We will now examine this process of adapting these concepts along with long-established local practice in Indonesia.

Community Based Total Sanitation (STBM) in Indonesia

CLTS spread quickly in Bangladesh with the cooperation of the national government and international non-governmental organisations. The WSP (Water and Sanitation Program) from the World Bank played an important role in disseminating this approach in India, Indonesia, and some African countries. Hearing of the successful implementation of CLTS in Bangladesh and India, representatives from several Indonesian ministries and some sanitation practitioners visited both countries to learn more about CLTS. Kamal Kar was invited to Indonesia to assess whether or not the CLTS method would be applicable to Indonesia (CLTS, 2015). By this time Indonesia faced the reality that the traditional approach to sanitation (relying on infrastructure and subsidies) had not achieved the required scale of success to change the unhealthy habits of its people.

The Government of Indonesia enthusiastically embraced CLTS and followed up the Kar visit by initiating pilot implementation of CLTS in six districts: Lumajang, East Java; Sumbawa, West Nusa Tenggara; Sambas, West Kalimantan; Muara Enim, South Sumatera; Muaro Jambi, Jambi; and Bogor, West Java. Kar was tasked to train officials in the CLTS method in May 2005 in Lumajang, East Java. An evaluation conducted six months later found the pilot

had been successful. After the pilot, sanitation practitioners from the government and NGOs applied the CLTS method in other regions. The results and lessons learned from the pilot implementation were documented and used in advocating the CLTS approach. Several organisations, both government and non-government, replicated or adapted the CLTS approach through programs such as WSLIC-2 (Water and Sanitation for Low Income Communities Phase 2), TSSM (Total Sanitation – Sanitation Marketing), and a program carried out by Plan Indonesia (CLTS, 2015). In 2007 Plan Indonesia had started to adopt the triggering method in its nine target districts and since 2009 has fully adopted the CLTS approach. Replication by various parties resulted in tremendous changes; in 2006 as many as 160 villages achieved Open Defecation Free (ODF) status and this increased to 500 villages in 2007. The District Government of Pandeglang succeeded in triggering and encouraging the construction of 1,719 toilets all without subsidy (CLTS, 2015).

CLTS is not enough

In 2007, the Indonesian sanitation world received a valuable yet disturbing study from the WHO and World Bank, analysis of which revealed that the poor sanitation state in Indonesia was causing an economic loss of 2.3 per cent from its Gross Domestic Product – equal to IDR58 trillion (AUD5.8 billion) annually. The poor sanitation and the unsafe hygiene behaviours of the community were resulting in the high incidence of diarrhea. As mentioned previously, diarrhea is one of the major causes of death for children under five years old in Indonesia. The WHO has stated that three things are needed to reduce the incidence of diarrhea (CLTS, 2015):

1. Increasing access to basic sanitation, reducing diarrhea incidence by 32 per cent;
2. Handwashing with soap, reducing diarrhea by 45 per cent; and
3. Household management of safe drinking water, reducing diarrhea by 39 per cent.

Integration of each of these conditions will result in the reduction of diarrhea incidence by 94 per cent. Based on the study from the WHO and World Bank, the Government of Indonesia decided that implementing CLTS was not enough. A grand scheme integrating the

three conditions stated above was required to improve the state of sanitation and reduce the incidence of diarrhea in Indonesia. Additionally, the TSSM project had experimented with three components in the program implementation in East Java (CLTS, 2015):

1. Demand creation
2. Supply improvement; and
3. Creation of an enabling environment

These three components represented an innovation in the development of the CLTS concept, which had only focused on demand creation. The study from WHO/WB, the six-province pilot and the TSSM experience encouraged the Government of Indonesia to formulate a national program to target the reduction of diarrhea incidence through behaviour change. A concept for a national strategy to escalate the sanitation access in villages was formulated, in line with the character of the Indonesian people. The result was the promulgation of Ministerial Decree of the Health Minister Number 852/Menkes/SK/IX/2008 on the National Strategy of Community Based Total Sanitation (STBM). Indonesia's STBM adopted the CLTS approach to change the behaviours of the community. The results of the WHO study are reflected in what is now widely known as the Five Pillars of STBM (CLTS, 2015):

1. Stop open defecation
2. Hand washing with soap
3. Household drinking water and food management
4. Household waste management
5. Household liquid waste management

The achievement of five conditions stated above within one community is the condition of total sanitation. The establishment of the Minister of Health's Decree on the National STBM Strategy, in addition to an advocating guide, was a major catalyst for more organisations to implement CLTS and later develop it into STBM. While there were doubts in the beginning, as with the initial implementation of CLTS, eventually STBM received support to become the

largest community-based sanitation program without subsidy in Indonesia. Under the coordination of the Health Ministry and supported by inter-ministerial institutions, the National AMPL Working Group and STBM stakeholders from government and non-government organisations begin advocating and implementing the STBM in various parts of Indonesia. Success was seen almost immediately, even in regions that were considered hard for this program to be implemented. Behaviour change and health impact was occurring thanks to the implementation of STBM, based on the principles of CLTS. Many parties had started triggering not only to stop open defecation but also to achieve total sanitation based on the STBM Five Pillars. While STBM was at first seen as a rural sanitation program it was being expanded in urban areas too, supported by organisations such as the United States Agency for International Development (USAID) and partners (CLTS, 2015).

The pillars of the STBM approach are also known as PHBS (Clean and Healthy Lifestyle) in urban areas of Indonesia. PHBS is part of the National Vision for Health Promotion contained in the framework towards Healthy Indonesia 2010, as announced by the Ministry of Health in 2005 in an effort to pursue the achievement of the national health targets. With PHBS, individuals in the household are encouraged to (1) prevent the onset of disease and other health problems related to sanitation, (2) improve their health status (3) utilise applicable science and technology, and (4) develop and conduct UKBM (Community Based Health Program).

Another key element as part of a supporting environment for the success of STBM at municipality or district level is whether inter-institutional coordination has been established to support water supply and sanitation program. Some provinces and districts already establish their *pokja* (working group) for this purpose. In addition to this *pokja*, special training for STBM facilitators is also needed to strengthen the institutional capacity for relevant local institutions, stakeholders and their communities. Schools, especially their management committees, became another potential institution to be involved in the implementation of STBM, and most schools already have UKS (School Health Unit) programs as an entry point.

Funding is a vital factor in the success and sustainability of any sanitation program. The funding mechanisms commonly used are grants, national budget (APBN) and regional government budget (APBD), as well as support from the private sector through philanthropic contributions. Some program such as PAMSIMAS use a collective model of public funding through in-kind contributions (labour and local materials) and cash. Several other projects, such as that managed by PLAN International, also mobilise funds from the district or village, for example through the Village Allocation Fund (ADD).

Around the same time, to improve access to sanitation services and facilities, the Government of Indonesia issued a policy that required every city to develop a City Sanitation Strategy (*Strategi Sanitasi Kota – SSK*) which is a comprehensive plan for water, sanitation and hygiene development for the city, to be used as a guide for stakeholders to develop their interventions (Kumar, Suya, Verma, Singh, & Verma, 2012). In 2014 in order to strengthen the position of STBM in Indonesia, the Minister for Health issued Permenkes (Ministry of Health Regulation) No. 3/2014 on STBM, in effect renewing and reinforcing Kepmenkes No. 852/2008 on STBM.

Remaining challenges to improve sanitation in Indonesia

There are often financial constraints so that governments lack the resources to fund public service delivery. In the urban sanitation sector, this is particularly true. The construction of urban wastewater infrastructure is costly, particularly because of the costs of land acquisition and the challenges of installing new underground piping in densely populated areas. All government decision-making about the sector therefore takes place with the knowledge that capital costs will be very high. One of the key findings from research funded by the World Bank's Water and Sanitation Program is that greater autonomy for local government does not mean higher allocation of budget for sanitation programs – advocacy is needed to create support for additional funding (Garbarino, Holland, Brook, Caplan, & Shankland, 2011; Mukherjee, Wartono, & Robiarto, 2011; WSP, 2008, 2011a).

There is also often a problem of government accountability, where the government is able to overcome the financial constraint but is not willing to use available resources for public service delivery. A lack of accountability might result from lower education levels, constraints on media, deficiencies in information transmission, the difficulty for citizens to monitor their government, or poorly functioning electoral mechanisms that make sanctioning the government a challenge for the citizenry (Adsera, Boix, & Payne, 2003; Przeworski, Stokes, & Manin, 1999). This lack of accountability is often associated with corruption that diminishes the quality of public service provision (Davis, 2004; Deininger & Mpuga, 2005; Reinikka & Svensson, 2005). However, community-based monitoring systems are suitable for use in grassroots programs, engaging change agents as the watchdogs for the success of the sanitation programs. Much of the development literature has focused on these supply-side problems, trying to explain why the government, for example, underprovides education or health services. In doing so, however, the literature often assumes that demand for public services exists. But with some public services that are important from the perspective of protecting common-pool resources, there may be a demand-side problem: citizens may not be asking the government to take any action in a particular sector (Winters, Karim, & Martawardaya, 2014).

Lack of demand

Despite these various supply-side problems, when public pressure for policy change is sufficiently strong, governments respond (Besley & Burgess, 2002). Another possible explanation, therefore, for slow policy innovation and substandard public service delivery is that citizen demand is insufficient to catalyse government action. Winters et al. (2014) outline three reasons why public demand might be absent in the wastewater sanitation sector in Indonesia. First, Indonesians appear generally content with the status quo in the urban sanitation sector, which translates into a lack of demands being made on government. Previous work has found that Indonesians generally do not link poor wastewater sanitation practices with health outcomes (Brook, Rimbasmaja, & Widyatmi, 2010; WorldBank, 2013). Second, even where there is some recognition of the need for improvements in wastewater management, there may be a concern among citizens with the

financial costs of creating a new system. Citizens may be interested in having their household toilets connected to modern sewerage but may dislike the connection and service fees that will accompany these improvements (WorldBank, 2013; WSP, 2011b). Among middle-class citizens, there may already be sufficient private provision of the services such that they see little to be gained from the creation of a public service provider. Third, there may be confusion among citizens about which level of government should provide wastewater sanitation services. This confusion serves to dissipate demand. Functional assignment across the various levels of government in Indonesia has been a frequently commented-upon problem in the decentralisation era, and citizens may lack a sense of to whom they should be making their demands (Buehler, 2011; USAID, 2009). As compared to the health and education sectors, where the physical location of the service providers is obvious, for most cities in Indonesia, there is no obvious institution to which an appeal can be made in the area of wastewater sanitation. This lack of an obvious point of interaction is compounded by the fact that Indonesians typically view human sanitation as a private—rather than a public—responsibility (WorldBank, 2013).

Much of the literature focuses on supply-side problems with service provision. For many public services, there is visible citizen demand, and the reasons for failure lie on the government side. With wastewater sanitation, however, citizens are far more likely to greet the topic with embarrassment and shyness, resulting in less expressed demand and therefore less government action (Coombes, 2010). In the Winters et al. (2014) research, they found evidence of demand-side constraints in the Indonesian case and show how these interact with supply-side constraints to limit public service provision in the sanitation sector. This result serves as an important reminder to those studying public service delivery that the demand-side needs to be understood as well as the supply-side (Winters et al., 2014).

The Winters et al. (2014) study reveals useful findings that help to explain demand side constraints. Service provision under democratic governance results from elected officials fearing that they will be removed from office in the event that they fail to provide sufficient service. This accountability relationship functions best when the community clearly articulates and voices its demands. In the wastewater sector in Indonesia, there is little

evidence of strongly articulated citizen demands. Most households currently cheaply dispose of their waste in the same fashion as most other households, think of this as a private matter, and do not think that there are any direct consequences to pay. Despite the objective tragedy of the environmental contamination, there is little recognition of it and instead a high level of contentedness with the status quo. In two of the study cities, they found very low levels of awareness about sanitation issues. In Cimahi, some focus group participants said that they felt bad about dumping wastewater into the river but that they did not know what to do instead. Focus group participants and journalists in Makassar likewise all said that problems with water and sanitation were not important concerns because the effects are not immediately felt; journalists said that neither water supply nor sanitation were subjects that appeared in the news with any frequency (Winters et al., 2014).

Continuing with the Winters et al. (2014) study, the lack of community interest in the issue brought complaints from across multiple government agencies. As a result the Department of Health in Cimahi funded some community empowerment activities that included education on sanitation issues, but communities were still doing little in the way of organising themselves. Cimahi faces additional challenges to demand-side organisation because of the transient nature of much of the population. Although Makassar has an active and engaged civil society, local nongovernmental organisations (NGOs) interested in environmental issues had nothing to say about wastewater sanitation, and a citywide environmental program called Go Green Makassar did not seem to have increased discussion of wastewater issues. Surabaya offered a contrast with Cimahi and Makassar. Focus group discussions and interviews revealed enthusiasm for new sanitation infrastructure in Surabaya. In contrast with Cimahi and Makassar, in the Surabaya focus groups, they heard complaints from citizens that the city government shows limited interest in and commitment to wastewater services, an action-oriented analysis that was not present in the other two cities. However, even when citizens are aware of the value of wastewater sanitation, they also may be afraid of the increased costs that will come with improved government service provision. There is a high likelihood that citizens would likely reject wastewater services because of the fees associated with them – for this reason

citizens currently do not make use of the septic tank cleaning services that are available from the government (Winters et al., 2014).

Willingness to pay for and maintain technology

Even in locations where there was organisation on the part of the community, concerns can still remain about consumer willingness to pay. In Surabaya, the head of the City Development and Planning Agency suggested that new infrastructure should be placed in high-income areas first; this official also noted that focus group discussions among residents had revealed a willingness to pay for off-site sewer services so long as the costs were comparable to those of having a septic tank cleaned. Perhaps more importantly in Surabaya, it was unclear if the commercial sector was ready to embrace centralised wastewater provision. In the central business district, several of the large commercial buildings have advanced-design, in-house wastewater infrastructure; joining a citywide system could potentially increase their costs while simultaneously decreasing reliability. Are government officials correctly understanding citizen's willingness-to-pay? Case study work from Medan in a joint World Bank and AusAID (2013) report on sanitation in Indonesia revealed that citizens were declining to connect to the sewer system in Medan—even when a connection was being provided for free—because they were content with the septic tanks in which they had already invested. Given that citizens are content with the status quo, the notion that they would not be willing to pay for a new service that they do not desire seems logical. However, the same report references other studies that suggest willingness to pay can be increased when the social, health and economic benefits of wastewater service provision are made clear to citizens through social marketing campaigns (Winters et al., 2014).

In a case study on sanitation produced by Roma and Jeffrey (2010) based on field work in Central Java, they reported participants communicated a sense of responsibility for the maintenance of the technology and felt included in its daily management activities. These findings relate to the participants' willingness to invest additional resources in improvements, including aesthetic ones such as wall decoration and planting trees. The use of participatory approaches in the implementation of sanitation systems has a strong impact

on the receptiveness of users and their acceptance of the technology. The participants who were engaged in the participatory activities were more satisfied with the technology than those people that did not take part. These results are supported by other studies which investigated the effects of participatory approaches on the outcomes of sanitation interventions (Nance & Ortolano, 2007; Prokopy, 2005) which reported a positive correlation between people's involvement in participatory methods and their satisfaction with the system made available to them. The case study includes chi square tests proving an association between participation in the community based sanitation activities and users' feelings of inclusion, responsibility for maintenance and willingness to invest in improved technology. This is consistent with evidence on the positive impact of participatory activities by instilling a sense of ownership in users of the technologies and strengthening their ability to maintain the systems (Roma & Jeffrey, 2010; White, 1981).

Institutional responsibility for sanitation in Indonesia

The Winters et al. (2014) research also revealed some degree of failure to attribute responsibility for the wastewater sector to the local governments. Journalists in Makassar argued that the city's citizens have come to not expect much from the government, making them more likely to try to solve problems on their own rather than to complain to the government. Multiple members of the Makassar city legislature described this lack of demand as problematic. They said that complaints from civil society and NGOs yield action and that there has not been much movement on the topic of wastewater sanitation by the city government exactly because there have not been many complaints.

Surabaya, on the other hand, again provides a contrast in this study. In that city, increased community awareness of sanitation issues appeared to result from the many community-level activities taking place there. The Surabaya 'Green and Clean' Program, which has been in existence since 2005 and involves private sector partners, such as Unilever and PT Jawa Pos Media Televisi Surabaya, has helped communities to create small sewerage systems and simple sewage treatment plants for recycling wastewater. In one urban neighbourhood, Kampung Gundih, the community is treating collected wastewater and reusing it for

gardening and washing motorbikes – without external funding. Multiple respondents—including several members of the city legislature—cited the Green and Clean Program as having improved the quality of wastewater treatment in the city. One civil society leader said that if citizens had a clearer understanding of who was responsible for sanitation-related issues in the government, then there would be even greater community demands for government action. In Surabaya, the success of the earlier Green and Clean Program and of community-level initiatives appears to be facilitating civil society pressure on government for additional activity in the wastewater sector (Winters et al., 2014).

Community based education is underutilised

The Winters et al. (2014) study highlights the need for continued educational campaigns on wastewater sanitation issues. Previous educational campaigns in Indonesia have led to newly expressed demands by citizens, and local governments have, in fact, been responsive to these expressed demands. Collaboration between the central government and civil society organisations with broad reach might be one of the ways in which to bring about this change in demand. The power of public information campaigns can be seen both in the behavioural changes that community-led total sanitation programs have brought about among rural Indonesians and also in the success of Surabaya's Clean and Green program, which has led citizens to expect and demand government action on the quality of the physical environment. Similarly, Roma and Jeffrey (2010) report that respondents who attended a health and hygiene education program had higher awareness of the health benefits derived from sanitation systems and from abandoning traditional unsafe practices such as open defecation.

Participation is vital

In those sanitation interventions where a successful participatory approach was undertaken and the system itself appears to be operating satisfactorily, local capacities are enhanced, increasing the confidence of users (Roma & Jeffrey, 2010). The importance of both these elements cannot be understated, for there is no point succeeding at participation while the

system does not support the users' action as this will likely lead to disillusionment and a return to old practices. This finding supports a study by Murphy et al. (2009) that the positive results of participation depend not only on the cultural aspects and social dynamics characterising the users' community, but also on the empowering institutional and legislative environment in the country. The involvement of participants in the process of technology transfer can impact their receptiveness, increasing the likelihood of users' ownership of the technology and associated behaviours (Roma & Jeffrey, 2010).

Looking again at the Central Java case study, the sanitation services providers demonstrated an innovative approach to the transfer of technology, mobilising communities to participate from the beginning of the process, through its execution, and to its evaluation. As with many interventions designed to reduce the awful impacts of poverty, sanitation could be further improved if communities were self-sustained beyond the initial intervention activities. This process involves the adoption of a comprehensive participatory approach where communities (and their local institutions) are empowered to take full ownership of the sanitation technology and to set their own agenda for maintenance and monitoring of the systems, once the providers, facilitators and funders have left (Roma & Jeffrey, 2010).

Where to now for improved sanitation in Indonesia?

At the end of 2014 in Indonesia, at least 16,228 villages (out of the national target of 20,000 villages by the end of 2014) have already implemented STBM. This means they have been triggered, they have a village plan for achieving ODF status, they have formed the Village STBM Team and are conducting STBM monitoring. Of these, only 2,867 have already achieved ODF status and there are many that still struggle with wastewater management (YCCP, 2014). STBM employs a direct intervention approach at the household level, which is a major element for successful sanitation programs. There are numerous other factors attributed to its success in Indonesia, including the support of institutions such as the National Drinking Water and Sanitation Working Group; establishment of regulations; and government budget commitment in the RPJMN (National Medium Term Development Plan). In all countries implementing CLTS, and shifting the approach from subsidised sanitation to

removal of subsidies, is considered to be the biggest challenge at both in the national and the community levels. But others remain, including the willingness to pay for and maintain the new technology.

To address these issues, community based education programs should be intensified and funded by the national government, working in conjunction with civil society to help create widespread attitudinal and behavioural changes. One basic component of such campaigns appears to be the need to inform and empower citizens so that they can make demands for service provision to their local governments. If educational campaigns succeed in creating local demand, the evidence from the health and education sectors reviewed suggests that this increased demand can be effective in two areas – eliciting action from local government officials and facilitating individual behaviour change.

Urban sanitation can be improved in Indonesia, but any top-down efforts by the central government need to be accompanied by attempts to create bottom-up demand that will serve to create a movement for change. This movement will include healthy individual behaviours, supportive social norms and improved service provision. Critical to the overall success of the STBM approach is the role of local working groups (*pokja*) at the district and city levels, partnership with stakeholders and the engagement of change agents as champions of sanitation in their communities (CLTS, 2015). As discussed in the previous chapter, these change agents are critical to facilitating individual behaviour change and shifts in social norms. The following chapter will set out a methodology to test whether previous participation and a sense of community affect the participation of change agents in a community based sanitation program, High Five, managed by the CCP Foundation.

CHAPTER 4. METHODS

Approach to the methods

This study used a mixed methods approach to examine the role of change agents engaged as part of a social and behaviour change program. The study has been developed in partnership with the CCP Foundation's 'High Five' community based sanitation project in Indonesia, which was used as the live setting as part of this study's quasi field experiment design. The treatment effect was generated by the High Five project's community based sanitation activities, however the focus for this study were the influences on change agents' participation in this program, which facilitates the individual and household behaviour change and subsequent health impact. The change agents selected by the High Five project staff for participation were local political and community leaders (heads of RT/RW/PKK/*kelurahan*), managers of health centres and posts (*puskesmas* and *posyandu*), health professionals (midwives, doctors and nurses), traditional and religious leaders, and youth group leaders from mosques and churches – all recruited from the target communities in the three Indonesian cities of Surabaya, Makassar and Medan.

The change agents were surveyed during the baseline data collection process and then deployed to their communities over the life of the three-year High Five project. The entire cohort of change agents recruited by CCP for the High Five program was surveyed. The impact of the High Five project was measured through an Endline household behavioural survey. For the quantitative research component, data was collected on the health behaviours of the participant populations, their Sense of Community (SCI) scores and general demographic information. This was complemented by qualitative interviews conducted with a selection of change agent participants, designed to provide context and depth for the findings of the quantitative tools. This chapter will describe the rationale for the design of the overall approach, including the use of triangulation. It will then set out the Participant Data, Instruments, Procedures, and Data Collection and Analysis for this study.

The mixed method approach to this study enabled the author to triangulate the analysis of the individual sets of quantitative and qualitative data collected. Triangulation, in the

context of the chosen research methodology, involves using more than one kind of method to study a phenomenon. It has been found to be useful in providing confirmation of findings, more comprehensive data, increased validity and enhanced understanding of studied phenomena (Bekhet & Zauszniewski, 2011). This study employed an across-method mix of quantitative (surveys and observations) combined with qualitative (interviews) methods, as well as reference to the literature and discussions with program staff. The aim was to reduce the weaknesses of each individual method, complement and confirm each method's results, and strengthen the outcome of the study and the application of its outcomes in future work (Casey & Murphy, 2009). The listing or resources allocated for each method does not imply a relative importance or hierarchy, as each method serves as a check and balance on each of the others. Furthermore, the use of each of these methods does not assume perfect compatibility, either in terms of application or results achieved (Denzin, 2012). Rather, the mix of methods helped the author bring together into a coherent text what is a complex set of social, economic, psychological and administrative dynamics affecting the success of YCCP's High Five sanitation project in Indonesia. Ultimately the definition of success for the High Five project was the impact on the wellbeing of the participant communities, made possible through changes in related behaviours. The success of change agents within that program is defined first by their individual actions, second by their collective efforts and third by the overall impact on behaviour change and the wellbeing of the community.

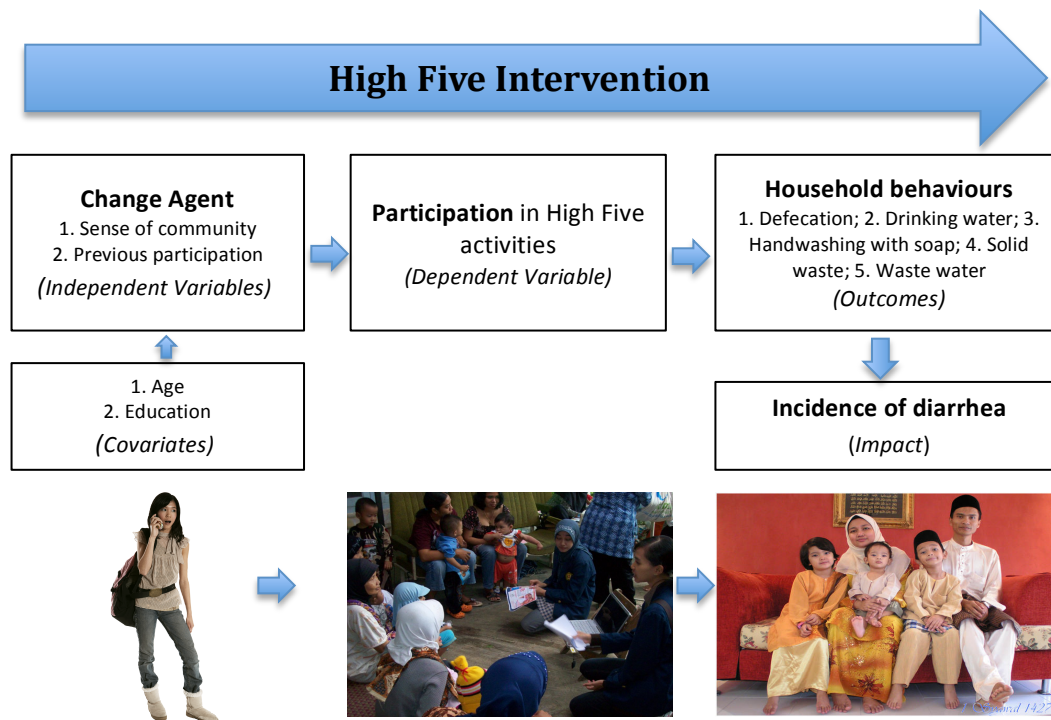
A core aim of this study was to analyse the role of change agents, particularly their previous participation and sense of community, in order to better understand their impact as part of a sanitation behaviour change program. The research examined the relationship between change agents and the impact of sanitation behaviour change programs in the communities in which they are active. However the study was unable to statistically test the direct relationship between the role of change agents and household behaviour change as well as health impact in the community. This was due in part because it was not possible with the resources available to track each individual change agent's participation and show a direct link to an individual or household change in behaviour. Also, the High Five project team decided not to include a valid control population in the data collection, making comparisons

more difficult. This is where this study's design diverges from the classic experimental model, which evaluates the effect of a treatment on a target population over time, accounting for various types of variables (e.g. covariates, moderators and mediators) that change the effect of the treatment.

The study focused on the role and impact of the change agents, with the treatment (High Five intervention) happening in parallel. This impact was defined in three ways in order of sequence. First was participation of the change agents in High Five program community outreach activities. The second was the change in behaviours at the household and individual level facilitated by the High Five community outreach activities. Third was the impact on the health of the participant communities contributed to by the change in their behaviours. The study tested whether previous participation by the change agents in community outreach activities would be a significant influence on their participation in High Five program activities. The study also tested whether a strong sense of community is a statistically significant factor, i.e. whether the variance between SCI scores was significant across the different groups of change agents. In turn, the study tested whether the level of participation by change agents is increased or decreased when they have higher or lower SCI scores. The study also took into account covariates – in particular age and education – to test the relative influence of each of these elements. The qualitative interviews enabled a deeper examination of the issues and elaboration on the dynamics that influenced the experience of the change agents as they participated in the High Five project.

Figure 1 below is a schematic representation of the hypothesised relationships between a change agent's sense of community, their previous participation (as well as age and education), on their future participation in High Five community outreach activities. It should be noted that other High Five intervention activities are been implemented in parallel with the change agent participation, which are not the subject of this study. A core assumption is that the change agent's participation facilitates behaviour change, which ultimately leads to improving the health of the communities that the change agents serve.

Figure 1. Model of relationships between change agents, sense of community, participation, behaviour change and impact in the High Five sanitation program



The study focuses on change agents engaged by the CCP Foundation’s High Five project team. The household behavioural and health data collected by this team serves to provide the impact context for the participation of these change agents. The reason for the selection of this project is to test the methodology in a “live” setting, using a quasi field experiment approach. The following sections describe the Participant Data, Instruments, Procedures, and Data Collection and Analysis for this study. The study protocol was approved by the University of Sydney’s Human Research Ethics Committee as well as the management of CCP Foundation’s High Five project in Indonesia.

Participant Data

To select the participants for this study, the author conducted desk research into potential partner organisations in Indonesia, Vietnam and Australia. The original aim was to compare programs focused on different social and behaviour change issues, with participants and their communities in a variety of socio-economic settings, in order to test the robustness

and applicability of the methodology. While this aim retains merit, it was decided that a multi-country comparison would not be possible with the limited resources available for the PhD study. Therefore the scope was narrowed to focus on one country and one project as a discrete test of the methods that could be studied and later refined for further application.

In late 2011 the author identified a list of potential partner organisations in Indonesia, including U.N. agencies, bilateral donors, international NGOs, local NGOs and universities. Contact was sought with key staff to request cooperation in the study. From this long list and their responses to the request, a short list of potential projects and organisations was finalised. The author then arranged face-to-face meetings and in November 2011 travelled to Indonesia to discuss the study with potential partners and others who might be able to provide referrals. The three main criteria for collaboration were that the partner organisation saw value in the proposed methodology and were willing to share access to their staff, data, networks and other resources. Another important criteria was that the methodology was to be tested in a “live” behaviour change program, where it was possible to track results and impacts on a participant population over the life of the program. Finally, the project needed to include the use of change agents as part of its approach to achieving social and behaviour change. Following a series of meetings and referrals, the author was able to secure the involvement of YCCP and their 3-year “High Five” project funded by the U.S. government development agency, USAID. The timing proved fortuitous as the High-5 project had recently been awarded to YCCP and the staff were preparing to conduct the baseline data collection. YCCP generously agreed to provide access to their team, data and partners in exchange for access to the final results of the author’s analysis.

This study therefore focused on the communities in the areas targeted for YCCP’s High Five community based sanitation project in Indonesia. This included inviting the entire cohort of 90 change agents recruited by YCCP to participate in the research. These change agents were selected by district level YCCP staff to undertake several tasks as part of the High Five program, including household visits and other forms of sanitation information dissemination, as well as monitoring and evaluation of household hygiene practices and behaviours, based on the five pillars of the High Five project. The change agents were

selected from all three urban sites of the High Five project – Medan, Makassar and Surabaya. The change agents selected for this study were local political and community leaders (heads of RT/RW/PKK/*kelurahan*), managers of health centres and posts (*puskesmas* and *posyandu*), health professionals (midwives, doctors and nurses), traditional and religious leaders, and youth group leaders from mosques and churches. The study examined the change agents' previous participation as well as their participation in community outreach activities through the life of the High Five program. Therefore, the data used in the hypothesis testing needed to be from those change agents who could be tracked through the entire three years of the High Five program.

To provide the context for the impact of the change agents, it was necessary to monitor the change in the behaviours of the communities in which they were active. A sample of households participating in High Five selected for the Baseline Survey were used as the referent population. According to Hair, Black, Babin, Anderson, and Tatham (2010), to ensure Maximum Likelihood Estimation (MLE) a sample of between 100 and 200 respondents should be selected so as to obtain the satisfactory explanatory power level of between 94 per cent and 95 per cent. The Baseline Survey used a sample of 120 households with children under the age of five in all six High Five *kelurahan*, chosen using a simple random selection process (Starnes, Yates, & Moore, 2010). In the selected *kelurahan* in each city, a mapping process was carried out of households with children under five years old, with the approval of local administration and community leaders. This mapping process was based on the CLTS approach detailed in Chapter 3, designed to pinpoint specific issues and trigger ownership of their solutions. After the population had been mapped, the household interval was determined by dividing the total number of households with children under five with the total respondent target (60 respondents) for each *kelurahan*. In this way, the respondents were selected for inclusion in the Baseline study (PollingCenter, 2011).

Instruments

Four instruments were used in this mixed methods study. The first instrument was the Baseline Survey of sanitation practices for the High Five project. The second was the Sense

of Community Index (SCI) survey, which measures the psychological sense of community of the change agent participants. The third instrument was the Endline Evaluation of the High Five project, which collected information on the impact of the change agents at the end of the project. The fourth was the Interview with change agents designed to provide context for the quantitative data collected on the SCI and reports provided by High Five.

1. Baseline Survey

The first instrument was the Baseline Survey, which established a reference point for evaluating the impact over the life of the High Five program. The design for this instrument was developed by CCP Indonesia with its market research agency contractor, Polling Center, the author advising on the inclusion of the Sense of Community Index survey. There were two types of respondents in this survey: primary caregivers of children under five years in the household; and community leaders (head of *kelurahan*, head of RW and RT, PKK, *posyandu* and environment cadres, or traditional community leaders). Practices and behaviours among household caregivers were measured for these sanitation indicators:

1. Eliminating open defecation: the study used the data collected on the caregiver's last place of defecation.
2. Hand washing with soap: based on the use of soap by each caregiver of children aged under five years, an evaluation of the five critical times of hand washing with soap was conducted, namely: (1) before eating; (2) before feeding the child; (3) before preparing food; (4) after defecation; and (5) after wiping the child's bottom. Each activity was assigned a score of one (1) if reported, thus giving a maximum score of five (5).
3. Household safe water treatment: this was based on the drinking water source used and the action taken to improve water quality before drinking.
4. Solid waste management: this was based on the practices of households to deal with their solid waste (garbage). This included the collection of solid waste at home and use of neighbourhood collection points, from which the authorities take it away.

5. Wastewater management: for this indicator the author used the methods households dispose of their bathroom and kitchen wastewater.

In addition to the sanitation indicators, data was collected as part of the Baseline Survey of household caregivers on the health of their children:

Child health (diarrhea): this served as an indicator of the impact of the High Five program and its five pillars. The lead indicator of program impact is defined as households reporting any incidence of diarrhea in the previous three weeks. This was then analysed in relation to the SCI scores of change agents to determine whether there is a direct relationship with the incidence of diarrhea.

In addition, demographic information was collected on location, age, gender, household expenditure, education and group. The following is a brief description of the variables to be included in the analyses:

Location: this was determined by the participant's choice of one of two *kelurahan* in the city where the interview took place.

Age: this was calculated in years based upon the participant's full date of birth. Discrepant ages were verified with the participant and corrected during the interview.

Gender: this was determined by the participant's choice of either male or female.

Household expenditure: this was based on average monthly household expenditure in Indonesian Rupiah (AUD1 = IDR10,000 approximately) and calculated using seven brackets; A1 = >IDR3,500,000; A2 = 2,500,001 – 3,500,000; B = 1,750,001 – 2,500,000; C1 = 1,250,001 – 1,750,000; C2 = 900,001 – 1,250,000; D = 600,001 – 900,000; and E = <600,000.

Education: this was determined by the participant's response on which was the highest level of formal education completed from the following six choices; No formal education; SD (primary school or equivalent); SMP (junior high school or equivalent); SMU/SMK (senior high school or equivalent); Diploma/Academy; and S1/S2/S3 (undergraduate, masters or PhD).

Group: this was used for the change agents only and determined by the participant's self identification as belonging to one of the following five groups – local political and community leaders (heads of RT/RW/PKK/*kelurahan*); managers of health centres and posts (*puskesmas* and *posyandu*); health professionals (midwives, doctors and nurses); traditional and religious leaders; and youth group leaders from mosques and churches.

2. Sense of Community Index Survey

The second instrument used in this study was the Sense of Community Index (see Appendix 1), which is a cross-sectional survey developed by Chavis et al. (2008). As discussed in Chapter 2, the concept of a psychological "Sense of Community" (SOC) was formally developed by Sarason (1974) as part of his work on mental health issues. It was further developed by Doolittle and MacDonald (1978) before being more fully defined by McMillan and Chavis (1986). The SOC, as defined by McMillan and Chavis, aimed to "strengthen and preserve the community." The survey, the version used was the SCI2, is the most widely used quantitative tool to measure a person's psychological sense of community. It has four interrelated elements:

1. Membership: a feeling of belonging and sharing relatedness;
2. Influence: of the individual over the group and vice versa;
3. Needs: fulfilment of the individual's needs by the resources of the group; and
4. Connection: the belief that group members share personal experiences and emotional associations.

Participants complete the survey by rating the 24 statements on a Likert scale according to how strongly they agree with the statement in relation to the nominated community – choosing from four options: “not at all”; “somewhat”; “mostly”; or “completely”. There is evidence that social desirability bias, arising from respondents' desires to please the interviewer, or appear helpful, or not be seen to give what they perceive to be a socially unacceptable answer, can be minimised by eliminating the mid-point ('neither... nor', uncertain etc.) category from Likert scales (Garland, 1991). The SCI2 survey is grouped into four subsets, with six statements for each. As part of the SCI2 survey, the author also collected demographical information relating to age, gender and education in the manner described above for the household surveys.

3. Qualitative Interview

The third instrument used for this study was the qualitative interview (see the summary NVivo report at Appendix 2), based on the four elements of the Sense of Community Index covered above. The four interview questions are open-ended versions of the SCI2 elements, designed to elicit more detailed information from the participants to provide context for their responses to the SCI2 statements. The interviews were conducted with a small selection (maximum n = 10) of change agents in order to provide a deeper understanding of their psychological sense of community and their role in the High Five program and the community to which they had been assigned. The number of interviews was selected based on the author's estimation of a realistic and useful number that could be obtained with the resources available.

To identify factors that influence the observed practices of the change agents, the results of the transcribed (post-observation and focus group) interviews were investigated using a thematic analysis. This method was used to elicit the affective factors that influence the impact made in the target communities (Miles, Huberman, & Saldaña, 2013). The open-ended nature of the questions provided the opportunities for the interviewer to explore responses that may not have been anticipated in the design of the project. The responses were coded, tagged and analysed using NVivo software.

4. Endline Household Survey

The final instrument used in this study was the Endline Household Survey of the High Five project, conducted by CCP staff and a professional market research company, the Polling Center, based in Jakarta (PollingCentre, 2014). The Endline Household Survey was conducted at the end point of the three-year High Five project and consisted of several reporting tools used to collect data on the activities undertaken as part of the intervention. This included both observing behaviours and collecting data reported by the participants. CCP Indonesia engaged the Polling Center, which recruited data collection staff to go from house to house, interviewing household caregivers about their sanitation behaviours and observing the presence of key infrastructure, including access to clean drinking water and wastewater disposal.

The Endline Household Survey also included questions to households on the incidence of diarrhea in the period immediately preceding the end of the High Five program. This included the incidence of diarrhea among caregivers and the children under five years living in the household in each of the three project cities. This enabled the author to analyse the impact of the community outreach activities carried out by CCP/High Five. As covered in both Chapters 2 and 3, the literature has established the role of interpersonal contact in the success of programs designed to achieve social and behaviour change and health impact, including in sanitation programs in Indonesia (Axsen & Kurani, 2010; Hamilton, 1988; Kempe et al., 2003; Kohler & Strain, 1990).

Procedures

A community assessment process was conducted prior to data collection for the purpose of developing the study protocol and its instruments as well as identifying the communities and procedures for the study. The rationale and design for this process has been covered in the literature (Green, 2010; Kidd & Kral, 2005) and is intended to ensure a more effective

study by strengthening the participants' ownership and incorporating their needs into its development. During the community assessment process the candidate conducted desk research and meetings with key stakeholders – including potential partner organisations, such as CCP and the Johns Hopkins Center for Communications Programs; government agencies, such as the Ministry of Health; researchers from the University of Indonesia; and others. The purpose of this research was to become more familiar with the issues and participant communities, assess the acceptability of the proposed study protocol and survey, as well as learn about the environments and contexts for the case studies. This process was also necessary to build the sampling frame from which communities were selected for data collection. This process included three research trips to Indonesia in 2011, 2012 and 2013, including High Five project site visits to Makassar, Surabaya and Medan.

Trained interviewers from the Polling Center, a research agency engaged by CCPF, conducted face-to-face interviews with the change agents using a standardised questionnaire on a handheld computer. Each of the change agent participants was given copies of the SCI2 survey, the University of Sydney Participant Information Sheet and the Participant Consent Form in Indonesian. The participants were advised of the community to which the survey relates and completed the SCI2 survey based on their attitudes toward that community. Their responses were collected, including the demographic information relating to age, education and gender. The change agents were then deployed to the field as part of community outreach and mobilisation activities over the three-year period of the High Five. The interviews of change agents were conducted verbally by the author in Indonesian, recorded using a digital device, translated and stored securely in the author's office.

Participants in this study were required to provide their consent prior to participation. Consenting participants responded to a 10-minute verbal survey and stated their agreement for CCP and the author to track their activity through the High Five project. Of those, a maximum total of ten (10) primary caregivers of children under 5 years (from all of the three High Five cities) were selected by CCP to participate in a 15-minute verbal interview. None of the participants received any remuneration or reimbursement for their participation.

Only those aged 18 years and above were invited to participate in the study. The qualitative interviews served to provide data to enable the author to triangulate the results by providing a more detailed context for the impact of the change agents.

Data collection and analysis

Data collection took place at three points during the study – first was the Baseline Survey, which included the SCI survey; second was the interviews; and third was the Endline Survey. Participants were all change agents engaged as part of the High Five project in the three locations of Surabaya, Medan and Makassar. Data from the initial SCI surveys of change agents was entered into the IBM Statistical Package for the Social Sciences (SPSS) software. Excluded from analysis were those change agents who did not participate in the Endline survey as this would preclude a comparison with the Baseline data.

For the initial analysis of the change agents' SCI scores in the three project locations, a simple one-way between groups analysis of variance (ANOVA) was conducted. The one-way ANOVA is used to determine whether there are any significant differences between the means of three or more independent (unrelated) groups (CERG, 2015). Following that, descriptive statistics were computed for a limited number of sociodemographic characteristics that may be related to participation or sense of community – these variables were age and education. To understand the relationship between these variables and the analysis variables, bivariate analyses were performed to examine associations between each of these characteristics and the analysis variables (i.e., sense of community and previous participation). The results of the bivariate analyses were used to examine sociodemographic variables that may co-vary with participation in High Five activities and possibly confound the analysis. According to Baron and Kenny (1986), a confounder is a factor that is associated with both the independent variables (i.e., previous participation and sense of community) and the dependent variables (i.e., participation in High Five). Variables associated with both participation and sense of community were controlled for in subsequent multivariate regression analyses examining each of the relevant hypotheses.

For the qualitative analysis, the data from the interviews was entered into QSR NVivo software. Nodes were created to enable the tagging of the interviews to capture key themes from the responses. These nodes were then counted to provide a descriptive analysis of the frequency with which these were recorded in the interviews. The tagging also enabled the author to extract more detailed examples and references to the overall themes covered in the interviews by the respondents.

Specific analyses for the hypotheses were:

H1. There will be a significant variance in the Sense of Community Index scores of change agents across different locations: A one-way between groups ANOVA was conducted to compare the effect of location on sense of community. Location was considered to have a direct effect on sense of community if its coefficient was significant.

H2. Change agents with a higher sense of community will participate in more community outreach activities: A stepwise multiple regression was conducted to determine the direct effect of any or all of the following variables – age, education and SCI score – on participation by change agents in High Five program activities. Specifically, the dependent variable (participation in High Five activities) was regressed on the independent variable (SCI score) and covariates (age and education). SCI score was considered to have a direct effect on participation in High Five activities after controlling for covariates if its partial regression coefficient was significant. These results were then triangulated with the results of the qualitative data generated from the interviews.

H3. Change agents with higher previous levels of participation in community outreach activities will have higher participation rates in the future.

A stepwise multiple regression was conducted to determine the direct effect of any or all of the following variables – age, education and previous participation – on participation by change agents in High Five program activities. Specifically, the dependent variable (participation in High Five activities) was regressed on the independent variable (previous participation) and covariates (age and education). Previous participation was considered to

have a direct effect on participation in High Five activities after controlling for covariates if its partial regression coefficient was significant. These results were then triangulated with the results of the qualitative data generated from the interviews.

H4. There will be higher rates of behaviour change in communities in which change agents with a higher sense of community are active. Data on the five sanitation behaviours were also collected during the Endline Household Survey. The author then built tables to enable a simple, non-statistical comparison of the results with the SCI scores of the change agents. These tables consisted of the household impact and behaviour data, broken down by city and subdistrict. If the comparison showed that SCI scores were higher in a location with a higher level of behaviour change, this was considered useful for qualitative analysis, but not statistically significant.

H5. There will be greater health impact in communities in which change agents with a higher sense of community are active. Data on the health impact (diarrhea) were also collected during the Endline Household Survey. The author then built tables to enable a simple, non-statistical comparison of the results with the SCI scores of the change agents. These tables consisted of the household impact and behaviour data, broken down by city and subdistrict. If the comparison showed that SCI scores were higher in a location with a higher health impact from the High Five program, this was considered useful for qualitative analysis, but not statistically significant.

Quantitative analyses were performed using SPSS, Version 22.0; qualitative analysis used NVivo, Version 10. Variables with unknown responses were excluded from analyses using listwise deletion. The alpha level for significance testing was .05. According to Tabachnick and Fidell (2001) the ratio of cases to variables in the model is important when conducting logistic regression analyses to avoid large parameter estimates and standard errors as well as failure of convergence. Given 69 cases were in the analysis dataset, it was anticipated that logistic models with more than two variables might have unreliable parameter estimates and standard errors. Thus, these estimates were monitored while building models. The following chapter (5) presents the results of the utilisation of the four data

collection instruments in the sample populations for the testing of the hypotheses. This includes the application of the stepwise regression model to the quantitative data and the qualitative analysis of the interviews.

CHAPTER 5. RESULTS

Overview of the results

The following chapter reports the data and the findings collected using the four instruments developed as part of the methods detailed in the preceding chapter, as well as the results of the tests performed against the hypotheses. The four instruments are: 1. Baseline Survey of Households; 2. Sense of Community Index Survey of Change Agents; 3. Interviews of Change Agents; and 4. Endline Survey of Households. In summary, for both the Baseline survey (#1) and the Sense of Community Index survey (#2), there was a sample of 360 households and 90 change agents interviewed and observed in the three cities of Medan, Surabaya and Makassar. For the Interviews of change agents (#3), a total of nine respondents participated in the three cities of Medan, Surabaya and Makassar. For the Endline survey, 357 households and 90 change agents were interviewed and observed in the three cities of Medan, Surabaya and Makassar.

The quantitative and qualitative data collected in partnership with the YCCP's High Five project team has enabled a useful set of results to be reported. This included tests for the effects of participation and sense of community on the change agents using the various multiple regression models and qualitative analysis. It became clear during the cleaning of the data sets that some aspects of the hypothesis testing would not be possible. There were gaps in terms of missing data for some respondents and variables. However, these gaps were managed and the resulting data sets enabled a rich analysis of the impact on individual behaviours and households as well as an understanding of the role of change agents in the High Five Program. The results are presented in detail below.

1. Baseline Survey of Households

The data from the first instrument, the Baseline Survey of Households, was collected from 16 January to 3 February 2012 by the research firm, Polling Center (PC), engaged by the High Five program of the author's partner organisation, YCCP. Table 2 reports in each of the six (6) *kelurahan*, 60 respondents from households and 15 change agents were interviewed and

observed. In total, there was a sample of 360 households and 90 change agents interviewed and observed in the three cities of Medan, Surabaya and Makassar (PollingCenter, 2011). The data was collected in the two Surabaya *kelurahan* from 16-27 January 2012. The data for the Medan and Makassar *kelurahan* were collected from 16 January to 3 February 2012.

Table 2: Sample Populations of High Five project areas

City (project <i>kelurahan</i>)	Change Agents	Households
Surabaya (Petemon and Wonorejo)	30	120
Makassar (Tallo and Lembo)	30	120
Medan (Kota Bangun and TSM3)	30	120
totals	90	360

As a result of the interview requirement that household respondents should be caregivers of children under 5 years of age, almost all (99.2 per cent) of the sample respondents identified as women (n = 357). Most of the respondents (55 per cent) were aged 25-35 years (n = 199). A large proportion (41.9 per cent) of the respondents (n = 151) had completed senior high school or higher. The largest socio-economic strata (37.8 per cent) for household expenditure was for those spending IDR1,250,001 to 1,750,000 (approximately AUD 125-175, assuming AUD1 = IDR10,000) per month (n = 136). The following sections are further breakdowns of the data according to the three geographic areas.

Surabaya

The majority of respondents (85 per cent) were caregivers for children under-5, aged between the ages of 25 and 45, who had been educated up to high school level or equivalent (55 per cent of total respondents). They occupied their own homes (77.5 per cent) and had an average monthly expenditure of between IDR1,250,001 and 1,750,000 (45 per cent), while 29 per cent had an average monthly expenditure of between IDR1,750,001 and 2,500,000. A total of 85 per cent of the respondents cared for one under-5, while 38 per cent shared their homes not just with immediate family members (wife-husband-child), but with between 4-5 other persons (besides the under-5s). 37.5 per cent lived only with immediate family members, i.e. 2-3 persons, besides the under-5s (PollingCenter, 2011).

Medan

A total of 82 per cent of the caregivers of under-5s were between the ages of 25 and 45, while 44 per cent had graduated from junior high school or equivalent. Meanwhile, 46.7 per cent were living in rented accommodation, while average household expenditure per month amounted between IDR1,250,001 and 1,750,000 in the case of 35 per cent of respondents, and between IDR1,750,000 and 2,500,000 per month in the case of 22.5 per cent. The majority of respondents (72 per cent) cared for one under-5, while 40.8 per cent lived with 2-3 members of their immediate families (wife-husband-child), while 35.8 per cent lived with more family members, i.e. 4-5 persons besides the under-5s (PollingCenter, 2011).

Makassar

The majority of respondents in Makassar (79 per cent) consisted of young (aged under 35 years) caregivers of under-5s, with 49 per cent of total respondents only having been educated as far as elementary school or equivalent. A total of 45.8 per cent occupied their own homes, while 30 per cent lived in accommodation belonging to family members. As regards socioeconomic class, 33 per cent were in C1 with an average monthly expenditure of between Rp 1,250,001 and Rp 1,750,000 (AUD125-175). 32.5 per cent were in class D, with an average monthly expenditure of Rp 600,000–900,000 per month (AUD60-90). A total of 64 per cent of respondents looked after one child under-5, while 30.8 per cent cared for two under-5s in the same house. As regards number of persons in the home, 35 per cent of respondents only shared their homes with 2-3 members of their immediate family (wife-husband-child), while 31.7 per cent shared their homes with between 4 and 5 family members, besides the under-5s (PollingCenter, 2011).

*Table 3. Summary of Respondent Profile – Baseline Survey**

Characteristic / Location	Surabaya	Medan	Makassar
Age	75% 25-45 years	82% 25-45 years	79% <35 years
Education	55% senior high school	44% junior high	49% primary
Number of children under 5 years in household	85% 1 under-5 14.2% 2 under-5s	72% 1 under-5 25.8% 2 under-5s	64% 1 under-5 30.8% 2 under-5s
Socioeconomic status	45% C1 29% B	35% C1 22.5% B	33% C1; 32.5% D 36% D (Tallo)
Home ownership	77.5% self owned	46.7% rented	45.8% self owned 30% belongs to family

**Taken from PollingCenter (2011)*

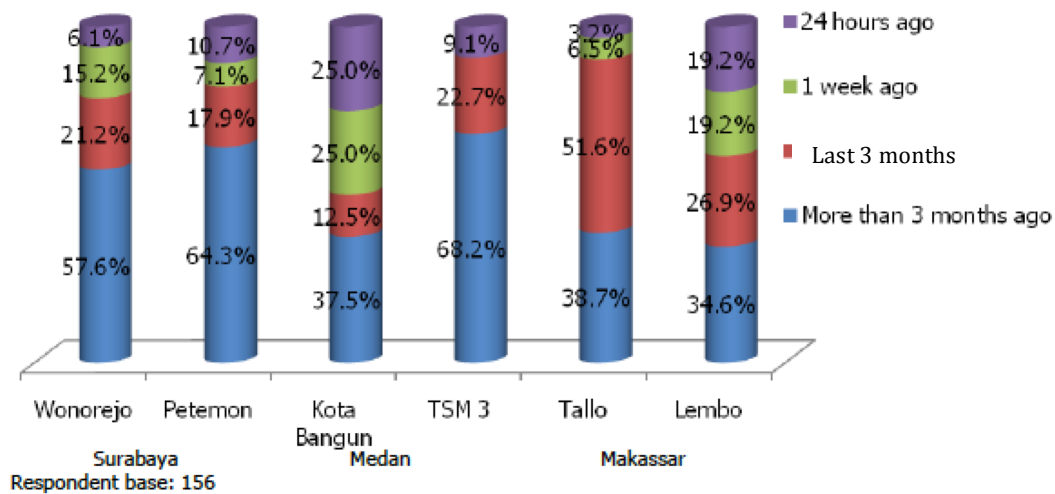
Lead health indicator – diarrhea

As described in Chapter 3 on Sanitation in Indonesia, the High Five program addressed a range of human health and environmental impacts. For the purposes of this study, incidence of diarrhea was selected as the lead health indicator used to track the overall impact of the High Five program.

In Medan (both Kota Bangun and TSM 3 *kelurahan*), the percentage of primary caregivers who said that their infants had ever suffered diarrhea was relatively low (26.7 per cent in Kota Bangun and 36.7 per cent in TSM 3). This was especially so compared with the other cities. In the intervention areas in Medan, the incidence was much lower than in the non-intervention areas. Surabaya had the highest incidence of under-5s who had suffered diarrhea (50.8 per cent), while in Makassar it was stated that 47.5 per cent of under-5s had at one time or another suffered diarrhea, with the figure being 51.7 per cent in Tallo and 43.3 per cent in Lembo.

In Surabaya, more than half of under-5s had suffered diarrhea the last time more than 3 months ago. In Medan also (37.5 per cent in Kota Bangun and 68.2 per cent in TSM 3) also said that their infants had suffered diarrhea the last time more than 3 months ago. In Tallo, 51.6 per cent of infants had suffered diarrhea within the last 3 months, while in Lembo 34.6 per cent had suffered diarrhea more than 3 months ago. In the case of under-5s who suffered diarrhea in the last week, the biggest percentages were in Kota Bangun, Medan (25 per cent) and Lembo, Makassar (19.2 per cent). A total of 15.2 per cent of under-5s in Wonorejo, Surabaya, suffered diarrhea in the last week. In the case of under-5s suffering diarrhea in the last 24 hours, the percentages were 25 per cent in Kota Bangun, Medan and 19.2 per cent in Lembo, Makassar.

Figure 2. Last time your under-5 child suffered diarrhea*



*Taken from PollingCenter (2011)

Five sanitation behaviour priorities

As described in the Introduction and in Chapter 3 on Sanitation in Indonesia, the High Five program determined that several behaviours needed to be addressed in order to make an impact on diarrhea and other health and environmental impacts. The following are the findings from the Baseline Survey relating to the five sanitation practices that form the priorities for the High Five program. The five priorities are:

1. Defecation in public spaces
2. Hand washing with soap practices
3. Safe drinking water treatment and storage
4. Household solid waste management
5. Proper wastewater management practices

1. Defecation in public spaces

According to the report from the PollingCenter (2011), the majority of respondents (80.8 per cent) said that they had last defecated in their own toilet, and that the same applied in the case of all the adults who shared the same home as the respondents. In Surabaya, 3.3-

10 per cent of respondents stated that they most recently defecated in a shared toilet. In Surabaya's Wonorejo, 83 per cent of respondents used private toilets, while 17 per cent used shared toilets. In Petemon, 90 per cent used private toilets, while 6.7 per cent used shared toilets and 3.3 per cent public toilets.

As regards flush toilets with septic tanks, these were only found in Medan, where the prevalence ranged from 3.3 per cent to 15 per cent. Around 6 per cent of respondents had other types of toilets (such as non-flush toilet leading to drains, rivers, ditches, streams or even ponds). In Kota Bangun, 90 per cent of respondents used private toilets, while the remainder used flush toilets leading to drains/rivers/ditches/streams or flush toilets with a connection to a sewer (6.7 per cent and 3.3 per cent, respectively). In TSM 3, 60 per cent of the respondents used private toilets, while the remainder used flush toilets with connections to septic tanks (30 per cent) and flush toilets leading to drains, rivers, ditches or streams (10 per cent).

In the Tallo and Lembo sub-districts of Makassar, the respondents in Tallo sub-district used a variety of locations for defecation. Only 45 per cent said they used private toilets (including other adults sharing the same home as respondents), while 26 per cent said they defecated directly into the sea. The remainder said that they had most recently used a flush toilet with connection to a septic tank (6.7 per cent) or a public facility leading to a river (5 per cent). Other responses include using a plastic bag, squatting over a river or pond, and non-flush or flush toilet with connection to an unlined septic tank. In Lembo sub-district, healthy defecation practices were more apparent, with 80 per cent of respondents using a private toilet (including other adults sharing the homes of respondents). Meanwhile, 15 per cent of respondents used a flush toilet with connection to a septic tank, and 5 per cent used a flush toilet leading to a drain, river, ditch or stream.

Almost all households (that had under-5s) in the sub-districts studied had a U-bend squat toilet (between 80 per cent and 90 per cent, except in Makassar, where the percentage was almost half that). In Tallo, Makassar, pit toilets were the second most common type of toilet used by households that had under-5s. In Lembo, embankment and sit-down toilets were

the second most common types of toilet (21.7 per cent each) after U-bend squat toilets. Also based on observations, it was found that overall in the three cities studies, the majority of bathrooms were located inside homes, while 19.7 per cent of respondents needed between 1 and 5 minutes to get from their homes to the bathroom and back again. Between 55 per cent and 72 per cent of bathrooms were found to be clean. The notable exception to this was Lembo, Makassar, where only 43 per cent were quite clean, while 33 per cent were dirty. The highest percentage of very dirty bathrooms was also found in Lembo, Makassar, while the highest percentage of very clean bathrooms was found in Wonorejo, Surabaya.

Overall, the condition of toilets in Surabaya and Medan was significantly better than in Makassar. A number of indicators of the poor condition of toilets in Makassar include the findings that faeces was found in 21 per cent of the toilets, while only 42.5 per cent had a water supply. In addition, only 68.3 per cent had a receptacle for storing water and only 69 per cent a water scoop available.

Table 4: Summary of First Pillar: Open Defecation Free Indicators

Indicator	Surabaya		Medan		Makasar	
	Wonorejo	Petemon	Kota Bangun	TSM 3	Tallo	Lembo
First pillar: open defecation free						
Caregiver's last place of defecation – 3 top answers						
In private toilet	83.3%	88.3%	81.7%	80.0%	45.0%	80.0%
Place of defecation of children of 0 – 3 years old – 3 top answers						
Disposable diapers	43.2%	48.9%				
In pants			48.1%	61.7%	72.3%	31.0%
Place of disposal of feces of children of 0 – 3 years old – 3 top answers						
Straight into the toilet	33.33%					
Wiped first, wastewater disposed of in toilet		30.0%	40.0%	38.89%	20%	36.11%
Place of defecation of children of 3 – 5 years' old – 3 top answer						
Private toilet	83.3%	94.1%	76.2%	77.8%	43%	60%
Action taken after child defecates – 3 top answer						
Wash with soap	91.7%	61.7%	78.3%	68.3%	78.3%	68.3%

**Taken from PollingCenter (2011)*

2. Hand washing with soap practices

According to the report from the PollingCenter (2011), in order to identify habits regarding the use of soap over the last two days, multiple response questions were used, and responses related to bathing and clothes washing were not used. Among the responses given were that caregivers of under-5s in Surabaya, the majority (76.7 per cent in Wonorejo and 45 per cent in Petemon) washed the baby's bottom using soap. Hand washing with soap before eating in Wonorejo amounted to 60 per cent. Hand washing before preparing meals was reported by 40 per cent of caregivers, and before feeding baby by 46.7 per cent. In the case of hand washing after defecation, 53.3 per cent of caregivers in Wonorejo said they did so. In Petemon, for the practice of washing hands after defecation, 3.3 per cent of caregivers in the intervention area in Petemon said they did so. In Medan, overall, Kota Bangun, the focus for High Five activities was found to be relatively good when it comes to the use of soap. 60 per cent of respondents washed baby's bottom with soap and 50 per cent washed children's hands with soap. In the case of hand washing with soap after defecation and after wiping baby's bottom, with respectively 40 per cent and 43.3 per cent of caregivers in the intervention area doing so in Kota Bangun, Medan. The practice of hand washing with soap in TSM 3 sub-district, Medan, was more pronounced than in Kota Bangun. However, there were three situations involving the use of soap in TSM 3 that were worse than in Kota Bangun, namely: (1) wiping baby's bottom (60 per cent in Kota Bangun and 53.3 per cent in TSM 3), (ii) before eating (43.3 per cent in Kota Bangun and only 33.3 per cent in TSM 3) and (iii) washing children's hands (50 per cent in Kota Bangun and only 33.3 per cent in TSM 3).

The incidence of hand washing with soap among caregivers of under-5s in Makassar (Tallo and Lembo) was overall lower when compared with Surabaya and Medan. Besides using soap for bathing and washing clothes during the last 48 hours, the next most frequent use of soap among caregivers of under-5s in Makassar was for hand washing after eating (21.7 per cent in Tallo and 18.3 per cent in Lembo). This was followed by washing baby's bottom (with soap) (18.3 per cent in Tallo, and less at 15 per cent in Lembo) and hand washing after defecation (11.7 per cent in Tallo and 8.3 per cent in Lembo. Hand washing with soap before

eating was only practiced by 8.3 per cent of caregivers of under-5s in Tallo and 10 per cent in Lembo, while hand washing with soap before feeding children was only practiced by 1.7 per cent of caregivers in both Tallo and Lembo.

Based on the use of soap by each caregiver who was interviewed, an evaluation of the 5 (five) critical times of hand washing with soap was conducted, namely: (i) before eating; (ii) before feeding child; (iii) after defecation; (iv) after wiping baby's bottom; and (v) before preparing food. Each activity was assigned a score of 1, thus giving a maximum score of 5.

In almost all sub-districts (except TSM 3, Medan) there were caregivers who did not practice hand washing with soap at any of the five critical times (45 per cent – the lowest – in Wonorejo, up to 81.7 per cent – the highest – in Petemon). The percentage of those practicing hand washing with soap at one of the 5 critical times –washing hands after eating – varied from 13.3 per cent (in Petemon, Surabaya) up to 23.7 per cent in TSM 3, Medan. The percentage that practiced hand washing with soap at two critical times (out of 5 in total) was highest in TSM 3 Medan (23.7 per cent). The highest percentage of those who did so at three critical times was also found in TSM 3 in Medan at 20.3 per cent. Of those who practiced hand washing with soap at four out of the five critical times, the highest percentage was once again TSM 3 at 11.9 per cent, while in the case of all five critical times, the highest percentage was found in Wonorejo, Surabaya, at 16.7 per cent.

Another indicator that may be employed to assess the second sanitation priority is the relationship between the practice of hand washing with soap and the availability of running water and soap in bathrooms and places for hand washing, as observed during the survey. In Surabaya, it was found that almost all (81 per cent) of the bathrooms observed had running water available, while in Wonorejo it was 75 per cent and 88 per cent in Petemon. In Medan, running water was only available in 30 per cent of bathrooms in Kota Bangun, while in TSM 3 the figure for running water in the taps was more than two times higher at 78.3 per cent. The situation in Tallo and Lembo in Makassar was the worst, compared with Medan (Kota Bangun and TSM 3) and Surabaya (Wonorejo and Petemon). In Tallo and Lembo, only 38.3 per cent and 46.7 per cent, respectively, of bathroom taps had water in

them when observed. More than half of households (that have under-5s) in these two sub-districts did not have running water in their bathroom taps.

If we compare the three cities, it can be seen that the highest percentage of soap availability (for washing hands or for dishes in the kitchen) was recorded in Surabaya at 93.3 per cent. In Medan, 87.5 per cent of houses that were observed had soap available (for hands or for dishes in the kitchen), but only 75.8 per cent of households that had under-5s in the two sub-districts surveyed had soap available in the house. In Wonorejo, Surabaya 86.7 per cent of households had soap. In Petemon, 93.3 per cent of households had soap available (for washing hands or washing dishes in the kitchen). In Kota Bangun in Medan, 85 per cent of households had soap available. In TSM 3, soap availability was higher at 93 per cent. In Makassar, 83 per cent of households had soap available in Tallo, only 68 per cent in Lembo.

Table 5. Summary of Second Pillar: Indicators of hand washing with soap

Indicator	Surabaya		Medan		Makassar		
	Wonorejo	Petemon	Kota Bangun	TSM 3	Tallo	Lembo	
Use of soap in last 48 hours – MA							
Washing hands after eating	55.0%	23.3%	53.3%	79.7%	21.7%	18.3%	
Washing baby's bottom	76.7%	45.0%	30.0%	55.9%	18.3%	15.0%	
Washing hands after washing baby's bottom	46.7%	8.3%	23.3%	55.9%	3.3%	6.7%	
Washing hands before eating	36.7%	10.0%	43.3%	32.2%	8.3%	10.0%	
Washing hands after defecation	30.0%	6.7%	21.7%	62.7%	11.7%	8.3%	
Washing child's hands	38.3%	15.0%	25.0%	35.6%		3.3%	
Washing hands after cleaning house	33.3%	5.0%	-	35.6%	5.0%	10.0%	
Washing hands before feeding child	23.3%	3.3%	18.3%	37.3%	1.7%	1.7%	
Other responses	5%	10%	3.3%	1.7%	3.3%	11.7%	
Observations							
Water available (if in tap, water runs from tap)	Yes	75%	88.3%	30%	78.3%	38.3%	46.7%
	No	25%	11.7%	70%	21.7%	61.7%	53.3%
Soap available	Yes	93.3%	93.3%	85%	90%	83.3%	68.3%
	No	6.7%	6.7%	15%	10%	16.7%	31.7%

**Taken from PollingCenter (2011)*

3. Safe drinking water treatment and storage

The next priority is the treatment of drinking water so as to make it safe and healthy. According to the report from PollingCenter (2011), the indicator selected for this study was the source of drinking water most frequently used in households (with under-5s) in the sub-districts selected in the intervention cities (Surabaya, Medan and Makassar). In Surabaya, branded packaged water was the principal source of the bulk of respondents (40-45 per cent), while mains water piped into the home was used by 18.3 per cent to 23.3 per cent of households, and refill water in third place (20 per cent-33 per cent). In the case of refill water, this was the number two source of drinking water in Petemon, after branded packaged water.

In Medan, branded packaged water was not as popular as in Surabaya, with refill water being the number one source of drinking water for almost all households in Kota Bangun and TSM3 sub-districts (68.3 per cent to 71.7 per cent) while 16.7 per cent of households used mains water piped into the home. A total of 6.7 per cent of respondents gave other responses (bore water, water purchased from cart, covered excavated well) in Kota Bangun, while 10 per cent gave other responses in TSM3 (water purchased from cart, covered excavated well). As in Medan, branded packaged water was not much used in Makassar as households' principal source of water. Instead, refill water (38.3 per cent) and mains water from a neighbour's house (33.3 per cent) were the two most common sources of household water in Tallo, while in Lembo both of these water sources were equally prevalent at 31.7 per cent. There were also households that used mains water piped into the home as their primary source of water (16.7 per cent in Tallo and 25 per cent in Lembo).

All caregivers of under-5s in Wonorejo and Petemon (Surabaya) and Kota Bangun in Medan said that they treated water from the mains, excavated wells and bore wells (in addition to vendors' carts) by first boiling it before drinking. In TSM 3 (Medan), 17.65 per cent of respondents said that they directly consumed such water without doing anything to improve its quality. In Makassar (both in Tallo and Lembo), between 16.7 per cent and 12.5 per cent of households did nothing to improve the quality of water before consuming it,

while 15 per cent said that they allowed such water to sit so as to allow dirt to sink to the bottom before consuming it.

One-gallon plastic water bottles were the most common receptacle used for storing water (41.7 per cent in Tallo, Makassar, and 70 per cent in Kota Bangun, Medan), except in Lembo, where covered pots or buckets were most commonly used (46.7 per cent). Covered pots or buckets were the second favourite place for storing drinking water in Petemon, Surabaya (28.3 per cent), Medan (both in Kota Bangun – 23.3 per cent – and TSM 3 – 25 per cent) and also in Tallo, Makassar (25 per cent). Only in Wonorejo, Surabaya, were covered pots or buckets less popular at 8.3 per cent, coming behind teapots/kettles (16.7 per cent). Only 10 per cent of households in Petemon, Surabaya, used teapots/kettles, and 8.3 per cent of households in Tallo, Makassar. 6.7 per cent of respondents in TSM 3, Medan, and 3.3 per cent each in Lembo and Kota Bangun, Medan also used teapots and kettles. Meanwhile, covered water jars were used by 18.3 per cent of households in Tallo, and 8.3 per cent each in Lembo, Makassar, and Wonorejo, Surabaya.

Based on observations, the water storage place most commonly used continued to be one-gallon plastic water refill bottles (41.7-45 per cent in Surabaya and 25 per cent to 33.3 per cent in Makassar) and dispensers (40-53.3 per cent in Medan). 10 per cent of households in Wonorejo and 18.3 per cent in Petemon, Surabaya, used kettles to store water. Meanwhile in Kota Bangun and TSM 3, Medan, 23.3 per cent and 16.7 per cent respectively used kettles as places for storing drinking water, while in both Tallo and Lembo in Makassar, 13.3 per cent of respondents also used kettles.

Covered pots were used by 6.7 per cent of households in Wonorejo, while the figure was more than three times higher at 21.7 per cent in Petemon, Surabaya. Only between 1.7 per cent and 5 per cent used covered pots to store family drinking water in Medan and Makassar. Uncovered buckets were only used by a small percentage – 3.3 per cent in Kota Bangun and 15 per cent in TSM 3 – of households in Medan. Water jugs or “jumbo” water receptacles were only popular in Tallo (11.7 per cent) and Lembo (10 per cent).

Based on the results of observation, almost all households in the sub-districts surveyed (97.5 per cent in Surabaya, 95.8 per cent in Medan and 99 per cent in Makassar) used some sort of medium for storing water for cooking purposes. The most common was a covered pot or bucket (in households with under-5s) in almost all sub-districts studied in the cities of Surabaya, Medan and Makassar. 46.7 per cent of households in Wonorejo, Surabaya, used a covered pot or bucket, while 41.7 per cent of other households used a covered earthenware water jar. Conversely, in Petemon covered earthenware jars were more commonly used (49.1 per cent), while the use of covered pots or buckets was 29.8 per cent. The remaining small percentage used one-gallon water bottles, or uncovered pots/buckets as a storage place for water used for cooking, or used water straight from the source.

Covered pots or buckets also dominated the receptacles used for storing water used for cooking in Kota Bangun and TSM 3 sub-districts in Medan (44.1 per cent and 44.6 per cent respectively). 30.5 per cent of households in Kota Bangun and 28.6 per cent in TSM 3 in Medan used uncovered pots or buckets. One-gallon plastic water bottles were also used by at least 15 per cent of the households in Kota Bangun and 21 per cent in TSM 3, while 20.3 per cent of households in Kota Bangun and 7 per cent in TSM 3 in Medan used the water straight from the source/tap, rather than storing it in a receptacle first. In Makassar, covered pots/buckets were most commonly used for storing water used for cooking (55 per cent in Tallo and 76.3 per cent in Lembo), while 18.3 per cent of households in Tallo and 13.6 per cent in Lembo used covered earthenware water jars. 20 per cent of households in Lembo took the water they used for cooking straight from the source/tap. Uncovered pots and buckets were only found in Tallo (10 per cent). The same applied in the case of uncovered earthenware water jars (6.7 per cent). A small portion of households in Tallo used other types of receptacle, such as a washbasin, drum, tank, open bucket, pond or open cement water tank.

Table 6. Summary of Third Pillar: Indicators for Safe Water Treatment

Indicator	Surabaya		Medan		Makassar		
	Wonorejo	Petemon	Kota Bangun	TSM 3	Tallo	Lembo	
Treatment of water prior to consumption (water from mains/well)							
Boil water	100%	100%	100%	82.3%	66.7%	72.5%	
Allow water to sit so that sediment can settle					16.7%	15%	
Indicator	Surabaya		Medan		Makassar		
	Wonorejo	Petemon	Kota Bangun	TSM 3	Tallo	Lembo	
Drink directly				17.7%	16.7%	12.5%	
Observations							
Receptacle with	Small spout	86.7%	76.7%	86.7%	78.3%	88.3%	75%
	Large spout	13.3%	23.3%	13.3%	21.7%	11.7%	25%
Hard material/no n-cloth	Yes	100%	88.3%	75%	86.7%	88.3%	81.7%
	No	-	11.7%	25%	13.3%	11.7%	18.3%
Status of hands when taking water	Touch	-	3.3%	1.7%	13.3%	-	3.3%
	Don't touch	100%	96.7%	98.3%	86.7%	100%	96.7%
Place used for keeping prepared food – 3 top answers							
In closed cabinet	51.7%	30%	61.7%	71.7%	65%	63.3%	
Protected by removable cover	31.7%	51.7%	33.3%	20%	10%	11.7%	
Left uncovered on the table	10%	10%	-	1.7%	10%	8.3%	

*Taken from PollingCenter (2011)

4. Household solid waste management

According to the report from PollingCenter (2011), the disposal of solid waste by households was relatively better in Surabaya compared with both Medan and Makassar. In the majority of cases in Surabaya, households gathered their solid waste which was then collected by the authorities (50 per cent in Petemon and 70 per cent in Wonorejo). Of the remaining respondents, at least 30 per cent brought their solid waste to a common collection point for it to be removed by the authorities. In Petemon, 6.7 per cent gave another response, namely, an official garbage collection point outside their houses. In Wonorejo, Surabaya, 66.7 per cent used official garbage collection services. The remaining respondents brought their solid waste to a designated place for collection by the authorities. The situation was different in Petemon, Surabaya, where 56.7 per cent of households brought their garbage to a designated place for collection by the authorities. Households disposed of solid waste in a

variety of ways in Medan (Kota Bangun and TSM 3). The authorities collected garbage house-to-house for only 3.3 per cent of respondents in Kota Bangun. By contrast, in TSM 3 household garbage collection services were used by 63 per cent of respondents. In Kota Bangun, the principal way of disposing of garbage was to dump it in the yard for burning (43.3 per cent). Other methods of solid waste disposal in Medan were throwing into the river, directly burning, or dumping in an open space outside the boundaries of the house.

Makassar also demonstrated a relatively diverse range of disposal methods for solid waste. The most common method of garbage disposal in Tallo sub-district was to dump the garbage into the sea (35 per cent), while 16.7 per cent of respondents directly dumped it into a river/stream. Meanwhile in Lembo, the most common method of disposal was to dump the garbage in an open space outside the house boundaries (38.3 per cent), or to dump it outside the house boundaries in a designated garbage pit or collection point (18.3 per cent). Among other methods of garbage disposal practiced by small percentages of households were dumping outside the house boundaries in a pond or pit, placing in a bucket in the yard, placing in a plastic bag, burning in the yard of the house, or dumping in the house cellar. The percentage of households availing themselves of official collection services was relatively small at only 6.7 per cent in Tallo and 5 per cent in Lembo.

Based on observations of the receptacles used for collecting garbage, respondents in both Wonorejo and Petemon in Surabaya used uncovered garbage bins as the most common receptacles for collecting garbage (40 per cent in Wonorejo and 43.3 per cent in Petemon). After uncovered garbage bins, the next most common receptacles were open and closed plastic bags. 25 per cent of respondents in Wonorejo and 16.7 per cent in Petemon used closed plastic bags, while 15 per cent of respondents in Wonorejo and 21.7 per cent in Petemon used open plastic bags. 18.3 per cent of respondents in both Wonorejo and Petemon, Surabaya used covered garbage bins.

The use of closed plastic bags was more common in Kota Bangun, Medan (63.3 per cent), while 38.3 per cent of respondents in TSM 3 used open plastic bags, and 30 per cent closed plastic bags. At least 10 per cent of the residents in TSM 3 and 11.7 per cent in Kota Bangun

used open garbage bins for collecting their household garbage. Around 11.7 per cent of respondents in TSM 3 used sacks to collect household garbage, while 5 per cent did so in Kota Bangun. A total of 6.7 per cent of residents in both Kota Bangun and TSM 3 used other receptacles, such as receptacles made from wood or directly took their garbage to a designated garbage pit.

Residents of Tallo and Lembo used a relatively wide variety of media to collect their household solid waste. Open plastic sacks were used frequently (23.3 per cent in Tallo and 36.7 per cent in Lembo, followed by closed plastic sacks (21.7 per cent in Tallo and 26.7 per cent in Lembo). Sacks (13.3 per cent in Tallo and 6 per cent in Lembo) and uncovered buckets (11.7 per cent in Tallo and 16.7 per cent in Lembo) were also used as receptacles for collecting household waste. Meanwhile, 25 per cent of households used other media, such as wooden receptacles and direct dumping at a designated site without using intermediate media in the home.

Table 7. Summary of fourth pillar: Solid waste management practices

Indicator	Surabaya		Medan		Makasar		
	Wonorejo	Petemon	Kota Bangun	TSM 3	Tallo	Lembo	
Garbage disposal – 3 top answers							
Collected at home for subsequent collection by authorities	70%	50%	3.3%	58.3%	6.7%	5%	
Indicator	Surabaya		Medan		Makasar		
	Wonorejo	Petemon	Kota Bangun	TSM 3	Tallo	Lembo	
Collected at a designated place for subsequent collection by authorities	30%	43.3%	21.7%	16.7%	8.3%	5%	
Dumped in an open space outside house boundary				5%	15%	38.3%	
Dumped outside of house boundary into the sea					35%		
Dumped in the yard (not in pit) and then burned			30.0%	1.7%	1.7%		
Dumped in pit in yard and then burned			23.3%	6.7%	1.7%		
Dumped outside house boundary in garbage pit/disposal point			1.7%	1.7%		18.3%	
Garbage Separation	No	91.7%	98.3%	90.0%	91.7%	83.3%	81.7%
	Yes	8.3%	1.7%	10.0%	8.3%	16.7%	18.3%
Garbage collection media – observed – 3 top answers							
Uncovered garbage bin	40%	43.3%	11.7%	10%	6.7%	6.7%	
Closed plastic bag	25%	16.7%	63.3%	30%	21.7%	26.7%	
Open plastic bag	15%	21.7%	8.3%	38.3%	23.3%	36.7%	

*Taken from PollingCenter (2011)

5. Proper wastewater management practices

The final pillar of STBM is the management of household wastewater. According to the report from PollingCenter (2011), in both Wonorejo and Petemon, more than 58 per cent of wastewater (from kitchen, bathroom and washing clothes) is discharged into a river, pond, drain or canal or into a sewer. Only in the case of around 20 per cent of respondent households is wastewater discharged into a closed channel. In Medan's Kota Bangun and TSM 3, most households dispose of wastewater (from kitchen, bathroom and washing clothes) through the sewer system (more than 70 per cent of respondents). Only 30 per cent of respondent households in Kota Bangun and only 5 per cent in TSM 3 discharge wastewater into a river, pond, drain, canal or open channel. The percentage of wastewater being discharged into a closed channel is even smaller at around 16 per cent.

Residents in Makassar (in Tallo and Lembo sub-districts) had relatively less concern about how their household wastewater was disposed. 40 per cent of the respondent households (in both sub-districts) discharged their wastewater into open channels. Households in Tallo (36.7 per cent) tended to discharge wastewater into rivers, ponds, drains or canals compared with households in Lembo (25 and 26.7 per cent). The sewage waste water system was used more by people in Lembo (25 per cent) than in Tallo (13.3 per cent). A small percentage (less than 7 per cent) of households both in Tallo and Lembo discharged household wastewater onto the street, into the yard, or into the garden. Similarly, a small percentage disposed of wastewater under the house (in the case of stilt houses). In Tallo, around 3 per cent of households discharged wastewater into a pit.

Only a small number of households said they did not have a septic tank (between 10 per cent in TSM 3 and 23.3 per cent in Kota Bangun, Medan), with the exception of Tallo, Makassar, where the biggest percentage (41.7 per cent) did not have a septic tank. Also for those who did not have septic tanks, observations in the field found that in Wonorejo, Surabaya, 88.9 per cent of residents discharged their effluent into a river or lake, while only 11.1 per cent (1 respondent) discharged effluent into a septic tank. In Petemon, all of the respondents (100 per cent) who did not have septic tanks discharged their effluent into a

river or lake. In Kota Bangun, 71.4 per cent of residents who did not have septic tanks also discharged effluent into a river/lake, while the remainder (28.6 per cent) discharged effluent into a drain. In TSM 3 of the residents who said they did not have septic tanks, observations found that 50 per cent actually did have septic tanks, even though the residents were not aware of this fact. Meanwhile, in 33.3 per cent of households it could not be identified where effluent went, while in 16.7 per cent of cases the effluent fed straight into the drainage system.

Of respondents in Makassar who did not have a septic tank, effluent flowed directly into the drainage system in the case of 88 per cent of households, while in the case of the remainder (4 per cent each), effluent discharged into a garden, field or directly into the sea. Meanwhile in Lembo, the ultimate destination of effluent could not be identified in the case of 44.4 per cent of households, while in 22.2 per cent of cases the effluent flowed into a septic tank, while in the case of the remainder (11.1 per cent each), the effluent was discharged into a river, lake or the sea, directly into the drainage system or into a pond/paddy field.

In Surabaya and Medan, almost all (between 80 and 98 per cent) of residents used toilets located within their houses so that essentially no time was needed to reach the toilet. In Makassar, between 40 per cent and 43 per cent of residents had toilets within the house. In Lembo, 43.3 per cent of residents, and 16.7 per cent in Tallo, required up to two minutes from leaving the house to reach a toilet, while 23.3 per cent of respondents in Tallo did not have a special place for defecating (defecated into the sea) and so could not state how long it took to get to “the toilet.” Between 10 and 11.7 per cent of respondents in Makassar needed between three and five minutes to reach a toilet.

Table 8. Summary of fifth pillar: wastewater management practices

Indicator		Surabaya		Medan		Makasar	
		Wonorejo	Petemon	Kota Bangun	TSM 3	Tallo	Lembo
Open channel			5.0%	33.3%	16.7%	40.0%	40.0%
Covered channel		25.0%	16.7%	11.7%	16.7%		
Do you have a septic tank	No	15.0%	20.0%	23.3%	10.0%	41.7%	15.0%
	Yes	85%	80%	76.6%	90%	58.3%	85%
Septic tank discharge – observed – 3 top answers							
Septic tank		86.7%	78.3%	76.7%	86.7%	56.7%	83.3%
River/lake/sea		13.3%	20.0%	16.7%	1.7%	36.7%	1.7%
Drain				6.7%	3.3%	1.7%	6.7%
Indicator		Surabaya		Medan		Makasar	
		Wonorejo	Petemon	Kota Bangun	TSM 3	Tallo	Lembo
Place where kitchen wastewater discharged– 3 top answers							
Into waste water sewer		60.0%	65.0%	10.0%	73.3%	13.3%	60.0%
Into river/pond/drain/canal		58.3%	71.7%	38.3%	5.0%	36.7%	58.3%
Open channel			5.0%	33.3%	16.7%	40.0%	
Covered channel		26.7%	16.7%	11.7%	18.3%		26.7%
Place where bathroom waste is discharged – 3 top answers							
Into sewer		61.7%	65.0%	13.3%	76.7%	13.3%	25.0%
Into river/pond/drain/canal		58.3%	71.7%	38.3%	5.0%	36.7%	28.3%
Open channel			5.0%	33.3%	16.7%	40.0%	38.3%
Covered channel		26.7%	16.7%	11.7%	16.7%		
Place where wastewater from clothes washing is discharged– 3 top answers							
Into sewer		61.7%	65.0%	11.7%	76.7%	13.3%	25.0%
Into river/pond/drain/canal		58.3%	71.7%	38.3%	5.0%	36.7%	28.3%

*Taken from PollingCenter (2011)

2. Sense of Community Survey

The data from the second instrument, the Sense of Community survey, was collected at the same time as the Baseline Survey from 16-27 January 2012 by the research firm, Polling Center (PC), engaged by YCCP (see Appendix 3). In each of the six (6) *kelurahan*, 15 change agents were interviewed. In total, there were 90 change agents interviewed in the three cities of Medan, Surabaya and Makassar. This group of 90 represented the full cohort of change agents engaged as part of the High Five project.

For the change agents surveyed for the project, most (57.8 per cent) identified as women (n = 52) and with the remainder (42.2 per cent) identifying as men (n = 38). The largest number of change agents (28.9 per cent) were aged 35-45 years (n = 26), with 26.7 per cent aged 45-

55 years (n = 24). 20 per cent were aged 25-35 years (n = 18) and 20 per cent were aged over 55 years (n = 18). A large majority (88.9 per cent) of the respondents (n = 80) had completed senior high school or higher. Only 32.2 per cent had completed any form of tertiary education (bachelors, masters or PhD).

Table 9. Frequency of age groups and education for change agents

Age group	n	%
<25 years	4	4.4
25-35 years	18	20.0
>35-45 years	26	28.9
>45-55 years	24	26.7
>55 years	18	20.0
<i>Total</i>	<i>90</i>	<i>100.0</i>
Education		
Junior High School	10	11.1
Senior High School or equivalent	39	43.3
Diploma/Academy	12	13.3
Degree (Bachelors/Masters/PhD)	29	32.2
<i>Total</i>	<i>90</i>	<i>100.0</i>

The respondents were fairly evenly divided between the groupings of type of change agents. The types occurring most frequently were head of the *puskesmas*, health worker (midwife, doctor or nurse), head of the PKK, manager of the *posyandu*, head of the *kelurahan* and head of the RW or RT – these were each reported as 13.3 per cent of the change agents (n = 12 each). The remainder were mosque or church-based youth leaders (10 per cent, n = 9) and traditional/religious leaders (10 per cent, n = 9).

Table 10. Frequency of change agent groups

	Frequency	%
Head of Puskesmas	12	13.3
Healthworker [Midwife, Doctor, Nurse]	12	13.3
Head of PKK	12	13.3
Manager Posyandu	12	13.3
Head of Kelurahan	12	13.3
Head of RW\RT	12	13.3
Youth Leader (Mosque/Church)	9	10.0
Traditional/Religious Leader	9	10.0
<i>Total</i>	<i>90</i>	<i>100.0</i>

Sense of Community Index Scores of Change Agents

For the 90 change agents surveyed, the initial question, “How important is it to you to feel a sense of community with other community members?”, is a validating question that can be used to help interpret the results. For this question the great majority (94.4 per cent, n = 85) rated the referent community as being important (62.2 per cent, n = 56), or very important (32.2 per cent, n = 29) to them. Only a small number (4.4 per cent, n = 4) considered the community to be somewhat important and even less (1.1 per cent) rated the community as not very important (n = 1). Table 11 shows that for the change agents’ Sense of Community Index scores, calculated based on the responses to the 24-question SCI survey, the range was between 34 and 66 out of a maximum possible total score of 72. The mean was 49.23 with a standard deviation of 5.48. The change agents with the ten highest SCI scores received 56 and above, while the lowest received scores of 44 and below.

Table 11. Total Sense of Community Index Score - Baseline

	N	Mean	Std. Deviation	Std. Error	95 per cent Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
Surabaya	30	51.70	3.75224	.68506	50.2989	53.1011	46.00	60.00
Medan	30	47.63	6.04856	1.10431	45.3748	49.8919	34.00	66.00
Makassar	30	48.37	5.64149	1.02999	46.2601	50.4732	39.00	66.00
Total	90	49.23	5.48143	.57779	48.0853	50.3814	34.00	66.00

Table 11 shows the distribution of SCI scores reported by location. Change agents in Surabaya (n = 30) had a mean SCI score of 51.7, Medan (n = 30) with 47.63 and Makassar with 48.37. This means that Surabaya change agents have an average of 5 per cent higher SCI scores than Medan and Makassar ($F(140.93) = 5.125, p = .008$).

Looking more closely at the SCI scores, Figure 4 shows the breakdown of the SCI scores by the four standard SCI subscales (A. Reinforcement of Needs; B. Membership; C. Influence; and D. Shared Emotional Connection). Overall there is not a significant difference between the means of the four subscales, with a range from 67-70 per cent of the maximum possible total of 18. The mean of A. Reinforcement of Needs is 12.46 (70 per cent of the maximum possible total of 18); the mean of B. Membership is 12 (67 per cent); C. Influence is 12.34 (67 per cent); and D. Shared Emotional Connection is 12.43 (69 per cent).

Figure 4. Change agent Sense of Community Index (SCI) scores by subscale

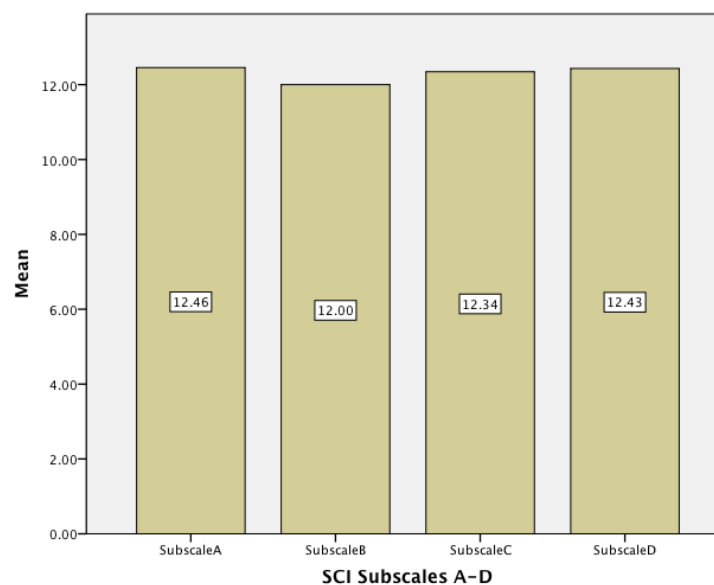
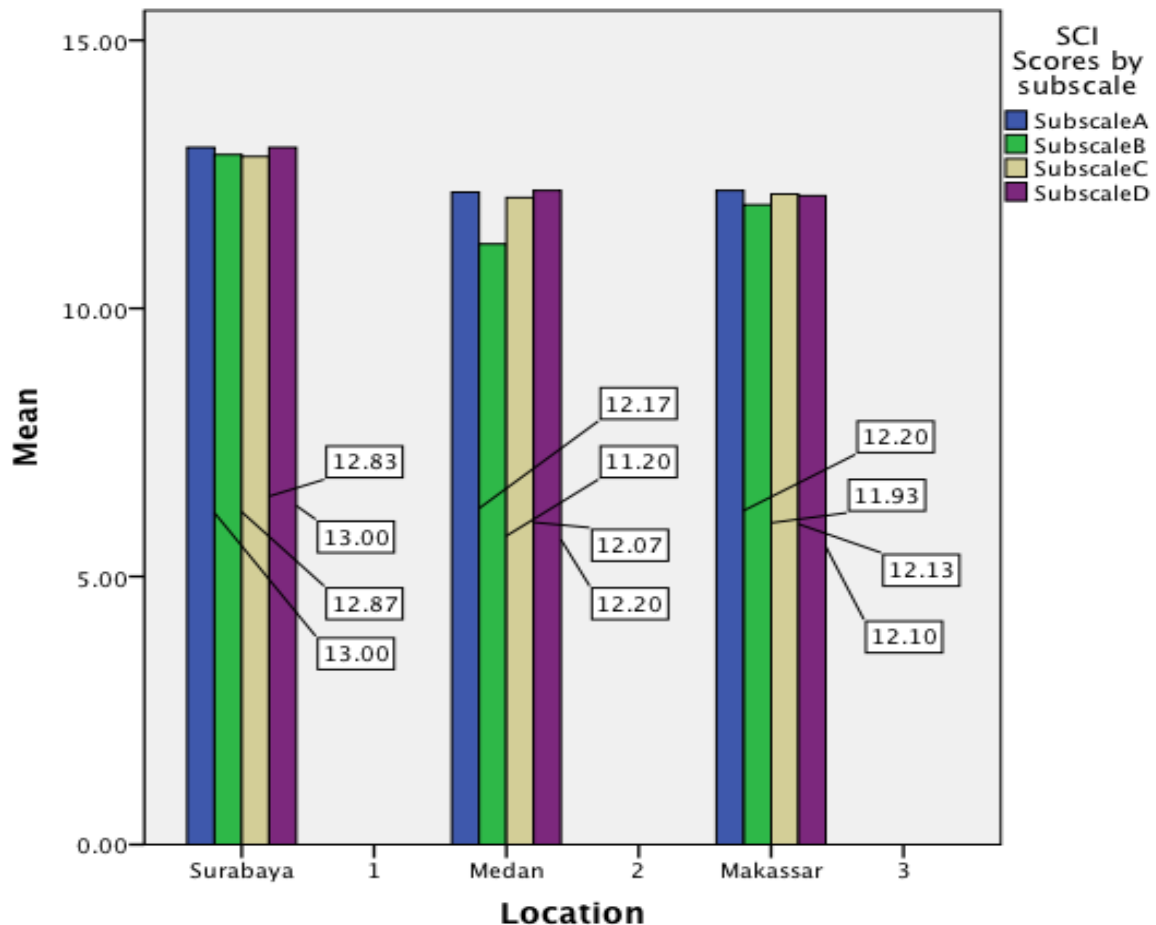


Figure 5 demonstrates that when the SCI subscales are compared across change agents in the three project locations, differences begin to emerge. For the subscale A. Reinforcement of Needs, the mean of the Surabaya scores is slightly higher at 13 (72 per cent of the total possible of 18 points for this subscale), Medan is 12.17 (68 per cent) and Makassar is 12.2 (68 per cent). For subscale B. Membership, the mean of the Surabaya scores is even higher (up to 10 per cent) than the others at 12.87 (72 per cent) compared with Medan at 11.2 (62 per cent) and Makassar at 11.93 (66 per cent). For subscale C. Influence, the mean of the Surabaya scores is slightly higher at 12.83 (71 per cent) than Medan at 12.07 (67 per cent) and Makassar with 12.13 (67 per cent). And finally for the subscale D. Shared Emotional

Connection, the mean of the Surabaya scores is slightly higher at 13 (72 per cent) than Medan with 12.2 (68 per cent) and Makassar at 12.1 (67 per cent).

Figure 5. Change agent Sense of Community Index (SCI) scores by location and subscale.



3. Interviews

The data from the third instrument, the qualitative interview, was collected from 17-21 June 2013 by the author, working with local High Five Program staff of YCCP. In each of the three cities respondents from households were interviewed, with a total of nine (9) households in Medan (4), Surabaya (3) and Makassar (2). The respondents were selected on the basis of their involvement as change agents in the High Five program and their willingness to be interviewed by the author.

The interviews were conducted in Indonesian and recorded by the author, with a High Five staff member present at every interview. Each interview began with a number of general questions to introduce the respondent to the author and create a more comfortable environment for the discussion. This included a question on whether the respondents had been previously involved in sanitation or other social programs. The author then asked a series of open-ended questions based on the four subscales of the Sense of Community Index: 1. Reinforcement of Needs; 2. Membership; 3. Influence; and 4. Shared Emotional Connection (see Chapter 4 'Methodology' for further detail on the SCI and its subscales). The interviews were transcribed in the original Indonesian and then translated into English. The English transcripts were then imported into the NVivo software. Nodes (themes) were created using tags based on the four SCI subscales. The interview transcripts were then tagged with the node themes and then tabulated.

Table 12. Summary of change agent interview references grouped by Sense of Community subscale

Node (SCI subscale)	Number of Source Interviews (max. 9)	Number of References (%)
SCI1. Needs	8	21 (24%)
SCI2. Membership	9	19 (22%)
SCI3. Influence	9	26 (30%)
SCI4. Connection	8	20 (23%)
	<i>total</i>	<i>86 (100%)</i>

Table 12 shows the summary of the references coded in the interviews, grouped according to the node. The node appearing most often in the interviews was SCI subscale 3 relating to 'Influence', accounting for 30 per cent of the references ($n = 26$) and being mentioned in all nine interviews with the change agents. Next most often, which all had similar results, were SCI subscale 1, 'Reinforcement of Needs', identified in 24 per cent ($n = 21$) of the references, and SCI subscale 4, 'Shared Emotional Connection', appearing in 23 per cent ($n = 20$) of the references. Finally the least common theme was SCI subscale 2, 'Membership', appearing in 22 per cent ($n = 19$) of the references.

SCI1. Reinforcement of needs

In the context of the High Five program, this subscale refers to the needs of the community members and the change agents. This includes the ability of the change agent to have their personal needs met by being a part of the community. For example, Sunaani in Lembo, Makassar said, “We are thankful for the High Five program because there is progress in dealing with our problems. I can become a garbage recycler which helps society...and motivates me because it is for the health and prosperity of the people” (Sunaani, 2013). Similarly, Dinar in Tallo, Makassar, said “I see *pokja* as the source of the solution” (Dinar, 2013). Dhani in Kota Bangun, Medan, said “I joined this program for the first time because it can be useful for myself and society” (Dhani, 2013). SCI1 statements also refer to the concept of the change agents valuing the same things as the members of the community. As Muamar in Medan said, “We can be the people to take action because the community comes to us first and tells us about what they need” (Muamar, 2013). SCI1 also refers to the change agent’s perceptions of the ability of the community to meet the needs of its members. Lina in Kota Bangun, Medan, said “I see about eighty per cent of the members are concerned and care about the environment” (Lina, 2013).

SCI2. Membership

In the context of the High Five program, this subscale refers to the constitution of the community, including the recognition and trust by the change agents of its members and vice versa. Sumarni in Wonorejo, Surabaya said, “Like Mr Prapto who has been a leader in this kelurahan for so many years...he already knows...and almost all the people know him”(Sumarni, 2013). Similarly Dudung in TSM3, Medan said, “we recruited them because they already get along well with the community” (Dudung, 2013). SCI2 statements also refer to common symbols and expressions and the links between membership and personal identity. As Sunaani said, “(Our participation) came from our own self consciousness, we care about the community” (Sunaani, 2013). Dinar said, “We are of the same tribe, so we are more like a family, for example we go to Koran study, and we always get together at

other events.” On a more personal level, Dinar also said, “I was also embarrassed of the family that litters” (Dinar, 2013).

SCI3. Influence

For the High Five program, this subscale refers to the influence of the community and the change agents on each other, including the ability of the community to change and be changed. As Sunaani said, “For me it was because we can make an impression on the community, we can change their behaviour.” She also said “Before this program, we used to work on the environment together once a month, but after this program we work as a group...every Sunday.” Sunaani adds, “I heard from (other members of the community) that they want to join (the High Five program) as they have seen how we have worked very actively” (Sunaani, 2013). Further to this, Dhani said, “we are the source of information, some of us are influential people...it means that now the community starts to understand and care about this program” (Dhani, 2013).

SCI3 is also about fitting in and caring what members of the community think about the change agents. As Sunaani says, “I think (what we do) is already approved by society” (Sunaani, 2013). Dinar describes it by saying, “I have had so many experiences when I joined (the High Five program), I gained much knowledge, new friends and now I can socialise with others, I can give counselling to them. I used to be distant from the *kelurahan* leader’s wife and others but not any more” (Dinar, 2013). Makmur said, “we’re all expected to help run this program. After I joined it, I started to feel that I have a responsibility to change the behaviour of people, especially around me.” Makmur continued by saying, “people like us can be role models” (Makmur, 2013). Muamar continued this theme, “So you can say that we’re people who are very close to the community” (Muamar, 2013).

SCI4. Shared emotional connection

For the High Five program, this subscale refers to the emotional bonds between the community and the change agents, including shared experiences and feelings of

connectedness. Sunaani said, “Working there for a long time they already have good connections and are close to the people, so it is no longer difficult to convince them.” She also says, “Yes, I was so excited because we can socialise with the women there” (Sunaani, 2013). Sumarni had a similar response, “I think most the (Working Group) members had been in other social programs before, especially those with a high concern for society” (Sumarni, 2013). Lina adds to this theme, saying, “we already had good relationship before joining (High Five), but after we joined, we are more like a brothers and sisters...it is better that way”(Lina, 2013). Muamar described more personal attachment, “Apart from (High Five) work, sometimes we hang out together for karaoke, dinner and have fun” (Muamar, 2013). But the experience of Dinar shows that this acceptance is not always immediate or constant, “Someone heard them say not to trust (us) as (we) will get money from this” (Dinar, 2013).

Previous participation

An additional theme mentioned by the change agents in the interviews relates to their involvement in previous social and behaviour change programs and groups. A separate node, ‘Previous Participation’ and its sub-nodes, or children, were created to capture the most common types of previous participation. Table 13 summarises the results for Previous Participation across all nine interviews.

Table 13. Previous participation by change agents

Type of Participation	Number of references (%)
<i>Kader</i> (Community volunteer corps)	5 (21%)
<i>PKK</i> (Women’s Empowerment of Family Welfare) organisation	5 (21%)
<i>Posyandu</i> (Integrated Health Service Post)	5 (21%)
Other (student, religious, other government etc)	9 (37%)
<i>Total</i>	24 (100%)

Previous participation in social and/or behaviour change programs and organisations was mentioned a total of 24 times by all nine of the interview respondents. The most common were three main groups all with 21 per cent ($n = 5$) of the total mentions: the *kader*

(community volunteer corps); the *PKK* (Women's Empowerment of Family Welfare) organisation and the *posyandu* (Integrated Health Service Post). There were also 31 per cent comprised of "Other" groups and programs, including student organisations, religious groups and other government programs (n = 9).

Of the interviewees, Sunaani made reference to her own previous participation saying, "It's been ten years since we joined to be the *kader* here and also *PKK kader* as well as with *majelis ta'lim* (Koran reading groups)" (Sunaani, 2013). Dinar, another long-serving volunteer, said, "I have been the coordinator for the *posyandu* for a long time" (Dinar, 2013). Also, Sumarni said that she had, "worked with the health department in (Surabaya)", also saying, "I was already working on a sanitary program with the *PKK* team in Wonorejo" (Sumarni, 2013). Lina made reference to the other members of the High Five working group saying, "most of the *POKJA* members have been involved in environmental issues before" (Lina, 2013). Muamar, who is a university student, mentioned that, "I was also an environmental activist so apart from *STBM*, we were also working on projects related to garbage and other environmental issues" (Muamar, 2013). Dhani also contributed saying, "Women here already know each other well before because they were from the *PKK* community" (Dhani, 2013).

4. Endline Evaluation

The data from the fourth instrument, the Endline Evaluation, was collected in March and April 2014 by the research firm, Polling Center (PC), engaged by CCP Indonesia. In each of the six (6) *kelurahan*, 30 households (caregivers of children) and 15 change agents in each RT were interviewed and observed. In total, there were 357 households and 90 change agents interviewed and observed in the three cities of Medan, Surabaya and Makassar.

Table 14: Sample Populations of High Five project areas

City (project <i>kelurahan</i>)	Change Agents	Households
Surabaya (Petemon and Wonorejo)	30	124
Makassar (Tallo and Lembo)	30	95
Medan (Kota Bangun and TSM3)	30	138
<i>totals</i>	<i>90</i>	<i>357</i>

Source: PollingCentre (2014), Report on High Five Program Endline Household Survey

As a result of the interview requirement that respondents should be caregivers of children under 5 years of age, all (100 per cent) of the sample respondents identified as women (n = 357). Most of the household respondents (61 per cent) were aged 25-35 years (n = 218). A large majority (94 per cent) of the respondents (n = 336) had completed senior high school or higher. The largest socio-economic strata (34.2 per cent) for household expenditure was those spending IDR1,250,001 to 1,750,000 (approximately AUD 125-175, assuming AUD1 = IDR10,000) per month (n = 122). The following are further breakdowns according to the three geographic areas (PollingCentre, 2014).

Surabaya

The majority (82.3 per cent) were housewives (caregivers of the children under five) of between 25 and 45 years of age, who had completed high school or above (58.9 per cent). They stayed in a house that they owned (71.8 per cent) and had an average monthly expenditure of between Rp 1,750,001 and Rp 2,500,000 (AUD175-250) per month (38.7 per cent) while another 27.4 per cent had a monthly expenditure that was lower, that is between IDR1,250,001 and IDR1,750,000 (AUD125-175). The majority of respondents in Surabaya (83.9 per cent) took care of one child under the age of five and 15.3 per cent of respondents took care of two children under the age of five. Respondents that stay with their immediate family (two to three people besides the child under five) were as many as 48.4 per cent. And 41.1 per cent of respondents stayed in a home not only with their immediate family (wife-husband-children) but also with four to six other family members.

Medan

Like Surabaya, the majority of respondents in Medan (89.9 per cent) were housewives between 25 and 45 years of age, who had also completed high school (55.8 per cent). 51.4 per cent lived in a house they owned and 39.1 per cent rented. They had an average household expenditure of between IDR1,750,001 and IDR2,500,000 (AUD175-250) per month (42.8 per cent) while another 25.4 per cent had a lower monthly expenditure of between IDR1,250,001 and IDR1,750,000 (AUD125-175). 7.3 per cent of respondents took care of one child under five years of age and 51.4 per cent of respondents lived in a house with their immediate family, that is two to three people besides the child. Those who stayed with a larger family (four to six people) were as many as 41.3 per cent.

Makassar

In Makassar, the majority of respondents were young housewives (caregivers of a child under five) of up to 35 years of age (73.7 per cent). Of these respondents 48.4 per cent of the total respondents had only completed elementary school education or its equivalent. As many as 65.3 per cent lived in a house they owned. Of these respondents, 55.8 per cent had an average monthly expenditure of between IDR1,250,001 and IDR1,750,000 (AUD125-175). Another 21.1 per cent had a smaller monthly expenditure of between IDR900,001 and IDR1,250,000 (AUD90-125). As many as 71.6 per cent of respondents looked after one child under the age of five and 28.4 per cent of respondents looked after two children under the age of five at home. Those who stayed in a house with only their immediate family, that is two to three people besides the child under the age of five, were 34.7 per cent of respondents, while those who stayed with a larger family (four to six people besides the child under five) were 54.7 per cent of respondents.

Table 15. Summary of Respondent Profile – Endline Survey*

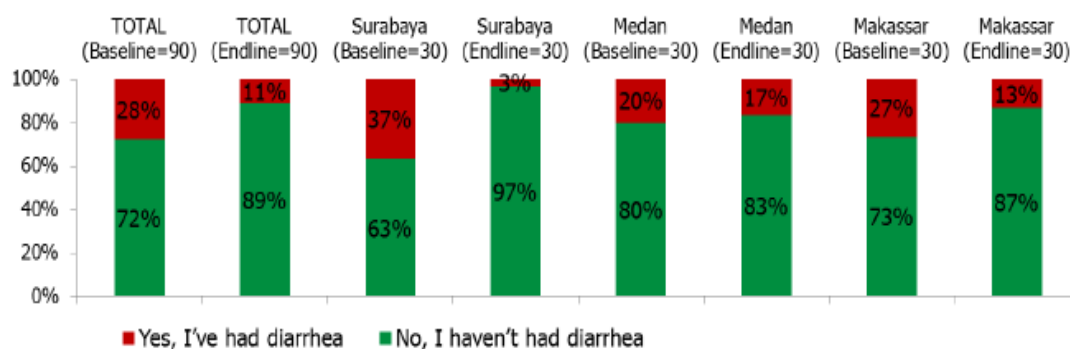
Characteristic / Location	Surabaya	Medan	Makassar
Age	82.3% 25 – 45	89.9% 25 – 45	73.7% < 35
Education completed	58.9% high school	55.8% high school	48.4% primary school
Number of children under five years in household	83.9% 1 child 15.3% 2 children	70.3% 1 child 29.7% 2 children	71.6% 1 child 28.4% 2 children
Socio-economic status	38.7% B 27.4% C1	42.8% B 25.4% C1	55.8% C1 21.1% C2
Home ownership	71.8% owned house 25% rented house	51.4% owned house 39.1% rented house	65.3% owned house 18.9% rented house

*Source: PollingCentre (2014)

Lead health impact indicator – diarrhea

Consistent with the approach employed for the Baseline Survey, diarrhea was selected as the lead health indicator used to track the impact of the High Five program through the Baseline Survey. Figure 6 shows the percentage of respondents (children in fifth and sixth grades – approximately 10-11 years old) who experienced a diarrhea episode in the two weeks prior to the Endline Survey declined by 17 per cent from 28 per cent at the time of the Baseline Survey (n = 90) to 11 per cent at the time of the Endline Survey (n = 90). The greatest declines in the incidence of diarrhea were recorded in Surabaya and Makassar. In Surabaya, diarrhea declined by 34 per cent from the Baseline of 37 per cent (n = 30) to the Endline of 3 per cent (n = 30). In Makassar, diarrhea declined by 14 per cent from the Baseline of 27 per cent (n = 30) to the Endline of 13 per cent (n = 30). And in Medan, diarrhea declined by 3 per cent from the Baseline of 20 per cent (n = 30) to the Endline of 17 per cent (n = 30).

Figure 6: Incidence of diarrhea in the previous 2 weeks



Q29a. In last 2 weeks, have you experienced loose stools more than 3 times in one period of 24 hours?

Five sanitation behaviour priorities

Also consistent with the Baseline Survey, the following are the five priority sanitation practices for the High Five program to be tracked through the Endline Survey. The five priorities are:

1. Defecation in public spaces
2. Hand washing with soap practices
3. Safe drinking water treatment and storage
4. Household solid waste management
5. Proper wastewater management practices

1. Defecation in public spaces

According to the report from PollingCentre (2014), during the Baseline Survey, 80.8 per cent of respondents stated that the last time they defecated was in a private latrine, likewise for the other adults that stayed in the same house. In Surabaya, both in Wonorejo and Petemon, the percentage had increased from the Baseline (even though being below 5 per cent was not a large increase) in the use of private latrines both by the respondents themselves as well as other adults staying in the house. When comparing the intervention areas with the non-intervention areas in Surabaya, it shows that in Wonorejo, in the

intervention area there were no longer any private latrines in which the effluent flushed into an open water system rather than a septic tank (as compared to 10 per cent of respondents in the Midline survey). For the non-intervention areas there were still some private latrines in which the effluent was channelled into an open drain, canal or river (6.7 per cent). For the subdistrict of Petemon both in the intervention area as well as non-intervention area, there was an increase in the number of people who defecated in private latrines (an increase of around 4 to 5 per cent) and public latrines were no longer used.

From the results of the Endline surveys in Kota Bangun in Medan, there was an increase (around 7.4 per cent) that used a private latrine for the last defecation for the respondents as well as other people staying in the house. Likewise for those who used a latrine that flushed into a river, canal or open drain rather than a septic tank there were still as many as 20 per cent at the time of the Midline survey, whereas at the time of the Endline survey, there were none found in the city of Bangun, Medan.

In Medan's TSM3, the use of private latrines also significantly increased, from 60 per cent at the time of the Baseline Survey and 100 per cent at the time of the Endline Survey. However, this was only found in the area of the High Five Program, while in the areas outside the program, 13.3 per cent of respondents still used public latrines. If a comparison is made between the two areas in the High Five program in Medan, it appears that there was a substantial change in the TSM3 subdistrict. In the period of the Endline Survey, all respondents had taken advantage of the private latrines and had given up their previous bad habits.

In Makassar the High Five program was conducted in a comprehensive manner in the subdistricts of Tallo and Lembo. At the time of the Baseline Survey, a private latrine (66.7 per cent), public latrines (17.9 per cent) and shared latrines (12.8 per cent) were the three preferred choices of respondents in Tallo for their last defecation. The subdistrict of Lembo has shown a healthier defecation habit, 76.7 per cent of respondents defecated in a private latrine (including other adults who resided in the same house). Use of private latrines

increased by 85.7 per cent in this subdistrict, and the remaining respondents used latrines with a flush system or a cistern in which the effluent was channelled into a septic tank.

Based on observations in the field, almost all the residents in Wonorejo and Petemon, Surabaya, use a toilet with a cistern (both the Western style toilet as well as the squat toilet). At the time of the Baseline Survey, 6.7 per cent of respondents still used a toilet built over an open waterway. However, this type of latrine was no longer found at the time of the Endline Survey. In the three cities studied the majority (at least 66.7 per cent) had a latrine in the home, except in the High Five program area in the city of Bangun Medan where only 28 per cent had a latrine in the home. The others needed three to five minutes to go to a latrine and come back, except in Tallo where they needed an average of 10 minutes.

2. Hand washing with soap practices

According to the report from PollingCentre (2014), overall there was no change in the habit of using soap for washing hands in Surabaya (Wonorejo and Petemon), which was stable from the Baseline Survey to the Endline Survey. Within the two High Five subdistricts some differences could be detected. In Wonorejo, respondents who used soap to wash their hands after the last defecation increased from 53.3 per cent at Baseline to 60 per cent at Endline. In Petemon, the increase for the same activity was from 3 per cent at Baseline to almost 18.8 per cent at Endline. In all the other activities, the percentage of using soap to wash hands at the time of the Endline Survey had increased when compared with the time of the Baseline Survey.

The use of soap to wash hands for only four of the ten activities in Medan's Kota Bangun showed an improvement when comparing the Baseline and Endline surveys. For example, the activity of washing hands after washing the baby's bottom, increased from 43.3 per cent at Baseline to 46.2 per cent at Endline. In the sub-district of TSM3, only two of the ten activities showed an improvement when comparing the Baseline and Endline surveys. For washing the child's hands, the activity went from a Baseline of 33.3 per cent to an Endline of

41 per cent. Other activities experienced marked declines, for example washing own hands after last defecation went from a Baseline of 60 per cent to an Endline of 33.3 per cent.

In Makassar the results were more encouraging. In both Tallo and Lembo sub-districts, nine of the ten activities involving use of soap in the last 48 hours experienced an improvement. For example in Tallo, the activity of washing own hands after last defecation went from the Baseline of 11.7 per cent to the Endline of 46.2 per cent. Similarly in Tallo, for the activity of washing hands after eating, there was an increase to 48.7 per cent from the Baseline of 21.7 per cent. The results reveal a similar story in Lembo. The activity of washing own hands after last defecation went from the Baseline of 8.3 per cent to the Endline of 32.1 per cent. For the activity of washing hands after eating, there was an increase to 18.3 per cent from the Baseline of 53.6 per cent.

Based on the use of soap by each caregiver who was interviewed, an evaluation of five critical times to wash hands using soap was done, namely: (i) before eating; (ii) before giving food or feeding the child; (iii) after defecating; (iv) after washing the baby's bottom and (v) before preparing food. The scoring was between one and five with the maximum score being five. In Wonorejo, Surabaya, there was an increase in the percentage of respondents who used soap to wash hands at two to four of the five critical times. Those who did not use soap for washing their hands in any of the five critical times also reduced. Likewise in Petemon, the percentage of those respondents who did not wash hands with soap at any of the five critical times reduced by around 2 per cent.

In Medan, in the subdistrict of Kota Bangun the use of soap while washing hands increased in percentage for at least one of the five critical times and the percentage that did not use soap at all reduced by around 3 per cent. In TSM3, there was no increase in the use of soap to wash hands at the five critical times. Only those who used soap at one of the five critical times showed a consistent increase (around 7 per cent) from Baseline to Endline in the intervention area. Additionally, there was a decrease in the use of soap in more than two of the five critical times and there was not even one respondent who used soap at four or five of the critical times.

Makassar again demonstrated better progress compared to Surabaya and Medan. In Tallo, there was a decrease for the two of five critical times measured from Baseline to Endline. For washing hands before eating, the percentage change was an increase from Baseline (23.3 per cent) to Endline (53.8 per cent). For washing hands before giving food or feeding the child, the percentage change was an increase from Baseline (3.3 per cent) to Endline (17.9 per cent). Overall it appears that Makassar experienced a rise in healthy living habits as there was a decrease in the number of respondents who did not wash their hands with soap at any of the five critical periods. With the exception of Wonorejo and several areas in Medan, no respondents washed their hands with soap at all the five critical times.

3. Safe drinking water treatment and storage

According to the report from PollingCentre (2014), for the third sanitation priority of treating and storing safe drinking water, the data collection for this project focused on the sources of drinking water for households. In the city of Surabaya, there was no significant change from Baseline to Endline in the use of drinking water for the families. Branded bottled water was the main source of drinking water for the family. The use of refillable branded bottled water was around 43.8 - 59.4 per cent. Aside from branded bottled water, refillable filtered drinking water was also used a lot, especially in the intervention areas. 30 per cent of residents in Wonorejo and 40.6 per cent of residents in Petemon used refillable drinking water as the main drinking water for the family. While the practice of using unsafe sources of drinking water, such as water from an unprotected well, was not seen in Surabaya at the time of the Endline survey.

In Medan, branded bottled water was not as popular as it was in Surabaya as a source of drinking water for the family. Refillable filtered water was the main source of drinking water for the families in the Kota Bangun subdistrict and TSM3 for almost all households. Another main source of drinking water is tap water, in TSM3 there was an increase to 23.1 per cent from 3.3 per cent of residents at the Baseline Survey that used tap water. While the practice

of using unsafe sources of drinking water, i.e. water from unprotected wells, was not seen in Medan at the time of the Endline study.

As in Medan, branded bottled water was not used as much in Makassar as the main source of drinking water for the family. For the subdistrict of Lembo, there were two main sources of drinking water, refillable filtered water (46.4 per cent) and tap water (35.7 per cent). In Lembo subdistrict a significant decrease was observed in the use of tap water of neighbours. At the time of the Baseline Survey, 31.7 per cent of residents used a neighbour's tap water, which reduced to 8.9 per cent. The cause of this decrease was a significant increase in the number of residents that used refillable water from a previous 31.7 per cent to 46.4 per cent. The practice of using unsafe sources of water, i.e. unprotected wells, was not seen in Tallo subdistrict. However in Lembo subdistrict, 1.8 per cent of residents used them.

For the action taken to improve the quality of water before drinking, there was not a significant difference seen between the Baseline and Endline surveys. Boiling the water was the main method residents used to improve the quality of the water before drinking; another method used by 22 per cent of residents was to use refillable filtered water; and 9 per cent of residents used branded bottled water. Two other methods – the first was leaving the water standing so that the impurities sink to the bottom; the second was mixing it with the chlorine-based water purifier “Sacred Water” (*Air Rahmat*), was practiced by 10 per cent of residents in each area surveyed. In the subdistrict of Kota Bangun, Medan, another method used is to heat up the water in the water dispenser (17.9 per cent). Based on the results of household observation, almost all areas in Surabaya saw an increase in the number of residents who consume drinking water from a dispenser. Around 36.7 per cent to 46.9 per cent of residents use a dispenser to take drinking water. Besides using a dispenser, the number of residents who use water directly from the refillable plastic gallon bottle (branded water) is almost the same number – around 16.7 per cent to 40.6 per cent.

In Medan, a significant increase was observed in the number of residents that use a dispenser, from 33.3 per cent to 76.7 per cent. In other areas, there was not a significant change observed compared to the Baseline Survey in which a dispenser was the main source

for water. This was seen in 48.7 per cent to 76.7 per cent of residents in the areas surveyed in Medan. Besides a dispenser, a kettle was used by 10 per cent to 28.2 per cent of residents to use drinking water, and refillable gallon bottles were used by 3.3 per cent to 41 per cent of residents. In Makassar, especially in Tallo subdistrict, the Endline saw an increase in the number of residents who use a kettle from 13.3 per cent to 30.8 per cent. In Lembo subdistrict there was an increase in the number of residents using a dispenser from 20 per cent at Baseline to 48.2 per cent at the Endline.

4. Household solid waste management²

According to the report from PollingCentre (2014), the location of garbage disposal in households in Surabaya was relatively better managed than in Medan and Makassar. The majority of respondents in Surabaya usually keep the garbage at home or in a communal place which is then collected by the garbage collector. In Wonorejo from the time of the Baseline survey there were changes in the way they disposed of their household garbage, previously they gathered it in their home and then it was collected by the garbage collector whereas now it is first put in a communal garbage receptacle and then collected by the garbage collector.

In Petemon subdistrict there was a change in where the households disposed their garbage. For the Baseline Survey, 57 per cent of households (who have a child under five years of age) disposed of their garbage in a communal dumping place, but at the time of the Endline survey this decreased to 30 per cent. Respondents were more likely to gather their garbage at home to be collected by a garbage collector. TSM3 subdistrict had a better garbage disposal habits compared to Kota Bangun. Households in Kota Bangun mostly threw their garbage in their yard without first putting it in a hole, and then burned it, while the majority of households in TSM3 would dispose of garbage in a proper designated place where it would be collected by the garbage collector. The majority of respondents in Kota Bangun threw their garbage in their yard without making a hole or piled it up and then burned it.

² For the fourth sanitation priority of managing solid waste, the data used for this project focused on the disposal of garbage by households. The final data provided by the partner organisation was not robust, with many results missing.

From the time of the Baseline to the Endline survey there was not a significant change in this habit. However, there was an increase in the households that disposed of their garbage in the proper place or gathered it to be collected by the garbage collector.

In TSM3, from the baseline onwards there was a decrease in the number of households that disposed of garbage in a particular place to be collected by the garbage collector, as it appears that the households now use the proper designated place. This is shown by the fact that there are no longer any households that dispose of their garbage in the river in the intervention area and there is a higher number of households that have their garbage collected by a garbage collector or disposed of in an official designated place.

In Makassar, households in Lembo subdistrict dispose of their garbage in a better way than in Tallo subdistrict. Households in both Lembo and Tallo no longer dispose of their garbage into the river or sea and there are a larger number of households that dispose of their garbage in an official designated place. At the time of the Baseline Survey the majority of households disposed of their garbage in an open space, while at the time of the Endline Survey the majority disposed of their garbage in the official designated place.

In Medan, the use of plastic as a means of collecting and storing garbage was relatively high, both in a closed and open plastic receptacle. In Kota Bangun, at the Endline survey there was an increase in the number of households that used closed plastic bags. With the increase in the number of respondents that used plastic bags to dispose of garbage, there was a corresponding decrease in the number of households using open baskets for garbage disposal. In TSM3, the same was indicated with many using plastic bags to store their garbage at home.

The means used to store garbage in Makassar was more varied overall compared with Medan and Surabaya. In Tallo subdistrict there was a decline in the number of households that dispose of garbage into the sea. This may be due to that fact that they have used other containers such as plastic bags and open baskets. This is shown in the increase in the number of households that store their garbage in open baskets and plastic bags. While

households experienced a decline in the use of open baskets, this was accompanied by the use of plastic bags as a means to collect and store the household garbage.

5. Proper wastewater management practices³

According to the report from PollingCentre (2014), for residents of Surabaya, the majority of residents dispose of kitchen wastewater through a closed drainpipe in both Wonorejo (90 per cent) and Petemon (71.9 per cent). For households in Medan, the majority of residents dispose of kitchen wastewater through a closed drainpipe in both areas of Kota Bangun (64.1 per cent) and TSM3 (51.3 per cent). For residents of Makassar, the majority dispose of kitchen wastewater through a closed drainpipe in both Tallo (61.5 per cent) and Lembo (92.9 per cent).

For residents of Surabaya, the majority of residents dispose of bathroom wastewater through a closed drainpipe in both in Wonorejo (90 per cent) and Petemon (71.9 per cent). For households in Medan, the majority of residents dispose of kitchen wastewater through a closed drainpipe in both in Kota Bangun (59 per cent) and TSM3 (51.3 per cent). For residents of Makassar, the majority dispose of kitchen wastewater through a closed drainpipe in both Tallo (61.5 per cent) and Lembo (91.1 per cent). Looking at ownership of a septic tank, the majority of residents of Surabaya have one in both Wonorejo (80 per cent) and Petemon (90.6 per cent). For Medan, the majority of residents own a septic tank in both Kota Bangun (79.5 per cent) and TSM3 (69.2 per cent). For residents of Makassar, the majority own a septic tank in both Tallo (53.8 per cent) and Lembo (89.3 per cent).

Results from testing the hypotheses

As described in the Literature Review and Methods chapters, different tests were applied to the different hypotheses. For H1, a simple one-way between groups Analysis of Variation (ANOVA) test was applied to determine the significant of the change agents' SCI scores in

³ For the fifth sanitation priority of managing waster water, the data used for this project focused on the disposal of kitchen and bathroom wastewater. The final data provided by the partner organisation was not robust, with many results missing, including the comparison with the Baseline data.

the different locations. For H2 and H3, the author first used bivariate analysis to examine the nature of the relationships between the different variables. This was followed by multiple regressions to test the significance of relationships between the selected variables. Finally for H4 and H5, a non-statistical comparison was made between the SCI scores of the change agents, with the behaviour change and health impact in the project locations.

H1. There will be a significant variance in the Sense of Community Index scores of change agents across the three different geographic locations.

Table 11 above (p. 138) reports the SCI scores for the 90 change agents undertaken with the Baseline Survey. It was expected that across the entire cohort the change agents' scores would be towards the higher end of the maximum possible SCI score as the change agents were selected due to their position or because they were already more active or prominent than average members of the community. It was also expected that the scores would differ across the location groups, reflecting local context and conditions. The analysis of the three locations reveals that change agents Surabaya had a higher average (51.7) for SCI scores, followed by Makassar (48.37) and a close last with Medan (47.63). Table 19 below reports the analysis of variance between these groups showing the significance of these results is high ($p < .01$). An analysis of variance (ANOVA) on the SCI scores yielded significant variation among conditions: $F(2, 87) = 5.125, p < .008$.

Table 19. Analysis of Variance for Total Sense of Community Index Score – Baseline

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	281.867	2	140.933	5.125	.008
Within Groups	2392.233	87	27.497		
Total	2674.100	89			

Note: only 89 of the 90 change agents were analysed as the data for one was excluded

H2. Change agents with a higher sense of community will participate in more community outreach activities in that community.

H3. Change agents with higher previous levels of participation in community outreach activities will have higher participation in similar activities in the future.

Bivariate correlations

The first step in testing the hypotheses was to examine the strength and size of relationships between the selected variables that comprised the hypotheses, using a Pearson Correlation analysis. The four variables included were: SCI score (taken from Baseline survey); previous participation in community development activities over the past year (taken from Baseline survey); participation in community outreach activities for the High Five program over the past year (taken from Endline survey); age and highest education level attained (taken from Baseline survey). Table 20 below shows the results, indicating that of these four variables, only two showed statistically significant correlation. The first relationship is that age is positively correlated with SCI score. The second is that previous participation is positively correlated with participation in High Five community outreach activities. There were no significant correlations found for education in relation to the other selected variables. Following this result, the author undertook stepwise multiple regressions to test the two significant relationships, to be reported below. The data used in the hypothesis testing needed to be from those change agents who could be tracked through the entire three years of the High Five program. During screening it was discovered only 69 of the original 90 change agents were tracked in both the Baseline and Endline surveys, hence the reduced sample size in the calculations below.

Table 20. Correlations for SCI scores, previous participation, participation in High Five, Age and Education

		Total Sense of Community Index Score (Baseline)	High Five: total frequency of participation over past year	Previous: total frequency of participation over past year	Age	Education
Total Sense of Community Index Score (Baseline)	Pearson Correlation	1	-.014	-.034	.254*	.081
	Sig. (2-tailed)		.909	.778	.035	.508
	N	69	69	69	69	69
High Five: total frequency of participation over past year	Pearson Correlation	-.014	1	.244*	-.108	.016
	Sig. (2-tailed)	.909		.044	.375	.899
	N	69	69	69	69	69
Previous: total frequency of participation over past year	Pearson Correlation	-.034	.244*	1	.109	-.026
	Sig. (2-tailed)	.778	.044		.371	.832
	N	69	69	69	69	69
Age	Pearson Correlation	.254*	-.108	.109	1	-.025
	Sig. (2-tailed)	.035	.375	.371		.839
	N	69	69	69	69	69
Education	Pearson Correlation	.081	.016	-.026	-.025	1
	Sig. (2-tailed)	.508	.899	.832	.839	
	N	69	69	69	69	69

*Correlation is significant at the <0.05 level (2-tailed).

Multiple regressions to test H2 and H3

To test both of these hypotheses, a stepwise multiple regression was conducted to evaluate whether any or all of the following variables – age, education, SCI score and previous participation – were necessary to predict participation by change agents in High Five program activities (reported at the Endline of the project). At step 1 of the analysis previous participation entered into the regression equation and was significantly related to participation $F(1,67) = 4.226, p < .05$. The multiple correlation coefficient was .244, indicating approximately 5.9 per cent of the variance of the change agents' participation could be accounted for by their previous participation. Age did not enter into the equation at step 2 of the analysis ($t = -1.149, p > .05$). Education also did not enter into the equation at step 2 of the analysis ($t = .184, p > .05$). Finally, SCI scores did not enter into the equation at step 2 of the analysis ($t = -.48, p > .05$). Thus the regression equation for predicting participation by change agents in High Five program activities:

$$\textit{Participation in High Five activities} = .140 \times \textit{Previous Participation} + 1.716$$

The results of the regression analyses to examine the direct effects of previous participation in social and behaviour change activities on participation in High Five program activities indicated that previous participation had a modest though significant effect. The regression analysis did not reveal a significant relationship between SCI scores and participation in High Five community outreach activities so this variable was not included in the model.

Comparative analyses for H4 and H5

H4. There are more likely to be higher rates of behaviour change in communities in which change agents with a higher sense of community are active.

The fourth hypothesis predicted that those communities in which change agents with a higher sense of community were active during the High Five program would achieve a higher rate of sanitation behaviour change. The behaviour change data was collected for all five of the sanitation behaviour indicators during the Endline survey of 357 household respondents. However, neither the author nor the partner organisation, YCCP, had the resources to track individual/household behaviour change in relation to individual change agents. While this meant that a statistical analysis was not possible, a non-statistical comparison was performed. Examination of the results presented in Table 21 shows that on the surface there appears to be no relationship between average SCI scores for change agents at the city level with behaviour change. This applies both to the average change across the four behaviours for which data was available, as well as for the four behaviours examined separately.

Table 21. Average SCI scores for change agents and household behaviour change by city

Location	Surabaya	Makassar	Medan
Average SCI Score for Change Agents	51.7	48.4	47.6
Average change across Behaviours 1-4* (%)	2.8	13.8	5.1
1. Defecation in public spaces (% change from Baseline to Endline)	5.3	23.7	15.4
2. Hand washing with soap practices (% change from Baseline to Endline)	3.8	16.5	19
3. Safe drinking water treatment and storage (% change from Baseline to Endline)	-4.5	6.6	-7.7
4. Household solid waste management (% change from Baseline to Endline)	6.5	8.5	-6.4
5. Proper wastewater management practices (% change from Baseline to Endline)	N/A	N/A	N/A

**Note: only the totals for #1-4 were used as the complete data for #5 were not available.*

H5. There will more likely be greater health impact in communities in which change agents with a higher sense of community are active.

The fifth hypothesis predicted that those communities in which change agents with a higher sense of community were active during the High Five program would experience a greater health impact. Data on the incidence of diarrhea as the proxy indicator for health was collected during the Endline Survey of 357 household respondents. As with H4 above, neither the author nor the partner organisation, YCCP, had the resources to track individual/household health impact in relation to individual change agents. While this meant that a statistical analysis was not possible, a non-statistical comparison was performed. Table 22 shows that when arranged in descending order of mean SCI scores per city, there appears to be a relationship between the SCI scores of the change agents and the incidence of diarrhea. This suggests the change agent's sense of community may have a positive effect on the health impact of the High Five program for the communities in which they are active.

Table 22. Mean SCI scores for change agents and incidence of diarrhea in the community

Location	Incidence of diarrhea (%)		% change in incidence of diarrhea	Mean SCI Score for Change Agents
	Baseline	Endline		
Surabaya	37	3	- 34	51.7
Makassar	27	13	- 14	48.4
Medan	20	17	- 3	47.6

In the following chapter, the results from the quantitative data collection will be triangulated with the results of the qualitative interviews, in the context of the evidence and practice of behaviour change programs. This will produce a discussion of the findings, limitations and conclusions for the project as well as recommendations for future programs and research.

CHAPTER 6. DISCUSSION

Overview of the findings

The purpose of this mixed methodology study was to better understand the role of change agents in social and behaviour change programs, using the High Five community based sanitation program as the case study. This led to the use of quantitative tools to analyse a number of factors that may influence the activity of the change agents, which in turn would be expected to lead to behaviour change and health impact in the target communities. The qualitative interviews enabled a richer and deeper understanding of the context and individual experience of the change agents engaged in the High Five program. The behavioural and health impact results reported by High Five show some progress against the five sanitation behavioural goals, with the need for additional resources and services as part of interventions designed to facilitate individual behaviour change and influence social norms. It is the contention of this study that to have the greatest opportunity for influence on these individual behaviours as well as the supporting social norms, the participation of change agents is one of the key ingredients for success.

One finding from this study was that the psychological sense of community (SOC) was a important factor that differentiated the change agents in the three High Five program locations. While the effect size was small, the analysis of variance showed that there was around 8 per cent difference between the average change agents' Sense of Community Index scores in each city. Another finding was that a modest but significant predictor of the likelihood that a change agent would participate in the High Five sanitation program community outreach activities was their previous participation in community activities. This factor prevailed after controlling for other factors associated with the change agents in this sample. And while the effects were also small, the regression analysis estimated that as previous experience increased by one unit the change agents engaging in community outreach activities increased by 5.9 per cent. Given it is possible that the relatively small size of these results may be due to inconsistent data collection, one way of linking and strengthening the two findings is through analysis of the results of the qualitative interviews. The interviews revealed that the change agents most often (30 per cent)

mentioned “Influence” as the significant motivating factor in their participation, including their ability to influence the communities in which they were active. Also, previous participation in community outreach activities was mentioned by all nine respondents – a total of 24 times in the interviews. These two findings further support the notion that a history of previous participation in the community coupled with their SOC to form a strong influence on a change agent’s activity with the High Five program.

Ultimately it is the behaviour change in the community and its impact on people’s health that determines the success of the High Five program. The study was able to measure an average of 3-20 per cent in behaviour change across four of the five the High Five behavioural priorities in the three locations, however the relationship with the change agents’ sense of community could not be determined. When examining the health impact of the behaviour change, using incidence of diarrhea as the lead indicator, the study determined that there was a reduction of 3-34 per cent in the three project locations. A non-statistical comparison of the average sense of community scores for the change agents revealed higher scores in the locations with greater reductions in the incidence of diarrhea. This chapter contains the detailed discussion of these findings, followed by a chapter with conclusions and recommendations from this study.

Variance in the sense of community scores of change agents

The variance between SCI scores for the change agents across the three locations of Medan, Makassar and Surabaya suggest that the individual and social dynamics associated with the SOC differ across these groups. This is consistent with other studies on the role of SOC, including those examining neighbourhoods and community organisations (Brodsky & Marx, 2001; McMillan & Chavis, 1986; Peterson, Speer, & McMillan, 2008). Surabaya change agents have an average of 5 per cent higher SCI scores (51.7 per cent) than Medan (47.6 per cent) and Makassar (48.4 per cent), which the literature suggests should be explained by the four SOC dimensions: needs, membership, influence, and shared emotional connection.

Looking more closely at the scores for the four subscales of the SCI, the two ways of grouping the data in Chapter 5 each enable deeper analysis of the results. The first way is the overall average of the scores for each SCI subscale across all change agents in the cohort. The lack of a significant difference for all four subscales (the distribution was between 67 and 70 per cent) means that this variation is probably not significant or reliable. This leads us to the second way to aggregate the SCI subscale data – across project locations. As described in Chapter 5, differences began to emerge when the averages of the SCI subscale scores are compared across the three project locations. SCI Subscale B. 'Membership' was up to 10 per cent higher for Surabaya (12.87 or 72 per cent) than it is for Medan (11.2 or 62 per cent) or Makassar (11.9 or 66 per cent). However while Surabaya is mostly higher for all the other three subscales (A, C and D), the variance was at most five per cent and did not follow a discernable pattern according to location or subscale.

These findings around the SCI subscales are similar to those from previous studies. Chipuer and Pretty (1999) assessed the SCI's subscale structure by using a principal components factor analysis which used both neighbourhoods and workplaces as community referents. They reported that responses to SCI statements were likely to load on different or multiple subscales in different sample populations, indicating that statements generally did not aggregate as expected based on the McMillan and Chavis (1986) model (Peterson et al., 2008). In addition, Chipuer and Pretty reported weak reliabilities for the overall SCI scale as well as for the subscales. More recent studies has raised important questions about the validity of the SCI, as well as other existing measures of SOC, and the McMillan and Chavis (1986) model itself (Chipuer & Pretty, 1999; Long & Perkins, 2003; Obst & White, 2004; Proescholdbell, Roosa, & Nemeroff, 2006; Tartaglia, 2006). Instead of rejecting or revising the SCI or suggesting changes to the McMillan and Chavis (1986) model, Chipuer and Pretty recommended using the SCI as a one-factor instrument until improved statements could be developed and validated (Peterson et al., 2008). The approach taken in this study is based in part on this recommendation, using total SCI scores in the analysis rather than examining the results at the subscale level.

This study used the qualitative interviews in concert with the SCI scores to expand on the locally and personally relevant factors that influence the participation of change agents in the High Five program. The approach this study adopted can be seen to be similar to the one proposed by Chipuer and Pretty (1999). Rather than focus on one subscale and only consider the themes covered by the six statements within it, the interviews in this study consisted of open-ended questions that enabled the author to identify themes that emerged across the entire SCI. This contributed to the finding that for change agents there is a significant relationship between previous participation and future participation in outreach activities, to be discussed further below. Before this, the results of testing the relationship between SOC and participation in outreach activities will be discussed.

Relationship between sense of community and participation in outreach activities

From the results of testing Hypothesis 3 – that change agents with higher previous levels of participation in community outreach activities will have higher participation rates in the future – there does not appear to be a substantial nor a statistically significant relationship between SCI scores among change agents and their participation in High Five outreach activities. For an increase of one additional unit of SCI score, the model predicted a very small negative change of -0.014 in the participation rate of the change agents. The test result of this relationship (significance of 0.909) was much higher than 0.05 and therefore well outside what is considered to be a prediction of a strong relationship. However this may be because there was not great variation between the SCI scores of the change agents. We could expect that change agents would have on average a higher sense of community than members of the general community due to a number of factors. This could include their sense of influence over the community due to their position of authority and influence, such as formal government posts (e.g. *kelurahan* or RT/RW) or informal community leadership positions (e.g. religious youth groups).

The nature of what participation is, and how it was measured, could also have affected this result. For both the Baseline and Endline surveys, the study collected information on the number of activities in which the change agents were active. The questions were open,

encouraging the respondents to mention any type of community outreach or education program in which they were active. This meant that more than 20 different activities were recorded, each of them allocated one point per activity and then the totals counted. This produced scores of participation for the change agents, with those mentioning more activities receiving higher scores. There are several methodological issues with this. First, the results were all self reported with no verification of the participation of the change agents in the activities they mentioned. Second, every type of activity was given a score of one with no differentiation according to the type, efficacy or impact of the activity. For some examples, the tallies included sanitation related community outreach activities, but also child nutrition, healthy lifestyles, Islamic community service and citizen journalism training activities. Some of these would likely have more or less relevance to sanitation and therefore the behaviour change and impact of the High Five program. Third, for the shorter list of community outreach activities that could be shown to have more direct relevance to the aims of a community based sanitation program, neither the High Five program nor this study examined their effectiveness or any form of impact on the target population. That means that we don't know whether one activity, e.g. counselling on diarrhea, was more effective than another, e.g. garbage disposal meetings. Therefore, including all types of community outreach activity, without outcome measurement or differentiation, would have clouded the data and likely decreased both the size and the significance of the results.

Change agents have been shown to be effective in evangelising and facilitating change (Glanz et al., 2008) and there is significant evidence that interpersonal communication is necessary for social and behaviour change programs to be successful (Nikolaou et al., 2007; Rogers, 2003; Thomas W. Valente & Saba, 1998). Therefore it is the contention of this study that the result for the statistical analysis undertaken to test Hypothesis 3 is inconclusive and should not be relied upon in attempts to answer whether a change agent's sense of community will affect their participation in community outreach and similar activities. The qualitative findings from this study's interviews with the change agents serve to confirm this with many of the respondents speaking of their strong feelings of connection and influence around their sense of community towards the target populations whom they had been tasked to serve. As Sunaani said, "(Our participation) came from our own self consciousness,

we care about the community” (Sunaani, 2013). These change agents spoke of these feelings about the community being a primary motivation for them to take part in the High Five program activities. A different design of the study could not only likely yield more useful results but would serve to assist program planners to determine which community outreach activities would likely be more effective in bringing social and behaviour change in sanitation programs as well as other interventions. The significance of these issues can be explored from a different perspective through an examination of the relationship between previous and future participation by change agents in outreach activities.

Relationship between previous and future participation in outreach activities

The strongest result from this study pointed to the relationship between the change agent’s previous record of participation in community outreach activities and the probability that they would engage in community outreach activities as part of the High Five program. The statistical analysis revealed that a modest yet significant proportion (5.9 per cent) of the overall variance in participation in High Five outreach activities could be accounted for by the previous participation by the change agents in similar activities. Interestingly, as part of the same regression analysis, neither age nor education level were statistically significant variables for the purposes of this analysis.

This result suggests that the history of participation in community-based programs by a change agent is a significant factor in the likelihood of future participation. This can be partly attributed to their institutional role or positioning, as those who occupy formal government or community leadership positions would likely be required to participate in these types of activities as part of their regular work. For the purposes of identifying and selecting change agents, this result fits with the evidence around several of the most commonly used selection techniques. T.W. Valente and Pumpuang (2007) describe one of these as the “positional approach” to identifying change agents, which allows program staff to make selections based on their occupational or official roles in the community such as elected officials, church leaders and community organisers. This technique is relatively more straightforward to implement in communities of different sizes and composition. The

positional approach is considered more reliable than selection by program staff alone because leadership is often defined as people who perform specific roles and will likely already have a largely agreed value to the community. Logically, change agents identified through the positional approach also typically have more power with regard to regulation or policy changes supporting health behaviour change (Howard et al., 2000).

However the small effect of previous participation calculated in this study may be due to perceptions among the community members of people who occupy these formal positions of power and influence. This includes the challenges faced by the High Five program staff when selecting people from the community to be members of the local *pokja* as well as the teams tasked to undertake community outreach and monitoring activities. One disadvantage for High Five may have been that staff may misinterpret an individual's ability to facilitate change, either over or under inflating their actual influence. A further limitation for the positional approach is that "formal" leaders may not be perceived as influencers within the "informal" community, and likely not on every issue in which they engage. Another disadvantage to both of these techniques is the potential lack of motivation by selected change agents to participate in the project (T.W. Valente & Pumpuang, 2007).

The change agent's ability to effect change is a function of at least three of their qualities (Elihu Katz, 1957): (a) values and traits, (b) competence or expertise, and (c) social position (who they know, who knows them, and how accessible they are). Therefore another factor in the result would be the nature of the community outreach and other activities mentioned by the change agents in the Baseline survey. The activities they reported participating in varied widely, including obviously relevant activities such as previous sanitation programs, as well as less directly related activities such as religious gatherings. However, without knowing the nature and effectiveness of each of these activities, it is not yet possible to analyse whether one may have been more significant than another. It is likely that only activities that provide relevant knowledge and skills for future similar activities could be considered effective for change agents when assessing previous participation.

The persuasiveness of change agents, and the receptivity of those people with whom they have influence, are dependent on many factors (Dillard & Pfau, 2002). Creating or strengthening social norms refers to the change agents' practices sending a message to others in the community that the behaviour is or will be popular. Leverage refers to change agents' adoption as increasing the social costs associated with non-adoption of the behaviours. Dinar said in her interview for this study, "I was also embarrassed of the family that litters" (Dinar, 2013). Once a leader adopts a behaviour, others in the community now perceive a cost associated with not engaging in the behaviour and so are more likely to adopt it (T.W. Valente & Pumpuang, 2007). As Makmur said in his interview for this study, "people like us can be role models" (Makmur, 2013).

The role of previous participation in social and behaviour change programs as a predictor for future participation can be seen in the context of the self efficacy of the change agents. The experience and skills gained during these provides the change agents with the competencies required to perform similar tasks in the future, i.e. "the conviction that one can successfully execute the behaviour required to produce the outcomes" (Bandura, 1997). Evidence in the literature supports the importance of self-efficacy in initiation and maintenance of behaviour change. For the High Five program to succeed, the change agents must feel threatened by current behaviours and social norms (perceived susceptibility and severity) and believe that change, of the nature prescribed by the High Five program, will result in a valued outcome at an acceptable cost (perceived benefit). To take action, they also must feel themselves competent (self-efficacious) to overcome the perceived barriers, both social and scientific. Bandura's work extended this concept to collective efficacy, demonstrating its effects on how people work in groups, organisations and communities (Bandura, 1997).

Previous participation as a basis for selection of change agents

The small but significant predictive effect of previous participation on the change agents' future participation in High Five program activities fits with the evidence from other studies. Howard et al. (2000) showed the associations between participation in tobacco control activities and various predictors, building a model that accounted for variance of 24 per

cent. The most important predictor of participation in tobacco control activities was organisational affiliation, which explained 17 per cent of the variance. The next most important predictors were the issue involvement variables (explained variance: 7 per cent). Demographics explained less than 1 per cent of the variance. Opinion leaders from health and education organisations were more likely to report participating in tobacco control activities during the previous year, with opinion leaders from media, business, and youth organisations the least likely. Having a friend or family member with a smoking-related illness, believing the use of tobacco was an important problem, and perceiving higher levels of community support for tobacco control, were positively associated with participation in tobacco control activities.

This result for the predictive effect of previous participation can be validated through examination of the responses from the interviews of change agents. The responses as part of the discussion around SCI Subscale #3 on “influence” are especially illuminating. The interview responses tagged under this subscale accounted for 30 per cent (n = 26) of the total response tags. The SCI statements used as part of this subscale include: “I have influence over what this community is like” and “If there is a problem in this community, members can get it solved” (Chavis et al., 2008). Additionally, in line with evidence that the overall SCI score is best used as a one-factor instrument than the separate subscales (Chipuer & Pretty, 1999; Peterson et al., 2008), there are also other statements that lend themselves to support the relationship between SOC and participation in community outreach activities as part of the High Five program. Under Subscale #2 ‘Membership’, which accounted for 22 per cent (n = 19) of the interview response tags, includes the statement #11, “I put a lot of time and effort into being part of this community.”

The predictive power of previous participation by change agents active in the High Five program lends itself to discussion on its possible inclusion as part of other models used to identify more effective change agents. There is potentially a good fit with previous work done on selection methods, including those reviewed by T.W. Valente and Pumpuang (2007). In particular, there are three social network analysis methods to identify change agents within a community – ‘snowball’, ‘sample sociometric’ and ‘sociometric’. First of

these is the snowball method, which starts with a randomly selected sample (known as index cases) who are interviewed and asked to nominate others in the community who are considered change agents. Everyone nominated in the first round, or a sample of them, can be interviewed in the second round, and the process is repeated until a sufficient number of change agents are identified. Change agents are identified as those who receive a previously agreed threshold number of nominations.

The snowball technique provides a valid method for determining the change flow structure in the community and is replicable in different situations. For example, Latkin (1998) asked injecting drug users to nominate peer opinion leaders from the community who were used to convey behaviour change messages to others (T.W. Valente & Pumpuang, 2007). With High Five, project staff surveyed the community to identify the potential participants as change agents, many of who were chosen based on previous participation. In the interview questions around the SCI subscale 2 concept of 'Membership', the discussion referred to the makeup of the community, including the recognition and trust by the change agents of its members and vice versa. Sumarni in Wonorejo, Surabaya said, "Like Mr Prapto who has been a leader in this kelurahan for so many years...he already knows...and almost all the people know him" (Sumarni, 2013). Similarly Dudung in TSM3, Medan said, "we recruited them because they already get along well with the community" (Dudung, 2013).

The inclusion of previous participation in the selection process for change agents can also help address some of the disadvantages of the snowball method. One of these is that it can take considerable time to locate individuals who are nominated as change agents. Second, it may take additional time to interview index cases, enter their data, and then repeat the interviewing process based on the data collected. The inclusion of previous participation also helps support an advantage of the snowball method that the data collection process can be modified during the study, stopping when enough change agents have been identified, or increasing the number of names requested and persons interviewed if there are too few (T.W. Valente & Pumpuang, 2007).

A different, yet related method of selection is sample sociometric, which also uses social network analysis but starts with a representative sample and uses them to solicit additional names. The data are analysed to determine who in the community receives nominations above a previously agreed threshold level to be considered effective. The difference between this and the snowball method is that the sample is much larger than the index cases selected for the snowball. In addition, the sample sociometric technique assumes that the boundary for the community is fairly well defined. Typically, a sample sociometric study would select a sample of about 50 per cent and have clearly defined borders for the community being studied. Simulations have shown that a sample of 50 per cent is 80 per cent reliable at identifying change agents (Costenbader & Valente, 2003). The advantage of the sample sociometric technique is that the research team collects data one time only. The same limitation remains, that the results are dependent on the representativeness of the sample. A second limitation is that this technique is useful in situations where borders are clearly defined, e.g., neighbourhoods, rather than those with more fluid boundaries, such as some online communities (T.W. Valente & Pumpuang, 2007).

According to T.W. Valente and Pumpuang (2007) the full sociometric technique may provide the most valid and reliable means for identifying change agents but may also be the most expensive and limiting. In this model, all (or almost all) community members are interviewed and a social network or matrix is constructed from the nominations. People who receive a previously agreed threshold of nominations, such as the top 10 per cent or 15 per cent, are identified as change agents. There are other measures of network position developed in the social network analysis field that can be used to identify those who are most central (Freeman, 1979). This may include previous participation in similar social and behaviour change programs. For example, Buller et al. (2000) used change agents to increase the consumption of fruit and vegetable in a work-site health promotion program. These change agents were “selected as being ‘central’ in their social groups at work – defined by coworkers’ reports of regular contact, close relationships, and respect for their opinions” (Buller et al., 2000, p. 233). For HIV prevention among women living in low-income housing areas, Sikkema et al. (2000) used change agents who were responsible for leading women’s groups created to promote reduction of risky behaviours. One advantage

of the full sociometric technique is that the entire communication structure of the community can be mapped and other centrality techniques used to locate change agents (Freeman, 1979). A second advantage is that it enables optimal matching strategies pairing change agents with people closest to them (T.W. Valente & Davis, 1999; T.W. Valente, Hoffman, Ritt-Olson, Lichtman, & Johnson, 2003). The disadvantage is that interviewing all members of a community is resource intensive, and in large communities of 1,000 or more, this technique may not be practical unless electronic means of data collection are used (T.W. Valente & Pumpuang, 2007). Hence the use of aspects such as previous participation may strengthen the results of the identification process, especially when a full sociometric analysis is not possible or practical.

Relationship between the change agents' sense of community, behaviour change and health impact

Two of the hypotheses related to testing whether there is a relationship between the SOC of the change agents and the outcomes for the community they were tasked to serve, in this case the six *kelurahan* in the High Five program. This was tested in two parts, one to determine whether there is a link between the change agents' SOC and change in the five sanitation behaviours targeted by the High Five program. The second test looked at the impact from this change in behaviours, i.e. the health status of the community, and whether this was influenced by the change agents' SOC. The results from this study indicate that there appeared to be no significant relationship between a change agent's SOC and the behaviour change in the target community for the sanitation behaviours forming the focus for the High Five program. In Surabaya where the average SCI score (51.7) was the highest, the average change across the four behaviours that could be analysed was the lowest (2.8 per cent). Makassar, which had the middle or second highest average SCI score (48.4) saw the highest average behaviour change (13.8 per cent). Finally Medan, with the lowest of the three average SCI scores (47.6) had the middle or second highest average behaviour change (5.1 per cent) across the four behaviour change priorities.

However, there appears to be a link between the change agents' SCI scores and the health impact of the High Five program. Using the lead indicator of diarrhea to measure the impact, the greatest change in incidence (reduction of 34 per cent) occurred in Surabaya – which had the highest average SCI score (51.7). Similarly in Makassar, which saw the middle or second highest reduction in incidence of diarrhea (14 per cent), the average SCI score was also the middle or second highest (48.4). Finally, it was Medan which saw the lowest reduction in the incidence of diarrhea (3 per cent) which corresponded with it having the lowest average SCI score (47.6).

Some of these inconsistencies can be accounted for in the data collection methods used by the High Five project team. Some of the gaps are germane to social and behaviour change programs, including how to ensure reliable and consistent measures of individual results. One problem is whether the degree of implementation, i.e. how well executed the activities were in each High Five location, contributed to the results described. Another longstanding issue has been the reliability of observed versus reported results, both by the target community and the change agents. Among the many issues raised by this problem is the monitoring (or Hawthorne) effect, defined as the problem in field experiments that the subject's knowledge that they are in an experiment modifies their behaviour from what it would have been without the knowledge (Adair, 1984). This could account for some of the higher scores on the questions relating to behaviour change. The High Five project collected data on so many behavioural questions that the sheer volume necessitated choices of lead indicators to act as aggregated proxies for the five priority sanitation behaviours. This opens the results up for further scrutiny, including the validity of the choices made and how representative these are of the change in people's behaviours and the overall impact of the High Five program. Despite the methodological gaps, including the lack of a robust data set, these results are worth discussing in the context of other social and behaviour change programs.

There is significant evidence that interpersonal communication, as the form most commonly conducted by change agents, is necessary for social and behaviour change programs to be successful (Nikolaou et al., 2007). Several hundred diffusion studies conducted in the 1950s

and early 1960s supported the idea that interpersonal communications was an important influence on behaviour change (Thomas W. Valente & Saba, 1998, p. 99). Opinion leaders have been shown to be effective at decreasing the rate of unsafe sexual practices (T.W. Valente & Davis, 1999, p. 57) and at decreasing the rate of caesarean births (J.A. Kelly et al., 1991; Lomas et al., 1991). These findings imply that maximising the effectiveness of change agents can accelerate the rate of diffusion of behaviour change within a community. In the (Lomas et al., 1991) study on caesarean births, the educational strategy of opinion leaders doing "detailing" based on the guideline produced a significant impact on practice patterns. After 24 months the trial of labor and vaginal birth rates were 46 per cent and 85 per cent higher, respectively, among physicians educated by an opinion leader. Duration of hospital stay was lower in the opinion leader education group than in the other groups. The overall caesarean section rate was reduced only in the opinion leader education group. Supplementary data on clinical outcomes and from surveys confirmed that opinion leaders encourage appropriate implementation of practice guidelines.

Closer examination of work around SOC shows a range of relationships with social and behaviour change, including as a predictor, correlate and framework (Chavis et al., 2008; Finlayson, 2007; Fisher et al., 2002; Glynn, 1981; McMillan & Chavis, 1986; Sanchez, Finlayson, Murrill, Guilin, & Dean, 2010; Sarason, 1974; Tartaglia, 2006). Much of the work to date has focused on the SOC as an end unto itself, a goal for an intervention, based on the idea that improving the SOC of a community will lead to better outcomes for a range of indicators of social stability and prosperity (Fisher, Sonn, & Bishop, 2002; Glynn, 1981; McMillan & Chavis, 1986; Sarason, 1974). More recently, and in increasing volume, has been a range of efforts to test the power of SOC in a causal relationship with specific forms of social and behaviour change (Finlayson, 2007; Sanchez et al., 2010).

In particular, the work of Finlayson (2007) in the United States with African-American and Latino men who have sex with men (MSM) is worth considering. These men carry a disproportionately large burden of the Human Immunodeficiency Virus (HIV) epidemic in the United States. Finlayson's study aimed to improve HIV prevention efforts among men of colour by conducting a survey within New York City's house ball community – a community

largely comprised of racial and ethnic minorities. Time-space sampling was adapted to recruit participants for the survey from venues frequented by members of the house ball community. Using regression analysis, this study examined the effects of sense of community, stigma, and self-esteem on unprotected anal intercourse (UAI) among a sub-sample of men in the survey. Finlayson found that sense of community was protective against engaging in UAI in this sample of men. It remained significantly protective against UAI after controlling for age, socio-economic status, and having a sexually transmitted infection. Finlayson concluded that strategies that strengthen the bond that men have with their community might serve to reduce their perceptions and experiences of social rejection as well as the likelihood that they will engage in UAI. Furthermore, because both stigma and sense of community contributed to engaging in UAI, strategies that both strengthen the bond with the community and reduce stigma are expected to have a larger effect on reducing risky sexual behaviours than strategies that focus on either one of these issues alone (Finlayson, 2007). The work of Finlayson (2007); Sanchez et al. (2010) focuses on the influence of SOC on the behaviour of the target community, which was not the focus of this study. As far as the author is aware, there is not yet any available published work that tests the effect of a change agents' SOC on their participation in community outreach and development activities. The results of this study are therefore a modest new contribution to that body of work.

The importance of the *pokja* for behaviour change and health impact

One of the critical elements of the High Five program appears to be the role of the local *pokja*. Indeed several of the respondents interviewed as part of this study were members of the *pokja* and referred to their work frequently. As part of the initial community dialogues to discuss the local High Five program action plan for the first time in every *kelurahan*, members of the local community consistently mentioned the need to form or assign a group of people who share interest on High Five's goals as agents (YCCP, 2014). This fit with the parent YCCP's experience that groups of people with similar ideas about sanitation, environment and health are vital to facilitate the implementation of behaviour change strategy in that community. Although there were sanitation-related groups from previous

programs in the various areas, the communities preferred to form new groups for the High Five program because the existing groups have other tasks and responsibilities and may not have been available or willing to engage (YCCP, 2014).

The *pokja* consisted of individuals from various socio-economic backgrounds and community groups, who were willing to play an active role to promote the community based sanitation approach in their community. Participants in the first community dialogue selected the *pokja* members. During the life of the High Five program, some of the original *pokja* members resigned or dropped out, but some new ones joined later. At the time of the Baseline survey, there were 14 men and 76 women still active in *pokja* in the three intervention cities. Their participation has included sharing knowledge about community based sanitation, encouraging the community to practice proper sanitation and hygiene behaviours, and undertaking community based sanitation related activities, such as operating waste banks, communal toilet operation and maintenance, and others (PollingCentre, 2014). The aim was to position the *pokja* as the centre for support and authority on sanitation in the community. As Dinar from Tallo, Makassar said in her interview, “I see *pokja* as the source of the solution” (Dinar, 2013).

Taking a closer look at the capacity building activities undertaken by High Five for the *pokja* enables a better understanding of what was required to ensure their success. High Five provided training in: integrated community based sanitation (including household water treatment and safe storage); facilitation skills and techniques; use of communications tools; advocacy strategy and implementation; participatory monitoring (including indicator development, motivational interviewing, data entry and analysis); citizen journalism (writing and photography); and fundraising. In addition to those trainings and workshops, High Five also worked with the *pokja* and other stakeholders to identify skills needed by community to ensure sustainability of their activities. For example, in Medan to further support solid waste management activities, they worked with a local nonprofit, Sekolah Sampah, to learn to produce MoL (microorganism liquid) and to use pampers for growing plants. High Five staff also took various *pokja* members to visit other areas to learn from their experiences. For example, the *pokja* from Petemon and Wonorejo visited Jombang in East Java to learn

about sanitation marketing. Overall, *pokja* members from 20 *kelurahan* were trained. Naturally the success and sustainability of these capability building efforts can be measured over the coming years in terms of the sanitation behaviours and health impact on the target communities.

Limitations of this study

The limitations of this study can be grouped by the nature of the issues that presented at the various stages of the project. Many of those discussed here are methodological, many of which are common to experiments and mixed method projects, others can be applied to programs conducted in resource poor settings. One significant limitation was the absence of clear control group(s) for the High Five program. While control groups were incorporated into the design of the program, were not rigorously maintained or reported. While this study did not directly address this issue with the High Five program staff during the project, common causes of the absence of control groups(s) often stem from the community's or implementing partners' reluctance to implement and enforce a situation where, in effect, one or more communities "miss out" on the benefits of the intervention. While this is a significant limitation for the High Five program in terms of comparative results, this is not as important for this study. The focus for this study was not the treatment versus control of the intervention activities; it was focused on the full cohort of change agents, especially their SCI scores and participation rates.

Another limitation was the small sample size for both the household behavioural surveys (Baseline and Endline) as well as for the qualitative interviews. While the household sample size did fulfil the generally accepted minimum required, a larger sample would have provided more richness in the resulting data and its analysis. Similarly, access to more interview respondents could have provided much deeper insights into the individual and collective lives of the communities in which the High Five project was conducted.

A further limitation is the self-reporting of behavioural results, both the results with the target communities as well as the change agents themselves. Self-reporting can affect the

validity of the results, either through respondents being overly negative or positive, as well as misunderstandings of the questions. The respondents' attitudes to the questions and researchers conducting the surveys can also play a role in the answers provided, especially when the questions cover sensitive or personal topics such as hygiene or child welfare. The High Five program staff went some way to addressing these issues by including observational techniques. These would have improved validity when measuring things like the presence (or not) of septic tanks and other sanitation infrastructure, which is more easily observable. However for other behaviours, such as hand washing with soap at the critical times throughout the day by different members of the household, would have been more problematic to observe, including in terms of the time and cost to do so.

Similar issues apply to the participation of change agents in the community outreach programs managed by the High Five program, as well as the other social and behaviour change activities analysed as part of the Baseline survey. As mentioned earlier, neither the author nor the High Five program staff were able to verify the participation of the change agents in these activities. Equally important, no analysis was done on the impact or relevance of these activities, including the relationship to the behavioural goals and the overall health and environmental impact of the High Five program. This becomes important when considering the results discussed for the importance of previous participation as its not yet clear which previous activities produce the skills and experience for the change agents that could enable them to be more effective in programs in the future.

There are also limitations with the SOC and the SCI instrument in particular. Some of these have been discussed earlier in relation to the validity of the SCI instrument as a measure of a psychological sense of community. Additional issues relate to the debate around whether SOC is static or fluctuates over time. The SCI survey used for this project was conducted at one time during the life of the High Five program, more specifically it was conducted with the change agents at the beginning of the program as part of the baseline research. How the change agents' SOC may have changed over the life of project is not known. In effect, therefore, it is a snapshot of SOC at one point in time. If SOC does change, other questions then arise that relate to how this may have affected the participation of the change agents

in the program. And if the scores were different then it would also have affected the statistical analysis undertaken for this study.

A further limitation relates to the choice of SOC as a basis for the analysis of the role of the change agents. Change agents are commonly selected based on their individual attributes, but this method can be problematic (Schneider et al., 2014). As mentioned previously, in contrast to similarities in training approaches, recruitment is often undertaken using a mix of methods: self-selection, peer-nomination, key informants, ethnographic observation, surveys, and other approaches (T.W. Valente & Pumpuang, 2007). This mix reflects a diversity of selection criteria that focuses primarily upon a given individual's attributes. These attributes are sought independently or in combination, though the rationale behind each approach is often poorly analysed or planned. The heterogeneity in attributes and referral approaches upon which change agents are selected may explain why these interventions have had only modest potency and mixed efficacy when tested in resource poor settings (Latkin et al., 2009; NIMH, 2010; Schneider & Laumann, 2011).

One additional instrument that may have strengthened the findings of the study is qualitative interviews with High Five program staff. Much of the contextual analysis of the High Five program used in this study relied on the official reports prepared by the research agency and submitted to the parent organisation, YCCP, as well as the financial donors supporting the program, specifically USAID. This study may have benefited from in depth interviews with High Five program staff, especially those based in the three cities of Medan, Makassar and Surabaya. These staff were closer to the activities implemented as part of the High Five program, which included the engagement of change agents. The High Five program staff also had a close working relationships with the *pokja*, which were the backbone of the program at the local level. The interviews may have elicited more detail on the activities of change agents, including verification of their participation and the context of their actions.

The absence of statistically significant findings for several of the hypotheses is a limitation. Although there are inconsistencies in the findings – most prominently that there appeared

to be no relationship between SOC and behaviour change, yet apparently there was with health impact – the overall results of the quantitative and qualitative data strengthens the view that SOC plays a role in social and behaviour change. This study and the findings of similar ones raise issues that may impact the design and delivery of community based sanitation programs and other types of social and behaviour change interventions.

Other factors in community based total sanitation

The complexity of social and behaviour change – combined with the multifaceted nature of community-based sanitation – means that there are several others factors that may account for the results in this study. Some of these variables are more commonly and easily accounted for, such as household expenditure and religious affiliation. However other factors are not, such as intervention design. These include the debate around whether the psychological profile is a more influential factor than the skills provided to the change agents during an intervention. Also as part of the intervention design, the development and use of communications and marketing materials is seen as a critical factor in the success of the change agents, and therefore the overall program. This section will analyse how these factors arose during the research with the High Five program.

Nature versus nurture: psychology and skills of change agents

The High Five program used a variety of methods to identify and select the change agents to be used in the High Five program. Most of these involved the High Five program staff working with and within existing structures of authority and established institutions to identify the change agents and seek their participation, a method known as “staff selection”(T.W. Valente & Pumpuang, 2007). These ranged from local government units, such as the *RT/RW* and *kelurahan*, to religious gatherings and community organisations. While some of these are more formal than others, including structures for decision-making and hierarchies of power, essentially all of the change agents were sourced through these formal systems. Interestingly these change agents volunteered to work with the High Five program and were not remunerated for their time or contribution. During the interviews,

many of them described their social and familial ties to others in the program. Sumarni in Wonorejo, Surabaya said, “Like Mr Prpto who has been a leader in this *kelurahan* for so many years...he already knows...and almost all the people know him” (Sumarni, 2013). Similarly Dudung in TSM3, Medan said, “we recruited them because they already get along well with the community” (Dudung, 2013).

It is likely that a reliance on the positional approach will help explain why some of the change agents were less successful. The positional approach may appear to be more reliable than staff selection based on observations because influence and leadership are often defined in terms of people who occupy specific roles and has a generally agreed-on social value. Logically, change agents identified through the positional approach are also more likely to have more power with regard to decisions, regulation or policy changes supporting behaviour change (Howard et al., 2000). One advantage is that the positional technique can be reported and replicated in a variety of settings. A disadvantage is that program staff may misinterpret a person’s influence, as “formal” leaders may not be considered leaders within different “informal” communities. Another disadvantage is the potential lack of motivation by selected change agents to participate, which may indicate an advantage of using the self-selection or self-identification techniques over staff selection. Participation may be influenced by the perceived relevance of a change agent’s occupational position to the health issue being promoted (Howard et al., 2000).

The experience of the change agents on the High Five program also demonstrates that while many positions and relationships remain static, there are some that change over time, sometimes directly as a result of an intervention. Some change agents may start as volunteers with a strong commitment to the program but less formal authority or influence. During the life of the program, especially one as long as three years or more, the community may come to recognise their authority on sanitation issues. This may include recognising their closeness to the formal authorities, such as government and religious organisations. As Dinar in Tallo, Makassar described it during her interview, “I have had so many experiences when I joined (the High Five program), I gained much knowledge, new friends and now I can socialise with others, I can give counselling to them. I used to be distant from the *kelurahan*

leader's wife and others but not any more" (Dinar, 2013). The impact of her change in status in the future is not clear, perhaps her closer links will provide her with more authority, however perhaps she will be considered part of the "system" and lose some of her informal trust as a member of the community. It is likely that this is a common experience, especially the rise of informal leaders to assume positions of more formal authority. For researchers and designers of social and behaviour change programs, this dynamic needs to be taken into account by selecting a variety of change agents from formal and informal sources of authority.

Another factor influencing the success of the change agents may be their knowledge and skills associated with community based sanitation. In contrast to the importance of authority described above, the nature of the change agents' positions in the community may not be congruent with the tasks required for the High Five program. As described above, the High Five program provided a number of training sessions for the local *pokja*, however it is not clear whether all members of the *pokja* would be able to participate in all of the capability building activities. It is also not clear whether all the members of the *pokja* had the previous knowledge required to participate in and benefit from the capability building activities. Some, for example, community health workers from the *puskesmas* or the *posyandu*, may have had the skills and knowledge needed to participate more fully. Others, such as the RT/RW and other formal government and religious community leaders, may not have been prepared.

Additionally, the roles of the change agents, including members of the local *pokja*, would be different in the subsequent outreach activities. Some would play roles as advocate for improved infrastructure and local budgets to support sanitation services. Others would play a more technical role, advising the community on the choices of technology, for example toilets, or the correct techniques for health behaviours, e.g. handwashing with soap. The High Five program appeared to differentiate these roles and tasks in their plans, however it was less clear how this worked in practice (PollingCentre, 2014; YCCP, 2014). The challenging nature of community based sanitation in resource poor settings means that likely roles would have been blurred and people would have come and gone during the life

of the program. Therefore a more flexible approach would have been required to ensure that these different role and responsibilities were fulfilled. However the overlapping of the roles would mean that the expertise of the change agents would likely be broader yet less deep, affecting the quality of the support provided to the target community.

Communications materials and the marketing mix

The use of communications tools and materials to help the change agents deliver their messages to the community plays a significant role in the success of social and behaviour change programs. One of the eight benchmark criteria for social marketing developed by the UK's National Social Marketing Centre is the marketing mix, one of which is 'Promotion' which often includes communications materials (Jeff French, 2010). Inadequate or inappropriate materials and strategy for their use, e.g. lack of testing, poorly designed materials etc., may have a negative impact on the impact of the program. While this study did not examine the use of communications materials nor the marketing mix, it is worth analysing the references in the High Five report.

To equip the *pokja* and other stakeholders, the High Five team distributed materials to city and provincial health offices, *puskesmas*, *pokja*, midwives, health/*posyandu* volunteers, schools, government agencies, NGOs and other community development programs in Jakarta, Medan, Surabaya and Makassar. These were designed to create awareness and trigger proper sanitation practices in the target communities. At the national level, High Five produced posters emphasising diarrhea prevention through proper sanitation practices. For outreach on household water treatment and safe storage as well as food management, High Five produced a flipchart. The program also produced a game for children on diarrhea contamination and prevention. All of these materials were to be used in the three cities.

In addition, communication strategies, tools and materials were developed specifically in each of the three cities and tailored to local needs. For example, High Five printed brochures on sanitation in Surabaya, but not in Makassar because, based on their assessment and discussions with the local *pokja*, reading was not yet a habit for communities in Makassar. In

addition to these materials, the local *pokja* work to improve sanitation practices in their communities through several methods. These include regular community meetings (*pengajian*, *arisan* and others), social conversations, motivational interviews, printed material (posters, brochures and leaflets), community events and social media (Facebook, blogs etc). The *pokja* in Lembo and Tallo (Makassar) created simple posters and brochures in their local language. High Five reports that they relied more on direct communication, such as social conversations. Motivational interviews were regularly carried out as part of household monitoring activities and were considered one of the most powerful methods to address improper sanitation practices at the household level. Motivational interviews provide the opportunity to the *pokja* to examine sanitation practices at the household and undertake the interviews in private and in a timely manner.

Change agents as early adopters

For much of the discussion so far, the focus for considering the importance of change agents has been as a trusted source of information for the beneficiary community that they have been tasked to serve. How the change agents are connected and with what prominence in the social network, also underpin this idea of the change agent as a leader. Another important role that change agents play in social and behaviour change programs is as early adopters of the targeted behaviours. Putting this into its theoretical context, the use of change agents as part of a behaviour change strategy draws on both individual cognitive as well as group empowerment and collective action theories. For example, Social Learning Theory asserts that people learn by observing the behaviour of others and that some serve as models who are capable of prompting behaviour change in other individuals (Bandura, 1997). The Theory of Reasoned Action holds that a person's perception of the social norms or beliefs that people important to them hold about a particular behaviour can influence their willingness to adopt it (Fishbein & Ajzen, 1975). The Diffusion of Innovation Theory states that particular individuals (often referred to as opinion leaders) from a group act as change agents by disseminating information and influencing norms in their community (Rogers, 2003). Peer education draws on elements of these theories in its understanding

that certain members of a given peer group (peer educators) can be influential in encouraging behaviour change among their peers (Horizons, 2009).

Looking at the High Five program, several of the change agents acted as early adopters of the sanitation technologies and associated behaviours. In Wonorejo (Surabaya), one of the *pokja* members, Niek Paidi, promoted APPSANI (Indonesian Sanitation Developer and Empowerment Association) microcredit facilities to enable households in her neighbourhood to build private toilets. By the end of High Five program, six new toilets were built that could be counted as the result of Niek's activity. In Makassar, several households needed to improve their toilets before getting connected to the shared septic tank. The neighbourhood residents (coordinated by the head of the RT) helped those who couldn't afford to build a new toilet by contributing materials and labour. In Makassar, a member of the Lembo *pokja*, Sunaani, who was also interviewed as part of this study, promoted Nazava water filters as an alternative to boiling for the treatment of drinking water. Her efforts were so successful that Nazava granted her a USD2,000 line of credit to provide loans to her customers to buy the Nazava water filter. Sunaani also created a garbage recycling service, working with the local community to sort and sell materials that would have otherwise created pollution or required government disposal. This participation reflects the concepts of the SCI subscale around reinforcement of needs. In the context of the High Five program, this subscale refers to the needs of the community members and the change agents. This includes the ability of the change agent to have their personal needs met by being a part of the community. As Sunaani in Lembo, Makassar said, "I can become a garbage recycler which helps society...and motivates me because it is for the health and prosperity of the people" (Sunaani, 2013). The High Five program was able to identify an additional 51 private toilets and one water treatment system that were built through the influence of the change agents, benefitting more than 200 people (PollingCentre, 2014; YCCP, 2014).

Other factors for change agents

Several of the findings and discussions in this chapter relate to the use of SOC as part of the methods for the selection of the change agents. A common debate in the literature revolves

around the right mix of socio-demographic, psychological and other elements and dynamics that influence the actions of change agents and therefore can be used or addressed to select them. One of these approaches to selecting change agents is based upon network theory, known as the popular opinion leader model (POL) (J.A. Kelly et al., 1991). The POL approach does not sociometrically identify change agents (i.e. calculate their positions within networks based upon the patterns of ties), but uses ethnographic observation to identify individuals who appear popular and are thus likely to be leaders. Grounded in social diffusion theory (Rogers, 2003), the POL approach includes recruitment and training of popular network members from a target population to promote social and behaviour change through interpersonal communication. Popular people often occupy important positions of prestige and visibility (Bonacich, 1987) and, as noted in diffusion studies, may be influential in the spread of ideas and behaviours. If a new behaviour seems to be one that will be embraced by the community, the opinion leader may adopt it earlier than others in the community. Subsequently, many others will see the behaviour of these POLs, which reinforces the acceptability of the new behaviour, and its adoption by others will be accelerated (Thomas W Valente, 2010).

Some evidence suggests that interventions should use POLs to accelerate diffusion of social and behaviour change innovations; however, such leaders may already be overloaded given their status as leaders (Borgatti, 2006). Intuitively this makes sense too, as it is not possible for every behaviour change program to identify and engage the same POLs in programs that are running concurrently. This evidence is also interesting given the result from this High Five study that previous participation has a small but significant predictive effect on future participation. Perhaps the change agents in this study would not have engaged in the same way if their participation in other social and behaviour change programs was greater or lesser. In addition, behaviour changes that are less compatible with existing norms (e.g., controversial HIV prevention strategies) or have the potential to change power dynamics may be adopted less by POLs because POLs have a vested interest in maintaining the status quo (Cancian, 1979). Or possibly change agents may participate, but with a view to protecting the community from change and resisting the innovation. The effectiveness of POL interventions can be further limited by several factors, including: heterogeneous and

overlapping networks, inadequate network assessments, and the POL's public position. While it has been found to be effective in settings where the social network has well-specified boundaries (Schneider et al., 2014), recent findings from a transnational randomised controlled POL intervention suggest that the POL condition was no better in changing behaviour and incident HIV/STDs than the control condition (NIMH, 2010). This lack of efficacy combined with the potential for change agents to have acted as bridges, warrants newer and more rigorous network approaches to change agent identification and a potential focus on bridging actors (Schneider et al., 2014).

Implications for social and behaviour change programs

Some of the most significant barriers to the adoption of healthy and safe practices across the world are the entrenched complex behaviours and social norms (Goodwin et al., 2014). The field of behaviour change provides frameworks and new ways of addressing these barriers (Maio et al., 2007). Historically, many behaviour change interventions have been based on rational cognitive models of behaviour. Scientists now understand the primacy of non-cognitive influences, such as emotion, on behaviour (Biran et al., 2014; Kahneman, 2011; Loewenstein et al., 2001). There has also been a move toward multi-level intervention models based on evidence from the fields of HIV/AIDS, sanitation, smoking, reproductive health and water (Glanz et al., 2008). One example of a multilevel model is social marketing, which includes the concept of "exchange" (cost versus benefit) that underpins the relationship between the consumer and a brand (J. French & Blair-Stevens, 2006). As this study and other behaviour change interventions have shown, an effective component of an intervention strategy has been the use of change agents, e.g. peer educators and community health workers, to help bring behaviour change interventions to scale (T.W. Valente & Pumpuang, 2007).

In addition to the limited time for change agents, there are limits to the time and other resources the people within the target population have to participate in community activities. These populations, especially the poorest of the poor, have limited space for additional infrastructure in the areas with high population density. The High Five program

reported challenges at the earliest stages of the program rollout, including conducting participatory assessments as the first step in engaging the community in the selected project areas. Contributing factors include the nature of the local culture and attitudes of community towards sanitation and similar programs. Apathy was found in communities due to the failure of several previous programs. For the High Five program, it was challenging to convince people that everyone is equal, has the rights to be heard, and able to change (YCCP, 2014).

High Five program staff adopted several different tactics, including those using change agents, to deal with these challenges. First, they conducted participatory assessment in several groups rather than attempting these with larger numbers of people. These smaller groups (approximately 20 participants) were created to subsets of the larger population, e.g. for children, adolescent, adult women or men. Other than making it easier to find the time and place for meetings, conducting the assessment with these separate groups gave them the opportunity to speak more openly in a group of like-minded people. A second tactic was to involve the community from the beginning, with activities undertaken for the participatory assessment (e.g. social mapping and infection transmission FGDs) to develop the High Five program action plan and skill improvement trainings, particularly for the change agents selected to participate. Not only did this help them to understand the sanitation and hygiene problems they face, but also that the success of this STBM improvement effort is in their hands. High Five's role was, in effect, to empower them to do this for themselves.

Effective and engaged change agents help ensure people's understanding that action to improve sanitation is not just an individual or household commitment. Sustained action on sanitation reflects a commitment by the affected community to maintain their involvement. For the target population, the High Five program staff had to emphasize that the commitment is not just that of the head of local government agencies and officials. Securing this commitment, and building the trust that underpins it, was an important task of the High Five team. The High Five team used small participatory actions, such as the "neighbourhood cleaning action" as a gateway to encourage community to further participate in sanitation related activities. Neighbourhood cleaning actions are highly valued in Indonesian culture

and deeply rooted as a social norm. This approach fits with Bandura's technique of mastery modelling, which breaks significant behaviour changes into smaller tasks (Bandura, 1997). According to PollingCentre (2014) small actions undertaken by the High Five program communities themselves were crucial to reducing apathy and encouraging sustained participation. High Five developed an eclectic approach (Lefebvre, 2013) to combine elements of general behaviour change theories to formulate a program level theory of change for the High Five intervention. The program theory of change was a combination of the positive deviance model and appreciative inquiry method that provided members of the community with different perspectives to understand the situation for sanitation in their community and emphasised that small steps can be taken consistently by the community themselves. This was intended to change people's perception that programs only deal with large change and therefore require large resources to address them (YCCP, 2014).

The High Five program also identified the need to engage government officials to ensure both the sustainability of the program as well as create a policy and political environment conducive to success. This is a space where change agents can bridge the gap between decision makers and target populations. The High Five program sought to achieve this engagement through a series of activities, including workshops and meeting to create space for collaboration within the community. This served to accelerate the adoption of the sanitation practices as the community's own program. Through these workshops and meetings, stakeholders exchanged information and developed understanding as well as relationships of trust. Witnessing this cooperation, the target communities were more likely to be convinced that sanitation was a significant issue at the city level and that sufficient resources would be allocated to support High Five efforts to improve sanitation and health (YCCP, 2014). This would help address their cynicism from previous experience and ensure their confidence in the program.

Program theory of change using change agents

Intervention designers should develop a program-specific theory of change, using change agents, to show how the expected outcomes will be achieved in a population given the local

conditions. This may include replicating a similar intervention (or combination of activities) in comparable circumstances. Making the intervention's hypothesis explicit and discussing the strength of evidence which supports it will provide a more solid foundation for the planned path from outputs to outcomes. Managers and researchers are strongly encouraged to consider incorporating strategies, plans and activities based on behavioural theory, models, experience and research. As part of this, they should report the use of behaviour change theories, models and techniques.

A review by Goodwin et al. (2014) highlighted that several successful behaviour change interventions took into account the various relationships and dynamics, including at the individual, interpersonal, community and national levels. It appears it is not enough to address personal perceptions and behaviours, interventions must include activities that reflect the relationships in the household as well as social norms and national regulations. For example, Shell Foundation's Room to Breathe clean cookstove project in India shows that social marketing messages must be convincing for the women who are doing the cooking, as well as to both husband and wife who share the decision making and interact with their communities (Shell, 2013). In contrast, the more top-down interventions, such as India's National Biomass Cookstoves Initiative (NBCI), did not appear to be based on research or activities designed to deal with behavioural challenges, nor engage local communities in the decision-making or solutions for their own problems (Lewis & Pattanayak, 2012).

Another aspect of achieving scale is the recruitment of change agents and use of product and/or technology demonstrations. The way the products are communicated to the community is important, including consultations with leaders, demonstrations and engagement of sales agents, health workers and other change agents. Successful behaviour change projects recruit members of the target populations who were early adopters of technologies and then deployed them as change agents in their communities. PATH's clean cookstove project in peri-urban Uganda, found that peer led promotion, which involved inviting current users of the intervention stove to speak about their perceptions and experiences with the product at the demonstrations, was an effective strategy to increase stove uptake (Shell, 2013). In the context of the High Five program, the success of some

change agents to promote water filters or facilitate recycling programs shows the potential of support to these change agents as early adopters.

Further research

There are a number of issues for further consideration and opportunities for future work raised by the results of this study. These relate to sanitation specifically as well as more broadly to social and behaviour change interventions and policy. While the results from the High Five program should be considered in their Indonesian and local community contexts, there are also opportunities to develop interventions in other countries and contexts that draw on the experiences and evidence generated by this program.

One area of work to be considered covers the other variables that could account for the participation of the change agents in the High Five community outreach activities as well as other social and behaviour change programs. The change agents' previous participation accounted for a small effect as part of the regression model, which accounted for SOC, age and formal education. Other demographic and socio-economic factors to be considered include household expenditure, period of residence in the community and social network position. One factor that may warrant closer examination is the skill set of the change agents. These skills may relate to the five sanitation behaviours as well as the facilitation and other skills required to be a successful peer educator or community health worker. In addition to SOC, there may be other emotional and cognitive factors influencing the participation and effectiveness of change agents. These factors may act as barriers or benefits to social and behaviour change.

The role of financial incentives and compensation for change agents is widely discussed and raises a set of highly contested issues. First of these relates to whether incentives and compensation should be used at all, often based on the argument that any form of financial benefit that accrues to change agents will undermine their credibility and trust in the community. The fine line between program staff and change agent is often considered crossed when the program provides a one-time or regular financial benefit, which could be

considered by the recipient community to be the equivalent of a fee for service, or wage for work. A second issue relates to the size of the incentive or compensation – at what level should it be set. This will influence the type and numbers of people who will be attracted to the role of change agent. For staff and organisations planning these interventions and building budgets, the addition of financial incentives and compensation adds considerable managerial burden. Not only will more funds be required to cover the incentives or compensation, but also an additional monitoring system will need to be developed and implemented to ensure that the funds are spent appropriately and the results tracked. There is some evidence that financial incentives work in the short term to encourage trial of the new behaviours by the recipient communities as long as the value of the underlying behaviour is created and enhanced during this period. The same might apply to encouraging the participation of change agents in social and behaviour change programs and could be a useful area for further research.

An additional area for consideration is the role that the change agent's own behaviour plays in the adoption of that behaviour by the community in which they are active. As discussed earlier, the role of change agents as early adopters is supported by a variety of evidence from programs across different contexts. In particular it would be interesting and useful to examine which determinants or factors affect whether a change agent is likely to adopt a new behaviour. These factors may be similar or different to the ones affecting the target population to which the change agents have been tasked. The evidence suggests that factors to be tested range from common socio-demographic ones, such as age, income and education, as well as emotional, psychological and other personal influences, such as SOC and whether the change agents are too busy with other commitments.

Further work is also needed to strengthen the evidence base for the relationship between SOC and behaviour change. To date much of the work on SOC has been focused on SOC as an outcome rather than a moderating and causal variable in a relationship with other variables. One factor to be examined is the relationship between the target community's SOC and their likelihood to participate in a community development program. This in turn would influence the probability that they will adopt the new behaviours and social norms.

Linked to this would be a closer examination of the four subscales of the SOC to determine whether particular subscales are more closely associated with a certain type of social and behaviour change. Additionally, it would be useful to consider whether a community's SOC influences the effectiveness of the change agents who are deployed to help facilitate behaviour change.

Additional work would be to understand the role of links to formal and informal organisations in the participation of change agents. Wilson and Musick (1997) argue that social networks are both formal social ties, such as organisational membership, and informal social ties, such as friendship networks. Formal organisations are critical "mediating structures" that can disseminate information about community projects, encourage interaction, bond, and trust among community residents and "provide their members representation and participation in the sociopolitical organisations of neighbourhood, community, state, and nation" (Couto, 1999, p. 68). Several studies support the significance of formal organisations to community involvement (Fischer, Mueller, & Cooper, 1991; McAdam, 1989; Moen, Fields, Meador, & Rosenblatt, 2000; Okun, 1993). Local organisations also play an essential role in community involvement in small towns and rural communities (Q. A. Liu, Ryan, Aurbach, & Besser, 1998). Therefore, it may be useful to examine whether organisational memberships and involvement in community participation activities may be related and how this relationship affects behaviour and social norms.

CHAPTER 7. CONCLUSION

The key findings from this mixed method study on change agents are that their previous participation, and their sense of community towards those communities in which they are active, are both significant. The quantitative analysis revealed effect sizes for the variables of participation and sense of community that were small, yet the importance of these influences was confirmed by the qualitative interviews. This means that participation and SOC are elements that could be useful for inclusion in sanitation interventions using change agents, as well as for other social and behaviour change challenges. It has also been possible to infer a relationship between the participation of the change agents and the sanitation-related behaviour change of the people living in the communities in which they are active, as well as the ultimate health impact in the form of incidence of diarrhea. This study does not seek to infer that what works in Indonesia will work the same way elsewhere, with different participants, or on issues other than sanitation. The results will be specific to the High Five project in Indonesia, however the study's design potentially has wider relevance and application. Any further use of the methodology would involve working with different organisations and communities of people, with their own needs and approaches. The mechanics of future research would therefore need to be tailored to each to enhance relevance and success.

This study started with the understanding that the nexus between community and communications is a meaningful and vital one. In 1964 Marshall McLuhan inspired a generation of communicators when he pointed to the light bulb as an example of this nexus (Marshall McLuhan, 2013). He reminded us that a light bulb does not have content in the way that a newspaper has articles or a television has programs, yet it is a medium that has a social effect. A light bulb enables people to create spaces during the night that would otherwise be obscured by darkness. McLuhan described how the light bulb, when switched on, creates an environment by its mere presence. The nature of change agents in the diffusion of innovation when applied as part of social and behaviour change programs bears some similarity to McLuhan's light bulb. Change agents are indeed the medium – as they bring the message – but they bring the social effect too. Change agents legitimise and enable the change contained in the message. Therefore it is change agents, and the

interpersonal relationships that are their tools of trade, that are one of the keys to success in dealing with sanitation and other behaviour change problems facing communities in Indonesia and around the world.

Change agents are not a homogenous group of people. Change agents range from opinion leaders with institutionalised positions of power and access to resources, to volunteers motivated by personal values and awareness of the needs of their community. Change agents can have technical skills, such as those acquired by community health workers, often supplementing and sometimes replacing public services in communities with inadequate access to resources (T.W. Valente & Pumpuang, 2007). Some people can play the role of change agent in one community, e.g. a minister in a religious group, and ordinary citizen in another, e.g. a child's parent in relation to their school, sometimes in the same location or with overlapping memberships. These dynamics remind us that engaging change agents should take into account the diverse and fluid forms of influence and power.

The results of this study might help us to reconsider how to approach the engagement of change agents in social and behaviour change programs. Long experience with implementation and analysis has provided a toolbox of methods to identify these change agents, which have then been tested and their efficacy confirmed across issues such as HIV/AIDS, maternal health, sanitation and environmentally sustainable behaviours (T.W. Valente & Pumpuang, 2007). Further work from community development programs and those aiming to build social capital has shown how these change agents play a role in participatory approaches, giving these programs the best opportunity for sustained success (Putnam, 2007; Xu et al., 2010). The results from this High Five study show there is a need to go even further to understand not only the qualities and resources of the change agents, but the other factors and determinants affecting their capacity for effective participation in social and behaviour change programs. These factors include values, emotions and other psychological drivers, the way decision making is programmed through habit, and the skills directly related to the content of particular programs — as well as more general communication and technical abilities (Kahneman, 2011). How a community health worker feels about the community to which s/he has been assigned could be just as important as to

whom in the community they are connected. Other factors that are consistently associated with increased participation, such as income, education and length of residence in a community, need to be incorporated into interventions aiming to engage change agents (A. Q. Liu & Besser, 2003). These pieces of evidence could help to fill persistent gaps that hold practitioners and researchers back from addressing critical human development issues.

Efforts to address what is described in diffusion studies as the “adoption gap” are the subject of much academic research, private consulting and public interventions. The results consistently show that successful diffusion requires the innovation to be the right one, both in terms of design and production. And thankfully the last few decades have seen extraordinary progress with technology, both in terms of the quality and affordability of infrastructure and systems, for daily needs such as sanitation and cooking. Time will always play a role in diffusion, with its pace and length influenced by the dynamics of its immediate context. But the two elements that seem to cause the most trouble, as well as provide the most opportunity for significantly greater progress, are the final two elements of successful diffusion – the social system (the community) and the means of communication. These two elements have formed the pillars for this study on the role of change agents in facilitating improved sanitation in Indonesia’s High Five program.

The findings from this study also show the limitations of change agents to help bring about behaviour change and directly create a positive impact on health. Change agents tend to be more effective in generating demand for services such as sanitation. Thus the supply side is also vital in the process of effecting change. If infrastructure and services to provide clean water, sewerage systems and dispose of household waste do not exist or are in poor condition, it is not possible to deliver the health and other benefits promised. For a thirsty person, even the most effective marketing cannot make up for a broken tap. Evidence of this can be seen in the lack of confidence of communities in Indonesia and other parts of the world in the ability of local authorities to provide services for them (Winters et al., 2014). Trust is essential to the success of change agents. If they are not trusted or if communities do not believe they can deliver on their promises, their ability to effect change is

diminished. The guarantee of reliable infrastructure and the services that support it is vital to successful social and behaviour change.

The High Five program design was based on several decades of experience and many more of theory and evidence around what works in behaviour change. The critical component of the widely acclaimed Community Led Total Sanitation approach, on which High Five is based, is that the process needs to be facilitated and led by people trusted by the communities in which the intervention is planned. It is not enough to summon the smartest and most experienced outsiders, bringing the latest in gadgets and tools. The evidence from issues like clean cook stoves, sanitation and HIV/AIDS, shows that often these people and technologies are warmly received as a novelty or attractive promise for communities constantly struggling to survive. However the expectations for the sustained and correct use of these tools and practices are often not met, despite sometimes-large investments of financial and human capital. New technologies break down, are abandoned and communities revert back to old tools and familiar ways of solving their daily problems.

The introduction to this thesis started with a direct question: “Why do millions of children aged under five years continue to die needlessly each year when tools are available to save them?” It remains an enormous question, both in terms of the debates and complexity it evokes, and also the importance of pursuing the answers to it. This study set out its aim to research and test the effects of participation and sense of community as part of solutions to one of the most pressing and persistent problems facing poor communities globally – sanitation. While countries like Indonesia have made significant strides in efforts to lift large numbers of their people out of poverty, substantial challenges remain to addressing the needs of those whose daily lives are characterised by difficult decisions on how to use the precious few resources they control. Understanding why and how the results of the High Five program were achieved using change agents will benefit not only those in Indonesia, the lessons learned could be utilised by communities and the organisations serving them all over the world.

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