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**MATERNAL HEALTH AND THE THREE DELAYS MODEL
IN RURAL GUATEMALA**

Examining Factors Affecting Maternal Health-Seeking
Behaviours and Health Service Utilisation in Quiché

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Abstract

Objectives. Guatemala exhibits disastrous maternal and child health outcomes, with the rural, indigenous populations disproportionately impacted by high maternal mortality, chronic malnutrition, and low skilled birth attendance. This study investigates maternal care in rural Guatemala through Thaddeus and Maine's Three Delays Model (1994) to understand delays to maternal health-seeking behaviours and health service utilisation as a function of socioeconomic and cultural factors, accessibility to healthcare services, and the quality of healthcare facilities in the context of Quiché, Guatemala. This approach offers a comprehensive analysis of the limitations in maternal care provision.

Methods. A mixed-methods case study investigation applied the Three Delays Model. Surveys were conducted with 450 mothers and pregnant women, in-depth interviews with 34 biomedical health workers in 10 nearby health facilities held, and ethnographic observational findings collected.

Principal Findings. Any solution tackling issues facing Guatemalan maternal care needs to address factors affecting all phases of delay simultaneously for any hope of effective improvements. The thesis' most actionable insights concern four Phase III flaws: health facility infrastructure; medication distribution and supply; supervision; and, staffing, capacity, and training. An extension of the Three Delays Model is also proposed to be explored, to include *delays in identifying the need to seek care*.

Keywords: health, healthcare system, health seeking-behaviours, health service utilisation, Three Delays Model, rural, Guatemala

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List of Abbreviations

BRES	Requisitions, Shipping, and Supplies form
CAP	<i>Centro de Atención Permanentes</i> Permanent Attention Centres
DAS	<i>Dirección de Área de salud</i> Health Area Office
ENSMI	<i>Encuesta Nacional de Salud Materno Infantil</i> National Survey of Maternal and Child Health
FGD	Focus group discussion
INE	<i>Instituto Nacional de Estadística</i> National Institute of Statistics
KPC	Knowledge, Practices, and Coverage
LAC	Latin American and Caribbean
MDGs	Millennium Development Goals
MSPAS	<i>Ministerio de Salud Pública y Asistencia Social</i> Ministry of Health and Social Assistance
MTI	Medical Teams International
PAHO	Pan American Health Organisation
SBA	Skilled birth attendant
SEGEPLAN	<i>Secretaría de Planificación y Programación</i> Planning Secretariat
SDGs	Sustainable Development Goals
SMI	Safe Motherhood Initiative
TBA	Traditional birth attendant
TFR	Total fertility rate
UHC	Universal health coverage
USAID	United States Agency for International Development
WHO	World Health Organisation

Definitions

Biomedical Healthcare Services	As opposed to traditional community-based practices. This terms also will also be referred to as ‘modern’ or ‘formal’ services, for lack of an adequate term, as inspired by Gleit and Goldman (2000) (see also Pebley <i>et al.</i> , 1999).
<i>Comadrona</i>	<i>Comadronas</i> are the traditional midwives, looking after pregnant women, attending births, and are often the primary providers of maternal healthcare in Guatemala’s rural areas (Goldman and Gleit, 2003; van Dijk <i>et al.</i> , 2013). They are essential for the safe delivery of newborns, considering that 70% of births in Guatemala do not occur in a biomedical health facility, but rather with a <i>comadrona</i> in a home-setting (Summer <i>et al.</i> , 2017).
Health-Seeking Behaviour	‘Health-seeking behaviour’ explains the patterns of decision-making in seeking, and later utilisation, health services amongst a population group or individual. The decision-making process is influenced by individuals and/or household behaviour, community norms, and expectations or care and health-providers. The notion of ‘seeking’ implies having the knowledge, awareness, and agency, of the need of seeking care of information, and the risks of not doing do (Clewley <i>et al.</i> , 2018; Oberoi <i>et al.</i> , 2016).
Health Service Utilisation	‘Health service utilisation’ refers to the actual use of healthcare services, resultant of decisions from health-seeking behaviour. The reasons for using health services are wide-ranging, including preventing and curing health problems, or obtaining information about health status. Health service utilisation is measured as the quantification or description of the use of services by individuals, and this measure is often used to examine how efficiently a healthcare system produces health in a population (Aday and Awe, 1997; Carrasquillo, 2013).

Chapter 1: Introduction

1.1. Motivation for Study

Maternal and child health is a topic which has received overwhelming attention in the academic world, as well as the political. Both the Millennium and the Sustainable Development Goals set targets to reduce infant and maternal mortality, improve the number and capacity of skilled birth attendants, and pursue Universal Health Coverage (Buse and Hawkes, 2015; WHO, 2015). The adoption of such global goals highlights the continued urgent need for comprehensive interventions and prevention plans to address and radically improve maternal and child health. Whilst international goal-setting is encouraging, progress has been unevenly spread: mortality rates remain 14 times higher in developing¹ than in developed regions (Skolnik, 2016:2037). Still in 2018, approximately 830 women die daily from preventable causes related to pregnancy and childbirth. Women living in rural areas and poorer communities face higher mortality rates, with 99% of all maternal deaths occurring in such low-resource settings, most of which are preventable (WHO, 2018a). Such stark discrepancies reflect the inequities in access to healthcare services between countries and social groups, legitimising investigations of these countries and these social groups, in efforts to better understand, and thus serve, their at-risk mothers and children.

Discrepancies even exist within countries. Guatemala, being one of the most socially stratified nations in the world with over 40% of the population identifying as indigenous² (Glei *et al.*, 2003), exhibits how ethnicity may significantly influence the distribution of resources. Low health service utilisation and lacking human resources in medical services contextualise this disparity, with urban areas hosting eight times more skilled health workers than rural areas³ (MSPAS-INE-ICF, 2017). Further, though the national maternal mortality ratio counts 88 deaths per 100,000 live births, this ratio almost doubles to 159 deaths per 100,000 amongst indigenous women. Tragically, indigenous women account for

¹ There are 159 nations are considered ‘developing countries’ by the UN, though an official definition for what a ‘developing country’ is, remains non-existent (World Bank, 2016). This study will use low-resource country instead.

² Notably, the indigenous populations are largely concentrated in Guatemala’s rural areas.

³ Urban areas host 25.7 skilled health workers, whilst rural areas average 3, per 100,000 inhabitants (Chomat *et al.*, 2014).

70% of all maternal deaths in the country (Summer *et al.*, 2017). To address this urgent and deep-rooted issue, one must comprehensively investigate the factors influencing the decisions of mothers to seek care, their accessibility to care facilities, as well as the capacity of the facilities they utilise.

This study thus investigates factors which delay or negate the process of maternal health-seeking behaviours and health service utilisation of mothers in rural Guatemala, using the comprehensive approach offered by Thaddeus and Maine's Three Delays Model (1994) to capture these integral and reinforcing factors of maternal healthcare. Thus, reviewing interlinkages between factors affecting delays in deciding to seek and utilise care offers a unique model for analysis, suggesting consequential and sustainable improvements to the Guatemalan maternal healthcare system and accordingly the lives of critically at-risk mothers and children in rural areas.

1.2. Purpose and Research Question

There is no shortage of research addressing health situations and practices of Guatemala's rural populations, detailing low health service utilisation, precariousness of health situations, particularly of indigenous mothers, and poorly-equipped health facilities (Acevedo and Hurtado, 1997; Bland *et al.*, 2017; Ishida *et al.*, 2012; Schooley *et al.*, 2007). However, few studies address these issues from a comprehensive theoretical approach, combining analyses of sociocultural settings, geographical issues, and systemic barriers. Existing works tend to focus heavily on sociocultural barriers to healthcare, broadly suggesting that low health service utilisation arises out of unmet cultural needs and resistance to outside influence. In such studies, the impacts of barriers negating health-seeking behaviours, such as the perceived quality of care, knowledge of health-needs, and safe access to quality and reliable healthcare facilities, are less frequently explored. Further, few studies engage in a discussion with *both* healthcare-seekers and healthcare-providers in the same study, leaving studies on these topics one-sided in their conclusions.

The objective of this study is therefore to further contextualise maternal healthcare in a case of rural Guatemala, seeking to apply the abovementioned comprehensive approach of analysing sociocultural settings, geographical issues, and systemic barriers. It is my hope

to complement and build on earlier studies, to include analyses of mothers' comprehensions and perceptions of healthcare, physical barriers of access, as well as structural and logistical obstacles within health facilities, through the application of Thaddeus and Maine's Three Delays Model (1994). The model provides an apt framework for analysis, modelling three phases of delay affecting maternal health-seeking behaviours and health service utilisation, namely delays in deciding to seek care, in accessing care, and in receiving effective care at a health facility.

With this objective, I conducted a mixed-methods investigation applying the Three Delays Model to examine factors of maternal health-seeking behaviours and resultant health service utilisation in the administrative Department of Quiché, Guatemala. The hope and broader aim of this study is thus to contribute to a context-specific discussion on impediments to mothers accessing and utilising healthcare in select rural communities of Quiché, and thereby further the improvement of maternal healthcare in Guatemala. With this research objective in mind, the following research question will guide the study:

In line with the Three Delays Model, how can we understand maternal health-seeking behaviours and health service utilisation as a function of socioeconomic and cultural factors, accessibility to healthcare services, and the quality of healthcare facilities, in the context of Quiché, Guatemala?

Various methods were employed depending on the phase of delay examined. Surveys were held with 450 mothers and pregnant women in 20 communities of Chicamán, Quiché; in-depth interviews with 34 biomedical health workers in 10 nearby health facilities were conducted; and ethnographic observational studies were carried out – all informing analysis of factors affecting phases of delays. Combining these methods through the aforesaid comprehensive approach, problematising all three phases of delays together, the analysis highlights important interlinkages of factors delaying mothers in seeking, accessing, and receiving healthcare in Quiché.

1.3. Outline of Thesis

Second to this introduction, I present the demography and socioeconomic realities of Guatemala, as well as introduce the case study area. Third, I review the literature and academic discourses pertinent to the topic of maternal and child health in the case of Guatemala. Fourth, I detail Thaddeus and Maine's Three Delays Model and the capacity in which it applies to the study. Fifth, the methodology and fieldwork plan are presented, detailing data-collection methods as well as discussing methodological limitations. Sixth, I present the results from the data collection and simultaneously analyse these results according to the Three Delays Model. In the seventh part, I discuss the implications of the findings for Guatemalan maternal health policy and contemplate how the Three Delays Model may be extended. Finally, in the eighth part, I return to reflect upon my research question and consider the implications of the topic.

Chapter 2: Background

The following chapter offers an understanding of the socioeconomic and sociomedical realities of Guatemala. It will discuss the intricacies between demographic and health settings of the country, as well as introduce the context of the conducted case study, Chicamán in the Department of Quiché.

2.1 Demographics and Dichotomies of Guatemala

Guatemala is the largest and most populous country in Central America, hosting Latin America's highest total fertility rate of 2.9 births per woman with the region's fastest population growth at 2.0% (World Bank, 2017a). Such indicators are troubling in a country where close to two-thirds of the 16 million inhabitants live under the poverty line, and almost a quarter live in conditions of extreme poverty (*ibid.*). Further troubling is that these conditions of extreme poverty rise to over a third in rural areas (PAHO, 2017), leaving rural areas carrying the heaviest burden of poverty (Pena, 2013).

Decades of neglect during 36 years of civil war, which haunted the country from 1960 to 1996, left social services weak and the health system seriously underfinanced (Economist, 2018; IPD, 2011). In fact, public investment in Guatemala's health sector falls far behind all other Central American countries, at a mere 2.6% of its GDP, resulting in severely lacking healthcare infrastructure (Bland *et al.*, 2017; van Dijk *et al.*, 2013). Further, Guatemala's tax revenue of 12.3% of GDP is one of the lowest in Central America, limiting the government's overall ability to provide publicly-funded services, which has shown to disproportionately impact rural, poor, and indigenous populations (Acevedo and Hurtado, 1997; Bland *et al.*, 2017; von Grebmer *et al.*, 2017).

The disparities between rural and urban settings are synonymous with differences between indigenous⁴ and nonindigenous peoples. Indigenous peoples make up the predominant part of rural populations (World Bank, 2017b), with far worse health outcomes than their nonindigenous counterparts. Urban areas host far higher numbers of skilled health workers

⁴ It should be noted that there is no standardised definition of indigeneity or indigenism. In some cases, spoken language, dress, personal identity, religion, community residence, mode of land ownership, etc., are considered determining characteristics (Cupples, 2013). In Guatemala, census-data includes self-identification as a determining factor.

than rural areas – respectively 25.7 skilled workers as opposed to 3.0 per 100,000 inhabitants (Chomat *et al.*, 2014). Biomedical health facilities also tend to be largely concentrated in urban areas, making access to health centres difficult from rural areas with poor public transportation infrastructure and frequently impassable roads, especially for poorer communities where motorised vehicles are uncommon (Acevedo and Hurtado, 1997; Ishida *et al.*, 2012). Maternal mortality rates further highlight these disparities, with five times as many women dying from pregnancy and childbirth related causes in some rural areas compared to the capital (Bland *et al.*, 2017; Goldman and Gleib, 2003; Ippolito *et al.*, 2017).

Arguably one of the main challenges for the indigenous and rural populations is the access to quality health services. According to the *Encuesta Nacional de Salud Materno Infantil* (ENSMI),⁵ less than half of deliveries in rural areas are attended in health facilities. Just over half of pregnant indigenous women received antenatal care⁶ from a medical doctor, compared to three-quarters of nonindigenous pregnant women who did receive such care. Further, Departments with larger indigenous and rural populations tend to have health facilities in need of structural maintenance or lacking essential equipment and supplies (Avila *et al.*, 2015). It is perhaps predictable that biomedical healthcare services in these Departments, such as Quiché, are accessed less frequently, particularly by those living below the poverty line (Benson *et al.*, 2015; Lindblade *et al.*, 2011; PAHO, 2017). Furthermore, another significant challenge in healthcare delivery is monolingualism, largely disadvantaging indigenous women who speak their Mayan mother tongue but not Spanish (PAHO, 2017).

It is, however, important to point out that Guatemala has also made some progress in improving its maternal and child health shortcomings. Under the decades of the MDGs, child mortality rates fell to 30 per 1,000 live births, surpassing the target of 37. TFR also fell, from 4.7 in 1999 to 3.0 in 2015, modern contraceptive prevalence increased from around

⁵ National Maternal and Child Health Survey

⁶ ‘Antenatal care’ can be defined as the care provided by skilled health worker to pregnant women in order to ensure the best health conditions for both mother and baby during pregnancy. The components of ANC include: risk identification; prevention and management of pregnancy-related complications; and health education and promotion (WHO, 2016:1).

20% to 49%, and skilled birth attendance increased from around 30% to 65% (Rick *et al.*, 2017). Many of these improvements have been attributed not to the role of the Guatemalan healthcare system, but rather to NGOs, who have played a crucial role in the nation's healthcare provision since the end of the civil war (La Forgia *et al.*, 2005; Maupin, 2009).

2.2 The Case of Chicamán, Quiché

Chicamán is a municipality of Quiché, one of Guatemala's 22 administrative Departments. Quiché is 250 kilometres north of the capital, with a population of almost one million, where Mayans account for up to 88.6% of the department's population (INE, 2014). Though seven indigenous languages are spoken in the Department, Poqomchi' and Q'eqchi' are those most spoken in Chicamán (SEGEPLAN, 2003). The landscape of Quiché is characterised by Guatemala's central highlands, with most of the Department's territory made up of mountain ranges, making transport difficult as well as dangerous considering the Department's underdeveloped transport links. These geographical barriers further impede access to health services for the largely indigenous rural population (van Dijk *et al.*, 2013).

The Department hosts some of the country's most distressing maternal and child health indicators, with Guatemala's highest rates of maternal mortality at 192 deaths per 100,000. Alarmingly, 72% of children have chronic malnutrition, and 67% of the population live in extreme poverty (Bland *et al.*, 2017). The 2014-2015 ENSMI revealed that less than half of pregnant indigenous women in Quiché received antenatal care from a skilled health worker (MSPAS-INE-ICF, 2017). Biomedical services are poorly lacking in rural areas, with traditional healers, traditional birth attendants⁷ (TBAs) or *comadronas*, and NGOs working to fill the unmet need (Pena, 2013; Summer *et al.*, 2017). *Comadronas* in particular support the maternal health needs of the rural population. It should also be noted that though *comadronas* remain the primary obstetric care providers, studies have recently found trends of increasing, albeit incrementally, utilisation of biomedical healthcare

⁷ The term "traditional birth attendant" has received criticism for being an ethnocentric, medicocentric, as well as Eurocentric reference in how it devalues local forms of knowledge (Cosminsky, 2001a; Pigg, 1995). Although TBA remains a commonly used term in the literature, I prefer to use the Guatemalan term *comadrona*, directly translating to "midwife".

services in parts of rural Guatemala where biomedical health service utilisation has been traditionally low (Bailey *et al.*, 2005; Goldman and Glei, 2003; Schooley *et al.*, 2007). Still, utilisation of modern antenatal and maternal care in Guatemala, especially amongst indigenous women, remains low (Glei and Goldman, 2000; Ippolito *et al.*, 2017; Pena, 2013). Having presented the Guatemalan context, the health complexities the country faces, as well as introduced the setting of case study, let us now turn to review the literature and academic discourses relevant to the topic of maternal and child health.

Chapter 3: Literature Review

The discussions to follow aim to provide an overview of the academic discourses and operative concepts pertinent to this investigation. First, the wider field of maternal and child health will be discussed, highlighting the interconnectivity of the topic with other policy areas. Subsequently, the concepts of health-seeking behaviours and health service utilisation will be reviewed, noting their role in affecting determinants of maternal health. The chapter will conclude by problematising the Guatemalan healthcare system.

3.1 Finding Maternal and Child Health in other Policy Areas

Several policy areas have been referenced as inherently linked with improvements in maternal and child health. Such policy connections can be found not only in healthcare policies, but also in relation to infrastructure, including factors of geographical service accessibility, and distribution of medical supplies (Ishida *et al.*, 2012; Kruk *et al.*, 2007; Pebley *et al.*, 1996); integration, concerning how perceptions in underserved areas influence biomedical healthcare use (Goldman and Gleib, 2003; Meessen *et al.*, 2006); and education policies, relating to both the availability of skilled birth attendants as well as knowledge of prevention practices on a community level (Avila *et al.*, 2015; Yanagisawa *et al.*, 2006). This broad range of determinants affecting maternal and child health highlights the importance of the comprehensive approach this study adopts, as well as elucidates the far-reaching academic and societal concern of this topic.

In approaching maternal and child health literature, a good starting point is the broader social determinants of health. In their seminal report, the WHO's Commission on Social Determinants of Health (CSDH) noted that "social determinants of health are the conditions in which people are born, grow, live, work, and age; ... shaped by the distribution of money, power and resources at global, national, and local levels" (CSDH, 2008). In the low-resource settings where 99% of all maternal deaths occur (WHO, 2018a), social determinants of health are known to be inequitable, disfavoured marginalised and poorer populations often located in remote and rural areas where access to healthcare services is limited (Bhutta and Black, 2013; Marmot, 2009). Consequently, it is relevant to consider the social determinants of maternal health, specifically the focus of women in rural areas, as a qualifying factor in the case selection of this study.

It has been repeatedly noted how improvements in maternal and child health are frequently linked with advances in the social determinants of health. Examples include education and school attendance, gender equality and improved opportunities for adolescent girls and women, and economic prosperity, to name a few (Oosterbaan and da Costa, 1995; Osotimehin, 2011; Raghupathy, 1996). It has been widely documented how increased maternal health-seeking behaviour and improved health service utilisation are believed to derive from development of greater autonomy in household decision-making, more equitable allocation of resources, as well as an active demand for improved healthcare service (Caldwell, 1986; Cleland and van Ginneken, 1988; Pebley *et al.*, 1996). Unfortunately, Guatemala is classed as the most inequitable country in Latin America with a low-scoring Gini coefficient of 48.3, and one of the lowest education budgets in the region with over 1.5 million school-aged children out of school (World Bank, 2015). Such measures indicate poor agency in decision-making for women, as well as distressingly low education levels, especially amongst girls.

Linkages can also be found at the other end of the spectrum, with both maternal morbidity and mortality associated with poor infant health outcomes, including low birth weight and weakened infant growth and development (Bhutta *et al.*, 2008; Martorell, 2010). The interlinkage between poverty and undernutrition is also well described: studies have made statistically significant findings suggesting that poverty is a significant social determinant in trends of maternal health-seeking behaviour (Chomat *et al.*, 2014; Ishida *et al.*, 2012; Pebley *et al.*, 1996). Further, almost half of all deaths in children under the age of 5 are believed to be associated with undernutrition (Bhutta and Black, 2013; Black *et al.*, 2013). Such poor infant health outcomes have lifelong and far-reaching consequences, both in impeding long-term societal and economic development in already vulnerable populations, reinforcing the double burden of disease (Delisle, 2008; Guerrant *et al.*, 2013; Ramirez-Zea *et al.*, 2014) and forcing at-risk communities into a vicious cycle of poverty and poor health (Godfrey and Barker, 2000; Martorell *et al.*, 2010; Solomons, 2009). With almost half of all Guatemalan children under the age of 5 stunted (PAHO, 2017) or chronically malnourished (von Grebmer *et al.*, 2017), there is cause for serious concern for Guatemala's long-term societal development, and a need for urgency in addressing issues associated with maternal and child health and obstetric healthcare services.

3.2 Determinants of Health-Seeking Behaviours & Health Service Utilisation

In studying maternal and child health, processes and measures of health-seeking behaviours and health service utilisation are often applied in order to gauge the factors contributing to maternal and child health outcomes (Shaikh and Hatcher, 2004; Maine and Rosenfield, 1999; WHO, 2015). It is thus worth recalling the operative definitions and linkages between health-seeking behaviours and health service utilisation. ‘Health-seeking behaviour’ identifies the *patterns* and *processes* of decision-making in choosing to seek, with the aim of utilising, health services (Clewley *et al.*, 2018). This decision-making process is influenced by many sociocultural factors, such as decision-making structures in the home, community norms, and expectations of care and health-providers (*ibid.*). The notion of *seeking* also implies having agency, as well as the awareness and knowledge of the need to seek care or information, and the risks of not doing so (Oberoi *et al.*, 2016). Consequently, ‘health service utilisation’ concerns the actual *use* of healthcare services which *result from* health-seeking behaviours. The measure of health service utilisation is the quantification or description of the use of services by individuals, and this measure is often used to examine how efficiently a healthcare system produces health in a population (Aday and Awe, 1997; Carrasquillo, 2013). The two concepts are inherently interlinked, with the decision to seek care aimed to result in utilisation of healthcare services (Shaikh and Hatcher, 2004). If care is not sought, health services are not utilised – there is a consequential logic between the two concepts. In-keeping with the comprehensive approach this study, both health-seeking behaviours and health service utilisation need to be investigated in order to provide a holistic analysis of factors influencing the decision to seek, as well as the usage of, obstetric and maternal health in Quiché.

One of the most influential models relating to maternal health-seeking behaviours and health service utilisation arguably comes from Thaddeus and Maine’s Three Delays Model (1994), which will be discussed in the following chapter. Beyond Thaddeus and Maine, recent decades have seen increasing attention paid to studying factors of health-seeking behaviour and determinants of health service utilisation of mothers (Ensor and Cooper, 2004; Gabrysch and Campbell, 2009; Goldman and Heuveline, 2000; Maine and Rosenfield, 1999). Such studies have broadly highlighted both as complex social phenomena, inferring relevance to factors of accessibility and availability of healthcare services, as well as

relationships with and between individual determinants, societal structures, and community health beliefs (Andersen, 1995; Kroeger, 1983; Lindstrom and Munoz-Franco, 2006).

Though there are numerous studies reviewing health-seeking behaviours, many hold the methodological shortcoming of selection bias, relying on samples of patients in hospitals, clinics, or other health facilities. Such a sampling does not account for large portions of a population which *have not* sought care, or which have sought but not *accessed* or *received* care – thereby emitting a fundamental population relevant to studies of health-seeking behaviour and health service utilisation. Further, the assumption is made that health facilities hold accurate medical records for those samples, an assumption often disproven in many low-resource countries (Glei *et al.*, 2003). Aware of these shortcomings, this study hopes to overcome or at least mitigate similar errors, the method for which will be explained later.

It is well described that biomedical antenatal care and delivery service utilisation tend to be lower in low-resource countries, as is the awareness of costs and benefits of such services (Kruk *et al.*, 2007; Phillips *et al.*, 1998; Thaddeus and Maine, 1994). In such contexts, perceptions of poor quality of care, refusal from husbands, fear of treatments, shame or embarrassment, language constraints, and poor access to health facilities may be some reasons for low utilisation (Cosminsky, 1982; Goldman and Glei, 2003:697; Hurtado and Saenz de Tejada, 2001). Particularly in Guatemala, patriarchal social structures, women's sense of self-worth, and expectations of access to culturally appropriate care have also been found to influence the decision whether or not to seek care (Cosminsky, 2001b; Schooley *et al.*, 2007), be the decision made by women themselves or someone else.

These sociocultural determinants have been argued in several cases to be more strongly associated with healthcare utilisation, than factors of access and availability to healthcare services (Glei *et al.*, 2003; Goldman and Glei, 2000; 2003; Lindstrom and Munoz-Franco, 2006). These findings imply no *direct* relation between the proximity of health services and their use, though highlight the importance of sociocultural, as well as demographic, factors in explaining health seeking-behaviours of women in rural areas (Hurtado and Saenz de Tejada, 2001). This further suggests that questions of accessibility and infrastructure will

not be enough on their own in addressing the discrepancy of health outcomes and healthcare service utilisation between women in urban and rural areas in low-resource countries. Furthermore, it may suggest that the failure to consider less tangible, sociocultural factors of maternal health-seeking behaviours could explain ineffective health services and policies in Guatemala, resulting in rural indigenous populations being disproportionately affected by health inequalities (Acevedo and Hurtado, 1997; Bland *et al.*, 2017).

3.3 Problematising Guatemalan Healthcare

The Guatemalan healthcare system is characterised by high levels of fragmentation amongst several public institutions, a private sector that essentially operates independently with marginal oversight (Avila *et al.*, 2015), as well as the coexistence and concurrent use of traditional practitioners i.e. *comadronas* (Goldman and Gleib, 2003). Though Guatemala's constitution obligates the government to provide health services to all citizens, less than half of those eligible are covered (Avila *et al.*, 2015; Ippolito *et al.*, 2017). One of the main drivers of the weak public health sector is the insufficient investment of resources, lagging at a mere 2.6% of GDP.⁸ Consequently, healthcare infrastructure across the country is greatly underserved, with public biomedical healthcare services often understaffed with frequent medication stockouts, particularly in rural areas (Cerón *et al.*, 2016; Goldman and Gleib, 2003). This reality is problematic in a largely rural nation (World Bank, 2017b), leaving rural and indigenous maternal and child groups the most at-risk and marginalised populations of the Guatemala health system.

Public biomedical community-level health coverage consists mainly of *Puestos de Salud* (health posts) offering primary medical care, though often lacking the medical supplies needed to provide adequate, comprehensive care (Bhatt, 2012). *Puestos* are run by an auxiliary nurse with only 10-11 months of training, or by a medical student (Gleib *et al.*, 2003; MSPAS, 2018). Secondary level care is provided at *Centros de Atención Permanentes*

⁸ As compared close to 10% in Costa Rica (WHO, 2018b).

(CAPs), or Permanent Attention Centres, which are 24-hour health facilities.⁹ However, such facilities are utilised by a minority of women in rural areas. Part of an explanation for this tendency may be found in the limited number of healthcare facilities, insufficiently trained staff, and lacking transportation links, as well as discernible cultural barriers (Chary *et al.*, 2013; Colombara *et al.*, 2016; Foster *et al.*, 2012; Summer *et al.*, 2017). The literature on mistrust, health inequity, and systemic violence may also help to explain these health-seeking behaviours (Castro *et al.*, 2015; Cerón *et al.*, 2016; Harvey, 2008; Hawkins, 2007; Ruano *et al.*, 2014).¹⁰ Such studies highlight how differential treatment counteracts health-seeking behaviours, especially those of rural, indigenous women. Addressing and understanding such sociocultural barriers must be a priority in developing health systems promoting Universal Health Coverage and adhering to the needs and expectations of vulnerable and marginalised populations (Avila *et al.*, 2015; PAHO, 2017).

When biomedical facilities are not utilised, *comadronas* remain the most frequently sought care provider at all stages of pregnancy in rural parts of Guatemala (Chomat *et al.*, 2014). In fact, *comadronas* have been the primary providers of maternal care in Guatemala since pre-Hispanic times (Hurtado and Sáenz de Tejada, 2001; van Dijk *et al.*, 2013). Perhaps predictably then, their role has been the root of much contestation. Since the 1980s, the Ministry of Health and Social Welfare (MSPAS) sought to integrate *comadronas* into the national healthcare system by offering formal training programmes in Western biomedical practices. The hope was that these programmes would support the development of a pluralistic health system¹¹ and foster cultural exchange between *comadronas* and biomedical healthcare providers in rural Guatemala (Chomat *et al.*, 2014; Hinojosa, 2004; Maupin, 2008). However, these programmes have seen underwhelming results (Chomat *et al.*, 2014; Goldman and Gleib, 2003).

⁹ As of 2017, Quiché hosts one tertiary care Region Hospital, two secondary care District Hospitals, 16 *Centros de Atención Permanentes* (CAPs), and 57 *Puestos de Salud* (MSPAS, 2018) (see *Annex 1* for overview).

¹⁰ Such findings were mirrored in other Latin American countries too. Studies discovered that indigenous women suffered mistreatment and abuse during child delivery in Guatemala, though also Bolivia and Nicaragua (Berry, 2008; Otis and Brett, 2008; Radoff *et al.*, 2012). Further, differential treatment based on ethnicity and language were documented in Mexico and Peru (Gamlin, 2013; Montero Mendoza, 2011; Reyes and Valdivia, 2010).

¹¹ ‘Medical pluralism’ denotes the utilisation of western biomedicine-based health services “alongside a parallel network of ethnomedical healing systems that include midwifery, herbalism, and shamanism” (Ippolito *et al.*, 2017:1; see also Benson *et al.*, 2015; Chary *et al.*, 2013).

One study evaluating the results of the programmes (Goldman and Gleib, 2003) found that though trained *comadronas* were more likely to refer women to biomedical providers, most pregnant women in rural areas still did not seek antenatal care with biomedical providers. The authors even noted that the quality of care provided was similar between trained and untrained *comadronas* (Goldman and Gleib, 2003), indicating that there was not only a preference amongst women in rural areas to remain with their traditional healthcare services, but also that these practices held a quality comparable to MSPAS standards. Subsequent studies support Goldman and Gleib's findings, some extending the results to show an active resistance to integration from both *comadronas* and biomedical healthcare providers (Mignone *et al.*, 2007; Stephens *et al.*, 2006), others emphasising the highly localised nature of training programmes (Chomat *et al.*, 2014). These findings are relevant to this study because they suggest that overcoming the core sociocultural tensions present between traditional and biomedical workers would require a rethinking not only of the *comadrona* training programmes, but a more systemic shift in the relationship between biomedical and tradition healthcare. Until the model for maternal healthcare provision in Guatemala allows for constructive exchange between the two norms of practice, mothers and children will keep suffering from the cultural and political deadlock.

Chapter 4: Theory

As has been demonstrated above, statistics and studies concerning maternal healthcare in rural Guatemala illustrate a dire reality. This is a reality littered with obstacles in seeking and utilising quality healthcare services, obstacles which can aptly be addressed with Thaddeus and Maine's Three Delays Model (1994). Recalling that the research question of this thesis seeks to investigate how the Three Delays Model can be used to understand maternal health-seeking behaviours and health service utilisation in Quiché, Guatemala, the model will now be presented and later used to structure the findings and discussion of the thesis.

4.1 The Three Delays Model

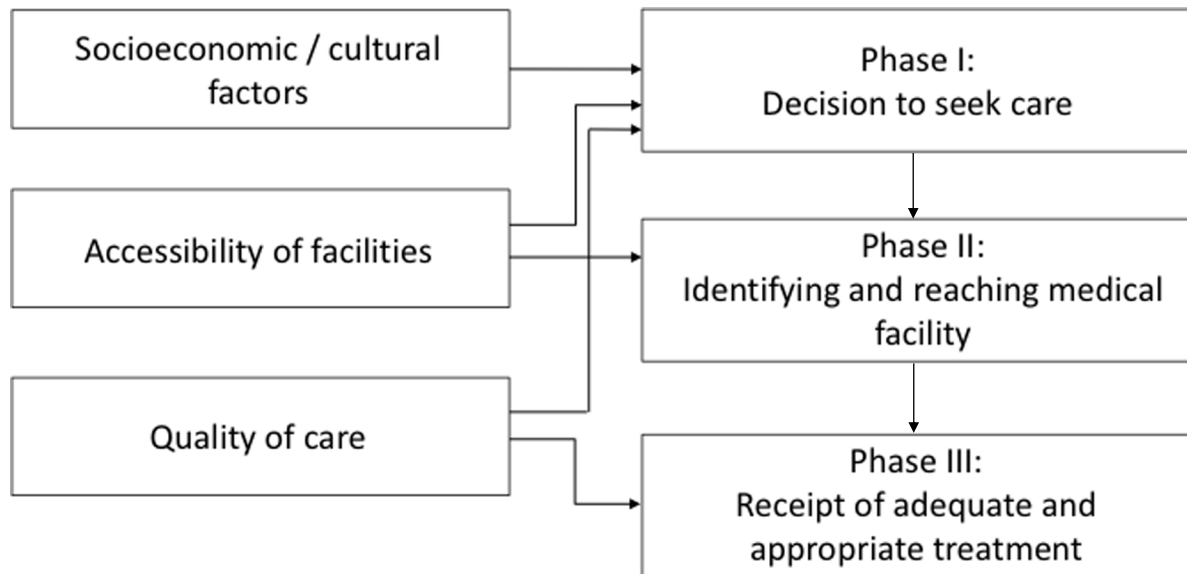
Thaddeus and Maine's conceptual framework was presented in 1994, in response to the challenges of persistent high maternal morbidity and mortality addressed by the Safe Motherhood Initiative (SMI). With the SMI's objective to reduce the high rates of maternal mortality and improve women's health in the developing world (Mahler, 1987), Thaddeus and Maine conducted a sweeping multidisciplinary literature review in preparing a programmatic guide for maternal mortality prevention (Thaddeus and Maine, 1994). Their consequent and now widely recognised Three Delays Model asserts that maternal mortality, especially amongst women in rural areas in low-resource countries, is highly correlated with three interrelated phases of, potentially indefinite, delay (see *Table 1*).

Table 1: Phases of delay of the Thaddeus and Maine Three Delays Model (1994).

Phase I.	Delays in deciding to seek care. <i>Such delays are mainly influenced by socioeconomic and cultural factors that affect the decision-making of pregnant women and their families.</i>
Phase II.	Delays in accessing or reaching care. <i>These concern accessibility, such as infrastructure, costs of transportation, and distance to biomedical healthcare facilities.</i>
Phase III.	Delays in receiving timely and effective care. <i>Delays associated with efficiency and quality of biomedical healthcare facilities, such as medical supplies, quality of care and professional health personnel.</i>

The model proposes a chronology of factors that may delay the process of mothers seeking, accessing, and receiving the obstetric care they need (see *Figure 1*). It asserts that mothers begin their health-seeking processes with the *decision whether or not to seek medical healthcare*, and here Phase I delays may arise. The most common barriers or constraints herein are sociocultural factors, though perceptions of the quality of care, distance, and cost also influence decisions (Thaddeus and Maine; 1994: pp.1093-1094). Once Phase I delays have been overcome and the decision to seek care has been made, issues of *accessing or reaching the medical health facility* may arise. The accessibility of healthcare services plays a dual role in the health-seeking process, influencing the decision to seek care (outlined in Phase I) as well as determining the time spent in actually getting to the healthcare facility (addressed in Phase II). Locations of healthcare facilities, travel distances resulting from their distribution, and the means of transportation necessary to cover these distances, thus make up Phase II delays. Essentially, Phase II delays arise from the physical accessibility of healthcare facilities, and such delays occur commonly in rural areas (*ibid.*:1100). Should the decision to seek care be made and the patient manages to arrive at the health facility, Phase I and II delays have been overcome. Phase III delays, accordingly, are those which occur at the treatment facilities, delaying *the receiving of effective care*. Such delays may be caused by inadequate care resulting from insufficient and unqualified staffing, shortages of essential drugs, missing supplies and equipment, or poor management. Late or wrong diagnosis and incorrect treatment by the healthcare workers may also contribute to delays in the timely provision of needed care (*ibid.*:1102). *Figure 2* below presents the factors and chronology of delays.

Figure 1: Schematic representation of how the various delay factors affect the interval between onset of obstetric complication and its outcome (Knight et al., 2013).



4.2 Factors of Delay in the Guatemalan Context

In the context of rural Guatemala, it is evident from numerous studies that mothers and women run the risk of delays at all three phases of Thaddeus and Maine's model. The following sections will address the factors of each delay phase and how they arise in the context of the study.

4.2.1 Phase I Delay Factors

The social context in which women live presents the first potential for Phase I delays impacting maternal health-seeking behaviours. Guatemala, and especially its rural areas, fosters strong familial networks. With several generations living under the same roof, parents as well as in-laws have been known to influence the decisions of their daughters or pregnant relatives based on their own experiences and traditions (Schooley *et al.*, 2007). In the highlands of Guatemala this is known to occur on topics of birthing practices, visits to clinics, and family planning methods (Carter, 2002). The result will often downplay the need to seek biomedical medical care for reasons of costs, difficulty in transport, or poor experiences of older relatives. Especially younger mothers find themselves at risk of these Phase I delay factors.

Further, in such settings, gender roles are clearly defined, with men considered the ‘breadwinners’ and women the ‘childrearers’. Within this structure, a machismo culture is evident, denoted by indicators such as marital status, husbands’ household decision-making authority, and husbands’ (non)participation in childcare (Chomat *et al.*, 2014). Paternalistic notions of how a man or woman should behave are also present, as well as imbalanced distributions of resources, opportunities, activities, and space (Carter, 2002; Gleib *et al.*, 2003). These gender dynamics highlight the role of the husband and in some cases weaken the decision-making agency of the woman or mother in such households, leading to evident Phase I delays.

Furthermore, the role of the *comadrona* cannot be underestimated in the decision-making of women in rural Guatemalan communities (Goldman and Gleib, 2003; van Dijk *et al.*, 2013). Oftentimes the primary obstetric care providers in these areas, charged with dissemination of healthcare practices and information, their role is highly respected by the communities in which they serve (Hurtado and Sáenz de Tejada, 2001). Consequently, they hold great influence over the maternal healthcare decisions of women and mothers, taking charge of several of the decisions which may lead to Phase I delays (Mignone, *et al.*, 2009; Rogoff, 2011).

Additional factors which feed into Phase I delays may concern perceptions or expectations of discrimination or poor quality in healthcare facilities, which both can discourage women to seek biomedical healthcare. There are numerous cases of women, especially indigenous women, facing differential treatment in health facilities in Guatemala, be it in relation to having to wait longer than other patients, or not being offered preferred cultural treatment practices (Boulware *et al.*, 2016; McMahon *et al.*, 2014). Another factor causing delays in decision-making may be as simple as a lack of knowledge amongst women about when they should seek medical attention (Chomat *et al.*, 2014). Should a mother not know she needs to seek medical attention, there is an indefinite delay in the decision to seek care.

4.2.2 Phase II Delay Factors

Secondly, Phase II delays relate to the physical accessibility of healthcare facilities, occurring especially in rural areas. Quiché is no exception. Considered a Department with largely inaccessible roads (Chomat *et al.*, 2014; Ishida *et al.*, 2012), travel to and from health facilities can often be a lengthy and precarious endeavour. Though the danger of travel may be considered under both Phase I and II delays, poor quality roads prolong travel times, and therefore can be considered a Phase II delay factor. A woman living in the community of *Sobre Sacá* in Quiché, for example, has to hike 60 minutes to access a drivable road. Such travel times are likely to increase for women requiring medical attention.

Relatively expensive options for public transport further complicate accessibility to health facilities. Furthermore, low ownership of vehicles limits the flexibility for families to make urgent trips to any health facility (Acevedo and Hurtado, 1997; Chomat *et al.*, 2014).

4.2.3 Phase III Delay Factors

Finally, delays occurring at treatment facilities, delaying the receiving of effective care, may arise from cultural issues or language barriers (Glei *et al.*, 2003). Unavailability of culturally appropriate care may also result in a mother not accepting the care she is offered and requires (Cosminsky, 2001b; Schooley *et al.*, 2007). Other factors may be the actualisation of the perceptions of poor care or discrimination, influencing Phase I delays. Long waiting lines, impacted by ethnicity or not, are also a cause of delayed care. Old or unmaintained facilities, poorly-educated staff, or medication stockouts are further documented factors in Guatemala (Cerón *et al.*, 2016; Ippolito *et al.*, 2017), all of which are likely to delay the receiving of effective care.

All the above delay factors for the three phases are known to occur in Guatemala, thereby informing the expectations of this study. Further, the existence or risk of such delays greatly impact the health-seeking behaviours of women (Benagiano and Thomas, 2003; Mgawadere *et al.*, 2017), and should be considered part of an explanation for the low health service utilisation, as well as for the troubling health outcomes amongst both maternal and infant morbidity and mortality in rural Guatemala.

4.3 A Comprehensive Theoretical Application

In considering the importance of the comprehensive approach the Three Delays Model offers, it is worth reemphasising the interconnectedness of these three phases of delay, reinforcing one another and requiring all to be simultaneously addressed to inspire sustainable change. For example, social and geographical settings of rural communities influence both the perceptions and expectations of health-seekers, but also the actual accessibility of health facilities. Or consider, should access and transport infrastructure be improved, such improvements to Phase I and II delay factors are meaningless if Phase III delays prevail, meaning health-seekers are met by insufficiently-trained staff, missing medications, or locked doors; leading to non-existent or inadequate care. Thus, applying the Three Delays Model to an analysis of maternal health-seeking behaviours and health service utilisation offers a comprehensive approach for evaluating potential delay factors at all three phases. It further offers an understanding of the holistic *process* of healthcare seeking and utilisation, emphasising identification of where improvements should be focussed to improve the child and maternal healthcare system.

To gain such a perspective, and based on the chosen application of the Three Delays Model, a theoretical framework for this case study should be developed to access the most useful data in the most appropriate manner possible. Several methods were utilised in this study, all of which will be elaborated in the following chapter. This section presents how the reasons for each phase of delay work in relation to the case. In order to compose this framework, a range of previous studies¹² have been drawn upon to collect and collate a list of expected reasons for delays, according to the Three Delays Model (see *Table 2 below*). The subsequent chapter will further present the types of evidence expected from this study and how they may be observed. It should be noted that this application does not mean to test the Three Delays Model, but rather apply it to a specific case and observe its organising capacity.

¹² The main sources of these expectations are found in Cerón *et al.*, 2016; Chomat *et al.*, 2014; Goldman and Gleit, 2003; Ippolito *et al.*, 2017; Schooley *et al.*, 2007; Summer *et al.*, 2017; van Dijk *et al.*, 2013.

Table 2: Expected reasons of delays in the case of this study.

Phase of Delay	Reasons for Delay
Phase I <i>Deciding to seek care</i>	If the community norm is to not utilise healthcare services, that is likely to be upheld amongst mothers too
	Without knowing the appropriate moments one might need to seek care, the decision to seek care will be indefinitely delayed
	Factors such as the fear of facing discrimination in health facilities or the ordeal of needing to leave community to get to a health facility, may work to discourage women to seek care
	Women are traditionally responsible for childrearing, a role that can impede leaving the home
	Mothers tend to have less agency compared to husbands and mothers-in-law in care-seeking decisions, negating the need to seek care especially with younger mothers
	<i>Comadronas</i> tend to be the preferred care-provider to health facilities
Phase II <i>Accessing or reaching health facility</i>	Reaching services may be slow and precarious due to difficult roads or poor distribution of health facilities
	Mothers are unable to control the means and times of travel to health facilities if ownership of motor vehicles is low and public transport options are unreliable and expensive
Phase III <i>Receiving quality and efficient care at health facility</i>	Long waiting lines in health facilities would delay the time taken for patients to be treated
	Some facilities may have old or poorly maintained facilities, and not be at full working capacity, therefore unable to treat as many patients as allocated
	Medical stockouts, documented to frequent Guatemala, may mean that basic treatments, such as vaccinations, cannot be provided, thereby indefinitely delayed
	Understaffed facilities will mean that patients cannot be treated in a timely manner
	An unavailability of, or reluctance to provide, culturally appropriate care may discourage or delay, even indefinitely, the receiving of care
	Female patients may be reluctant to be treated by a male health worker

Chapter 5: Methodology

In what follows, I present the methodological choices of this mixed-methods investigation. First, an overview of the research design is provided, followed by a presentation of the research methods and data. Herein, practical aspects of the fieldwork and data-collection will be presented, as will sampling and data-processing. The chapter will conclude by reflecting upon limitations and ethical considerations of the applied methods.

5.1 Research Design

A sequenced mixed-methods research design was employed as the guiding methodology in examining the research question. Fieldwork for both quantitative and qualitative data-collection methods were carried out over a four-month period. Firstly, surveys were conducted with 450 mothers and pregnant women, subsequently I held in-depth interviews with 34 biomedical health workers in ten nearby health facilities, and further collected ethnographic observational findings. An iterative engagement with data was adopted, allowing me to refine my research question and probe deeper into the case context so to appropriately organise the constructed realities of participants.

The qualitative elements of the research design were made up of two site-intensive methods (SIM) of data-collection (Kapiszewski *et al.*, 2015: pp.237-238). This entailed being intensively engaged and immersed in the research context, collecting and collating narratives from health facility workers, as well as observations of the working practices and dynamics of those facilities. In that regard, the SIMs applied in this study fall under the umbrella of ethnographic research, abiding by the Willis and Trondman definition, that “ethnography is the direct and sustained social contact with agents, and of richly writing up the encounter, respecting, recording, representing at least partly in its own terms, the irreducibility of human experience” (Willis and Trondman, 2000:5).

Insights from survey data, interviews, informal conversations, and ethnographic observations from field visits and health facilities, as all as second-hand data from focus group discussions (FGD), will thus be discussed in unison through the comprehensive approach discussed earlier, structured by the Three Delays Model. The below table provides an overview of the appropriate methods of data-collection and knowledge

generation in relation to the theoretical expectations identified in the previous chapter. Subsequent to *Table 3*, the following sections will chronologically discuss each step of the research methods in greater detail.

Table 3: Overview of mixed-methods for data collection according to expected results.

Phase of Delay	Evidence of Reasons for Delay	Data Collection Method
Phase I <i>Deciding to seek care</i>	i. Health service utilisation of mothers is low	- Surveys in communities
	ii. Knowledge of appropriate moments to seek healthcare services amongst communities is poor	
	iii. Fears of discrimination against patients from healthcare services / workers	- Surveys in communities - FGDs with mothers
	iv. Mother's perceived ordeal of needing to leave community to get to a health facility	
	v. Mother's concerns for leaving children home	
	vi. Husbands and mothers-in-law influence decisions to seek care, especially with younger mothers	
	vii. Perceptions that mothers choose not to seek biomedical care in preference of care from <i>comadrona</i>	- Interviews with healthcare workers ¹³
	viii. Husbands and mothers-in-law may not let mothers leave for fear of costs of travel and/or care	- Interviews with healthcare workers - FGDs with mothers
Phase II <i>Accessing or reaching health facility</i>	i. Poor distribution of health facilities, therefore forcing long journeys	- Observations throughout data collection
	ii. Difficult roads between communities and facilities	- FGDs with mothers
	iii. Expensive to travel	
	iv. Lack of own motor vehicles	- Surveys in communities

¹³ It is worth clarifying here that expectations concerning Phase I delays from healthcare providers should be considered and weighed as second-hand information about why women do not seek care, as opinions of healthcare providers do not infer meaning onto the motivations or behaviours of women as health-seekers.

Phase of Delay	Evidence of Reasons for Delay	Data Collection Method
Phase III <i>Receiving quality and efficient care at health facility</i>	i. Long waiting lines before being treated	- Observations of facilities - Interviews with healthcare workers
	ii. Old or poorly maintained facilities	
	iii. Medical stockouts in health facilities	
	iv. Understaffed health facilities	
	v. Unequal treatment between indigenous and nonindigenous patients	- Observations of facilities - FGDs with mothers
	vi. Culturally appropriate care methods not always available	
	vii. Language barriers	
	viii. Many male health workers, with mothers holding a preference to be seen by a female health worker	- FGDs with mothers

5.2 Research Method and Data

5.2.1 Surveying Communities

Firstly, a total of 450 women¹⁴ from 20 rural communities in Chicamán, Quiché were surveyed on topics of health practices and health-seeking behaviour in relation to Phase I delays (see *Table 4*). Two separate survey guides with closed questions were produced. Both included scripted introductions, presenting the survey's purpose, informing that the participant's anonymity was guaranteed, and that the participant may abstain from answering any question or end the interview at any time. The introduction ends by asking for consent to conduct the survey. Permission to take photos was also requested.

Both surveys were modelled on the Knowledge, Practices, and Coverage (KPC) survey methodology,¹⁵ though also inspired by past studies (Carter, 2002; Chomat *et al.*, 2014; Gleit and Goldman, 2000). Questions concerned topics contributing to Phase I delays, such

¹⁴ 300 mothers of children under 24 months and 150 pregnant women

¹⁵ Developed at the request of USAID, the KPC model is an assessment tool used to rapidly generate “a concise and manageable set of indicators to monitor and estimate the results of interventions [addressing child and maternal health]” (Espetu, 2001:1). Further, and more importantly, the execution of the survey tool seeks to promote local participation in recognising health priorities as well as in monitoring community health status.

as sociodemographics data, access to water and sanitation, obstetric history, and other aspects of community life. Both survey guides were in Spanish, as well as Q'eqchi' and Poqomchi' (included in *Annex 2*) and were field-tested to improve language and flow. Participants had the option of doing the survey in Q'eqchi', Poqomchi', or Spanish,¹⁶ depending on the abilities of the data-collectors.

With the support of the NGO Medical Teams International,¹⁷ a team of 13 data-collectors were used when conducting the surveys (see *Annex 3* for list of data-collectors). Community leaders and *comadronas* acted as our gatekeepers to communities and homes of mothers and pregnant women. Participants were randomly selected using the widely-applied 30-cluster stratified sampling methodology (Bennett *et al.*, 1991; Henderson and Sundaresan, 1982; WHO, 2016; 2018). Women were eligible for inclusion in the study if they identified themselves as pregnant or having a child under 24 months to the interviewer, and subsequently gave informed consent to partake.¹⁸

Considering the gender dynamics, household compositions, and community power structures at play, it was relevant to seek more private conversations with women to gain access to their personal opinions rather than those of husbands or older relatives. Where this was not appropriate, it was of interest to observe and take note of the interactions and interventions of husbands and older relatives during surveys, so as to gain insight into what the decision-making process, and thereby Phase I delays, might look like. Though maternal health-seeking behaviours and health service utilisation concern the actions of women and mothers, the social structures and networks influencing decision-making cannot be underestimated and therefore are considered of analytical interest, especially to Phase I delays.

¹⁶ Q'eqchi' and Poqomchi' are the two primary languages in communities, though Spanish is also spoken by some.

¹⁷ Medical Teams International is an NGO working in community health programmes, health systems strengthening, and humanitarian relief projects, both in protracted and crises zones (MTI, nd). Their work in Guatemala centres on child and maternal health programmes in the rural highlands, thereby were an ideal partner in data collection for this study.

¹⁸ See *Annex 4* for sample selection overview.

Table 4: Target population of rural communities in Chicamán, Quiché (MSPAS, 2018).

	Community	Population	Children under 24 months	Pregnant women
1	Agua Blanca	236	26	8
2	Buena Vista El Amay	133	15	5
3	Cruz Chut	398	44	14
4	El Pinal	151	17	5
5	El Zapote	326	36	11
6	La Campana	624	69	22
7	La Ceiba	434	48	15
8	La Lima	113	11	4
9	La Unión	667	74	23
10	Los Lopez el Amay	236	21	8
11	Lote III	645	72	23
12	Panaman	275	30	10
13	Pancul	214	24	7
14	Pancuz	392	43	14
15	Pantolox	286	32	10
16	San Sebastián Beleju	2959	328	104
17	Santa Cruz Zapote	423	47	15
18	Santa Gertrudis	623	69	22
19	Sobre Sacá	142	16	5
20	Tiritibol	753	84	26
	TOTAL	10,030	1107	351

5.2.2 Interviewing Biomedical Healthcare Workers

Secondly, semi-structured interviews with doctors, nurses, and other health facility workers were scheduled to explore the personal experiences and perceptions concerning their health services. In total, 34 participants partook in the interviews, representing ten different biomedical health facilities. Interviewees consisted of six doctors, 15 nurses, 11 auxiliary nurses, and two administrative staff (see *Table 5*). Healthcare facilities¹⁹ were selected on the basis of purposive sampling (Robson and McCartan, 2016).

¹⁹ See *Annex 1* for overview of health facility coverage of Quiché.

Table 5: Distribution of biomedical healthcare workers.

Hospitals.	<i>Uspantán, Quiché</i>	Doctors (5), Nurses (6)
Centros de Atención Permanentes.	<i>Chicamán, La Parroquia</i>	Doctors (1), Nurses (8), Auxiliary Nurses (3), Admin (2)
Puestos de Salud.	<i>Caracol, Choló, El Amay, El Palmar, San Sebastián, Sicaché</i>	Auxiliary Nurses (9)

Inspired by previous prominent studies (Schooley *et al.*, 2007; Summer *et al.*, 2017), the interviews were loosely-structured with broad, open-ended questions on five topics (see Table 6 and Annex 2). This model allowed for personal reflections and unique perspectives of the participants as to how their health facility functions as well as how they manage to operate in the larger healthcare system of the country.

Table 6: Semi-structured in-depth interview guide sections.

Section 1. *Demographics*

Section 2. *Scope of Work/Perceived Roles of the health facility*

Section 3. *Perceptions of maternal and child health*

Section 4. *Perceptions of indigenous women's health*

Section 5. *Other reflections*

All participants were asked the same introductory questions, concerning their position, educational background, and how they perceive their facility's role in the context of the Guatemalan healthcare system. Beyond this, I probed for participants' reflections on specific indicators related mainly to Phase III delays, but also Phases I and II, such as; perceptions on health-seeking behaviours of indigenous women, shortcomings of Departmental or national healthcare systems, and quality of medical infrastructure. All participants offered their consent to being interviewed, and interviews have been anonymised.

Interviews were scheduled with a few key informants to begin with, thereafter following a principle of chain-referral and snowball sampling (Kapiszewski *et al.*, 2015:212). The Director of the health facility was often the first invited to be interviewed, after which I asked to be referred to available staff providing maternal healthcare services. Once all available maternal health providers had been invited to interviews (no more than five per facility to counter over-representation), the day of interviews was considered complete. During these visits, I also arranged for return visits to conduct observational studies, to which all health facilities accepted.

5.2.3 *Observing Health Facilities*

Thirdly, ethnographic observational studies were conducted to complement and contextualise the case study further, especially in relation to Phase III delays. An interpretivist ethnographical approach was adopted in this regard, in that I sought to maximise my “understandings of everyday practices” of the research context (Kapiszewski *et al.*, 2015:239). This methodology follows the central principles of SIMs, in that observations were conducted in the name of immersion into the research context, adopting a contingent and open-ended approach (*ibid.*).

It was my intention to allow this portion of the fieldwork to develop naturally as it occurred, remaining open to uncovering relevant issues and themes emerging from the experience. This method speaks to the constructivist approach, in emphasising the realities of participants rather than those of researchers (Mills *et al.*, 2006; Willig, 2013). As such, in my observations I assumed principles of SIMs of immersion and an unstructured, open-ended methodology, taking note of patterns or experiences I thought relevant to the Three Delays Model’s theoretical framework. Supported by gatekeepers identified during my interviews, I visited health facilities in the morning where I spent the morning in the waiting rooms, and was sometimes permitted to observe consultations and stock deliveries.

5.3 Data Processing and Triangulation

Epi Info²⁰ version 7.1.5 was used to generate descriptive statistics for analysis of survey results. Variables of interest dealing with Phase I delays included: skilled birth attendance; the availability of traditional and biomedical health providers; obstetric history; health beliefs and knowledge; medical settings for delivery; trimester of pregnancy for first antenatal care visit, as well as justifications for avoiding such antenatal visits; setting and frequency of medical check-ups; and, vaccinations for both mothers and children (Creswell, 2012; Saldaña, 2011; Schram, 2006; Summer *et al.*, 2017). Takeaways from focus groups discussions²¹ were also drawn on to complement analysis of the survey results.

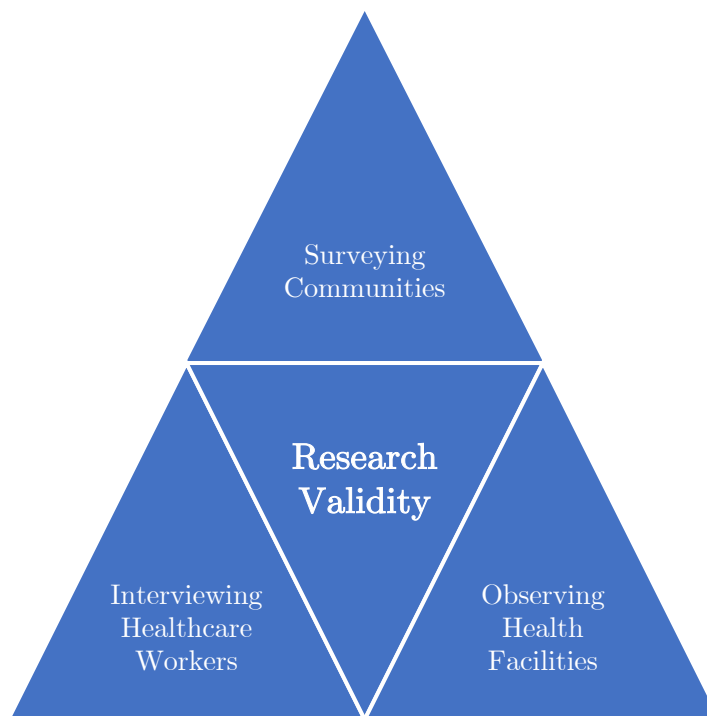
Relevant extracts from interviews with biomedical health staff were transcribed and manually coded using NVivo12 according to the framework of delays set out in the Three Delays Model. Further, a constant comparison technique was applied, “searching for emerging themes, categories, and patterns” (Hewitt-Taylor, 2001). This technique was operationalised by looking for significant statements from interview data in order to develop a scheme for categorisation and organising said data, subsequently identifying patterns and structures connecting the thematic categories (Polit and Beck, 2004; Schooley *et al.*, 2007). Any findings made during the observational studies that spoke to the identified thematic categories were also annotated and included in the coding.

Applying a mixed-methods methodology and conducting such a multilevel analysis should facilitate a more comprehensive interpretation of phases of delays affecting maternal health-seeking behaviours and health service utilisation in the case study. As such, the three means of data collection were employed as part of a strategy of triangulation to strengthen the validity of the research, and by extension, the claims made in the thesis (see *Figure 2*).

²⁰ Epi Info is statistical analysis tool for public health and epidemiology developed by Centers for Disease Control and Prevention (CDC).

²¹ Second-hand data in this study. Collected by MTI in 16 of the case study communities in September 2017.

Figure 2: Validity model of research methodology (modelling inspired by Tally, 2011).



5.4 Limitations, Positionality, and Agency

In order to inform and improve future studies, the limitations of this research should be acknowledged. Firstly, though it facilitates access to research areas, one may problematise conducting research in collaboration with an NGO. With Medical Teams International I was supporting the preparation and implementation of a baseline study, the data of which would inform health interventions in an upcoming community health programme. Whilst I was able to influence the questions included in the survey, the organisation did block the inclusion of some suggested questions on the basis that they did not align with their indicators of interest. The limiting factor in this case might be considered as the interests of the organisation restricting the scope of the study. Fortunately, this was the case with only a small number of questions, and the majority of requested additions were approved.

A second limitation to consider is the language barrier between myself and many of the participants in the case study communities. With my not speaking Q'eqchi' nor Poqomchi', I was unable to engage in more active, iterative discussions with mothers, and therefore had to rely on surveys rather than interviews. Using data-collectors fluent in the indigenous languages was an effective method to overcome this barrier, though there are always some

things lost in translation. Fully aware of this, emphasis was placed on the quantitative data collected from the surveys, more than any qualitative comments that may have been made.

Finally, my positionality in relation to the research participants, as well as to the research taking place, is important to consider. As a foreign researcher in a relatively closed community, it is not unreasonable that my appearance and presence may have influenced the actions and answers of respondents. For example, female participants may not have wanted to share their stories, especially on topics of maternal health, with a foreign man (Chomat *et al.*, 2014). Alternatively, the presence of a westerner²² may result in communities expecting direct benefits or donations, thereby exaggerating their answers (Schech *et al.*, 2018). To overcome these potentially negative impacts, my association with and accompanying a known NGO with Guatemalan staff eased acceptance of my position, both in communities and in health facilities.

5.5 Ethical Considerations

Due to the sensitive nature of the study, a number of ethical considerations must be made. Firstly, as this research topic concerns some intimate matters of health and personal choice, I aimed to be conscious of respecting and ensuring participants' privacy and anonymity. Upon receiving an explanation of the nature of the study and their involvement as participants, all informants gave their consent to partake. To safeguard participants' anonymity, all survey and interview responses were coded, and no names were explicitly identified in the findings of this paper. Further, across all methodological choices, cultural sensitivity and thorough background research was required to understand the appropriateness of the different topics and questions included in surveys and interviews (Banks and Scheyvens, 2014; Schuurman, 2009). In the pursuit of such knowledge, I hoped to minimise the initial lack of pre-understanding of cultural dynamics, livelihoods, and practices in the particular communities of study (Hammersley, 1992). I sought to bolster my appropriateness in these topics through my immersion into the Guatemalan context, as well as through regular consultation with the local staff of the NGO supporting my

²² Or 'gringo' as I was often called.

work. In addition, the epistemological implications of being a foreign researcher were important to consider, reflecting upon the way in which information is articulated in my study, seeking to avoid Eurocentrism and taking away the agency of the participants (Hammersley, 1992; Sultana, 2007). This issue I hoped to overcome through adopting a constructivist ethnographical research approach whilst conducting medium-length fieldwork (Kapiszewski *et al.*, 2015), ensuring my intense engagement with, and exposure to, the intricacies of the research context. Furthermore, as this case study focuses on one Department, it is important to emphasise that this will not be representative for the whole of Guatemala nor the global issue of child and maternal health. Nonetheless, the case holds potential of transferability of findings via analytical generalisation. Finally, it should be noted that all research was conducted in accordance with prevailing university ethical principles, and the thesis supervisor did not deem formal ethical approval necessary to be obtained from the Lund University's LUMID Ethics Board.

Chapter 6: Analysis of Results

Before delving into the presentation of findings and main analytical section of this thesis, it is worth noting how this chapter will work to respond to the research question. Recalling that the research question asks how the Three Delays Model can be used to understand maternal health-seeking behaviours and health service utilisation in Quiché, this chapter will examine each of the three phases of delay evidenced by the findings from this research. The analysis will be organised by the Three Delays Model, presenting a clear and comprehensive overview of the factors affecting maternal health-seeking behaviours and health service utilisation, thereby offering a better understanding of the shortcomings and areas for improvement of maternal healthcare of Quiché. It will conclude by summarising the major takeaways from these findings, with the subsequent chapter hereafter reflecting upon the most striking findings and implications of the research. Before the contributing reasons for delays are examined, an overview of the participant data is presented below.

Table 7a: Overview of participant data from community surveys and FGDs.

Mothers and Pregnant Women²³

450 women were surveyed. Sample of mothers accounted for around 35% of the population. Sample of pregnant women accounted for 43% of the population.

Mother with children. Mean age of mothers with children under 24 months was 26 years, ranging from ages 16 to 50. Mothers had between 1 and 12 children, and on average 3.5 children. Children averaged 11 months of age.

Pregnant women. Mean age for pregnant women was 25.4 years, ranging from ages 15 to 41. Not the first pregnancy for almost three-quarters of the 150 women.

FGD data. Collected by MTI in 16 communities in September 2017. 45 women partook, of which 28 mothers with children under 24 months and 17 pregnant women.

²³ These data from communities primarily provide findings for Phase I delays concerning the socioeconomic, cultural, and familial factors of mothers' decisions to seek care. However, they also allow for findings on Phase II delays, regarding the physical accessibility and means of transportation between health facilities and communities.

*Table 7b: Overview of participant data from interviews and observational studies of health facilities.***Biomedical Healthcare Workers²⁴**

34 biomedical health staff interviewed. Six doctors, 15 nurses, 11 auxiliary nurses, and two administrative staff.

Ten biomedical health facilities. Accounting for 13% of facilities in Department; two-thirds of the hospitals, two of the 16 *CAPs*, and six of the 57 *Puestos de Salud*.

Sex. 18 females, 16 males.

Language. Most spoke at least one indigenous language. Six spoke only Spanish.

6.1 Reasons for Phase I Delays

Several elements of Phase I delays can be highlighted from this study. Some of the more tangible factors observed concern the lack of safe sanitation and water infrastructure. Of the households surveyed, about one-in-three had access to an improved source for drinking water²⁵ and about one-in-eight households were using an improved toilet facility.²⁶ These numbers indicate how sanitation conditions of rural families in Chicamán are poor, risking adverse health effects, such as gastrointestinal illnesses from food contamination.

Mothers reported that almost half of all children had either had diarrhoea (43%) or cough with rapid breathing (40.67%) in the two weeks prior to the survey, signalling high prevalence of the two largest contributors to infant mortality (Goldman and Heuveline, 2000; Ippolito *et al.*, 2017). Of the 129 children reported to have had diarrhoea, few had been given the appropriate treatment of oral rehydration salts (ORS) (34%) or were treated with zinc (2.33%). Of the 122 children reported to have shown signs of pneumonia, less than half were taken to an appropriate health provider within two days of the start of symptoms. Again, what these findings indicate is a lacking awareness amongst mothers as

²⁴ These data primarily provide findings for Phase III delays associated with efficiency and quality of biomedical healthcare facilities. Moreover, they facilitate insights to Phase I and II delays, as many interviews speak of sociocultural settings of mothers and issues in accessing healthcare. It is important to note however that these insights do not infer meaning onto Phase I or II delays, but rather provide second-hand contextual information.

²⁵ An improved drinking water source adequately protects water from contamination, in particular from faecal matter. Common examples include piped household water, protected dug well, and rainwater collection. Unimproved drinking water sources include surface water collection, or tanker truck water (UNICEF and WHO, 2012).

²⁶ Improved toilet facilities, or improved sanitation, are facilities that hygienically separate human excreta from human contact. Examples include toilets with sewer or septic system connections, pour-flush latrines, and ventilated pit latrines. Unimproved facilities include open pit latrines, buckets, or the open air (UNICEF and WHO, 2012).

to when or how they should seek healthcare services, an evident case of Phase I delays. Conversely, although only 35% of cases of gastrointestinal and respiratory illnesses resulted in a visit to a biomedical healthcare provider, biomedical care and medicines were sought in 54% of the cases to treat such symptoms, indicating that modern medical care does play some role in the treatment of infectious illnesses amongst children in Quiché.

Surveys also revealed low health service utilisation in the case study communities. Of the 450 women interviewed, 60% had received appropriate antenatal care with a biomedical health facility; 53% of pregnant women and 35% of mothers had either not had an antenatal check-up, or had one conducted at home by a *comadrona*. In-keeping with previous studies (Chomat *et al.*, 2014; Summer *et al.*, 2017), over two-thirds of mothers gave birth at home. Only 20% of mothers interviewed gave birth in the hospital. Of the 300 mothers, only one-in-four had received postnatal care from an appropriately trained health worker within two days after birth. Women could present health cards²⁷ for themselves in less than half (45.33%) of surveys, and for their children in less than a third (32.67%). These findings confirm the low health service utilisation of these communities as found in other studies (Acevedo and Hurtado, 1997; Bland *et al.*, 2017; Ishida *et al.*, 2012) and justify the need to investigate the health-seeking behaviours influencing Phase I delays for this case.

Phase I delays largely revolve around the decisions to seek care, influenced by socioeconomic and cultural factors of women and their families, thus the observational studies in particular shed light upon these dynamics. The influential role of older female relatives and husbands was evident when surveying several mothers, with husbands as well as mothers-in-law standing imposingly over the mother during surveys, and oftentimes answering questions for the women (see *Image 1*). This happened in particular with younger mothers and with questions considered taboo, such as contraceptive use and family planning. These dynamics not only support the existence of the machismo culture and paternalistic structures, as examined by Chomat and colleagues (2014), but also indicate the influential role of family members in the decision-making process through this active and imposing body language and tendencies of “speaking for” the mother. These findings are also consistent with those of Carter (2002) as well as Schooley and colleagues (2017).

²⁷ Maternal and child health are cards documenting immunisations and check-ups, distributed by health facilities.

Image 1: Taken during survey in Santa Cruz Zapote. Shows a mother of two children, with her husband standing close by, and their comadrona observing closely. The image depicts the manner in which husbands and comadronas often placed themselves during surveys.²⁸



When discussing low antenatal care utilisation in one FGD, participants reported delaying or abandoning visiting a healthcare facility because their grandmothers or mothers-in-law told them “in the past they did not need it” (FGD, 2017). The social settings and power structures in their homes have been known to greatly impact the decisions made by mothers in Guatemala (Carter, 2002; Schooley *et al.*, 2007). In the same FGD, women also cited

²⁸ In presenting this photo, it is worth acknowledging the tension between depicting faces yet striving to maintain anonymity of participants. Though the face of the mother participating in the survey may be identifiable, the specific data collected from her remains unreferenced. Therefore, a standard of anonymity is maintained, whilst also allowing for the presentation of the significant takeaways, concerning agency and sociocultural influences women may experience, that this image depicts. Although blurring the faces may have been an alternative option, the desired effect of showing the emotions, gestures, and reactions of participants during the survey would have been lost, as well as potentially weakening expressions of agency. Though discussing the ethnographic disciplinary traditions of photos in research may be of academic interest (LeCompte and Goetz, 1982; Willis and Trondman, 2000), this study unfortunately does not have the scope to do so.

concerns for leaving their other children alone at home when they go to health facilities. Others noted being “afraid of the caesarean” (FGD, 2017). All these factors relate to the perceived obstacles in seeking care or perceptions of the care they may receive, all of which adversely impact the decision-making process to seek care, therefore clearly contribute to Phase I delays.

The above findings speak to the role others may have on mother’s decision-making. An indirect outcome of such paternalistic structures, where women and mothers may not hold much agency, concern the way in which pregnancy affects their self-esteem. More than one-third of pregnant women did not seek appropriate antenatal care from a biomedical health facility, and almost half of these cited “shame” as the reason for not doing so. Findings from Gamlin (2013) suggested that feelings of shame or embarrassment are correlated with younger mothers who have had fewer pregnancies, though this demographic trend cannot be supported by this study. Still, though it is difficult to pinpoint the origin of this shame, it is important to note that shame clearly remains an evident, potentially indefinite, Phase I delay factor. Further, in FGDs, women also spoke of feeling ashamed for the pregnancy as a cause of low antenatal care utilisation, as well as reporting how some “husbands do not allow them to seek medical attention because they are jealous” (FGD, 2017). Interestingly, none of the women mentioned distance or communication links as the main reason for avoiding care, a finding which will be discussed along with Phase II delays below.

Other important factors concern the health practice knowledge of women. Specifically, knowing when they should seek care or the practices to mitigate the need for seeking care. Less than half (40%) of pregnant women could name at least one appropriate reason for which they should seek medical care; 24% could name at least two reasons. Similarly, 12% of mothers could name at least two appropriate reasons for which they should seek postnatal medical care for themselves, and 41% could name at least one appropriate reason for which they should seek postnatal medical care for their child. Of all women surveyed, 30% could demonstrate appropriate handwashing techniques using soap.

A final factor leading to Phase I delays can be tentatively identified from interviews with health workers.²⁹ Some referenced the influence which *comadronas* have in whether or not mothers seek treatment in health facilities through the referral system. Though this study cannot investigate this claim without interviews with *comadronas* themselves, there are previous studies which speak to both reluctance from, or lacking knowledge of, *comadronas* in referring patients to biomedical health facilities (Goldman and Gleib, 2003; Mignone *et al.*, 2007; Stephens *et al.*, 2006). Themes of *comadrona* pride and tradition came up in interviews, and the at-times overbearing and protective attitudes of *comadronas* witnessed during surveys in communities also work to substantiate this assertion. However, further studies, including perspectives from *comadronas* and referral statistics from health facilities, are necessary to corroborate the claim.

6.2 Reasons for Phase II Delays

Delays in accessing or reaching health facilities were noted from the observational studies and FGDs, as well as some interviews with healthcare staff, speaking to Phase II delay factors. During FGDs, some mothers lamented that they did not have money to pay for transport to health facilities for antenatal check-ups or for the delivery of their children. Beyond the financial limitation, there were very few households in the target communities which had access to their own motor vehicles, and therefore would be reliant on the public shuttle buses, which are irregular in their schedules. The financial limitation, absence of personal transportation, and irregular public transport are all clear examples of Phase II delays in accessing healthcare facilities and services, factors illustrated in previous studies also (Acevedo and Hurtado, 1997; Ishida *et al.*, 2012).

The difficulty and delay in travel is amplified during raining seasons, which makes the roads slower and more dangerous to travel, therefore delaying the travel time in reaching an appropriate health facility. These insights are verified by my observational studies in travelling between communities and health facilities, finding roads being of poor quality,

²⁹ Again, it is further worth noting that data from healthcare providers concerning Phase I delays should be considered and weighed as second-hand information, not inferring meaning onto the motivations or behaviours of women as health-seekers.

very slow to pass, without railings or fences on the sides to stop rocks falling or cars falling off the edges (see *Image 2*). Further, there are several communities which are only partly accessible by road, such as *Agua Blanca*, *Panaman*, or not at all accessible, such as *Sobre Sacá*. These communities demand traversing through challenging terrain, requiring up to 60-minutes hiking, travel time likely to increase for pregnant women or mothers with ill children. Such physical factors are all further Phase II examples delaying the safe and timely accessing of healthcare services.

Moreover, six of the interviews with health workers mentioned poor-quality roads and communication links for hard-to-access communities, factors which likely impede the ability of mothers in rural areas to seek and utilise healthcare services.

It scares me, this road. Cases of traffic accidents are some of the most common I see and treat.

(Interview 19)

...it's a miracle they [the ambulances] haven't broken on these roads yet.

(Interview 23)

Image 2: Taken when travelling to the community of Cruz Chut, as the 4x4 gets stuck in the mud.



Interestingly, surveyed mothers did not refer much to distance or travel time being the main obstacle to their use of healthcare services – only one of the pregnant women surveyed cited ‘access’ as the main reason why she did not seek antenatal care. The fact that health workers and health-seekers differ in whether or not to perceive distance or travel time as an important factor of delay is noteworthy. After all, geographical barriers and service accessibility are regularly noted as strong determinants of health service utilisation as well as maternal health-seeking behaviours in the formal biomedical healthcare sector (Ishida *et al.*, 2012; Raghupathy, 1996). One explanation may be found in that communities living in rural Guatemala have always been deprived of safe roads and infrastructure, so the expectation of functioning communication links has not previously existed. Conversely, health workers have needed to travel to urban centres to educate themselves and have perhaps become accustomed to accessible roads. Another explanation could be that mothers in these impoverished areas have greater concerns than those of infrastructure, and consider other factors as the *main* reasons for not seeking or utilising healthcare services. More detailed studies would be required to investigate the particular topic of accessibility to find solutions appropriate to the needs and expectations of health-seekers in the rural highlands.

6.3 Reasons for Phase III Delays

Delays relating to receiving timely and effective care in biomedical healthcare facilities arose as some of the most evident delay factors from the study. These Phase III delay factors can be broadly grouped as: unmaintained physical working environment; shortages in equipment and supplies; issues with leadership, motivation, and staffing; and, attitudes towards rural communities.

Physical Working Environment

The first clear trend found in interviews and observations concerns poor physical working conditions, unmaintained buildings, and unreliable plumbing and electricity: factors which can impede the provision of effective obstetric care. One doctor at the hospital in Uspantán laments how “hot water is still missing in some parts [of the hospital], and lights in some theatres are unreliable” (Interview 18). Another doctor at the same hospital bemoans the

old and borderline-dangerous wiring system, and how there has been no consequential maintenance since when it was built in 1985 (Interview 6). One visit to a *Puesto* revealed a broken water tank, meaning the facility had no reliable clean running water. In fact, four of the six *Puestos* visited lacked running water, which not only reveals a fallacy in the manner in which water is planned to be provided, but also signals risks for safe and effective treatments at these facilities if health workers are unable to clean and sterilise hands and equipment. Further troubling, three *Puestos* were working without electricity, two were missing roof riles or had holes in the ceiling, and one complained about mould. Though not directly leading to delays in receiving care, these factors of poor structural integrity of facilities are likely to make care provision less efficient and therefore contribute to Phase III delays.

Image 3: Taken during observational studies at Uspantán hospital. Shows nurse indicating old birthing equipment, as well as inoperative sink.



Equipment and Supplies

A second remarkable observation concerns the quality and availability of medical equipment and medicine stock. Upon inspections of the bodegas and pharmacies of health facilities, only three of the ten were fully-stocked with the intended medicinal supply. In some cases, there were stockouts of the most basic supplies, such as rudimentary antibiotics, Vitamin A doses, scalpels, and gloves – one interview citing all four being “regularly out of stock” (Interview 32). According to interviews with auxiliary nurses at more than one facility, the distribution model for medicinal supplies is far from ideal. One explains how “it usually takes some extra days when we order stock, though not all of it arrives” (Interview 14). Another insists how the erratic delivery shipments mean they “can't provide the quality care as efficiently as we want to” (Interview 30). Not only do findings indicate deliveries to be unreliable, but the system for coordinating shipments appears equally inefficient. Though medical stockouts should be electronically reported since 2014, according to an administrator responsible for stocking one health facility the system is not implemented across all Departments, and in Quiché they are still required by the DAS³⁰ to fill in the paper BRES form³¹ when requesting supplies, meaning they are unable to get an overview of what is stored in the DAS (Interview 31). Such frequent stockouts and the inefficient distribution system, evidently hinder the ability for health workers to provide effective and quality care, offering a prime example for Phase III delays.

These findings are consistent with results of an expansive USAID-funded analysis of Guatemala's health system. The analysis found the 2014 move to decentralise healthcare provision to Departments led to “fragmentation and multiple mini-contracts for medicines and other consumables” (Avila *et al.*, 2015:43), resulting in missed opportunities to build economies of scale with bulk buying schemes. The decentralisation left more rural Departments disadvantaged due to difficulties in transportation, and the recurrence of stockouts of basic medicines and supplies accelerated (Avila *et al.*, 2015; Cerón *et al.*, 2016).

³⁰ The Health Area Office (*Dirección de Área de salud*), coordinates and evaluates health policy implementation in its own jurisdiction, and should do so with all *CAPs* and *Puestos* in their Department (Avila *et al.*, 2015:100).

³¹ The Requisitions, Shipping and Supplies (BRES) form is a monthly reporting form to monitor the supply of required medicines (Avila *et al.*, 2015:97)

Leadership, Motivation, and Staffing

An interpersonal theme arose through interviews as well. These are cases where staff spoke of frustration towards how their facilities were managed or supervised, how they may be demotivated in their work, or issues with the capacities of other staff. Though not as obvious as a lacking medication or an absence of running water, these factors influence the efficiency and enthusiasm with which health workers conduct their work, and thereby contribute to Phase III delays.

Feelings of neglect and stress were referenced in several interviews (Interviews 3, 11, 14, 17, 26). When speaking of coordination with MSPAS, one doctor said the “idea of supervision of the hospital...is a bad joke” (Interview 3). Such feelings of neglect are bound to trickle down and result in demotivation. The deprioritisation of support mechanisms or qualified human-resource staffers concerned one Uspantán hospital nurse, who explained that a harsh target-driven management style of the Director has led to much stress and burnout amongst staff (Interview 17). Further, the auxiliary nurse at the *Puesto* with the broken water tank was told by the DAS they would come to fix it, but it had been weeks since he informed them:

I don't know if they have forgotten or if they are planning on ever fixing it.

I'm tired of chasing them now.

(Interview 26)

At the *CAP* in La Parroquia, one nurse shared a similar experience:

I know what I am doing, what we are doing here, is important. But there's no real direction or motivation from the DAS. We're pretty much on our own. I cannot remember the last time I met or spoke with our supervisor.

(Interview 22)

Similarly, there were notable remarks made regarding the abilities and qualifications of some workers that had interviewees concerned. One nurse, who supervises three *Puestos*, complained about how some auxiliary nurses are too inexperienced or do not have proper training from university.

Either they do not feel comfortable or confident in the treatments, or they just don't know what to do, sometimes basic things. It's good they are there, but at the same time I wonder what they are learning in the university.

(Interview 21)

This frustration from a supervising, more experienced nurse is perhaps understandable, considering the heavy workload in these areas. Though the opposing perspective is worthwhile to consider. One auxiliary nurse explains how she dreamed of being a licenced nurse, but could not afford the full education, so 'settled' with the auxiliary nurse training:

As an auxiliary nurse I can at least do some good, though I know a lot of the time I don't know enough... It's very frustrating, but what other option do I have?

(Interview 9)

These findings reveal tensions between several actors working with the health facilities, between administrators and practitioners, between experienced and learners. Such tensions can be expected to impact the working environment; with both tangible outcomes such as lacking water tanks, and intangible outcomes such as frustrated and distracted staff. Consequently, these factors should be considered contributors to Phase III delays.

Attitudes towards Rural Communities

Finally, there were several remarks made by health facility interviewees concerning the sociocultural settings of women in their communities. Though these findings do not directly impact Phase III delays, they do provide another perspective of the above discussion on Phase I delays. What is more, they also inform on healthcare workers' perceptions towards these patients, perceptions which may influence the manner in which care is provided, and therefore relevant when contemplating Phase III delays.

The roles and agencies of decision-making in communities were referenced on five occasions. Recurring in several interviews was how women are not the ones making the decision of when they should or should not seek care, “it’s the men of the community or older women in their homes” (Interview 29). According to one auxiliary nurse:

We still have rules in Guatemala, that tell us women need permission to do certain things. Husbands often have that role, and so if he is out working, the wife cannot ask and get permission to go.

(Interview 27)

Another hindrance, which arose from surveys with mothers also, concerns the topic of shame:

Many [younger women] don't want to talk to anyone about intimate issues of their pregnancy or similar issues, because they're uncomfortable or embarrassed or ashamed.

(Interview 29)

Rather than providing new insights, these remarks work to support the findings made in the surveys and observations in communities with relation to Phase I delays, and how sociocultural norms and structures may influence the decisions of younger mothers. Further, there were also five references of how *comadronas* do not always effectively refer patients to health facilities, either for incapacity or reluctance to do so, thus delaying medical attention. There were a few patronising references made regarding the work of *comadronas*, either how some do not “refer women in time, hoping that they themselves can solve the issue” (Interview 27), or the Director of one facility asserting:

This issue lies much in their [the comadrona's] fault, they don't know what they are doing. They think they know it all, but they don't! Many don't want to share patients with hospitals, so don't refer them - it's a backward culture.

(Interview 16)

Whilst no clear conclusions concerning phases of delays should be drawn from these comments, they do offer credence to the cases of differential treatment or discrimination of more traditional practices found in other studies (Cerón *et al.*, 2016; Cosminsky, 2001b; Hurtado and Sáenz de Tejada, 2001). Moreover, these references to *comadronas* may also support explanations for low healthcare utilisation. According to one auxiliary nurse, there is lacking awareness not only from mothers to know “themselves it’s ‘time to go’, but also in getting the *comadrona* to ensure that mothers go to the health facility” (Interview 33). This is a claim difficult to confirm, though there are such cases identified in other studies (Glei *et al.*, 2003; Goldman and Glei, 2003; Maupin, 2008).

6.4 Summary of Findings

Overall, the findings illustrate a reality littered with barriers for women and mothers of rural areas in accessing and utilising biomedical healthcare services, deeply impacting their ability to lead safe and prosperous lives. Social and normative structures do not encourage the use of biomedical healthcare services, and knowledge of when mothers need to seek such services is poor. Results revealing low skilled birth attendance at delivery are in-keeping with previous studies, indicating increased risks for women in childbirth.

These findings also offer insights into the difficulties faced by healthcare workers hoping to provide those services, in their navigating the complexities and incoordination of the healthcare system they operate in. Maintenance of facilities appears poor, stockouts plague almost all facilities, and coordination with supervisors and MSPAS is discussed with frustration. Several basic requirements for efficient administration of a healthcare facility appear to leave much to be desired.

It is worth noting that this analysis is not inherently meant as a critique of the Guatemalan healthcare system, rather as an evaluation of troubling discrepancies the system appears to harbour, especially disadvantaging women in rural areas. The subsequent chapter will examine the implications of the findings in the broader context of the Guatemalan healthcare system, as well as propose how the analytical framework of the Three Delays Model could be extended.

Chapter 7: Discussion

7.1 Takeaways for the Guatemala Healthcare System

The discussion thus far has sought to examine the findings of this study according to the framework of the Three Delays Model, thereby understanding the data in relation to the model itself. This following chapter seeks to examine the implications of the findings and their relevance to health policy and the healthcare system in Guatemala more systemically.

First, there are some troubling institutional realities to take note of. The high frequency of home-births documented from this case, as well as other studies and government estimations (Chary *et al.*, 2013; MSPAS-INE-ICF, 2017; Summer *et al.*, 2017), indicates that health facility utilisation for childbirth across the country remains low and that *comadronas* are often preferred to formal healthcare alternatives, confirming suggestions made by Goldman and Glei (2002). Other ethnographic studies refer to a range of sociocultural reasons for this, including perceptions of poor care, language barriers, lacking confidence in biomedical treatments, or discrimination or differential treatment (Cosminsky, 2001b; Glei and Goldman, 2000; Hurtado and Sáenz de Tejada, 2001), factors also identified in part through this study. Further, MSPAS approximates the institutional capacity of biomedical facilities of Guatemala to handle only about one-fifth of births (Chomat *et al.*, 2014), suggesting a healthcare system ill-equipped to deal with the needs of its populace, one which is growing at great pace. Collectively, these factors suggest the continued protraction of low health service utilisation, especially by women in rural areas, highlighting the importance of strengthening the critical role which *comadronas* play in their communities until more institutional solutions can be put in place. Such institutional solutions to enhance the access and utilisation of existing healthcare facilities could focus on strengthening systems for referrals from *comadronas* to the biomedical healthcare providers so to encourage constructive partnership, rather than reinforcing existing tensions. Further, improving communication infrastructure is necessary to reduce the delays mothers in rural areas face when seeking and accessing emergency biomedical care. Moreover, though addressing all factors of delay is crucial in improving maternal health in Guatemala, Phase III delays are perhaps the most important. As the findings reveal, Phase III delays are arguably the most actionable of the three phases, and therefore allow for

modelling some key factors contributing to such delays. Organising these flaws as such offers a structure for potentially addressing the systemic issues therein. The four themes derived from this study are critiques also found in other literature on the Guatemalan healthcare system, though not compactly synthesised as such. Therefore, and though this study speaks to the case of Quiché, future studies could investigate shortcomings in other Departments in Guatemala in relation to these four flaws, namely: infrastructure; medication distribution and supply; supervision; and, staffing, capacity, and training.

7.1.1 Infrastructure

Firstly, infrastructure is an evident area of shortcomings. Not only does the sheer inaccessibility of the highlands make a safe and swift trip to the nearest clinic near impossible, but interviews revealed that many health personnel lamented to the lack of maintenance of their facilities. One doctor explains how “our hospital is 40 years old, and you can tell. Hot water is still missing in some parts [of the hospital], and lights in some theatres are unreliable” (Interview 18). Further, from the observations made in health facilities, several had structural issues or did not have any running water inside the facility. A safe and functioning building is after all a prerequisite to offering efficient and quality care.

In this regard, the quality of roads and means of communication must be an area of infrastructural development. Though there are many studies indicating that proximity to health facilities alone is not a significant determinant in maternal healthcare utilisation, the poor quality of roads leads to increased and more precarious travel times. In other words, it will not matter if services are improved or new facilities are built, unless it is easier to get to them. At the same time, increased physical access to health facilities will not necessarily directly translate into increased biomedical healthcare utilisation (Glei *et al.*, 2003; Goldman and Glei, 2003). In short, the infrastructural issues of maintenance and roads need to be tackled comprehensively and collectively: one without the other would be in vain.

7.1.2 *Medication Distribution and Supply*

Secondly, uncoordinated shipments of medication and supplies suggests a highly inefficient distribution system. A recurrent theme in interviews highlighted the regular stockouts of medications – as is also noted in previous studies – apparently a result of inefficient resource allocation routines by the DAS and MSPAS. As elaborated previously, factors influencing the poorly-stocked bodegas may be found in the uncoordinated supply and distribution models and the lacking oversight from administrative centres. Interviews made reference to these issues regularly, the observational studies also noted much on this matter, and previous studies attest to these concerns (Avila *et al.*, 2015; Cerón *et al.*, 2016). These tensions between health practitioners and policy-makers can be viewed as an outcome of the healthcare decentralisation of 2014, leaving more rural areas in poorer Departments worse off than before the move. The resultant fragmentation of healthcare provision has left the system less efficient and less able to provide equal and equitable healthcare services to all Guatemalans. The inadequacies of this system have only been further highlighted by recent political instability, and subsequent deprioritisation of rural areas. Inspiration for necessary steps to reduce the rate of such critical stockouts could be found in cases in sub-Saharan Africa, where central supply chain analyses and strict inventory have proven successful (Leung *et al.*, 2016).

7.1.3 *Supervision*

Thirdly, the theme of supervision arose as an issue with several staff, not only discontent with supervision from MSPAS, but also some superiors in health facilities. “I have worked here for years,” said one doctor, “and have never seen the supervisor from the Ministry for our hospital” (Interview 3). The doctor went on to explain how this disconnect from the Ministry felt like they were deprioritised, directly affecting morale. Another informant spoke of the successes of NGOs, especially in the rural areas, though also noted how he felt they were not efficiently supported by the health facility’s Director, nor did the Ministry encourage constructive dialogue between health facilities and NGOs. This lack of active leadership from the Ministry and missing integration of health actors in the area, the informant meant, limits the capacity for the coordination of important efforts (Interview 23). This issue is also raised by Maupin (2009), suggesting that this disconnect reflects a

failed model of decentralisation, where NGOs act more as service administrators, rather than collaborative partners in the provision of quality health services to rural communities (Maupin, 2009).

7.1.4 *Staffing, Capacity, and Training*

Fourthly, concerns arise as to how facilities, especially *Puestos* and *CAPs*, are staffed. From interviews as well as observations, it was evident that these facilities are oftentimes understaffed, with minimally-trained personnel. This leads to a related issue in the capacity of staff. The auxiliary nurse training is far shorter (10-11 months) than the licenced nurse programme (four-five years), yet still auxiliary nurses are staffed to care to the primary care needs of *Puestos*, oftentimes overburdened with cases too advanced for them. Without any peer-to-peer trainings, unconfident and sparsely-trained staff, there is a stagnant workforce often learning how to deal with cases as they come along. Instances of such lacking capacities resulting in delays have been previously studied (Avila *et al.*, 2015; Hinojosa, 2004; Maupin, 2008), and is only one of the broader takeaways which this comprehensive approach with Three Delays Model has revealed.

Moreover, though the study showed most healthcare providers spoke at least one indigenous language, there remains a language barrier between some providers and seekers. Past studies indicate how Spanish fluency is one of the strongest determinants of healthcare utilisation amongst mothers in Guatemala (Chomat *et al.*, 2014; MSPAS-INE-ICF, 2017). Thus, efforts to ensure the ability and availability of medical translators when necessary, as well as staff sensitive to indigenous practices and thereby able to deliver culturally appropriate care, could narrow the cultural gaps and encourage more non-Spanish-speaking indigenous women to seek biomedical healthcare. Such systems may be inspired by pluralistic medical models for Chinese women in England (Green *et al.*, 2006), Mexican immigrants to the United States (Belliard and Ramírez-Johnson, 2005; Kiesser *et al.*, 2006), or HIV/AIDS patients in rural South Africa (Moshabela *et al.*, 2011). In the case of Guatemala, both biomedical and Mayan beliefs and practices should be incorporated into maternal healthcare.

Further, it can be argued that there is too much of a clinical healthcare focus of MSPAS in educating new health workers. By focusing on clinical healthcare and curative medicine, rather than preventive healthcare, there is no emphasis on tackling health issues such as nutrition or family planning before they result in health problems. Furthermore, such a reliance on curative medicine obstructs the provision of services once those services face stockouts of basic medications, proven to be a common reality of healthcare facilities in Quiché.

7.2 Extending the Three Delays Model

The Three Delays Model is one which clearly and aptly can be applied to the case of maternal health-seeking behaviours and health service utilisation in the case of Quiché in Guatemala. However, as seminal as it is, based on this case and the data collected therein, there is room for discussing an extension of the framework.

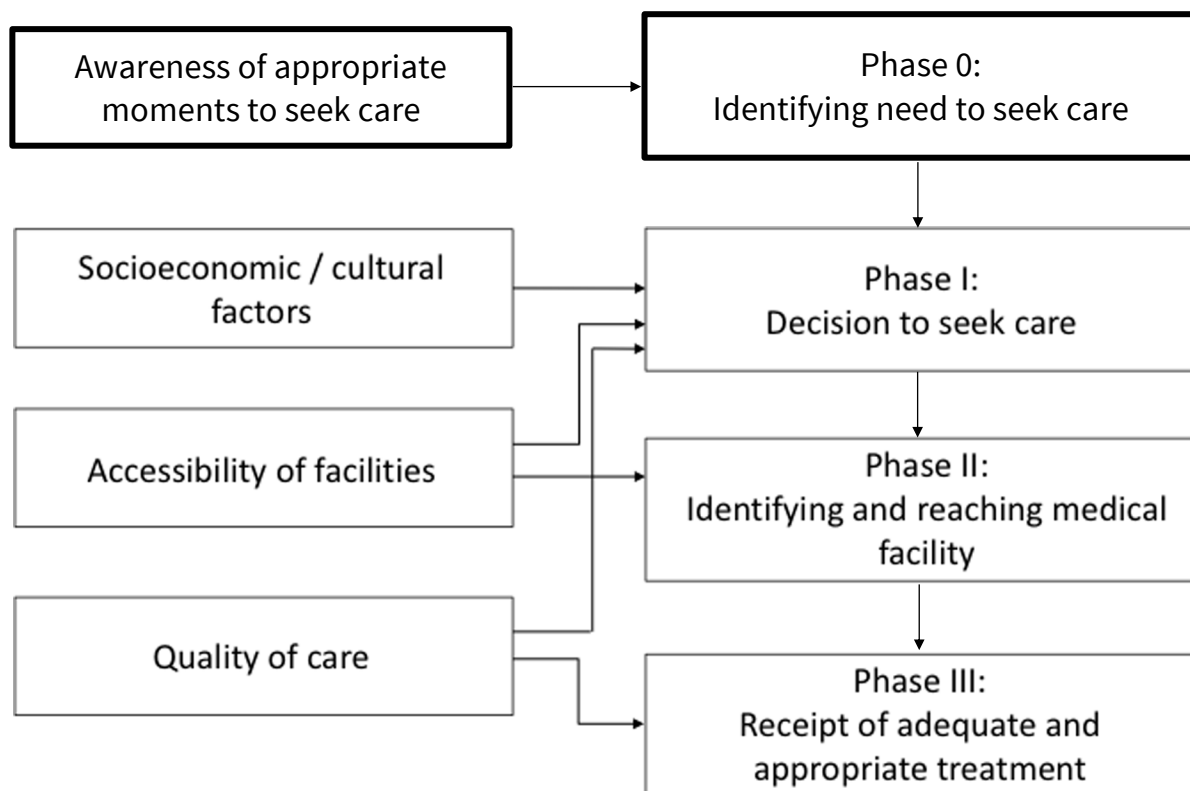
The chronology of the Three Delays Model suggests that delays in accessing obstetric care begin with Phase I, with *deciding whether or not to seek* medical care (Thaddeus and Maine, 1994: pp.1093-1094). As such, the model assumes that the relevant parties are already aware of the need for obstetric care. From this investigation, it is evident that this assumption does not always hold. As found in the case of Chicamán, knowledge of health practices was poor³² as was knowledge of ante- and postnatal warning signs.³³ The low numbers for knowledge of warning signs is especially troubling, suggesting that only about one-in-five women could name instances when they should seek medical attention. Thus, there are assumedly instances where women do not reach the stage to decide whether or not to seek medical care, thereby not ‘arriving at’ Phase I delays, though still delayed, perhaps indefinitely, in accessing obstetric care. Further, there are a couple of references in interviews with healthcare personnel commenting on how *comadronas* may delay in identifying patients needing to seek medical care. This may be the result of lack of knowledge or just preferring to treat patients herself.

³² Only 30% of women surveyed could demonstrated appropriate handwashing techniques.

³³ One-quarter of pregnant women could name two appropriate reason for which they should seek antenatal medical care; only one-in-eight mothers could name two appropriate reasons for which they would seek postnatal medical care for themselves, and one-in-four could name two appropriate reason for their child.

Judging by the evident poor knowledge of health practices as well as of ante- and postnatal warning signs, and drawing on previous prominent studies suggesting unwillingness of *comadronas* to refer mothers (Goldman and Gleib, 2003; Gleib *et al.*, 2003), it appears logical to suggest an additional phase of delay, preceding Thaddeus and Maine's Phase I delay in *deciding whether or not to seek care*. This additional delay may be considered as *Phase 0, delays in identifying need to seek care* (see *Figure 3*). In the context of this case, it is often not until the medical issue is identified that sociocultural or familial factors may affect the decision to seek care. But in a setting where women hold little education and little agency in the decision-making in their social structure, it may be the case that many health issues go unidentified, thereby *delaying even the idea of seeking care*, and potentially leading to morbidity or mortality. In short, in order to seek care, one must know they need care. Thus, in hopes of extending and improving Thaddeus and Maine's framework, future research may aim to investigate the impacts of lacking knowledge and agency of women in their social structures which may hinder them from 'arriving at' Phase I delays.

Figure 3: Suggested extension of the Three Delays Model, to include 'Phase 0, delays in identifying need to seek care'. Based on model from Knight and colleagues (2013).



Chapter 8: Conclusions

8.1 Purpose and Research Questions revisited

The purpose and guiding research question of this study has been to elucidate determinants of, and delays impacting, maternal health-seeking behaviours and health service utilisation in rural highland communities of Quiché, Guatemala. In doing so, a comprehensive analytical approach was adopted, applying Thaddeus and Maine's Three Delays Model analysing sociocultural settings, geographical issues, and systemic barriers, drawing on data both from health-seekers in rural communities as well as healthcare-providers in health facilities. Applying the Three Delays Model highlighted how there are factors influencing delays across all three phases; in seeking, accessing, as well as receiving maternal healthcare. Such delays are undoubtedly impacted by sociocultural settings of the case study communities, geographical issues of the Quiché highlands, and systemic barriers of the fragmented Guatemalan healthcare system.

Several of the findings made herein are consistent with results encountered by investigations in other low-resource settings, such as sociocultural barriers negating agency of women in health-seeking decisions, high rates of *comadronas* attending home-births, and frequent cases of medical stockouts. However, this study also highlights other noteworthy insights. As my study expands beyond populations typically reached in prior studies, I was able to gain greater insight to the underrepresented population in the study of maternal health-seeking behaviours and health service utilisation, namely women who had previously *not* sought or utilised care. This broader sample allowed for the more vivid illustration of the health-practice realities and particularly Phase I determinants, revealing how few mothers could list reasons they should seek medical attention, or how impactful the determinant of 'shame' is in deterring pregnant women in seeking healthcare services.

Whilst actions addressing all three phases of delay will be important to improve maternal health in Guatemala, Phase III delays are perhaps the most important. Investments and new political prioritisations must be made for improvements in obstetric care to take effect. Though family and community education projects may take place, *comadrona* referral systems strengthened, and transport links improved, improving such Phase I and II delay factors is meaningless if women actually reach a health facility only to be met by

insufficiently-trained staff or missing medications; leading to inadequate or non-existent care. Health service utilisation will remain low amongst Guatemala's marginalised and at-risk women if they continue to perceive services to be ineffective, unpleasant, or dangerous.

Overall, this study contributes to a number of actionable insights tackling the systemic flaws of the healthcare system in Quiché. Four themes for improvement were outlined in striving for more efficient and higher quality maternal care, namely: infrastructural improvements, such as water supply and building maintenance; reliable and coordinated medication distribution and supply; continuous and consequential supervision; and, strengthened staffing, capacity, and training.

These findings have important implications for maternal health policy in Guatemala. Any solution aimed at tackling the complex issues facing maternal care in Guatemala needs to address socioeconomic and cultural factors, accessibility to healthcare facilities, *as well as* the quality of healthcare facilities, if there is to be real hope for effective improvements in Guatemalan maternal healthcare and consequently the lives of mothers in rural areas. In conclusion, without a plan to overcome the variety of factors identified by the comprehensive analysis of the Three Delays Model, the reproductive needs of women in rural areas will remain unmet, limiting their and their children's chances of healthy and productive lives.

8.2 Critical Reflections for Future Studies

Future studies of this topic are suggested to include a more in-depth exploration of the qualitative opinions of mothers in the target communities in relation to the efficiency and quality of health services. Their perceptions surrounding the quality of health services would give more context to Phase I delays impacting health-seeking behaviour. Additionally, interviews with *comadronas* would also benefit future studies, considering their central role on healthcare provision for mothers in rural communities. Having *comadronas* respond to the comments from health workers concerning delays in referrals would also be of analytical interest.

Further, another central finding concerns the impact that the proposed 'Phase 0 delays' in *identifying a need* to seek healthcare may have on health service utilisation and maternal

health-seeking behaviours, as well as on the Three Delays Model. Therefore, future studies may seek to investigate the extension of the Three Delays Model to include a ‘Phase 0 delay’, accommodating for factors delaying the initial identification of the need to seek care.

8.3 The Road Ahead

So why does this all matter? Why should this topic of maternal and child health continue to receive such overwhelming attention from the academic and political worlds? Despite global efforts over 800 women still die on a daily basis from preventable causes related to pregnancy and childbirth. In Guatemala, mothers in some rural areas are three times more likely to die from pregnancy-related issues than those living in the capital. Such a reality is not a sustainable foundation on which to grow a healthy and prosperous population, inevitably limiting the possibilities for future Guatemalan generations.

The immediate and unfortunate reality in Quiché, Guatemala remains that health facilities are chronically underfunded, face dire shortages of skilled health workers, regular medical stockouts, and insufficient infrastructure. There is no quick fix for these deep and systemic problems, and the sad truth is that many more mothers and children and families of Guatemala’s rural highlands will continue living in depravity and without adequate government support before substantial change occurs. In the absence of effective, centralised maternal healthcare planning, the most feasible option may be found in the contracting of NGOs, as was the case prior to the healthcare decentralisation of 2014.

An appropriate starting point for this herculean task would be a normative shift in the manner health-policy is formulated in Guatemala. The unmanaged decentralisation of healthcare provision, the overemphasis on clinical healthcare, and failure to consider local sociocultural determinants impacting obstetric care decisions are all partial explanations to why prevailing policies have led to ineffective health services. This study has contributed to the body of knowledge recommending this normative reorientation towards a more inclusive pluralistic healthcare model. In such a transformation much can be drawn on from the fields of ethnography and medical anthropology to ensure the needs of all populations, especially those rural and marginalised, are appropriately addressed.

As discussions surrounding the Sustainable Development Goals and Universal Health Coverage continue to pick up pace, so must our comprehension of the barriers that delay patients and families from receiving the lifesaving, quality services they are entitled to. Without this, we stagnate in finding comprehensive interventions and prevention plans to radically improve accessibility of maternal care. We thereby risk extending lifelong and far-reaching consequences of poor maternal and child health, furthering pervasive differences that exist between and within countries, and impeding long-term societal and economic development in already vulnerable populations. Such a future cannot be permitted; thus, it is my hope that this thesis works to further the actions and ideas necessary to avoid it.

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Annexes

Annex 1 – Health Facility Coverage of Quiché

Annex 2 – Materials

Annex 2.1 – Survey Guide for Communities

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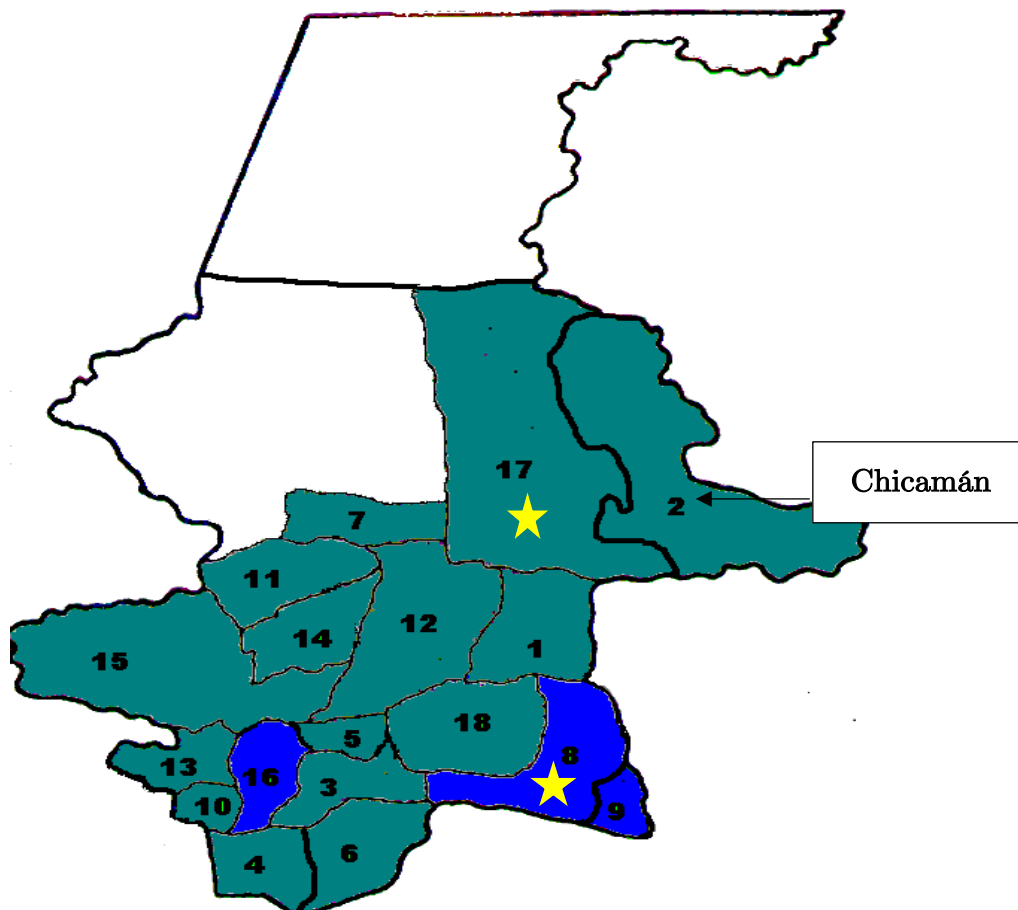
Annex 5 – Map of Guatemala

Annex 1 - Health Facility Coverage of Quiché

Health Facilities

- 1 Regional Hospital
- 2 District Hospitals ★
- 16 Permanent Attention Centers (*Centros de Atención Permanentes - CAP*)
- 2 Health Centres (*Centros de Salud*)
- 57 Health Posts (*Puestos de Salud*)
- 98 Territories

Map 1: Map of Department of Quiché. Chicamán is municipality labelled 2. Image from presentation by Dr. Gregorio Velásquez Barreno, Epidemiologist of the Área de Salud Quiché.



Annex 2 – Materials

2.1 Survey Guide for Communities

The survey guides are not included here in their entirety due to their length and thus the impracticality of an extra 100 pages. The links are however provided to each of the survey guides.

Survey guide for pregnant women

Sections of question concerned: demographic information; obstetric history; vaccinations; diet and nutrition; knowledge of health warning signals, and preference of care provision.

English <https://drive.google.com/file/d/1Ux6NNOxjsO_zoEPeO6yDoV2TYqXmEOFJ/view>

Spanish (with Poqomchi' and Q'eqchi' translations)

<<https://drive.google.com/file/d/1fvktONWPjnOjSY1K5JrE6c6UJ0yzJ1iD/view>>

Survey guide for mothers with children under 24 months

Sections of question concerned: demographic information; anthropometry of child; obstetric history; maternal care for the newborn; vaccinations; knowledge of health warning signals; preference of care provision, family planning; breastfeeding, diet and nutrition; gastrointestinal and respiratory illnesses; handwashing practices; and, water and sanitation.

English <<https://drive.google.com/file/d/1F6qm7tqKTcEfOR3hfUiWtM4NmJHyKHDT/view>>

Spanish (with Poqomchi' and Q'eqchi' translations)

<<https://drive.google.com/file/d/1wDK37p6EwOXdpnt2NFpmX9wqSJ3hs1ym/view>>

2.2 Semi-structured in-depth interview guide sections

Section 1. *Demographics:* Who are you, and which languages do you speak? What is your educational background? What kind maternal health service do you provide?

Section 2. *Scope of Work/Perceived Roles of the health facility:* What are the main functions of this health facility? Why are they important? Could the facility improve its functions in any way?

Section 3. *Perception of maternal and child health:* What do you think are the threats to maternal and child health here in Quiché? How can they best be addressed?

Section 4. *Perceptions of indigenous women's health:* In your perspective, does this health facility offer culturally appropriate care? In which ways? Do you think indigenous women could use your services more? What might encourage or hinder them from doing so?

Section 5. *Other reflections:* Do you have any other thoughts you want to share with me, about your work, the healthcare facility/system, or the state of maternal and child health here in Quiché/Guatemala?

Annex 3 – List of Contributors³⁴

3.1 Community Data Collection Team

Supervisors

1. *Carlos Cu*
2. *Gladys Ramirez*
3. *Hugo Dürr*
4. *Walter Lopez*

Data Collectors / Translators

1. *Romeo Lem*
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4. *Irma Tun*
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7. *Rosaura*
8. *Angelica*
9. *Angela*
10. *Wilma*
11. *Norma*
12. *Nelly*
13. *Noe Caal*

3.2 Summary of Participants for Interviews at Health Facilities

	Role	Gender	Age	Type of Health Facility	Location
1.	Nurse	M	34	<i>CAP</i>	Quiché
2.	Doctor	M	46	Hospital	Quiché
3.	Doctor	M	35	Hospital	Uspantán
4.	Nurse	F	31	<i>CAP</i>	Chicamán
5.	Nurse	M	40	<i>CAP</i>	Chicamán
6.	Doctor	M	56	Hospital	Uspantán
7.	Nurse	F	32	Hospital	Uspantán
8.	Doctor	M	49	<i>CAP</i>	Chicamán
9.	Auxiliary nurse	F	30	<i>CAP</i>	La Parroquia
10.	Auxiliary nurse	M	42	<i>CAP</i>	La Parroquia

³⁴ Full names are included for those data collectors who gave their permission. Others did not want their surnames, though their first names are included as a way of acknowledging their great contribution to this study. All interview participants remain anonymised.

11.	Nurse	F	55	Hospital	Uspantán
12.	Nurse	F	28	Hospital	Uspantán
13.	Auxiliary nurse	M	30	<i>Puesto de Salud</i>	Sicaché
14.	Auxiliary nurse	F	40	<i>Puesto de Salud</i>	El Palmar
15.	Auxiliary nurse	F	42	<i>Puesto de Salud</i>	Caracol
16.	Doctor	M	61	Hospital	Uspantán
17.	Nurse	F	35	Hospital	Uspantán
18.	Doctor	M	55	Hospital	Uspantán
19.	Auxiliary nurse	F	40	<i>Puesto de Salud</i>	El Amay
20.	Auxiliary nurse	F	24	<i>Puesto de Salud</i>	El Amay
21.	Nurse	F	45	<i>CAP</i>	La Parroquia
22.	Auxiliary nurse	M	38	<i>CAP</i>	La Parroquia
23.	Nurse	M	32	<i>CAP</i>	Chicamán
24.	Nurse	F	52	<i>CAP</i>	Chicamán
25.	Auxiliary nurse	F	37	<i>CAP</i>	La Parroquia
26.	Auxiliary nurse	M	44	<i>Puesto de Salud</i>	San Sebastián
27.	Auxiliary nurse	F	32	<i>Puesto de Salud</i>	San Sebastián
28.	Nurse	F	35	<i>Puesto de Salud</i>	San Sebastián
29.	Nurse	M	29	<i>CAP</i>	Chicamán
30.	Nurse	F	45	<i>CAP</i>	Chicamán
31.	Nurse / Admin	F	50	<i>CAP</i>	Chicamán
32.	Nurse / Admin	M	34	<i>CAP</i>	Chicamán
33.	Auxiliary nurse	F	36	<i>Puesto de Salud</i>	Cholá
34.	Nurse	M	30	Hospital	Uspantán

Annex 4 – Sample selection of survey clusters using the 30-cluster stratified sampling methodology

	Community	Population	Children under 24 months	Pregnant women	Accumulated Population 1	Cluster No.	Accumulated Population 2	Cluster No.
1	Buena Vista El Amay	133	15	5	133		133	
2	Los Lopez el Amay	236	21	8	369	1	502	14
3	Cruz Chut	398	44	14	767	2	1269	15
4	Pancuz	392	43	14	1159	3	2428	16
5	Tiritibol	753	84	26	1912	4	4340	17
6	Santa Cruz Zapote	423	47	15	2335	5	6675	18
7	Lote III	645	72	23	2980	6	9655	19
8	Pantolox	286	32	10	3266		12,921	20
9	Panaman	275	30	10	3541	7	16,462	21
10	La Unión	667	74	23	4208	8	20,670	22
11	Sobre Sacá	142	16	5	4350		25,020	23
12	La Ceiba	434	48	15	4784	9	29,804	24
13	El Zapote	326	36	11	5110		34,914	25
14	San Sebastián Beleju	2959	328	104	8069	10	42,983	26
15	Santa Gertrudis	623	69	22	8692	11	51,675	27
16	El Pinal	151	17	5	8843		60,518	28
17	Agua Blanca	236	26	8	9079	12	69,597	29
18	La Lima	113	11	4	9192		78,789	30
19	La Campana	624	69	22	9816	13	88,605	
20	Pancul	214	24	7	10,030		98,635	
	TOTAL	10,030	1107	351	98,635			
			Sample interval	334				

A 30-cluster stratified sampling design was utilised to select the participants for surveys with mother of children under 24 months, with a parallel sample used to select pregnant women. A total of thirty (30) clusters were sampled in the target area, with ten (10) households from each cluster being selected for surveys with mother of children under 24 months, and five (5) households for pregnant women. The overall sample size of 300 households was derived from modifying the simple random sampling design. In a simple random sampling design, a sample size (n) of 96 is derived based on the formula:

$$n = z^2 (pq)/d^2$$

- *With a desired precision of $d = 0.5$:*
- *The estimated proportion $p = 0.5$ (chosen as it requires the largest sample size, thus ensuring that an adequate sample size is chosen), and $q = 1-p$.*
- *The desired Confidence Interval = 95% leads to a $z^2 = 1.96$*
- *The required sample size (n) = 96.*

A cluster sample introduces bias in the form of the design effect into the sampling frame, meaning that households in close proximity have more in common than households from different areas of the same community, which decreases their possible variation. Therefore, the number of households needed to be doubled, to at least 192. Considering that KPC surveys are used to estimate coverage for many different interventions at the same time, requiring looking at sub-samples (such as children less than six months old in order to estimate rates of exclusive breastfeeding), the sample size was increased even further, and therefore a sample size of 300 was chosen. Consequently, a 30-cluster stratified sampling design was adapted for the catchment area, with ten (10) households surveyed in each cluster. The true estimate of the survey results included a margin of error as derived using the formula of 95% confidence limits:

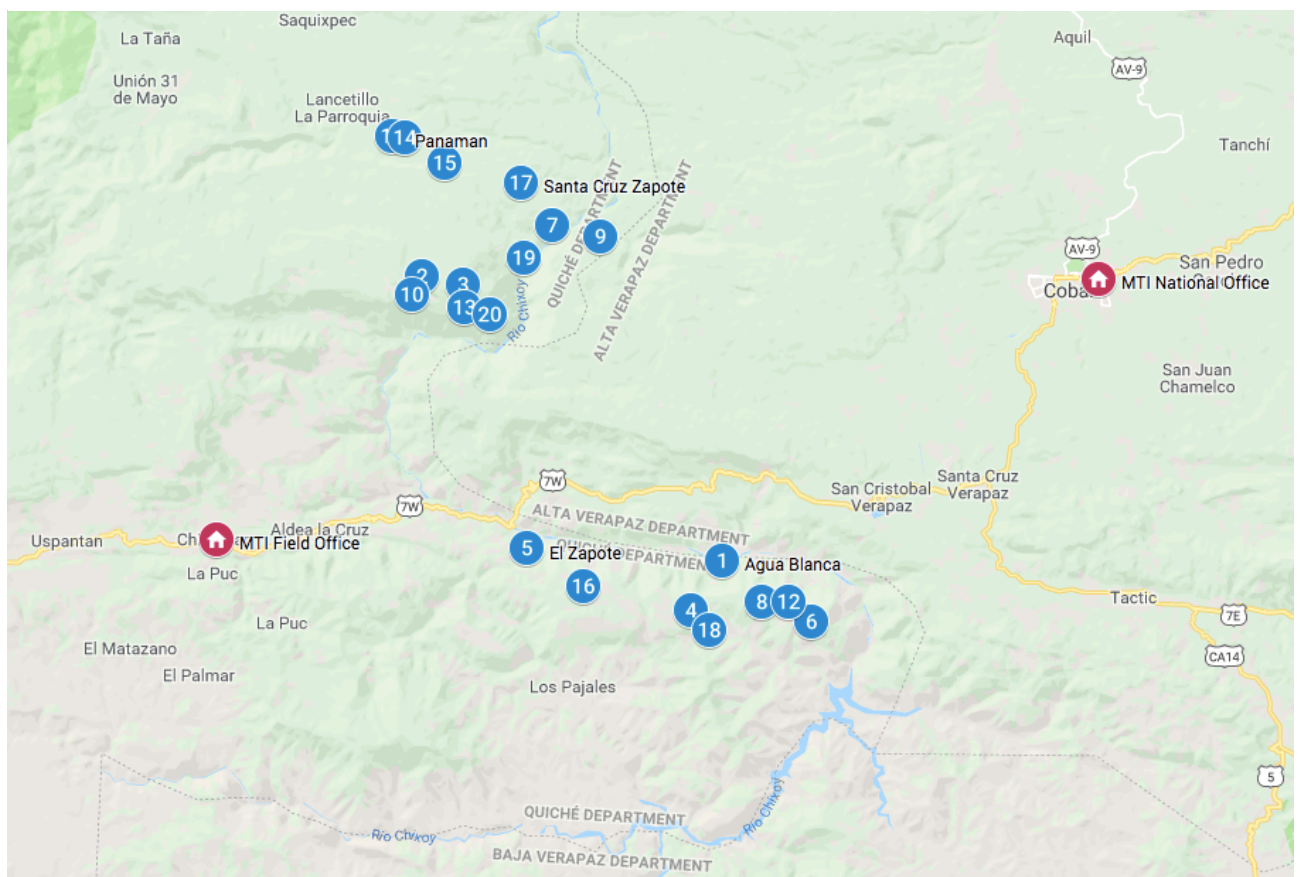
$$P = p + z \sqrt{(pq/n)}$$

- *P = the actual rate or proportion*
- *p = the survey estimate*
- *p = prevalence*
- *$q = 1-p$*
- *z = the confidence level (1.96 for a confidence level of 95%)*
- *n = sample size*

Due to the small population size of the project area (10,030) it was not possible to find ten (10) pregnant women in each cluster through parallel sampling. Therefore, parallel sampling was utilised in each of the 30 clusters to survey five (5) pregnant women, for a total sample size of 150, which was done to ensure that each cluster would be able to obtain the necessary sample size and therefore be counted in the averages equally, while still allowing for a large enough sample size to ensure a confidence interval of less than ± 10 .

Consequently, thirty (30) clusters of ten (10) mothers and five (5) pregnant women, for a total sample size of 450, were chosen to ensure that the 95% confidence interval of each estimate would be narrow enough to distinguish differences in indicators over time in a meaningful way.

Map 2: Map of case study area, detailing locations of 20 target communities in Quiché.



- | | | |
|---------------------|-------------------|----------------------|
| Agua Blanca | La Lima | Sacrabinac Lote III |
| Buena Vista el Amay | La Unión | San Sebastián Beleju |
| Cruz Chut | Los Lopez el Amay | Santa Cruz Zapote |
| El Pinal | Panaman | Santa Gertrudis |
| El Zapote | Pancul | Sobre Sacá |
| La Campana | Pancuz | Tiritibol |
| La Ceiba | Pantalox | |

To make the cluster sample selection listed above according to 30-cluster stratified sampling methodology, each community was listed randomly, with its population beside it. When the list was complete, the cumulative population of each community was determined by summing the total population of that community, with the combined population of all the preceding communities on the list. The total cumulative population of the communities in the case study were subsequently divided by 30 to obtain the sampling interval for that region. A random number was then chosen, with the stipulation being that the number had to be less than or equal to the sampling interval. The cumulative population of each community was then consulted, and the community containing the random number (the community whose cumulative population is equal to or larger than the random number, and whose preceding community had a cumulative population less than the random number) was chosen as cluster number 1. The second cluster was then identified by adding the sampling interval to the random number. The community whose cumulative population contained this number was chosen as the location of cluster number 2. The remaining clusters were then identified by continuing to add the sampling interval to the number that identified the previous cluster. In this way, each cluster was randomly chosen, with proper weight assigned to each community based on its population size. The larger the size of a population of a community, the greater the chance of having one or more clusters assigned to it.

Annex 5 – Map of Guatemala

Map 3: Map of Guatemala with Medical Teams International's offices mapped (United Nations Cartographic Section, 2004).

