

The London School of Economics and Political Sciences

Beyond Excess Mortality: The Demographic Life of a
Mayan Community after a War of Massacres

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Declaration of Authorship

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The thesis consists of 59,683 words.

Diego Alburez-Gutiérrez

Abstract

This thesis focuses on the demographic consequences of mass killings on local populations. Three empirical studies written as journal articles explore the patterns of mortality and fertility after a series of massacres in the village of Río Negro in Guatemala. The first paper was motivated by the dearth of reliable numerical data on massacre-affected populations. It describes the Extended Genealogy Method (EGM), an innovative data collection approach that brings together concepts and methods from various disciplines to reconstruct the demographic history of populations for which no data are available. The EGM was applied to reconstruct the last 40 years of Río Negro's demographic history producing complete, reliable, and high-quality data suitable for demographic analysis. The second paper focuses on mortality by studying the role of family support and 'scarring' effects during and after the Río Negro Massacres, which caused the death of over a third of the village's population. The article explores four mechanisms driving mortality in the village in the short- and long-term. It presents evidence of the protective effects of networks of family support. It also shows the lingering negative consequences of the massacres on survivors – social and psychological scarring were associated with higher long-term mortality. The third paper focuses on the fertility behaviour of the survivors of the Río Negro Massacres. It discusses potential factors driving fertility after the killings, including age, gender dynamics, social pressure, and scarring effects. The paper finds evidence of a fertility 'drop and rebound', with young women and older men having the highest post-killings fertility. Exposure to the killings was associated with lower subsequent fertility (particularly for women) evidencing profound scarring effects. A community-led pronatalist ideology encouraged high fertility amongst survivors of the massacres. This is the first study to explore the demographic consequences of mass killings in detail.

Abstract (Maya Achi)

Ri investigación kuch'ob' upa sa' u'anik ri kamik x'anitaj taq chupa ri junaab' 80 xu'an k'axk'oliil chi ke ri qatz qachaaq' re ri komoon Pa Nima' (Río Negro), Guatemala. Che ri junaab' 1982, 40% chi ke taq ri qatz qachaaq' re ri komoon xekamisaxik, chi kixo'l e k'o ixoqiib', achijaab' jay k'omaab'. Wa' e jun ch'ob'ooj chwi ri k'asleem ke taq ri xek'asi' kanoq. Ri investigación karaaj kumaj usuuk' sa' u'anik ri k'axk'oliil xu'an k'ax che ri kik'asleem ri xek'asi' kanoq. Ri tziij xmol uchii' pa jun junaab' re chaak pa taq komoon re Pa K'uux (Pacux) jay re Pa Nima'. Ri nab'ee estudio kuya' chi retamaxiik ri ub'eyaal xchapab'exiik re xmol taq uchii' ri chilonik ke ri alk'o'aal ke ri xek'asi' kanoq. Wa' e nab'ee ch'ob'ooj xuchapab'eej wa jun ub'eyaal, ub'i' *Método Genealógico Extendido* (EGM pa ch'aatem inglés). Uka'm estudio kuch'ob' raqan sa' u'anik ri e k'o che ri alk'o'aal xkito' kiib' chi kiwach e chiri' x'an ri k'axk'oliil jay e chi ri' xik'ow ri kamik Pa Nima'. Wa tziijonik kuch'a'tib'eej sa' uchaak jujun taq qatz qachaaq' xek'asi'ik jay jujun chik xkisok taj. Wa uroox estudio keb'utaqeej ri tikaweex xk'o'ji' kalk'o'aal chwi ri rik'owib'al ri k'axk'oliil. ¿Sa' uchaak jujun taq ixoqiib' xkaj xk'o'ji' kalk'o'aal chwi ri rik'owib'al ri k'axk'oliil jay jujun na xkaj ta chik? Che wa ch'ob'ooj kinch'a'tib'eej ri eta'mab'al re ri k'axk'oliil, ri junaab', ri achi jay ixoq jay la xik'owik xu'an k'axk'oliil che ri ujikib'axiik taq wa'. Ri k'isb'al re ri chomanik investigación kuk'utub'eej sa' uchaak wa ch'ob'ooj iil uwach. Xoqo kinya' chi retamaxiik sa' taq ri na xel ta chi utz jay taq ri estudios utz ka'an pan chi qawach.

Abstract (Spanish)

Esta tesis doctoral estudia las consecuencias demográficas de masacres cometidas contra población civil. Tres estudios empíricos, escritos como artículos científicos, exploran las relaciones entre mortalidad, fecundidad y apoyo social tras las masacres en la comunidad Maya Achi de Río Negro, Guatemala. El primer artículo está motivado por la falta de información cuantitativa sobre poblaciones afectadas por masacres. El estudio describe el Método Genealógico Extendido (EGM). Esta nueva metodología busca reconstruir las dinámicas demográficas de poblaciones sobre las cuales no existen datos confiables. La tesis muestra cómo el método se aplicó para reconstruir los últimos 40 años de historia demográfica de Río Negro, produciendo datos de alta calidad. El segundo estudio explora el papel positivo del apoyo familiar durante y tras las masacres. Más de un tercio de la población de Río Negro falleció en las masacres. Estos eventos también tuvieron efectos a largo plazo para quienes sobrevivieron. El artículo identifica cuatro mecanismos que vinculan apoyo familiar y mortalidad. El tercer estudio se enfoca en el comportamiento reproductivo de sobrevivientes de las masacres. El artículo muestra un patrón de ‘caída y recuperación’ de la fecundidad y discute el papel que la experiencia de la guerra, la edad, el género, la estructura familiar y la presión social jugaron en estos procesos. Las mujeres jóvenes y los hombres mayores tuvieron la fecundidad más alta tras las masacres. La fecundidad de las mujeres que tenían 20 o más años nunca se recuperó, sugiriendo la existencia de profundas cicatrices dejadas por la guerra (lo mismo no ocurrió a los hombres de la misma edad). Este es el primer estudio en explorar en detalle los efectos de las masacres en dinámicas poblacionales.

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Abbreviations and acronyms

ADIVIMA Association for the Integral Development of the Victims of the Violence of the Verapaces, Maya Achi

Asociación para el Desarrollo Integral de las Víctimas de la Violencia en las Verapaces, Maya Achi

ALMG Academy of Mayan Languages of Guatemala

Academia de Lenguas Mayas de Guatemala

APROFAM Association for the Wellbeing of Families in Guatemala

Asociación Pro-Bienestar de la Familia de Guatemala

ASFR Age-specific Fertility Rates

CEH Guatemalan Commission for Historical Clarification

Comisión para el Esclarecimiento Histórico

CIIDH International Center for Human Rights Research

Centro Internacional para Investigaciones en Derechos Humanos

CIRMA Center for Meso-American Research

Centro de Investigaciones Regionales de Mesoamérica

COCAHICH Coordinating Committee of Communities Affected by the Chixoy Dam

Coordinadora de Comunidades Afectadas por la Construcción de la Hidroeléctrica Chixoy

COPREDEH Presidential Human Rights Commission of Guatemala

Comisión Presidencial Coordinadora de la Política del Ejecutivo en materia de Derechos Humanos

DHS Demographic and Health Surveys

Encuesta Nacional de Salud Materno Infantil

DNS	Doctrine of National Security
EAFG	Guatemalan Forensic Anthropology Team <i>Equipo de Antropología Forense de Guatemala</i>
EHA	Event History Analysis
EHC	Event History Calendar
EGM	Extended Genealogy Method
EGP	Guerrilla Army of the Poor <i>Ejército Guerrillero de los Pobres</i>
FAFG	Guatemalan Forensic Anthropology Foundation <i>Fundación de Antropología Forense de Guatemala</i>
FGD	Focus Group Discussion
IACHR	Inter-American Court of Human Rights
IDB	Inter-American Development Bank
IDP	Internally Displaced People
INDE	National Electricity Institute of Guatemala <i>Instituto Nacional de Electrificación de Guatemala</i>
INE	National Statistics Institute of Guatemala <i>Instituto Nacional de Estadística de Guatemala</i>
KI	Key Informant
MINUGUA	United Nations Verification Mission in Guatemala <i>Misión de Verificación de las Naciones Unidas en Guatemala</i>

NGO	Non-Governmental Organisation
ORPA	Revolutionary Organisation of the People in Arms <i>Organización del Pueblo en Armas</i>
PAC	Self-Defence Civilian Patrols <i>Patrullas de Autodefensa Civil</i>
PGT	Guatemalan Labour Party <i>Partido Guatemalteco del Trabajo</i>
PMA	Military Mobile Police <i>Policía Militar Ambulante</i>
RA	Research Assistant
REMHI	Recovery of Historical Memory Project <i>Proyecto Interdiocesano de Recuperación de la Memoria Histórica</i>
TFR	Total Fertility Rate
UCDP	Uppsala Conflict Data Program
UFC	United Fruit Company
UNHCR	United Nations High Commissioner for Refugees
URNG	Guatemalan National Revolutionary Unity <i>Unidad Revolucionaria Nacional Guatemalteca</i>
UVG	Universidad del Valle de Guatemala

Ma at on raal suutz',

ma at on raal mayuul?

Ma at on okitajinaq uloq

chuwach chaay,

chuwach lab'aal?

Are you not a child of the clouds,

are you not a child of the mist?

Did you not come running

from the spears,

from war?

Rabinal Achi – Xajooj Tun

Fifteenth Century Maya Achi Drama

Act I, Scene I (own translation)

Chapter 1 Introduction

1.1. Armed conflicts, massacres, and demography

Armed conflicts affect the livelihoods of millions of people, mostly in low- and middle-income countries. These events have devastating consequences for civilians, including increased mortality, morbidity, trauma, and forced displacement. The number of forcibly displaced individuals has increased on an almost yearly basis since 1997. At the end of 2017, around 9% of the world population, 68.5 million, had been forcibly displaced, many because of conflict (UNHCR, 2018; c.f. Butler, 2017). Even if conflicts are becoming less lethal overall, they continue to produce extensive indirect excess deaths by subjecting civilians to disease and malnutrition (Gleditsch et al., 2002; Gat, 2013).¹ Indirect deaths, which can occur years after the end of a conflict, are usually excluded from official death tolls (Spagat et al., 2009). This is an issue because indirect conflict mortality is higher than direct mortality in some contexts (Lacina & Gleditsch, 2005). More research is needed to understand how armed conflicts affect the demographic dynamics of populations affected by them.

This thesis is a study of the demographic consequences of mass killings.² Massacres have historically been a part of armed conflicts (Sundberg & Melander, 2013), especially during civil wars fought between weak governments and powerful insurgent groups (Ulfelder & Valentino, 2008). Data from the Uppsala Conflict Data Program (UCDP) show that mass killings of varying magnitude continue to occur around the world. The average number of massacres has remained relatively constant in recent years (Table

¹ Excess mortality is “the mortality attributable to the crisis, above and beyond deaths that would have occurred in normal conditions” (Checchi & Roberts, 2005: 5). Direct mortality are deaths “relating to either combat between warring parties or violence against civilians” (Croicu & Sundberg, 2017: 10). Indirect mortality are deaths “caused by a decline in living conditions” brought about by the conflict (Heuveline, 1998: 57).

² Defined as conflict events that result in the intentional death of at least five non-combatants, following the convention of the UN-backed Guatemalan Commission for Historical Clarification (CEH, 1999c: 276). A non-combatant is “any unarmed person who is not a member of a professional or guerrilla military group and who does not actively participate in hostilities by intending to cause physical harm to enemy personnel or property” (Valentino, Huth & Balch-Lindsay, 2004: 377–378).

1-1), but the locus of the violence has shifted considerably – the incidence of mass killings in the Americas, for example, has more than halved since the 1980s.

No demographic study to date has focused on how mass killings affect local populations.³ Massacres are targeted events that affect communities as a whole and can disturb patterns of mortality and reproductive behaviour in a number of ways. Mass killings, for example, produce a high number of direct deaths, but it is unclear how these events affect massacres survivors. Similarly, the high levels of physical and sexual violence that frequently accompany mass killings can have long-lasting effects on the fertility of survivors, but little is known about the demographic consequences of these events.

Table 1-1. Number of known massacres committed during events of organised violence around the world (1985-2015)

Deaths per event	1985-1994			1995-2004			2005-2015		
	>5	>50	>100	>5	>50	>100	>5	>50	>100
Africa	805	211	130	2,018	413	259	1,777	120	42
Asia	409	38	14	745	52	20	1,133	71	17
Middle East	145	12	10	107	6	4	798	45	12
Europe	184	14	5	201	28	12	52	5	4
Americas	119	13	9	402	6	2	62	3	1
Total	1,662	288	168	3,473	505	297	3,822	244	76

Source: UCDP data, version 18.1. The unit of analysis is an ‘instance of fatal organised violence’, which includes state-based armed conflicts, non-state conflict, and one-sided violence. (Sundberg & Melander, 2013: 524–525).

This thesis explores the demographic consequences of the 1982 Río Negro Massacres in Guatemala. The introductory chapter summarises the available evidence on how mortality and fertility are affected by armed conflicts and mass killings drawing on

³ In this thesis ‘local populations’ are sub-national communities where members know and interact with each other. They are usually small (towns, villages, gated communities in cities, etc.).

studies from around the world. After identifying a number of knowledge gaps, the chapter describes the aims of the PhD and the structure of the thesis.

The following literature review focuses on two thematic areas: mortality and fertility. The review centres on the demographic consequences of armed conflicts in general since very few demographic studies have focused on massacres in particular. It also includes relevant evidence on the demographic effects of natural disasters that resulted in generalised mortality. The first part of the review focuses on patterns of excess mortality during armed conflicts and mass killings. It outlines the role of family support in emergency settings, particularly as it relates to survival after events of mass violence. The second part of the review is concerned with fertility behaviour in the context of armed conflict. It highlights the heterogeneity of fertility responses to conflict, focusing on the pattern of fertility decline and rebound reported for several post-conflict settings. The section concludes with a discussion of the role of individual agency and social pressure in post-conflict reproductive behaviour.

1.1.1. Direct and indirect mortality

One certainty in the demography of conflict is that direct excess mortality will go up in the short-term (Li & Wen, 2005). On average, between 70 and 80% of those killed in armed conflicts are young men (Reza, Mercy & Krug, 2001; Obermeyer, Murray & Gakidou, 2008), but the distribution of direct mortality can vary depending on the nature of the conflict.⁴ Direct mortality from genocides, for example, tends to be high across all sectors of the population (Heuveline, 2001; Verwimp, 2003). Researchers have been unable to find consistent demographic patterns across conflict-affected populations. This is partly because the specific causes and dynamics of armed conflicts vary widely, making it difficult to generalise particular findings on the demographic consequences of armed conflict to other settings (Randall, 2005).

Direct mortality is a common proxy measure of the intensity of a conflict (Tabeau & Bijak, 2005; Coghlan et al., 2006; Alkhuzai et al., 2008). Estimates of direct mortality have been used as evidence for truth and reconciliation commissions (Ball, 2000; Ball et

⁴ ‘War’, ‘conflict’ and ‘armed conflict’ are used as synonyms in this thesis, following previous studies (Ormhaug & Hernes, 2009); a more specific typology of armed conflicts can be found in Gleditsch et al. (2002).

al., 2003) and served to prove the crime of genocide in court. The International Criminal Tribunal for the former Yugoslavia (Brunborg, 2003; Fenrick, 2005) and the 2013 Genocide Trial in Guatemala (Patrick Ball, personal communication, November 8, 2014; Organismo Judicial, 2013) are illustrative examples. Results from this thesis were used for a trial focusing on campaigns of war-time sexual violence in Guatemala.⁵

Armed conflicts subject populations to adverse living conditions such as famine (Heuveline, 1998), forced displacement (UNHCR, 2018), and reduced access to health services (Rahim et al., 2009). These events cause malnutrition and the spread of infectious diseases, leading to an increase in non-violent deaths (Grein et al., 2003). Indirect deaths usually account for a large share of the total excess mortality of a conflict. Lacina and Gleditsch (2005) have shown that almost two thirds of excess deaths in recent major conflicts in Sub-Saharan Africa were caused indirectly. Young children are the group most vulnerable to excess mortality after armed conflicts. Studies have found extremely high under-5 mortality rates following conflicts in Guinea-Bissau (Aaby et al., 1999), Angola (Grein et al., 2003), and Tanzania, Uganda, and the Democratic Republic of Congo (Davis, 1996).

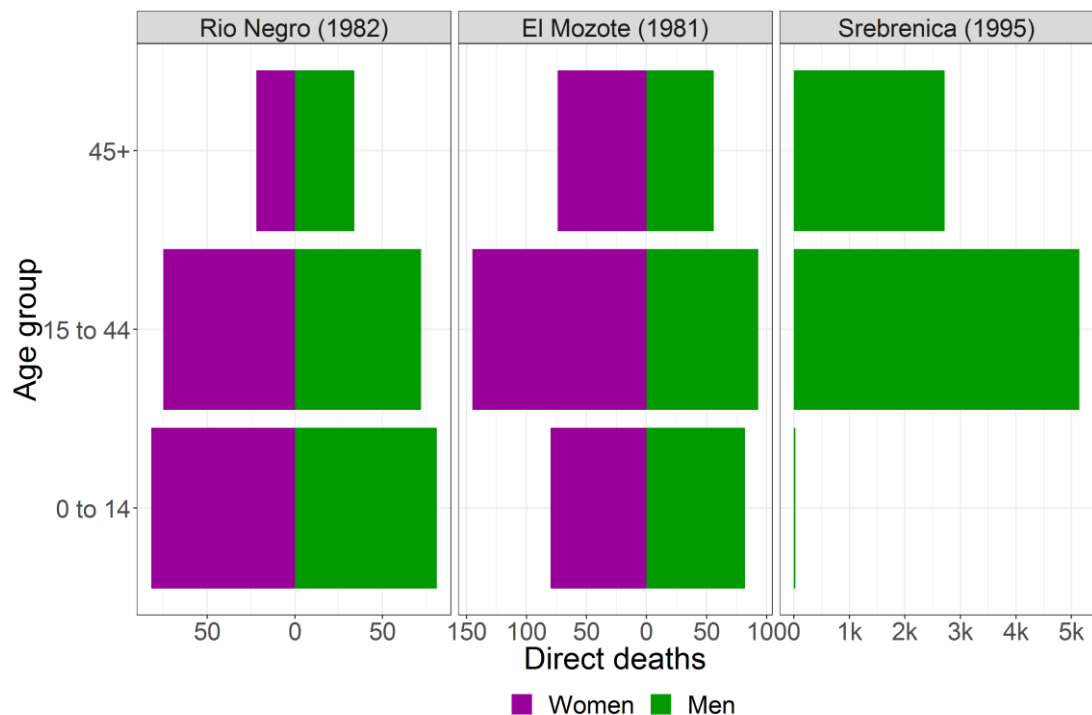
Mass killings produce high direct mortality, forced displacement, and expose non-combatants to extreme forms of physical, sexual and psychological violence (Kinyanda et al., 2010). Survivors are likely to experience long term psychological and physical trauma (Warner, 2007). Furthermore, mass killings target communities as much as they target individuals. As a method of genocide (Sullivan, 2012), massacres have lasting negative effects on the social life of the individuals and communities affected by them (Card, 2003). It has been argued that mass violence tears apart the social fabric of local populations (Esparza, 2005), but these assertions have rarely been studied using quantitative techniques. Little is known about the effects of mass violence on the demographic life of local communities affected by them (Valentino, Huth & Balch-Lindsay, 2004).

Aggregate measures of country-level conflict mortality conflate massacre- and non-massacre deaths (Brück et al., 2013). This is problematic because the age and sex

⁵ Chapter 7 discusses in more detail how data from this thesis were used for the trial, which was ongoing at the time of writing (September 2018).

distribution of direct mortality in massacre-affected populations varies markedly from that of the national population. Massacres tend to affect all members of a population, but they are not indiscriminate acts of violence. Mass killings usually result from detailed planning on the perpetrators' side (Valentino, Huth & Balch-Lindsay, 2004; Schwartz & Straus, 2018). Perpetrators can target men of fighting age, women, children, or the elderly to different degrees. The leftmost and middle panels of Figure 1-1 show that this was the case in two state-sponsored massacres in Central America: one in Guatemala (this study) and another in El Salvador (Binford, 1996). Men can be targeted exclusively, as happened during the 1995 Srebrenica massacre of Bosnian Muslim shown in the rightmost panel of the figure (Brunborg, Lyngstad & Urdal, 2003). Men and boys in Srebrenica were separated from their families and massacred in the course of several days. This variation highlights the fact that the mortality outcomes of mass killings also depend on contextual factors.

Figure 1-1. Distribution of direct mortality from three historical massacres by sex and age group of victims



Source: Publicly available data from the El Mozote⁶ and Srebrenica⁷ massacres were used to estimate the age and gender of victims. Río Negro data come from this study.

⁶ http://soaw.org/index.php?option=com_content&view=article&id=43, accessed 24 July 2018

Studies have been limited by the low quality and scarcity of data given the logistic and ethical issues associated with primary data collection amongst war-affected populations (Spagat et al., 2009; Brück et al., 2013). Direct excess mortality is usually estimated retrospectively using national registration data (Li & Wen, 2005), censuses (McCaa, 2003; Neupert & Prum, 2005), and household survey data (Agadjanian & Prata, 2002; Cetorelli, 2014). Other studies have relied on secondary reports of war deaths (Lum, Price & Banks, 2013) given the lack of routine data collection in conflict settings.

1.1.2. Mortality and family support

This thesis explores the relationship between social support and survival drawing on notions of social capital. Social capital was initially defined by French sociologist Pierre Bourdieu as: "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (Bourdieu, 1985: 248). Family support is a related concept that refers to the mutual assistance that individuals provide to their close kin.⁸ Focusing on networks of family support is useful because kinship ties are a universal feature of human societies that facilitate the exchange of material and emotional resources within members of a group – they promote cooperation (Apicella et al., 2012).

Networks of family support have protective effects in non-emergency settings (Holt-Lunstad, Smith & Layton, 2010) and during natural disasters (Frankenberg et al., 2011), but their role during episodes of mass violence has not been studied. The experience of mass violence can lead to trauma and depression, mental health conditions that affect physical health in the long run and increase mortality risks (Sibai, Fletcher & Armenian, 2001). It is known that conflicts can create social capital (Goodhand, Hulme & Lewer, 2000; Jennings & Sanchez-Pages, 2017), but more research is needed to understand how individuals draw on their networks of family support for survival after armed conflict (Justino, 2011). This omission in the literature is partly explained by the fact that no

⁷ <https://www.rferl.org/a/27114531.html>, accessed 19 July 2018.

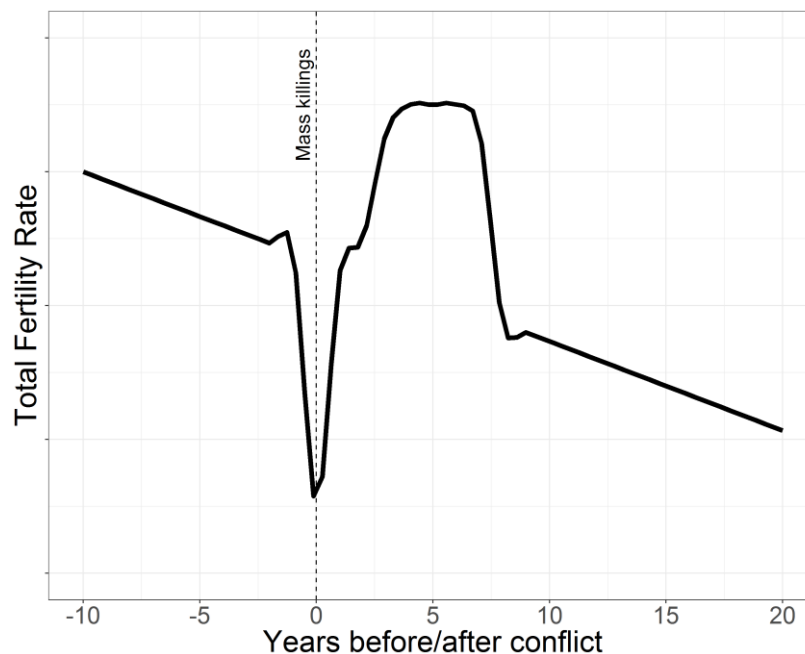
⁸ The parents, children, siblings, and spouses of an individual are called 'close kin' in this thesis (the 'extended kin' also include cousins, aunts, uncles, nephews, grandparents, and grandchildren). 'Kinship groups' and 'kin networks' are used interchangeably to refer to collections of kin members.

time-variant data of social support amongst conflict-affected populations exist, even if the need for these data has long been recognised in the literature (Li & Wen, 2005).

1.1.3. *Changes in total fertility*

It is common for fertility to plummet during periods of armed conflict as spouses are separated, fecundity decreases, and there is uncertainty about the future (Hill, 2004; Neupert & Prum, 2005; de Walque, 2006). Declines in total fertility (a measure of the average fertility levels in a population) are usually followed by short-term fertility recoveries commonly known as ‘baby booms’. The pattern of “drop and post-war rebound” (Agadjanian & Prata, 2002: 215) was first identified after World War I (Henry, 1966) but the best known case is the baby boom experienced by high-income countries after World War II (Van Bavel & Reher, 2013). The phenomenon has also been documented for Latin America (Reher & Requena, 2014) and other post-conflict settings, including Cambodia (Heuveline & Poch, 2007) and Angola (Agadjanian & Prata, 2002).

Figure 1-2. Simplified representation of ‘drop and rebound’ post-massacre fertility scenario



Source: Adapted from Staveteig’s ‘replacement/crisis hypothesis’ (2011: 145). The timeframes in the horizontal axis are arbitrary; the actual timing depends on contextual factors. The scales of the vertical axis intentionally left blank for the same reason.

Some studies have explored how conflict-induced changes in fertility interact with broader fertility patterns in a population. Most contemporary armed conflicts take place in low-income countries undergoing a sustained decline in total fertility, a phenomenon known as the fertility transition.⁹ Baby booms tend to be short-lived, meaning that they do not lead to sustained increases in fertility (Blanc, 2004; Woldemicael, 2008, 2010). Studies from the war in Lebanon (Khlat, Deeb & Courbage, 1997; Kulczycki & Saxena, 1999) and the genocide in Rwanda (Hill, 2004; Westoff, 2013) showed no significant long-term fertility declines either. Nonetheless, conflict can stall the progress of the fertility transition, as happened in Guatemala (Grace & Sweeney, 2016). Little is known about the effects of massacres on the fertility behaviour of survivors.

1.1.4. What drives fertility behaviour after armed conflicts?

Individual-level explanations of demographic behaviour emphasise the role of individual actors as decision makers. They focus on individual agency as a driver of demographic change. Risk-insurance approaches, for example, state that individuals have more children than they really want in contexts of high infant mortality with the expectation that not all will survive (Preston, 1978; Cain, 1983; Nugent, 1985; Clay & Vander Haar, 1993). This approach was initially used in demography to explain the relationship between fertility and mortality in the context of the demographic transition. It has recently been applied to study fertility behaviour after mortality crises such as armed conflicts (Staveteig, 2011; Grace & Sweeney, 2016) and natural disasters (Nobles, Frankenberg & Thomas, 2015).

Other studies have suggested that women adjust their fertility as a response to the experience of war. Fertility rates increased amongst more educated women during the 1987-1991 Palestinian Intifada, for example, a phenomenon that Khawaja (2003) interpreted as an attempt to increase the size of the group in the face of a perceived threat. Similarly, women with higher socioeconomic status were more likely to have lower fertility during the Angolan Civil War and to bear more children after it

⁹ The fertility transition is part of a wider phenomenon known as the first demographic transition. The term describes the historical process (originally described for European societies) whereby a population goes from having high mortality and fertility rates to lower mortality and fertility rates (Kirk, 1996).

(Agadjanian & Prata, 2002). Both studies concluded that this resulted from an individual-level response to the experience of the conflict.

Structural explanations of post-conflict fertility behaviour focus on top-down factors, such as changes in population density and population structure or in dynamics of contraceptive use (Heuveline & Poch, 2007). A classical structural explanation of baby booms states that since some women delay their childbearing during armed conflicts, there are more women who can become pregnant towards the end of the crisis (see Sheps, 1973). Other explanations have focused on ideational factors by emphasising the role of changing norms and values in a population. In her study of fertility after the 2003-2011 war in Iraq, Cetorelli (2014: 599) proposed that the post-2003 “resurgence of sectarian, tribal, and other conservative forces” explained the rising fertility rates amongst younger women.

It is difficult to distinguish between ‘agency’ (individual-level decision making) and ‘structure’ (top-down factors) when it comes to post-conflict fertility behaviour. A recent study of the aftermath of the 2004 Indian Ocean Tsunami (Nobles, Frankenberg & Thomas, 2015) showed how this can be achieved. The authors concluded that a local pronatalist ideology resulted in a baby boom after the natural disaster – the post-tsunami fertility behaviour was a combination of individual-level (pronatalist sentiments driven by the desire to replace lost children) and community-level factors (a shared project to rebuild the community). National governments have long promoted top-down pronatalist policies to increase birth rates (Demeny, 1986; Duvander, Lappegård & Andersson, 2010) but very little evidence exists on bottom-up or ‘grassroots’ pronatalist ideologies.

A communal project to rebuild the community implies pressurising certain members of the population (chiefly, those of reproductive age) to achieve high fertility. Research has shown that kin networks tend to reproduce pronatalist behaviours (Keim, Klärner & Bernardi, 2013; Lois, 2016). In traditional societies – where kin-centred social networks are the dominant form of social organisation (Geertz, 1994; Berkman et al., 2000) – relatives are in a privileged position to exercise social pressure on their kin to bear children. Studies have suggested that traditional gender roles can be reinforced in the aftermath of armed conflicts (Warner, 2007; Grace & Sweeney, 2016). This could explain why baby booms are usually driven by higher fertility amongst young women. A

shift towards childbearing at younger ages has been documented for women in studies on the post-World War II baby boom (Van Bavel & Reher, 2013) and after conflicts in Cambodia (de Walque, 2006), Rwanda (Staveteig, 2011), and Iraq (Cetorelli, 2014). The reproductive pressure exercised by kin networks after mortality events has not been studied in detail.

1.2. This thesis

This thesis focused on a series of massacres suffered by a Maya Achi population in Guatemala during the country's civil war. Episodes of mass violence and alleged genocide took place in the highlands of the country between 1981 and 1983 (CEH, 1999a). At the time, Río Negro, the main village in the basin of the Chixoy River, lost almost half of its population in less than two years to mass killings (data from this study). Survivors were forcibly displaced and resettled to allow the building of a major hydroelectric dam (See Chapter 2).

The thesis used a mixed-methods design to reconstruct 60 years of Río Negro's recent demographic history (1955-2015). This approach combined genealogical interviews, in-depth qualitative interviews, and Focus Group Discussions. Río Negro's geographic isolation, ethnic homogeneity, and kinship structure made this type of inquiry possible. The empirical component of this thesis focused on the relationship between mortality and fertility in the context of mass killings using a range of theoretical approaches and methods. To the best of my knowledge, this is the first research to take this approach towards understanding the consequences of mass killings in any context.

1.2.1. *Motivation and gaps in the literature*

The studies in this thesis address four important gaps in the demography of conflict literature. The first one relates to the lack of individual-level data on the same population throughout armed conflict (Woldemicael, 2008). This thesis developed an original method for collecting these data using techniques from anthropology, genealogy, and demography. The method (detailed in Chapter 4) can be used to collect retrospective demographic and social network data on local populations in the context of armed conflicts.

Second, mass killings are usually 'lumped together' with other conflict events. As a result, the particular dynamics of massacres are lost in discussions of national- or

regional- level conflicts. The tendency to focus on average measures of conflict mortality means that little is known about the specific dynamics of mass killings.

Third, the influence of family support on survival during and after armed conflicts is poorly understood. Strong social networks have been shown to improve survival in non-emergency situations, but it is not clear whether the protective effects of social networks extend to episodes of mass mortality. To the best of my knowledge, no study has applied this approach to understand how individuals draw on networks of support to survive mass killings and their aftermath. This thesis contributes to address this gap in knowledge by exploring the association between family support and survival in the context of the Río Negro Massacres.

Fourth, few studies have focused on the dynamics of human reproduction after mass violence. In particular, no study has looked at the fertility behaviour of massacre survivors. Mass killings have multiple effects on survivors, such as physical and psychological trauma and affect the social fabric that binds populations together. Little is known about how individual agency and social pressure influence childbearing behaviour after mass violence. This thesis uses unique genealogical data to study the fertility behaviour of survivors of the massacres in Río Negro.

The thesis also contributes to document the effects of the Guatemalan Civil War. This is important because the armed confrontation has not received much attention in the scholarly literature, in spite of its historical relevance and devastating effects (Schwartz & Straus, 2018). In particular, the study contributes to record the atrocities committed against the Maya Achi ethnic group, a topic that has received very little attention in the national and international academic literature.

I also had a personal motivation for conducting this research. I had been familiar with the residents of Río Negro and the history and language of the village long before starting the PhD. At the time, it concerned me that that very few Guatemalans knew about the Río Negro Massacres, one of the most important events in the country's recent history. My interest in raising awareness of these events was reinforced after leaving Guatemala to pursue my academic career – I soon realised that many outside of the country were surprised to even find out that there had been an armed conflict in Guatemala. This thesis was intended to help document some of the atrocities that characterised this conflict.

1.2.2. *Research questions*

In light of the gaps identified in the literature, the thesis aimed to answer the following overarching research question:

How did the 1982 mass killings affect mortality outcomes and fertility behaviour in the village of Río Negro?

The objective of the thesis was to document these changes and to understand how and why they happened. Therefore, to answer this broad question the empirical studies addressed four specific research questions related to mortality and fertility in the population. The first two ancillary questions (a-b) relate to the relationship between family support and the risk of dying both during and after the 1982 Río Negro Massacres. The other two (c-d) centred on the fertility behaviour of the massacres survivors.

- a. *How did the availability of family support affect the risk of dying in the 1982 Río Negro Massacres?*
- b. *In what way did the loss of family support influence mortality risks after the mass killings (in the 1983-2015 period)?*
- c. *How did the 1982 Río Negro Massacres affect the fertility behaviour of the survivors?*
- d. *What are the factors that explain the post-1982 fertility recovery in the population?*

The next section provides an overview of the structure of the thesis and summarises the chapters.

1.2.3. *Structure of the thesis*

This thesis is structured as a dissertation by papers. Chapters 1-3 are introductory and provide a general overview of the research objectives, historical background, and research design of the study. The core of the thesis is three chapters written as scientific articles (Chapters 4-6). Each of the papers is a self-contained unit summarising the results of an empirical study. This structure inevitably led to some repetition between chapters (e.g. Chapters 5 and 6 both include a summary of the background and data collection). I chose to keep these redundant sections to preserve the integrity of the papers but edited them to emphasise elements of particular importance for each study. The rest of this section summarises the content of the remaining chapters of the thesis.

Chapter 2 outlines the historical context, emphasising the causes and consequences of the Guatemalan Civil War. It discusses the origins of mass violence in the Rabinal municipality and the development of the Chixoy Hydroelectric Project. The emphasis of the chapter is on the 1982 Río Negro Massacres. It discusses how the village was decimated by state-sponsored mass killings and how the survivors were forcibly resettled in a military-run facility known as Pacux. A detailed description of the events is intended to give the reader a broad understanding of the national and local context in which the mass killings took place. The chapter includes a discussion about the term ‘genocide’ (which can be understood both as a crime and as a ‘social scientific’ fact) and how it was used in this thesis.

Chapter 3 describes the design of the thesis, including the process of collecting and managing sensitive information during fieldwork and the role that the vernacular language (Maya Achi) played in the process. A separate section discusses the challenges of integrating qualitative and quantitative data as part of the mixed-methods design of the study. The chapter addresses the ethical challenges of the research, including issues of compensation and relationship to survivors of the killings and to local organisations. I also discuss my personal involvement and experience as a researcher during the data collection.

Chapter 4 introduces the Extended Genealogy Method, an original methodology for reconstructing the demographic history of war-affected populations using cross-checked family histories. The chapter discusses issues of data completeness and quality using primary data collected in the village of Río Negro. It summarises how existing network sampling strategies were adapted to make the data collection more efficient and reliable. The chapter introduces the concept of ‘genealogical saturation’, which combines approaches from qualitative and social network traditions to evaluate the completeness of the primary genealogical data.

Chapter 5 explores the short- and long-term effects of the 1982 Río Negro massacres on mortality dynamics in the village. The first part of the paper quantifies the direct mortality from the massacres. The rest of the paper centres on the mechanisms through which the availability and loss of family support affected differential survival during and after the killings. Using a process tracing approach, the study explores the mechanisms linking survival with family support. The study argues that access to networks of family

support can play a determinant role during mortality crises, especially for the most vulnerable members of the population.

Chapter 6 presents the results of a study on fertility behaviour after the mass killings in Río Negro. The chapter combines quantitative and qualitative analyses to explore the role of the experience of the mass killings on the subsequent fertility behaviour of the survivors. It focuses on how individual-level characteristics interacted with population structure and social pressure to bring about a local fertility recovery after the massacres. The paper discusses the factors that brought about both low and high fertility after the killings in the population.

Chapter 7 summarises the findings and contributions of the thesis. It discusses how the Extended Genealogy Method can be adapted to address a range of research questions in demography. The chapter also underlines the theoretical and practical contributions of the thesis. It concludes by considering the implications of the findings and proposing avenues for further research.

At the time of submission (September, 2018), Chapter 4 was under review in the peer-reviewed journal *Demographic Research*. Chapter 5 was being prepared for submission to the *Journal of Genocide Research* (expected submission: November 2018). Chapter 6 was being prepared for submission to the journal *Population Studies* (expected submission November 2018).

This chapter presented the motivations and objectives of the thesis. It provided a brief introduction to the literature on the subjects of interest, mainly patterns of mortality and fertility in the context of armed conflicts. Finally, it outlined the structure of the thesis. The next chapter considers the historical background of the case study in more detail.

Chapter 2 Historical context

El clamor por la tierra, es, sin duda alguna, el grito más fuerte, más dramático y más desesperado que se escucha en Guatemala.

The cry for land is, without any doubt, the loudest, the most dramatic and the most desperate sound in Guatemala.

Joint Pastoral Letter of the Guatemalan Bishops' Conference, 1988

2.1. Introduction

This chapter provides the essential background for situating the 1982 Río Negro Massacres in a historical context. It starts with a short introduction to the ethnic composition of Guatemala. The second section explores the historical connections between colonialism, agricultural structure, and social and economic exclusion in the country. The historical review of the Twentieth Century centres on how the frustrated Guatemalan Revolution was followed by the emergence of guerrilla organisations and how this shaped the political landscape of the country during the 1960-1996 civil war. The third section explores the effects of the armed conflict, focusing on the victims and perpetrators of human rights violations. This section briefly touches upon the question of genocide in Guatemala, its definitions, and the 2013 Genocide Trial in the country.

The last section of this chapter is concerned with the 1982 Río Negro Massacres. It describes how the intersection of counterinsurgent policies, international developmental initiatives, and local politics resulted in the destruction of the Maya Achi village in the highlands of Guatemala. The description of the massacres themselves is followed by an account of the forced displacement caused by the Chixoy Hydroelectric Power Plant and the resettlement of the survivors in a camp under military control. Even though the chapter provides a rich and detailed historical review, the chronology of events is by no means comprehensive. Specific sources given throughout the text point to more nuanced discussions of the historical processes. A visual summary of the most relevant events related to the Río Negro Massacres can be found in Figure 2-9 (page 56).

2.2. Country context: Guatemala

Guatemala is a Central American country with an estimated population of 17 million. About 40% of the country's population are indigenous (INE, 2013). There are 23

recognised ethno-linguistic groups in the country: 21 are of Mayan descent, one is afro-Caribbean and one is a language isolate (Richards, 2003; Rogers, 2016). These populations largely preserve their vernacular languages and traditional forms of social organisation, which exhibit a combination of pre-Colombian, colonial, and republican traits.

The remaining 60% of the country's population belong to the Ladino group, who were first identified during colonial times as Spanish-speaking indigenous people in Central America. The term later became a synonym for mixed-race but the Ladino group never assumed a *mestizo* identity (Taracena Arriola, 2004).¹⁰ Instead, the ethnonym Ladino is used to deny all biological and cultural connection to the indigenous population and emphasise a supposed European heritage (Euraque, Gould & Hale, 2006). In the words of anthropologist Carol Smith (1994: 94) “[Ladinos] are popularly assumed to be descendants of Spanish/Indian liaisons (i.e., to be mestizos) but are in fact mostly Mayans in biological heritage who have assimilated national language and culture”. Table 2-1 shows the distribution of indigenous population in the country ordered by *departamento*.¹¹

Mayans have been marginalised from the economic and political life of the country ever since the establishment of Castilian colonial rule in the Sixteenth Century, when exclusionary and racist social institutions granted radically different rights to natives and Europeans (Casaús, 2001, 2010). Nowadays, most (68%) of the contemporary Mayans live in rural areas and 79% are poor (in contrast, 47% of Ladinos are poor) (INE, 2015).¹² The historical precedents of this inequality include the structure of agriculture, racism, and authoritarianism. These three factors have been identified as the key historical causes of the civil war in Guatemala (REMHI, 1998a; CEH, 1999b).

¹⁰ The term *mestizo* means literally ‘mixed’. It is used throughout Latin America, but mainly in Mexico, to recognise a shared indigenous and European heritage (Euraque, Gould & Hale, 2006).

¹¹ *Departamentos* are the highest-level administrative division in the country. Each *departamento* is composed of a number of municipalities (*municipios*), which enjoy a certain degree of autonomy. The Rabinal municipality is included in the table because the village of Río Negro is located in it.

¹² The definitions of poverty are available on the report of the respective survey (INE, 2015: 3–4).

Table 2-1. Guatemalan population by ethnicity and *departamento* in 2008

Departamento	Total population	Indigenous population	
		Total	Percentage
Totonicapán	433,751	426,373	98.3
Sololá	398,580	384,392	96.4
Alta Verapaz	1,014,556	942,009	92.8
Quiché	861,276	764,683	88.8
Chimaltenango	562,590	445,021	79.1
Huehuetenango	1,056,787	688,227	65.1
Baja Verapaz	252,062	148,333	58.8
Rabinal municipality	36,404	29,783	81.8
Quetzaltenango	737,537	399,111	54.1
Suchitepéquez	480,943	247,869	51.5
Sacatepéquez	296,882	125,448	42.3
San Marcos	950,471	297,283	31.3
Petén	563,819	174,459	30.9
Izabal	383,619	89,273	23.3
Retalhuleu	284,406	64,570	22.7
Jalapa	293,891	56,572	19.2
Chiquimula	347,823	57,965	16.7
Guatemala	2,993,722	404,343	13.5
Escuintla	655,104	48,993	7.5
Jutiapa	416,048	14,207	3.4
Santa Rosa	329,418	9,142	2.8
El Progreso	151,026	1,352	0.9
Zacapa	213,350	1,670	0.8
Total	13,677,661	5,791,295	42.3

Source: Projections from the National Statistics Institute (INE) using 2002 census data (CODISRA, 2010). *Departamentos* sorted according to the share of indigenous population.

2.3. Historical background

2.3.1. *European colony, racism, and inequality*

The first European troops arrived in present-day Guatemala in 1524 under the aegis of the Crown of Castile. At the time, the Guatemalan territory was inhabited by several Mayan polities organised in city-states without a unified regional government (Hill, 2001; Arroyo et al., 2015). The largest and more powerful group was the Maya K'ichee', based in the city of *Q'umark'aj*, present-day Santa Cruz del Quiché, and the Maya Kaqchikel in their capital *Iximche'*, now known as Tecpán. These groups were descendants of the Classical Mayans who had occupied the region for thousands of years, building the monumental cities preserved in the country's jungles and mountains (Carmack, 1979). However, the highly centralised and hierarchical form of social organisation that characterised the Classical Mayan societies had collapsed by the time the Spaniards arrived to the territory, possibly following the depletion of natural resources, the effects of accelerated climate change, and political upheaval in the northern lowlands of present-day Guatemala (Hodell, Curtis & Brenner, 1995; Demarest, 1997).

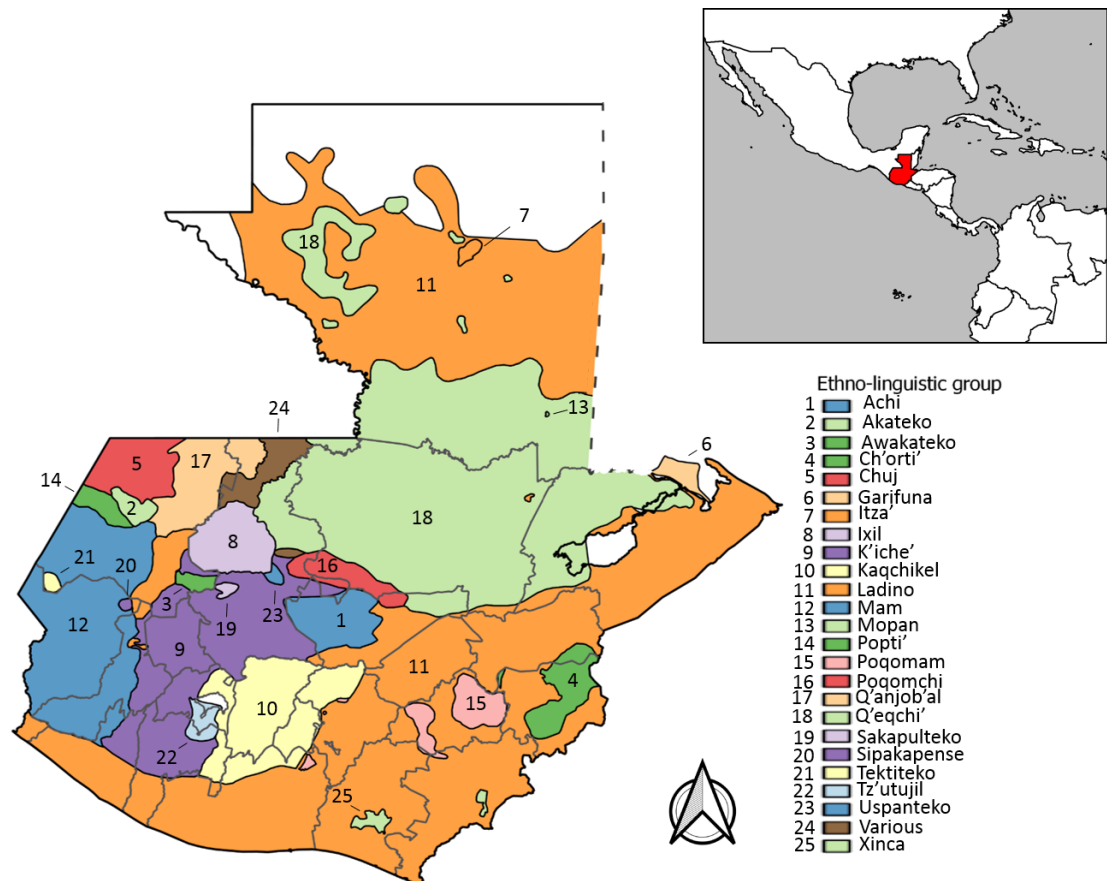
The arrival of the European troops was preceded by outbreaks of smallpox and influenza of epidemic proportions that decimated the indigenous populations in the area. In the Rabinal region of Guatemala, where this thesis is set, the population shrank by 80% between 1560 and 1590 due to increased morbidity and drastic drops in fertility (Bertrand, 1980, 1986). The weakened survivors faced invading armies of Mexican warriors led by Spanish troops. *Q'umark'aj* was captured by the end of 1524 and its rulers were forced to swear allegiance and pay tributes to the Castilian Crown. The colonisers faced rebellions and attacks from Mayan groups throughout the colonial period (Maxwell & Hill, 2006; Vela Castañeda, 2011).

In 1821, the region's *Criollo* population (Spaniards born in the Americas) championed a non-violent independent movement aimed at seizing control of the political and economic institutions established by the Spanish Crown (Severo Martínez, 2009). The colonial economy was based on metal extraction (scarce in the region), forced labour, and slavery (Acemoglu, 2012). The slavery of indigenous people was formally abolished in 1542, with the publication of the New Laws, and black African slaves were

emancipated in 1821. Forced labour continued to affect Mayan groups until the late Twentieth Century (Castellanos, 1985).

The secessionists created an independent regional union that came to be known as the Federal Republic of Central America, *República Federal de Centro América*, comprising present-day Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica. Ladinos consolidated their influence in the region during a series of brutal civil wars that ultimately led to the demise of the Federal Republic and to the establishment of the contemporary Central American nations.

Figure 2-1. Map of Guatemala showing the current distribution of ethno-linguistic groups (coloured areas) and administrative boundaries of *departamentos* (black lines in background)



Source: Map drawn with administrative data from <http://ideg.segeplan.gob.gt/geoportall/>, accessed July 09 2018.

Ladinos gradually became the country's dominant ethnic group, securing key position in government and industry (Dosal, 2005). The emergence of a large mixed-race group in the Spanish colonies was initially unforeseen by the colonial authorities. Ladinos,

neither Mayans nor African slaves, initially inhabited a legal limbo that allowed them to move freely and own property, which they often appropriated from indigenous communal lands (Torras, 2007; González-Isas, 2014).

The descendants of the *Criollos*, however, continued to play a central role in the economy, which until the early Twentieth Century was predominantly export-oriented following the extractive logic of the colonial economy (Acemoglu, 2012). *Criollos* inherited extensive land properties that had been appropriated or otherwise taken from the indigenous population during the colony (McCreery, 1994; Severo Martínez, 2009) and a racist ideology that continues to exist in contemporary Guatemala (Taracena Arriola, 2004; Casaús, 2010).

This unequal distribution of land, which still characterises the region, was identified by the CEH (1999b: 83–86) as one of the main historical causes of the country’s civil war. The next section is concerned with the events that ultimately led to the emergence of guerrilla organisations in the country and to the start of the armed conflict. As we will see, thwarted efforts to redistribute the land through agrarian reform policies played a central role in this process.

2.3.2. *The Guatemalan Revolution: ten years of democracy (1944-1954)*

Guatemala was governed by a series of strong military men after its independence from Spain in 1821. The country’s first period of representative democracy came in 1944, when the dictator Jorge Ubico (in office from 1931 to 1944) was ousted by a progressive coalition of military and civilian forces. The years between 1944 and 1954 are known as the Guatemalan Revolution – the ten “years of spring in the land of eternal tyranny” (Cardoza y Aragón, 1955: 9). This section summarises the most important events of this period, especially as they relate to the start of the civil war.

The governments of Juan José Arévalo Bermejo (1945-1951) and Jacobo Árbenz Guzmán (1951-1954) made major efforts to establish a welfare state in the country. They revoked the ‘Vagrancy Laws’ – a system of forced labour mainly targeting rural Mayans – introduced a progressive Labour Code, and established universal health and social care systems. The revolutionary governments granted the vote to literate women

and indigenous people.¹³ A series of economic policies aimed at reducing the country's dependence on monocultures for export and incentivising the development of a market economy (Glejises, 1989). The latter focused on modernising the country's infrastructure through a programme of major public works that included the building of the country's first state-owned hydroelectric power plant, Jurún Marinalá.

These reformist plans were not universally well received. Conservative land-owning elites and stakeholders of the United Fruit Company (UFC) were particularly displeased. The US-based company exported tropical fruits, mainly bananas, and was the single largest land owner in the country at the time. Previous administrations had been generous with the company.¹⁴ As a result, the UFC owned the country's railways, the cargo ships to transport its produce (known as the 'The Great White Fleet'), and effectively controlled the only commercial port on the Atlantic Ocean, Puerto Barrios (Schlesinger & Kinzer, 2005). President Árbenz intended to compete with the UFC's monopoly of access to the Atlantic by building a highway to the ocean and constructing a new port on the Atlantic, Santo Tomás de Castilla (Glejises, 1989).

The next stage of Árbenz' modernising plan was even more controversial. The Agrarian Reform Bill of 1952 aimed to change the extremely unequal distribution of arable land in the country. In essence, the bill allowed the expropriation of unused lands in exchange for government bonds. Facing great losses, the UFC unsuccessfully challenged the estimated price of the expropriated land, calculated from the amount declared by the company for tax purposes. At the same time, Harry Truman's administration in Washington grew weary of the Guatemalan Revolution as Árbenz got closer to members of the communist Guatemalan Labour Party (PGT). The Agrarian Reform Bill, with its effects on US companies in the region, appeared to confirm their suspicions of an emerging communist threat in the country.¹⁵

¹³ The latter was coupled with policies to forcibly assimilate Mayan populations (*ladinizar* in Spanish) into the dominant Ladino culture (Taracena Arriola, 2004).

¹⁴ Manuel Estrada Cabrera (in office 1898 to 1920) granted the company tax exemptions and extensive land concessions lasting 99 years. These privileges were later confirmed by Jorge Ubico.

¹⁵ This continues to be a controversial subject. Some argue that Árbenz did intend to establish a communist regime in the country (Schneider, 1959; Sabino, 2009). Others maintain that Árbenz was close

These events ultimately eventually led to a CIA-orchestrated counter-revolutionary movement that overthrew the Árbenz regime. In 1954, a group of poorly-armed troops invaded the country from Honduras, where they had been trained by CIA forces, and marched towards the capital city (Cullather, 1994). The Guatemalan Army refused to engage in combat with the troops, for fear of a major US military reprisal (Gleijeses, 1991). Following these events, Árbenz resigned on June 1954 and was succeeded by Carlos Castillo Armas, a fierce dictator that instituted a number of hard-line anti-communist policies and was assassinated himself in 1957.¹⁶

The counter-revolutionary government annulled the Agrarian Reform Bill and returned the expropriated lands to their original owners in 78% of the cases (Handy, 1994). This re-established the very unequal structure of agriculture in the country. According to the 1950 Agricultural Census, 516 large estates made up 40% of all arable land, whilst 88% of all estates accounted for only 14% of the available land (cited in CEH, 1999b: 84). Similarly, the 1964 census showed that 62% of land was owned by 2.1% of landowners, whilst 87% of farmers lacked enough land to even engage in subsistence agriculture. The unresolved issue of land ownership was a contributing factor to the poverty and social exclusion that led many to support the guerrillas.

2.3.3. *Civil War (1960-1996)*

The origins of the Guatemalan Civil War cannot be understood without considering the institutionalisation of an anti-communist ideology in the region. After the fall of the Guatemalan Revolution, the Castillo Armas administration ushered in a policy that later came to be known as the National Security Doctrine (NSD). The doctrine stated that the state apparatus should be subordinate to the military in order to fight the communist threat (Feierstein, 2010). The doctrine legitimatised the use of violence against all political dissidents, who were identified as ‘internal enemies’ of the state (Leal Buitrago, 2003). The new administration initially imprisoned between 9 and 14 thousand suspected sympathisers of the revolutionary government, 2-5 thousand of

to members of the PGT, but his economic reforms were ultimately intended to develop a welfare state based on a capitalist market-based economy (see Gleijeses, 1989, 1991).

¹⁶ The CIA intervention in Guatemala and the links between senior members of the US administration and the UFC have been explored in detail elsewhere (Cardoza y Aragón, 1955; Gleijeses, 1991; Schlesinger & Kinzer, 2005).

whom were executed under the accusation of sympathising with communist ideologies (Handy, 1994). The government's anti-communist policies were radicalised even further after the 1959 victory of the Cuban Revolution, as Washington regarded the Central American region as the weakest link through which communism could infiltrate the Americas (Schirmer, 1998).

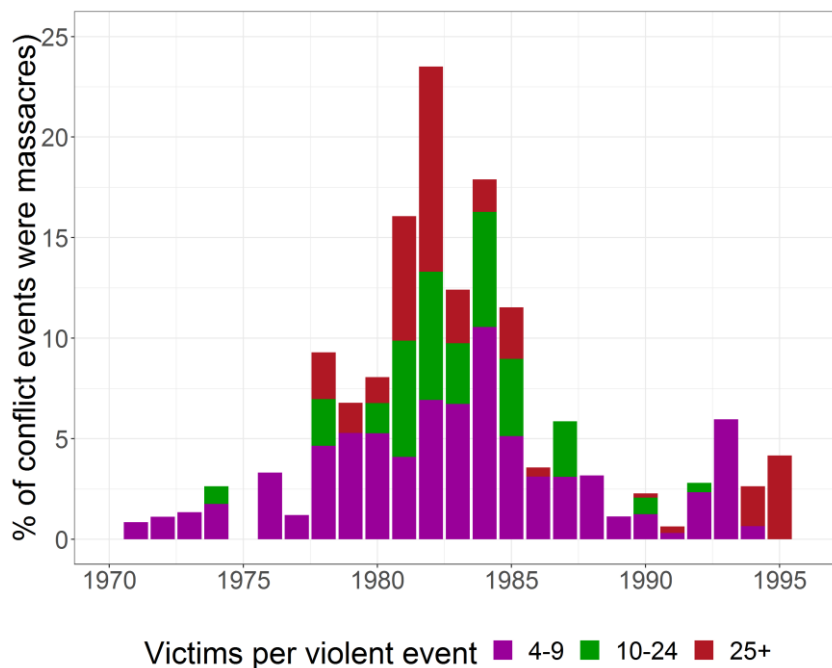
This first phase of the Guatemalan Civil War played out in the southern Lowlands of the country, a mainly Ladino region. In 1960 a group of young army officers staged a revolt to protest the government's decision to allow US-backed Cuban troops to train in the country ahead of the 1961 Bay of Pigs Invasion. The revolt was brutally quashed by the military, contributing to the radicalisation of a coalition of exiled soldiers, leftist organisations, and former members of the Árbenz government. In 1962, they formed the first guerrilla organisation in the country, the *Movimiento Revolucionario 13 de Noviembre* (MR-13). Other guerrilla groups soon followed, but by the end of the decade they had all been defeated by the Guatemalan Army, aided by US military educators flown in from Vietnam (Vela Castañeda, 2016). A clear pattern of state repression emerged in this period: mass violence was used against rural communities whilst opposition leaders and sympathisers were selectively 'disappeared' and executed in urban areas.

A new wave of guerrilla organisations arose in the seventies, led by the *Ejército Guerrillero de los Pobres* [Guerrilla Army of the Poor] (EGP) and the *Organización del Pueblo en Armas* [Organisation of the People in Arms] (ORPA). These groups were influenced by new interpretations of the Marxist doctrine which identified the marginalised Mayan population with the oppressed proletariat (see Guzmán-Böckler, 1975; Severo Martínez, 2009). This marked a turning point in the conflict since the guerrilla groups (initially composed of urban Ladino men) started operating in the central and north-western highlands of the country, a mainly indigenous area, in an attempt to involve the Mayan population in the armed struggle. The guerrilla strategy up until the mid-eighties revolved around establishing and expanding a social base in Mayan communities, which were expected to provide logistic support, food, and other essential supplies for surviving in the Guatemalan jungle (Payeras, 1983, 1985).

The new guerrilla strategy had limited initial success, but the guerrillas had gained wide popular support amongst rural Mayan communities in the highlands by the end of the seventies. The increased guerrilla presence in Mayan territories had a profound effect on

the violence that these populations suffered in later years. By the time the Sandinista Revolution triumphed in Nicaragua in 1979, the Guatemalan guerrilla organisations had managed to establish close links with religious groups and with student and trade unions. The rise of this second wave of guerrilla groups coincided with the emergence of a number of social movements that promoted civic engagement, particularly amongst marginalised Mayans (Adams & Bastos, 2003). At the same time, the Guatemalan Catholic Church, motivated by a Marxist-influenced religious ideology known as Liberation Theology, started playing an increasingly important role in organising local committees and promoting social activism in rural communities (Oglesby & Nelson, 2016).

Figure 2-2. Incidence of mass killings as a share of reported lethal conflict events during the Guatemalan Civil War (1970-1996)



Source: Data from the CIIDH Database on Human Rights Violations in Guatemala (<http://hrdata.aaa.org/ciidh>, accessed July 14 2017). The dataset is not comprehensive of all human rights violations in this period.

The army's response to these developments was brutal. A new counterinsurgent strategy was developed after 1981 to counter the new mass support enjoyed by the guerrillas (Vela Castañeda, 2014). Following the logic of the NSD, entire Mayan communities were regarded as legitimate military targets (Schirmer, 1998; CEH, 1999b: 178; Casaús, 2001; Schwartz & Straus, 2018). The military aimed to deprive the guerrillas from popular support and assistance ('draining the sea') and to implement coercive social

policies to ‘win the hearts of the population’ (Gramajo, 1995; CEH, 1999b: 197). The approach was later institutionalised in militarised ‘social policies’ with names like *Frijoles y fusiles* (Beans and Rifles) and *Techo, trabajo y tortilla* (Shelter, Work, and Food) (Schirmer, 1998; Garrard-Burnett, 2009).

These scorched earth policies initiated a period of unprecedented mass violence against Mayan civilians, in which the massacre became a defining component of the army’s counter-insurgent strategy (Le Bot, 2003). Figure 2-2 shows the share of violent events that were massacres during the Guatemalan Civil War. The prevalence and magnitude of mass killings increased between 1978 and 1985 and was highest in 1982, when almost a fourth of all registered organised violent events were mass killings.

From 1984, it became government policy to forcibly resettle survivors of the mass violence in military-run camps known as ‘Poles of Development’ and ‘Model Villages’. In these militarised colonies, civilians were forced to undergo military training and systematic programmes of ideological indoctrination (‘re-education’). In most cases, the survivors relied entirely on the Guatemalan Army for accessing food, shelter, and basic services. Physical abuse, torture, and sexual violence were common (Garrard-Burnett, 2009). Men were forced to organise in so-called Self-Defence Patrols, *Patrullas de Autodefensa Civil* (PAC). These local militias, trained and armed by the Guatemalan military, were accused of committing numerous human rights violations during the armed conflict, particularly in the 1981-83 period (Manz, 2004: 156–181).

The army’s strategy resulted in the military defeat of the guerrilla by the end of 1982 (CEH, 1999b: 198; Garrard-Burnett, 2009). The campaigns of mass extermination, forced resettlement of survivors, and the general militarisation of the civilian life weakened the social bases of the guerrilla and forced them to retreat from the Mayan territories and across the Mexican border. Many civilians were also displaced to Mexico, particularly after members of the Guatemalan Army and of the country’s elite occupied vast extensions of land belonging to Mayan communities that had been either exterminated or forcibly displaced (Vela Castañeda, 2011).

The proclamation of a new constitution in 1985 and the election of a constitutional government in national elections that same year accelerated the political transition towards democracy. Peace talks began in 1987 between the Guatemalan government and guerrilla organisations, represented by the *Unidad Revolucionaria Nacional Guatemalteca*

(URNG). The Accord for a Firm and Lasting Peace was signed on December 29 1996, effectively putting an end to 36 years of armed struggle. The signing of the Peace Accords did not end the suffering of many in the country, who continued to experience the negative consequences of the conflict, particularly in rural and Mayan communities (Jonas, 2000).

2.4. Effects of the Guatemalan armed conflict

2.4.1. Victims of human rights violations

The preceding section outlined the main historical events related to the Guatemalan Civil War. This section focuses on the consequences of the armed confrontation for the civilian population. It considers the national-level impact of the war before discussing the particular case of the Río Negro Massacres. The review draws on several sources, including the report of the UN-backed Guatemalan Commission for Historical Clarification (CEH, 1999a, c). The document was produced under the supervision of the United Nations Verification Mission in Guatemala (MINUGUA) by common agreement between the URNG and the Guatemalan government.

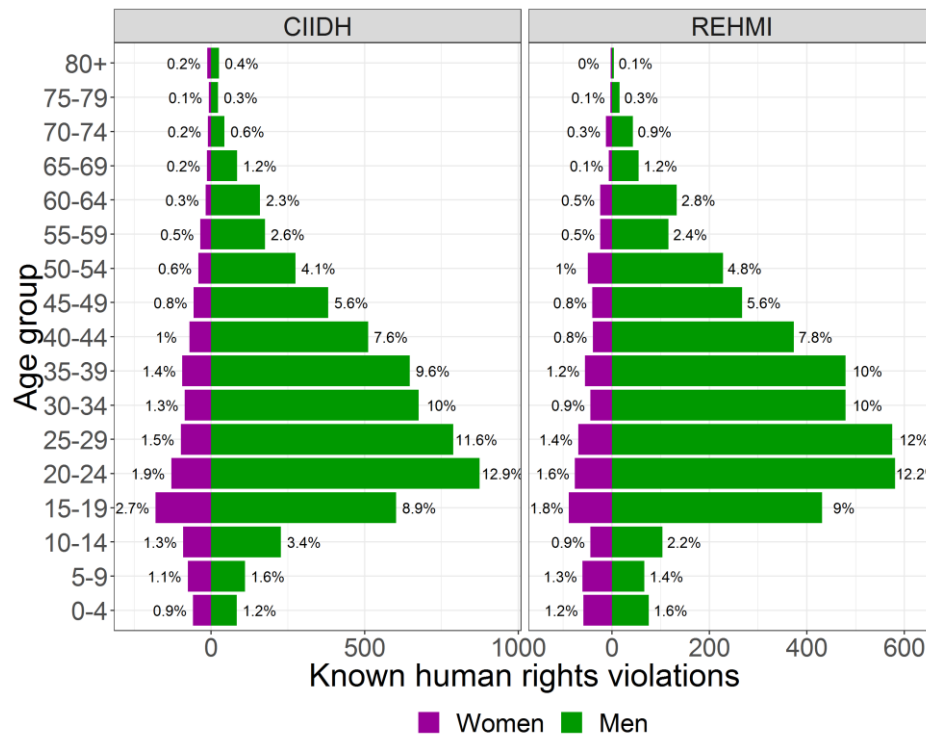
The Guatemalan Civil War caused the direct death or forced disappearance of around 200,000 civilians and the forced displacement of between 500,000 and 1.5 million.¹⁷ Most of the known victims of conflict violence (i.e. extrajudicial execution, forced disappearance, torture, etc.) were young men, as shown in Figure 2-3. However, this does not mean that other groups were unaffected by the violence of war.

Mayan women suffered disproportionately from sexual violence during the armed conflict. 99% of the reported victims of sexual abuse were women and 89% were Mayan. In addition, 35% were under 18 years of age, 62% were aged 18-60, and 3% were older than 60 (CEH, 1999a: 23). The overwhelming majority of cases of sexual violence were committed by state-sponsored armed forces (CEH, 1999a: 24). Survivor testimonies emphasised the cruelty that accompanied the sexual violence and the efforts of perpetrators to inflict as much pain and visible harm as possible by institutionalising practices including leaving bodies exposed after genital mutilation (CEH, 1999a: 484).

¹⁷ Estimates of the total number of excess deaths are uncertain. The official estimate of 200,000 is based on an analysis of three independent datasets on human rights violations. The Annex III of the official CEH report estimates the death toll between 119,300 and 145,000 (see Ball, 2000).

All massacre survivors interviewed by the CEH reported that the perpetrators had committed acts of sexual violence against the victims before murdering them. Nevertheless, sexual violence was underreported for both genders, but particularly for men given the social stigma and shame associated with these events (CEH 1999b:320).

Figure 2-3. Age and sex profile of victims of human rights violations in Guatemala (1960-1996) according to two independent data sources



Source: CIIDH and REHMI datasets. Both datasets relied on independent convenience samples of human right violations reports. Age and sex were only known for 35% of the CIIDH records and 58% of the REMHI records.

The violence affected the Mayan population disproportionately: 83% of the victims of all human rights violations were Mayan and 16% were Ladino (see section ‘2.5. Genocide’). Some indigenous areas were more affected than others. The Maya K’ichee’ territory of Momostenango, for example, was largely spared from the mass violence (Tedlock, 1992; Carmack, 1995). The Maya Achi area of Rabinal, on the other hand, was one of the worst affected. Members of this group suffered from a high number of massacres, amongst them that of Río Negro, because the group as a whole was defined as a military target by state forces (CEH, 1999a: 314–423).

2.4.2. *Perpetrators of the human rights violations*

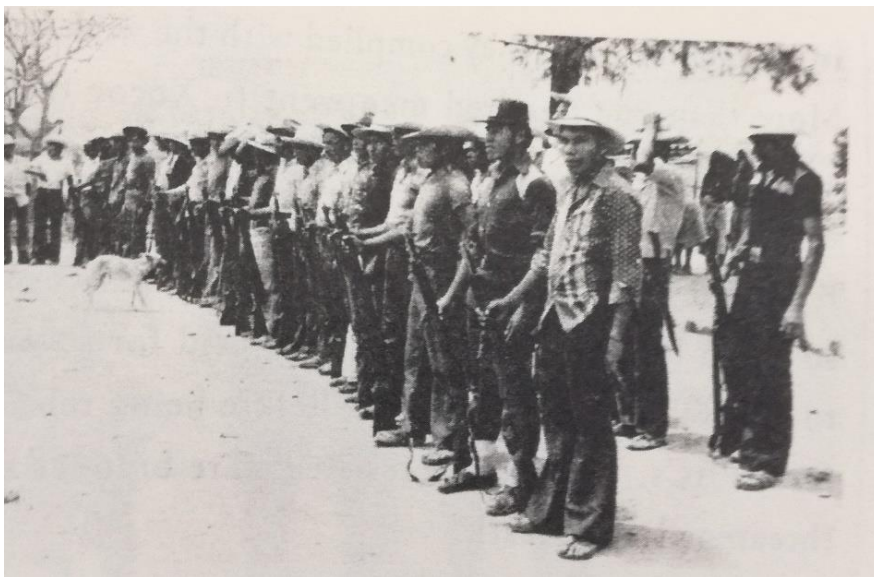
93% of the violent deaths during the Guatemalan Civil War could be attributed to the state or to paramilitary forces supported by the state. Members of the Guatemalan Army were directly involved in 85% of the reported human rights violations; PAC militias in 18%; and other government forces in 15%. The guerrilla was only involved in 3% of all known human rights violations (CEH, 1999a: 324). State-sponsored forces were responsible for most of the known cases of gender-based violence. Members of the National Army took part in 89% of the known rape cases, the PAC in 15%, and other security forces in 18% (CEH, 1999a: 24–25).

The CEH (1999a: 50;320) concluded that gender-based violence had been applied as a weapon of war to intimidate the population and inhibit the reproduction of Mayan communities, which were seen as both internal enemies of the state (within the DNS) and inherently less valuable than non-indigenous populations. Testimonial evidence from perpetrators confirmed that commanding officers gave explicit orders to rape women before committing a massacre and that sexual violence and rape were integral parts of the ‘re-education’ programmes implemented in military-controlled communities (CEH, 1999a: 38–39). During the 2013 Genocide Trial in Guatemala (discussed below), the tribunal concluded that sexual violence had been carried out with the intent to destroy the Maya Ixil group (Crosby, Lykes & Caxaj, 2016). Extensive research by leading Guatemalan historian Marta Casaús (Casaús, 2015; Casaús & Ruiz, 2017) and US archivist Kate Doyle (2013) has proven this point repeatedly.

This view contrasts with the ‘two devil’ theory put forward by US anthropologist David Stoll (1993) to explain responsibility for the atrocities committed during the armed conflict. In his view, the guerrilla’s strategy of involving Mayan communities in the armed struggle situated them in the crossfire between two armies, which ultimately led to them being targeted by the government’s contra-insurgent campaigns. The idea of a shared responsibility for the human rights violations has been criticised for justifying the disproportionate degree of violence employed against civilians (Benítez Jiménez, 2018). It has also been challenged for conferring “moral equality on state and guerrilla terror, and [underpinning] the trial process by which both state security agents and opponents were to be held accountable for atrocities” (Moon, 2012: 194).

This controversy relates to the question of whether the Guatemalan Army committed acts of genocide against the Mayan population. The issue is divisive domestically (Molden, 2016; Olson, 2016), in spite of the fact that the CEH identified four cases of genocide between 1981 and 1983 in the country (CEH, 1999a: 314–423).¹⁸ This is relevant for the thesis because the Río Negro Massacres have been identified as an illustrative case of genocide (CEH, 1999a: 360–377). Before considering the Guatemalan genocide, it is useful to consider the history of the term and the different ways in which it has been defined over the years.

Figure 2-4. Members of a Self-defence Patrol (PAC) in Xococ, Rabinal (ca. 1980)



Source: CIRMA Historical Archive (cited in Tecú Osorio, 2012: 65).

2.5. Genocide

2.5.1. *Legal and social scientific definitions*

Shortly before the end of War World II, the Polish jurist Raphael Lemkin coined the term ‘genocide’ to describe the crimes committed by Nazi Germany during the Holocaust (Lemkin, 1944). He described the neologism, which combined the Greek *genos* (race) and the Latin suffix *-cide* (the act of killing), as “a coordinated plan of different actions aiming at the destruction of essential foundations of the life of national

¹⁸ The four reported cases of genocide took place in Rabinal, the Ixil Triangle, Zacualpa and northern Huehuetenango. They affected the Achi, Ixil, K’ichee’, Q’anjob’al, and Chuj Maya groups.

groups, with the aim of annihilating the groups themselves” (Lemkin, in Manaktala, 2012: 180).

Genocide was first recognised as a crime by the United Nations in 1948 with the Convention on the Prevention and Punishment of the Crime of Genocide (the ‘Genocide Convention’), which provided a technical definition of the crime. The drafting of the Genocide Convention was highly political and reflected both the historical circumstances of its creation and the interests of the member states (Schabas, 2008).¹⁹ Nevertheless, the phrasing of the Genocide Convention has had a lasting effect on the public understanding of genocide:

In the present Convention, genocide means any of the following acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group, as such:

- (a) Killing members of the group;
- (b) Causing serious bodily or mental harm to members of the group;
- (c) Deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part;
- (d) Imposing measures intended to prevent births within the group;
- (e) Forcibly transferring children of the group to another group.

(Article II, UN, 1948)

The crime of genocide is proven in court by establishing the existing of an *actus reus* and a *mens rea* – the objective element of the crime and the intent to commit it. The first relies on evidence that members of a national, ethnical, racial, or religious group did, in fact, suffer from any of the grievances defined in the legal instrument. Demographic and statistical evidence were used extensively to prove the objective element of genocide for the first time by experts in the International Criminal Tribunal for the former Yugoslavia (Brunborg, 2003; Brunborg, Lyngstad & Urdal, 2003) and has been subsequently used in other cases, including the 2013 Genocide Trial in Guatemala (Patrick Ball, personal communication, November 13 2017). Archival, historical,

¹⁹ The Soviet Union, for example, opposed to the inclusion of political groups as potential victims of genocide given its own history of persecution (LeBlanc, 1988). The Convention also excluded what is now known as *ethnic cleansing*, “[...] a purposeful policy designed by one ethnic or religious group to remove by violent and terror-inspiring means the civilian population of another ethnic or religious group from certain geographic areas” (UN, 1994: 33).

psychological, and sociological analyses can be used to prove the intent to destroy a group. These studies focus on finding evidence of intentionality or establishing the existence of an effective chain of command. It is only by combining different types of evidence that a compelling case for genocide can be made (Spirer & Seltzer, 2008).

Genocide can also be understood as a ‘social scientific’ phenomenon (Schwartz & Straus, 2018: 223).²⁰ A legal definition of genocide must be proven in courts, but a social scientific one does not depend on the outcome of a criminal investigation. Neither does it, by itself, provide grounds for punitive measures, although it can be used as proof during a criminal investigation. Social scientists have criticised the 1948 UN Genocide Convention as being overly technical and legalistic, ignoring the political, social, and cultural dimensions in Lemkin’s original definition (for a summary of the critiques, see Manaktala, 2012). In this thesis, I discuss the genocide of the Maya Achi as a social scientific fact, following the general consensus amongst social scientists that episodes of genocide did take place during the Guatemalan Civil War (Esparza, 2005; Rosser, 2007; Brett, 2013, 2017; Schwartz & Straus, 2018).²¹

I am only aware of three academic works that openly deny the Guatemalan genocide or parts of it. A recent study found no evidence of genocidal intent against the Maya Ixil after studying the *Operación Sofía* military campaign plans. The authors concluded that the mass violence had a ‘coercive and communicative’ function aimed at deterring civilian collaboration with the guerrillas and was not aimed at destroying the group as such (Schwartz & Straus, 2018: 10). David Stoll has argued for an interpretation of the armed conflict, where the guerrillas and the army share equal responsibility, as discussed above (e.g. Stoll 2018; c.f. Drouin 2016). Finally, a highly criticised book by Carlos Sabino (2009) also denied the existence of a genocide in Guatemala (for a summary of the main critiques, see Castellanos, 2008; Benítez Jiménez, 2018).

This section introduced two definitions of genocide – one legal and one social scientific. Before moving on to discuss the particular case of the genocide against the Maya Achi

²⁰ Also been called a ‘commonsense’ (Garrard-Burnett, 2009: 15) or ‘sociological’ (Manaktala, 2012: 181) definition of genocide.

²¹ See all articles in the special issue “Guatemala, the question of genocide” published by the Journal of Genocide Research (2016).

in Guatemala, it is important to consider the recent trial of Efraín Ríos Montt in the country. The case is relevant for this thesis because the retired general was found guilty of genocide for acts committed against Mayan populations around the time when the Río Negro Massacres were committed.

2.5.2. *The 2013 Genocide Trial in Guatemala*

In 2013, the former dictator Ríos Montt (in office from March, 1982 to August, 1983) and his head of military intelligence Rodríguez Sánchez were indicted for genocide and crimes against humanity.²² This was the first time that a former head of state was tried in a national court without the intervention of an international tribunal (Ross, 2016). Ríos Montt was found guilty of both charges and sentenced to 80 years in prison by a national court (50 for genocide and 30 for crimes against humanity). Rodríguez Sánchez was acquitted. The sentence was annulled after ten days because of procedural matters. Ríos Montt died on April 1 2018, but the trial against Rodríguez Sánchez was ongoing at the time of writing (September 2018). The Genocide Trial, as it is known domestically, had a profound impact on the country's collective memory, as the victims' testimonies of their experiences during the conflict received wide press coverage and attention (Brett, 2016; Burt, 2016).

The 2013 Genocide Trial was not the first court procedure to consider whether genocide had been committed during the Guatemalan Civil War. The Inter-American Human Rights Court concluded in 2004 that the Guatemalan Army had committed genocide against the Maya Achi after analysing evidence of a 1982 massacre committed in the village of Plan de Sanchez, Rabinal, where 188 civilians were killed (IACHR, 2004). This trial, and another one carried out locally in 2008 for the 1982 Río Negro Massacres, set important precedents for the 2013 Genocide Trial (Vela Castañeda, 2016).

2.6. **Violence against the Maya Achi and the Río Negro Massacres**

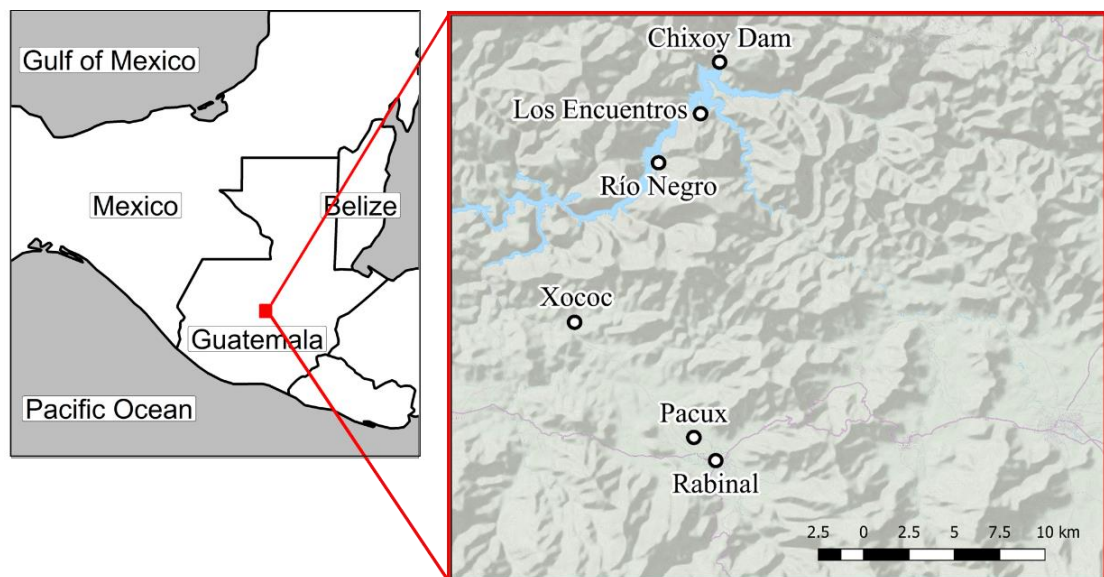
The thesis focuses on the 1982 Río Negro Massacres, a series of violent events that took place in the Rabinal municipality of Guatemala during the 1980-1982 genocidal

²² The Guatemalan government ratified the Genocide Convention in 1949. Article 376 was added to the Penal Code in 1973 (Villa, 2013).

phase of the country's civil war. These are one of the most emblematic events of the conflict, but they have received limited attention in the scholarly literature. This section summarises the main events that led to the building of the Chixoy Hydroelectric Power Plant and the subsequent Río Negro Massacres, including a description of the mass killings themselves.

The historical events were reconstructed from qualitative interviews and handwritten testimonies collected by the author, published accounts from survivors (Chen Osorio, 2009; Tecú Osorio, 2012), and secondary qualitative data (Kupprat, 2010a). A key resource was the timeline of events included in the *Chixoy Dam Legacy Issues Study* (Johnston, 2005a). The most important source of information on pre-1982 Río Negro was an unpublished study commissioned by the National Electric Company, *Instituto Nacional de Electrificación* (INDE) before the construction of the Chixoy Dam.

Figure 2-5. Map of the Chixoy River Basin showing Río Negro, the resettlement camp Pacux, and other locations mentioned in the chapter



Source: Drawn with data from OpenStreetMap data.

Before the mass violence, all the inhabitants of Río Negro belonged to the Maya Achi ethnic group. The ethnic group as a whole had approximately 50,000 members in 1981 (0.8% of the national population) and 106,000 members in 2002 (0.9% of the population), making it the seventh largest Mayan group in the country (INE, 1984,

2003).²³ The vast majority of Maya Achi people currently live in the municipality of Rabinal, located in the central highlands of the country (Figure 2-5). The municipality itself is largely indigenous: three fourths of its population identified as Maya Achi during the 2002 census. Rabinal is amongst the most deprived municipalities in Guatemala, with 66% of its population living in poverty (INE, 2015).

The Rabinal region did not experience systematic state-sponsored mass violence until the end of the 1970s, when scorched earth policies were implemented in the highlands of Guatemala. These campaigns affected indigenous regions disproportionately, where support for the insurgent groups was high. This was the case of Rabinal, where the EGP guerrilla had focused on recruiting young farmers from Maya Achi communities (EAFG, 1995). Support for the guerrillas increased towards the end of the 1970s, as local communities opposed the building of the Chixoy Hydroelectric Power Plant, a state-owned dam that flooded hundreds of acres of arable land on the shores of the Chixoy River and displaced thousands of Maya Achi from their ancestral lands (Einbinder, 2017).

Figure 2-6. Men and women from Río Negro photographed before the Río Negro Massacres (ca. 1980)



Source: CIRMA Historical Archive (cited in Tecú Osorio, 2012: 69–70).

It is estimated that a fifth of the population of Rabinal was killed in counterinsurgent operations overseen by the National Army between 1981 and 1983 (EAFG, 1995). The inhabitants of the basin of the Chixoy River were the most affected given their proximity to the Chixoy Hydroelectric Power Plant (Tecú Osorio, 2012). The mass violence against the Maya Achi must be understood in the context of a wider offensive

²³ The 1981 census, conducted during the most violent period of the country's civil war, may underestimate the total number of indigenous populations.

against civilian populations at the time. Rural Mayan communities around the country, characterised as potential guerrilla supporters and collaborators, suffered from systematic campaigns of mass violence. Separate campaigns of mass killings took place in the Ixil, Zacualpa, and northern Huehuetenango regions these years (CEH, 1999a).

Río Negro was the most populous village on the river basin in 1978, hosting around a third of the total population displaced by the reservoir – 970 out of the 3,445 (Gaitán, 1981). Very few villagers in Río Negro had undergone formal education before the 1982 mass killings. According to a report from 1976, only 22 residents were literate at the time (Gall, 1976), which is not surprising considering that the village was geographically isolated and its first primary school was only built in 1978 (Douzant, 2003). In his report, Gaitán (1981: 97–99, own translation) characterised the village as “a precapitalist economy [...] based on a precarious subsistence agriculture and primitive technologies, a system that generates no surplus for trade or purchase”. Like many other contemporaneous Mayan communities, Río Negro relied on yearly seasonal employment migration to the large plantations on the Pacific Coast in the south of the country (Castellanos, 1985).

Río Negro was characterised by a strong community cohesion based on the availability of kinship resources (Chen Osorio, 2009; Tecú Osorio, 2012). The population of Río Negro was, and continues to be, organised in kinship groups identified by their paternal surname. Members of these patrilineal groups of descent, known as *alaxik* in Maya Achi, often live close to each other. Patrilocality, a system where married couples reside near the husband’s household, is the norm amongst the Maya Achi. Data from 1979 (Gaitán, 1981) showed that, at the time of the killings, households in Río Negro were intergenerational units containing members of the *alaxik*. This form of kin-based social organisation has been a historical feature of Mayan communities in Guatemala (Adams & Bastos, 2003). Amongst the Maya, kinship ties are usually complemented by a social institution known as *compadrazgo*, which creates alliances between family groups through godparent-godchild relations (Early, 1982).

The mass violence affected some of the traditional forms of social organisation in Río Negro. The history of the *cofradía* in the village exemplifies this. The *cofradía* is a social institution of colonial origin that promotes community-oriented values. It is instrumental for redistributing wealth whilst promoting local identity and solidarity.

Cofradías are led by high-status men who are in charge of financing expensive religious rituals (for a more detailed description, see Carmack, 1979). There were two *cofradías* in Río Negro at the end of the 1970s. Both disappeared after 1982, when all the village's spiritual leaders (*ajq'ijab'* in Maya Achi) were killed in the massacres. The *cofradías* were never re-established and by 2015 the community still lacked *ajq'ijab'* to conduct traditional rituals (on Mayan spirituality and how it was affected by the armed conflict, see Tedlock, 1992). This attack on indigenous social institutions was characteristic of the state violence against Mayan populations in Rabinal and in other regions of the country (Nelson, 2015).

As this study will show, a series of state-sponsored mass killings known as the Río Negro Massacres produced very high mortality in the village. Contemporaneous sources all indicate that there was no major refugee flow out of the Rabinal area during the civil war, but some of the survivors moved to Guatemala City (EAFG, 1995; Chen Osorio, 2009; Tecú Osorio, 2012). Outmigration was limited even before the conflict, except for seasonal labour migration. International migration to the USA was relatively low until recent years (SEGEPLAN, 2010).

2.6.1. *The Chixoy Hydroelectric Power Plant and mass violence in Río Negro*

The need to modernise and diversify the Guatemalan energy sector had been recognised for a long time. President Árbenz planned the country's first hydroelectric power plant in 1953. In subsequent years, the World Bank and the Inter-American Development Bank (IDB) were involved in attempts to restructure the country's energy sector with a focus on taking advantage of its extensive hydrological resources (Einbinder, 2017). Plans to build a major hydroelectric dam on the Chixoy River started to materialise in 1972, when the INDE conducted initial studies on the hydrological potential of the Lower Basin of the Chixoy River, the second longest in the country and the one with the largest water discharge. The Guatemalan Government applied for an initial loan to the IDB in 1975 to cover the costs of the project. At roughly the same time, it signed contracts with foreign construction companies and publicly announced the project (Colajacomo, 1999). The World Bank and IDB provided essential funding for the construction of the Chixoy Hydroelectric Power Plant between 1973, when the first feasibility study was conducted, and 1986, when the plant started commercial operations (Johnston, 2005a: 16;60).

Works for the construction of the dam began in 1977, after which several villages conducted emergency evacuations. There were no realistic resettlement programmes as the waters started rising (Johnston, 2005a: 51).²⁴ Representatives of the INDE and of the Guatemala Army first arrived to Río Negro in 1976 to inform the villagers about the project. The news was met with scepticism by community leaders, who suspected that the visitors intended to appropriate their lands (Chen Osorio, 2009). Nevertheless, by 1978 20 families had agreed to move to a purpose-built camp (Pacux) next to the municipal capital of Rabinal. The families moved in 1980 but quickly returned to Río Negro, appalled by the lack of arable land and the low quality of the milled lumber houses (having being offered cinder and block ones).

Figure 2-7. Chixoy Dam seen from the reservoir on the Chixoy River (the floodgates are visible on the left hand side)



Photograph by Vivian Guzmán (2015).

The first act of mass violence against Río Negro took place in 1980. A member of the Military Police (PMA) shot and killed 7 villagers after an incident in which villagers were accused of stealing food from the construction site kitchens. The PMA was captured, beaten, and his firearm was stolen. He escaped but was later found dead by members of the armed forces. Days later, two soldiers visiting the village were also captured, beaten,

²⁴ Interview with KI-9.

and stripped of their weapons (Chen Osorio, 2009; Tecú Osorio, 2012). The stolen firearms “eventually found their way to the EGP”, according to Johnston (2005a: 39). This incident was commonly brought up by the military to justify the future aggressions against members of the community.

After this, the villagers faced constant harassment from soldiers who surrounded the village, forced their way into houses with the excuse of looking for the missing weapons, and conducted a series of indiscriminate arrests. Later that year, two local Río Negro authorities carrying the only copy of the agreements negotiated with the INDE (the building of transport infrastructure, the provision of boats and ferries to transport produce to the Rabinal market, etc.) were kidnapped, tortured, and killed. The documents were lost with them.

Figure 2-8. Internally displaced persons from Río Negro shortly after the 1982 mass killings



Source: CIRMA Historical Archive (cited in Tecú Osorio, 2012: 109).

The first massacre in the Chixoy region did not affect Río Negro, but the nearby village of Xococ. In October 1981, 300 soldiers marched into the village, massacring residents suspected of collaborating with the guerrilla. The survivors were forced to organise PAC patrolling groups. A month after these violent events, around a hundred men from Río Negro travelled to Xococ to de-escalate the conflict and avoid further violence in their community. They were captured by the army and held captive under threat of

death at the Rabinal military base, accused of being part of the guerrillas. The villagers were eventually released and forced to organise PAC groups in Río Negro (Tecú Osorio, 2012).

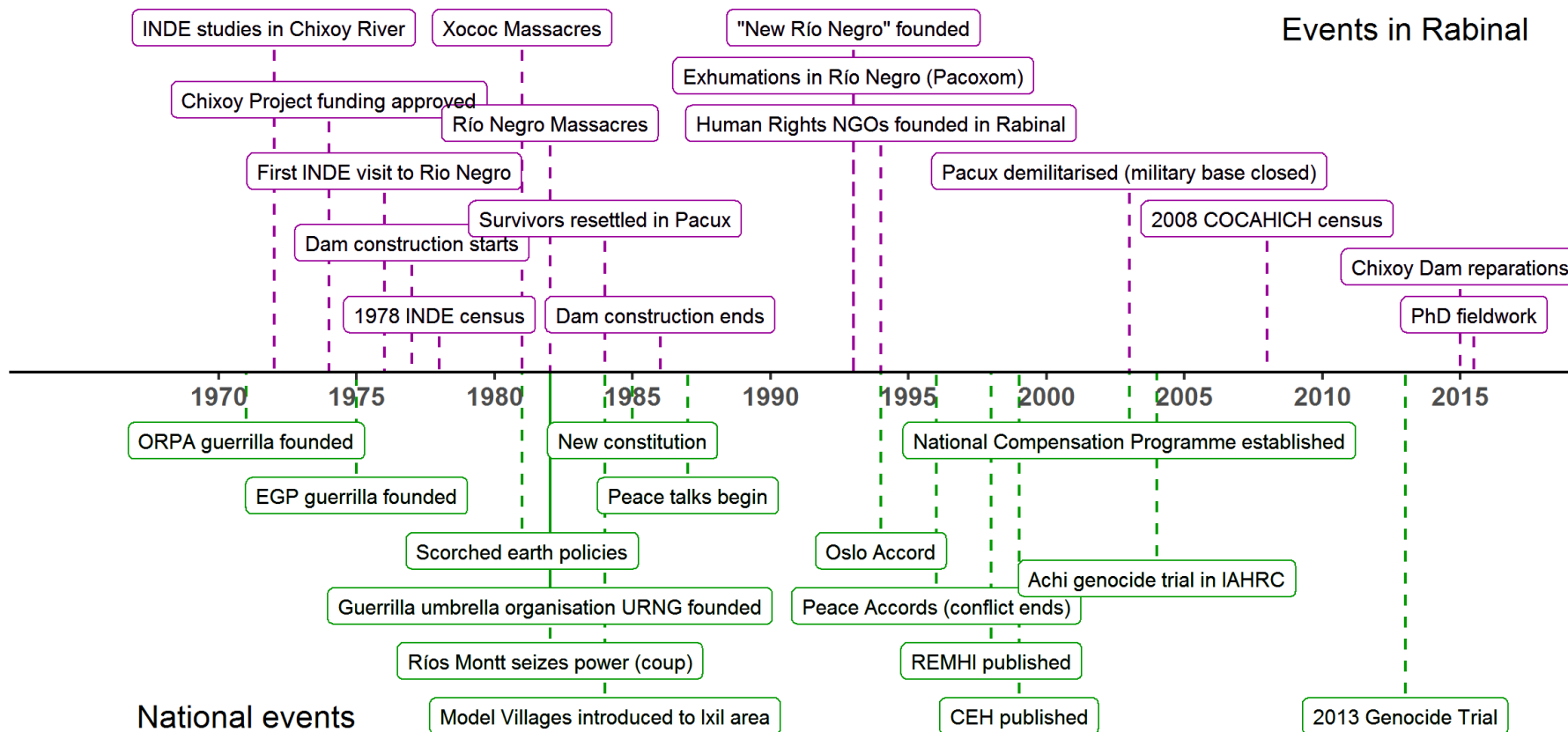
Following these events, villagers in Río Negro became increasingly worried about their safety. In February 1982, the Xococ market was burnt down by members of the guerrilla, one of whom was captured and, under torture, accused members of Río Negro of having supported the assault. Over 80 Río Negro villagers were summoned to Xococ in the next days, where they were formally accused of having orchestrated the market incident. Following two days of imprisonment, their identity cards (*cédulas de vecindad*) were confiscated and they were ordered to collect them in a week's time. On February 13 1982, 71 Río Negro villagers were massacred in Xococ. Some survived and returned to their community with stories of the massacres, warning their close kin and friends that soldiers and patrollers from Xococ were heading their way. The armed groups arrived on the next day, February 14, shooting indiscriminately at the population. Several individuals fled after the attack, taking refuge in the surrounding hills or in nearby villages where they had acquaintances or relatives (Dill, 2000).

The deadliest of the Río Negro Massacres was conducted a month later, on March 13 1982 (ten days before the coup d'état that brought Ríos Montt to power). Soldiers and Xococ PAC patrollers forced the remaining Río Negro population to march up to a place known as Pacoxom. There, the patrollers killed 177 villagers, mainly women and children.²⁵ Many women were raped or gang raped before being executed. The perpetrators engaged in degrading behaviour, spitting on the victims, verbally abusing them, forcing them to dance, and accusing them of being 'witches'.²⁶ The patrollers abducted 18 children and took them back with them to Xococ, where they were forced to perform unpaid household and agricultural labour for years. The perpetrators and their families neglected and abused the children, eventually leading to the death of two of them (CEH, 1999a: 72).

²⁵ The victims' remains were exhumed in 1993 and moved to a cemetery in the municipal capital of Rabinal (EAFG, 1995).

²⁶ Literally, of turning into animals at night. This is a reference to the widespread Mesoamerican belief that ritual specialists have the ability to take animal shapes at will (Romero, 2015).

Figure 2-9. Timeline of regional and national events related to the construction of the Chixoy Dam and the Río Negro Massacres.



Source: Author.

The survivors of the massacres were displaced to the mountainous areas surrounding the village, where they remained until the end of 1984. Some turned themselves in to the army when the Ríos Montt government declared an Amnesty Law in June 1982. Those who did were tortured and forced to settle in Pacux. Around 105 internally displaced persons (IDPs) from Río Negro were killed during this period as airplanes and helicopters repeatedly bombarded the hills where they hid (Johnston, 2005a: 48–49; Tecú Osorio, 2012).

Río Negro IDPs suffered from two further massacres in 1982. A group of Pacoxom survivors were discovered by army officers in the village of Los Encuentros and, under torture, revealed the whereabouts of other survivors. Around 90 civilians were killed that day, including an unknown number of Río Negro villagers. Fifteen women were kidnapped and forcibly disappeared, and some of their remains may have been identified in a military base known as Zepur Sarco (Casaús & Ruiz, 2017). A separate group of IDPs from Río Negro had taken refuge in the village of Agua Fría. On 14 September 1982, that community was accused of supporting the guerrilla and around 92 civilians were murdered, including 35 young IDPs from Río Negro.²⁷

2.6.2. *Discipline and punish: concentrating the survivors in the resettlement Pacux*

Pacux is the settlement built by the INDE Electric Company and the Guatemalan Army to house the displaced population from Río Negro. The camp was established between 1979 and 1981, but it initially served as a military garrison for the army in the 1981-1983 period (Douzant, 2003; Johnston, 2005a: 45). Only 17 families from Río Negro had moved to Pacux by the end of 1982 but it is estimated that most of the survivors were already living in the resettlement by 1984 (according to internal INDE documents cited in Johnston, 2005a: 51).

Pacux was a precursor of the Model Villages introduced from 1984 in the Ixil region of the country. Model Villages were built on a square grid and had guarded bases controlling the single road leading to the settlement. Row nine in Figure 2-10 (*1 calle*) shows the only entrance to Pacux, a dirt road which was regulated by a military base at the entrance of the settlement (not shown in map). The areas between B2 and K8 and

²⁷ At around the same time, the army committed separate massacres in the municipal capital of Rabinal (September 1981; 200-800 victims) and the town of Plan de Sánchez (July 1982; 268 victims).

between S2 and Z17 housed additional military personnel. Model Villages were also characterised by a centralised access to basic services controlled by the military. This pattern was first observed in Pacux, which was close to the municipal capital of Rabinal but was not connected to the city's water, sewage, or electricity systems (Johnston, 2005a: 42).

Living conditions in Pacux were very precarious, with the wooden houses fitted with asbestos roofs already showing evidence of rotting a couple of years after being built. The original resettlement held 150 houses, a health centre, a school, a community hall, a catholic church, a water system, and a dirt road. The houses lacked latrines, separate kitchens, storm drains, and running water (Informe, Ing. Arturo Classon Tojo [31 of October 1982], in Douzant 2003). The resettlement was over-crowded from its inception, which limited the access to housing for future generations.

The inhabitants of Pacux faced strict restrictions on movement that had a major impact on the population's long-term development. Two military bases guarded the entrance to Pacux; one of them was built in 1982 using forced labour from residents. The base guarding the entrance to the camp was only decommissioned in 2003 and exhumations conducted shortly after revealed 73 bodies buried in the area (EAFG, 1995).²⁸ The case of Francisco Chen Osorio, who arrived with his wife and children and three other families at Pacux in 1983, exemplifies how new arrivals were received at the military-run facility:

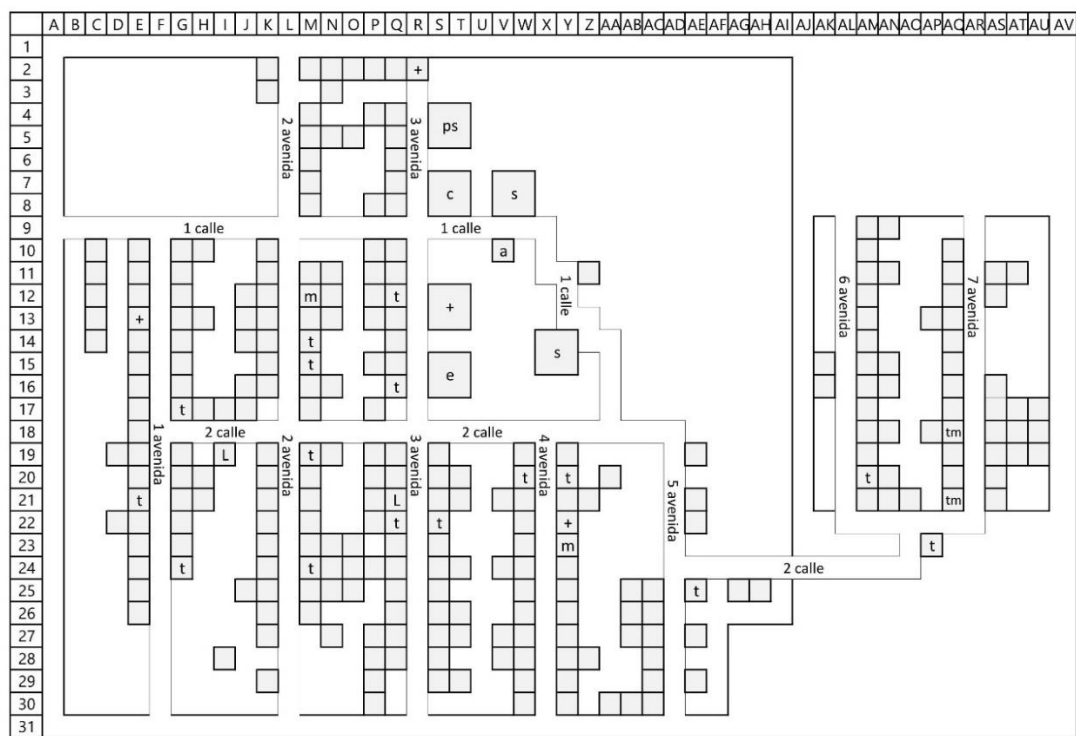
When they first arrive they are not allowed to leave the settlement and are fenced in. The men and women in these families are taken away to the military base and interrogated, the women released, but the men are held in a latrine for eight days without food or water, and beaten. Soldiers return them to Pacux, and they are warned that they cannot go into the woods, to their lands to farm, or to the coast to earn money by working on plantations. The prohibition on travel lasted until 1986. The only work the men could do was forced labor at the military base (gather firewood, build latrines).

(Biesemans and Janssens, cited in Johnston, 2005a: 52).

²⁸ This was not the end of the influence of the INDE Electric Company on the population of Río Negro. In 2015, villagers wanting to enter the village through the reservoir on the Chixoy River still needed to apply for an entry permit from the company in advance.

In 2015, Pacux had around 1,200 inhabitants (data from this project), most of whom lived in overcrowded conditions: households in Pacux had an area of 80 square meters and held, on average, 6.5 members. In addition to this, about one hundred villagers lived by the artificial lake created by the Chixoy Dam, in a ‘New Río Negro’ founded in 1992 close to the village’s original location (Einbinder, 2017). Ironically, there was no electric power in the New Río Negro before 2015, when the village was finally connected to the national electricity grid. At the time, the inhabitants of Río Negro constantly visited their relatives in Pacux and most households owned property in the resettlement.

Figure 2-10. Layout of households and other buildings in the resettlement Pacux (2015)



Source: Author. Legends: t shop; m maize mill; L library; + church; e school; s hall; c kitchen; ps health post; a local authority. Each square represents a household.

The mass killings have had lasting social and economic consequences for the survivors. Young people still find it difficult to secure a job within or outside Pacux. The inhabitants of Pacux are stigmatised and labelled as *guerilleros* (guerrilla fighters) and, more recently, as *mareros* (gang members) given the lethal outbreaks of gang violence that affected the community in the nineties and early 2000s. Local experts interviewed for this thesis indicated that the rates of incarceration and homicidal violence are high in

Río Negro and Pacux compared to the surrounding populations.²⁹ The combination of stigma and economic deprivation have led many to pursue dangerous, yet stable, professions including private security guards, police officers, and (unlikely as it sounds) careers in the Guatemalan Army.

Local Human Rights organisations and Maya Achi activists have led a long struggle for justice and reparation in Rabinal. In 2008, five perpetrators of the Río Negro Massacres were sentenced to life imprisonment in a trial conducted by a local court. More recently, a plan for monetary reparations for the survivors of the mass violence in Rabinal was agreed. Extensive negotiations between the local NGOs and the government entitled each household to a one-off cash payment of GTQ 80,000 (around GBP 8,000).³⁰ Compensation cheques were handed out in public events that were ongoing during my PhD fieldwork. However, the process of accessing war reparations was long and tedious for survivors. Administrative inconsistencies often took years to correct. Meanwhile, victims and perpetrators continue to live together in Rabinal, often crossing paths in the town's cobblestone streets. Activists, academics, and lawyers continue their efforts to bring justice and reconciliation to the inhabitants of the region.

This chapter provided a concise introduction to the historical background of the Río Negro Massacres. The review included an overview of the origins and consequences of the Guatemalan Civil War and a discussion of the concept of genocide. It provided a detailed description of the events of mass violence that affected the Rabinal region between 1979 and 1982. This historical review is essential for understanding the empirical studies contained in this thesis. The next chapter focuses on the thesis design.

²⁹ Interviews with KI-4 and KI-5.

³⁰ The negotiations were led by the Coordinating Committee of Communities Affected by the Construction of the Chixoy Dam (COCAHICH). An English version of the 'Plan for Reparations' agreed between COCAHICH and the Guatemalan government can be accessed online:

<http://alburez.me/pdf/COCAHICH%20Reparation%20Plan.pdf>

Chapter 3 Research design and fieldwork

3.1. Introduction

This chapter outlines the research design of the thesis and provides details on the main primary and secondary data sources used in the empirical studies. It describes how data were produced and managed during and after fieldwork. The chapter ends with a discussion on the limitations of the research and the ethical considerations of conducting it. It does not focus on the genealogical methodology and data as these are discussed in length in Chapter 4. Similarly, the chapter does not describe the data analysis since the particular analytical methodologies used in each of the empirical studies are presented in the corresponding chapters.

3.2. Research design

The thesis used a mixed methods research design aimed to reconstruct demographic data from Río Negro and to collect information about the residents' interpretation of demographic change after the 1982 mass killings. The data collection was sequential, with each component of the research providing input for the design of the next (Ivankova, Creswell & Stick, 2006). The quantitative (i.e. genealogical) data collection was preceded by a formative phase of qualitative data collection. The subsequent qualitative sampling strategy and instrument design were, in turn, informed by preliminary analysis of the genealogical data conducted in the field.

The quantitative data constituted the backbone of the papers, since they provided a description of the actual material processes in the community (e.g. an individual's date of birth and death). The qualitative analysis captured how the participants interpreted the observed changes by focusing on their lived experiences. Qualitative data were used to complement the findings of the quantitative analyses. The studies in Chapters 5 and 6 used different analytical strategies to combine the qualitative and quantitative data – these are explained in the respective papers.

Crucially, the mixed methods design of this thesis must not be seen as a form of methodological triangulation as observations collected by different methods were not expected to converge or confirm each other. Rather, they were regarded as complementary approaches shedding light on different dimensions of demographic

change in the population. Some of the ‘discrepancies’ between qualitative and quantitative data were used in the empirical chapters to analyse the social processes that influenced population change over time.

3.2.1. *Case study design*

A case study design was chosen for this thesis. Case studies are used to conduct an in-depth study of a phenomenon in its context using multiple sources of evidence (Yin, 2009). They are appropriate for obtaining a more holistic understanding of a phenomenon by providing explanations that take into account its social or historical context. I chose this approach because I was interested in understanding the demographic consequences of the Río Negro Massacres in depth and in relation to the contextual factors that shaped the development of the community before and after the violent events. A case study design was the most appropriate for answering the research questions of the thesis. This decision also took into consideration the time and financial resources available. The empirical chapters and the ‘Limitations’ section of Chapter 7 discuss how this choice affected the research.

The 1980 residents of Río Negro (the ‘original population’) and their descendants and spouses in the 1980-2015 period were the general population of interest. Anyone residing in Río Negro or Pacux during this period was excluded if they had no genealogical ties to the original population (a more detailed description of the genealogical population of interest is given in Chapter 4). The empirical studies focused on specific sub-sections of this population, which are defined in the corresponding chapters.³¹

The case was selected because it provided a unique opportunity to study the relationships between mortality shocks and fertility in a context of low migration. This facilitated the identification of the consequences of the massacres. It also made the data collection more efficient since most of the population of interest still resided either in Río Negro or in Pacux. Access was another important consideration. I was familiar with the area and spoke the Maya Achi language, having worked in the region for a number

³¹ A summary of the populations of interest for each study can also be found in Appendix I.

of years. I knew members of the community personally and had visited the area on a regular basis since 2008.

Finally, the Río Negro Massacres continue to be emblematic of very poorly implemented development projects. The killings were part of the implementation of the Chixoy Project, a state-sponsored development project with backing and funding of major international organisations like the World Bank and the Inter-American Development Bank (Johnston, 2005a). The events in Río Negro have been used in court as examples of genocidal violence, but have received almost no attention in the international academic literature and in the international press.³²

3.2.2. *Research team*

Data collection was a team effort conducted in collaboration with two local research assistants (RAs) from Pacux. The RAs were ‘insiders’ in the sense that they had “in-depth knowledge of respondents, their families and/or communities, and [were] themselves indigenous to the communities of interest” (Schatz et al., 2015: 373). This meant that they were familiar with the local history, politics, and residents. As members of the community they (and their families) were embedded in the local politics, which both improved and restricted their access to research participants. The RAs underwent 15-hours of paid training as neither had any previous research experience. The training covered the basics of the research design (research questions, motivations and methods), interviewing techniques, informed consent, and IT skills. We conducted practice interviews and Focus Group Discussions (FGDs) as part of the training.

The main task of the RAs was to collect and transcribe genealogical data from members of the community. In addition to this, they were involved in the planning of the interviews and data input. I oversaw the initial genealogical interviews conducted by the RAs. Interviews were conducted in parallel when the RAs were familiar enough with the interviewing techniques and data retrieving procedures. Quality checks were applied to

³² The case was featured in the press in 2014, when the U.S. Government Appropriations Bill required that the World Bank and the Inter-American Development Bank reported on progress being made concerning the reparation programmes for massacre survivors in the Chixoy area (see <https://www.theguardian.com/global-development/2014/jan/17/guatemala-chixoy-dam-reparations-bill>, accessed September 13 2015).

the data produced in all genealogical interviews (see Chapter 4 for more details). The collected data were shared in real time using secure cloud storage applications. These allowed the RAs to access the genealogical and census data and portraits of the massacre victims (see below) during the interviews using their computers and mobile phones.

Throughout the fieldwork, we held weekly meeting to share our progress, plan upcoming interviews, and find solutions to logistic and political problems arising from the data collection (e.g. family disputes or misunderstandings about the nature of the project). The RAs' inside knowledge allowed me to navigate the sometimes troubled political waters of the community. The team meetings were useful for making decisions on issues related to data collected during the week (e.g. censored information, inconsistent reporting, unreliable data, etc.). We also discussed preliminary findings of the quantitative results prior to the qualitative data collection. The RAs provided valuable assistance for defining the FGDs topic guides and for translating the material Maya Achi.

3.2.3. *Primary data*

Primary qualitative and quantitative data for this thesis come from interviews and FGDs with survivors of the Río Negro Massacres and interviews with key informants (KI) in the municipality of Rabinal and in Guatemala City. Table 3-1 summarises the sources of primary data. This section focuses on the primary qualitative data sources, as Chapter 4 is concerned with the genealogical interviews and data (the quantitative component of this project).

Qualitative interviews with massacre survivors and KI were an essential data source. I had initially not planned to conduct one-to-one qualitative interviews with survivors of the killings. However, during the fieldwork it became evident that certain participants (mainly elderly respondents) were less willing or able to engage in the structured conversation needed to produce reliable genealogical information. In these cases, the conversation would invariably derive into *testimonios*, a Spanish word used by participants to refer to a detailed recollection of their experience of the conflict; an “autobiographical text related to memoir fiction, poetry, and storytelling” (Boesten, 2014: 76). In seven cases, the genealogical interview transformed into unstructured conversations that covered a wide range of topics, including their experience of forced

displacement, survival, marriage, sexual violence, and reproduction after the mass killings.

Table 3-1. Sources of primary data used in this thesis

Component	Participants	Method	Number
Qualitative	Massacre survivors	Focus Group Discussions	15
		<i>Testimonios</i> (informal interviews)	7
	Key informants	Semi-structured interviews	9
		Group interviews for Event History Calendar (EHC)	2
	Direct observation	Field notes	NA
Quantitative	Massacres survivors	Genealogical interviews	100

Note: 'NA' stands for 'not applicable'.

KI interviews were useful for collecting information on specific areas of interest from local authoritative sources (Patton, 2015). In Río Negro, these interviews provided reliable background information on six subjects: war-time sexual violence, resettlement programmes after the massacres, prosecution of war crimes, war reparations programmes, and the Río Negro census data. The KI for these interviews were experts with practical knowledge in the given subject. In most cases, they had leading positions in organisations working with the programme or policy in question. KI included a former engineer in charge of the resettlement programme in Pacux and the director of a local Non-Governmental Organisation (NGO) working on sexual violence, amongst others. The KI interviews, all of which I conducted, were the only source of primary data collected in Spanish.³³

In addition to these qualitative interviews, we planned 112 genealogical interviews between January and October 2016 in Pacux. Of these, 100 were conducted successfully, and 12 could not be conducted for several reasons.

³³ A complete list of the KI interviews is included in Appendix C.

Parallel to these conversation-based data collection methods, I conducted direct observation throughout the fieldwork and recorded the most relevant insights in a field diary (Bernard, 2006). I took field notes down as jottings as the events unfolded or immediately afterwards and later transcribed them to a digital field diary. The field diary comprised 110 entries, including descriptive notes, analytical insights, and methodological reflections. Each entry was tagged using pre-defined codes that were later used to categorise the notes and conduct queries on specific topics.³⁴ The field notes provided valuable material both during fieldwork to guide the data collection and in the analysis phase, when they informed the interpretation of the results.

FGDs are semi-structured discussions with a group of purposefully selected participants. This data collection method is appropriate for exploring the range of opinions or perceptions around a given topic. I chose FGDs as the main source of qualitative data for this thesis because group conversations provided spaces for interaction that motivated participants to share their own experiences and compare these to the experiences of their peers. The method was appropriate for exploring the subjective understanding of participants on the demographic processes of interest to this thesis. The group dynamics that characterise FGDs were clearly distinct from the one-to-one dynamic of the genealogical interviews, which were often lengthy. This helped avoid attrition caused by the unwillingness of participants to engage in ‘yet another’ interview (some FGD participants had been present during genealogical interviews in their homes).³⁵

The FGDs conducted with survivors of the Río Negro Massacres focused on perceptions of demographic change in the village after the killings and attitudes towards fertility and marriage. Participants were encouraged to compare their personal experiences with those of their peers, parents and children. The topic guides focused on the killings themselves, emphasising the role that close kin and kin networks played during and after the violent events. A final component of the discussion centred on life in Río Negro before the killings and how it had changed as a result of the violent

³⁴ A preliminary list of codes was derived from the research design of the thesis and new terms were included during the data collection to capture emergent themes (see Appendix G).

³⁵ Field notes, 14 May 2016.

events. These topics were addressed in all FGDs, although the specifics varied depending on the gender and birth cohort membership of the participants.³⁶

Participant selection for the FGDs relied on a purposive sampling strategy that aimed at representing a broad spectrum of the population in terms of gender, birth cohort, and exposure to the conflict. Data for the participant selection were drawn from the genealogical information collected in a previous stage of the study. Separate FGDs were conducted for men and women and for members of different birth cohorts (Table 3-2).³⁷ Sex segregated FGDs were designed to provide safe spaces for women in particular to express their experiences and opinions without being interrupted or overshadowed by men. I observed this happen repeatedly in daily interactions given the prevalence of traditional gender dynamics.³⁸

Table 3-2. Number of Focus Group Discussions carried out in Río Negro by sex and birth cohort of participants

Cohort	Birth year	Age at 1982 killings	Age at 2016 fieldwork	FGDS Planned/Conducted	
				Women	Men
A	1940-1954	28-42	62-76	2/2	2/2
B	1955-1955	17-27	51-61	3/3	3/2
C	1966-1980	2-16	36-50	2/2	2/1
D	1981-1991	1 or unborn	25-35	2/2	2/1
Total	1940-1991	unborn to 42	25-75	9/9	9/6

Four birth cohorts were defined to represent the experiences of participants of different ages at the time of the killings. All members of cohorts A and B were of reproductive age in 1982, whilst members of cohort C were children at the time. Cohort D was

³⁶ A selection of the FGD topic guides can be found in Appendix B (eight different guides were used depending on the birth cohort and gender of the participants, as defined in Table 3-2).

³⁷ See Appendix I for a summary of the different birth cohorts used in the thesis.

³⁸ Field notes, 24 September 2016.

included to get a perspective from participants born after the mass killings. The precise boundaries of each cohort were defined taking into account the availability of participants (e.g. it was more difficult to find participants amongst the oldest age groups). Turnout was higher for FGDs with women than for men. Men often work in the fields or in the municipal capital of Rabinal and assistance was generally low even after making an effort to conduct the FGDs in times that would be convenient for them. Informal conversations revealed that many considered the FGDs to be ‘unnecessary’ if they had already taken part in a genealogical interview.³⁹

3.2.4. *References to primary data from this study*

The thesis references primary data collected during fieldwork using a consistent format. Quotes from FGDs are cited in-text by providing a unique identifier for the FGD and basic demographic information about the participants, for example: *FGD_B_2, with men aged 17-27 the year of the massacres*. All individual participants are identified using pseudonyms. KI interviews are referenced in footnotes using alphanumeric codes (e.g. KI-1), a full list of which can be found in Appendix C. Field notes are cited by indicating the day in which they were recorded in the field diary.

Quotes in Maya Achi use the official alphabet of the Academy of the Mayan Languages of Guatemala (ALMG). The alphabet marks vowel length (e.g. *a* and *aa*) and uses apostrophes to indicate glottalisation (e.g. *tʔ', k', a'*).

3.2.5. *Secondary data*

Secondary data for this thesis came from two unpublished local censuses containing information on the inhabitants of Río Negro and Pacux (conducted in 1978 and 2008, respectively). The 1978 census was conducted by the INDE Electric Company before the construction of the Chixoy Dam. It was intended to provide background information on the area and populations living in the basin of the Chixoy River to inform and guide future compensation programmes. As such, it included over 500 pages describing the demography, economy, social structure, settlement patterns, and

³⁹ Field notes, 26 September 2016. The ‘Limitations’ section of Chapter 7 discusses how this affected the interpretation of the data.

many other aspects of the communities in the region.⁴⁰ However, the study was ultimately ignored by the INDE engineers in charge of the resettlement project.⁴¹

The census included a list with the names of all the inhabitants of Río Negro grouped by household.⁴² In addition to this, it recorded whether a household owned maize, beans, millet, peanuts, chili, vegetables, or fruit plantations in 1978. The report indicated whether any household member took part in commercial activities (e.g. handicraft production) or owned livestock and provided information on the amount of land owned by each household. These data were used to construct a household-level pre-killings socioeconomic index for the quantitative analyses.⁴³

There were some problems with the quality of the data from this census as the political violence in the area had already begun when they were collected. An analysis of the reported ages showed that they were largely rounded (Whipple's index = 241).⁴⁴ Informal conversations with current residents of Pacux who were alive at the time revealed that the residents did not trust Gaitán and his team at the time, who were seen (correctly) as envoys of the INDE Electric Company.⁴⁵ Nevertheless, age rounding was not an issue for this thesis as the census data were only used to check the completeness of the genealogical reporting (Chapter 4).

The 2008 census was used to identify the beneficiaries of a major governmental programme of war reparations in Rabinal. It was commissioned by an umbrella

⁴⁰ Excerpts of the report are included in Appendix A

⁴¹ Interview with KI-9.

⁴² The census reports did not specify how households were defined, but local experts recalled that participants were asked about relatives who regularly slept and shared a kitchen in the house (interviews with KI-4 and KI-9).

⁴³ The socioeconomic index was defined as the linear combination of these characteristics. This simple approach was chosen over more complex methods for reducing the dimensionality of the data (such as Principal Component Analysis) because it produced equivalent results in the regression analyses.

⁴⁴ The Whipple Index measures the degree to which reported ages were rounded to multiples of five. Index values over 125 indicate a strong heaping effect (rounding to the nearest multiple of five), whilst values 105 point towards very accurate age reporting.

⁴⁵ Interview with KI-4. I was granted access to a manuscript of the 1978 census by a relative of the author, to whom I am greatly indebted.

organisation for human rights⁴⁶ and implemented by the Latin American Social Sciences Institute (FLACSO). It was a *de jure* census, meaning that it registered individuals independent of their current location as long as they were descendants of the original population (i.e. those alive at the time of the massacres).⁴⁷ This census included the place of birth and date of birth of all live individuals listed by kinship group.⁴⁸ Individuals were required to present their national identity card upon registration, which contributed to improving the quality of the data.

Analysis of the census data showed a much lower degree of age rounding compared to the 1978 census (Whipple's Index = 111). There was a small degree of underreporting as some members of the population refused to be included in the census. A small number of emigrants (mainly children born from sexual abuse, who were given in adoption to families abroad) could not be located.⁴⁹ However, the fact that registration in the census defined eligibility for a war reparations programme described below provided a strong incentive for registration.

3.3. Data collection and fieldwork

The fieldwork was conducted in two stages. In the first stage, I made contact and established partnerships with local actors and KI. During the second stage, I led two local researchers in collecting the primary data of the study. Although it is convenient to think of the fieldwork as a discrete process composed of clearly defined stages, the boundaries between them often overlapped in practice. We continued collecting genealogical data until the end of the fieldwork, for example, even after the nominal end of the genealogical data collection stage.

Substantive fieldwork was carried out from November 2015 to November 2016 in Pacux and Río Negro, both located in the municipality of Rabinal, Guatemala. The

⁴⁶ The Coordinating Committee of Communities Affected by the Construction of the Chixoy Dam (COCAHICH) formally represents ADIVIMA and other local human rights NGOs in negotiations with the government.

⁴⁷ Interviews with KI-7 and KI-4.

⁴⁸ This grouping was based on an *ad hoc* definition of 'family groups' that did not reflect living arrangements but eligibility criteria for the war-time reparations programme. Married couples, for example, were always reported as separate family groups even if they lived together with other relatives.

⁴⁹ Interview with KI-8 and field notes, 27 May 2016.

fieldwork, including all data collection, was conducted in the vernacular Maya Achi. I did not require an interpreter, as I am fluent in the language. This made it easier to become familiar with members of the community and generate rapport. It also allowed me to interact freely with monolingual members of the community (mainly women and older adults), who have often been excluded from research projects.

3.3.1. First stage: exploratory visit to the field (January 2015)

After several months of planning, I conducted a preliminary field visit to Guatemala in January 2015 to establish strategic partnerships, obtain feedback on the research proposal, and discuss the project with local authorities. As part of this visit, I met with researchers at the Universidad del Valle de Guatemala (UVG) and with the director of the Presidential Human Rights Commission of Guatemala (COPREDEH) in the capital city. I received valuable support from the UVG throughout the fieldwork, but chose not to be affiliated with COPREDEH or any other government institution in any way given ethical and practical concerns. In Rabinal, I held meetings with members of grassroots NGOs, the municipal council of Rabinal, the Community Museum⁵⁰, the local health centre, and municipal parish. Keeping with traditional customs, I delivered letters to the indigenous authorities of Río Negro and Pacux and I addressed the residents during assembly meetings where I outlined the objectives of the project. I also conducted a number of pilot genealogical interviews with community leaders to show the nature of the interviews and to pilot an early version of the questionnaires.

The data collection was conducted in partnership with the largest human rights NGO in the area at the time of the data collection – ADIVIMA⁵¹. The NGO's work on access to justice, cultural promotion, and education was widely known by villagers in Río Negro and Pacux. ADIVIMA was in charge of implementing the governmental war reparation scheme that was ongoing during my fieldwork. Partnering with the NGO was strategic in this respect, given the potential influence that the compensation programme would have on the data collection. Special care was put to inform participants that the research

⁵⁰ The 'Community Museum Rabinal Achi' promotes local culture (e.g. traditional dance, music, and handicrafts) and the history of the Maya Achi genocide: <https://perma.cc/JL5R-BEZE>.

⁵¹ The 'Association for the Integral Development of the Victims of the Violence of the Verapaces, Maya Achi' was founded by survivors of the 1982 massacres. It manages legal, educational, and cultural promotion programmes: <https://perma.cc/L873-MNYA>.

was completely unrelated to the war reparations programme. The ethical dimensions of the partnership are discussed in the section on ‘Ethics’ below.

3.3.2. *Second stage: rapport and groundwork (October-December 2015)*

The initial three months of the fieldwork were spent building rapport with members of the community. I attended meetings with local organisations and community leaders to discuss the study and worked on improving my Maya Achi language skills through informal conversations with residents. I conducted customary introductions at several households but avoided conducting structured interviews in this time.

In this initial phase of the fieldwork, I prepared contextual material that was later used during the data collection. This included the creation of an Event History Calendar (EHC)⁵² – a compilation of historical dated events of relevance to the population which were used to aid the retrospective reporting during the genealogical interviews (Axinn, Pearce & Ghimire, 1999; Luke, Clark & Zulu, 2011). The Río Negro EHC recorded 276 events of relevance to the community (e.g. war-time mass killings), the municipality (e.g. the establishment of a maternity ward), and the country (e.g. presidential elections). The calendar was developed using archival data (town meeting minutes and personal diaries from residents) and group interviews with community leaders. New events were added to the calendar throughout the data collection process.

The two RAs were hired and trained in this period. Their first assignment was to conduct a preliminary mapping of the households in Pacux. Using administrative data obtained from the Community Museum, we compiled a list of the heads of household in the village and produced the schematic map of the community presented in the previous chapter (Figure 2-10 in page 59). Preliminary analysis of the data helped identify how households were organised and clustered in the resettlement. These data were later used to select participants for the genealogical interviews.

Simultaneously, informal conversations were conducted with residents and NGO workers about the local kinship dynamics in the population. The aim of these conversations was to understand issues such as patterns of marriage (e.g. formal marriage versus cohabitation), patterns of residence after marriage, and household

⁵² An excerpt of the EHC is included in Appendix E.

formation. These observations were registered in field notes and later incorporated in the design of the genealogical interviews conducted in the next stage of the fieldwork. They also informed the analysis of the data. For example, the empirical chapters distinguish between ‘close kin’ and ‘extended kin’ use definitions of the terms that are both culturally appropriate and coherent with the established literature.

By the end of this initial fieldwork stage, a data collection toolkit was developed to gather and manage the primary data on site. The next section discusses how the data were collected.

3.3.3. *Second stage: data collection (January – October 2016)*

Between January and October 2016, we conducted the main data collection exercises. This included the collection of genealogical and qualitative data using interviews and FGDs. The vast majority of the population of interest resided either in Río Negro or in Pacux. However, there were small pockets of Río Negro emigrants residing in Guatemala City, and other communities located in the *departamentos* of Baja Verapaz and Alta Verapaz. We conducted a small number of interviews in these communities, but we mainly approached hard-to-reach individuals (e.g. those residing in the capital city or in remote locations) during meetings and rallies routinely organised by ADIVIMA in Rabinal.

The FGDs were conducted after most of the genealogical data had been collected. We started designing the FGD topic guides, piloting, and translating them to Maya Achi in July 2016. By this time, we had conducted 46 out of the 100 genealogical interviews, which included 70% of the total population of interest. Preliminary analysis of these data fed into the design of the FGD topic guides.⁵³ Preliminary analysis of the genealogical data, for example, showed evidence of a fertility drop and recovery after the 1982 massacre. Fertility behaviour was markedly different across birth cohorts but young women, whose reproductive life started after the conflict, appeared to have had particularly high fertility. This was not unexpected as the literature review had shown similar patterns for other contexts, but it did motivate us to include more detailed questions on fertility intentions in the FGDs topic guides. The exploratory analysis of the quantitative data showed that massacre-derived mortality had been remarkably high

⁵³ A selection of the FGD topic guides can be found in Appendix B.

for young women. Similarly, all of the *testimonios* emphasised that sexual violence against women had been common during the armed conflict. After discussions with the RAs, we did not deem it appropriate to include a specific section on sexual violence in the topic guides. However, the subject was followed up when it came up spontaneously in the FGDs.

Figure 3-1. View of the (New) Río Negro village, located on the shores of the Chixoy River reservoir



Photograph by Vivian Guzmán (2015).

We conducted the FGDs from August to October 2016 in a community hall located behind Pacux's Catholic Church. The location regularly hosted community events and was chosen because it was neutral, isolated, and easily accessible (S12 in the map presented in Figure 2-10). Most FGDs were moderated by one of the RAs under my supervision. I played the role of observer, taking notes on the interactions between participants and other data that were not captured in the audio recordings of the group discussions.

3.3.4. Data management and data protection

All interviews and FGDs were recorded using multiple digital audio recorders and later transcribed verbatim by an RA in the language they were conducted in (Maya Achi in most cases) following standardised criteria. Participants in the FGDs were identified using unique alphanumeric codes that linked them to their corresponding records in the

genealogical database (in which they were all included at the time). Each intervention in the conversation was marked by this alphanumeric id (unique for each speaker) followed by a guillemet (e.g. **3h>**). Unidentifiable speakers were registered as **x>**. Standardised headings were used to indicate discussion of a specific topic from the topic guide. This simple structure proved efficient for managing and querying the data since specific discourse elements could be extracted from the text using regular expressions (character sequences used in computational linguistics to match string patterns) without altering the conversation order. All the text data management and qualitative data analysis was carried out in the R language for statistical computing using Shiny applications specially designed for this purpose (Chang et al., 2016).⁵⁴

The protection of personal information was a priority. Some interviews contained personally identifying data, and other sensitive information including allegations of war-time rape. Others identified living perpetrators of the killings. The hand-written genealogical questionnaires were transcribed on site and sent out of the field site periodically to a secure storage in Guatemala City. The transcribed genealogical data were kept in two separate datasets – one anonymised and one containing the personally identifying information. All sensitive files were encrypted to prevent access by third parties. The audio files and the anonymised transcripts were only accessible to the main researcher and one of the RAs. All sensitive data were stored in a password-protected external drive. Data shared with the RAs in cloud-based storages were encrypted to prevent access by third parties.

3.4. Ethics

Ethics clearance for the project was obtained from Ethics Committees at the London School of Economics (Ref # 000399) and the Universidad del Valle de Guatemala (12-01-2016). The study was also reviewed and approved by traditional indigenous authorities and discussed in community assemblies with residents of Río Negro and Pacux. This was done to comply with the Maya Achi systems of governance, which function in parallel to those of the national government.

⁵⁴ A working example of the scripts used to create these Shiny applications is included in Appendix H.

3.4.1. *Informed consent*

Oral consent was sought and audio recorded before every interview; a printed summary of the informed consent was handed out to all participants.⁵⁵ The informed consent process, carried out in Maya Achi, emphasised that data would be anonymised and kept private. Written informed consent was not sought from the participants for practical reasons. Initially, written consent was avoided given rumours of delinquent activities being carried out in the area by so-called researchers who would convince participants to sign off their possessions or property during an interview.⁵⁶ Members of the partner organisation ADIVIMA advised against collecting signatures to avoid the study being confused with the highly bureaucratic programme of war reparations. Because of this, the oral informed consent emphasised that the study would not affect their eligibility for war reparations. It also mentioned that no data would be shared with the government.

All possible measures were taken to avoid the research project being confused with the programme of war reparations. However, some of the refused or incomplete interviews were explained by the fatigue caused by these processes. The payment of monetary reparations also created internal divisions in the village, as some believed that they had been unfairly excluded from the programme or that their payments were being deliberately delayed. Nevertheless, most residents of Pacux and Río Negro had already received their reparation payments by the time the second stage of the data collection started.⁵⁷

3.4.2. *Secondary participants*

Non-response occurs when participants are either unavailable or unwilling to take part in a study when the data are being collected. This produces missing data as the information is not available to the researcher. During genealogical reconstructions, the unobserved data can be obtained from a close relative such as a sibling or a spouse. This is convenient but it raises ethical concerns since informed consent is not sought from individuals whose information is provided by third parties. Social network studies refer to these individuals as ‘secondary participants’ (Marsden, 2011: 384).

⁵⁵ The full informed consent form can be found in Appendix F.

⁵⁶ Field notes, 20 December 2015.

⁵⁷ Field notes, 07 March 2016.

This issue had been anticipated by the research design and, after lengthy discussions with members of the community and the team of RAs, we decided to collect information on secondary participants under the premise that kinship data are a communal good in close-knit societies like Río Negro (i.e. they are not the exclusive property of any given participant).⁵⁸ Furthermore, all personally identifying characteristics were removed from the genealogical dataset meaning that individual identification was impossible. A suitable relative willing to provide information on their family histories was found for each of the eight genealogical interviews which were refused by respondents. The stated reasons for refusing to participate in interviews varied, but informal conversations with residents suggested that most were motivated by a dislike of ADIVIMA or its leaders. A limited number of participants requested for specific relatives to be removed from the genealogical dataset (e.g. previous spouses or relatives in prison) but no data were censored because of a respondent's requests.

3.4.3. *Incentives for participants*

All participants received a medium-sized (450 g) package of oatmeal and one of Incaparina (a popular maize and soybean food supplement) as symbolic compensation for their participation and time.⁵⁹ During the fieldwork, staff at the Community Museum unearthed 130 portraits of massacre victims. With the help of the RAs we identified the subjects in the portraits by name. The genealogical database collected by this study was then used to determine whether the victims in the portraits had any living relatives in the village. In this way, we were able to distribute the portraits when conducting an interview with the relatives in question. Access to the portraits was not conditional on research participation. As news about the portraits spread, we received multiple portrait requests, which we delivered in all cases. The portraits were highly appreciated by the participants, who in many cases did not have a picture of their close kin killed during the conflict.

I am also concerned with the dissemination of the findings in Río Negro. I will produce a Spanish summary of the thesis (as literacy in Maya Achi is extremely low) and share

⁵⁸ Field notes, 15 December 2015, 04 February 2016, and 23 June 2016.

⁵⁹ The content of this *compensation package* was defined together with community leaders in Pacux (field notes, 24 January 2015). This type of compensation also drew on my own experience conducting field research in the country.

the report with ADIVIMA, who has committed to making it accessible to any interested party. Copies will be available at the Community Museum and the community library of Rabinal. Finally, I will conduct a series of Maya Achi workshops in Rabinal towards the end of 2018 to share the results of the thesis with the research participants and the population in general.

3.5. Reflexivity

In the last section of this chapter, I reflect on my own background and experience, and how it affected the production of knowledge both within and outside the field. I was born and raised in Guatemala City, shielded from the horrors of the civil war: I was seven years old when the 1996 Peace Accords were signed and my close relatives (urban, non-indigenous, and middle-class) was not directly targeted by the government's repression. We never spoke about the war at home and my primary school teachers only covered the subject superficially in class.

My first memory of war comes from a novel. I read *One Hundred Years of Solitude* by Gabriel García Márquez as a teenager and I remember being shocked by an episode in which soldiers open fire on a group of workers from a banana plantation, killing adults and children alike. Later in the book, the authorities deny that the massacre ever happened and school teachers treat it as a legend. This episode came back to me when I first visited Río Negro in 2008, when I was 19 years old, and learned about its history. I have been involved with the community in different ways ever since, learning Maya Achi and building meaningful and trusting friendships with its residents.

The social position, identity, and motives of a researcher affect the production of knowledge (Williams, 2010). They can be powerful markers of difference even when researcher and participants share a nationality (Sultana, 2007). During the fieldwork, I was constantly aware of how my own ethnicity, gender identity, and social class (amongst many other factors) conditioned my interactions with participants. I am Ladino, which means that I am Guatemalan but not Mayan. My ability to speak the language allowed me to communicate freely, but I was still regarded as a foreign researcher, especially given my association with a foreign university. Residents of Río Negro often questioned whether I was being paid to carry out the research (apart from

a PhD Studentship, I was not). Money was a contentious subject because it was considered inappropriate to profit from the suffering of the community.⁶⁰ As a man, I was constrained by local gender roles, which restricted my access to certain domains of social life including the traditionally ‘female topics’ of reproduction and child rearing. One of the RAs, a woman from the community, helped overcome some of these limitations by conducting the FGDs with women and giving valuable insights on these topics.

Working with ADIVIMA facilitated the process of accessing participants and local authorities. My affiliation with the NGO granted legitimacy to the research, made participants less suspicious of my intentions as a researcher, and encouraged participation. This partnership also had complex political implications as being affiliated with an organisation implies endorsing its reputation and political views. ADIVIMA has been accused of corruption and nepotism in the past, most notably when a former employee stole a large sum intended for rebuilding the Community Museum. Throughout the fieldwork, there was an ongoing dispute between ADIVIMA, the local authorities, and another local human rights NGO which made it difficult to access certain kinship groups.⁶¹ Similarly, my request to examine the parish archives was refused on the grounds that ADIVIMA had not complied with a previous institutional agreement with the Church. All of these factors affected the process of collecting the data but in my opinion had little impact on their quality. Even though there were problems with collaborating with the NGO, it would have been impossible to collect the data without their support.

Conducting the fieldwork was difficult. It involved daily conversations with survivors, who would often break down in tears when recounting the events that led to the violent death of their relatives. In all cases, it brought back painful memories. I was prepared to refer distressed participants to organisations specialising in post-war trauma, but there was no need for this since the organisations were well known in the community. I was not so well prepared to manage my own emotional response to these conversations. In hindsight, I should have made better arrangements to look after my own mental health (distance therapy, or regular debriefing conversations, for example), particularly as the

⁶⁰ Field notes, 17 February 2016; see the discussion on war reparations in Nelson (2015: 104–112).

⁶¹ Field notes, 10 September 2016.

process of writing a PhD is very demanding in itself. I would recommend researchers attempting to work on similar circumstances to learn from this experience.

The thesis is concerned with atrocities that would not have happened in a fairer world. I am convinced that knowledge and awareness of these events are important. Many of the participants told me that this is what motivated them to take part in the study. This conviction did not limit my capacity to produce a systematic account of the facts. It encouraged me to be as thorough as possible to provide an accurate representation of the events in the community.

This chapter provided an overview of the research design and the data collection for the doctoral project. The next chapter describes the methodology developed during the PhD for reconstructing demographic data using genealogical interviews.

Chapter 4 A new method for reconstructing demographic populations after armed conflicts using genealogies⁶²

Abstract

This paper introduces the Extended Genealogy Method (EGM), a new approach for collecting high-quality data for demographic analysis using extended genealogies. The EGM uses chain-referral sampling to create socio-centric kin networks including all members of a local population. The sampling and data processing strategies of the EGM address selection bias and help evaluate data completeness. The multiple reporting resulting from the network sampling strategy of the EGM can be used to reduce the error associated with retrospective reporting. To evaluate the quality of the data produced by this method, the paper shows how it was applied to reconstruct the demographic history of the village of Río Negro in Guatemala after a series of massacres in 1982. Data on 3,566 unique individuals and 1,986 marriages were collected from 100 EGM interviews. The paper describes how the data were collected, processed, and checked for systematic sources of error. It also shows how they were used to characterise the demographic dynamics in the population for the 1955-2015 period. The EGM can be applied to reconstruct the demographic dynamics of local populations in contexts of data scarcity, including during and after armed conflicts. It produces time-variant demographic and social network data that can be used to study a range of social phenomena. This is useful because most of the existing methods to produce this type of data are difficult to apply in war-affected settings.

⁶² A version of this paper is forthcoming in the peer-reviewed journal *Demographic Research* as: Albrez-Gutierrez, Diego (2019) Blood is Thicker than Bloodshed: A Genealogical Approach to Reconstruct Populations after Armed Conflicts. *Demographic Research* (in press).

Ma wi sachel ub'i' umaam uqajaan, are poq'ol kirol chila' pa Releb'al Q'ijj.

They are not forgotten, the names of our fathers and grandparents who procreated and multiplied in the East.

Popol Wuj, Sixteenth Century Maya K'ichee' cultural narrative (own translation)

4.1. Introduction

Our understanding of the demographic consequences of conflict has been constrained by the scarcity of data. It is usually not a priority to collect demographic data using traditional methods such as household surveys in the context of mortality crises (Hill, 2004). As a result, data collected before or after the crisis are often used for studying the demographic changes brought about by war. Household survey data (Agadjanian & Prata, 2002) and census data (Neupert & Prum, 2005) have both been used to study the effects of conflict. However, conflict-affected areas tend to be underrepresented in nationally representative surveys. Mali's northern regions, for example, were not sampled in the 2012-2013 Demographic and Health Survey (DHS) due to access and security concerns (CPS/SSDSPF, 2014). This is a common problem – surveys carried out in Nigeria, Sri Lanka, Egypt, and Colombia have also suffered from this limitations (Brück et al., 2013). Researchers analysing survey data from conflict-affected regions do not always report these sampling limitations nor consider how they affect their analyses.

This paper proposes a data collection method that contributes to fill this gap and to improve our understanding of the impacts of armed conflict on population and kinship dynamics. The article has two objectives. The first is to present an original approach for collecting demographic data in settings of armed conflicts using genealogical data. This includes showing how the proposed methodology differs from the existing approaches. It also discusses how the method integrates qualitative tools to enhance the collection of quantitative data.

Second, it shows that the proposed data collection method can be used to produce retrospective data for conducting demographic reconstructions of local populations in post-conflict settings. It describes how the method was applied to reconstruct the demographic history of an indigenous population in Guatemala after a series of mass killings in 1982. The paper evaluates the quality of the evidence produced by the new

data collection method and its potential for conducting demographic research on other populations for which no other data exist. This is of particular importance given that time-variant data on conflict-affected population are not widely available.

4.1.1. *Data sources in the demography of conflict*

Most quantitative analyses of armed conflict have relied on national registration data, censuses, or household surveys. Each of these data sources has drawbacks. Armed conflicts cause statistical offices to discontinue data collection or to produce unreliable data (Hill, 2004). Censuses are carried out with long intervals, the length of which can be extended by the conflict. Even when census data or national registration data are available, they can be inaccurate – sometimes deliberately manipulated for political goals (Morland, 2014). The lack of accurate data also affects model-based approaches including population projections that use demographic parameters as inputs (Alburez-Gutierrez & Segura, 2018).

Demographic studies usually analyse household surveys that were conducted before the conflict, or at some point after its termination. Some use nationally representative samples (de Walque, 2005; e.g. Agadjanian, Dommaraju & Glick, 2008; de Walque & Verwimp, 2010), but others do not (Verwimp, 2003; Randall, 2005; Heuveline & Poch, 2007). Low quality baseline data affect the sample design of these surveys. Choosing primary sampling units with probability proportional to size, for example, requires basic population data (Himelein et al., 2016). On top of this, surveys face security concerns, administrative complexity, and high costs.

Data on conflict-affected populations can also be obtained from qualitative research with in-depth studies of smaller (non-representative) samples. This approach can be useful to suggest mechanisms through which conflict affects demographic behaviour. Few studies in the demography of conflict have a strong qualitative component (Lubkemann, 2002, 2005; Randall, 2005). Qualitative data are usually collected to complement quantitative research, to explore the participants' own perspectives, or to clarify local definitions. Heuveline & Poch (2007: 411), for example, accompanied their quantitative analysis of marriage and birth histories with “focus group discussions with different cohorts of women on marriage formation and fertility preferences”. Singh et al. (2005) used qualitative research to clarify what refugees from the Sudanese civil war understood to be ‘home’ when answering a survey.

The lack of longitudinal or time-varying data on war-affected populations limits our understanding of how conflict violence affects local populations. It is difficult to follow up individuals as they experience violent events or forced displacement and very few studies have done so. The Chitwan Valley Family Study collected monthly panel data on demographic events in the eponymous Nepalese valley during the 1996-2006 civil war (Axinn, Ghimire & Williams, 2012). The Study of the Tsunami Aftermath and Recovery conducted a longitudinal survey that followed up 30,000 individuals in 10,000 households before and after the 2004 Indian Ocean earthquake and tsunami. These two projects have produced a wealth of information on demographic change (Frankenberg et al., 2011; Axinn, 2015); displacement and migration (Gray et al., 2014; Williams, 2015); and the role of community and social organisations in dealing with disaster (Williams, 2013; Nobles, Frankenberg & Thomas, 2015).

4.1.2. *Genealogical data for demographic research*

There is currently no systematic approach for collecting genealogical data for demographic analysis. Anthropologists have a long tradition of collecting genealogies, but whereas the initial studies of kinship in social anthropology were highly technical (see Lévi-Strauss, 1969), this approach has been increasingly replaced by a critical stance that seeks to challenge traditional assumptions on gender and family rather than focus on the accuracy of the genealogical data (Mckinnon, 2000; Kuper, 2003). For this reason, anthropological kinship data rarely meet the high data quality standards required for demographic analysis. Unmarried women, marriages without children, and early deaths tend to be underreported in historical and anthropological accounts (Castilla & Adams, 1996; Gamella & Carrasco-Muñoz, 2017). Demographic studies that have reconstructed and analysed genealogies from archival sources, including parish records (Hammel & Gullickson, 2004), national registers (Kolk, 2014), and historical family trees (Zhao, 2001), warn that genealogies recorded in administrative sources suffer from similar limitations.

Outside the social sciences, population genetics has produced the most systematic and up-to-date protocols for collecting genealogies (Williams-Blangero & Blangero, 2006; Poletta, Orioli & Castilla, 2014). However, these guidelines were designed for studying genetic inheritance, not demographic processes. ‘Pedigrees’ (genetic genealogies) usually do not record childless marriages and tend to underreport child mortality, making them unsuitable for the study of the social processes that underlie demographic change. This

is a particular concern for this study since child mortality rates tend to soar after armed conflicts (Aaby et al., 1999; Grein et al., 2003).

Complete genealogies have many analytical advantages. On the one hand, they encode the vital events of all members of a population over time (including information on members who were no longer alive when the data were collected). On the other, they record the relationships between them. This means that it is possible to derive a wide array of demographic measures and rates using genealogies. Birth histories, for example, can be easily reconstructed for women and men. It is also possible to observe changes in demographic behaviour over generations (e.g. compare the fertility of parents to that of their children). Since genealogies are in themselves social networks (more precisely, they are kin networks) they can be analysed using the principles of social network analysis (Borgatti et al., 2009). The thesis used this approach to evaluate the influence of social support and social pressure on demographic behaviour.

4.2. The Extended Genealogy Method (EGM): a new approach

This section presents the basic principles of the data collection method developed for this thesis. The Extended Genealogy Method (EGM) uses theory and methods from anthropology, historical genealogy, and population genetics. The method is an efficient approach for collecting genealogies that contain all related individuals that have lived and died in a given population during a specific period ('extended genealogies').

No such tool currently exists in the field of demography. Most kin network data in demographic studies come from survey household rosters. These usually assume that families are limited to the household. Therefore, they tend to produce a series of unrelated family trees, one for each household interviewed (Randall & Coast, 2014). The resulting genealogies are ego-centric, meaning that they are defined exclusively in relation to the head of household. These cannot be used to produce extended genealogies since there is no way of merging individual ego-centric networks to create a unified data base of all kinship relations in a population (Milligan, 2010; Madhavan et al., 2017).

This section introduces the design of the EGM, emphasising respondent selection and data collection tools.

4.2.1. *Participant selection and reliability*

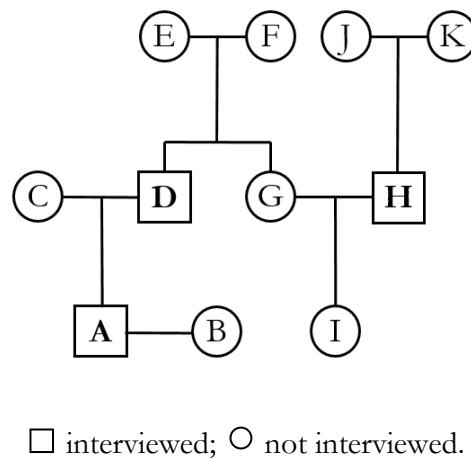
An extended genealogy is built by merging multiple family histories into a unique genealogical dataset. Genetic studies often rely on a census-like approach for this, where genealogical data are collected from all households in a given population. Post-hoc efforts are made to merge the data and remove duplicates (e.g. Choh et al., 2001; Pinkerton et al., 2011). This procedure generally produces one large cluster of related individuals and several minor isolated genealogies. The latter are usually ignored in the analysis. In a classical study of the genetic epidemiology of Chagas disease, Williams-Blangero et al. (1997) interviewed 1,758 individuals and found that 954 belonged to a single genealogy. The remaining 804 individuals, distributed amongst 254 unrelated family clusters, were subsequently dropped from the analysis. The rest of the section outlines a more efficient approach for collecting and managing genealogical data in local populations.

Participant selection is a central component of primary data collection. The EGM relies on a form of researcher-led chain-referral sampling (Platt, Luthra & Frere-Smith, 2015) to improve data collection efficiency by removing the need to interview every household in a population. The sampling strategy starts with a given seed respondent – who is purposefully chosen to meet criteria of accessibility, marital status, and age – and selects the next case from the list of individuals generated in the first interview. Multiple initial cases, or seeds, can be chosen and interviews conducted in parallel. More details on seed selection are given in the next section.

Interviews should follow a standard structure to reduce interview length and minimise respondent fatigue. Respondents are initially asked to produce information on their parents and siblings. The marriages and offspring of these individuals are then recorded in the EGM questionnaire (including nephews and nieces). Figure 4-1 represents a population reconstructed in this way from three hypothetical genealogical interviews. In this example, a seed interview with individual *A* produced data on individuals *A* through to *D*. A second interview with individual *D* produced data on individuals *A* to *I*. The last interview, with individual *H*, yielded information on her parents, spouse, and child (*G* to *K*). Note that the respondents for the next interviews were always drawn from the pool of individuals known at the time.

Seven out of the eleven members of this hypothetical population were reported in at least two independent interviews (individuals *A*, *B*, *C*, *D*, *G*, *H*, and *I*). I call this ‘multiple reporting’. Genealogical networks with a higher degree of multiple reporting (i.e. where individuals are reported by more independent sources) provide additional opportunities for cross-checking and inputting missing data. They can also be used to estimate the degree of underreporting (e.g. child mortality or childless marriages), as explained below.

Figure 4-1. Hypothetical genealogy demonstrating the logic of the EGM chain-referral sampling



This process should be repeated until all members of the population have been enumerated. I introduce the concept of ‘genealogical saturation’ as a criterion for evaluating to degree to which all members of a population have been registered in the genealogical interviews. The criterion is useful for determining whether more interviews need to be carried out. The concept is based on the notion of ‘theoretical saturation’, which in qualitative research is understood as “a process in which the researcher continues to sample relevant cases until no new theoretical insights are being gleaned from the data” (Baker & Edwards, 2012: 18). Drawing on this notion, I defined genealogical saturation as the point at which all members of the population and the kinship relationships between them have been accurately recorded using EGM interviews.

Genealogical saturation is achieved when collecting new genealogical data no longer increases the number of individuals or relationships (of descent or affinity) in a given

population. The genealogical chain-referral sampling results in a considerable overlap in reporting – someone might be reported as a mother in one interview and as a sister in another. Multiple reporting is a feature of this sampling method that helps mitigate the effects of recall bias, since multiple observations from independent sources exist for the genealogical records. It also addresses the known limitation that reporting reliability decreases for more distant relatives in genealogical interviews (Heady, 2010).

4.2.2. *Getting to know the population of interest*

Knowledge of local kinship dynamics and principles of social organisation is essential for making the participant selection process more efficient and for collecting data in a consistent manner – e.g. is there a unique local definition of a marriage? If this information is not available in the published literature, it can be generated from exploratory qualitative research. The same data can later be used to interpret the results of the quantitative analysis, since understanding local social norms can help screen for errors and inconsistencies in the data. Typographical and transcription errors can produce impossible circular relations (i.e. individuals married to themselves). Finally, it is useful to consider biological constraints. It is unlikely for individuals under 13 years of age and for women over 50 to bear children. Birth intervals shorter than 9 months for the same woman are also improbable. Automated checks can be implemented to identify these cases.

A first step in the process of collecting genealogies is to determine who counts as a member of the population. This is known as the “boundary specification problem” (Marsden, 2011: 371). The boundaries of the population have to be defined both ‘vertically’ (i.e. in terms of generational depth) and ‘horizontally’ (e.g. should the relatives of an in-marrying partner be recorded?). Clear criteria must be developed regarding migrants. Should they be followed up? It is important to keep in mind that the quality of the EGM-generated data will decrease with physical distance and time of separation, meaning that more interviews may be required to ensure that the data on migrants are accurately recorded. Researchers must also determine the type of relationships that the EGM will record. Families can be defined in strictly biological terms, but they can include adopted or fostered individuals, polygamous unions, or other forms of locally defined kinship relations. All of these criteria must be defined considering the research question, the size of the population, and the available resources.

This thesis was interested in reconstructing the demographic dynamics before, during, and after the 1982 mass killings in Río Negro. Therefore, the population of interest for the EGM interviews was defined as all the individuals who ever lived in Río Negro (and in the resettlement Pacux) before and up to 2015. Individuals who resided in the community but had no kinship ties to the original population were excluded from the study (e.g. a researcher living in the village for a year). Members of other communities married to Río Negro residents were included, but their own families (e.g. their parents and siblings) were not of interest for the study. These principles provided clear criteria for limiting the scope of the data collection, which would otherwise have extended indefinitely. Applying them systematically made the genealogical interviews more efficient by excluding non-relevant records.

4.2.3. *Data collection tools: the EGM questionnaire*

This section outlines the structure of the questionnaires that the EGM uses for registering genealogical data. The basic questionnaire consists of three sequential modules for recording household members, individuals, and marriages, respectively. A household was defined as the collection of individuals who regularly slept in one or more dwellings with a shared kitchen.⁶³ This thesis refers to the three modules collectively as the ‘EGM questionnaire’. The EGM differs from published guidelines in genealogical research in two important ways. First, it places emphasis on recording all the children ever born and not only those that survived to a certain age or formed a union (this is standard practice in birth histories). Second, the design includes an intentional degree of redundancy intended to reduce reporting error at the expense of making the interviews longer – examples are given below. Both features were introduced to improve the quality of the data.⁶⁴

The first component of the EGM questionnaire is the ‘Household Module’. This module is included to keep a record of current household characteristics and members. It is similar to household survey rosters but can include an ‘Individual ID’ field to link the members of the household to the ‘Individuals Module’ (see below). The EGM

⁶³ The definition was culturally appropriate, as expressed in interviews with KI-4 and KI-9.

⁶⁴ The EGM questionnaires used in this study can be found in Appendix N (translated from the original Spanish). All the questionnaires were pilot tested on the field and two local research assistants helped with the data collection.

questionnaire used in Río Negro only collected data on date of birth and civil state of household members. Additional fields can be included to collect information on schooling, employment status, etc., depending on the objectives of the study.

The second component of the questionnaires is the ‘Individuals Module’. In it, every row represents a unique individual. This module records information on all the members of the kin network, including their unique id, name, sex, date of birth, current age, date of death, age at death, survival status, cause of death, place of birth, parity, total number of marriages, and current location. Additional information can be collected to address specific research questions.

The third component of the questionnaire is a ‘Marriages Module’, in which every line represents a separate marriage between two partners. Two fields (‘Partner 1’ and ‘Partner 2’) reference the row numbers of the marriage members in the Individuals Module. As an extra precaution, interviewers can be asked to write the partner’s forename next to their respective ids. All current and previous marriages must be recorded in this module. The module also collects data on the characteristics of the marriage, including type of union (e.g. marriage, cohabitation), start date and end dates, reason for termination, etc. As with the previous component of the questionnaires, new fields can be added to record other information.

The EGM uses the principles of relational database design to record kinship relations. The Individuals Module and the Marriages Module are tables linked by ID fields that uniquely identify rows in each table. Table 4-1 shows how the hypothetical genealogy shown in Figure 4-1 would be recorded in this tabular format (including only individuals *A-G* for simplicity’s sake). The ‘Individuals Module table’ includes two columns that register the marriages associated with an individual. The ‘Parent marriage ID’ field refers to the ID of the marriage formed by the parents of the individual. The field ‘Couple marriage ID’ refers to the ID of the marriage(s) between the individual and their partner(s). A similar relational field is included in the ‘Marriages Module table’ (the colour of the columns indicate how the fields are linked across the two tables). The resulting tables are redundant by design: the repetition is intended to reduce typographical and transcription errors.

The EGM layout can be modified to incorporate existing data, such as archival records or registry data. Digital data collection tools can be used to display additional

information in real-time as new data are entered in mobile phones or tablets. This can include showing contextual data and images, or suggesting dates and potential matches from the existing genealogical records (more on this below). The EGM can be easily integrated with qualitative data collection tools. Interesting questions or themes emerging from the genealogical interviews can be explored in subsequent in-depth interviews or focus group discussions carried out with respondents identified during the genealogical data collection. The rest of this paper exemplifies these points by showing how the EGM was applied to reconstruct the demographic history of a war-affected population in Guatemala.

Table 4-1. Relational database design of the EGM questionnaires: Individuals and Marriages Module tables (recording a hypothetical genealogy)

Individuals Module table					Marriages Module table				
Ind.ID	Ind. name	Parent marriage ID	Couple marriage ID	...	Marriage ID	Ind. ID	Ind. name	...	
1	A	2	3	...	1	Partner 1	5	E	...
2	B	NA	3	...		Partner 2	6	F	...
3	C	NA	2	...	2	Partner 1	3	C	...
4	D	1	2	...		Partner 2	4	D	...
5	E	NA	1	...	3	Partner 1	1	A	...
6	F	NA	1	...		Partner 2	2	B	...
7	G	1	NA	...					

4.3. Applying the EGM after a mortality crisis

4.3.1. *The context: Río Negro*

Río Negro is a relatively isolated rural Maya Achi community in Guatemala that underwent a significant mortality crisis induced by armed conflict in the context of an ongoing fertility transition. In 1979, it was the major village on the basin of the Chixoy River in the central highlands of the country. From 1980 to 1984, in the midst of the country's civil war, the area was caught up in a spiral of violence, especially after construction works started for a state-owned hydroelectric dam that threatened to flood hundreds of acres of arable land (Einbinder, 2017).

EGM-generated data showed that more than a third of Río Negro's population died between 1979 and 1983; 94% of these deaths were directly attributable to the conflict.

After years of forced displacement, most of the population was resettled in a town built by the INDE Electric Company in the nearby municipal capital of Rabinal. The resettlement area was under strict military surveillance until the end of the civil war. The killings in Río Negro were identified as genocide in the report of the UN-backed Truth Commission established as a result of the signing of the Peace Accords in 1996 (CEH, 1999a).

4.3.2. *Implementation of the EGM*

This section gives details of the application of the EGM and discuss how it fitted into the general research design of the study outlined in the previous chapter. A mixed methods design was implemented to reconstruct the demographic history of Río Negro, including its experience throughout the armed conflict. An initial qualitative stage of the study generated contextual information for the design of the EGM questionnaire and the sampling.

Fieldwork was carried out between November 2015 and November 2016 in the municipality of Rabinal, Guatemala. Most interviews took place in the resettlement area, although short visits were made to other locations to collect information on hard-to-reach kinship groups. The initial three months were spent building rapport, getting acquainted with the local kinship organisation and creating an Event History Calendar (Axinn, Pearce & Ghimire, 1999) to help date events in relation to locally relevant landmarks, such as the building of a church or the establishment of the local maternity ward. The final calendar included 276 dated events between 1898 and 2016, including war-related events, political developments, and infrastructure projects. The calendar only included events that could be cross-checked using independent archival or historical records.

Genealogical data were collected between January and October 2016. Respondents for the two initial or seed interviews were selected according to three criteria: (a) they possessed relevant genealogical knowledge (as assessed by other members of the community), (b) they had been born before the 1982 massacres, and (c) they resided in Pacux. The initial qualitative component of the study provided the information needed to identify potential respondents for the seed interviews. Following a chain-referral sampling methodology, the next respondents were chosen from the pool of records produced by the previous interviews until genealogical saturation was achieved.

This method of selecting seed respondents could have biased the composition of the EGM-generated data since purposefully sampled seed respondents tend to be better connected than the population average (Platt, Luthra & Frere-Smith, 2015). In a genealogical network, this means that seed respondents would tend to have more relatives than the population average. This is a concern because it might bias the population towards members of more extensive kin networks. However, analysis of the genealogical data showed that this was not the case in Río Negro, where seed respondents had, on average, smaller close kin networks than the other respondents.

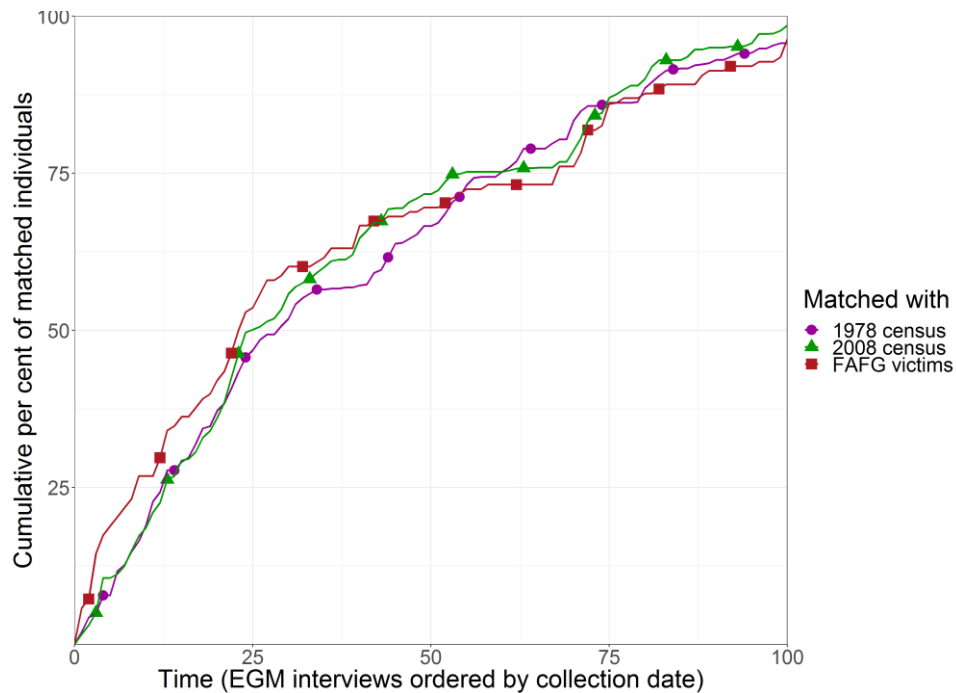
All in all, 112 genealogical interviews were scheduled in Río Negro. Of these, eight were refused, and four could not be finished given the advanced age of the respondents. The 100 completed interviews yielded information on 5,803 individuals and 1,604 marriages. Many of these were duplicates – 62% of all individuals were reported by at least two independent respondents. On average, each individual was recorded in 2.5 separate interviews ($sd = 1.26$). After removing the duplicate records, 3,566 unique individuals and 1,018 unique marriages remained. The genealogical data were processed in the field as they were collected and transcribed. I developed a suite of graphical user interfaces in the R language to manage the qualitative and quantitative data. R Shiny web applications (Chang et al., 2016) and record linkage techniques (Borg & Sariyar, 2016) were used to input, merge, and analyse the data.

On average, each interview recorded data on 58 individuals ($sd = 35.07$) and 16 marriages ($sd = 10.2$). The median interview length was one and a half hour (range 0.5-4 hours). 59% of the interviews were answered by a single respondent, and 68% were completed in a single visit to the household. Interviews with women and couples were preferred, since they are known to provide more accurate genealogical accounts than interviews conducted exclusively with men (Poletta, Orioli & Castilla, 2014). The interviews carried out in Río Negro included women in 50% of the cases.

4.3.3. Data completeness and genealogical saturation

This section discusses how genealogical saturation was evaluated to determine when the data collection should be terminated. Three tests were conducted to assess the completeness of the genealogical data produced by the EGM in Río Negro (i.e. to determine whether genealogical saturation has been achieved). All of them required comparing the EGM-generated data to independent population registers.

Figure 4-2. Genealogical saturation estimated by matching EGM-generated records with list of victims and with census records



Initially, the EGM data were matched by name to the records in a publically available dataset of victims of the Río Negro Massacres exhumed by the Guatemalan Forensic Anthropology Foundation (FAFG).⁶⁵ The FAFG list was incomplete since not all victims have been exhumed yet. Nevertheless, all the listed victims should have been reported during the EGM interviews. For the second and third tests, the genealogical records were matched by name and date of birth with the two local censuses available for Río Negro, one conducted in 1978 and another one in 2008.⁶⁶ Matching the EGM data with the census records provided the opportunity to assess genealogical saturation at two fixed points in time – before and after the killings.

These matching exercises made it possible to evaluate the progression towards genealogical saturation. The vertical axis in Figure 4-2 represents the completeness rate of the EGM-generated data matched against three independent sources. The graph

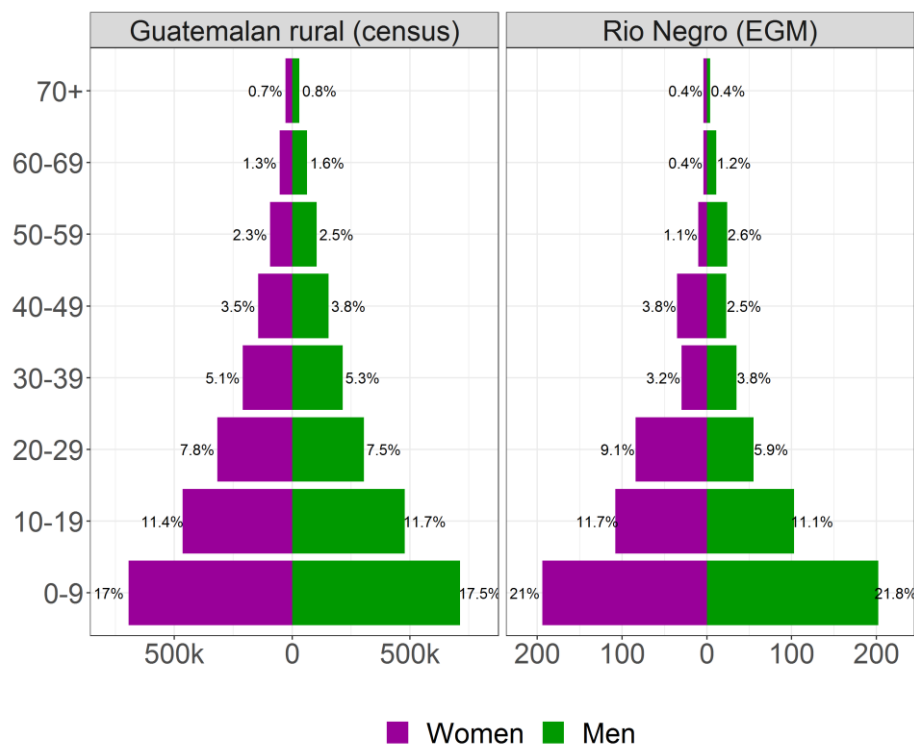
⁶⁵ https://www.fafg.org/bd/b_victima.php, accessed April 25 2018.

⁶⁶ The 1978 census was conducted by the INDE Electric Company to serve as a baseline for future compensation programmes. The 2008 census was carried out to identify the beneficiaries of the monetary war reparations provided by the Guatemalan government. See Chapter 3 for more details.

shows that completeness rates approached 100% after conducting the 100 genealogical interviews. The individuals who were missing altogether from the genealogical dataset were identified as members of three households for which all households members died during the war and had no living descendants. The percentage of omission (2%) is too small to have affected the final population composition significantly.

The sampling criteria prioritised accessible respondents. This means that the first interviews produced data on the more visible members of the population. Later interviews recorded information on harder-to-reach individuals. This included internally displaced members of the population or individuals with few living relatives. Initial interviews were more likely to report ‘new’ individuals who had not been reported before (50% of the census records were matched in the first 25 interviews). As the genealogical network became increasingly dense, the interviews produced more redundant records.

Figure 4-3. Age-sex structure of the Río Negro population – comparing genealogical data with census records



Source: Data from the 1981 Guatemala census (left) and from this study (right).

Anthropological and historical genealogies tend to underreport women and children (Zhao, 2001; Gamella & Carrasco-Muñoz, 2017). To evaluate whether this was the case

in Río Negro, it is useful to compare the population structure of the village, reconstructed from the genealogical data, with that of the Guatemalan rural population as a whole. A visual examination of Figure 4-3 shows that the age and sex distribution was remarkably similar for both populations in 1981, one year before the mass killings. This provides additional confirmation that the EGM produced reliable demographic data since Río Negro was a typical indigenous community before the mass killings, according to the 1978 INDE census report (Gaitán, 1981). The preceding analysis of genealogical saturation supported the conclusion that no particular demographic group was underreported in the genealogical data. The next section evaluates the quality of the EGM-generated data even further.

4.3.4. *Evaluating the quality of the EGM-generated data*

The system of multiple reporting built into the sampling of the EGM helped minimise the share of missing data resulting from non-response. Independent respondents produced duplicated records on the same individuals and these were later merged to assess data quality and reduce missing values.⁶⁷ The share of missing data of eight key demographic variables (date of birth, date of death, place of birth, current location, number of times married, marital status, children ever born, and cause of death) was reduced from 25% before merging the genealogical datasets to only 11% after their consolidation. Completeness rates were high across all individual variables, with the exception of the date of non-violent deaths (rates of missing values = 44%). The events of 1982 overshadowed non-conflict deaths. It is possible that interviewers and respondents made more effort to accurately report conflict casualties than non-conflict deaths.⁶⁸

The paper now considers four potential sources of bias in the genealogical data. This was essential because most of the EGM-generated records were ‘secondary participants’ (i.e. relatives of the respondent; see Chapter 3). The sources of error were evaluated by considering whether (1) data on more distant relatives were less accurate; (2) data quality

⁶⁷ Multiple systems were implemented to identify and merge duplicate records to avoid double counting. Records were matched by name, date of birth, date of death, and a range of other variables including mother’s name, mother’s date of birth, etc. This minimised the number of duplicate records, although inevitably some remained in the final database.

⁶⁸ Appendix J includes a table with the completeness rates for these variables.

was poorer for individuals who were not alive at the time of the data collection; (3) data on migrants were underreported; and (4) interview length affected reporting quality. Three indicators of data quality were considered to determine the presence of these sources of bias: age heaping, the share of individuals with no reported parents, and the share of individuals for whom the dates of birth and death were unknown (Table 4-2).

Table 4-2. Data quality and completeness of EGM-generated data: an evaluation of four potential sources of bias

	Whipple index for ages		Unknown values %		
	18-47	23-62	Parents id	Birth date	Death date
1 Distance to respondent					
Closest relative - Q1	95.2	96.2	9.0	3.1	2.5
More distant relative - Q4	103.9	94.5	19.1	4.0	1.6
2 Status in 2015					
Alive	100.2	97.8	15.1	3.8	NA
Dead	120.2	114.1	14.1	4.7	NA
3 Location in 2015					
Local	99.5	100.7	9.1	2.6	1.7
Migrant	105.7	100.0	26.5	5.8	1.8
4 Interview length					
Shortest - Q1	99.5	122.4	13.9	4.7	1.4
Longest - Q4	102.5	88.9	15.2	4.9	1.9

Whipple Index key: < 105 very accurate; 105-110 relatively accurate; 110-125 acceptable; 125-175 bad.

Overall, these sources of bias did not affect data quality systematically, with one exception. Information was less reliable for individuals who were already dead at the

time of the data collection. This is evidenced in the differential degree of age heaping between dead and living individuals. Social distance does not appear to have impacted data quality. Data on individuals more remotely connected to the respondent (defined using the shortest path to the respondent in a kin network) were less reliable, but the difference was not pronounced. The age of migrants was more likely to be rounded to the nearest 5 or 10 digit only for those aged 18-47. Migrants were, on average, less connected to the general genealogical network, as evidenced by the fact that their parents were more likely to be unknown. Finally, there was no evidence that respondent fatigue led to poorer reporting. More lengthy interviews (i.e. those reporting more individuals) were of a better quality. Older and better-informed respondents produced longer interviews with more reliable data. As expected, interviews with couples were the most reliable; those with only male respondents tended to be less complete and accurate.⁶⁹

This section found no systematic source of bias in the Río Negro EGM-generated data that would have significantly affected data quality. The next section includes examples of how data from the EGM were used to reconstruct the historical population of the village.

4.3.5. *Reconstructing the historical population of Río Negro using EGM-generated data*

The size and composition of a population are elemental demographic measures. Table 4-3 shows this breakdown for Río Negro in five selected years (1981, 1983, 1993, 2003, and 2013). The table gives the exact size of each demographic group and makes it possible to compare the distribution of the population over time.⁷⁰ Each of these yearly populations were reconstructed by conducting ‘pseudo-censuses’ on the genealogical data (i.e. by filtering only those individuals who were alive in any given year). The variables required for this filtering (date of birth and date of death) were obtained from the genealogical data. Pseudo-censuses could only be carried out after fully

⁶⁹ Measured in terms of share of missing data, accuracy of date reporting, and underreporting of known individuals.

⁷⁰ Apparent discrepancies between this table and population figures in later chapters result from filtering criteria. For example, the 1983 population in Table 4-3 is not the ‘surviving population’ as such – it includes both the survivors of the killings and their new partners from other communities.

deduplicating the EGM-generated records to avoid artificially inflating population size or over-representing any particular age group.

Río Negro has been a young population over time. The share of adults over 45 years of age has been consistently small, whilst children under 15 constituted a clear majority before the year 2003. There were signs of population ageing after this year, with the population under 15 constituting a smaller share of the total population in 2013. Nevertheless, the population remained relatively young at this point.

There was a clear 'dip' in total population size in 1982, resulting from the Río Negro Massacres. According to the genealogical data, 38% of the pre-conflict population was killed in 1982 (366 of the 970 original inhabitants of the village). A comparison of the 1981 and 1983 populations evidences that the 1982 massacres affected members of all age groups. More children under 10 were killed in absolute terms, but older males were the most affected after adjusting for population structure. The high incidence of child excess deaths suggests that mortality amongst the youngest was not underreported in the genealogical data. This is important because child excess mortality tends to be underreported in retrospective surveys.

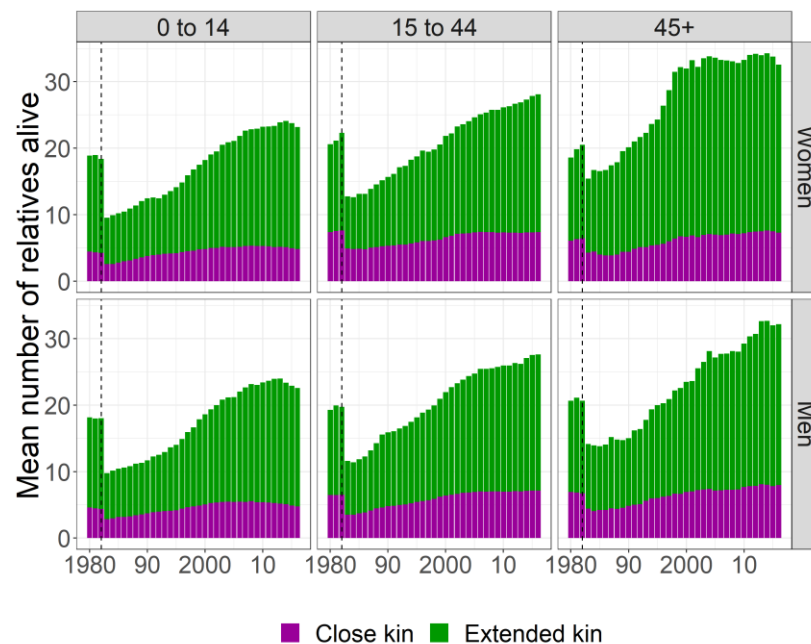
It is remarkable that, even though the mass killings produced extensive mortality, they did not alter the male to female ratio in any age group considerably. Men and women were similarly affected by excess mortality (179 women and 187 men were killed), even if more women of reproductive age were killed in total. Respondents in the FGDs reported that physical abuse and rape were common during these events, but these types of violence were not captured by the genealogical interviews. This suggests that violence was directed against young women in particular, as discussed in the next chapter.

Table 4-3. Age-sex distribution of massacre-derived mortality in Río Negro reconstructed from EGM data

Year Age group	1981 (pre-killings)		1983 (post-killings)		1993		2003		2013	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
0 to 4	106	103	61	65	121	145	175	169	139	147
5 to 9	88	99	75	80	98	106	185	164	143	145
10 to 14	74	56	56	51	57	62	120	142	172	165
15 to 19	34	47	27	36	72	78	97	106	184	162
20 to 24	48	26	20	21	54	50	57	62	120	139
25 to 29	36	29	25	26	27	35	70	78	96	98
30 to 34	18	16	12	9	20	21	53	50	57	59
35 to 39	12	19	10	10	25	22	27	34	68	76
40 to 44	17	12	6	7	12	7	20	20	53	48
45 to 49	18	11	9	1	9	9	25	22	23	32
50 to 54	4	13	6	5	6	6	11	7	19	20
55 to 59	6	11	3	6	7	1	9	9	25	20
60 to 64	2	9	1	2	5	4	6	6	10	6
65 to 69	2	2	1	3	3	6	7	1	9	9
70 to 74	3	1	0	1	0	2	4	4	5	4
75 to 79	0	0	1	0	1	2	2	6	7	0
80+	1	3	0	0	0	0	1	3	5	9
Total	469	457	313	323	517	556	869	883	1135	1139

Conflict mortality also affected the survivors of the violence. Data from this study showed that all the inhabitants of Río Negro lost at least one member of their extended kin during the mass killings.⁷¹ The genealogical dataset produced by the EGM was used to quantify the effects of the mass violence on kinship structure. This was achieved by considering changes in the number of close and extended kin alive over time. Figure 4-4 shows that women and men in all age groups saw a dramatic reduction in the size of their kin networks after the massacres. The average number of extended kin alive, for example, plummeted by 44% between 1981 and 1983 (from 19.3 to 10.8). This reduction was more dramatic for younger individuals. Children under 15 saw the average size of their extended kin networks more than halved in the same period (from 14.1 to 6). Adults over 45, on the other hand, lost 25% of their kin in the killings (from 13.8 to 10.4). These figures would be very difficult to obtain from traditional household surveys, which tend to focus on the relatives living in the household (Madhavan et al., 2017).

Figure 4-4. Number of close and extended kin for Río Negro inhabitants by sex and age group (1980-2015)



⁷¹ Close kin are parents, children, siblings, and spouses; extended kin also include cousins, aunts, uncles, nephews, grandparents, and grandchildren.

4.4. Discussion

4.4.1. *A genealogical approach for reconstructing population data*

The paper showed that the EGM can be used to produce quality demographic data on populations affected by armed conflicts by exploiting the network structure of kinship relations. It emphasised its uniqueness: the EGM is the first approach for producing high-quality data for demographic analysis from genealogical interviews. The method was designed to address the underreporting and data quality issues affecting anthropological genealogical data (e.g. by reducing the underreporting of infant mortality using multiple reporting techniques). The EGM produces the accurate and unbiased reporting required for demographic analysis. Strategies for improving accuracy include controlled redundancy in the questionnaire design and multiple reporting.

In the study of Río Negro, multiple reporting reduced non-response rate by 14% across all variables. The improvement was considerably higher in date of birth reporting, where the number of missing values was halved after integrating data from independent sources. Secondary data sources on the population can be used to assess the accuracy and completeness of the EGM data. Independent population registers were used for the case of Río Negro. Similar data can be obtained from other sources – registries in refugee camps or records kept by local organisations, for example. Even fragmentary data can be used to compare the respondents' accounts with independent records.

The EGM is characterised by its sampling efficiency, which takes advantage of the network structure of genealogies. The genealogical chain-referral sampling method substantially reduced the amount of data needed to reconstruct an extended genealogy, as compared to examples from the medical genetics literature. A population of 3,566 was reconstructed with considerable accuracy from only 100 genealogical interviews. This paper showed how individual-level demographic characteristics of the population can be calculated from these data. A flexible research design and dynamic data management tools allowed the selection of the most appropriate respondents at a given point in time during the data collection.

A third strength of the EGM is the successful integration of qualitative tools into its design. In Río Negro, formative qualitative work on local kinship dynamics was essential for establishing an appropriate research design. Qualitative data provided information on vernacular kinship terminology, marriages definitions, and child naming

and rearing practices necessary for interpreting the genealogical data in a relevant conceptual framework. The extended genealogy only recorded biological relations of descent and of marriage or cohabitation, relying on the local definitions and kinship terminology. Lastly, the iterative nature of the research design meant that qualitative and quantitative evidence could be constantly used to improve the demographic data collection procedures.

The extent to which kinship relations can be established between members of a population is determined by the generational depth of the data; mainly, by the number of ancestors known for every individual. This is known as ancestry depth. An individual with known parents and grandparents has an ancestry depth of two – one step from individual to parents; another step from parents to grandparents. A depth of two, the minimal required to identify cousins and parents' siblings, was available for 70% of the inhabitants of Río Negro. Cousins, aunts, and uncles could not be identified for one third of the population. Most of these were individuals in older cohorts who did not provide information about their own parents.

4.4.2. Limitations of the EGM method

Retrospective questions are prone to recall bias. This is a limitation that affects all retrospective data collection methods. The multiple reporting built into the EGM sampling strategy helped address this source of error, but it did not eliminate it completely. Recalling war-time violent events can be distressing and proper training should be provided to the interviewers; psychosocial support services should be identified in advance whenever possible.

The EGM can be used to reconstruct historical demographic data. This thesis successfully reconstructed the last 60 years of Río Negro's demographic history. However, genealogical interviews are unlikely to produce reliable data on the distant past (e.g. demographic events that took place over a century ago). The boundaries of the historical periods that can be reconstructed are limited by the accuracy of the respondents' recollections. Furthermore, the EGM was applied in a small, isolated, and rural community. It might be less successful in urban communities or in localities with high migration (Williams-Blangero & Blangero, 2006).

Focusing on a single population sacrifices external validity for greater depth. In this sense, there is a point to be made for analytical generalisations as opposed to empirical ones (Yin, 2009). The particular processes observed in Río Negro, for example, cannot be readily generalised to other populations. But they can help construct analytical frameworks that explain demographic behaviours in the context of other mortality crises.

The method outlined in this paper can be used to collect demographic data, including information on fertility, mortality, and marriage formation. It is not appropriate for collecting other types of information, such as longitudinal data on socioeconomic characteristics or health data. This limits the range of possible analyses. However, it is possible to link the genealogical data to other available data sources to obtain this information. The Río Negro genealogical data, for example, was linked to local censuses using record linkage techniques, which made it possible to obtain household-level socioeconomic data. Similar data sources can be available in other contexts.

A final note on ethics. Chapter 3 noted that ‘secondary participants’ are third parties about whom information is collected, but whose consent is not sought (Marsden, 2011: 384). This was the case for the eight individuals who refused to be interviewed in Río Negro. Given the networked structure of genealogies, their information could be retrieved from a sibling or a cousin. As was discussed in the section on ethics in the previous chapter, data were collected in this way under the assumption that kinship information is part of a shared communal knowledge.

4.4.3. Analysing the EGM-generated social network data

Reliance on survey-generated data has encouraged individual-level analysis in demography; it has also limited the choice of research questions and widened the gap between demographic research and social theory (Kirk, 1996; Bachrach, 2014). Although proposals have recently been made to address this issue (Madhavan et al., 2017), alternative methods are scarce. Social network analysis (Knoke & Yang, 2011) is a promising field of study that has only been partially explored in the demography of conflict, even though armed conflicts are usually assumed to have negative effects on the ‘social fabric’ (Justino, 2011: 13) or the ‘social bonds’ of a community (Esparza, 2005: 387).

A network perspective can help incorporate notions of social norms and institutions as exogenous factors that influence demographic behaviour. This approach provides a straightforward way of quantifying notions such as social support, transfer of information, and similar processes. Genealogical data are limited in that they do not consider networks of friendship or other forms of association. However, the principles of the EGM can be expanded to record them too. Kin network data can be used to analyse social structure, a concept that has generally been ignored in the demographic literature.

The structure of a network around an individual can be taken as an explanatory factor for that individual's behaviour. This is done in the next two chapters, which present studies of mortality and fertility in Río Negro. It is not sufficient to focus on the availability of networks of support, since, in itself, the structure of the network does not reveal anything about its function (i.e. whether individuals actually receive support from their social networks). How effectively these networks are used is important (Cohen & Wills, 1985; Rafnsson, Shankar & Steptoe, 2015). Integrating qualitative and quantitative data is key for achieving a more comprehensive understanding of these relationships.

Genealogical data are easily transformed to perform demographic analysis. This can be achieved by conducting pseudo-censuses on the data to obtain cross-sectional population figures. Time-variant demographic rates can also be reconstructed in this way. It is also possible to follow-up individuals or kinship groups over time in order to explore longitudinal changes in demographic behaviour. The association between variables of interest can be explored using traditional descriptive, regression, or survival analyses.

4.5. Concluding remarks

This paper outlined the principles of the Extended Genealogy Method (EGM), a systematic approach for collecting retrospective demographic data using socio-centric kin networks. Anthropologists, genealogists, and geneticists have collected family histories in the past, but no approach currently exists to ensure that the data meet the specific data quality requirements for demographic analysis. The EGM provides a unified framework for sampling, managing, and merging overlapping genealogies. It also provides a set of criteria to evaluate data quality and completeness, which no other methodology currently does. The EGM approach relies on a dynamic and efficient

sampling strategy that reduces the required sample size for reconstructing a population while maximising data accuracy. The generated data can be used to analyse demographic change at a community and at an individual level using traditional demographic analysis or more novel social network analysis tools.

Future studies can address different research questions by modifying the EGM questionnaires as necessary. Child fostering and adoptions can be easily studied by adding a field to record these relationships. Kin networks can be taken as proxies for networks of support. The EGM can be adapted to study networks of friendship or other types of relations. The principles of the EGM can also be applied to reconstruct multiple, unconnected, extended genealogies. This could be useful for studying, for example, kin networks or networks of support in displacement settings (Betts, Omata & Sterck, 2018). The United Nations High Commissioner for Refugees (UNHCR) has recently become interested in applying this approach to understand networks of support in refugee camps.⁷² There is a growing interest in applying social network analysis to understand the transmission of fertility in low- and high-income countries (Kohler, Billari & Ortega, 2002; Bernardi & Klärner, 2014). A major limitation of the studies to date is the lack of longitudinal social network data. A genealogical approach has much to contribute to this field of inquiry.

This chapter focused on the demography of armed conflict by showing how the EGM was used to reconstruct the population of Río Negro in Guatemala after an episode of mass violence thirty years ago. It showed that the EGM approach can be used to answer a wide range of research questions, particularly in the context of data scarcity. The following two chapters present studies that applied the EGM-generated data to explore mortality and fertility in Río Negro during and after the mass killings of 1982.

⁷² I say more on my contribution to these processes in the ‘Conclusions’ chapter of the thesis.

Chapter 5 Surviving the Río Negro Massacres: the role of family support⁷³

Abstract

Little is known about the role of social support in the context of mass violence. This paper explores the mechanisms linking family support to survival during and after the 1982 Río Negro Massacres in Guatemala using a unique genealogical dataset reconstructed from interviews carried out with survivors of the killings. Process tracing methods are used to explore four potential causal mechanism linking family support to mortality in the 1982-2015 period. The mixed methods research design combines qualitative data with quantitative analysis (logit and survival models). The study shows that residents with larger kin networks at the time of the killings were more likely to survive the event. The paper proposes that cooperation between close kin helped prevent direct deaths from the massacres thanks to information exchange and physical assistance. The study also shows evidence of the lingering effects of the killings on survivors. Social and psychological scarring are identified as determinants of differential long-term mortality after the massacres. Survivors who lost more relatives in the killings also died earlier in the years that followed. This is the first study to link social support to mortality using data on the same population before and after an episode of mass killings.

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Guatemalan journalist David Dubón said that in 1968, after the first terrible wave of counterinsurgency violence, the government held a census but his activist friends joked that it was not to determine “*cuántos somos sino cuántos quedamos*” (not how many there are, but how many are left).

Diane Nelson, *Who Counts? The Mathematics of Death and Life after Genocide*

5.1. Introduction

Mass killings of non-combatants have continued to be common during armed conflicts since the end of the World War II (Valentino, Huth & Balch-Lindsay, 2004).⁷⁴ Mass violence affects the social relationships in local communities, disrupting the dynamics of cooperation and support that characterise all human societies (Apicella et al., 2012). Close kin assist each other during natural disasters (Frankenberg et al., 2011) and social support can promote cooperative behaviour in the context of armed conflicts (Jennings & Sanchez-Pages, 2017), but no studies have looked at the role of social support in the context of mass killings. Previous research has highlighted the need to focus on social support in the context of mass violence since conflict mortality has adverse effects, including physical and mental health consequences, and increased mortality risks (Sibai, Fletcher & Armenian, 2001; Smith, 2016).

The study of social support in the context of extreme conflict mortality has been hampered by the lack of appropriate data (Li & Wen, 2005). Studies using aggregate, often country-level, data are not able to distinguish between deaths from massacres and deaths from other conflict events (Lacina & Gleditsch, 2005). This is problematic because massacres have specific characteristics. They affect non-combatants exclusively and are often accompanied by extreme psychological and sexual violence (Rehn & Johnson Sirleaf, 2002). Studies of the distribution of country-level mortality have shown that young men (aged 15-44 years) are, on average, more likely to die during conflicts (Obermeyer, Murray & Gakidou, 2008). However, excess mortality from mass killings tends to be more similar across age and sex. The mortality dynamics of mass killings remain largely understudied (Valentino, Huth & Balch-Lindsay, 2004).

⁷⁴ Mass killings, or massacres, refer to violent events resulting in the intentional death of at least five non-combatants. This follows the convention of the UN-backed Guatemalan Truth Commission (CEH, 1999a; cf. Valentino, Huth & Balch-Lindsay, 2004).

This paper focuses on Río Negro, an indigenous village in Guatemala that suffered extreme massacre-related mortality in 1982, during the country's civil war. The aim of the study is to explore the influence of social support provided by close kin (i.e. family support) on survival during and after these events. To meet this objective, two research questions are posed. *How did the availability of family support affect the risk of dying in the 1982 Río Negro Massacres? In what way did the loss of family support influence mortality risks after the mass killings (in the 1983-2015 period)?* This research used an innovative mixed-methods approach combining qualitative and quantitative analyses to consider the mechanisms linking family support to excess mortality in the context of mass violence. It is the first to study mortality in relation to cooperation within kinship groups using data on the same population before, during, and after mass killings. It provides a unique insight into the crucial role of close kin in the context of mass violence and the potentially negative effects of losing the support they provide.

5.1.1. *Family support and survival in the context of mass killings*

The study considers how family support (or its lack) is related to mortality risks in a population affected by mass killings. This section outlines four potential causal mechanisms (M₁-M₄) linking support to mortality both during and after the event of mass killing (Figure 5-1). This section discusses how these mechanisms relate to the existing literature on the subject.

The concept of social support is closely related to that of social capital, popularised in its contemporary form by French sociologist Pierre Bourdieu (1985). Social capital refers to the sum of the potential resources available to individuals derived from their membership of a social group. Resources can be economic or result from access to information or other institutional benefits of group membership. These ideas have heavily influenced the study of within-group cooperation, including the notion of social support as the mutual assistance provided by members of a social group or network (Portes, 1998). This paper defines family support as the social support provided by close kin. The scarce literature on social support during armed conflicts (Jennings & Sanchez-Pages, 2017) and natural disasters (Frankenberg et al., 2011) suggests that social support may have protective effects during and after events of mass mortality.

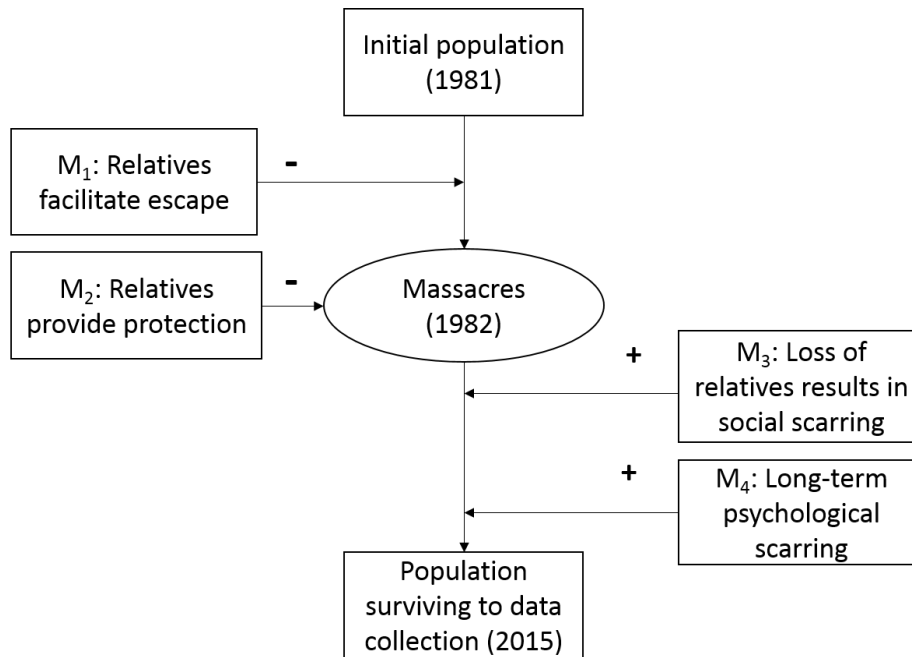
The paper proposed two causal mechanisms linking family support to survival during mass killings (M₁ and M₂). These hypothesise that individuals with larger kin networks

will be less likely to be killed during massacres. M_1 , *facilitate escape*, states that close kin will provide advanced warnings about an impending massacre if they are aware of it. Individuals might witness or hear rumours about triggers of mass violence, such as the execution of political leaders or political turmoil in neighbouring communities (Harff & Robert, 1998). It is difficult to study the word-of-mouth spread of rumours about mass violence (Bhavnani et al., 2009), but a recent study of online social networks found that better-connected individuals had an awareness advantage in the hours leading to the 2012 Hurricane Sandy in the US (Kryvasheyev et al., 2015). If awareness of a massacre spreads through social networks in a similar way, then individuals with larger families will be more likely to receive early warnings of violence.

An awareness advantage can only affect mortality outcomes if it is followed by action to avoid the massacres. Studies have shown that close kin play a crucial role in providing the economic and logistic assistance for escaping from political violence (Binford, 1996; Czaika & Kis-Katos, 2009). Therefore, it is logical to expect that access to more extensive networks of family support will increase an individuals' capacity to escape out of harm's way. This requires that non-combatants choose flight over fight as a survival strategy when faced with the prospect of mass violence; eyewitness accounts suggest that this was the case before the Río Negro Massacres (EAFG, 1995; CEH, 1999a, and this study).

The second mechanism, M_2 is concerned with those who stay behind and must face the perpetrators. It proposes that close kin will *provide physical protection* during the killings by acting as human shields, facilitating concealment or escape, or confronting perpetrators. Published accounts from massacre survivors suggest that these strategies are not always successful and often result in the death of the protector (EAFG, 1995; Binford, 1996). Individual-level characteristics (e.g. age and frailty) influence the type of physical assistance available to an individual; adult, able-bodied, and healthy individuals are generally in a better position to provide physical assistance (Davis, 1996). The provision of assistance is also influenced by social norms; parents, for example, are expected to assist their young children. The role of physical protection provided by close kin during mass killings has not been studied before, but research has found that close kin provide life-saving physical assistance during natural disasters (Frankenberg et al., 2011).

Figure 5-1. Four mechanisms linking family support to survival in the context of mass killings



Source: Author. Key: + increases mortality risks; - decreases mortality risks.

This study was also concerned with the long-term impacts of the violence on the population that survived the Río Negro Massacres. It hypothesised that survivors whose families experienced higher mortality during the killings were less likely to survive themselves in the aftermath of the event. The two mechanisms affecting long-term mortality after the killings (M_3 and M_4) were derived from the premise that networks of family support were disrupted by the massacres. Close kin provide support; the ‘holes’ left by their absence has negative consequences for survivors of mass violence.

Claudia Card (2010: 262) defined social death as the process whereby the perpetrators of genocide “aggravate physical death by making it indecent, removing all respectful and caring ritual, social connections, and social contexts that can make dying bearable and make one’s death meaningful”. This study proposes the related concept of *social scarring* (M_3) to describe the effects of mass violence on those that survive it. Mass mortality disrupts family support by creating smaller and more loosely connected kinship groups, ultimately leading to reduced opportunities for cooperation. This affects the vital communal dynamics that facilitate cooperation in kin-based societies. The reduced size of the potential networks of support caused by the death of close kin restricts access to resources in the aftermath of violence, a situation that has been described as damage to

the ‘social fabric’ of communities (Smith, 2016: 242). Social scarring matters because, amongst many other things, close kin provide food, shelter, and the means for preventing disease. Limiting access to these vital resources can lead to malnutrition and infectious diseases, two of the main causes of indirect conflict deaths (Davis, 1996; Lacina & Gleditsch, 2005).

The last mechanism identified in this study (M_4) refers to the effects of the process by which the lack of family support would have contributed to an early death after the mass violence. This can be called *psychological scarring*, following the established literature (Costa, 2012). The experience of mass violence can produce feelings of loss of meaning and belonging, post-traumatic stress disorder (PTSD), depression, and, ultimately increase long-term mortality risks (Sibai, Fletcher & Armenian, 2001; Warner, 2007). Research has shown that Guatemalans who survived a massacre or witnessed the violent death of a relative were more likely to develop symptoms of anxiety and PTSD compared to victims or other types of human rights violations (Sabin et al., 2003). The loss of close kin aggravated this process, since close kin provide emotional support for coping with the detrimental mental health consequences of armed conflict. Existing studies have documented the acute negative psychological effects of the Guatemalan Civil War (e.g. Melville & Brinton Lykes, 1992) and the importance of networks of family support for dealing with trauma in its wake (Warner, 2007).

To sum up, the first two mechanisms (M_1 - M_2) are hypothesised to increase survival before massacres, whilst the other two (M_3 - M_4) are hypothesised to lower survivorship after the mass killings.

5.1.2. *Mass killings in Guatemala: the case of Río Negro*

The end of the 1970s was a turbulent period in Central America. The Sandinista revolutionaries deposed the U.S.-backed dictator Somoza in Nicaragua in 1979, shortly after a civil war broke out in nearby El Salvador. In Guatemala, an armed struggle between Marxist guerrillas and government forces had been underway since 1960. The dynamics of the conflict changed dramatically during the late seventies and by the early 1980s, military campaign plans outlined a new scorched earth policy in which indigenous populations were defined as an ‘internal enemy’ of the state (Schwartz & Straus, 2018: 9).

Between 1980 and 1982 state violence was directed against non-combatants in an attempt to cut support for an insurgency that came very close to seizing power (Schirmer, 1998). There was a systematic campaign of mass violence that resulted in up to 75,000 casualties (Valentino, Huth & Balch-Lindsay, 2004); the aggregate death toll of the conflict ranged between 119,300 and 145,000, of which 83% of all direct deaths were amongst the indigenous population. More than 600 massacres were committed by the military in the course of the conflict, according to the UN-backed Guatemalan Commission for Historical Clarification (CEH) (1999a: 519).

This paper analyses the effects of mass violence in Río Negro, a Maya Achi community in the heart of the Guatemala highlands. The ethnic group numbered 50,000 in 1981, of which around 1,000 lived in Río Negro at the time of the killings. The CEH (1999a: 317) reported that the Guatemalan state committed acts of genocide against the Maya Achi between 1981 and 1983. This coincided with the building of the Chixoy Hydroelectric Project, the largest and most important hydroelectric power plant in Guatemala, providing around 15% of its energy needs. The construction of the dam was coordinated by the Guatemalan National Electricity Company (INDE) from 1977 to 1985 with funds from the World Bank and the Inter-American Bank, amongst others. The ongoing conflict and the major infrastructure project resulted in the internal displacement of thousands of local residents (CEH, 1999a).

At the time, Río Negro was the most populous village in the Chixoy River basin. A local census carried out immediately before the killings (Gaitán, 1981) reported that Río Negro was an impoverished agricultural community with high rates of infant mortality (89 deaths per 1,000 births), malnutrition (69% of children under 15 were stunted), and a high prevalence of infectious diseases. The nearest health clinic was in the municipal capital of Rabinal, eight hours away by foot. Poverty was widespread in the village and data on crop and livestock ownership showed that economic inequality was low before the massacres.

Nearly 40% of the inhabitants of Río Negro (all non-combatants) were killed in five massacres carried out by paramilitary forces between February and September 1982.⁷⁵

⁷⁵ The perpetrators belonged to the so-called *Patrullas de Autodefensa Civil* (Self-defence Patrols). These state-sponsored paramilitary group was responsible for 18% of the known human rights violations during

Testimonial evidence from this thesis and published accounts from survivors (EAFG, 1995; CEH, 1999a) suggest that the killings followed a similar pattern. The population was initially surrounded and forced to march to isolated locations such as mountaintops. Close kin were permitted to remain together but were sometimes separated as they suffered from physical and sexual abuse. Most women aged over 10 years and some men experienced sexual violence and rape. Forensic examinations of mass graves revealed that the killings were carried out using rocks, ropes, and machetes; young children and newborns were smashed against boulders. The massacres lasted several hours – it takes a long time to kill with only rudimentary technologies.

After the killings, the surviving population took refuge in neighbouring hills for several months. Evidence from this study showed that the community organised around kinship lines during this time; close kin (parents, children, and spouses) formed the basic unit of survival, with some groups including members of the extended kin. The area was repeatedly bombarded by the military until an ‘amnesty’ was declared in 1983 by Efraín Ríos-Montt (the former dictator who in 2013 was found guilty of genocide) offering a resettlement for the survivors. Many of those who accepted were tortured and some executed. By 1984 the majority of survivors had been resettled in a purpose-built camp (Pacux) close to the municipal capital where they remained under strict military surveillance until the official end of the war in 1996. Extrajudicial killings, torture, and sexual violence were common in Pacux and mobility was highly restricted, which reduced outmigration to very low levels. Data from this study showed that less than a fifth of massacre survivors had migrated out of Pacux by 2015. Access to food and sanitation was limited in the village, which was run by the army as a concentration camp (EAFG, 1995).

The Río Negro Massacres are an appropriate case for studying patterns of excess mortality for four reasons. First, sufficient time (33 years) has elapsed to study the long-term effects of the killings whilst still being able to collect data from the survivors. Second, the massacres did not result in extensive displacement since the population was forcibly resettled in a military-run camp where mobility was highly restricted. This

the Guatemalan Civil War (CEH, 1999a). According to a former INDE field supervisor interviewed for this study (interview with KI-9), the massacres were carried out with the full knowledge of local and national authorities.

greatly reduced in- and out-migration until 1996, when the Guatemalan Civil War came to an end; military personnel continued to monitor the entrance to the camp until 2004. Third, Río Negro was a kin-based society at the time of the killings, meaning that kinship played a central role in the social life of the community and influenced marriage dynamics, patterns of residence, the organisation of labour, etc. This point is discussed further below. Finally, the Guatemalan Civil War remains largely unexplored, despite its large death toll, including three accounts of genocide (Schwartz & Straus, 2018). The massacres of Río Negro remain one of the most emblematic of all the state-sponsored acts of violence during the country's war, but has received no attention in the demographic literature.

5.2. Research design

This study was grounded on the principles of process tracing, an analytical approach developed in sociology and political science to reveal 'traces' of hypothesised causal mechanisms using within-case evidence (Bennett & Checkel, 2015). Process tracing provides a conceptual and practical framework for combining mixed-methods evidence to explore demographic processes in studies of local populations. The approach has not been applied in demographic studies in this way before, to the best of my knowledge.

The case-centric process tracing approach used in this study starts by defining and operationalising a set of hypothesised mechanisms and proceeds by evaluating their feasibility given the available evidence and in light of rival explanations (Beach, 2017). Mechanisms, as understood in the process tracing framework, are not causes but processes triggered by causes. Mechanistic evidence, therefore, does not amount to causal inference. Process tracing requires the researcher to "mentally inhabit the world of the hypothesis" to ask "how surprising (low probability) or expected (high probability) the evidence would be in that world" (Fairfield & Charman, 2017: 369). The analysis should determine whether the found mechanistic evidence is part of a generalised pattern or whether it is specific to a given source.

To achieve this, the paper used a mixed-methods research design. Quantitative and qualitative data were combined to provide a detailed description of the evidence related to the causal mechanisms identified in the previous section. By bringing together quantitative and qualitative evidence in this way, this study provided a nuanced account of the processes that linked mortality to family support in the context of the Río Negro

Massacres. The inhabitants of Río Negro alive at the start of 1982 (before the mass killings) were the population of interest. All data for this study were collected by the author in the village of Río Negro and in the resettlement camp Pacux (jointly referred to as Río Negro hereafter) from November 2015 to November 2016.

5.2.1. Collecting genealogical data from survivors of the genocide

The quantitative data come from a genealogical dataset that included all the inhabitants of Río Negro between 1982 and 2015. Relational fields were used to record all relations of marriage and descent. The dataset recorded dates of births, deaths, and marriage formation and dissolution. No other data source has recorded the demographic life of a massacre-affected population with this level of detail. The data were obtained by collecting and matching genealogical records in contemporary Río Negro; 100 genealogical interviews were carried out successfully with survivors of the mass killings (89% response rate). A calendar of local events was used to aid recall. Cause of death was recorded for over 95% of all reported deaths.⁷⁶

Respondents were selected using a chain referral method. Two initial seed respondents were identified using qualitative data from the study. Seed selection took into account local knowledge, experience of the conflict, and access to participants. The initial interviews produced data on the parents, siblings, spouses, children, nephews, nieces, and grandchildren of the respondents – a total of 79 records. Respondents for the next interviews were selected from this list if they (a) were older than 35, and (b) could provide data to expand the genealogical dataset. The age limit was chosen after data from pilot interviews showed that younger respondents (i.e. older than 18) provided less reliable genealogical reports. This approach, intended to maximise the number of new records produced by each interview, required real-time data processing to identify and merge duplicates as new data were collected.

⁷⁶ The EGM questionnaires recorded the following causes of death: ‘conflict violence’, ‘injuries (violent, non-conflict)’, ‘injuries (non-violent)’, ‘disease’, and ‘other causes’ – see Appendix N. The categories were defined to be broadly comparable to other data sources. Pilot EGM interviews revealed that participants were unlikely to report more specific causes of death, such as cardiovascular disease.

5.2.2. *Quality and completeness of genealogical data*

The data collection produced a high-quality genealogical dataset containing all members of the population for 1982-2015. The completeness of the genealogical dataset was assessed by comparing the collected information to independent population registers. A first test successfully matched 98% of the records in two local censuses (1978 and 2008) to the genealogical data by name and date of birth. The primary data were also compared to a list of known massacre victims, 94% of whom were reported independently in the genealogical interviews. Finally, the age-sex distribution of the Río Negro population in 1981 proved to be almost identical to that of the rural population in the country at the time.

The genealogical data can be prone to survival bias and individuals with no living descendants may be less likely to be reported. This is important because deaths from massacres were clustered within kinship groups – 16% of the 1978 households had all their members killed in the massacres (22/138). Nonetheless, the genealogical data approached completeness of death registration even within kinship groups that suffered very high mortality during the killings: only 2% of the household reported in the 1978 census were not captured by the genealogical interviews (3/138). Further underreporting may have resulted if emigrants were systematically omitted from the dataset. However, outmigration from Pacux (the resettlement camp) was heavily restricted by the Guatemalan Army after the massacres and significant steps were taken during the data collection to include information on migrants. Additional interviews were conducted in the Alta Verapaz region, where almost half of Río Negro migrants resided, to minimise underreporting caused by outmigration.

Multiple checks were used to improve data reliability. The data overlap resulting from the sampling methodology helped improve data. An algorithmic approach was applied to resolve inconsistencies in the data based on a series of operationalised assumptions about response patterns (e.g. data accuracy decreases with social distance; mothers provide more reliable data about their children than fathers, etc.). An analysis of the reported dates of birth showed little evidence of age heaping and there was no evidence of male-bias due to the underreporting of female records. The number of individuals for whom no parents were reported in the genealogical data was used to determine

whether the number of close kin of massacre victims was underreported.⁷⁷ The share of missing values was equivalent for victims (14%) and survivors (13%). This suggests that it was unlikely for the number of close kin to be systematically underestimated for those that died during the killings.

5.2.3. *Statistical analysis of the genealogical data*

A binary logistic regression, considering only the 970 individuals alive at the start of 1982, was used to study the association between family support and direct massacre mortality (M_1 and M_2). The outcome variable determined whether an individual died in the killings. Family support was operationalised as a function of the number of live close kin. Qualitative data from the study suggested that the location, age, and social roles of close kin were particularly important for determining the amount and quality of support they were able to provide. Weighted variables were computed to reflect the support that each relative could have provided given their age at the time of the killings. For example, adults aged 15-44 were presumed to be able to assist children under 15 and adults aged 60+. It was assumed that children aged under 5 provided no support at all. The variable ‘number of close kin alive at the year of killings’ recorded the number of close kin alive at the start of 1982. A quadratic transformation of the variable was included to account for the quadratic relationship between kin size and probability of being killed in the massacres (described later in this paper). The model controlled for whether an individual was born locally (i.e. in Río Negro) and included covariates for their birth cohort and a socioeconomic index computed from data on pre-killings crop and livestock ownership derived from the 1978 census.

A Cox proportional hazards model with time dependent covariates was fitted to the data to explore the long-term consequences of the violence (M_3 and M_4), the second research question. The population of interest were the 604 individuals that survived the massacres observed over the 1983-2015 period. The main explanatory variable was the share of close kin killed in the massacres. A test of the proportional hazard assumption showed that it held for all covariates and for the Cox model itself. The variable ‘number of close kin surviving after the massacres (time-variant)’ recorded the number of living close kin in any given year. Socioeconomic status at the time of the killings was included

⁷⁷ Unless stated otherwise, ‘close kin’ refers to the parents, children, siblings, and spouses of an individual.

as a proxy for individual-level frailty since no health data were available. The remaining covariates were equivalent to the ones in the logistic model. All statistical models were run and are presented separately for women and men.

5.2.4. *Qualitative evidence: data collection and analysis*

Qualitative data come from discussions with survivors of the genocide living in the resettlement Pacux. The fifteen Focus Group Discussions (FGDs) included questions about personal war experiences and life after the killings. Participants were selected purposefully to be representative of the population in terms of age, sex, number of close kin lost during the conflict, and other individual-level characteristics. The demographic information to select the participants was obtained from the quantitative component of the study. The FGDs often followed the narrative conventions of *testimonios*, as was mentioned in Chapter 3.

The qualitative analyses in this study aimed to identify mechanistic evidence of the causal mechanisms linking family support to mortality outcomes during and after the mass killings in Río Negro. A two-stage qualitative coding strategy combined deductive and inductive approaches to categorise the empirical traces of the different constituent parts of the theorised causal mechanisms (Saldaña, 2009). The initial phase of the analysis relied on a theory-derived codebook in which mechanisms were analysed as entities (represented by nouns) engaged in activities (represented by verbs), following process tracing practice (Beach, 2017). Inductive codes were introduced at a later stage to record emergent dimensions of the evidence or to account for alternative explanations. The contextual conditions that may have affected the phenomenon under study were recorded using separate codes. The qualitative analysis was conducted using the original Maya Achi transcripts and emergent codes were created *in vivo* (i.e. they were labelled using the participants' literal words) to take into account local cultural understandings. The illustrative quotes presented in this paper were translated by the author and are attributed to respondents using pseudonyms.

5.3. **Survival in Río Negro (1982-2015): results from this study**

Río Negro was a typical rural Mayan community at the time of the killings. Data from this study showed that the population was young (median age = 12 years; 56% population aged under 15 years), homogeneous (around 85% had been born locally and

all were of the same ethnicity), with a low age at first marriage (several marriages having started at age 13), and high fertility (Total Fertility Rate was 7.8 in 1978). The qualitative data suggested that pre-conflict Río Negro was a kin-centred community and individuals had a high share of long-lasting and close ties to their close kin. Kin-centred social networks are characteristic of traditional societies and contrast with societies where non-kin ties (friends and acquaintances) have a greater societal relevance (Apicella et al., 2012). The kinship system in the village was patrilineal, residence was patrilocal, and traditional gender norms prevailed. Parallel to these there were a series of social institution that promoted community-oriented behaviour, such as *cofradías* (Carmack, 1979). Households were composed of parents with their young children and often included other members of the paternal kin, known as *alaxik* in Maya Achi (i.e. cousins, aunts, uncles, nephews, grandparents, and grandchildren).

Río Negro experienced a dramatic transformation after the 1982 mass killings. By 2015 most of the survivors lived in the resettlement Pacux and a small number had settled close to the original location of the village, now flooded by the Chixoy Dam. Qualitative discussions revealed that improved access to education, the market, and the media had contributed to erode traditional values and forms of social organisation, including relaxing traditional gender roles. Many of the village elders and all of its religious experts, known as *ajq'ijab'* in Maya Achi, were killed in the massacres. Important social institutions such as the *cofradía* disappeared from the community with them. Nonetheless, kinship was still patrilineal, even when patrilocal arrangements were complicated by overcrowding and military-imposed restrictions of movement. According to a local expert interviewed for this research, reports of domestic violence against women were still commonplace in the village in 2015.⁷⁸

The violence against Río Negro villagers in 1982 was generalised. In a 2008 trial, men accused of having taken part in the Río Negro Massacres acknowledged that they had been instructed to kill every person in the village.⁷⁹ Most houses were burnt down and livestock and crops were plundered or destroyed. Table 5-1 summarises the excess mortality resulting from the Río Negro Massacres based on the genealogical data from this study. Differences in death rates were negligible across genders, even if more men

⁷⁸ Interview with KI-8.

⁷⁹ http://www.corteidh.or.cr/docs/casos/articulos/seriec_250_ing.pdf, accessed August 08 2018.

over 44 years died than women of the same age. However, the mortality differences in this age group are not large in absolute terms since Río Negro was a young population at the time of the killings (only 94 out of the 970 members of the community were older than 45).

Mortality was highest amongst adults in relative terms (as a share of the number of adults alive), but more children were killed in absolute terms. There were practically no gender differences in the mortality rates of the 163 children under 15 killed in the massacres. The mortality profile in the village was more balanced than the national conflict mortality. Female mortality was 1.4 times higher in Río Negro compared to the Guatemalan conflict as a whole and 1.9 as high as in other contemporaneous conflicts (Obermeyer, Murray & Gakidou, 2008). Under 5 excess mortality was 6.2 times higher in Río Negro than in the overall Guatemalan Civil War. This is important because high mortality across all genders and age groups may be a distinguishing feature of mass killings.

Table 5-1. Number of Río Negro residents alive at the time of the killings and distribution of massacre-derived excess mortality by sex and birth cohort

Age at killings	Alive before massacres			Killed in massacres ^a			Killed in massacres (%)		
	(A)			(B)			(B/A)*100		
	All	Women	Men	All	Women	Men	All	Women	Men
0 to 14	544	273	271	163	82	81	30.0	30.0	29.9
15 to 44	332	170	162	147	75	72	44.3	44.1	44.4
45+	94	43	51	56	22	34	58.9	51.2	66.7
Total	970	486	484	366	179	187	37.7	36.8	38.6

Source: Data from this study.

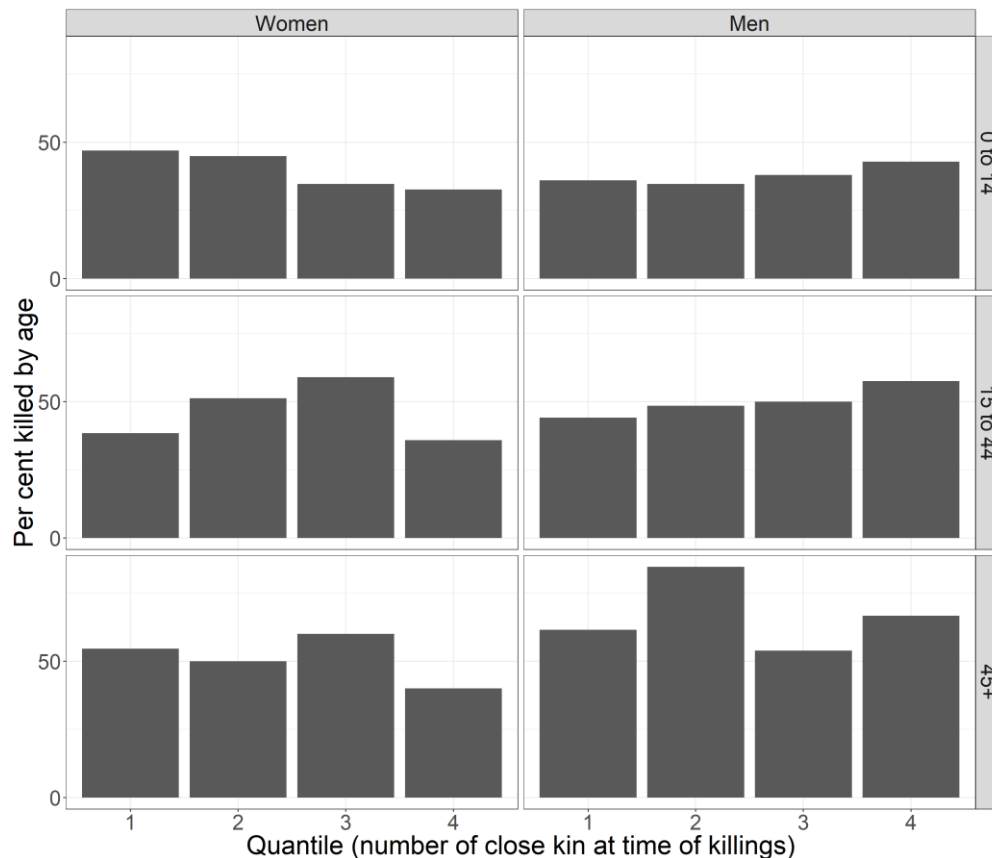
a. Total number (count) of individuals that died in the mass killings by birth cohort.

5.3.1. *Surviving the killings: protective effects of family support*

This section considers the evidence relating to the existence of the theorised causal mechanisms based on qualitative and quantitative analyses. M_1 and M_2 were derived from the hypothesis that family support led to lower direct mortality during the 1982

killings. This was the result of close kin providing both advanced warnings and the means to escape before the killings (M_1) and of close kin physically protecting each other during the event (M_2). Evidence that individuals with larger kin networks were more likely to survive would be consistent with these two mechanisms.

Figure 5-2. Distribution of massacre-derived mortality according to number of close kin alive by sex and birth cohort



Descriptive evidence of the relationship between number of close kin and massacre mortality is shown in Figure 5-2. The number of women under 15 killed in the massacres decreased with larger kin sizes. The opposite was true for men aged 0-44: those with more relatives were more likely to be killed. The figure showed a quadratic association between kin size and mortality risks for women aged 15-44. The lack of a clear pattern for individuals older than 45 is unsurprising since the age group had considerably fewer members in 1982 (less than 10% of the total population belonged to this age group).

Table 5-2. Direct mortality from the massacres as a function of the available support from close kin – output from logit model

Outcome:	Model 1		Model 2		Model 3	
	Women	Men	Women	Men	Women	Men
Number of close kin alive at the year of killings						
Number of close kin (total) ^a	0.90** (0.05)	1.03 (0.06)	0.84*** (0.05)	0.98 (0.06)	0.84*** (0.05)	0.97 (0.06)
Number of close kin (squared) ^a	1.01 (0.00)	1.00 (0.01)	1.01* (0.00)	1.00 (0.01)	1.01* (0.01)	1.00 (0.01)
Spouses able to provide support ^b					0.59*** (0.09)	0.77** (0.10)
Children able to provide support ^b					1.00 (0.09)	1.22** (0.12)
Parents able to provide support ^b					1.15 (0.12)	0.98 (0.10)
Born in Río Negro [Ref.: Other]			6.75*** (3.11)	2.50** (0.96)	6.11*** (2.99)	2.78** (1.12)
Socioeconomic index			1.00 (0.06)	1.03 (0.06)	1.00 (0.07)	1.03 (0.07)
Age at killings [Ref.: 15-44]						
0-14			0.53** (0.14)	0.54** (0.14)	0.19*** (0.08)	0.38*** (0.14)
45+			1.07 (0.47)	2.09* (0.81)	0.81 (0.58)	0.72 (0.44)
Observations	330	340	330	340	330	340
Pseudo R2	0.02	0	0.11	0.09	0.17	0.12

* $p < 0.1$ ** $p < 0.05$ *** $p < 0.001$

a. Count variable recording the total number of parents, spouses, siblings, and children alive at the start of 1982 (i.e. before the killings). b. These are weighted variables that consider the number of close kin alive in 1982 and their age as a proxy for family support before the killings.

A set of binary logistic regressions was fitted to the 1981 Río Negro population to explore the factors associated with differential survival during the massacres. The three models in Table 5-2 include a quadratic term to account for the non-linear effect of kin size on the odds of surviving the killings. The results confirmed that the odds of dying in the massacre were significantly lower for women with larger families at the time of

the killings after controlling for all relevant factors. The same was not true for males, for whom kin size did not predict differential survival (i.e. the effect size was small and non-significant in all models). Models 2-3 show that locals, women in particular, were less likely to survive the killings than those born elsewhere.

Model 3 showed a stronger positive association between the availability of spouses and the odds of surviving the killings, suggesting that having a spouse in a position to help had a protective effect for both partners during the killings, all else being equal. Parental availability was not associated with the outcome variable. However, this does not mean that parents did not attempt to assist their offspring. Multiple eyewitnesses referred to instances of parents attempting to save their children but being unable to do so (and being killed together as a result). The statistical analysis supports this: the odds of a father surviving the killings decreased with each additional child he had. Finally, there is no evidence that socioeconomic status determined differential mortality risks during the Río Negro Massacres.

The qualitative analysis provided additional evidence on the proposed mechanisms. M_1 hypothesised that information about the killings was available in advance and that it spread through kin networks. The historical evidence supports this, especially since separate mass killings had already been committed in the area before the Río Negro Massacres (EAFG, 1995). In the qualitative discussions, several respondents recalled that news of these massacres had been related to them first hand from close kin:

Santa: Many were killed in Xococ, they were tortured and their ears were cut off. It was very sad. But at the time nobody in Río Negro thought it was true. It's all lies, they said, it's a trick to steal our lands. But then the survivors came back. They were crying and they told us the stories. I managed to flee with my family but others stayed behind and died.

FGD_B_1, with women aged 17 to 27 the year of the massacres

Nevertheless, many stayed in the village even after being warned about the imminent massacres. Some did not believe what they regarded as rumours and others had nowhere else to go. Participants in the qualitative discussions emphasised that the geographic distribution of kin networks was important because those with close kin outside of the village were better able to escape from the violence. The fact that locals were less likely to survive the killings supports the hypothesis that kin networks of

support provided the means for avoiding the massacres altogether (especially as there was no evidence that victims were targeted because of their place of origin.).

M₂ assumed that close kin remained together at the time of the killings and that they attempted to assist their close kin during the violent event. It takes a long time to carry out a massacre using only machetes, rocks, and ropes. This means that individuals had time to seek assistance from close kin, particularly since no effort was made to split families immediately before the killings. According to survivors' testimonies, the Pacoxom massacre, in which 177 members of Río Negro were murdered, started in the morning of the 13th March 1982 and carried on into the late afternoon. Kinship groups were made to walk three kilometres to the site of the killings; women were forced to perform traditional dances and many were raped by members of the PAC militias from the neighbouring village of Xococ.

The qualitative data included several examples of individuals facilitating the escape or concealment of their close kin during this period. A woman pushed her children off a cliff in a desperate attempt to save them. Parents often acted as human shields. Testimonies of individuals refusing to assist their close kin were rare, suggesting a tendency to underreport egoistic acts such as choosing flight over cooperation. Altruistic behaviour in the face of death is possible, but it seems unlikely that it was a universal response to the mass violence.

Survivors emphasised the role that social expectations played during the killings. Healthy, able-bodied, adults were expected to assist the elderly and the young. Most of the survivors believed that individuals had a duty of care towards members of their close kin. Fathers were expected to assist all their close kin, whilst it was assumed that mothers would protect their children. However, not all strategies to minimise risk were successful. Many believed that the perpetrators would not harm women and children, who stayed behind whilst the men hid in the neighbouring hills. This had lethal consequences for those that chose to stay behind. On the other hand, attempts to assist kin during the massacres were often futile and resulted in close kin dying together. Respondents repeatedly exemplified this by referring to episodes of mothers attempting to run from the perpetrators carrying their children on their backs but failing to escape. There was not a single mention of a non-combatant successfully overpowering the perpetrators.

M_1 and M_2 were concerned with mortality during the mass killings. The next section considers how the massacres affected the mortality outcomes of survivors of the killings in the long term.

5.3.2. *Surviving after the 1982 killings: social and psychological scarring*

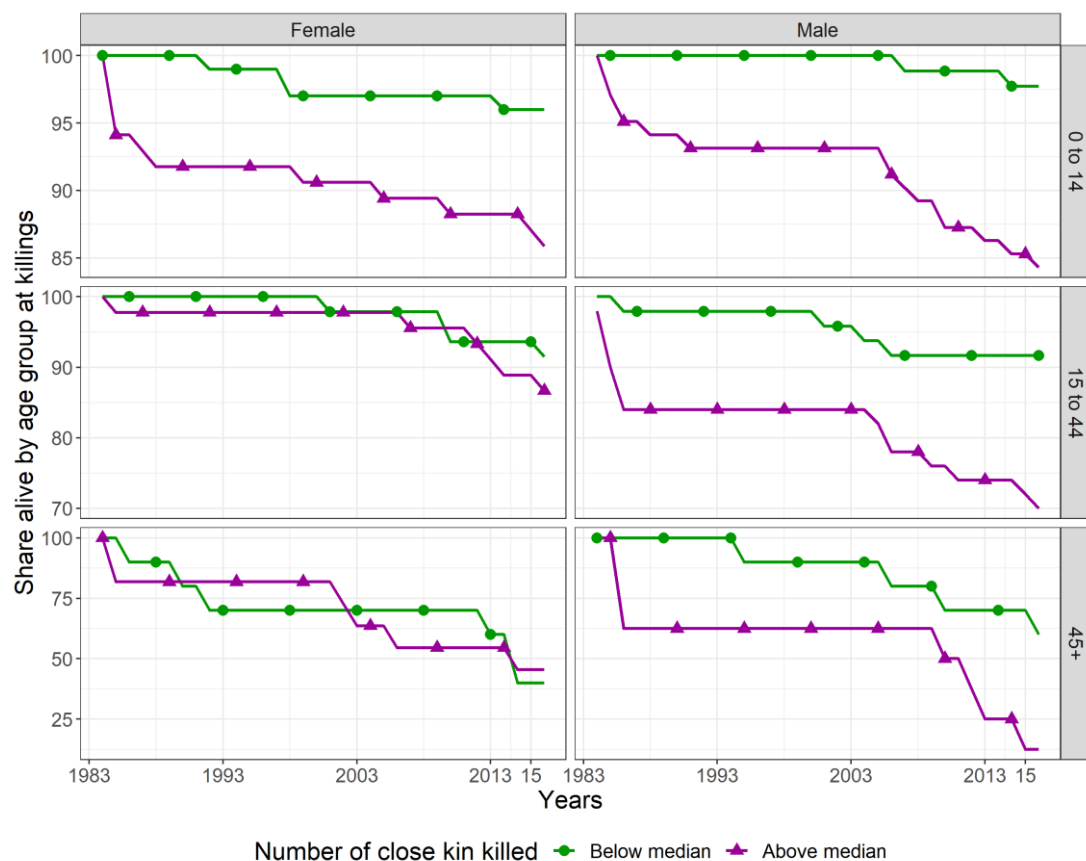
The 604 survivors of the Río Negro Massacres endured many hardships between 1983 and 2015. Of the 92 deaths reported in this period, 40% were children under 15 (individuals in this age group made up almost a third of the total population of massacre survivors). Half of all deaths were violent, either related to the conflict (selective killings continued after the massacres) or to the gang violence that started in the community in the late 1990s. The rest were attributed to disease. The five years after the massacres saw the highest mortality rates, particularly amongst children under five years of age. According to the qualitative data, living conditions were dire in this period, as survivors hid in the wilderness and foraged for food, avoiding lighting fires for fear of being located and executed by the military. The area was constantly bombarded by the armed forces in this period (Johnston, 2005a).

This study identified two mechanisms through which the experience of the massacres explained differentials in long-term mortality: social scarring (M_3) and psychological scarring (M_4). Both hypothesised that survivors of the killings were more likely to die in the 1983-2015 period if they lost more relatives (close kin) in the massacres. An initial descriptive analysis of the data (Figure 5-3) showed that men in all age groups and female children did indeed die earlier the more relatives they lost in the violent event. The mortality differentials emerged shortly after the killings with the gap becoming wider over time. Respondents in the qualitative discussions explained the increase in male mortality around the year 2005 as the result of gang violence in the resettlement camp. Scarring effects were either not present for women older than 14 at the time of the massacres or they were offset by the effects of positive selection (i.e. only the fittest women surviving the mass killings). These selection effects are discussed below.

Social scarring (M_3) was defined as the process whereby generalised mortality reduced the opportunities for cooperation between members of a group. The existence of kin ties is critical in close-knit communities, where close kin are important sources of financial, psychological, and physical support. Severing kin ties removes individuals from their communal environment, affecting the transfer of emotional and physical

resources between close kin. In the presence of social scarring, we would expect a reduction in the size of kin networks as a result of the killings. An analysis of the genealogical data showed that kin networks did become smaller and more fragmented after the mass violence. Both total kin size and the number of close kin in a position to provide support decreased by 40% after of the massacres. The average number of close kin decreased from 5.5 in 1981 to 3.3 in 1983. The average number of extended kin decreased from 19.3 to 10.8 in the same period. The change affected members of all age groups, suggesting that massacre survivors had fewer relatives from whom they could receive support after the killings.

Figure 5-3. Share of the population surviving after the Río Negro Massacres: comparing groups by their exposure to the mass killings



Note: The median value refers to the median number of close kin lost by survivors of the massacres belonging to the three birth cohorts of interest.

A Cox proportional hazards model was fitted to the data to explore the association between the death of close kin in the massacres and own-mortality during the 1983-2015 period. The results (Table 5-3) confirmed the positive association between the death of close kin and differential post-conflict mortality. On average, losing more close

kin increased the mortality hazard of massacre survivors. Nonetheless, this association only held for men after controlling for all relevant factors, which confirms the descriptive results presented in the figure above. This is significant because studies from other contexts have suggested that females tend die at a faster rate in the long-term as a result of their exposure to armed conflicts (Ormhaug & Hernes, 2009).

Table 5-3. Time until death for massacres survivors in the 1983-2015 period - hazard rates of survival model

Outcome:	Model 1		Model 2		Model 3	
	Women	Men	Women	Men	Women	Men
Years to post-killings death						
Share of close kin killed in the massacres ^a	1.16*** (0.05)	1.29*** (0.05)	1.11* (0.07)	1.14** (0.06)	1.04 (0.07)	1.14*** (0.06)
Number of close kin surviving after the massacres (time-variant) ^b					0.88*** (0.04)	1.02 (0.04)
Born in Río Negro [Ref.: Other]			4.25* (3.31)	3.91* (2.94)	6.05** (4.80)	3.62* (2.74)
Socioeconomic index			1.18* (0.11)	1.09 (0.10)	1.07 (0.11)	1.10 (0.10)
Age at killings [Ref.: 15-44]						
0-14			1.08 (0.51)	0.80 (0.30)	0.91 (0.43)	0.82 (0.31)
45+			2.52* (1.28)	3.33*** (1.33)	3.47** (1.75)	3.50*** (1.43)

* $p < 0.1$ ** $p < 0.05$ *** $p < 0.001$

a. Number of close kin (fathers, mothers, children, spouses, and siblings) killed as a share of the total number of close kin alive at the end of 1981 (i.e. before the killings). b. Total number of close kin alive at the end of a given year.

M₃ anticipated that survivors of the killings would exhibit higher long-term mortality if they had fewer surviving close kin after the massacres (i.e. as a result of social scarring). Model 3 showed that having more live close kin after the killings reduced the hazard rates for women but not for men. The analysis also showed that locals were associated with increased hazard rates and that socioeconomic status did not predict changes in the mortality hazard.

Survivors of the killings organised in bands in the aftermath of the massacres. These groups were largely composed of close kin, but occasionally included wounded or orphaned children from other kin groups. Participants in all FGDs emphasised the importance of family support in this period. There is evidence to suggest that new marriages were initiated to increase the size of their kinship networks. The number of new unions surged in the aftermath of the killings with twice as many marriages taking place in 1982 compared to 1981. Participants in the FGDs were clear about the transactional nature of these marriages, which were seen as a means to improve survival opportunities for the young and for those who had lost a spouse. Quantitative analysis of spousal support (i.e. social support provided by a spouse) during this time was limited by the fact that these new unions were often short-lived and unstable. This made it difficult for respondents to recall the start and end dates of these unions and may have affected the estimates of the survival model. Transactional marriages are discussed in more detail in Chapter 6.

Participants in the qualitative discussions stressed that sexual violence (sometimes committed by the survivors themselves) had a lasting effect on the physical and mental health of women. There was a generalised perception that it had led to social isolation and difficulties in finding a partner after the killings. Nevertheless, it is important to keep in mind that the focus on mortality means that the statistical models did not capture this dimension of suffering. Similarly, the qualitative analysis showed that gendered social roles were reinforced after the killings, potentially increasing power differentials in this period. Primary evidence supporting these claims is presented in the next chapter.

M₄ proposed that the massacres had negative effects on the mental health of the survivors. This was corroborated by a majority of respondents, who were convinced that the killings had produced deep psychological scars. A special form of sadness, *b'iiis*, was identified as a common cause of death amongst the massacre survivors. Statements like 'she died from diabetes caused by *b'iiis*' were common in the interviews. *B'iiis* was usually translated as 'sadness', but it is also a root word used to construct a wide range of terms related to distress, loneliness, sorrow, and grief. The noun *b'iiisob'aal*, for example, is something that saddens (such as the death of a relative). The verb *b'iiisoxik*

means to mourn or to miss someone (e.g. *xeb'ub'üsooj* – ‘she grieved them’).⁸⁰ The painting ‘*K'o b'is pa nuk'ux*’ (‘There is grief in my heart’) by Guatemalan anthropologist Ana Cofiño explores the multiple meanings of the term (included in Appendix K).

Participants in the FGDs believed that the death of close kin had led to severe feelings of *b'üs* amongst survivors, which can be interpreted as symptoms of trauma and depression (Smith, 2016). This could have, in turn, increased mortality risks given the well-established link between negative mental health conditions and mortality (Sibai, Fletcher & Armenian, 2001). The following quote exemplifies how survivors themselves linked the experience of the war to mortality in its aftermath.

Fernanda: Thank God we're still alive. But after the violence some people were overcome by sadness [*b'üs*]. They cried. Everything stuck in their heads and they became ill and died because they thought about it too much. Working the land had made them happy in the past but here in Pacux everything is fenced. They could not go and plant their crops. In the old days, you could just find a plot of land and start working it but all the land here was private already. They just had to stay at home and do nothing.

FGD_A_1, with women aged 28-42 the year of the massacres

5.4. Discussion

5.4.1. Gender, age, and survival

The study hypothesised that relying on family support helped individuals survive the mass killings but losing kinship resources led to earlier deaths in the long term. The analysis showed that women benefitted more than men from having larger families during the killings. This is partially explained by gendered expectations of care. The qualitative evidence showed that fathers and other male close kin were expected to provide protection during the violent event. This could have led to higher male mortality if men strived to provide physical protection to their close kin, putting themselves at a higher risk. On the other hand, women were more likely to be killed together with their close kin than men. Differences in strength, speed, and restrictive

⁸⁰ See Sis Iboy (2007) for an introduction to the morphology of Maya Achi.

clothing can have been proposed as factors explaining differential survival by gender during sudden mortality crises (Frankenberg et al., 2011).⁸¹

The association between the violent death of close kin and long-term mortality only held for men after controlling for all relevant factors, whilst women with larger surviving kin networks were more likely to survive in the wake of the killings. The qualitative evidence supported the hypothesis that kinship resources were instrumental for countering the effects of psychological and social scarring caused by the killings. This is consistent with the observation that women tend to rely more heavily on networks of support than men do (Sabin et al., 2003; Warner, 2007). It would also explain why men who lost more relatives during the killings were more likely to die in the long term. Not only did they lose kinship resources during the killings, they were also less likely to rely on their surviving kin networks for emotional support.

Respondents in the qualitative interviews repeatedly referred to the important role that their close kin played in the aftermath of the killings. In the years after 1982, survivors of the killings took refuge in the mountainous regions area around the Chixoy River. The mass violence disrupted the functioning of important social institutions such as the *cofradías* and religious groups. Alone in the mountains, refugees from Río Negro had to rely on the support provided by their close kin, with whom they had formed small bands. This radical breakdown of the traditional forms of social organisation was temporary since most of the surviving population was eventually resettled in Pacux towards 1984, where communal life was resumed. Nevertheless, quantitative data from this study showed that the 1982-1984 years were critical for survival as mortality was very high, especially amongst young children.

Special consideration should be given to factors affecting the survival odds of children, who are the most vulnerable group in mortality crises. Excess child mortality was extremely high in Río Negro compared to the Guatemalan Civil War and to other contemporaneous conflicts (Obermeyer, Murray & Gakidou, 2008). It is logical to expect children to be in need of assistance and therefore be more affected by the presence (or absence) of family support. Accordingly, the evidence of the theorised

⁸¹ Maya Achi women traditionally wear a wrap-around loom skirt known as *uuq* (*corte* in Spanish). The garment provides considerably less freedom of movement than the trousers worn by men.

mechanisms was more conclusive for children under 15 in this study, irrespective of their gender. This is consistent with the notion that family support is especially important for the differential survival of the youngest members of the population in the context of mass violence.

5.4.2. *Challenging the assumptions of the study*

The paper has focused on the evidence supporting the existence of the four hypothesised mechanisms (M₁-M₄). This section considers three competing explanations for the observed patterns – factors that could have affected mortality dynamics in Río Negro but have not been discussed so far. The section argues that these factors were unlikely to have significantly influenced the patterns of mortality described above.

The first one is that the assistance provided by non-kin relations was more important than family support. The study focused on family support and did not consider the assistance provided by non-kin relations because Río Negro was a kin-based community at the time of the killings. Consequently, respondents in the FGDs repeatedly referred to the support provided by close kin, not by friends (as a matter of fact, there is no direct translation for ‘friend’ in Maya Achi; native speakers tend to borrow the Spanish *amigo* or *compadre*).⁸² According to the survivors of the massacres, support from close kin was essential for survival after the mass killings, particularly in the years when survivors were fled to the mountains surrounding the village and survived in small bands. This resonates with the findings of Warner’s study of Mayan refugee women, who after the war “rarely received support from neighbors, friends, *compadres*, and affinal kin. The most common source of support that women identified and that I directly observed was from natal kin, especially their mothers” (2007: 212).

Secondly, the analysis showed that cooperation was not always mutually beneficial. It is possible that cooperation increased mortality risk in some cases. There is considerable evidence, for example, that individuals attempting to protect their close kin during the killings were often unsuccessful and were themselves killed. That close kin were available does not imply by itself that they were willing or able to provide help. No

⁸² A *compadre* (or *comadre* if female) is the godparent of one’s child. *Achi’l* or *achib’ul* are used in the cognate language Maya K’ichee’ to refer to acquaintances, but I am not aware of an equivalent term in Maya Achi.

quantitative data were collected to evaluate this, but *testimonios* from survivors repeatedly pointed out that close kin risked their lives and often died attempting to protect their kin.

Finally, it is possible that selection effects were more important than scarring for explaining long-term mortality. The analysis of long-term mortality focused on the scarring effects of the mass violence without discussing the role of positive selection, the process by which the survival of the fittest members of a population leads to better average outcomes in the long-term (Ho et al., 2017). No health data were available to determine the extent to which selection effects altered the frailty distribution in the population, but it seems likely that the widespread violence exercised against the community would have limited (but not completely neutralised) the effects of positive selection. Nevertheless, this means that scarring effects (i.e. the gap in long-term mortality) could have been underestimated. Alternatively, the forced displacement that followed the massacres improved the access to the national healthcare system. However, since the provision of health services was regulated by the army, it is unlikely that individual-level characteristics determined differential access to them. The statistical models captured part of this variance by controlling for pre-1982 socioeconomic status.

5.4.3. *Generalising the mechanisms and limitations of the study*

The analytical strategy of this study focused on evaluating ‘traces’ of the hypothesised causal mechanisms. This approach is not appropriate for establishing statistical causality, which means that the results cannot be readily generalised to other populations. Nevertheless, it is still possible to discuss the conditions needed for these mechanisms to operate in other, ‘causally similar’, cases (Beach, 2017: 15). This section is committed to this purpose.

A first condition relates to the existence of strong kinship ties in the population. Kinship is a universal feature of human societies, but family support is likely to be more relevant in kin-based societies. Data from the Uppsala Conflict Data Program (Croicu & Sundberg, 2017) show that the most lethal massacres in the past thirty years have taken place in low-and middle income countries, often affecting traditional rural populations, mainly in Africa and Asia (see Table 1-1 in Chapter 1). It is reasonable to expect family support to have a less central role in urbanised Western societies with modern economies, where non-kin ties play a more important part.

Secondly, physical proximity is required for close kin to provide physical assistance. Massacre victims can be segregated (as was the case during the mass killings in Srebrenica), limiting the ability of close kin to provide direct protection. Nonetheless, survivors are likely to attempt to remain close to their families in the long-term after mass killings, even in contexts of forced displacement. The Río Negro Massacres were chosen for this study because they provided the opportunity to study the effects of family support on long-term mortality in a context of low migration. Separate research is needed to explore whether family support has had similar effects in other contexts.

Mortality will be more generalised during mass killings than during other types of conflict events. This was true for Río Negro, where direct mortality was similar across age, sex, and socioeconomic status. Little research has been carried out on the mortality outcomes of mass killings, but analysis of publicly available lists of victims from mass killings in El Mozote (El Salvador – 1981), Tiananmen (China – 1989), and Aleppo (Syria – 2016) suggest that direct mortality was similarly distributed in these cases. Nevertheless, it is likely that model-based approaches perform poorly when studying massacre-derived mortality given the extraordinary nature of these events.

The data used for this study have important shortcomings. Data quality was likely compromised by survival and retrospective bias, despite the various mechanisms put in place to reduce systematic sources of bias. In addition to this, time-variant socioeconomic and household membership variables could not be reconstructed from the genealogical interviews and could not be included in the analyses. Data on emigrants were less reliable than data on inhabitants of Pacux, even though outmigration was greatly reduced by the control exercised by the military on the population.

A final limitation of this paper was the lack of focus on social institutions. The paper focused on the support provided by close kin after the Río Negro Massacres. The analysis centred on the transfer of support within kin networks and on the negative consequences of psychological and social scarring. This was appropriate for the case of Río Negro, since the entire village virtually ceased to exist in the aftermath of the killings (as the survivors gathered in bands and the town was flooded by the reservoir). Yet, this breakdown of social institutions may not occur in other contexts.

5.5. Conclusions

This study relied on unique social network data to evaluate mechanistic evidence linking family support to short- and long-term mortality in the context of mass killings. The study used a mixed-methods design – the qualitative component focused on finding evidence of the ‘traces’ left behind by the causal mechanisms and the quantitative analysis determined whether these were part of a generalised pattern. The first part of the paper presented evidence linking family support to survival during the 1982 massacres in the Maya Achi village of Río Negro. Women in more extensive families were more likely to survive the massacres and men and women with a living partner had higher survival odds. The qualitative data supported the hypothesis that advanced awareness of the massacres spread through kin networks and allowed some (mainly those with kinship ties outside of the village) to avoid the mass violence. Testimonies from eyewitnesses supported the proposition that close kin attempted to protect each other during the killings, although this occasionally resulted in entire kinship groups being killed together. Traditional gender roles may have affected the mortality dynamics as men were expected to provide physical protection to their close kin.

The second part of the study explored the association between the death of close kin in the conflict and own-survival after the mass killings. Men who lost more close kin during the 1982 killings were more likely to have an earlier death in the 1983-2015 period. The same was true for women with smaller surviving families. This paper hypothesised that the long-term mortality of the massacre survivors was partially explained by the effects of social scarring, the process by which the massacre reduced the opportunities for cooperation. Analysis of the genealogical data showed that the average number of close kin able to provide support (i.e. excluding young children and older adults) decreased by 40% as a result of the mass violence. The high mortality of close kin affected the dynamics of communal cooperation that characterised the village before the killings, as confirmed by primary and secondary accounts of massacre survivors.

The qualitative data revealed that survivors of the genocide were clearly aware of the importance of kin networks for their survival and actively sought to expand them by initiating new partnerships – the marriage rate in the year after the killings was the highest on record. This may also have reinforced gender roles and led to increased (non-lethal) violence against women. A second explanation stated that higher exposure

to the mortality of close kin resulted in psychological scarring. Even though psychological diagnoses were unavailable, qualitative accounts stressed the prevalence of feelings of 'sadness' (*b'üis* in Maya Achi) that corresponded to clinical definitions of depression and PTSD. This is important because these mental health conditions have been associated with increased mortality risks. The paper proposed that the gender gap in long-term survival was partially explained by the fact that women tend to rely more on networks of social support than men.

The distribution of excess mortality in Río Negro was markedly different from that of the Guatemala civil war. However, the mortality dynamics observed in Río Negro may be like those of mass killings elsewhere, particularly if the community has strong social ties and if the survivors continue to live together after the violent event. This was the first study to consider the relationship between family support and survival in the context of mass killings. No previous study has used data on the same population throughout after an episode of mass violence. Still, more research is needed to confirm whether the mechanisms identified in this paper can be generalised to other massacre-affected populations. The results of the study have practical implications for the reunification of families after mass killings; failing to do so might contribute to the rapid spread and prolongation of suffering amongst extremely vulnerable populations.

This paper provided detailed information about the dynamics of mortality in the village, particularly in relation to the mass killings in 1982. The next chapter considers the fertility behaviour of survivors, another important dimension of demographic change in the village.

Chapter 6 Fertility behaviour in Río Negro after the 1982 massacres⁸³

Abstract

Temporary increases in fertility after armed conflicts are common but it is difficult to determine why or how they happen. This paper focuses on the factors that drove high fertility amongst survivors of the 1982 Río Negro Massacres in Guatemala. It evaluates the role of pronatalism, replacement fertility, scarring effects, and population structure in this process using a unique genealogical dataset. Data are analysed using demographic rates, regression models, and qualitative evidence. The paper shows evidence of a collective fertility response to excess mortality, with pronatalist ideals being enforced by close kin. There was no evidence of a fertility postponement/catch-up effect. The massacres had ‘scarring’ effects for women – those more exposed to the violence had lower subsequent fertility and suffered from social stigma. They were less likely to find a partner and bear children after the killings. Surviving men tended to marry considerably younger women and women from other communities. The killings disrupted the availability of modern contraception, but the forced resettlement of the population in a military-run camp eventually increased access to public healthcare, education, and employment. The paper discusses how these processes resulted in high and low fertility across subsets of the surviving population.

⁸³ A version of this paper is currently being prepared for submission to the peer-reviewed journal *Population Studies* (expected submission November 2018) as: Albrez-Gutierrez, D. What Drives Fertility Recovery after Armed Conflict? A Case Study from the Guatemalan Genocide.

Try telling it, and who will give you a job then, who will marry you? We were silent as fish.

Svetlana Alexievich, *The Unwomanly Face of War*

6.1. Introduction

Temporary increases in fertility have been reported repeatedly after conflict-induced fertility drops, but there is little agreement about the factors that drive this behaviour. The best known example is the ‘baby boom’ that took place in many industrialised countries after World War II (Reher & Requena, 2014; Reher, 2015). However, these fertility recoveries have also been reported after armed conflicts in low- and middle-income countries (Khlat, Deeb & Courbage, 1997; Agadjanian & Prata, 2002) and after other types of mortality crises (Watkins & Menken, 1985; Nobles, Frankenberg & Thomas, 2015).

The exact mechanisms that underlie post-conflict fertility recoveries are not fully understood, but exposure to extraordinary mortality is thought to play a central role (Randall, 2005; Heuveline & Poch, 2007). Individuals react to perceptions of mortality – high excess mortality can usher in a pronatalist ideology if they believe that their community is under threat. High fertility in the aftermath of a conflict can also result from parents trying to ‘replace’ their dead children (Nobles, Frankenberg & Thomas, 2015). Exposure to the conflict can reduce the fertility of some in the presence of trauma (Elezaj et al., 2015) and social stigma (Ward & Marsh, 2006). Fertility is also influenced by structural factors. Armed conflicts usually reduce the supply of modern contraception, leading to higher fertility (Giacaman et al., 2009). It is common for spouses to be temporarily separated because of the conflict and their reunification after the crisis can lead to short-term fertility increases (Heuveline & Poch, 2007). In practice, it is difficult to study these processes since fertility data on conflict-affected populations are usually missing or are not entirely reliable (Hill, 2004).

This paper considers the influence of war-time mass killings on fertility behaviour in local populations. As was shown in Chapter 5, massacres affect local communities in specific ways by subjecting victims to extreme forms of violence. It is therefore important to consider their response to these events in isolation. The study focuses on the fertility behaviour of the survivors of the Río Negro Massacres. Fertility in the

population dropped before the 1982 killings and was followed by a quick recovery in the aftermath of the events. This case is studied in depth to address the following research questions: *How did the 1982 Río Negro Massacres affect the fertility behaviour of the survivors? What are the factors that explain the post-1982 fertility recovery in the population?* The latter question was considered in the light of the main explanations for fertility recoveries given in the literature.

The study contributes to the literature on why populations exhibit high fertility after mass mortality. Mortality crises are a unique setting for studying the interaction between mortality and fertility in local populations. Focusing on the experience of a single massacre-afflicted population allowed a rich discussion about the processes that drove the fertility recovery amongst survivors of the Río Negro Massacres. This is the first study to consider the fertility behaviour of men and women in the same population after an episode of war-time mass killings.

The next section discusses the general patterns of fertility documented after armed conflicts in general since no research has looked at fertility in the aftermath of mass killings in particular.

6.1.1. Fertility recoveries after armed conflicts

Fertility usually declines before and during armed conflicts and other periods of distress, but these drops are generally short-lived (Reher & Requena, 2014). They result from a combination of lower fecundity⁸⁴ (affected by stress and malnutrition), changes in marital behaviour, and spousal separation (Hill, 2004; Neupert & Prum, 2005; de Walque, 2006; Abu-Musa et al., 2008). Uncertainty about the future can also cause couples to delay childbearing during armed conflicts, contributing to lower fertility in the population.

Conflict-triggered drops in fertility do not usually result in long-term fertility declines (i.e. there is no evidence that they accelerate the onset of the fertility transition). Studies from the genocide in Rwanda found neither a significant long-term fertility decline nor a fertility increase following the conflict at the national level (Schindler & Bruck, 2011;

⁸⁴ Fecundity should not be confused with fertility – the former refers to the potential for reproduction whereas the latter is the actual number of offspring born.

Westoff, 2013). The same may not be true for protracted conflicts, which can bring about a sustained reduction of fertility, as happened in Ethiopia (Lindstrom & Berhanu, 1999), but this pattern has not been widely reported. The study of how mortality shocks interact with ongoing fertility trends is important because most contemporary armed conflicts have occurred in countries where fertility transitions from high to low levels of fertility are underway (Blanc, 2004; Abu-Musa et al., 2007; Woldemicael, 2008, 2010).

Declines in fertility rates are usually followed by temporary fertility rebounds after the conflict. The ‘baby boom’ that followed World War II in several industrialised countries has been widely studied (Van Bavel & Reher, 2013), but the phenomenon has also been observed after conflicts in Cambodia (Heuveline & Poch, 2007) and Angola (Agadjanian & Prata, 2002). Fertility recoveries have been reported following tsunamis (Nobles, Frankenberg & Thomas, 2015), hurricanes (Cohan & Cole, 2002; Pörtner, 2006), and terrorist attacks (Rodgers, John & Coleman, 2005). Much of the literature has focused on aggregate (i.e. national-level) conflict mortality, obscuring the particular dynamics of mass killings.

Table 6-1. Potential outcomes of mass killings on local populations and hypothesised effects of these on fertility

Outcome of mass killings	Factors affecting fertility	Effect on fertility
High excess mortality in population	Rise of pronatalist ideology	+ +
Violent death of own child	Replacement effects	+
Vulnerability of survivors and reinforcement of traditional roles	Increase of transactional marriages	+
Exposure to violence	Scarring effects	- -
Forced displacement to urban area	Changing access to contraception, education, and employment	- -
Spousal segregation and increased uncertainty	Fertility postponement/catch-up	+

Source: Author, based on literature review. Key: + short-term increase; ++ long-term increase; - short-term decrease; - - long-term decrease

The rest of this section discusses potential factors through which mass killings affect fertility (see Table 6-1).

6.1.2. *Pronatalism and replacement fertility*

This paper defined pronatalism as an ideology that promotes childbirth to achieve high fertility. Pronatalism has often been understood as a set of national policies through which governments promote high fertility (Demeny, 1986; Van Bavel & Reher, 2013) but pronatalist sentiments can also emerge organically in local populations (Khawaja, 2000; Rahim et al., 2009).⁸⁵ Mortality crises may spark pronatalist agendas if there is a perception that the group is in danger. The baby boom that followed the 2004 Indian Ocean Tsunami, for example, was driven by a community-level pronatalism, where increases in marriage rates and fertility rates were part of a bottom-up project to rebuild the community after the natural disaster (Nobles, Frankenberg & Thomas, 2015).

Pronatalist ideologies are only successful if they manage to bring about higher fertility. Governments can offer incentives to promote childbirth by instituting national-level policies such as parental leave (Duvander, Lappegård & Andersson, 2010). Community-led pronatalist ideologies, on the other hand, operate mainly through social influence in the absence of similar top-down incentives (Kennedy, 1973). Social influence refers to the extent to which members of a community affect the behaviour of others. This research was particularly interested in the coercive dimension of this influence – social pressure (Lois & Arránz Becker, 2014). ‘Family pronatalism’ was defined as the process by which individuals exercise social pressure on their close kin to promote high fertility within the kinship group. Such an ideology is likely to be more effective in traditional societies that rely more heavily on kin-oriented (as opposed to friendship-oriented) social networks (Keim, Klärner & Bernardi, 2013; Lois, 2016).

Women are likely to experience much of this pressure, since they carry the symbolic burden of reproduction (Blake, 1972; Hollingworth, 2000). This is important because mortality crises are known to reinforce gender roles and traditional societal norms. This can increase the power differential between genders favouring men, who yield considerably more power in many traditional societies. The war in Guatemala led to

⁸⁵ ‘Organically’ is understood as developed locally and in the absence of a centralised pro-birth policy.

both an increase in violence against women (Warner, 2007) and a rebirth of an indigenous pronatalist culture (Kupprat, 2010b; Grace & Sweeney, 2016). The relationship between these processes and fertility has not been explored so far.

Fertility replacement effects have also been reported after mortality crises. The replacement effect theory states that individuals react to perceptions of mortality within their own families. Traditional approaches predict that in the context of high infant mortality parents have more children than they actually want with the expectation that some will die during the mortality crisis (Cain, 1983; Clay & Vander Haar, 1993). Parents can also increase their fertility as a response to the mortality of their own children, resulting in temporary baby booms. This phenomenon has been reported for Bangladesh (Hossain, Phillips & Legrand, 2007) and after the Indian Ocean Tsunami (Nobles, Frankenberg & Thomas, 2015). Replacement effects differ from pronatalism in that they are not part of a larger ideology that promotes sustained high fertility in a population. They are individual-level ‘adjustments’ following the death of close kin.

6.1.3. *Transactional marriages and scarring effects*

Marital fertility is an important contributor to the post-conflict fertility recovery (Khawaja, 2000; Van Bavel & Reher, 2013).⁸⁶ Armed conflicts can lead to an increase in transactional marriages, where economic gain is an important (but not the only) consideration. This happens because many survivors of atrocities are left in a vulnerable position that drives them to exchange companionship and sex for protection (Staveteig, 2011: 101). In particular, research has reported an increase of transactional sex between younger women and older men in the context of armed conflict (Neal, Stone & Ingham, 2016). Coincidentally, studies of female fertility have shown that young women who enter reproductive age towards the end of a conflict tend to have particularly high fertility in its aftermath (Heuveline & Poch, 2007; Cetorelli, 2014; Nobles, Frankenberg & Thomas, 2015). More studies are needed to understand the role of transactional marriages in these processes.

Armed conflicts have psychological, social, and physiological ‘scarring effects’ on survivors. This is particularly true for those affected by mass killings, who are subjected

⁸⁶ In this paper, ‘marriage’ encompasses formal partnerships and cohabitation.

to extreme levels of violence, including torture, and witness the violent death of close kin and friends. War-time sexual violence, which mainly affects women, deserves special attention (Schott, 2011). Rape survivors experience gynaecological complications throughout their lives (Kinyanda et al., 2010) and survivors of sexual violence face social stigma in their own communities that makes it difficult for them to find a spouse or bear children (Ward & Marsh, 2006).

The effects of trauma on fertility have not been studied extensively. The existing research has shown that post-traumatic stress disorder (PTSD) can have negative effects on the fertility of men (usually war veterans) (Elezaj et al., 2015). Little is known about the effects of psychological trauma on female fertility, even though studies have suggested that post-conflict PTSD is more prevalent amongst women (Roberts et al., 2008; Ayazi et al., 2014). No study has looked at the effects of trauma (whether physical or psychological) on fertility after episodes of mass killings. This is partly explained by the fact that individual-level measures of exposure to mass violence and fertility are usually not available for members of the same population.

6.1.4. Urbanisation and changing access to contraception

Armed conflicts undermine a country's health infrastructure, reducing the availability of modern contraception (Santiso-Galvez & Bertrand, 2004; Giacaman et al., 2009). Reduced access to these resources can lead to higher fertility. This happened in Guatemala, where the demographic transition was stalled during the civil war given the reduced contraceptive offer, particularly amongst the Mayan population (Santiso-Galvez & Bertrand, 2004; Grace & Sweeney, 2016).

War-time violence commonly results in rapid urbanisation as populations are forcibly displaced from rural to urban areas (UNHCR, 2018). Accelerated urbanisation can act as a modernising force in itself. Physical proximity to urban areas can expand access to the market economy, wage labour, and public schooling (Khawaja & Randall, 2006). These processes expose survivors to novel expectations of ideal family size and improve access to modern contraception, especially when they affect sub-national and pre-transitional minorities (Devkota & van Teijlingen, 2010). The supply of modern family planning methods (Bongaarts, 1978), employment (Blau & Robins, 1989), and education (Caldwell, 1980) have long been identified as key contributors to the sustained decline of fertility that characterises the fertility transition.

6.1.5. *Fertility postponement*

Armed conflicts can cause the temporary separation of spouses. Classical demographic studies have shown that compulsory military service and high male excess mortality can result in a lower supply of marriageable men during and after the conflict (Henry, 1966). The resulting delays in childbearing means that there will be more women who can get pregnant at the end of the crisis, leading to a short-term baby boom (Neupert & Prum, 2005; de Walque, 2006; Heuveline & Poch, 2007). The magnitude of this baby boom can be expected to vary across contexts (Van Bavel & Reher, 2013; Reher & Requena, 2014). Nonetheless, the phenomenon is short-lived since it results from temporary disturbances in the age-sex structure of a population and in the share of women able to become pregnant.

6.2. Context

Guatemala is a Central American country with an estimated population of 17 million. Around 40% of the population is of Mayan heritage (CODISRA, 2010). The Guatemalan Civil War, fought between Marxist guerrillas and the Guatemalan Army in the 1960-1996 period, was the most lethal of all the contemporaneous armed conflicts in Latin America. The death toll was highest amongst non-combatants; the vast majority of the estimated 132,000 people killed were Mayan (Ball, 2000). In 1996, a United Nations report concluded that acts of genocide had been committed against the indigenous populations, citing the case of Río Negro as an example of these events (CEH, 1999a: 360–377). This study is concerned with events that happened during the most violent years of the conflict, between 1980 and 1982, when entire villages in the indigenous countryside were destroyed as part of a scorched earth policy.

The Río Negro Massacres were one of the most emblematic events of this war. In 1979, Río Negro was a village of one thousand inhabitants – all indigenous, Maya Achi speakers – in the central highlands of Guatemala. The town relied on subsistence agriculture and yearly seasonal employment migration to the large plantations on the Pacific Coast of the country (Gaitán, 1981). Prior to 1979, it had largely been unaffected by the war. This changed when the community refused to be resettled as construction work began for the state-owned Chixoy Hydroelectric Dam. In 1982, more than a third of the population was killed within a couple of months by paramilitary groups under the aegis of the Guatemalan Army (Johnston, 2005b).

The survivors were forcibly displaced to the surrounding mountains for several years, but most had been resettled in a military-run camp known as Pacux by 1985. Power, water, and food provisioning in Pacux were regulated by the army until 1996, when war in the country officially came to an end. Most of the population still live in Pacux but around 14% have moved to Guatemala City. The inhabitants of the resettlement Pacux continue to face poverty, overcrowding and poor sanitation. In 2016, young people still found it difficult to join the labour market given the social stigma derived from the village's history.

6.3. Research design

6.3.1. Data sources and population of interest

This study combined quantitative and qualitative data sources on fertility after the massacres in Río Negro. Quantitative data were collected using the Extended Genealogy Method (EGM) as described in Chapter 3. Individual genealogies were collected and consolidated in a single dataset that contained data on all members of the population born before 1982. Birth histories were reconstructed from the individual genealogies of the massacre survivors. Qualitative data came from Focus Group Discussions (FGDs). Participants were selected purposefully to represent different combinations of sex, birth cohort, and exposure to conflict. The group discussions produced data on the participants' experiences and perceptions of the demographic processes in the community. These data were recorded, transcribed verbatim, and analysed in the vernacular Maya Achi language.

The survivors of the mass killings and their spouses were the population of interest for this paper. The case was selected for the opportunity it presented to understand how fertility reacts to violent changes in mortality. The analysis focused on members of three birth cohorts (the 'youngest', 'middle, and 'oldest' cohort in Table 6-2). The cohorts, which are different from the ones used in Chapter 5, were selected under the premise that age at the time of the killings largely defined an individual's experience of the conflict and their subsequent fertility behaviour. Those in the youngest cohort were children at the time of the killings. Members of the middle cohort were also young, but some had already started their reproductive life or were in a union at the time. Most in the oldest cohort had already had a child in 1982, when the killings took place.

Table 6-2. Number of Río Negro inhabitants who survived the mass killings by sex and birth cohort

Cohort label	Cohort definition		Individuals who survived the killings ^a		
	Birth years	Age at killings	Women	Men	Total
---	≤ 1953	30-99	47	40	87
Oldest	1953-1962	20-29	42	45	87
Middle	1963-1972	10-19	77	82	159
Youngest	1973-1982	0-9	132	139	271
All	≤ 1982	0-99	298	306	604

a. This column shows the total number of individuals alive at the start of 1983, immediately after the killings. Data on the distribution of massacres-derived mortality are shown in Table 6-3.

6.3.2. Data analysis

Different analyses were carried out to provide a detailed account of the fertility behaviour of the survivors of the massacres. Quantitative data and analysis constituted the backbone of this study. Qualitative evidence helped interpret the numerical results. Combining quantitative and qualitative sources was particularly useful for discussing the role of the factors outlined in the introductory section of the paper.

The paper applied three sets of demographic analyses to characterise fertility in post-1982 Río Negro. The first set used measures of total fertility and age-specific fertility (reconstructed from the genealogical data) to characterise period fertility in the village. The other two sets of analyses were conducted to study cohort-specific patterns of fertility. Additive OLS linear regression models were fitted to the data to explore post-conflict fertility outcomes. The outcome variable in these models was the total number of children born after 1982, the year of the massacres. Covariates included total kin size at the time of the killings, and kin size disaggregated by type of relative (e.g. number of siblings, parents, etc.).⁸⁷ Other variables captured the parity and marital status of the residents at the time of the killings. The regression analyses included measures of excess

⁸⁷ As in previous chapters, 'kin size' refers to the number of ego-centric close kin alive at a given time.

mortality of close kin (both as the total number of close kin killed and disaggregated by type of relative killed). Birth cohort and place of birth were included as control variables.

The second set of analyses focused on the differences in timing of childbearing across cohorts. The paper used discrete-time Event History Analysis (EHA) models with time-variant covariates to study the factors that affected the timing of the first birth after the massacres. Binary logistic regressions were fitted to the data to study the time that it took for survivors to give birth to a child after the killings. The response variable was a binary measure of whether an individual had a child at any given year after 1982. Episodes were counted from age 13 and censored at age 55 using an age variable.⁸⁸ Ties were handled using the Breslow method (Breslow, 1975). Individuals were observed from birth to death and data were only right-censored for emigrants, although such cases were rare. The exploratory variables in the EHA model were similar to those in the OLS regression.

Qualitative data were analysed using a framework approach to thematic analysis (Ritchie & Lewis, 2003). This involved iteratively summarising the data in matrices until a comprehensive collection of categories emerged. A set of initial analytical themes were derived from the research design and further categories were added as the analysis progressed.⁸⁹ The qualitative analysis focused on the factors behind the post-conflict fertility recovery, as well as on the social narratives that members of the population used to make sense of their traumatic experiences, both at an individual level and at the level of their community.

6.4. Quantitative results

The first part of this section presents a summary of the excess mortality from the mass killings. Following this, it outlines the overall fertility trends in the community by focusing on the period and cohort effects of the mass violence suffered by inhabitants of Río Negro.

⁸⁸ The lower age limit was chosen because it was the minimum marriageable age in pre-war Río Negro, according to the qualitative data.

⁸⁹ See Appendix G.

6.4.1. *Exposure to violence and excess mortality during the Río Negro Massacres*

The 1982 massacres produced extensive mortality amongst the residents of Río Negro, affecting members of all birth cohorts and both genders. 366 out of 970 individuals alive at the start of 1982 were killed in the conflict – 38% of the population. Residents older than 19 were proportionally more affected by the war. Female deaths outnumbered male deaths amongst those under 30. This was consistent with a scenario where violence was directed against the population as a whole and not only against young men as is common during armed conflicts (Obermeyer, Murray & Gakidou, 2008).

All the massacre survivors lost at least one relative in the violent events. Older residents tended to lose more relatives because they had larger families at the time of the killing. Residents in the oldest cohort had the highest levels of own-child mortality (many of the youngest villagers were childless at the time of the mass killings). Table 6-3 shows that the mortality of close kin was higher for women. On average, women lost more children and close kin than men of the same age.

Table 6-3. Massacre-derived mortality: share of birth cohorts killed in 1982 and mortality of their close kin

Cohort label	Age at killings	Share of the cohort died in the killings ^a		Share of survivors lost a child in killings ^b		Share of close kin killed in the massacres ^b	
		Women	Men	Women	Men	Women	Men
Oldest	20-29	48.15	37.50	50.62	43.75	32.36	28.46
Middle	10-19	34.17	27.68	5.0	1.79	22.77	20.31
Youngest	0-9	29.02	32.37	NA	NA	18.84	18.75

Note: 'NA' (not applicable) values indicate that all members of the given group were childless at the time. a. This column considers the percentage of all cohort members killed in the massacres. b. These columns only consider mortality of close kin for survivors of the massacres.

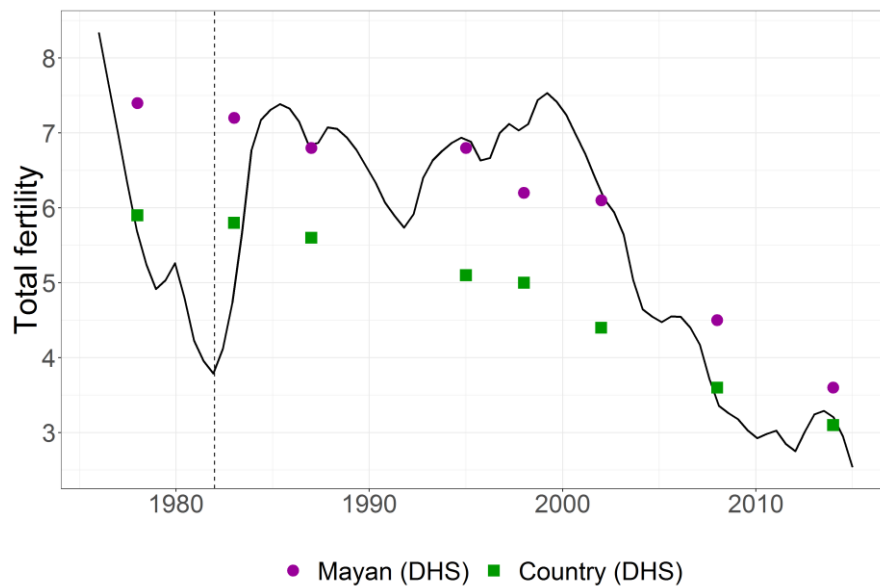
6.4.2. *Period fertility in Río Negro after the mass killings*

The previous section summarised how the residents of Río Negro were affected by excess mortality derived from the massacres. The paper now considers period fertility in the village between 1982 and 2015.⁹⁰ The first part of the following section focuses on total fertility, a measure of the general levels of fertility in the population. The second part centres on how these fertility levels varied across different age groups.

6.4.2.1. Total fertility

Overall, total fertility in Río Negro (Figure 6-1) resembled that of the national Mayan population. There was no evidence of a sustained fertility decline before 1979 but fertility did drop rapidly towards the end of the Twentieth Century. The fertility trends in Río Negro differed considerably from those of the national Mayan population only between 1976 and 1983, when the village suffered from a prolonged campaign of intimidation and mass violence.

Figure 6-1. Total Fertility Rates in Río Negro (line) and reference national and Mayan populations (points): 1970-2015



Source: Río Negro data come from this study; Mayan and country averages come from Demographic and Health Survey data (DHS) (APROFAM, 1978, 1985, MSPAS, 1987, 1996, 1999, 2003, 2010, 2015).

⁹⁰ Period fertility “relates to the number of births in a population during a period of time to some measure of exposure” (Preston, Heuveline & Guillot, 2001: 93).

Total fertility dropped sharply before the 1982 killings and reached its lowest level (2.9) in the year of the massacres. The years leading to the mass killings were characterised by uncertainty and fear in the area as residents were forcibly relocated to allow for the construction of the Chixoy Dam. In this period, the region became increasingly militarised and entire communities were threatened and intimidated by the Guatemalan Army and local militias.⁹¹ Fertility increased rapidly after 1983 to roughly the same levels reported for the national Mayan population and remained high at around 6.5 until 1999.

Fertility in Río Negro started a sustained decline from the year 2000. The rate of decline was more pronounced in the village than amongst the national Mayan population. As a result, by 2015 total fertility in Río Negro was 2.3 – below the average of the Mayan population (3.6) and that of the country as a whole (3.1) (MSPAS, 2015). This pattern is consistent with the evidence that fertility recoveries are often followed by periods of lower fertility; baby booms are followed by ‘baby busts’ (Reher, 2015).

Total fertility is a useful measure for understanding population-level trends, but it provides no information about the distribution of fertility by age. This is covered in the next section, which presents Age-Specific Fertility Rates (ASFR) for Río Negro in the 1977-2015 period, reconstructed from the retrospective data produced by the EGM.

6.4.2.2. Period age-specific fertility

Measures of age-specific fertility in Río Negro reflected the fertility drop and rebound pattern discussed above. The upper panels of Figure 6-2 show that the killings had a clear tempo effects on childbirth – fertility rates were low at all ages in 1982.⁹² After the massacres, it increased to levels higher than those reported before the violent events (i.e. in the 1977-1981 period). Fertility rates declined steadily only after 2002 and the lowest fertility at all ages were reported for the most recent period (2013-2015).

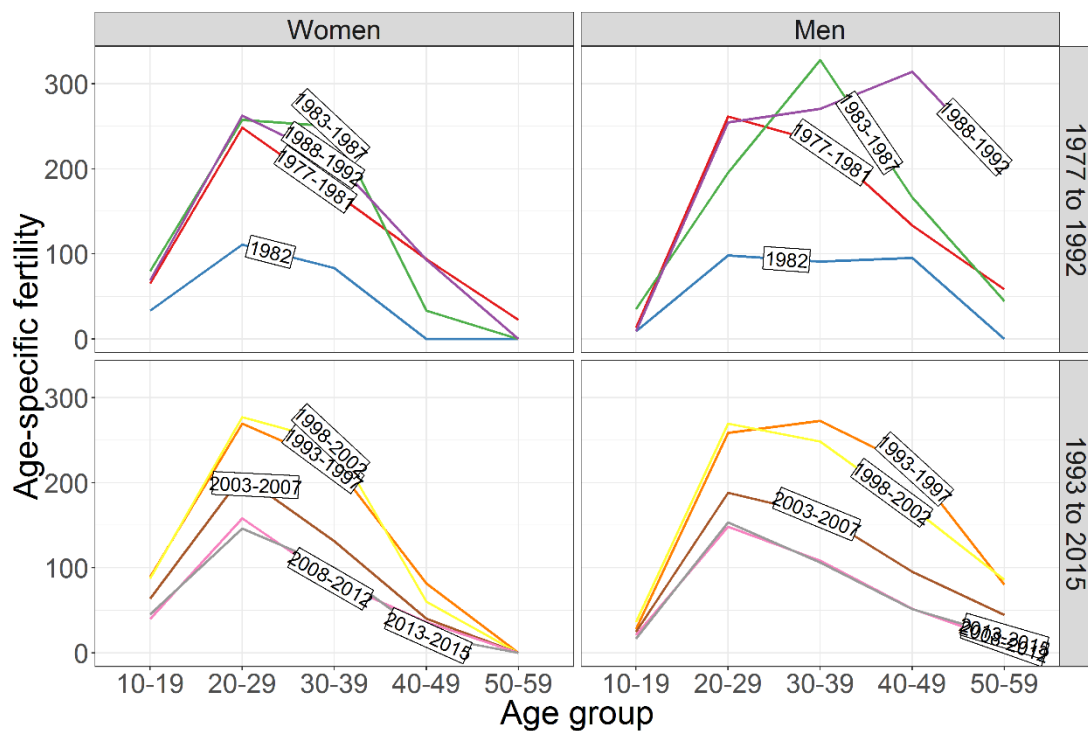
⁹¹ There were concerns about potential attacks before the killings. A 1979 news report stated boldly that “the residents of Río Negro, Baja Verapaz, are willing to die before giving in a single inch of their lands”. (Prensa Libre, June 1 1979, *‘Impugnan expropiación de tierras para el INDE’* [‘Land expropriations for the INDE are challenged’]).

⁹² In the figure, ASFR are presented as four-year periods, except for the 1982 rates which are presented separately.

There were noticeable differences in the age distribution of fertility by gender. Female fertility was generally highest amongst women younger than 30, but after 1982 high fertility until the age of 40 was common. This trend began in the 1983-1987 period (the ‘recovery’ years after the killings) and continued up until 2002, when female age-specific fertility fell back to levels similar to those of the national averages.⁹³

The pattern for men was similar, albeit with higher fertility rates at older ages, which is not surprising since men are able to conceive children at older ages compared to women. Between 1983 and 1987, fertility was highest amongst men aged 30 to 39. Fertility amongst men aged 40 to 49 was remarkably high during the next period (1988-1992), suggesting the presence of a cohort effect (i.e. men in a given birth cohort having particularly high fertility over time). Male fertility at older ages continued to be high up until 2002, when it started resembling the national (female) fertility levels.

Figure 6-2. Period Age-Specific Fertility Rates of the total population of Rio Negro over time (1977-2015)



Note: The vertical axis represents live births per 1000 individuals.

⁹³ National-level Age-Specific Fertility Rates reported by from DHS sources are included in Appendix L.

6.4.3. *Cohort fertility in Río Negro after the mass killings*

The previous section presented aggregate patterns of fertility at a population level. This section considers fertility from a cohort perspective, focusing on how fertility outcomes varied across members of the three birth cohorts.⁹⁴ The following analyses focus on the levels of fertility and on the distribution of fertility by age.

6.4.3.1. Cohort fertility

In a society undergoing the demographic transition, and in the absence of a mortality crisis, each subsequent (younger) cohort would be expected to have lower levels of cohort fertility, with births being postponed to later ages. In other words, members of the oldest cohort should have had the highest cohort fertility of all, followed by members of the middle and youngest cohorts respectively.

This was not the case in Río Negro, where women and men in the middle cohort (aged 10-19 at the time of the killings) had the highest fertility of all (Figure 6-3). Men in the oldest cohort had a higher fertility than men in the youngest cohort. The pattern of older cohorts having higher fertility than younger cohorts is characteristic of populations undergoing the fertility transition. However, the opposite was true for women: those in the oldest cohort had the lowest cohort fertility of all (indeed, even lower than women born 20 years later). The violence had a particularly negative effects on the fertility of women who were aged 20 to 29 at the time of the killings.

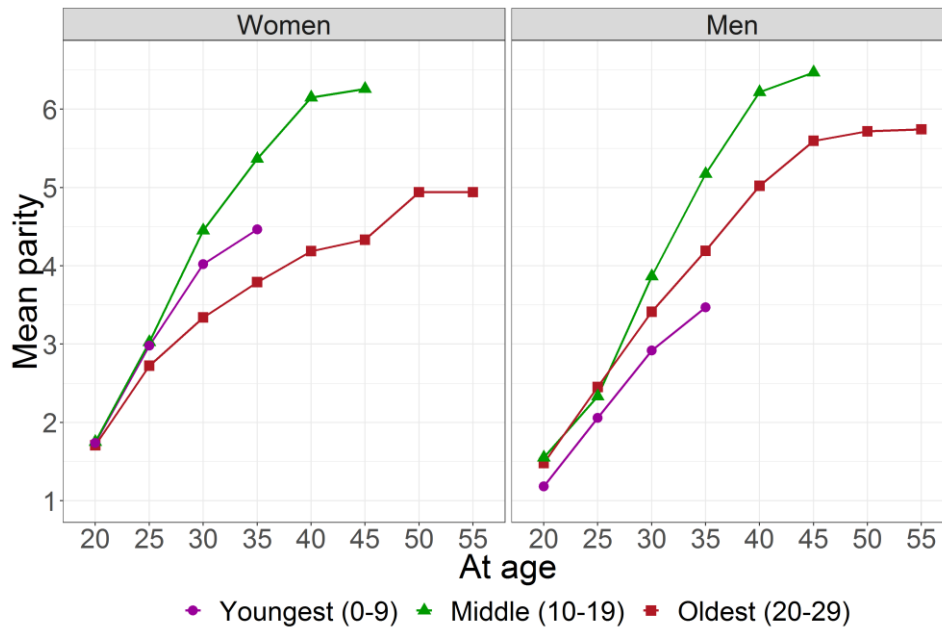
The previous analysis showed cohort-specific patterns of fertility behaviour after the killings. It is now necessary to evaluate the factors responsible for the differential fertility outcomes in the population after the 1982 mass killings. A regression analysis was fitted to the population of survivors of the killings for this purpose (Table 6-4).

The regression analyses showed that, all else being equal, women with larger families at the time of the killings were more likely to have higher fertility in the aftermath of the massacres (Models 1-2). The composition of kin networks also affected post-killings levels of fertility. For women, the number of children and siblings at the time of the

⁹⁴ Cohort fertility was defined as the average number of children ever born to members of a given cohort. Cohort fertility at age 30, for example, was calculated as the mean parity of members of a cohort by the time they reached age 30.

killings was associated with higher long-term fertility. Marital status was an important predictor of higher fertility for men but not for women.

Figure 6-3. Mean parity at different ages for members of the three birth cohorts of interest in Río Negro



Higher exposure to conflict was consistently associated with lower fertility in the long-term. This was true for men and women but the effects were stronger for the latter. Model 3 showed how the death of different types of relatives affected the subsequent fertility behaviour of survivors. Losing a child, parent, sibling, or spouse all led to lower post-killings fertility, all else being equal. The association between the death of a spouse and low post-conflict fertility was particularly pronounced for women. Losing a parent or a sibling resulted in lower fertility for men in the long term.

Women born in Río Negro were significantly more likely to have lower fertility after the killings compared to women born elsewhere. The same was not true for men, for whom no significant association was found between place of origin and post-killings fertility. This was related to patterns of marriage that are discussed later in this paper. The analysis also showed that the oldest women at the time of the killings had the lowest fertility after the event. There was no significant association between birth cohort membership and post-killings fertility for men, after controlling for all relevant factors. The same was true for socioeconomic status, which did not predict fertility levels after the killings.

Table 6-4. Total number of live births after the killings in the 1983-2015 period – coefficients of OLS linear regression

Response variable:	Model 1		Model 2		Model 3	
	Women	Men	Women	Men	Women	Men
Number of close kin alive at the year of killings ^a						
Number of close kin (all)	0.25*** (0.05)	0.07 (0.06)	0.33*** (0.05)	0.11* (0.07)		
Number of children					0.46** (0.19)	-0.07 (0.38)
Number of parents					0.18 (0.27)	-0.41 (0.31)
Number of siblings					0.32*** (0.08)	0.14 (0.09)
Number of spouses					0.29 (0.56)	2.77*** (0.77)
Massacre-derived mortality of close kin ^b						
Number of close kin killed	-0.64*** (0.08)	-0.33*** (0.09)	-0.57*** (0.08)	-0.42*** (0.10)		
Number of children killed					-0.61** (0.25)	-0.57 (0.40)
Number of parents killed					-0.59** (0.25)	-0.71*** (0.26)
Number of siblings killed					-0.52*** (0.13)	-0.28** (0.14)
Number of spouses killed					-1.32** (0.58)	-0.91 (0.77)
Birth cohort [Ref.: Oldest]						
Middle (10-19)			1.69*** (0.45)	0.23 (0.57)	1.73*** (0.57)	0.35 (0.83)
Youngest (0-9)			1.12*** (0.42)	-1.44*** (0.54)	1.16* (0.62)	-1.04 (0.85)
Born in Río Negro [Ref.: Other]			-1.91*** (0.41)	-0.11 (0.48)	-1.77*** (0.45)	0.43 (0.53)
Socioeconomic index			-0.05 (0.09)	-0.12 (0.10)	-0.03 (0.09)	-0.08 (0.10)
Observations	353	326	320	296	320	296
R ²	0.15	0.04	0.24	0.11	0.25	0.17

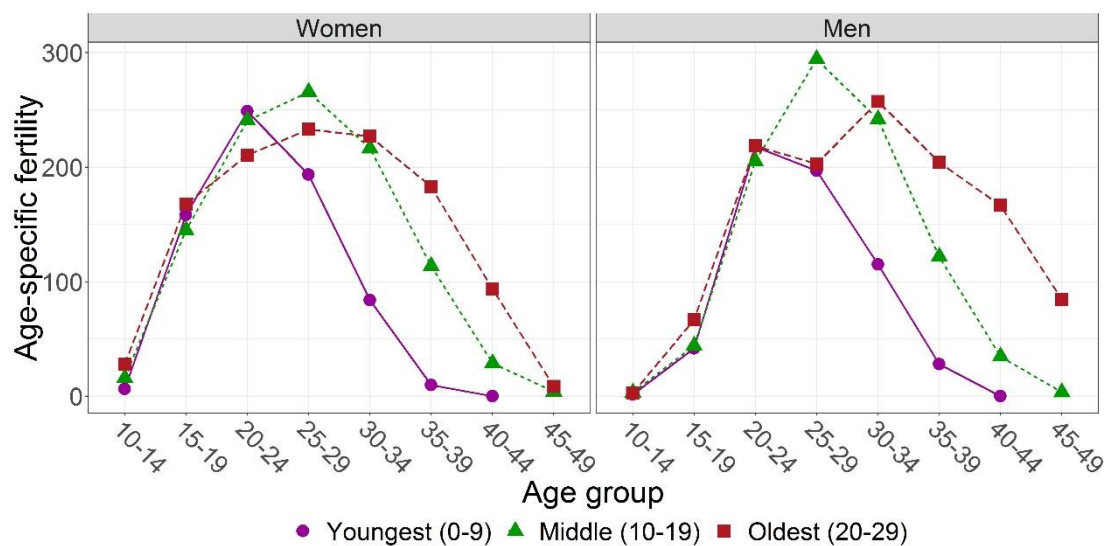
* p < 0.1, ** p < 0.05, *** p < 0.001

a. Count variables recording the number of parents, siblings, spouses and children alive at the start of 1982, before the killings. b. Count variable stating the total number of close kin killed in the massacres.

6.4.3.2. Cohort age-specific fertility

This section explores the distribution of fertility by age for members of the three birth cohorts considered in this study by focusing on cohort age-specific fertility. In Río Negro, members of younger cohorts had less extensive childbearing periods than members of older cohorts (i.e. they had lower fertility rates at older ages). This was true for men and women, as Figure 6-4 shows. For members of the oldest cohort births at more advanced ages were mainly of a higher parity, since around 40% of individuals in this cohort had already given birth in 1982. The middle cohort showed a relatively extensive childbearing period with high fertility between ages 20 and 29. Those in the youngest cohort had considerably shorter reproductive lifespans. Age-specific fertility declined sharply after the age of 25 for members of this cohort and approached zero by the age of 40.

Figure 6-4. Cohort Age-Specific Fertility Rates for members of the three birth cohorts of interest



Note: The vertical axis represents live births per 1000 individuals.

There were also important differences by gender. Women in the youngest cohort had consistently higher fertility than coetaneous men, a pattern already noted in Figure 6-3. Furthermore, fertility at age 15-19 was considerably higher for women than for men of the same cohort. The 15-19 age group is significant because it represented the start of the reproductive life for most survivors of the killings in this cohort. The fact the fertility was higher for women shows that it was mainly young women (and not young men) who had the highest fertility in the aftermath of the killings.

Older men tended to have children with younger women after the mass killings. The high fertility amongst the youngest survivors of the killings coincided with an increase in the fertility of men who were older at the time. This can be seen in the fertility 'peaks' at age 25-29 for men in the middle cohort and at age 30-34 for those in the oldest cohort. Female age-specific fertility was lower in older cohorts (i.e. middle and oldest cohorts).

The preceding analysis showed the differences in the timing of childbearing for men and women by birth cohort. Now follows a more nuanced statistical analysis aimed at disentangling the factors that affected the timing of the first post-massacre birth in the population.

The EHA statistical model (Table 6-5) showed no consistent association between kin size and the timing of the first birth after the mass killings. Despite this, the full model (Model 3) showed that kin network composition did make a difference. Having more children was associated with earlier births for women. Men with surviving parents were less likely to have earlier births in the aftermath of the violence but this was not true for women, for whom no significant association was found between the two variables. Men and women in a marital union (i.e. those with a surviving spouse after the killings) were considerably more likely to have earlier births.

Overall, the timing of the first post-1982 birth was independent of the total number of close kin killed in the massacres, after controlling for all relevant covariates. The type of relatives killed in the conflict was more important. Own-child mortality explained the variation in the timing of fertility for women only: those who lost a child tended to have later births after the killings. Men who lost a parent or a sibling tended to have earlier births (the effects are not strong). Losing a spouse was not a significant determinant of the post-killings timing of fertility.

Men from Río Negro had earlier births, compared with men born elsewhere, all else being equal. Men and women in the younger cohorts had significantly earlier births after the killings than members of the oldest birth cohort. The effects were considerably stronger for women in the youngest cohort. Finally, socioeconomic status before the mass killings made no difference for the timing of the first birth after the Río Negro Massacres.

Table 6-5. Time to first birth after the 1982 massacres for survivors of the killings – coefficients of binary logistic regression

Response variable:	Model 1		Model 2		Model 3	
	Women	Men	Women	Men	Women	Men
Number of close kin surviving after the massacres (time-variant)^a						
Number of close kin (all)	0.01 (0.02)	-0.01 (0.02)	0.02 (0.02)	0.01 (0.02)		
Number of children					0.34*** (0.10)	0.12 (0.17)
Number of parents					-0.13 (0.16)	-0.45*** (0.15)
Number of siblings					-0.01 (0.04)	0.09** (0.04)
Number of spouses					1.27*** (0.25)	1.64*** (0.25)
Excess mortality of close kin in the mass killings^b						
Number of close kin killed	-0.12*** (0.04)	-0.05 (0.03)	-0.03 (0.04)	0.04 (0.04)		
Number of children killed					-0.59*** (0.18)	-0.11 (0.18)
Number of parents killed					-0.20 (0.16)	0.34** (0.14)
Number of siblings killed					0.06 (0.06)	0.13** (0.06)
Number of spouses killed					-0.23 (0.34)	-0.2911
Born in Río Negro [Ref.: Other]			-0.35* (0.2)	0.27 (0.20)	-0.25 (0.23)	0.49** (0.22)
Birth cohort [Ref.: Oldest]						
Middle (10-19)			1.06*** (0.25)	1.63*** (0.29)	1.42*** (0.31)	1.78*** (0.34)
Youngest (0-9)			1.70*** (0.24)	1.55*** (0.27)	2.15*** (0.33)	1.65*** (0.33)
Socioeconomic index			0.02 (0.05)	-0.05 (0.05)	0.05 (0.06)	-0.04 (0.05)

* p < 0.1, ** p < 0.05, *** p < 0.001

a. Count variables specifying the number of parents, siblings, spouses and children alive at any given year after 1982. b. Count variable stating the absolute number of close kin killed in the 1982 massacres.

6.5. Discussion: what drove fertility after the massacres?

This section evaluates how the empirical results presented so far help understand the factors that drove fertility in Río Negro after the killings. The discussion integrates qualitative and quantitative evidence relating to the processes of (1) pronatalism and replacement fertility, (2) transactional marriage and scarring, (3) urbanisation, and (4) fertility postponement.

6.5.1. *Pronatalism and replacement effects*

The own-child replacement theory predicted a temporary increase in fertility as parents attempted to ‘replace’ their children killed in the massacres. This study found no evidence that survivors attempted to replace their own children (or any member of their families) by having high fertility after the violent events. For women in Río Negro the death of a child meant a lower fertility in the long term and a delayed first birth after the killings. Male fertility after the event was also not correlated with own-child mortality. These results are similar to the ones reported by Nobles et al. (2015), who found that own-child mortality did not fully explain the fertility recovery after the 2004 Tsunami in Indonesia.

The qualitative data suggested that a community-level pronatalism developed in Río Negro after the mass killings, conditioned by traditional gender roles that granted more decision power to men. Discursive ‘traces’ of this pro-birth agenda remained in 2016, when total fertility in the village was lower than the national average. Male participants in the FGDs agreed that there had been a need to promote high fertility after the massacres. They emphasised that increasing fertility had been appropriate and necessary to ‘correct’ the dramatic population decline caused by the mass killings (*usuk’umaxiik*; literally ‘setting straight’). Many saw a large population size as the best indicator of a successful demographic recovery. A member of the ‘oldest’ cohort summarised this view by describing with pride how massacre survivors ‘had managed to grow the village’ (*xojnimarisaniik*) after the killings, to the degree that Río Negro was now almost as populous as the neighbouring Xococ (home to the perpetrators of the massacre). This pride in numbers was less frequent amongst women, who tended to focus on the negative consequences of the mass violence for survivors. Only few women spoke about high fertility after the killings in a positive way. More often, they referred to the falling birth rates in the community when discussing fertility behaviour after the killings,

linking them to the increased availability of modern contraception (which some saw as beneficial and others as pernicious). This topic is covered in more detail below.

These pronatalist attitudes developed in the absence of a national-level pronatalist policy during or after the Guatemalan Civil War. As a matter of fact, many of the survivors were convinced of the existence of an antinatalist agenda in Pacux (i.e. policies aimed at preventing births in the population). This was epitomised by the persistence of rumours that the local authorities had carried out mass campaigns of forced sterilisation in the resettlement after the massacres.⁹⁵ In the FGDs, members of all birth cohorts emphasised that the very existence of the community had been at risk at the time. The memories of the mass killings were a clear reminder of this.

It is now necessary to determine whether this bottom-up pronatalism did in fact influence the fertility behaviour of the survivors. The ‘family pronatalism’ approach outlined in the background section of this paper stated that kin networks can help spread pronatalist behaviour. In Río Negro, this was achieved by individuals exercising social pressure on their female close kin to bear children. Women with more extended kin had higher fertility after the massacres compared to those with smaller surviving families. However, the size of a man’s kin network did not influence his subsequent fertility behaviour. This gender variation supports the hypothesis that the reproductive behaviour of women was affected to a greater degree by pressure exercised by close kin.

Traditional gender roles were strengthened after the massacres. Men were expected to fulfil the role of ‘breadwinners’ and providers of safety. The domestic role of women, responsible for the cultural and physical reproduction of the community, was also reinforced. Women in this study attested that domestic violence was common after the mass killings and there were multiple reported cases of rape committed by members of the community themselves (i.e. in addition to the rapes committed by the militias). According to a social worker dealing with survivors of sexual violence in the village, the

⁹⁵ A human rights expert from the community was convinced that these rumours were false (interview with KI-4). According to a national fertility expert, there is no evidence that APROFAM (the country’s leading family planning provider) conducted nation-wide sterilisation campaigns during the armed conflict (Alejandra Colom, personal communication, August 28 2017).

incidence of domestic and sexual violence in Pacux continues to be high compared to neighbouring populations.⁹⁶

The next section explores the influence of gender dynamics on reproductive behaviour amongst the survivors in more detail.

6.5.2. *Transactional marriages and scarring effects*

After the killings, many survivors found themselves in dire need of support after losing parents, siblings, and spouses. There was a ‘marriage boom’ in the months that followed the 1982 massacres. The number of new marriages that took place that year was double the number reported in 1981. However, most of these marriages were informal and short-lived, which means that their start and end could not be captured accurately by the genealogical interviews.

Transactional marriages between older men and younger women were common after the mass killings.⁹⁷ On average, men were considerably older than their spouses in marriages that formed after 1982, with age differentials between partners varying by birth cohort. The middle cohort stands out for having the largest age gap between spouses – in almost 10% of these marriages men were at least 15 years older than their spouses. This is important because women in this cohort had the highest total fertility and were main contributors to the fertility recovery. The following quote exemplifies the view (shared by male and female participants) that many of the marriages after the massacres resulted from ‘need’ rather than from ‘love’:

Arcadio: After the violence, there were many widows and widowers. People got together out of pure need. The widows had to find a husband whether they wanted to or not. They looked for a partner because how else would they have found the maize to eat every day and to make their tortillas? We men got the maize, we stole it during the night. But someone had to cook it and serve it. You see, everybody had to find a partner at the time. There was no other way.

FGD_B_2, with men aged 17-27 the year of the massacres

⁹⁶ Interview with KI-8.

⁹⁷ Age differentials were used to determine whether a marriage was transactional. This is a proxy as marriages can be non-transactional even in the presence of large age differences between partners.

Further evidence of the changing nature of marriage after the mass killings was provided by the prevalence of marriages with members of other communities. These became more common after the 1982 killings and after the survivors were forcibly resettled in Pacux. Men in the oldest cohort were more likely to marry women from other communities. Women were less likely to do so. This was partially explained by the prevailing system of patrilocal residence, according to which women were expected to move in with their husbands after marriage. It was logistically easier for women from outside to move into the military-run Pacux than for local women to leave the community after marriage. On the other hand, men were more exposed to life outside the community than women, who were generally excluded from labour outside the household.

The experience of the massacres explained the sharp increase in the incidence of marriages between locals and individuals from other communities. Participants in the qualitative discussions believed that stigma and social isolation shaped the demographic dynamics after the mass killings. Some women in the middle and oldest cohorts were unwilling to marry or remarry after the killings. Others were ostracised after suffering from sexual violence. Women suspected of having been raped were often referred to as being 'damaged' (*xb'an k'ax chi ke*) by the survivors in the qualitative discussions. This was consistent with evidence from a range of post-conflict settings, where women who suffered sexual violence (or were suspected of having suffered it) have been rejected by their families and partners (Ward & Marsh, 2006). The case of women in the oldest cohort, who were 20 to 29 years old at the time of the massacres, demonstrated this. Women in this cohort were the most affected in terms of conflict mortality and of violent deaths within their families. The qualitative discussions suggested that they also suffered the most from sexual violence, sometimes in the form of repeated rape. Around a quarter of women in this cohort remained single after the mass killings. This was the highest non-marriage ratio of all cohorts and was consistent with a scenario where exposure to violence would have led to lower fertility in later life. Women in this cohort had the lowest cohort fertility of all, even lower than women born decades later. A member of this cohort summarised this point in a FGD, to the approving nods of the other participants:

Rebeca: Some [women] married again after the violence. But others were raped, they were damaged. They separated from their husbands, and some married again in the mountains, others married here [in Pacux]. Others never got

together with a man again and didn't have more children. It was easier for younger women to find husbands [after the war] because older women couldn't have any more children.

FGD_B_2, with women aged 17-27 the year of the massacres

The presence of scarring effects was confirmed by the fact that exposure to the killings was associated with lower long-term fertility, particularly for women. Higher exposure to violence might have affected the fecundity of women aged 20-29 at the time of the massacres (in addition to causing psychological trauma and social isolation) but not data were available to evaluate this. This contrasted with the experience of members of the youngest cohort, all of whom were less than ten years old at the time of the killings. The rate of external marriages in this cohort was equivalent for men and women, all of whom married for the first time after 1982 (and were less affected by the physical and sexual violence that accompanied these events).

Traditional forms of social organisation in Río Negro facilitated the ostracising of female survivors of the 1982 massacres. References to this phenomenon were common in FGDs with survivors of both genders. The qualitative analysis suggested that the prevalence of traditional gender roles in the community contributed to the systematic exclusion of vulnerable women, including survivors of sexual violence, orphans, and widows from the killings. Many were socially segregated, unable to find a spouse, led to live in isolated areas, or even accused of witchcraft. Male survivors, less affected by this form of scarring, were encouraged to marry younger women or women from other communities.

The next section will focus on how the forced resettlement in an urban area affected fertility outcomes in the community.

6.5.3. Urbanisation and changing access to contraception

It is difficult to disentangle the influence of the mass killings on long-term fertility from the effects of the known determinants of fertility (Bongaarts, 1978). Contraceptive offer was low in 1982 Río Negro, a time when the village was geographically and culturally isolated from the rest of the country. The prevalence of modern contraception in the village decreased even further between 1982 and 1984, when the population had no

access to any healthcare system due to its forced displacement.⁹⁸ Studies in other contexts have shown that armed conflicts also reduce the availability of modern contraception (Namasivayam et al., 2017). It is possible that the prevalence of traditional contraception (such as withdrawal or abstinence) was altered in the aftermath of the killings, but no quantitative data were available to evaluate this.

Even though access to public services was precarious in Pacux, its closeness to the municipal capital improved access to the public healthcare system (Douzant, 2003). This included more availability of modern contraception and exposure to novel ideas of ideal (lower) family size. Fertility declined in the village after the year 2000, coinciding with the reduction of fertility amongst the national Mayan population. Improved contraceptive offer certainly played a major role in this, but better access to education and employment (especially for women) also mattered.

Older participants constantly referred to the improved supply of family planning methods in Pacux during the qualitative discussions, emphasising how foreign these technologies had seemed initially. The sudden exposure to modern contraception, together with the traumatic experience of the war, might explain the emergence of rumours of forced sterilisation in Pacux. Traces of this scepticism towards modern contraception can be seen in the following exchange between two women from the oldest birth cohort. This attitude contrasted strongly with the eagerness with which younger women spoke of the benefits of family planning in other FGDs.

Remedios: In the old times, people didn't use any modern contraception [*keunab'aal*; literally 'medication'] like they do here in Pacux. You had as many children as God provided. But now girls only have one or two children. Before, I accepted if God wanted to give me ten children. We had to fight for our children.

Sofía: Now everything has changed, there are new ideas, there many things that we didn't know before. We never heard about those things; what are young

⁹⁸ Secondary sources on Río Negro (Gaitán, 1981) and similar Mayan communities (Early, 1982) provide no data on contraceptive use. However, DHS data showed that contraceptive demand was very low amongst the Mayan population in 1987 (only 5.5% of Mayan women reported using modern contraception – see Appendix M). It is unclear how the war affected the supply and demand of modern contraception in indigenous areas (Santiso-Galvez & Bertrand, 2004; Grace & Sweeney, 2016).

people doing now? They don't want children, I don't know why. They don't want any more kids.

FGD_A_1, with women aged 28-42 the year of the massacres

In Río Negro, socioeconomic differences did not fully explain the fertility behaviour of survivors. This can be explained by the fact that income inequality was low in the village before the mass killings, since most villagers relied almost exclusively on subsistence agriculture. Whilst Pacux remained under military control, all services and most of the employment were regulated by the military. This dependency on the army maintained most residents of Pacux in a protracted and generalised state of deprivation.

The last section of this paper focuses on the influence of population structure on the fertility recovery that followed the mass killings.

6.5.4. Fertility postponement

The theory of childbearing postponement stated that a higher share of women would be able to become pregnant at the end of a conflict because childbirth tends to be delayed during crises (Heuveline & Poch, 2007: 409). In Río Negro, this would have resulted in higher fertility amongst women who already were of reproductive age at the time of the killings (since it was only them who could have delayed their fertility).

This was not the case in the aftermath of the mass killings in Río Negro. Women in the cohort aged 20-29 in 1982 contributed only a small percentage of the births that made up the fertility recovery. It was women aged 10-19 who had the earliest births after the killings. These younger women also had the highest cohort fertility and the highest number of births after the killings. Most did not postpone their fertility as a result of the massacres because their reproductive life started after 1982.

The potential influence of delayed childbearing were offset by the extremely high excess mortality and exposure to violence experienced by older women. Women who were of reproductive age at the time of the mass killings were particularly likely to be targeted by perpetrators and, as a result, experienced particularly high levels of sexual violence. This means that, even if there were more women at risk of pregnancy after the killings, they were not always able or willing to give birth.

It is possible that the effects of fertility postponement are diminished by these factors in other contexts of mass killings. Chapter 5 showed that mass killings tend to produce relatively high mortality for men and women of different ages. They also affect the mental, physical, and social wellbeing of those who suffer them to a greater extent than other types of conflict events. The particularly negative effects of mass violence on women have been documented for Rwanda (de Walque & Verwimp, 2010) and Cambodia (de Walque, 2006). However, more research is needed to generalise the findings of this study to other contexts.

6.6. Conclusions

This paper focused on a sub-national population that experienced a series of mass killings in 1982. The Río Negro Massacres in Guatemala produced high mortality across the different demographic groups of the population and included extreme levels of psychological, physical and sexual violence. Fertility in the village declined dramatically before the massacres but the rates recovered quickly, following a known pattern of fertility drop and rebound (Agadjanian & Prata, 2002; Van Bavel & Reher, 2013).

This study explored the factors that influenced fertility behaviour in this period. Bottom-up pronatalist attitudes developed as a response to the perception that the future of the community was compromised, but survivors did not necessarily act to replace their own children. Rather, there was evidence that individuals exercised social pressure on their close kin to achieve high fertility. Traditional gender roles were reinforced after the killings, leading to an increase in the gender power differentials between men and women. This, together with the fact that many found themselves in very precarious circumstances after the killings, resulted in a greater prevalence of marriages between older men and younger women. These marriages, in turn, tended to have very high fertility.

Women who were more affected by the violent events had the lowest subsequent fertility as a result of ‘scarring’ processes, partly derived from their experience of sexual violence. The social stigma derived from this experience led men to seek younger spouses (who had been less exposed during the mass killings) and to marry women from outside the village. Older men in this cohort had very high fertility until old ages but the same was not true for women of the same age, whose fertility plummeted because of the killings and never recovered afterwards.

The prevalence of modern contraception was extremely low in Río Negro before the killings. The forced resettlement of the population in an urban area improved access to modern contraception, education, and employment. This may have influenced the rapid fertility decline in the village after the year 2000. The same can be true for other marginalised communities relocated from less accessible to more accessible areas during armed conflicts, but more research is needed to establish this.

The fertility recovery in Río Negro occurred in the absence of fertility postponement. Women aged 10-19 had the highest post-killings fertility but most were single or too young to have children at the time of the crisis. The effects of postponement are likely to be more important in the presence of sex segregation (e.g. military conscription). Women who were already of reproductive age at the time of the massacres had lower fertility in their aftermath given the scarring processes mentioned above.

The in-depth description of the Río Negro case helped identify processes underlying the post-conflict fertility recovery, but the results cannot be generalised to other settings without further research. This paper emphasised that massacres are a particular type of conflict event that deserve separate attention. Collecting more evidence on mass killings will help improve our understanding of fertility behaviour after these events.

A better understanding of fertility behaviour after armed conflicts can help humanitarian organisations provide more effective assistance. The United Nations High Commissioner for Refugees (UNHCR) is in the process of introducing demographic models to project the future size and composition of displaced populations. This will allow resources to be allocated more efficiently to field operations (Alburez-Gutierrez & Segura, 2018). At the moment, these demographic projection models rely on simplified assumptions about how mortality and fertility react to armed conflict. This study can help improve these assumptions, ultimately leading to more accurate population projections. Further research on this subject is urgently needed given that armed conflicts will continue to affect millions in the foreseeable future.

Chapter 7 Conclusions

El daño ocasionado es de carácter irreparable, las vidas humanas que se perdieron en las masacres, rebasa todo nivel de entendimiento humano.

The resulting damage cannot be repaired. The human lives lost in the massacres. It is beyond all human understanding.

Sentence of the 2013 Genocide Trial in Guatemala (own translation)

The thesis was motivated by the lack of studies on the demographic effects of war-time mass killings and on how these events affect local populations. It focused on the 1982 Río Negro Massacres, a series of mass killings that produced very high mortality amongst residents of a Maya Achi village located in the central highlands of Guatemala. These emblematic events remain largely unknown outside of the country and their demographic consequences have not been studied.

The main research question was: *How did the 1982 mass killings affect mortality outcomes and fertility behaviour in the village of Río Negro?* To answer this, the thesis considered four ancillary questions. The first two were concerned with patterns of mortality: *How did the availability of family support affect the risk of dying in the 1982 Río Negro Massacres? In what way did the loss of family support influence mortality risks after the mass killings (in the 1983-2015 period)?* The other two questions focused on the fertility behaviour of the survivors: *How did the 1982 Río Negro Massacres affect the fertility behaviour of the survivors? What are the factors that explain the post-1982 fertility recovery in the population?*

This concluding chapter summarises the main findings of the thesis and discusses how they relate to the existing demographic literature and highlights the contributions of the thesis in light of the gaps in knowledge identified in Chapter 1. The chapter ends with a series of recommendations for future research derived from the findings and limitations of the thesis.

7.1. Summary of findings

This section outlines the main demographic patterns in post-1982 Río Negro. The first part summarises the evidence related to mortality during and after the mass killings, topics covered in Chapter 5. The second part discusses patterns of fertility amongst the survivors of the massacres, summarising the main empirical findings of Chapter 6.

These descriptive results highlight the main demographic processes discussed in the thesis. A later section focuses on the factors that explained the observed demographic change in the population.

7.1.1. *Mortality in Río Negro (1982 to 2015)*

Río Negro was a typical Mayan village in rural Guatemala before 1982. Villagers relied on subsistence agriculture and seasonal labour migration to the plantations in the southern lowlands of the country. Poverty was generalised in the population and formal education virtually non-existent (less than 5% of the residents could read or write). Río Negro was an ethnically homogeneous and culturally traditional Maya Achi community. Social relations were organised around kinship ties. The community was geographically isolated from the nearest urban centre, the municipal capital of Rabinal, which could only be reached on foot. Outmigration from the village was very limited at the time.

In demographic terms, Río Negro was very similar to other contemporaneous rural Mayan communities: young, with high fertility, mortality, and morbidity (Gaitán, 1981; Early, 1982). Data from this study showed that, like the most of the rural indigenous populations in the country, the population had not yet started the fertility transition (Grace & Sweeney, 2016). In 1977, total fertility in Río Negro was 8.1, slightly higher than the value reported for the national Mayan population one year later (7.4) (APROFAM, 1978).

The demographic stability in the village (high mortality and fertility, and low migration) changed abruptly between 1980 and 1982, when 366 out of the 970 residents were killed in events that came to be known as the Río Negro Massacres. Direct mortality from the mass killings was remarkably similar by sex: 37% of all women and 38% of men were killed. Mortality was also consistently high across all age groups. The extremely high mortality of children stands out: 30% of all children under 15 died in the massacres.

Violence in Río Negro was directed against the population as a whole and not only against a specific group, such as young men. The distribution of direct excess mortality from the Río Negro Massacres was considerably different from that of the Guatemalan

Civil War as a whole, in which most victims were men aged 20 to 45 (CEH, 1999a).⁹⁹ However, this does not mean that violence was haphazard – perpetrators purposefully targeted all members of the population, including groups that posed no immediate threat to them (e.g. children and pregnant women). Residents of Río Negro were also exposed to a higher-than-average incidence of physical, sexual, and psychological violence compared to other victims of the conflict. Many witnessed first-hand the violent death of close kin. On average, survivors lost one fourth of their close kin in the killings.

The massacres had quantifiable negative consequences for survivors. Men who were more exposed to the killings died earlier after the events compared to those who were less exposed to the violence (hazard rate = 1.14). Women suffered particularly high levels of sexual abuse during and after the massacres, resulting in negative long-term psychological and social consequences. This resonated with the findings of previous studies in Guatemala (Warner, 2007) and other contexts (Kinyanda et al., 2010; Neal, Stone & Ingham, 2016), all of which have emphasised the devastating effects of armed conflicts on survivors in general and women in particular. Child mortality rates were very high in the aftermath of the massacres, confirming the well-established fact that children tend to carry much of the burden of armed conflict (Machel, 1996).

This section summarised patterns of mortality relevant for the first two specific research questions of the study. The other two specific research questions were related to the effects of the killings on the childbearing behaviour of survivors. This is the subject of the next section.

7.1.2. *Fertility amongst the survivors of the Río Negro Massacres*

Before 1980, fertility in Río Negro had followed the averages of the national Mayan population, showing no sign of a sustained fertility decline (Grace & Sweeney, 2016). This study found a pattern of fertility *drop and rebound* in Río Negro, where Total Fertility Rates (TFR) declined sharply before the massacres from a high of 8.1 to a low of 2.9 but quickly recovered afterwards, remaining relatively high until the end of the century

⁹⁹ This was similar to the distribution of non-combatant excess mortality in other national conflicts, where young men tend to have the highest mortality rates (Obermeyer, Murray & Gakidou, 2008).

(at around 6.5). This was consistent with the fertility responses to armed conflicts reported in other contexts (Agadjanian & Prata, 2002; Van Bavel & Reher, 2013). During the Twentieth Century, fertility in Río Negro declined at a faster rate than in the rest of the country. By 2015, total fertility in the village (2.3) was lower than amongst the Mayan population as a whole (3.6), according to DHS data.

Gender and age at the time of the killings were important for explaining the differences in the post-massacre fertility behaviour of survivors, particularly for women. This was related to the fact that exposure to the mass violence was itself conditioned by the gender and age of the villagers in 1982. Women who had already reached puberty were more likely to have experienced acute forms of sexual violence during and after the massacres, including rape and gang rape. Men also suffered from extreme forms of violence in this period, including physical abuse and torture. However, they did not suffer the same degrees of sexual and psychological violence directed at women because of their gender.¹⁰⁰ Men largely avoided the physical and social consequences of the massacres that affected many women, including social stigma and infecundity (Kinyanda et al., 2010).

These differences by gender were highlighted when comparing the patterns of female and male fertility within the population. Women who were under 20 at the time of the killings had the highest cohort fertility in the population. The high fertility amongst women in this group ultimately drove the post-1982 fertility recovery. Their average parity at age forty was 1.5 times higher than that of women who were 20 years or older at the time of the killings. Many of these younger women started their reproductive age after the killings (i.e. they had their first child after 1982). As a result, they were less likely to have suffered from the same degree of sexual abuse than older women during the violent events. On the other hand, men who were under 20 at the time of the killings also had high fertility after the massacres, but the youngest amongst them (those who had not reached puberty in 1982) did not go on to have exceptionally high cohort fertility, as women of the same age did. The youngest men had the lowest cohort fertility of all, something that would be expected from a population undergoing the demographic transition in the absence of a mortality crisis.

¹⁰⁰ This is true even if sexual violence against men was underreported – see ‘Limitations’ section in this chapter.

A very different pattern was found for individuals who were 20 years or older at the time of the killings. The fertility of women in this age group never really recovered after 1982: it remained at the low levels observed around the time of the killings. Many interrupted childbearing completely by not bearing further children after the massacres. Single women and women who lost their spouse in this period were less likely to marry after the massacres. On average, post-1982 fertility in this group was very low. In contrast, men who were older than 20 at the time of the killings had relatively high fertility until late ages. These men, however, tended to have children with younger partners or with women from other communities.

This section presented a brief summary of the most relevant patterns of demographic behaviour in Río Negro during the 1982-2015 period. The results showed that the killings of 1982 had direct and indirect effects on the inhabitants of the village. The next section explores the different processes involved in bringing about the patterns of mortality and fertility described above.

7.2. Integrative discussion

The thesis focused on the role that two social processes played on population change in Río Negro. The first one was *the social influence of relatives*, which included relations of social support and social pressure within kinship groups. The second were *scarring effects* left by the experience of the massacres. These were defined as the negative social and psychological consequences of the killings in the demographic behaviour of survivors. This section shows how these two processes were operationalised in the empirical studies and how they helped explain demographic behaviour in Río Negro.

This thesis also considered other factors influencing population change during and after the events of 1982. Age and gender were identified as prominent factors for explaining the difference in demographic outcomes within the population. The thesis underlined the relevance of gender dynamics for understanding demographic behaviour in the context of mass killings. The unique data produced by the EGM made it possible to complement the discussions about the role of gender in Río Negro with reliable evidence about the demographic behaviour of men and women in the same population (something unusual in the demography of conflict, where many studies have focused exclusively on women).

The analysis showed that other factors were less relevant for explaining the variation in demographic outcomes in the population. This was the case for the socioeconomic status of the village's inhabitants before the killings. The results were explained by the fact that income inequality has been consistently low in the village until recent times. Before the killings, the population relied on subsistence agriculture and poverty was prevalent. After the massacres, survivors were resettled in a military-run facility where the provision of services and labour was regulated by army personnel. Military control of Pacux was weakened in 1996, when the Peace Accords were signed, but continued until 2003.

The following discussion summarises the factors that drove mortality and fertility in the village and how they were related to the experience of the mass killings. The first part outlines the conclusions of the analyses focused on explaining why some Río Negro residents survived the massacres and their aftermaths and others did not.

7.2.1. *Explaining mortality in Río Negro: the role of social support and scarring effects*

The thesis tested four mechanisms related to the influence of family support (social support provided by close kin) on mortality outcomes in the context of the Río Negro Massacres. Some of these mechanisms were derived from the existing literature on the demography of conflict, in the absence of a comprehensive body of literature focusing on the demographic consequences of mass killings. Others were original contributions of this research.

The initial two mechanisms were concerned with the protective role of kin networks during mass killings. They examined the potential positive effects of family support on survival. The notion of 'family support' used in this study was not just an academic abstraction – participants in the qualitative discussions constantly referred to the importance of support and assistance provided by close kin for ensuring survival in the context of the mass killings. This is consistent with evidence from studies in non-conflict settings, which have found that having strong social connections helps reduce mortality risks (Holt-Lunstad, Smith & Layton, 2010).

The first mechanism described the process by which the availability of family support *facilitated the escape* of some residents from Río Negro before the killings. These individuals used the support and assistance provided by their close kin to escape from

the area in the period leading to the massacres, thus avoiding almost certain death. The thesis showed how news of the impending massacres spread through kin networks, giving some residents an awareness advantage over others. Those with close kin living outside of the village were able to move in with them in order to avoid the mass violence.

The second mechanism described how those who remained behind attempted to *provide physical protection* to their close kin by acting as human shields or facilitating the flight of their close kin during the killings. This was possible because the killings extended for several hours as perpetrators executed their victims using rudimentary methods (wooden clubs, machetes, and rocks). This assistance facilitated the survival of some residents. In other cases, entire kinship groups were killed together due to the refusal of individuals to forsake their close kin. The age, gender, and family composition of the Río Negro residents were also important for determining their survival. Social and gender norms determined who was worthy of assistance and who should provide it (e.g. young men were expected to protect their families; young women, their children).

The other two mechanisms identified in the thesis were related to the lingering negative effects of the killings on survivors through processes of scarring. These mechanisms emphasised the different ways in which the experience of the killings reduced the opportunities for cooperation and undermined the physical wellbeing of survivors in the long term.

The third mechanism, *social scarring*, was defined as the process by which the massacres fragmented kinship groups, resulting in more loosely connected kin networks. This limited the potential opportunities for collaboration between survivors. Previous studies have proposed that genocides damage the social fabric of local populations (Esparza, 2005; Card, 2010; Smith, 2016) but the concept had not been operationalised before. Survivors of the Río Negro Massacres continued to rely on the social fabric of their community after the mass killings. These relations of cooperation became even more important after the dramatic events of 1982. However, the massacres reduced the availability of close kin in Río Negro – the average number of relatives able to provide support decreased by 40% because of the killings. The severing of kinship ties diminished the potential family support available to survivors, along with its positive consequences.

The fourth mechanism, *psychological scarring*, referred to the profound psychological consequences of the killings on survivors. In qualitative discussions, participants emphasised the prevalence of feelings of *b'iiis* or 'sadness' using a vocabulary that other studies of the Guatemalan Civil War have identified with depression and post-traumatic stress disorder (PTSD) (Warner, 2007; Smith, 2016). These descriptions were common in discussions with men and women, who often listed *b'iiis* as the cause of death of their close kin after the massacres. Participants were convinced that the prevalence of psychological scarring was related to long-term higher mortality. This is important because similar mental health conditions have been associated with increased mortality risks after armed conflicts in other settings (Sibai, Fletcher & Armenian, 2001).

This section summarised the main factors explaining the patterns of mortality in the village during and after the 1982 mass killings. The next section focuses on the factors that brought about high and low fertility in the population of survivors of the Río Negro Massacres.

7.2.2. *Explaining fertility after the massacres: what drove fertility amongst the survivors?*

The thesis evaluated a number of factors to explain fertility behaviour after the killings in Río Negro. The potential explanations were adapted from previous studies on armed conflicts and natural disasters. Some related to the processes of social influence and scarring discussed above; others considered alternative factors known to affect fertility, including ideational change and population structure. The analysis sought to determine their relevance for explaining childbearing behaviour after mass killings by focusing on the case of Río Negro.

The first factor was related to the *development of ideologies to promote childbirth* in the village after the massacres. The thesis showed evidence of a bottom-up pronatalist ideology fuelled by the perception that the very existence of the community was under threat. This pronatalist ideology portrayed high fertility as a communal achievement benefitting all members of the group. Social pressure exercised by close kin after the massacres was crucial for translating these pronatalist sentiments into high birth rates. Kin networks facilitated the spread and enforcement of pronatalist ideas. This was consistent with evidence from non-conflict settings, where kin networks tend to promote high fertility (Lois, 2016). It was also in line with evidence of bottom-up pronatalist feelings reported

after other mortality crises (Nobles, Frankenberg & Thomas, 2015; Grace & Sweeney, 2016).

However, there was no evidence of an own-child replacement fertility effect, a pattern reported in other conflict settings (e.g. Hossain, Phillips & Legrand, 2007). The post-1982 fertility recovery in Río Negro was not a result of parents attempting to ‘replace’ their children killed in the war. As a matter of fact, individuals who lost more children in the killings had lower fertility after the events. It was younger women, most of whom were childless at the time of the killings, who had the highest long-term fertility of survivors.

A second factor referred to the *scarring effects of the killings* on the fertility behaviour of survivors. The experience of the killings resulted in lower fertility for some survivors given the negative effects derived from the exposure to the killings and the associated physical, psychological, and sexual violence. In Río Negro, the association between exposure to the killings (defined as the number of close kin killed) and low fertility was stronger for women than for men. Two factors explain this. On the one hand, the surviving women of Río Negro (especially those who given their age had been more exposed to sexual and physical violence) faced a high degree of social stigma and isolation after the massacres. In addition to this, many were unwilling or unable to marry and bear children. As a result, many men married women from other communities after the killings. This helped explain why the fertility of women over 20 years of age remained very low after the killings.

The third factor identified was related to the *reinforcement of traditional gender roles* after the violence. The killings left many of the survivors in a very vulnerable position having lost their close kin, possessions, and means of subsistence. This led to a strengthening of traditional gender roles that granted more power to men, who increasingly came to be seen as the providers of sustenance and protection, particularly within marriage. This contributed to the higher fertility of young women, particularly as the incidence of marriages between men and younger women increased after the killings. The fact that older men were in a better position to enforce their own (high) fertility preferences explained their high levels of fertility in this period. Other studies have concluded that events of mass violence reinforced traditional values amongst Mayan communities in Guatemala (Warner, 2007; Kupprat, 2010b; Grace & Sweeney, 2016).

A fourth factor concerned the *forced resettlement of the population in an urban area*. The accelerated urbanisation of Río Negro after the killings played a role in bringing about low fertility, especially amongst the youngest members of the population. In Pacux, survivors were exposed to an improved offer of modern contraception and better educational and employment opportunities, even when the resettlement was controlled by the military. This helped explain the relatively low fertility of the youngest generation of survivors, all of whom reached puberty in Pacux, an urban area close to the municipal capital of Rabinal. The decline in fertility amongst the youngest survivors coincided with the start of a national-level fertility decline.

The last factor considered in the thesis was related to the *postponement of fertility* as a result of the separation of spouses and the uncertainty inherent to armed conflicts. This temporary delays in the timing of childbearing are usually followed by short-lived ‘baby booms’ as spouses reunify and couples resume their reproductive lives after the crisis (Heuveline & Poch, 2007). This was not the case in Río Negro. Those who could have postponed their fertility because of the killings (women who were already in a marital union at the time), had the lowest subsequent fertility of all given the scarring processes described above. It was the youngest women who had the highest fertility after the killings. Many of them reached puberty after 1982, which means that it is unlikely that they would have postponed their fertility because of the violent events. Younger women had earlier births after the killings than older women, a pattern reported for other armed conflicts (Neal, Stone & Ingham, 2016).

This section outlined the main findings of the thesis with the aim of answering the research questions. The next section summarises the scholarly and practical contributes of the thesis.

7.3. Contributions of the research

The thesis aimed to address a number of gaps in knowledge regarding the demographic consequences of mass killings. These were (1) a lack of data on the same population before, during, and after mass killings, (2) a lack of discussion focused on mass killings as distinctive types of conflict events, (3) a poor understanding of the relationship between social support and excess mortality, and (4) a dearth of evidence on fertility behaviour after mass killings. This section describes how the thesis addressed these gaps and made other important practical contributions.

7.3.1. *Methodological contributions*

In the course of the PhD I developed the Extended Genealogy Method (EGM), an original approach for reconstructing retrospective demographic data from cross-checked genealogical interviews. The EGM responded to the lack of traditional data sources (such as household surveys) in the context of mortality crises. This is the first method developed especially for collecting genealogical data for demographic analysis in these settings. Chapter 4 showed how the EGM was implemented to reconstruct the demographic history of Río Negro before and after the 1982 massacres with good results. The chapter also provided guidelines on how to generalise the principles of the EGM to other settings.

The EGM is different from the existing methods for collecting genealogical data in three important ways. First, it emphasises the generation of ‘socio-centric’ kin network data (i.e. kin networks not centred on any individual). Time-variant social network data can be reconstructed from socio-centric genealogies. The thesis used these type of data to evaluate the availability of family support over time.

Second, the EGM was designed to address known retrospective biases and the underreporting of unmarried individuals, childless marriages, young woman, and children (Zhao, 2001). The method uses ‘multiple reporting’ (independent observations on the same individuals) to check for data completeness and improve data quality. A controlled degree of redundancy is built into the genealogical questionnaire and sampling strategy.

Third, the EGM uses the network properties of kinship structures to improve the data sampling strategy and minimise the number of genealogical interviews needed to reconstruct a historical population. The EGM makes participant selection more efficient by processing, matching, and merging the genealogical records during the data collection phase. This contrasts with the census-like sampling strategies used in previous studies, which make posterior efforts to merge independent ‘ego-centric’ networks after fieldwork (i.e. kin networks centred on a particular individual) (Milligan, 2010; Pinkerton et al., 2011).

This PhD produced the most comprehensive demographic data to date on a local population affected by mass killings. The EGM-generated dataset contained

demographic and social network data on all the inhabitants of Río Negro for the 1955-2015 period. This provided unique data about the demographic dynamics in a close-knit community that suffered from very high direct excess mortality. The data were used to conduct analyses that would have been impossible with traditional demographic data sources such as household surveys or censuses.

The next section summarises how the empirical studies contributed to fill the gaps in knowledge identified in the introductory chapter of the thesis.

7.3.2. *Empirical contributions*

This thesis provided the first in-depth and comprehensive overview of demographic behaviour in a massacre-affected population. Focusing on the experience of Río Negro, it proposed mechanisms to explain these demographic patterns and conducted systematic analyses to evaluate their existence. The theoretical models developed in this thesis provided a starting point for understanding how mass killings affect populations at a local level and how these effects differ from those of other conflict events. Advancing these models is important because the particular dynamics of mass killings (and their consequences) are often obscured in national-level studies that conflate massacres with other types of conflict events (Lacina & Gleditsch, 2005).

The thesis maintained that mass killings should be regarded as a distinctive type of conflict event in which perpetrators target entire communities. Massacres generally produce high excess mortality across demographic groups (not only amongst young men as in national-level conflicts) and are accompanied by degrading behaviour, torture, mass rape, and the continued persecution of survivors (Meierhenrich, 2014). All of these behaviours have been common in genocides after the Holocaust, including that of the Maya Achi in Guatemala (Casaús, 2015; and this study) and the 2017 genocide of the Rohingya people in Myanmar (UNHRC, 2018). The thesis advocated for the use of a relational approach to understand the consequences of mass killings – the studies centred on discussions of social support, social isolation, and social pressure. This perspective was chosen because mass killings have negative impacts on the social life of communities that transcend excess mortality.

Second, the thesis highlighted the role of gender in demographic processes following mass violence, a topic that needs more attention in the demography of conflict. The

study showed that even though excess mortality had been high for all demographics in Río Negro, the killings affected women and men in different ways. Women were more likely to suffer from sexual violence and the associated negative effects in the long term. The thesis highlighted the role of scarring, social stigma, and social isolation which affected women after the massacres in particular. This was the first study to consider the demographic behaviour of women and men in the same population throughout an episode of mass killings. Previous studies have focused on women exclusively because many surveys do not record information on male fertility (Schoumaker, 2017).

Third, the thesis showed that the social and demographic consequences of mass killings linger over time, affecting survivors and their close kin long after the violence subsides. The ripples of the 1982 massacres continue to affect the residents of Pacux and Río Negro to this day, more than 35 years after the events. Exposure to the killings explained long-term mortality and affected the fertility behaviour of survivors in clear and distinct ways. This matters because many studies in the demography of conflict continue to regard direct excess mortality as the absolute measure of a conflict's intensity.

Finally, the thesis makes a contribution to the growing literature on the Guatemalan armed conflict. On the one hand, it provided the first in-depth description of the demographic processes that followed an episode of mass killings in the country – one of the many massacres committed by the army in this period (CEH, 1999c). On the other, it presented unique quantitative evidence on these processes – the vast majority of studies on war-time mass violence in Guatemala have been entirely qualitative (Casaús, 2015; Brett, 2016; Crosby, Lykes & Caxaj, 2016; Grace & Sweeney, 2016; Vela Castañeda, 2016; Casaús & Ruiz, 2017; Benítez Jiménez, 2018; Schwartz & Straus, 2018). It also contributes to address the general lack of awareness of the human rights violations committed during the Guatemalan Civil War. The thesis presented valuable evidence to counter those who have attempted to diminish the extent of the human rights violations committed by the Guatemalan State or deny that they ever took place (Sabino, 2009; c.f. Benítez Jiménez, 2018).

7.3.3. *Implications for policy*

The evidence presented in the thesis underlined the need to focus on the social needs of those who survive atrocities. International and charitable organisations already provide

shelter, food, protection, healthcare, and many other services to these populations. Less attention is currently directed at enhancing the positive effects of social support (Aina Saetre, personal communication April 02 2018). Nevertheless, there is a growing interest in exploring how humanitarian organisations can make use of the existing social capital of displaced populations to bring about positive outcomes (e.g. Betts, Omata & Sterck, 2018). At the time of writing (August 2018), I was involved in a UNHCR project to understand the role of kin networks and social support amongst Rohingya refugees from Myanmar and host communities in Bangladesh. My contributions to the project design drew heavily on my experience developing the EGM and applying it in Río Negro.

The results of this thesis are relevant for family separation policies in contexts of forced displacement. The 2018 ‘zero-tolerance’ immigration policy implemented by US authorities is a recent example of this phenomenon, which is all too common outside high-income countries (de Jong et al., 2001).¹⁰¹ The thesis underscored the long-recognised need to assist the youngest members of the population after atrocities (Davis, 1996; Machel, 1996). Children in Río Negro were the age group most likely to be affected by the loss of the social support provided by close kin. This was in line with previous research showing that the lack of social support has detrimental effects on the physical and mental wellbeing of children affected by armed conflict (Sabin et al., 2003).

The results from this thesis also emphasised the importance of supporting research on the experiences of women during wars, particularly where atrocities are concerned. Data from Río Negro showed that atrocities can affect men and women in very different ways, both in the short and in the long term. Women experienced distinctive types of violence and had to deal with particular forms of social pressure in their own communities after the massacres. In 2000, the UN Security Council adopted a resolution concerning women, peace, and security (S/RES/1325), highlighting the need to recognise the role of women in all stages of armed conflicts, from prevention to

¹⁰¹ At the time of writing (September 2018), the Texas Tribune had provided an exemplary coverage of the policy, which amongst other things caused thousands of mainly Central American children to be forcibly separated from their parents at the US-Mexico border:

<https://www.texastribune.org/series/separated-immigrant-families-zero-tolerance/>

post-conflict reconstruction. The conclusions from this thesis contribute to the chorus of voices calling for more research on the subject (Rehn & Johnson Sirleaf, 2002).

7.3.4. *Impact of the thesis*

This section describes how results and insights from this thesis have already been used to support survivors of atrocities. The two instances described below highlight the way in which academic research can help advance projects which are relevant for research participants themselves.

First, results from the empirical studies have been used as evidence to support the prosecution of the perpetrators of the atrocities described in this thesis and those committed in Rabinal more broadly. At the time of writing, a summary of the findings of this thesis had been submitted to the Prosecutor's Office of the Guatemalan Public Ministry for an ongoing trial on campaigns of mass sexual violence and slavery of Maya Achi women (Marta Casaús, personal communication August 29 2018). Results and data from Chapters 5 and 6 were used to support the claim that state-sponsored militias executed campaigns of mass rape against Maya Achi women in Rabinal during the armed conflict.

Second, insights from this thesis have contributed to improve the quality of the services provided to forcibly displaced populations around the world. I was involved in developing the UNHCR Demographic Projection Tool, an online application that uses demographic projection methods to provide estimates of the future size and demographic structure of forcibly displaced populations using administrative data from the United Nations High Commissioner for Refugees (UNHCR) (Alburez-Gutierrez & Segura, 2018).¹⁰² The tool is currently being deployed to UNHCR field operations for conducting data-driven planning and budgeting exercises. I provided key input on the assumptions about post-conflict mortality and fertility in the model, which were informed by own experience writing this thesis. This is a valuable tool which can be further improved by operationalising the specific ways in which different types of humanitarian crises, including mass violence, affect demographic processes.

¹⁰² The UNHCR Demographic Projection Tool was developed by the UNHCR's Field Information and Coordination Support Section (FICSS). It can be accessed online:

<http://DemographicProjection.unhcr.org/>.

7.4. Limitations

Every research is limited in some way. Limitations can be related to the research design, the data collection, or the data analyses. They can also concern scientific values such as transparency and replicability (Douglas, 2007). This section summarises the main limitations of this thesis covering these areas. After identifying the limitations of the study, the following section proposes how future research can help address some of these shortcomings.

7.4.1. *Empirical limitations*

The quality of all retrospective data depends on the accuracy of the participants' recollection. The genealogical data in this thesis were more reliable for recent events. In addition to this, it was difficult to reconstruct socioeconomic data and retrospective information on household membership. Representative household-level data (e.g. standard socioeconomic indicators such as main source of drinking water, construction materials etc.) could not be collected at a population level since the network sampling strategy of the EGM was not randomised.

The qualitative data in this study were also affected by retrospective bias. Many participants subscribed to a 'Golden Age narrative' that idealised life in the village before the killings. It was common, for example, for participants to argue that poverty, hunger, and disease had not existed in the village before the massacres. This was evidently not true: 70% of children under 15 were malnourished in 1979 Río Negro according to Gaitán (1981: 95). For this reason, the qualitative analysis focused on interpreting the role that these narratives played on demographic behaviour in the population rather than taking them at face value.

Collecting genealogies can be time consuming. This is important because lengthy interviews can lead to fatigue both for interviewers and participants, particularly for older respondents. Chapter 4 showed that more extensive interviews tended to be conducted with more knowledgeable members of the population. Because of this, they were more accurate than shorter interviews with less knowledgeable participants. The participant selection methodology of the EGM minimised the number of genealogical interviews needed to produce complete genealogies and reduced the length of each individual interview. Nevertheless, the EGM was designed for reconstructing local

populations and is not well suited for large-scale populations. At the end of this chapter, I discuss alternative approaches for studying such populations.

This thesis was concerned with sensitive topics that were sometimes difficult to discuss. I was very aware of the way in which my personal attributes (e.g. Ladino, male, urban) influenced the content of the conversations I was able to have. This was more evident around subjects of reproduction, sex, and sexual or domestic violence. Focus Group Discussions (FGDs) led by a female RA provided most of the qualitative data on the subject used to study these topics. Nonetheless, the reporting of these events was far from thorough. Not a single case of sexual violence against men was reported, in spite of the known fact that perpetrators systematically exercised sexual violence against women and men during mass killings in the Guatemalan Civil War (CEH, 1999c: 320).

It was also considerably more difficult to conduct qualitative discussions with men than with women. This was true even after adjusting schedules to avoid interfering with their work schedules. In informal conversations, men confided that they had ‘no time to waste in unimportant meetings’ (i.e. FGDs), particularly if they related to ‘female topics’ such as family planning and childrearing. Nevertheless, the few existing academic studies on the village have privileged male voices (Horacio Martínez, 2009; Kupprat, 2010b; Einbinder, 2017). Men in Río Negro tend to inhabit public spaces to a greater degree than women, which means that they have historically been in a better position to make their voices heard by being interviewed or taking part in research studies. It is no coincidence that the only three existing autobiographies of Río Negro survivors were written by men (Sánchez Chen, n.d.; Chen Osorio, 2009; Tecú Osorio, 2012).¹⁰³ Maya Achi women are more likely to be monolingual, which has limited their ability to communicate with non-Achi speaking researchers.

7.4.2. *Analytical limitations*

The case study design of this thesis allowed me to provide a rich and detailed analysis of the events that unfolded during and after the 1982 Río Negro Massacres in Guatemala. Limitations of time and financial resources, coupled with the pioneering nature of the data collection method, made it difficult to collect information on a counterfactual case.

¹⁰³ I am only aware of one exception: *Discovering Dominga* is a video documentary about a female survivor of the Río Negro Massacres growing up in the USA (Flynn & McConahay, 2003).

Data on such a case would have improved the explanatory power of the analyses. Furthermore, the chosen research design was not appropriate for establishing statistical causation. This means that the findings of the study, including the proposed causal mechanisms, cannot be generalised to other populations. They need to be evaluated empirically using data from other contexts to determine their generalisability.

A related limitation is the fact that mass killings, like armed conflicts, are extremely heterogeneous events. This makes it difficult to generalise about them (Randall, 2005). Some historical mass killings have affected all members of a population similarly (e.g. El Mozote, see Binford, 1996), whilst others have targeted men exclusively (e.g. Srebrenica, see Brunborg, Lyngstad & Urdal, 2003) or women and children (Pacoxom, this thesis). Nevertheless, it is reasonable to expect war-time massacres to differ from other types of conflict events or from national-level patterns of excess mortality, as was argued repeatedly in the course of this thesis.

The statistical models used in the empirical chapters were limited by the available data. Exposure to sexual violence, for example, was inferred from a number of proxies given that it was not reported directly. The analyses included a time-fixed measure of socioeconomic status (estimated using data from the 1978 INDE census). Similarly, the lack of information on the availability and use of modern contraception also limited the scope of the analyses. The statistical models assumed that all individuals had an equivalent probability of dying in the massacres. Testimonial evidence suggested that this was not always true. Some residents left the village after the first massacres in 1980 or after the events in Xococ described in Chapter 2. Those that remained were more likely to be killed in the massacres, but it was impossible to account for the location of the Río Negro residents at the time of the massacres. It is worth pointing out that these limitations are not specific to this research: they are common in demographic studies of armed conflict.

Another limitation of the analysis was that kin size was not a perfect proxy for social support. On the one hand, the availability of close kin does not mean that they will provide support (in network parlance: the structure of a network differs from its function). On the other, the proxies used in this thesis did not consider the social support provided by friends and acquaintances. Nevertheless, studies have shown that friends, neighbours, and other companions rarely provided support to survivors of mass

violence in Guatemala – most of the valuable assistance came from close kin (Warner, 2007: 212).

Finally, the quantitative results from the thesis are not completely reproducible given privacy concerns.¹⁰⁴ This was the case because making socio-centric genealogies publically available without compromising the participants' anonymity is challenging. This is especially true for genealogies of local populations where individuals can be uniquely identified from their attributes and their structure in the network (e.g. by considering the number and dates of birth of siblings and children). Nevertheless, anonymised subsets of the data (i.e. without the genealogical links between individuals) can still be shared without compromising the participants' confidentiality.¹⁰⁵

7.5. Further research

This section provides directions for future research. Some of the proposed research plans address limitations identified in the preceding section. Others point to new applications of the methodology and analytical approaches developed in this thesis.

Initially, more research is needed to generalise the results of the studies. This can be done by gathering data from other massacre-affected populations. Alternatively, future research can analyse the Río Negro data using different methodologies (including causal inference) to improve the explanatory power of the theoretical models and determine whether the identified mechanisms can be transferred to other contexts. Future studies can also focus on establishing within-country generalisations for Guatemala since perpetrators of mass killings in the country generally followed a similar *modus operandi*.¹⁰⁶ It is important to understand how these events affected the social and demographic life of hundreds of local communities affected by mass violence in the country.

The complexities of gender dynamics in the aftermath of mass killings are poorly understood. This thesis touched upon these topics, but more research is needed to comprehend how gender interacts with demography after atrocities. Regarding fertility,

¹⁰⁴ Reproducibility is understood as the ability to replicate results following the same analytical routine.

¹⁰⁵ The scripts and data needed to reproduce the analyses in this thesis are available upon request.

¹⁰⁶ Testimonies from survivors of the country's armed conflict (REMHI, 1998b; CEH, 1999c, a), quantitative forensic data, and expert witness testimonies from the 2013 Genocide Trial (Organismo Judicial, 2013).

qualitative approaches are in a privileged position to explore the role of individual agency and coercion in the aftermath of mortality crises, especially in the presence of pronatalist agendas. This includes studies about changing fertility intentions (i.e. ideal family size) amongst survivors of atrocities. More research is needed to understand how survivors of mass violence relate to and negotiate the use of different forms of contraception (Grace & Sweeney, 2016).

Future work can focus on adapting the EGM for use in other populations. In its current form, the EGM performs optimally in small communities with a small degree of outmigration and strong kinship ties. Nevertheless, the approach is flexible and can be modified for other settings. The method can be easily extended to record other types of kinship arrangements (e.g. polygamy, homosexual unions, or adoptive relations).¹⁰⁷ The EGM can also be applied if the data collection does not aim to reconstruct complete genealogies – its principles, for example, can be adapted to collect smaller scale socio-centric data in the context of forced displacement.

Finally, genealogies are under-researched sources of demographic information. The internet offers exciting possibilities for studying population processes at a global scale. In recent years, online communities of enthusiast genealogists have produced unprecedented amounts of geocoded genealogical data spanning back centuries (Kaplanis et al., 2018). These data can be analysed to understand, amongst other things, the changing nature of demographic dynamics throughout history and around the world.

¹⁰⁷ The EGM questionnaires applied in Río Negro relied on the assumption that formal marriages happened exclusively between a man and a woman. The premise was chosen for this thesis since non-heterosexual and polygamous marriages are not sanctioned by rural Mayan communities in the country.

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Appendices

Appendix A - Extracts from the 1978 INDE census of the Chixoy River Basin

ALDEA RIO NEGRO, RABINAL, BAJA VERAPAZ

		<u>E D A D</u>	
58.	Jefe de Familia:	1) [REDACTED]	29 años
	Señora:	2) [REDACTED]	29 "
	Hijos:	3) [REDACTED]	7 "
		4) [REDACTED]	5 "
		5) [REDACTED]	3 "
		6) [REDACTED]	
		7) [REDACTED]	
	Otros:	8) [REDACTED]	55 " Viuda
59.	Jefe de Familia:	1) [REDACTED]	32 años
	Señora:	2) [REDACTED]	25 "
	Hijos:	3) [REDACTED]	12 "
		4) [REDACTED]	10 "
		5) [REDACTED]	5 "
		6) [REDACTED]	2 "
		7) [REDACTED]	6 meses
	Otros:	8) [REDACTED]	65 años Viuda
60.	Jefe de Familia:	1) [REDACTED]	59 años
	Señora:	2) [REDACTED]	50 "
61.	Jefe de Familia:	1) [REDACTED]	86 años
	Señora:	2) [REDACTED]	70 "
	Hijo:	3) [REDACTED]	
62.	Jefe de Familia:	1) [REDACTED]	19 años
	Señora:	2) [REDACTED]	18 "
	Hijos:	3) [REDACTED]	2 "
		4) [REDACTED]	7 meses
63.	Jefe de Familia:	1) [REDACTED]	15 años
	Hijos:	2) [REDACTED]	20 días
		3) [REDACTED]	

.../

First page of Río Negro inhabitants enumeration (anonymised). Source: Gaitán (1981: 345).

Appendix B - Focus Group Discussion guides and recommended questions (selection)

FGD_A (women) – translated from original Maya Achi

Participants
Gender: Female
Birth: 1940-1954
Current age: 62-76
Age at killings: 28-42

Date:	Participants	id_c
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Introduction

Dynamic: “*cadena de nombres*”

Family size

Nab'e kwaj kintz'onoj che alaq pa kiwi' le ixoqib' wara Pak'ux.

Para comenzar, me gustaría preguntarles sobre las familias aquí en Pacux.

I would first like to ask you about the families here in Pacux.

1. Sa kach'ob' le alaq che, la chi rajawaxik jun ixoq kuriq rib' y kuril uwa ral? Su chak?
Creen ustedes que es necesario que una mujer tenga pareja y tenga hijos? Por qué?
Do you think a woman must have a partner and children? Why?
2. La utz juna ixoq kuril k'i uwa ral? O na k'i ta ral? Su chak?
Es mejor que una mujer tenga muchos hijos o sólo pocos? Por qué?
Is it good if a woman has many children? Why?
3. Alaq k'i le al alaq xil la kiwach chi kiwach le chu alaq? Su chak?
Ustedes tuvieron menos o más hijos que sus mamás? Por qué?
Did you have more children than your mothers did? Why?
4. Le al alaq kilom uwach mas kal chuwach alaq? Su chak?
Sus hijas han tenido familias más grandes que ustedes? Por qué?
Did your daughters have more children than you? Why?

Importance of marriage

O jujun tikawex kakiriq kib' y kekuli'k; y o jujun chik xa kakuk'aj kib', na kek'uli' taj.

Algunas parejas se casan por la iglesia y otras sólo están unidas y viven juntas.

Some couples marry in the church and others just live together without getting married.

5. Sa kach'ob' le alaq che, la importante kak'uli' junoq o rajawaxik taj? Su chak?
Creen ustedes que es importante que las parejas se case por la iglesia?
Do you think it is important for couples to marry in the church?
6. Le ojer tan, kek'uli' mas, o junam ruk' wa'ora?
Antes se casaba más la gente por la iglesia? O es igual a ahora?
Did more people marry in the church before? Or was it the same as now?

7. Sa xub'an le ojer tan, e chi ri xeb'el cha taq juyub'? K'a o jujun xkiriq kib'?
Cómo era cuando estaban en las montañas? Hubo gente que se unió o casó en esos tiempos?
How was it when you were living in the hills? Did anyone get together or marry then?

Effects of 'the violence'

Qeta'am que pa le k'axk'olil xekam ixoqib', achijab', k'omab' y qati' qamam.
En la guerra murieron mujeres, hombres, niños y ancianos.
Women, men, children, and elderly were killed in the war.

8. Sa kach'ob' le alaq che, xkil mas k'ax la e o pa tiempo o le e nima winaq chik?
Creen que la guerra afectó más a los jóvenes o a las personas mayores?
Do you think the war affected more younger people or the elderly?
9. La xkil mas k'ax le achijab' chikiwa le ixoqib'?
Creen que sufrieron más los hombres que las mujeres?
Do you think men suffered more than women?

Loss of children in the killings

K'o jujun ixoqib' xekamisax jun o ka'ib chike le kal pa k'ax.
Algunas mujeres perdieron un hijo o varios hijos en la violencia.
Some women lost a child in the time of 'the violence'.

10. Sa xkik'ulumaj? La k'a xkil kan uwa kal despues re la k'ax?
Qué pasó en estos casos? Estas mujeres tuvieron más hijos después de la violencia?
What happened in these cases? Did they go on to have more children after 'the violence'?

Marriage after the killings

K'o jujun ixoqib' xkamisax kan le kachajilal chupa le k'ax.
Algunas mujeres perdieron a sus parejas durante la violencia.
Some women lost their partners during the killings.

11. Sa xkik'ulumaj? K'a xkiriq kachajilal?
Qué paso con estas personas? Se unieron de nuevo?
What happened to them? Did they find another partner?
12. Sa xub'an chi kiq'ab' le achijab' le xkam kixoqilal? Xub'an facil kekiriq kib' o xub'an k'ax?
Fue diferente para los hombres?
Was it different for men?

Life before and after 'the violence'

Wa'ora kojch'at puwi' sa le b'anom alaq ojer tan, antes de la violencia, chila' Río Negro.
Ahora quiero que hablemos sobre la vida en Río Negro antes de la violencia.
I would like us to speak about life in Río Negro before 'the violence'.

13. O mas nib'a'il ojer chila' Río Negro cha wa'ora?
Había menos pobreza que en Pacux?
Was there less poverty than in Pacux?
14. Le ojer tan, la xekam mas k'omab' roma yab'il cha le wa'ora?
Se morían los niños por enfermedad? Más que ahora?

Did children die because of disease? More than now?

15. Ta mata le k'ax, xek'iyar na wi le cristinanos chila' Río Negro?

Habría más gente?

Would Río Negro be a larger village than it is now?

16. Mataji le k'ax, k'o na wi ch'a'oj chikix'ol le komon chwach le wara?

Habrían menos problemas entre habitantes de la comunidad?

Would there be fewer conflicts between residents?

Conclusion

17. Le alk'wal alaq xkiriq mejor vida chwach alaq?

Por último, creen que sus hijas tendrán una mejor vida que ustedes? Por qué?

Lastly, do you think your daughters will lead a better life than you did? Why?

FGD_D (men) – translated from original Maya Achi

Participants' details
Gender: Male
Birth: 1981 - 1991
Current age: 25 – 35
Age at killings: not yet born

Date:		
	Participants	id_c
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Introduction

Dynamic: “*cadena de nombres*”

Family size

Nab'e kwaj kintz'onoj che alaq pa kiwi' le ixoqib' wara Pak'ux. K'o jujun ixoqib' kakil k'i uwa kal, o jujun na k'i ta y o jujun chik na kakil uwa kal.

Para comenzar, me gustaría preguntarles sobre las familias aquí en Pacux.

I would first like to ask you about the families here in Pacux.

1. Sa kach'ob' le alaq che, la chi rajawaxik jun ixoq kuriq rib' y kuril uwa ral? Su chak?
Creen ustedes que es necesario que una mujer tenga pareja y tenga hijos? Por qué?
Do you think a woman must have a partner and bear children? Why?
2. La utz juna ixoq kuril k'i uwa ral? O na k'i ta ral? Su chak?
Es mejor que una mujer tenga muchos hijos o sólo pocos? Por qué?
Is it good if a woman has many children? Why?
3. Alaq k'i le al alaq xil la kiwach chi kiwach le qaw alaq? Su chak?
Ustedes tuvieron menos o más hijos que sus padres? Por qué?
Did you have more children compared to your fathers? Why?
4. Le al alaq kakil na wi uwach mas kal chuwach alaq? Su chak?
Creen que sus hijos tendrán familias más grandes que las suyas? Por qué?
Do you think your children will have more children than you? Why?

Importance of marriage

O jujun tikawex kakiriq kib' y kekuli'k; y o jujun chik xa kakuk'aj kib'.

Algunas parejas se casan por la iglesia y otras sólo están unidas y viven juntas.

Some couples marry in the church and others just live together without marrying.

5. Sa kach'ob' le alaq che, la importante kak'uli' junoq o rajawaxik taj? Su chak?
Creen ustedes que es importante que las parejas se case por la iglesia?
Do you think it is important for couples to marry in the church?
6. Le ojer tan, kek'uli' mas, o junam ruk' wa'ora?
Antes se casaba más la gente por la iglesia? O es igual a ahora?
Do you think it is important for couples to marry in the church?

Effects of 'the violence'

Qeta'am que pa le k'axk'olil xekam ixoqib', achijab', k'omab' y qati' qamam.

En la guerra murieron mujeres, hombres, niños y ancianos.

Women, men, children, and elderly were killed in the war.

7. Sa' la tom alaq che la k'axk'olil xkik'ulumaj chila' Río Negro?
Qué saben ustedes sobre lo que pasó en Río Negro?
What do you know about what happened in Río Negro?
8. Sa kach'ob' le alaq che, xkil mas k'ax la e o pa tiempo o le e nima winaq chik?
Creen que la guerra afectó más a los jóvenes o a las personas mayores?
Do you think the war affected more younger people or the elderly?
9. La xkil mas k'ax le achijab' chikiwa le ixoqib'?
Creen que sufrieron más los hombres que las mujeres?
Do you think men suffered more than women?
10. Qeta'am que na xk'iy ta alaq chila' Río Negro. Sa xub'an le k'ax che la k'aslemal alaq?
Sabemos que algunos nacieron después de la violencia. Creen que la violencia afectó sus vidas?
Cómo?
Some of you were born after 'the violence'. Do you think the war affected your life? How?

Life after 'the violence'

Qeta'am que ya na xjeqi' ta chi alaq chila' Río Negro. Pero kwaj kojch'at puwi' le tom alaq o eta'am alaq re la k'aslemal chila' Río Negro, antes de la violencia.
Sabemos que ustedes ya no nacieron en Río Negro. Pero quiero preguntarles sobre lo que saben o han oído de la vida en Río Negro antes de la violencia.
I know that you were no longer born in Río Negro. I want to ask you about the things you know or have heard about life before 'the violence'.

11. O mas nib'a'il ojer chila' Río Negro cha wa'ora?
Había menos pobreza que en Pacux?
Was there less poverty than in Pacux?
12. Le ojer tan, la xekam mas k'omab' roma yab'il cha le wa'ora?
Se morían los niños por enfermedad? Mas que ahora?
Did children die because of disease? More than now?
13. La junta ch'a'oj chiwach alaq chila' Río Negro antes de la violencia? La junam ruk' le wa'ora.
Habían problemas entre miembros de la comunidad? Podría dar un ejemplo?
Were there conflicts between residents? Can you think of any example?
14. Ta mata le k'ax, xek'iyar na wi le cristinanos chila' Río Negro?
Habría más gente?
Would Río Negro be a larger village than it is now if it weren't for the war?
15. Mataji le k'ax, k'o na wi ch'a'oj chikix'ol le komon chwach le wara?
Habrían menos problemas entre habitantes de la comunidad?
Would there be fewer conflicts between residents?

Conclusion

16. Ilom alaq mejor vida chi kiwach la qaw alaq?
Por último, creen que ustedes tendrán una mejor vida que sus padres? Por qué?
Did you lead a better life compared to your parents?
17. Le alk'wal alaq kakiriq mejor vida chwach alaq?
Por último, creen que sus hijas tendrán una mejor vida que ustedes? Por qué?
Lastly, do you think your own children will lead a better life than you did? Why?

Appendix C - Key Informant Interviews conducted during fieldwork (Rabinal and Guatemala City)

ID	Topic of interview	Key Informant profile	Gender
KI-1	History of political and human rights activism in Rabinal and Río Negro	Local activist	Male
KI-2	History of healthcare in Río Negro	Healthcare worker	Female
KI-3	History of education in Río Negro	Education worker	Female
KI-4	Data and census registration in Río Negro	Lawyer	Female
KI-5	Lobbying and US involvement in the Chixoy case	Local activist	Male
KI-6	Prosecution of human rights violations in Rabinal	Lawyer	Female
KI-7	Reparations for war-time violence	Local activist	Male
KI-8	Sexual violence in Rabinal and Río Negro	Psychologist	Female
KI-9	Building of Chixoy Dam and resettlement of the affected population	INDE Engineer	Male

Appendix D - Guides for semi-structured Key Informant Interview (selection)

KI-4: Data and census registration in Río Negro (translated from original Spanish)

1978-1981 INDE CENSUS

Me gustaría preguntarle sobre el censo que el Dr. Gaitán elaboró en 1978 para el INDE.
I want to ask you about the census conducted by the Dr. Gaitán in 1978 for the INDE.

1. ¿Han utilizado ustedes información del estudio del Dr. Gaitán en su trabajo?
Have you used information from this study for your work?
2. Existen dos versiones del censo, una publicada en 1978 y otra en 1981, ¿en qué se diferencian?
There are two versions of the census, one published in 1978 and another in 1981. How are they different?
3. ¿Qué tan completo está el censo del Dr. Gaitán? ¿Quiénes no fueron incluidos y por qué?
Is the census complete? Who was not included and why?

2008 COCAHICH CENSUS

4. ¿Por qué se realizó un nuevo censo en el 2008?
Why did you conduct a new census in 2008?
5. ¿Quién recopiló la información de este censo?
Who collected the data?
6. ¿Cómo se decidió quiénes eran las familias que recibirían el resarcimiento?
How did you decide eligibility for the war reparations?
7. ¿Cómo definieron un “hogar”? ¿Por qué?
How did you define a ‘household’? Why?
8. ¿Está completo el censo del 2008? ¿Quiénes no fueron incluidos y por qué?
[Discutir ejemplos]
9. *Is the census complete? Who was not included and why? [Discuss examples]*
10. ¿Cuáles son los principales problemas al revisar los documentos para el resarcimiento?
What were the main difficulties when checking the documents for the war reparations?
11. Hablando de Río Negro y Pacux, ¿ha habido mucha migración desde la guerra? Qué se hizo en estos casos?
Was there a high degree of outmigration from Río Negro and Pacux? How did you record data on migrants?

MARRIAGE AND UNIONS

12. ¿Qué tan comunes son los matrimonios civiles en las comunidades?
Is it common for residents to get married?
13. ¿Cuál es la forma más común de unión en las comunidades?
What is the most common type of partnership?
14. ¿Cómo era antes de la violencia?
Was it also the case before ‘the violence’?
15. ¿La gente siguió casándose durante los años de la violencia, en los cerros?
Did survivors of the killings continue to marry when they were IDPs?

CHILD-REARING

16. ¿Encontraron casos de adopción NO relacionados a las masacres?
Did you come across any cases of adoption not related to the killings?
17. ¿Juegan los padrinos o madrinros un papel importante en la adopción? ¿Fue esto igual durante la guerra?
Are godparents important in this respect? Was it similar during the war?
18. En caso de adopción, ¿hay cambio de apellidos?
Does a child's surname usually change after adoption?
19. En general, ¿qué ocurrió con los huérfanos de las masacres?
In general, what happened to children who lost their parents in the killings?

RIGHT TO A NAME

20. ¿Qué problemas han encontrado con respecto a los nombres en Pacux?
What are the main issues related to naming in Pacux?
21. Si no fuera por el resarcimiento, ¿qué tan importante cree que sería el “derecho al nombre”?
If it weren't for the war reparations, would you still care about the 'right to a name'?

FAMILY AND HOUSEHOLD ORGANISATION

22. ¿En Pacux, cuando un hijo se casa, a dónde se pasan a vivir? ¿Y si es mujer la que se casa?
When a man gets married in Pacux, where does he move into? What if it is a woman?

KI-6: Prosecution of human rights violations in Rabinal (translated from original Spanish)

INTRODUCTION

1. En pocas palabras, cuénteme qué experiencia tiene trabajando en el caso Chixoy.
In a few words, tell me your experience working with the Chixoy case.

GENOCIDE TRIAL

2. ¿Podría resumir los procesos jurídicos más importantes relativos al caso Chixoy hasta la fecha?
Could you please summarise the main judicial processes related to the Chixoy case up to now?
3. ¿Cuáles han sido los mayores logros?
What has been achieved to date?
4. ¿Cuál es el estado actual del proceso por genocidio en Rabinal?
What is the state of the Genocide Trial in Rabinal?
5. ¿Quiénes son los acusados y de qué se les acusa?
Who are the accused and what are they charged with?
6. ¿Qué organizaciones llevan el caso? ¿De qué manera se involucran las comunidades en este proceso?
Which organisations are involved? Are members of the communities involved?
7. ¿Por qué es importante el caso Chixoy?
Why is the Chixoy case important?
8. ¿En qué se diferencia del caso por genocidio en el área Ixil? ¿Cuáles son las similitudes?
How is it different from the Genocide Trial in the Ixil area? How are they similar?
9. ¿Afectan los procesos de resarcimiento de alguna forma a los procesos jurídicos por las violaciones a DDHH?
How are the war reparation programmes related to the judicial processes for human rights violations?
10. ¿Cómo cree que se desarrollará el proceso en el futuro?
How do think the process will develop in the future?

ACCESS TO JUSTICE

11. ¿En general, cuáles diría usted que son las medidas de reparación más urgentes en este momento?
In general, what would you say are the most urgent reparation measures needed at the moment?
12. ¿Qué debe ocurrir para que usted crea que ya se ha hecho justicia?
What do you think needs to happen for justice to be made?
13. ¿Cree usted que las organizaciones como COCAHICH, ADIVIMA y COPREDEH manejan la misma idea de “justicia” que la gente en las comunidades?
Do you think that organisations such as COCAHICH, ADIVIMA and COPREDEH have a similar definition of ‘justice’ than the communities themselves?

KI-8: Sexual violence in Rabinal and Río Negro (translated from original Spanish)

VIOLENCE DURING THE ARMED CONFLICT

1. ¿Qué papel jugó la violencia sexual durante el conflicto armado en Rabinal?
What was the role of sexual violence during the armed conflict in Rabinal?
2. ¿Quién ejerció la violencia sexual? ¿Vino únicamente de afuera de las comunidades?
Who were the perpetrators of sexual violence? Were the perpetrators always from outside the communities?
3. ¿Cree que fue usada de manera sistemática en contra de la población?
Do you think it was used systematically against the population?
4. ¿Cuáles son los efectos de esta violencia sexual en la actualidad?
What are the current effects of these acts of sexual violence?
5. ¿Cree que las comunidades afectadas por la construcción de la hidroeléctrica han sufrido más en este sentido?
Do you think the communities affected by the Chixoy Hydroelectric Dam were more affected than the rest?

CURRENT TIMES

6. ¿Cree que la situación ha mejorado en términos de violencia sexual en tiempos recientes?
Has the situation regarding sexual violence improved in recent years?
7. ¿Qué tipos de casos de violencia sexual son comunes en las comunidades?
What kinds of sexual violence are usually reported in the communities?
8. ¿Existe una relación entre la violencia sexual en la actualidad y en el pasado?
How is current sexual violence related to war-time sexual violence?
9. ¿Qué tanta apertura existe para hablar sobre estos temas en las comunidades?
How open are residents when it comes to discussing these topics?

INTERVENTION

10. ¿Qué organizaciones han tratado el tema de la violencia sexual en Rabinal?
Which organisations work with sexual violence in Rabinal?
11. ¿Qué tipo de intervenciones se han realizado en estos temas?
What kind of programmes or interventions do they implement in this respect?
12. ¿Cree que las políticas de resarcimiento pueden influir en las dinámicas de violencia sexual en Rabinal?
Do you think the war reparation programmes can influence the dynamics of sexual violence in Rabinal?

Appendix E - Event History Calendar (excerpts)

Year 1982 (Topic: War and Chixoy Dam)			
Manuel de León, mayor of Rabinal	Romeo Lucas García, president	January 8 Chicupac Massacre	
		February 4 Xococ market burnt down	
		6 La Laguna Massacre	
		7 Men of Río Negro deliver <i>cédula</i>	
		13 Xococ Massacre	
		March 13 Pacoxom Massacre	
		23 Coup d'etat (Ríos Montt)	
		28 Livestock from Río Negro looted	
		April	
		May 14 Los Encuentros Massacre	
José Armando Garzona Sánchez, mayor of Rabinal	Efraín Ríos Montt, president	June 18 Plan de Sánchez Massacre	
		Official start of PAC groups by 'volunteer' patrollers	
		July Army offers an amnesty to IDP survivors of massacres in Chixoy River Basin	
		August	
		September 14 Agua Fría Massacre	
		October	
		November	
		December	
		Dam gates are closed. Waters rise in Chixoy reservoir	
		27	

Events related to the armed conflict and the Chixoy Project in the Chixoy River Basin (1982) (translated from Spanish original)

Highlands calendar (<i>jujub'</i>)	Month	Lowlands calendar (<i>q'alaj - vegas</i>)
	JANUARY	
Preparations for planting (<i>roz̄as</i> , <i>buataleos</i> and <i>barbechos</i>).	FEBRUARY	
Planting of maize (highland variety)	MARCH	Preparations for planting (<i>roz̄as</i> , <i>buataleos</i> and <i>barbechos</i>).
Preparation of land.	APRIL	Second maize planting (<i>chucuy</i> variety).
First cleaning for highland maize.	MAY	Irrigation, planting of maize, beans, peanuts and millet. Herds go to comunal grasslands.
Second cleaning for highland maize.	JUNE	Harvest transplant: pepper, tomato, beans, peanuts, millet. First maize cleaning.
	JULY	Second maize cleaning. <i>Calzas</i> towards the end of the month.
Planting of beans (<i>chuy</i> and <i>patuy</i> varieties).	AUGUST	Cleaning of pepper and tomato. Start of harvest: millet and peanut.
First cleanings of beans. Planting of beans, pepper and tomato.	SEPTEMBER	Main harvest (<i>jach'</i>) of pepper and maize.
Optional: planting of beans (<i>chuy</i> and <i>patuy</i> varieties).	OCTOBER	Cleaning of pepper and tomato. Start of harvest: millet and peanuts.
	NOVEMBER	Harvest of squash, <i>chicozapote</i> and other fruits. Look after millet. Herds return to valley.
Harvest of maize, pepper, tomato or beans	DECEMBER	Second harvest of pepper, tomato or beans

Yearly calendar of agricultural activities in Río Negro (wet and dry season).

Appendix F - Printed Informed Consent forms for EGM interviews**Informed Consent for genealogical interview (translation from Spanish original)**

My name is Diego Alburez and I am a PhD student at the London School of Economics in the United Kingdom. I am currently conducting a study to understand how *the violence* [i.e. the mass killings] affected the residents of Río Negro and their families (their children, nephews, grandchildren and others). The study in Rabinal will last for approximately one year. Please note that this study is not associated with the Guatemalan Government in any way. It is also not related to the war-time compensation programmes.

I would like to invite you to participate in this study by taking part in an interview about the history of your family. You do not have to take part in the study if you do not want to. Now, I will give you more information about the study so that you can decide whether you would like to answer any of the questions. During the interview, I will ask you about your past and about your family and ancestors. The questions will be about events in your family. For example, the marriage of your parents or the death of your grandparents. The aim of the study is to understand what happened to the survivors of the massacres and their families since 1982. Some questions can be sensitive, such as the death of your relatives in the killings. There is no problem if you chose not to answer.

Each interview will last approximately one hour. However, the interview can be longer if you wish to share more information about your past and you family with me. I will write down all of your answers in these questionnaire. If you agree, I will also make an audio recording of our conversation. We can conduct the interview in Achi or in Spanish. Everything that you tell me will be confidential. This means that only I will be able to access it and I will not share it with anyone else. I will not use your name or that of your relatives without your consent. The final report will not use any real names.

By taking part in this study, you help to make the history of Río Negro known within and outside the country. I will deliver a copy of the results to the COCODE [a form of local authority] and the Community Museum in Rabinal. There should be no negative consequence or risk for you derived from your participation in this study. If you have any question about the study, you can reach me on my mobile phone. Finally, let me remind you that you have the right to finish the interview at any time, if you wish so.

Informed Consent for genealogical interview (original in Spanish)

Investigación “Efectos demográficos a largo plazo de las masacres en Río Negro y Pacux”

Mi nombre es Diego Alburez y soy estudiante de doctorado en la Escuela de Economía de Londres, en Inglaterra. Actualmente estoy realizando un estudio para conocer los efectos de la violencia en los pobladores originales de Río Negro y en sus familiares y descendientes en Río Negro y Pacux (hijos, sobrinos, nietos y otros). La investigación durará aproximadamente un año. Por favor tome en cuenta que este estudio no está asociado al Gobierno de Guatemala de ninguna manera ni está relacionado a los procesos de resarcimiento.

Me gustaría invitarla/o a participar en este estudio mediante una entrevista sobre la historia de su familia. Su participación en este estudio es completamente voluntaria. Esto quiere decir que usted tiene derecho a decidir si desea participar o no. A continuación le daré más información sobre el estudio para que usted puede decidir si le interesa participar en la entrevista. En esta entrevista, le preguntaré sobre su vida pasada, su familia y sus antepasados. Las preguntas serán sobre las fechas en que ocurrieron eventos importantes en su familia. Por ejemplo, el casamiento de sus padres o la muerte de sus abuelos. El fin es conocer qué pasó con los sobrevivientes de las masacres y sus descendientes hasta la fecha. Algunas preguntas pueden tocar temas delicados, como la muerte de sus familiares durante las masacres. Si no desea responder estas preguntas, no hay ningún problema.

Cada entrevista dura aproximadamente una hora. Sin embargo, la entrevista puede ser más larga si usted desea compartir más información sobre sus antepasados y su familia. Yo apuntaré todas sus respuestas en estas hojas. Si está de acuerdo, grabaré el audio de la entrevista en mi grabadora de voz. Podemos hacer la entrevista en castellano o en achi. Toda lo que usted diga en la entrevista será confidencial. Esto quiere decir que únicamente yo tendré acceso a esta información y no la compartiré con nadie más. Además, me comprometo a no utilizar su nombre ni el de sus familiares sin su autorización. En el informe final de este estudio solo se hablará de familias y no se usarán nombres particulares, a menos que se tenga autorización de la persona.

Al participar en este proyecto, usted está ayudando a que la historia de Río Negro se conozca mejor en el país y en el extranjero. Una copia de los resultados principales de la

investigación se entregará al COCODE y al Museo Comunitario de Rabinal. Participar en este estudio no debe traerle ningún inconveniente o riesgo. Si tiene cualquier duda sobre el estudio, puede contactarme en cualquier momento al teléfono que está al final de este documento. Por último, le recuerdo que si no desea continuar con la entrevista, tiene derecho de abandonarla en cualquier momento.

Lic. Diego Alburez Gutiérrez

Cel1. XXXXXXXXX (Tigo)

Cel2. XXXXXXXXX (Claro)
alburezg@lse.ac.uk

Appendix G - Descriptive codes used for qualitative coding of Focus Group Discussions and field notes

Category	Subcategory	Description
Family	Desirable number of children	Ideal or 'adequate' number of children (women and men)
	Comparison to parents	Family size comparison to respondents' mothers or fathers
	Comparison to children	Family size comparison to respondents' children
	Children's future	Expectations of son, daughter or grandchild's future life
	Support – family	Types of support provided by relatives with examples
	Support – others	Types of support provided by friends or acquaintances
Marriage and partners	Marriage as a social institution	Changing perceptions around marriages and unions
	Finding a partner during the war	Experiences of finding partner while displaced by the killings
	Finding a partner after the killings	Experiences of finding a partner after massacres
Pre-conflict life in RN	General descriptions	Descriptions of pre-conflict Río Negro
	Illness and mortality	Perceptions of disease prevalence, child and adult mortality
	Internal conflicts and social organisation	Presence of internal conflicts in village and social organisation
	Golden Age Narratives	Idealised recollections of life before the killings
War experience	Loss of children	Experiences and reactions to losing a child in war
	Loss of partner	Experiences and reactions to losing a partner in war
	Loss of other relatives	Experiences and reactions to losing a relative in war
	Effects of killings - personal	Perceived effects of mass killings in own life
	Effects of killings – community	Community-level effects of mass killings
	Coping mechanisms	Examples of mechanisms for survival after killings
	<i>B'is</i>	Feelings of grief, sadness, isolation, etc.
	Modern contraception	Changing access, acceptance, and use
Population	Massacre-related mortality	Perception of the distribution of excess mortality
	<i>Usuk'umaxiik</i>	Fertility as a mechanism to 'correct' direct mortality from massacres
	Counterfactual Río Negro	How would Río Negro look like and be organised in absence of killings
	Social narratives	Social or cultural narratives related to demographic processes in village

Appendix H - Simplified script for qualitative data coding and analysis in R

The code below outlines the building blocks of a Shiny app (Chang et al., 2016) for qualitative text coding, querying, and exporting. This is an open-source alternative to commercial software like NVivo or Atlas.ti. The app integrates JavaScript and R code to allow text highlighting and instant coding using keyboard shortcuts ('1' in the example below). The code can be run in RStudio.

```
# DEVELOPED IN UBUNTU 18.04.1 LTS; SHINY 0.14.2; RSTUDIO 1.0.136; R 3.3.2

if (!require(shiny)) install.packages(shiny); library(shiny)

text <- "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce ne
c quam ut tortor interdum pulvinar id vitae magna. Curabitur commodo conse
quat arcu et lacinia. Proin at diam vitae lectus dignissim auctor nec dict
um lectus. Fusce venenatis eros congue velit feugiat, ac aliquam ipsum gra
vida. Cras bibendum malesuada est in tempus. Suspendisse tincidunt, nisi n
on finibus consequat, ex nisl condimentum orci, et dignissim neque est."

coded_text <- character(0)

# use JavaScript to select highlighted text
highlight <- '
function getSelectionText() {
var text = "";
if (window.getSelection()) {
text = window.getSelection().toString();
} else if (document.selection) {
text = document.selection.createRange().text;
}
return text;
}
document.onmouseup = document.onkeyup = document.onselectionchange = funct
ion() {
var selection = getSelectionText();
Shiny.onInputChange("mydata", selection);
};
'

# Press "1" in keyboard to trigger button: save text in "code 1"
code1 <- "
$(function(){
$(document).keyup(function(e) {
if (e.which == 49) {
$('#code1').click()
}
});
})"

# User Interface -----
ui <- bootstrapPage(
  tags$script(highlight),
  tags$script(code1),
  fluidRow(
```

```

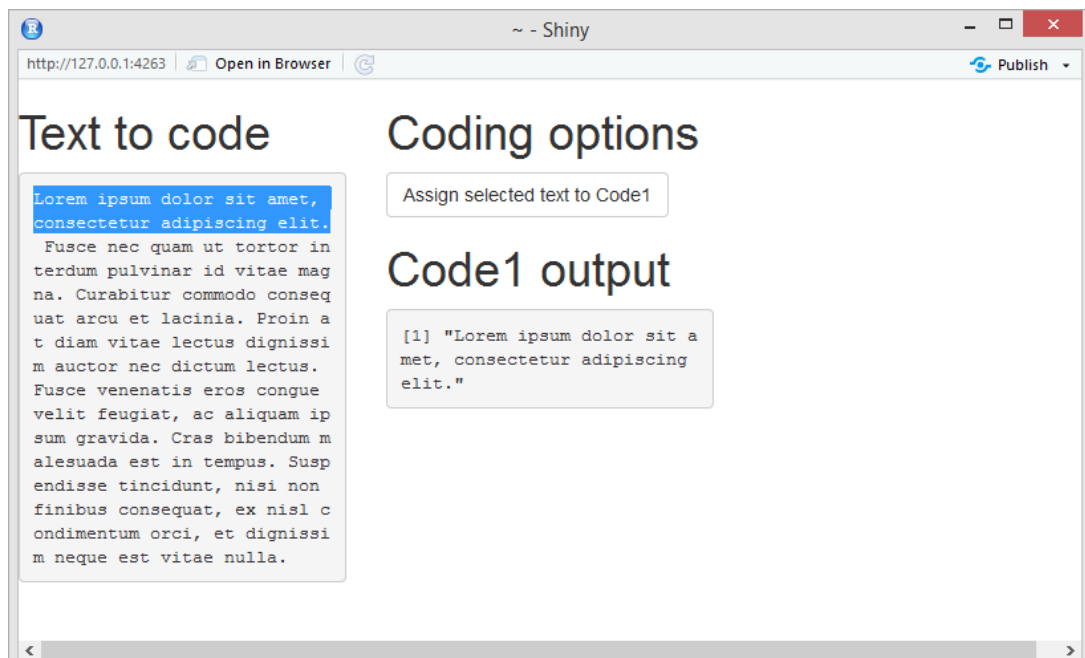
column(4,
  tags$h1("Text to code"),
  verbatimTextOutput("text")
),
column(4,
  tags$h1("Coding options"),
  actionButton("code1", "Assign selected text to Code1"),
  tags$h1("Code1 output"),
  verbatimTextOutput("selected_text")
)
)
)
)
# Server function -----
server <- function(input, output) {
  output$text <- renderText(text)

  coded <- eventReactive(input$code1, {
    coded_text <- c(coded_text, input$mydata)
    coded_text
  })

  output$selected_text <- renderPrint({
    coded()
  })
}

# RUN APP -----
shinyApp(ui = ui, server = server)

```



User interface of app for qualitative data analysis in RStudio's Shiny

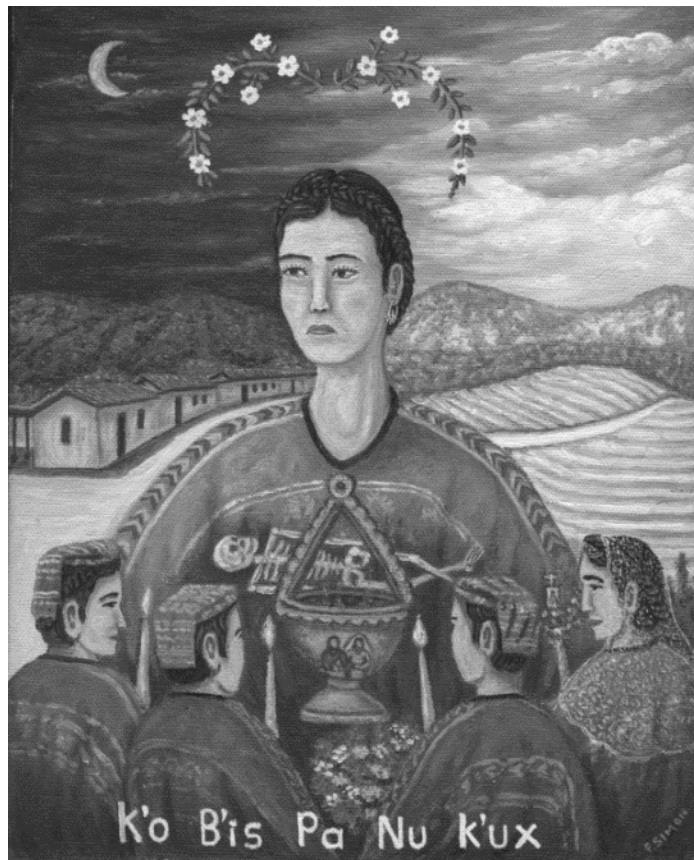
Appendix I - Birth cohorts of Río Negro inhabitants used in the different components of the thesis

	Label	Age at killings (1982)	Age at fieldwork (2015)	Birth years
Participant selection for				
Focus Group				
Discussions				
	A	28-42	62-76	1940-1954
	B	17-27	51-61	1955-1955
	C	2-16	36-50	1966-1980
	D	1 or not yet born	25-35	1981-1991
Chapter 5 (Mortality)				
	0-14	0-14	34-48	1968-1982
	15-44	15-44	49-78	1938-1967
	45+	45+	79+	< 1938
Chapter 6 (Fertility)				
	Youngest	0-9	34-43	1973-1982
	Middle	10-19	44-53	1963-1972
	Oldest	20-29	54-63	1953-1962

Appendix J - Data completeness rates: share of non-missing values for selected variables from EGM-generated data (%)

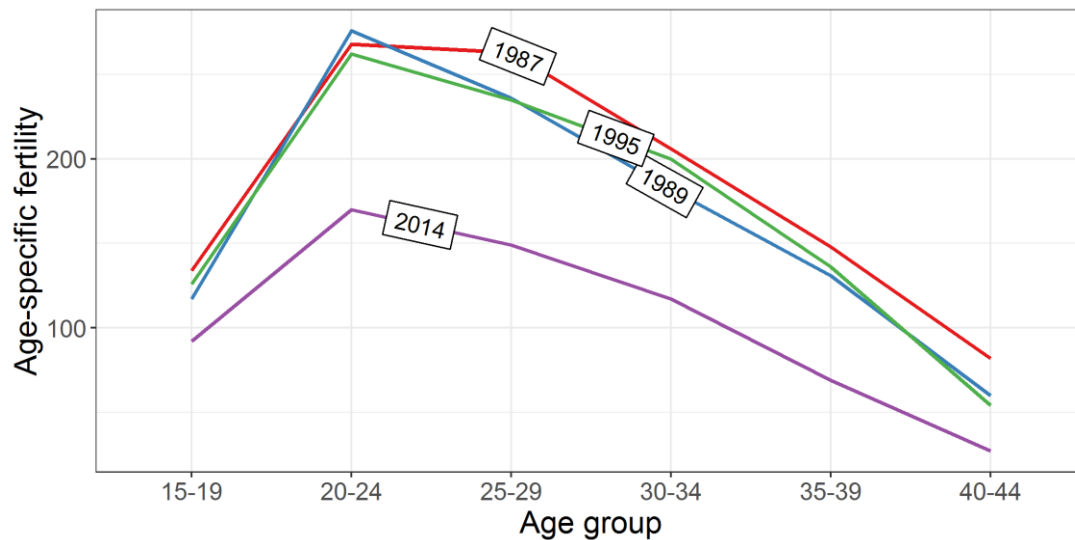
Variable	Single reporting (A)	Multiple reporting (B)	Improvement (B - A)
Date of birth	44	84	40
Date of death (all)	67	79	12
Non-conflict date of death	38	56	18
Place of birth	89	92	3
Current location	64	69	5
Times married	86	95	9
All variables (average)	75	89	14

Appendix K - 'There is grief (*b'iis*) in my heart', painting by Ana María Cofiño representing the grief of Mayan women after the Guatemalan armed conflict.



Source: Cofiño (2007), used with kind permission.

Appendix L - National-level female Age-Specific Fertility Rates in Guatemala according to DHS data.



Source: Data from DHS Program STATcompiler. <http://www.statcompiler.com>, accessed July 27 2018.

Appendix M - Contraceptive knowledge and use in Guatemala (1987-2014)

Year	Knows any method (%)			Uses any method (%)		
	All married	Mayan	Northern region ^a	All married	Mayan	Northern region
1987	60.4	43.4	42.9	23.2	5.5	10.4
1995	81.8	62.1	63.0	31.4	9.6	13.7
1998	85.1	63.4	69.3	38.2	12.9	20.8
2002	92.7	82.6	86.1	43.3	23.8	32.3
2008	97.4	94.1	95.3	35.6	26.1	33.1
2014	98.9	97.9	97.8	60.6	52.3	54.8

Source: Guatemalan DHS reports (MSPAS, 1987, 1996, 1999, 2003, 2010, 2015).

a. Rabinal is classified as part of the 'Northern region' in the DHS.

Appendix N - EGM questionnaires used in this study (translated from Spanish)

HOUSEHOLD MODULE

Household quest. ID.

--	--	--	--

GENERAL INFORMATION				
1. LOCATION	RÍO NEGRO- 1 <input style="width: 20px; height: 15px;" type="checkbox"/>	PACUX - 2 <input style="width: 20px; height: 15px;" type="checkbox"/>	OTHER: _____	
2. NAME OF HEAD OF HOUSE	_____		<input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/>	LINE NUMBER
3. LOCATION IN MAP		<input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/>	
4. WHAT3WORDS	<input style="width: 100%; height: 20px;" type="text"/>			
5. RESPONDENT(S)		<input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/>	LINE NUMBER
6. CONTACT NUMBER		<input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/>	LINE NUMBER
<p>MY NAME IS _____ AND I AM A PHD STUDENT AT THE LSE. I AM CONDUCTING A STUDY ABOUT THE EFFECTS OF THE MASSACRES IN RIO NEGRO. I WOULD LIKE TO INVITE YOU TO TAKE PART IN THIS STUDY BY ANSWERING SOME QUESTIONS ABOUT YOU AND YOUR FAMILY. THE INTERVIEW WILL TAKE AROUND ONE HOUR. EVERYTHING YOU SAY WILL BE KEPT CONFIDENTIAL AND WILL NOT BE SHARED WITH ANYONE ELSE. YOU DO NOT HAVE TO TAKE PART IF YOU DO NOT WANT TO. YOU CAN CHOSE NOT TO ANSWER ANY QUESTION OR FINISH THE INTERVIEW AT ANY POINT. WOULD YOU LIKE TO TAKE PART IN THE STUDY?</p> <p><input style="width: 20px; height: 15px;" type="checkbox"/> Yes, permission granted → HAND OUT INFORMATION SHEET AND COMPLETE FIELDS BELOW</p> <p><input style="width: 20px; height: 15px;" type="checkbox"/> No, permission denied → FINISH INTERVIEW</p>				
VISITS TO HOUSEHOLD				
	1	2	3	LAST VISIT
DATE	7 _____	10 _____	11 _____	11 DATE <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/> / <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/> / <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/> DAY MONTH YEAR
RESULT*	8 _____	9 _____	12 _____	12 RESULT* <input style="width: 20px; height: 15px;" type="checkbox"/>
DATE NEXT VISIT: TIME	_____	_____		13 TOTAL NUMBER OF VISITS <input style="width: 20px; height: 15px;" type="checkbox"/>
<p>* CODES FOR 'RESULT' FIELDS</p> <p>1 COMPLETE</p> <p>2 NO ONE AT HOME OR NO QUALIFIED RESPONDENT PRESENT</p> <p>3 HOUSEHOLD ABSENT FOR EXTENDED PERIOD OF TIME</p> <p>4 INTERVIEW PARTLY COMPLETED, WILL CONTINUE ANOTHER DAY</p> <p>5 REFUSED</p> <p>6 OTHER (SPECIFY): _____</p>				<p>14 NO. OF HOUSEHOLD MEMBERS <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/></p> <p>15 REPORTED MARRIAGES <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/></p> <p>16 REPORTED INDIVIDUALS <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/></p> <p>17 ID OF MARRIAGE MODULES USED</p> <p><input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/></p> <p>18 ID OF INDIVIDUALS MODULES USED</p> <p><input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/> <input style="width: 20px; height: 15px;" type="checkbox"/></p>
<p>FIRST INTERVIEWER _____ SECOND INTERVIEWER _____</p>				

AC01.	AC02.	AC03.	AC04.	AC05.		AC06.
ID	NAME	SEX	RELATIONSHIP TO MEMBERS	DATE OF BIRTH/AGE		CIVIL STATE
	FULL NAME OF ALL HOUSEHOLD MEMBERS. IF APPLICABLE, WRITE ACHI NAME IN PARENTHESIS.	MASC..1 FEM.....2	WRITE RELATIONSHIP CODE AND LINE NUMBER OF RELATIVE. E.G. S1 IF SON OF MEMBER IN LINE 1.	BIRTH DATE.....1	AGE.....2	SINGLE.....0 MARRIED.....1 COHAB.....2 WIDOW.....3 SEPARATED.....4
ID	NAME	SEX	RELATIONSHIP*	COD	DATE/AGE	CIVIL STATE
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
ID	NAME	SEX	RELATIONSHIP*	COD	DATE/AGE	CIVIL STATE
13						
14						
15						
16						
17						
18						
19						
20						
ID	NAME	SEX	RELATIONSHIP*	COD	DATE/AGE	CIVIL STATE
* RELATIONSHIP CODES			FATHER.....F HUSBAND.....H BROTHER.....B MOTHER.....M WIFE.....W SISTER.....Z SON.....S MAID.....T OLDER.....e DAUGHT.....D TENNANT.....P YOUNGER.....y			

GENERAL COMMENTS

METHODS COMMENTS

POTENTIAL RESPONDENTS

Left-hand side sheet

MARRIAGE MODULE

ID:

ID	NAMES OF UNION MEMBERS		AGE START	AGE END	DURATION	START	END DATE
	Line number	Name	Optional: Age at marriage?	Optional: Age at end of marriage?	Optional: Union duration?	Date of marriage start	Date of marriage end
1	Partner 1						
	Partner 2						
2	Partner 1						
	Partner 2						
3	Partner 1						
	Partner 2						
4	Partner 1						
	Partner 2						
5	Partner 1						
	Partner 2						
6	Partner 1						
	Partner 2						
7	Partner 1						
	Partner 2						
***	*****		AGE START	AGE END	DURATION	START	END
8	Partner 1						
	Partner 2						
9	Partner 1						
	Partner 2						
10	Partner 1						
	Partner 2						
11	Partner 1						
	Partner 2						
12	Partner 1						
	Partner 2						
13	Partner 1						
	Partner 2						
14	Partner 1						
	Partner 2						
***	*****		AGE START	AGE END	DURATION	START	END

Right-hand side sheet

MARRIAGE MODULE

ID	TYPE	LOCAT.	ACTIVE	REASON END	COMMENTS
	1- marriage 2 - cohab 3 - false union 4 - other	1- RN 2- Pacux 3- Rabinal 4 - Guate 5 - USA 6 - Hills	0 - not active 1 - active	1 - conflict death 2 - non-conflict death 3 - separation 4 - other	
1					
2					
3					
4					
5					
6					
7					
***	TYPE	LOCAT.	ACTIVE	REASON	COMMENTS
8					
9					
10					
11					
12					
13					
14					
***	TYPE	LOCAT.	ACTIVE	REASON	COMMENTS

Left-hand side sheet

INDIVIDUALS MODULE

ID:

ID	MARRIAGE		NAME	SEX	BIRTH	DEATH	AGE	DEATH	ALIVE
	PARENT	COUPLE					optional	optional	
	parents marr.	All applicable	Full name in Spanish and Achi (if applicable)	Male1 Female...2	Date of birth	Date of death	Age now	Age at death	Is still alive?
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
**	PAREN	COUPLE	NAME	SEX	BIRTH	DEATH	AGE	DEATH	ALIVE
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
**	PAREN	COUPLE	NAME	SEX	BIRTH	DEATH	AGE	DEATH	ALIVE

Right-hand side sheet

INDIVIDUALS MODULE

ID	ORIGIN	PARITY	MARRIAGES	CIVIL STATE	CHILDREN	CAUSE	LOCATION	COMMENTS
	1-Río Negro 2-Pacux 3-Rabinal 4 - Guate 5 - USA 6 - Hills	In your family, which number is X? (the first, second...)	Times has married or cohabitated	0 - single 1 - married 2 - cohab 3 - widow 4 - separate	Total number of children ever born	1 - conflict 2 - other violent 3 - disease 4 - accident 5 - other (what?)	1-Río Negro 2-Pacux 3-Rabinal 4 - Guate 5 - USA 6 - IDP	
1		/						
2		/						
3		/						
4		/						
5		/						
6		/						
7		/						
8		/						
9		/						
10		/						
**	ORIGIN	PARITY	MARRIAGE	CIVIL STATE	CHILDREN	CAUSE	LOCATION	COMMENTS
11		/						
12		/						
13		/						
14		/						
15		/						
16		/						
17		/						
18		/						
19		/						
20		/						
**	ORIGIN	PARITY	MARRIAGE	CIVIL STATE	CHILDREN	CAUSE	LOCATION	COMMENTS