

The London School of Economics and Political Science

**Migration and health: A mixed-methods study among
female migrants in Accra, Ghana**

Samantha Radcliffe Lattof

A thesis submitted to the Department of Social Policy of the
London School of Economics for the degree of Doctor of Philosophy,
London, November 2017

Declaration

I certify that the thesis I have presented for examination for the PhD degree of the London School of Economics and Political Science is solely my own work other than where I have clearly indicated that it is the work of others (in which case the extent of any work carried out jointly by me and any other person is clearly identified in it).

The copyright of this thesis rests with the author. Quotation from it is permitted, provided that full acknowledgement is made. This thesis may not be reproduced without my prior written consent. I warrant that this authorisation does not, to the best of my belief, infringe the rights of any third party.

The main findings of this thesis have been published in peer-reviewed, open-access journals. The references to these articles are:

Lattof, S.R., E. Coast, T. Leone, and P. Nyarko. (2018) “Contemporary Female Migration in Ghana: Analyses of the 2000 and 2010 Censuses.” *Demographic Research* 39(44): 1181–1226.

Lattof, S.R. (2018) “Health insurance and care-seeking behaviours of female migrants in Accra, Ghana.” *Health Policy and Planning* 33(4): 505–515.

Lattof, S.R. (2018) “Collecting data from migrants in Ghana: Lessons learned using respondent-driven sampling.” *Demographic Research* 38(6): 1017–1058.

Lattof, S.R., E. Coast, and T. Leone. (2018) “Priorities and challenges accessing health care among female migrants.” *Health Services Insights* 11: 1–5.

The findings of this thesis have also been presented eleven times at global conferences and disseminated via invited blog posts.

I declare that my thesis consists of 54,380 words.

Samantha Radcliffe Lattof

Statement of conjoint work

I confirm that Chapter 2 is based on a manuscript that I co-authored with my advisors, Ernestina Coast and Tiziana Leone, and with Philomena Nyarko at Ghana Statistical Service and the University of Ghana. I contributed 85% of this work.

Abstract

This thesis contributes to understanding female migration and health in Ghana at the national and sub-national levels. It presents the first detailed comparative analyses of female migration using data from Ghana's Population and Housing Censuses (2000–2010) and exploits these data to understand the gendered dimensions of migration in Ghana. This thesis then presents primary analyses from mixed-methods fieldwork to examine health and migration at the sub-national level among female migrants who work in the informal sector as market porters (*kayayei*).

Primary data on migrant *kayayei* in Accra were collected using respondent driven sampling in an attempt to overcome challenges reported by other researchers surveying *kayayei*. Analyses of survey data (n = 625) and in-depth interviews (n = 48) examine the usefulness of respondent driven sampling in sampling migrants and assess health insurance and care-seeking behaviours among recently ill/injured migrant *kayayei*.

The findings in this thesis highlight that working-age migration is particularly pronounced in 2010, reinforcing economic opportunity as a likely driver of migration for both sexes. Census data identify one in three Ghanaian girls and women as internal migrants. Capturing data on highly mobile, vulnerable migrant populations can be difficult. Respondent driven sampling is not a one-size-fits-all solution for sampling hard-to-reach migrants in low- and middle-income countries, although respondent driven sampling produced the most comprehensive data set on migrant *kayayei* to date. These data show that access to formal health care in Accra remains largely inaccessible to *kayayei* migrants who suffer from greater illness/injury than the general female population in Accra and who are hindered in their ability to receive insurance exemptions.

Too often, the lack of data on female migration reinforces the out-dated stereotype that girls and women do not participate in migration. The analyses in this thesis refute this stereotype and challenge historical assumptions that underestimated female migration. With internal migration on the rise in many settings, including Ghana, health systems must better recognise and respond to the varied needs of populations in multi-ethnic and multilingual countries to ensure that internal migrants can access affordable, quality health services across domestic borders.

Acknowledgements

I am indebted to my advisors, Ernestina Coast and Tiziana Leone at the London School of Economics and Political Science (LSE), for their unwavering support and thoughtful guidance throughout my PhD. They are the reason I chose the LSE for my studies, and their mentorship has surpassed my wildest expectations. I am truly grateful for the privilege to have had such wonderful professionals and academics guiding my research.

I am incredibly grateful to Ama de-Graft Aikins at the University of Ghana and to Philomena Nyarko at Ghana Statistical Service for their guidance during my time in Ghana. I also thank Catherine and Aaron Finch for their kindness and hospitality during my fieldwork.

Special thanks to the Kayayei Youth Association and its Director, Mohammed Salifu, for permitting this research to be conducted through their organization; to Gifty Danwah, Lariba Ibrahim, Akos Kwaku, Enyonam Nanewortor, Humeida Sayibu, Nazira Abdulmajeed, and Abigana Akolgo for their hard work and assistance collecting the survey data; to Gifty Danwah for translating the in-depth interviews; and to Lariba Ibrahim for reviewing the interviews for translation quality.

I thank Rob Dorrington at the University of Cape Town for providing technical assistance on fitting the multi-exponential model migration curve in Chapter 2.

I would like to thank Eleri Jones, Emily Freeman, Ellie Hukin, Else Knudsen, Dwan Kaoukji, Liz Bailey, Louise Caffrey, Paul Bouanchaud, Melissa Shannon, Valeria Cetorelli, Heini Väisänen, and Rachel Deacon for welcoming me with open arms my first year at the LSE. They made the office a warm, inspiring place and set me on the right path. I am grateful for their friendship and support along with that of Rishita Nandagiri, Alexis Palfreyman, and Laura Sochas.

I give my heartfelt thanks to my family who was always there to encourage me and to support me despite the distance. Their love and belief in me kept me going these past four years. My husband, Philip Meier, and my brother and sister-in-law, Andrew and Darcy Lattof, showed unfailing interest in my work. Philip also showed great understanding when

my research materials occasionally spread well beyond the confines of my desk. My parents and most vocal cheerleaders, Janet and Allen Lattof, provided regular advice that saved me from multiple setbacks. Following their advice, I spent an entire week in Ghana scanning over 17,000 pages of survey data and study files in order to create an electronic backup. When the United States Postal Service lost a parcel containing a week's worth of survey data, I was horrified but prepared. Finally, I am grateful to my daughter, Amelia, for keeping me company during the many late nights I spent writing.

I especially thank the migrant *kayayei* who agreed to participate in this study. Their time and willingness to share their experiences with the research team were invaluable.

This thesis was funded with generous support from the LSE PhD Studentship award.

For the inspiring kayayei migrants, who made this research possible.

Table of contents

Declaration	2
Statement of conjoint work.....	3
Abstract	4
Acknowledgements	5
List of tables	12
List of figures	14
Acronyms, glossary, and translations	15
Chapter 1. Introduction	16
1.1 Background.....	16
1.2 Migration in Ghana.....	18
1.2.1 Child migration.....	19
1.2.2 Migrant kayayei.....	20
1.3 Access to healthcare in Ghana.....	21
1.3.1 User-fees and fee exemption policies.....	22
1.3.2 National Health Insurance Scheme.....	22
1.4 Gender, migration, and health	23
1.5 Research aims and questions	26
1.6 Thesis outline.....	27
Chapter 2. Contemporary female migration in Ghana: Analyses of the 2000 and 2010 Censuses.....	30
2.1 Introduction	30
2.1.1 Data sources for analysing migration in Ghana.....	31
2.2 Data and methods	33
2.2.1 Data.....	33
2.2.2 Methods	38
2.3 Results	39
2.3.1 Identification of migrants	39
2.3.2 Demographic structure of internal migrants.....	46
2.3.3 Interregional female migration	54
2.4 Discussion.....	57
2.5 Contributors.....	61
2.6 Summary.....	61
Chapter 3. Fieldwork methodology	62
3.1 Use of mixed methods	62
3.2 Ethics	65
3.3 Preliminary fieldwork.....	66
3.3.1 Scoping trip	66
3.3.2 Fieldwork preparations	67
3.3.3 Key informant interviews	68
3.3.4 Community observations and outreach	69
3.3.5 Setting.....	70
3.4 Methodology for primary survey.....	72
3.4.1 Survey design	72
3.4.2 Selection of the data collection team.....	75
3.4.3 Training of the data collection team	77
3.4.4 Sampling of participants.....	79

3.4.5 Sample size estimation	82
3.4.6 Eligibility criteria.....	83
3.4.7 Ineligibility criteria	85
3.4.8 Informed consent	85
3.4.9 Relationship between the participants and me.....	87
3.4.10 Data collection.....	88
3.4.11 Coupons and coupon tracking	89
3.4.12 Participant compensation.....	91
3.4.13 Non-response data	93
3.4.14 Quality control.....	93
3.4.15 Data processing.....	93
3.4.16 Safety	94
3.4.17 Procedure for quantitative data analysis	94
3.5 Methodology for in-depth interviews	95
3.5.1 Setting.....	96
3.5.2 Semi-structured interview guide.....	97
3.5.3 Sampling strategy	98
3.5.4 Ethics, informed consent, and participant compensation	99
3.5.5 Translation and transcription	100
3.5.6 Quality control.....	100
3.5.7 Data security	101
3.5.8 Procedure for qualitative data analysis	102
3.6 Limitations.....	102
3.7 Summary.....	103
Chapter 4. Collecting data from migrants in Ghana: Lessons learned using respondent driven sampling	104
4.1 Background.....	104
4.1.1 Surveying migrants with respondent driven sampling	105
4.1.2 Sampling female migrants in Ghana	108
4.2 Data and methods	110
4.2.1 Formative research	111
4.2.2 Recruitment of seeds and participants	113
4.2.3 Data collection.....	115
4.2.4 Analyses	117
4.3 Results	118
4.3.1 Recruitment productivity	119
4.3.2 Network size and ties.....	122
4.3.3 Successes and challenges implementing respondent driven sampling	130
4.4 Discussion.....	134
4.5 Conclusion.....	141
4.6 Summary.....	143
Chapter 5. Health insurance and care-seeking behaviours of female migrants in Accra, Ghana	144
5.1 Introduction	144
5.2 Methods	146
5.2.1 Study design and setting	146
5.2.2 Methodology for survey	147
5.2.3 Analyses for survey	150
5.2.4 Methodology for in-depth interviews	151
5.3 Results	152
5.3.1 Sample characteristics	152
5.3.2 Care-seeking for recent illness/injury	156

5.3.3 Health insurance status	162
5.4 Discussion.....	165
5.4.1 Limitations.....	168
5.5 Conclusion.....	168
5.6 Summary.....	169
Chapter 6. Conclusion.....	171
6.1 Summary of findings	171
6.2 Findings in context and contributions to the literature	173
6.3 Strengths and limitations	177
6.4 Implications for policy and further research.....	179
6.5 Future publications	181
6.5.1 Sexual and reproductive health among Ghana's migrant kayayei.....	182
6.5.2 Expectations and consequences of remittances among Ghana's migrant kayayei	185
6.6 Summary.....	187
References.....	189
Appendices	204
Appendix 1: Demographic methods	205
A1.1 Rogers-Castro multi-exponential model migration schedule	205
A1.2 Logistic regression analyses	206
A1.3 Estimates of net internal female migration from place of birth data	207
A1.4 Estimates of net female migration using the cohort component method.....	213
Appendix 2: Migrants identified by Ghana census questions on migration, 2000 and 2010 (10% microdata)	219
Appendix 3: Lifetime female in-migrants by region of origin, out-migrants by region of destination, and net lifetime migration streams, Ghana, 2000 and 2010.....	221
Appendix 4: Lifetime male in-migrants by region of origin, out-migrants by region of destination, and net lifetime migration streams, Ghana, 2000 and 2010.....	222
Appendix 5: Estimates of the net number of female in-migrants of those born outside by age group, Ghana, 2000–2010.....	223
Appendix 6: Estimates of the net number of female out-migrants by region of birth and age group, Ghana, 2000–2010.....	224
Appendix 7: Approval from the LSE Research Ethics Committee	225
Appendix 8: Approval from the Noguchi Memorial Institute for Medical Research ..	226
Appendix 9: Research confidentiality agreement for data collectors.....	227
Appendix 10: Approval from the Kayayei Youth Association's Board of Directors ..	228
Appendix 11: Approval from the Department of Social Welfare	229
Appendix 12: Survey questionnaire	230
Appendix 13: Research team values.....	255
Appendix 14: Recruitment script.....	256
Appendix 15: Ineligibility form.....	257
Appendix 16: Survey consent form for adults and emancipated minors.....	258
Appendix 17: Survey assent form for children.....	260
Appendix 18: Survey consent form for parents of participants.....	262
Appendix 19: Refusal form	264
Appendix 20: Coupon tracking form.....	265
Appendix 21: Financial reporting form	266
Appendix 22: Non-response form	267
Appendix 23: Field incident report form.....	268
Appendix 24: Semi-structured in-depth interview guide	269

Appendix 25: Interview consent form for adults and emancipated minors.....	273
Appendix 26: Interview child assent form	275
Appendix 27: Interview consent form for parents of participants.....	277

List of tables

Table 1: Comparison of microdata samples to the 2000 and 2010 Censuses.....	34
Table 2: Criteria for classifying migrants and non-migrants by Ghana census questions on migration.....	36
Table 3: Female population classified by region of birth and region of enumeration, Ghana, 2000 and 2010	41
Table 4: Male population classified by region of birth and region of enumeration, Ghana, 2000 and 2010	42
Table 5: Regression results explaining female internal migration status in Ghana, 2000 and 2010 Census microdata, with internal migrant as the dependent variable	52
Table 6: Female interregional migration rates in 2000 as proportions of survivors of the 1995 population, female population aged five years and older	55
Table 7: Estimates of overall net female out-migrants, in-migrants, and migration streams, Ghana, 2000 to 2010.....	56
Table 8: Key informant interviews (n = 23)	69
Table 9: Noteworthy changes to the original survey questionnaire	74
Table 10: Questionnaire composition.....	75
Table 11: Characteristics of <i>kaya</i> data collectors	77
Table 12: Characteristics of seeds	81
Table 13: Qualitative sampling matrix	99
Table 14: Characteristics of seeds sorted by increasing recruitment productivity	121
Table 15: Comparison of questions on personal network size and participants' mean network sizes	123
Table 16: Effect of personal network size questions on network sizes and homophily for key demographic characteristics.....	124
Table 17: Sample proportions for demographic characteristics versus population estimates by personal network size question.....	127
Table 18: Sampling challenges/limitations among studies of <i>kayayei</i> in Ghana and how respondent driven sampling performed against these approaches.....	136
Table 19: Demographic characteristics of recently ill/injured participants compared to the entire study sample and to GLSS6 data on females residing in Accra.....	153
Table 20: Sample population proportions and population proportion estimates for key health variables	156
Table 21: Sample population proportions and population proportion estimates for key health consultation variables	157
Table 22: Summary of logistic regression analysis for variables predicting whether a recently ill or injured survey participant (n = 239) sought medical care.....	159
Table 23: Sample population proportions and population proportion estimates for key health insurance variables.....	162
Table A1.1: Comparison of overall net migration estimates based on changes to survival factors	209

Table A1.2: Estimation of the net number of female in-migrants of those born outside by age group, Greater Accra Region, Ghana, 2000–2010.....	211
Table A1.3: Estimation of the net number of female out-migrants of those born inside by age group, Upper East Region, Ghana, 2000–2010	212
Table A1.4: Estimating net intercensal female migration by age (birth) cohorts, according to the cohort component method, in the Upper East Region, Ghana, 2000–2010	215
Table A1.5: Estimation of female births surviving the projection interval, Upper East Region, Ghana, 2000–2005	216
Table A1.6: Comparison of estimates of net female migration in Ghana produced using different methods	217

List of figures

Figure 1: Map of Ghana by region with differentiated urbanization levels (2010).....	19
Figure 2: Lifetime female migration streams, Ghana, 2000 (blue) and 2010 (red).....	44
Figure 3: Lifetime male migration streams, Ghana, 2000 (blue) and 2010 (red).....	45
Figure 4: Female population pyramid by migrant status, 2000 Census (top) and 2010 Census (bottom).....	47
Figure 5: Male population pyramid by migrant status, 2000 Census (top) and 2010 Census (bottom)	48
Figure 6: Regional out-migration by sex over the five-year interval, 1995–2000, and fitted with a 7-parameter model schedule, Ghana, 2000 Census 10% microdata.....	50
Figure 7: Mixed method research design typologies (Leech and Onwuegbuzie 2007)	63
Figure 8: In Accra, the Kayayei Youth Association office is situated on the Old Fadama side of Hansen Road with Agbogloboshie located just opposite.....	71
Figure 9: Flowchart to describe use of respondent driven sampling to sample survey participants.....	80
Figure 10: Front (top) and back (bottom) of an un-numbered recruitment coupon	90
Figure 11: The coupon book.....	91
Figure 12: Inside the Kayayei Youth Association office	97
Figure 13: Participant flow diagram of <i>kayayei</i> migrants in Accra, Ghana (March-April 2015).....	119

Acronyms, glossary, and translations

Acronyms

AIDS	Acquired Immunodeficiency Syndrome
ASFR	age-specific fertility rate
Census	Ghana Population and Housing Census
DHS	Demographic and Health Survey
GDHS	Ghana Demographic and Health Survey
GH¢	Ghana cedi(s)
GHS	Ghana Health Service
GLSS	Ghana Living Standards Survey
GMS	Ghana Migration Study
GSS	Ghana Statistical Service
HIV	Human Immunodeficiency Virus
LSE	London School of Economics and Political Science
NCRM	National Council on Research Methods
NHIA	National Health Insurance Agency
NHIS	National Health Insurance Scheme
NMIMR	Noguchi Memorial Institute for Medical Research
RDSAT	Respondent Driven Sampling Analysis Tool
SSNIT	Social Security and National Insurance Trust
TFR	total fertility rate
UHC	universal health coverage
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs

Glossary and translations

female migrants	Girls and women who migrate
female migration	The migration of girls and women
<i>kayayei</i>	Female porters who carry loads on their head at markets and transportation centres. <i>Kayayei</i> is a compound word formed from the Hausa and Ga languages. <i>Kaya</i> is often translated from Hausa as “load” or “burden.” In Ga, <i>yei</i> means “women.”
<i>kayayoo</i>	A female porter who carries loads on her head at markets and/or transportation centres. <i>Kayayoo</i> is a compound word formed from the Hausa and Ga languages. <i>Kaya</i> is often translated from Hausa as “load” or “burden.” In Ga, <i>yoo</i> means “woman.”
<i>obruni</i>	A Twi word meaning “foreigner” or “white person”

Chapter 1. Introduction

1.1 Background

The 2030 Agenda for Sustainable Development marks the first time that migration is included within the global development agenda (UN General Assembly 2015). The agenda recognizes the importance and contributions of migrants to sustainable development, specifically referencing migration in six of the Sustainable Development Goals. This global attention to migration's role in sustainable development is timely, given that projections indicate that two-thirds of the world's population will reside in urban areas by 2050 due to population growth and urbanization (UNDESA 2014).

Effectively planning for and managing this shifting population distribution requires better understanding of established and new migration patterns as well as the impacts of internal migration. For too long, researchers studying migration patterns and impacts incorrectly assumed that migrants and migrant workers were predominately male, in part due to a lack of sex-disaggregated data and statistical evidence (Zlotnik 2003). This historical inattention to female migration reinforced out-dated stereotypes that girls and women do not actively participate in migration. Whilst increased recognition and reporting of female migration has occurred in recent years (Hofmann and Buckley 2012, Beegle and Poulin 2013), knowledge of contemporary female migration patterns and outcomes remains insufficient, particularly in low- and middle-income countries.

Knowledge of the relationship between migration and health is also insufficient. With contemporary migration occurring at multiple times in multiple cycles in multiple ways, factors affecting a migrant's health status are not limited to the migrant's destination. Beiser (2005) proposes three pathways to explain the factors affecting a migrant's health status: (1) a migrant's exposure to the social, cultural, and physical influences in her/his new destination leads to morbidity and mortality profiles similar to that setting; (2) environmental stressors in the migrant's new setting (e.g., poverty, lack of social networks, poor access to services) leads to negative health effects; and (3) the interaction between stressors causing an individual to migrate and stressors involved in settling into a new

environment interact to determine the migrant's health status. These pathways, however, may overlook the lived experiences of contemporary migrants. A more recent framework by Zimmerman et al. (2011) recognizes that factors affecting a migrant's health status go beyond place of destination; this framework proposes five different phases during which public health policies and health interventions may affect a migrant's health: pre-departure, travel, destination, interception (e.g., temporary detention, interim residence), and return. Each phase offers different opportunities for addressing and improving migrant health.

Women appear more affected by migration-related health inequalities than men (Malmusi, Borrell et al. 2010). The effects of migration on women's health vary, improving women's health in some instances and worsening women's health in other instances, but women generally experience worse health effects from migration than men (Adanu and Johnson 2009). Since studies on women's health often sample populations by household or at health facilities (Adanu, Seffah et al. 2012, Fink, Arku et al. 2012, Tunçalp, Hindin et al. 2012), these studies may potentially exclude female migrants who may be transient, homeless, and infrequent users of facility-based health services. Examining the health of female migrants to better assess migration-related health inequalities requires different sampling techniques to ensure sufficient representation, especially among vulnerable migrant populations.

Using primary and secondary data from Ghana, this thesis attempts to fill in knowledge gaps regarding internal female migration patterns and female migrants' health outcomes at the national and sub-national levels. It presents the first detailed comparative analyses of contemporary female migration in Ghana using data from the Population and Housing Censuses (2000–2010) and uses these data to understand the gendered dimensions of migration. This thesis then presents primary analyses from mixed-methods fieldwork to examine health and migration among female migrants who work in Ghana's informal sector as market porters (*kayayei*). These analyses appear in three papers that comprise the empirical body of this thesis. The following sections in this introductory chapter provide background context to situate the papers.

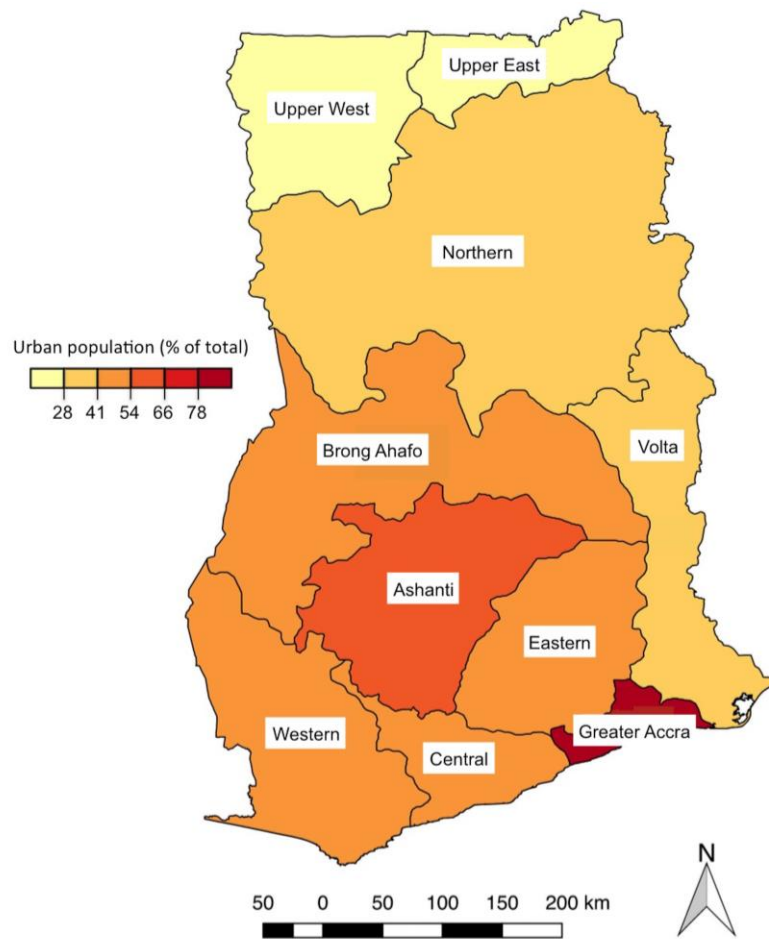
1.2 Migration in Ghana

Migration has historically been a way of life in West Africa, and migration within Ghana is no exception. Ghana's internal migration is primarily a north-south phenomenon established well before the census started officially recording migration data in 1960 (Agyei and Ofosu-Mensah Ababio 2009). Since 1960, each census has recorded large out-migration streams from Ghana's northern regions and significant in-migration streams into the Greater Accra Region, with Ghana's 2010 Census recording an intercensal in-migration rate of 40.72% for Greater Accra (GSS 2013c). Nearly one-third (32.2%) of the Greater Accra Region's population is between the ages of 15 and 29 years, due to a high rate of age-selective in-migration and rapid natural increase (GSS 2013b). Migrants residing in Accra also tend to be long-term migrants, with only about one in ten having moved in the 12 months prior to the 2010 Census (GSS 2013b). As a result, Ghana's urban centres (Figure 1) are facing growing challenges brought on by unemployment, inadequate sanitation, and the development of shantytowns. Of the 1.6 million migrants residing in the Greater Accra Region during the 2010 Census, about 10% originated in Ghana's three northern regions (GSS 2013b).

With growing social acceptance of female independence and mobility, women and girls are now the majority of Ghana's internal migrants. Among adolescents, females migrate from Ghana's rural areas to the country's urban areas at greater rates than males (GSS 2013a). The same pattern exists among youth¹ aged 25 years and younger, with girls and young women comprising 60.5% of migrant youth (Anarfi and Appiah 2009). Girls frequently migrate before completing their education. Depending on the estimates, between 50% and 80% of female migrants have no formal education (Agyei and Ofosu-Mensah Ababio 2009, Frempong-Ainguah, Badasu et al. 2009, Quartey and Yambilla 2009).

¹ In accordance with Ghana's National Youth Policy, "youth" comprises all people aged 15–35 years. Any exceptions will be noted in the text.

Figure 1: Map of Ghana by region with differentiated urbanization levels (2010)



[Map created by the author]

1.2.1 Child migration

The literature on child² migration tends to focus on independent child migrants as opposed to street children, foster children, or trafficked children. With regards to independent child migrants, a debate exists over whether children decide to migrate primarily as a result of poverty or whether they migrate for economic reasons (Anarfi and Agyei 2009). Commonly cited reasons for child migration include deteriorating agricultural land, drought, poor market facilities, poor transport networks, ethnic conflicts, lack of employment opportunities, and lack of desire to participate in the agricultural industry

² In accordance with Ghana's 1998 Children's Act (Act 560), this paper defines "child" as a person below the age of 18 years.

(Frempong-Ainguah, Badasu et al. 2009). Urban-pull factors and rural-push factors also influence children's migration decisions. Push factors for child migration include parental inability to provide for their children's needs, ethnic conflicts, lack of privacy and money, lack of interest in schooling from parents and/or from children, maltreatment from family members, desire to prevent being given away in marriage, and lack of independence (Frempong-Ainguah, Badasu et al. 2009). Pull factors for child migration include assisting a sibling with work, schooling, learning a trade, working for money, experiencing city life, and staying with a relative (Frempong-Ainguah, Badasu et al. 2009).

Child migrants experience a number of problems related either to their work or their young age: for instance, a decline in business, cheap prices for migrant services, harassment from city guards, financial problems, physically demanding work, work that is too difficult, no/insufficient work, no place to sleep, and high taxes (Kwankye and Addoquaye Tagoe 2009). Given these challenges, child migrants commonly return to their place of origin (Addoquaye Tagoe and Kwankye 2009). A survey conducted in northern Ghana among returned child migrants found that other reasons for children's return included continuing education, changed marital status, and being needed at home (Addoquaye Tagoe and Kwankye 2009). As children (and their families) appear to constantly weigh the costs and benefits of migrating to and from their place of origin, repeated migrations may occur (Anarfi and Kwankye 2009).

1.2.2 Migrant kayayei

The *kayayei*³ represent the face of female north-south migration in Ghana, with most female child migrants (95%) taking up this occupation upon arrival in Accra (Kwankye and Addoquaye Tagoe 2009). Though the majority of *kayayei* are aged 16–30 years (82%), it is not unheard of for girls as young as eight-years-old⁴ and women beyond their thirties to also seek employment as *kayayei* (Opere 2003, Awumbila 2007). Easily identified at markets and transportation stations due to the large metal pans that they carry on their heads, the *kayayei* make an important contribution to Ghana's economy. Many *kayayei*

³ *Kayayei* are female porters, most often teenagers and young women, who earn their living by transporting goods on their heads around markets and transportation hubs. The singular form of *kayayei* is *kayayoo*.

⁴ The Children's Act of 1998 (Act 560) restricts children less than 13-years-old from working for profit, though this Act does not deter the *kayayei*. This Act also sets forth minimum ages for child labour (15 years), light work (13 years), and hazardous employment (18 years). Porterage of heavy loads is considered to be one type of hazardous work, as it may affect a child's health, safety, and morals.

earn US\$ 3–5 daily⁵ for shifts lasting up to 14 hours, and they send remittances home (Badasu, Frempong-Ainguah et al. 2009, Rabiou 2013). Working as a *kayayoo* is often considered an adaptive response to poverty in the literature with rural push-factors (as opposed to urban pull-factors) driving a *kayayoo*'s migration.

Despite their growing presence, the *kayayei* are an extremely vulnerable population. Being a *kayayoo* may increase one's vulnerability to poverty; homelessness; harassment; violence; and health risks, particularly sexual and reproductive health risks (Anarfi and Appiah 2009, Kwankye and Addoquaye Tagoe 2009). Homelessness among the *kayayei* is not synonymous with unemployment. Research suggests that approximately 85% of *kayayei* chose to sleep on the streets, at markets, or at transportation stations in order to save their earnings (Kwankye and Addoquaye Tagoe 2009). Sleeping on the streets is particularly risky for this population, leading to rape, kidnapping, and assault. For female migrants residing in Accra's informal settlements, risk of pregnancy is elevated in their first years post-migration (Rokicki, Montana et al. 2014). Additional sexual and reproductive health risks include unsafe abortion and sexually transmitted infections (Quartey and Yambilla 2009).

Only one in four *kayayei* seek health services from a health facility (Kwankye and Addoquaye Tagoe 2009). When health issues arise, they often self-medicate or seek advice from friends, peddlers, chemists, or healers; these actions can result in accidental death as a result of using herbs to treat basic diseases or as an abortifacient⁶ (Kwankye and Addoquaye Tagoe 2009, Quartey and Yambilla 2009). Girls and women occasionally return north sick and/or pregnant (Addoquaye Tagoe and Kwankye 2009).

1.3 Access to healthcare in Ghana

As part of its strategy to transition from a low-income country to a middle-income country, a transition that Ghana achieved in 2011, the Ghanaian government has focused on improving the nation's health status (Kenny and Sumner 2011). Ghana's Ministry of

⁵ This figure is greater than the minimum wage of US\$ 2.65 per day.

⁶ On 22 February 1985, the Ghanaian government enacted Law Number 102, legalising abortion in cases of rape, incest, the "defilement of a female idiot," risk of foetal abnormality, or if the women's health or life is in danger. While the law is one of the more liberal abortion laws in the region, there is a lack awareness of the legal status of abortion, and abortion is widely stigmatised (Guttmacher Institute 2013).

Health established a national policy that includes objectives and strategies ranging from improving quality of care to increasing geographic and financial access to health services to increasing overall resources in the health sector with equitable and efficient distribution of these resources (Ghana Ministry of Health September 2007).

1.3.1 User-fees and fee exemption policies

User-fees restrict vulnerable populations' access to care and cause economic hardship. Before passing the National Health Insurance Act in 2003, Ghana's health system was based on user-fees that often presented a barrier to care for the poor. Whilst the policy around user-fees attempted to indirectly reduce the number of people entering poverty as a result of medical costs, the user-fee system negatively impacted the poor (Nyonator and Kutzin 1999). Health workers obtained financial exemptions far more easily than poor Ghanaians, resulting in the poor delaying or avoiding medical care (Nyonator and Kutzin 1999). Vulnerable populations struggled to ensure access due to the system's lack of functional exemptions.

Delivery fee exemption policies, such as Ghana's policy that provided free supervised deliveries to any pregnant woman in labour, can be cost-effective and decrease health inequalities (Witter, Adjei et al. 2009). This particular policy increased demand for maternity services (Witter, Kusi et al. 2007), but most health care providers highlighted serious problems with the policy's sustainability and management. The unpredictability of funding resulted in hospitals implementing the fee exemption in different ways (Witter, Arhinful et al. 2007) with some facilities re-enacting fee-for-service policies (IMMPACT Project 2005). Such unpredictability decreased consumer and provider confidence (IMMPACT Project 2005). Ultimately, the fee-for-service model resumed in 2007 when external donor funding ended.

1.3.2 National Health Insurance Scheme

With the creation of the National Health Insurance Scheme (NHIS) in 2003, basic health care became available to all citizens after a small registration fee and an initial premium determined by each district's health insurance scheme. Two in five Ghanaians are active members in the scheme with children comprising the largest group of active members

(46.5%) (National Health Insurance Authority 2014). Although the NHIS intends to be pro-poor, membership is positively associated with urban residence and with higher socioeconomic status (Akazili, Welaga et al. 2014). Three in five Ghanaians report that they are unable to afford the renewal payment, and 71.6% of the uninsured report that they cannot afford the premium (Jehu-Appiah, Aryeetey et al. 2012). Although several categories exist under which a person may receive an exemption from the premiums, such as poverty and pregnancy, data show that many individuals have not utilized these exemptions (GSS, GHS et al. 2009).

Without clear guidelines/criteria for identifying the core poor or “indigents” and with the homelessness criterion disqualifying nearly everyone, individuals seldom benefited from the indigent⁷ exemption (Kotoh and Van der Geest 2016). The lack of a concise, realistic definition around what constitutes being “poor” meant that the designation was left to individual scheme managers and may have been applied inconsistently. Furthermore, public awareness of health insurance exemptions for the poor remains low. One in three individuals in northern Ghana⁸ reported being aware of exemptions for the poor (Derbile and van der Geest 2013). In 2013, the National Health Insurance Agency (NHIA) began implementing different strategies to more effectively identify and insure the poor, including collaborating with pro-poor intervention programmes. Through these efforts, the NHIA increased indigent enrolment by 213% between 2012 and 2013 to cover 1,231,305 Ghanaians (National Health Insurance Authority 2014).

1.4 Gender, migration, and health

Defining the roles of girls and women as daughters, mothers, and wives has failed to recognise women’s work beyond reproductive labour (e.g., caregiving, household labour, unpaid work). This narrow view of female roles is present in the literature on migration. Migrant girls and women may be classified as ‘dependent’ or ‘independent’ based on whether they migrate as wives and daughters or as members of the workforce (Llácer,

⁷ Indigents are considered the poorest of the poor. According to the 2004 National Health Insurance Regulations (L.I. 1809), “A person shall not be classified as an indigent under a district scheme unless that person: (a) is unemployed and has no visible source of income; (b) does not have a fixed place of residence according to standards determined by the scheme; (c) does not live with a person who is employed and who has a fixed place of residence; and (d) does not have any identifiable consistent support from another person.”

⁸ In this thesis, “northern Ghana” refers to the Upper East, Upper West, and Northern Regions.

Zunzunegui et al. 2007, p. ii4). Similarly, the migration literature has referred to girls and women who migrate with husbands and fathers as “passive” migrants rather than “active” migrants (Findley 1989). These labels are absent from the literature on migrant men and boys. Male migrants are not classified according to their relationship to their wives and mothers.

In addition to using different language to describe the migration of girls and women, the migration literature has historically overlooked the roles of female migrants. Girls’ and women’s forms of migration and their migration-related employment have often been invisible and unrecognised, especially with regards to migrant domestic work (Elias 2010). This invisibility stems from research from the 1960s and 1970s in which researchers often assumed migrants were male, focusing analyses on male migrants and historically underestimating female migration (Caldwell 1969, Zlotnik 1995). Sex-disaggregated census data increasingly show growing mobility among girls and women, with migration rates frequently balanced between the sexes (Beegle and Poulin 2013, GSS 2013c, Camlin, Snow et al. 2014). Whilst census data are limited to sex-disaggregated analyses, examining differences between the migration patterns of women and men is the first step in advancing our understanding of gender and migration.

Migration increasingly allows girls and women to challenge traditional social roles in rural societies (Guo, Chow et al. 2011). In Ghana, girls challenge these roles by independently deciding to migrate (70% of girls versus 54% of boys) and by personally financing their migrations (57.6% of girls versus 34.9% of boys) (Anarfi and Agyei 2009). Research from the Democratic Republic of Congo and Senegal finds that, in patriarchal settings, women’s access to and support from migrant networks is crucial in order for women to migrate (Toma and Vause 2014). Upon migrating, migrant women develop and strengthen community ties by strategically giving gifts, sharing food, caring for children, and participating in reciprocal labour (Tufuor, Niehof et al. 2015).

Evidence suggests that gender-specific factors may influence girls’ and women’s choice of destination. Based on a survey of 450 child migrants residing in Accra and Kumasi in 2005, researchers found that migrant girls were occasionally pursued and recaptured by their families; this finding may illustrate one of the reasons why many females decide to move to Accra, the urban centre that is furthest from the northern regions (Anarfi and

Agyei 2009). In addition to choice of destination, gender may influence where migrants may work. In Accra, public spaces have historically been gendered: markets are associated with female entrepreneurship, whereas bus stations are associated with male entrepreneurship (Thiel and Stasik 2016).

When mothers migrate, it can lead to restructuring of the parent-child relationship as well as paradoxes pertaining to mothers' caregiving role (Resurreccion 2009, Contreras and Griffith 2012). With economic support now a key component of 'superior motherhood,' this type of support comes at a cost for migrant mothers: mothers may be absent from their children's lives and unable to provide their children with emotional support and care from afar (Contreras and Griffith 2012, p. 62). Migration can enhance the value of motherhood, as mothers provide increased resources and improved material conditions for their children; however, migration can also diminish motherhood, as other family members are called upon to provide childcare responsibilities in the mother's absence (Contreras and Griffith 2012). In this regard, mothers migrating independently without their children are in fact dependent upon family members' ability to fulfil the daily caregiving role.

With regards to health and wellbeing, migrant girls and women may experience double segregation and vulnerability based on their migrant status and their gender (Llácer, Zunzunegui et al. 2007). Women experience unique challenges accessing health care that depend on their ability to access and control resources as well as their ability to make decisions about their own health. Female migrants in Ghana experience these challenges both in their place of origin and in Accra. Among currently married women aged 15–49 years, 30.3% of women reported that their husbands make the final decisions about their wives' health care (Ghana Statistical Service, Ghana Health Service et al. 2009). In northern Ghana, some men believe that contraception encourages infidelity; women using contraception, particularly in areas practicing bridewealth⁹, may be punished and abused for not bearing children (Bawah, Akweongo et al. 1999). These sociocultural norms and beliefs can be a particularly powerful influence over women's health and their reproductive autonomy. Rural-urban return migration can shape these attitudes and behaviours and lead to changes over time, as female migrants return home with new attitudes and knowledge of sexual and reproductive health (Chen, Liu et al. 2010).

⁹ In areas of Ghana that practice bridewealth, men acquire wives by a bridewealth payment that usually consists of sheep and cattle (Bawah, Akweongo et al. 1999).

In Ghana, gender dynamics also affect women's enrolment in and drop out of the NHIS. Compared to men, women are more likely to drop out of the NHIS if they have unreliable incomes, live with young children, and are food insecure (Dixon, Luginaah et al. 2014). Female migrants working in the informal sector, such as migrant *kayayei* whose income varies daily, may thus be at greater risk of being uninsured. Moreover, poor people may be effectively penalized by the NHIS since the scheme has a mandatory delay in health insurance coverage before members who dropped out can re-enrol (Dixon, Luginaah et al. 2014).

1.5 Research aims and questions

Five primary aims drive the research presented in this thesis: First, to understand contemporary female migration in Ghana; second, to study approaches for collecting data from hard-to-reach migrant populations; third, to assess the strengths and weaknesses of respondent driven sampling as a sampling strategy for migrant populations in low- and middle-income countries; fourth, to determine the ways in which health insurance status affects female migrants' care-seeking behaviours; and fifth, to examine whether a vulnerable migrant population can access health services and relevant social safety nets like insurance fee exemptions.

Three primary research questions address these aims and form the basis of the substantive papers presented in the ensuing empirical chapters:

1. What is the current status of female migration in Ghana? (Chapter 2)
 - a. How have patterns, trends, and determinants of female migration in Ghana changed over time?
2. Can respondent driven sampling offer an improved approach for surveying hard-to-reach migrant *kayayei*? (Chapter 4)
 - a. What modifications, if any, are required to implement respondent driven sampling successfully in limited-resource settings?
 - b. What do analyses of recruitment productivity, network size, homophily, and ties of internal migrants reveal about the suitability of respondent driven sampling for sampling migrant *kayayei*?

- c. What lessons implementing respondent driven sampling among migrants in Ghana, both successes and challenges, may be relevant in other low- and middle-income countries?
- 3. Why do *kayayei* migrants working in the informal sector (not) use health services in Accra? (Chapter 5)
 - a. What role does health insurance play in female migrants' decision and ability to access health care?

1.6 Thesis outline

This thesis is conducted as a thesis by papers. The introduction (Chapter 1) establishes the evidence and literature within which this thesis is situated. Chapter 2 presents a national overview of female migration in Ghana. The methodology chapter (Chapter 3) details extensive mixed-methods fieldwork in Ghana from which the papers in Chapters 4 and 5 are produced. The conclusion (Chapter 6) pulls together findings from all three papers to present a current picture of female migration and health in Ghana. Each of the following chapters is outlined below.

Chapter 2 presents empirical findings from a secondary analysis of Ghana's Population and Housing Censuses (2000–2010) and provides a national overview of contemporary female migration in Ghana.¹⁰ This chapter presents the first detailed comparative analyses of female migration using microdata from Ghana's 2000 and 2010 Censuses and exploits these national data to understand the gendered dimensions of migration in Ghana. Secondary analyses use direct and indirect methods to describe the scale, type, and demographic structure of contemporary female migration; assess the distribution of female migrants across age and geography; and estimate net internal female migration. Knowledge of female migration patterns is scant despite increased recognition and reporting of the feminization of migration. Recent data on female internal migration in Ghana challenge historical assumptions that underestimated female migration.

¹⁰ *Demographic Research* published the paper based on this chapter. Earlier versions of this paper were presented in September 2017 at the British Society for Population Studies Annual Conference in Liverpool, United Kingdom and in October 2016 at an international workshop on Demography and Gender organized by Le Centre de Recherche de l'Institut de Démographie de l'Université Paris 1 in Paris, France.

Chapter 3 describes the methodology that I used to collect primary quantitative and qualitative data over a period of seven months in Ghana. This chapter discusses my motivation for using mixed-methods research and adds depth to the shorter methodology sections that appear in the papers that form Chapters 4 and 5.

Chapter 4 presents findings and lessons learned from applying respondent driven sampling in Ghana.¹¹ Policymakers and program implementers require high-quality data on migrants and migration in low- and middle-income countries; however, a shortage of high-quality data exists in these settings. Sampling migrant populations requires better techniques. Respondent driven sampling, used frequently in high-income countries, may be one such solution. Using Ghana as a case study, the objectives of this chapter are to: (1) assess respondent driven sampling recruitment productivity, network size, and ties of internal migrants; (2) test for homophily; (3) detail the successes of and challenges to implementing respondent driven sampling in Ghana and how these lessons can be applied in other low- and middle-income countries; and (4) compare how respondent driven sampling performed against other methods sampling the same population.

Chapter 5 presents empirical findings from my mixed-methods study in Ghana to examine health insurance and care-seeking behaviours among migrant *kayayei*.¹² People working in Ghana's informal sector have low rates of enrolment in the publicly funded NHIS. Informal sector workers, including migrant girls and women from northern Ghana working as *kayayei*, report challenges to obtaining insurance and seeking formal health care. This chapter analyses how health insurance status affects *kayayei* migrants' care-seeking behaviours. Analyses explore health status and health seeking behaviours for recent illness/injury. Binary logistic regression modelled the effects of selected independent variables on whether or not a recently ill/injured participant (n = 239) sought health care.

Chapter 6 concludes the thesis by pulling together findings from the three papers. I highlight the contributions that these findings have on understandings of contemporary

¹¹ *Demographic Research* published the paper based on this chapter. I presented an earlier version of this paper in November 2016 in London, England at the British International Studies Association workshop on The Process and Challenges of Conducting Research on Africa.

¹² *Health Policy and Planning* published the paper based on this chapter and highlighted this research in an accompanying blog post. *Health Services Insights* published an invited commentary on this paper. I presented an earlier version of this paper in February 2017 in London, United Kingdom at the International Health Policy Conference.

female migration and migrant health in Ghana. Finally, I discuss the implications that these findings have for policy, present limitations and their analytic implications of the papers, and propose avenues for future research.

Chapter 2. Contemporary female migration in Ghana: Analyses of the 2000 and 2010 Censuses

2.1 Introduction

Due to population growth and urbanization, projections suggest that two-thirds of the world's population will reside in urban areas by 2050, with most of this increase occurring in Asia and Africa (UNDESA 2014). Planning for and managing this changing population distribution will require better understanding of new migration patterns and the impacts of internal migration. This includes a better understanding of female migration, which has been historically underestimated, with analyses focused on male migrants or assumptions that migrants were male (Caldwell 1969, Zlotnik 1995).

Knowledge of female migration patterns is scant despite increased recognition and reporting of the feminization of internal migration (Hofmann and Buckley 2012, Beegle and Poulin 2013). Research from South Africa challenges the assumption that females represent the residentially stable population, finding women in rural areas to be highly mobile (Camlin, Snow et al. 2014). In Malawi, where young women now migrate more than young men, assumptions of traditional patterns of matrilineal residence following marriage no longer hold (Beegle and Poulin 2013). As evidence reveals changes in the sex composition of migrants, it also reveals changes in the reasons for migrating.

Whilst both sexes may attribute their migration decisions to factors such as the need to seek employment or a lack of independence at the place of origin, gender-specific factors emerge. In South Africa, compared to boys, girls experience an increased risk of moving out of the household following a parent's death related to Acquired Immunodeficiency Syndrome (AIDS); families experiencing a death may expect girls to perform caring duties elsewhere or may prefer to keep boys (Ford and Hosegood 2005). In Ghana, girls and women attribute their migrations to the need to accumulate property for marriage; to avoid harm, including female genital mutilation; and to avoid forced or arranged marriages that

may be polygamous¹³ (Anarfi and Agyei 2009). These factors influence both the decision to migrate and the choice of destination.

Data from Ghana's two most recent (2000 and 2010) Population and Housing Censuses indicate that there are more female than male internal migrants, particularly at younger ages (GSS 2013c). Among adolescents (those aged 10–19 years), females migrate from rural to urban areas at greater rates than males (GSS 2013a). The growing number of younger migrants puts increasing pressure on social services and employment opportunities in urban areas. Some migrants move to Ghana's urban areas independent of available resources or employment opportunities (Agyei and Ofosu-Mensah Ababio 2009).

This study analyses Ghana's 2000 and 2010 Censuses using census microdata disaggregated by sex to provide a comprehensive picture of internal female migration at all ages. We use direct and indirect techniques to analyse the patterns, trends, and determinants of contemporary female migration. Our comparative analyses are the first to exploit national data from the 2000 and 2010 Censuses with a view to understanding the gendered dimensions of migration in Ghana.

2.1.1 Data sources for analysing migration in Ghana

Ghana's internal migration data come primarily from the decennial censuses and ad hoc population surveys, as Ghana has no population register or administrative data suitable for migration analyses. Whilst census data provide limited depth of information on female migration, they provide the most comprehensive source of evidence on female migration at all ages that can be exploited using demographic techniques. Ad hoc sub-national surveys and research on female migration in Ghana are localised and small-scale, precluding national-level analyses (Awumbila and Ardayfio-Schandorf 2008, Anarfi and Kwankye 2009). These studies address important aspects of migration, such as push- and pull-factors underlying independent child migration, childcare practices among young migrants, and migrants' livelihood strategies. National migration data come from the Ghana Migration Study (1991–1992), “Development on the Move” migration study (2008–2009), Ghana Demographic and Health Surveys (conducted in 1988, 1993, 1998, 2003, 2008, and 2014), Ghana Living Standards Survey (conducted in 1987, 1988, 1991–1992, 1998–1999,

¹³ Polygamy is illegal under Ghanaian civil law, but it is common in northern Ghana.

2005–2006, and 2013), and post-independence censuses (1960, 1970, 1984, 2000, 2010). Each of these data sources has strengths and limitations for national-level analyses of migration.

The 1991–1992 Ghana Migration Study (GMS), developed in response to inadequate migration data in prior censuses, provided a depth of migration data unparalleled by more recent surveys. It collected evidence on the processes, mechanisms, and effects of internal migration; however, this survey has not been repeated (GSS 1995). Despite its relative depth of migration data, the 1991–1992 GMS has significant limitations: exclusion of child migrants younger than 15 years of age; documented implementation challenges, such as inaccessible enumeration areas (i.e., resulting from floods, ethnic conflicts, and broken transportation); and a lack of technical assistance required to implement the survey (GSS 1995).

To fill evidence gaps in migration’s developmental impacts and policy that were unaddressed in the GMS, the Regional Institute for Population Studies at the University of Ghana and the Global Development Network collaborated in 2008–2009 on a nationally representative survey entitled “Development on the Move: Measuring and Optimising Migration’s Economic and Social Impacts” (Yeboah, Doodoo et al. 2010). This study focused on international migration and its socioeconomic impacts on households and individuals remaining in Ghana.

Ghana’s Demographic and Health Surveys (GDHS) (1988, 1998, 2003, and 2008) have each asked the same single question about migration—“How long have you been living continuously in (NAME OF CURRENT PLACE OF RESIDENCE)?”—and defined migrants based on how long they have lived in the enumeration area (GSS and IRD 1989, GSS and Macro International 1999, GSS, NMIMR et al. 2004, GSS, GHS et al. 2009). This question has several drawbacks for measuring migration. It precludes identification of types of migrants (e.g., internal, international) and calculation of sub-national inter-regional migration flows. The 1993 GDHS included a five-question migration module that went beyond birthplace to include whether or not the respondent had lived elsewhere for at least six months, age at first migration, and reason for first migration (GSS, GHS et al. 1994). Most recently, the 2014 GDHS asked respondents how many times in the last 12 months they had been away from home for one or more nights and whether they had been

away from home for more than one month at a time (GSS, GHS et al. 2015). These questions have not been repeated, preventing comparative analyses across GDHS. Furthermore, GDHS sampling in Ghana excludes girls and women outside of 15–49 years of age.

The Ghana Living Standards Survey (GLSS) assesses living conditions in Ghanaian households using a nationally representative sample. In the household roster, the 2012–2013 GLSS6 captures region/country of birth (question 11) and how many months during the past 12 months the person (aged six months and older) has been away from this household (question 22). The survey also contains a ten-question module on migration (Section 5A) that collects data such as timing of move/return, intentions to stay, occupation and industry of migrant labour, and reason for migrating. The GLSS6 is a valuable source of migration data since these migration data are linked to detailed individual- and household-level socio-demographic data; however, the ten-question module is only asked of household members aged seven years or older.

2.2 Data and methods

2.2.1 Data

Through the Ghana Statistical Service (GSS), I obtained a 10% random sample for both the 2000 and 2010 Censuses along with all available questionnaires, manuals, codebooks, and reports. To assess data quality, I reviewed the post-enumeration surveys conducted to assess coverage and content errors (GSS 2003, GSS 2012). Three months after the 2000 Census, the post-enumeration survey sampled 200 out of 26,716 enumeration areas to collect data on eight selected census questions, including place of usual residence (GSS 2003). The post-enumeration survey data were matched to the census data and reconciled where necessary. Unfortunately, planning for the 2000 post-enumeration survey was more effective than its data management; the 2000 post-enumeration survey data are physically missing, preventing analysis of whether or not the final census results required adjustment.

Implementation was greatly improved for the 2010 Census post-enumeration survey, which sampled 250 out of 37,488 enumeration areas seven months after the census (GSS 2012). The post-enumeration survey found an omission rate of 3.0%, the erroneous inclusion of

1.3% of the population in the census, and a greater chance of males (3.3%) being omitted from the census than females (2.8%) (GSS 2012). Based on the low net coverage error of 1.8% at the national level, it was unnecessary to adjust the 2010 Census results for our analyses. However, some populations, such as migrant *kayayei*, proved challenging to enumerate in the 2010 Census since they are highly mobile and occasionally homeless; this population reportedly exceeded estimates and required additional time to enumerate in Accra (Daily Express 2010). Comparing key variables between the microdata and censuses reveals that the microdata sample from the 2010 Census more accurately reflects the complete census than the microdata sample from 2000, in which the age structure differs slightly (Table 1).

Table 1: Comparison of microdata samples to the 2000 and 2010 Censuses

	2000		2010	
	Census	Sample (10.0%)	Census	Sample (10.0%)
Total population	18,912,079	1,891,158	24,658,823	2,466,289
Sex				
Female	9,554,697 (50.5%)	955,504 (50.5%)	12,633,978 (51.2%)	1,262,598 (51.2%)
Male	9,357,382 (49.5%)	935,654 (49.5%)	12,024,845 (48.8%)	1,203,691 (48.8%)
Enumeration locality				
Rural	10,637,809 (56.2%)	1,063,732 (56.2%)	49.1%	49.1%
Urban	8,274,270 (43.8%)	827,426 (43.8%)	50.9%	50.9%
Age structure				
Median age	19.4	19.0	20.0	20.0
Dependent population †	8,965,233 (47.4%)	880,031 (46.6%)	10,617,930 (43.1%)	1,060,608 (43.0%)
Regional population distribution				
Highest share	Ashanti (19.1%)	Ashanti (19.1%)	Ashanti (19.4%)	Ashanti (19.3%)
Lowest share	Upper West (3.0%)	Upper West (3.0%)	Upper West (2.8%)	Upper West (2.9%)

† Respondents aged <15 and >64 years.

The 2000 and 2010 Censuses both included four questions to measure migration. However, the phrasing of these questions differed (Table 2), affecting cross-census comparability. Given these changes to the phrasing of migration questions between the 2000 and 2010 Censuses, the 2010 Census National Analytical Report acknowledges that the census data underestimate people's actual mobility and "do not provide enough and adequate information on patterns and differentials of migration in a country" (GSS 2013c, p. 205). Several response categories also changed between the 2000 and 2010 Censuses. Changes to response categories between censuses (e.g., additions, removals, or changes in definitions), and their analytic implications, are explored in the results.

Table 2: Criteria for classifying migrants and non-migrants by Ghana census questions on migration

2000 Census			2010 Census		
Census question	Migrant determination	Non-migrant	Census question	Migrant determination	Non-migrant
<p>P06a BORN IN THIS TOWN / VILLAGE: Was (NAME) born in this town or village? If YES go to P07.</p> <p>[Note: Only asked of respondents who were Ghanaian by birth.]</p>	<p>Person who is Ghanaian by birth and enumerated in a place different from the place s/he was born</p> <p><i>A NO answer is a lifetime migrant.</i></p> <p><u>International migrant</u> = person for whom this answer is missing (implying that they are a foreign citizen)</p>	<p>Person who is Ghanaian by birth and enumerated in the place where s/he was born</p> <p><i>A YES answer is a non-migrant.</i></p>	<p>P05 BIRTHPLACE: Was [NAME] born in this village/town? If Yes, go to P07.</p>	<p>Person enumerated in a place different from the place s/he was born</p> <p><i>A NO answer is a migrant.</i></p>	<p>Person enumerated in the place where s/he was born</p> <p><i>A YES answer is a non-migrant.</i></p>
<p>P06b BIRTHPLACE OUTSIDE THIS TOWN / VILLAGE: In what region or country was (NAME) born?</p> <p>[Note: Only asked of respondents who were Ghanaian by birth.]</p>	<p>Person who is Ghanaian by birth and enumerated in a place different from the place s/he was born</p> <p><u>Internal migrant</u> = person who is Ghanaian by birth and born in one of Ghana's nine regions outside the region of enumeration</p> <p><u>International migrant</u> = person who is Ghanaian by birth and born outside of Ghana</p> <p><i>All respondents answering are lifetime migrants.</i></p>	--	<p>P06 BIRTHPLACE: In what region or country was [NAME] born?</p>	<p>Person enumerated in a place different from the place s/he was born</p> <p><u>Internal migrant</u> = person born in Ghana outside the place of enumeration</p> <p><u>International migrant</u> = person born outside of Ghana</p> <p><i>All respondents are migrants.</i></p>	--

2000 Census			2010 Census		
Census question	Migrant determination	Non-migrant	Census question	Migrant determination	Non-migrant
P07 USUAL PLACE OF RESIDENCE: In what district is (NAME'S) usual residence?	<p>Person enumerated in a place different from her/his usual place of residence</p> <p><u>Internal migrant</u> = person who usually resides in one of Ghana's districts outside the district of enumeration</p> <p><u>International migrant</u> = person who usually resides outside of Ghana</p>	Person enumerated in her/his usual district of residence	P07 LIVING IN THIS VILLAGE / TOWN: Has [NAME] been living in this village or town since birth? If Yes, go to P09.	<p>Person who has not lived in the place of enumeration for her/his entire life</p> <p><i>A NO answer is a migrant.</i></p>	<p>Person who has lived in the place of enumeration for her/his entire life</p> <p><i>A YES answer is a non-migrant.</i></p>
P08 PLACE OF RESIDENCE 5 YEARS AGO: IF (NAME) IS 5 YEARS OR OLDER – In what district was (NAME'S) usual place of residence 5 years ago?	<p>Person whose place of residence at the 2000 Census differs from her/his place of residence in 1995</p> <p><u>Internal migrant</u> = person who usually resided in 1995 in one of districts outside the district of enumeration</p> <p><u>International migrant</u> = person who usually resided outside of Ghana in 1995</p>	Person whose district of residence at the 2000 Census is the same as that in 1995	P08 NUMBER OF YEARS LIVED IN THIS VILLAGE / TOWN: For how long has [NAME] been living in this village or town?	Person who has lived in the place of enumeration for a period less than her/his age	Person who has lived in the place of enumeration for her/his entire life

Definitions in this paper are consistent with those used by GSS. “Lifetime migrants” are people whose residence at the census differs from their birthplace (GSS 2013c), with “birthplace” defined as “the town or village (locality) of usual residence of the [infant’s] mother at the time of birth,” (GSS 1999, p. 37). “District of usual residence” refers to the district in which the respondent usually resides and may be the place where s/he was enumerated; however, in cases where respondents maintain multiple residences (e.g., students, military personnel), “usual residence” refers to “where the person spends most of his/her days or time,” (GSS 1999, p. 38). A respondent may also be considered a “usual resident” if s/he has “lived there for at least six months or has the intention of staying for the next six months,” (GSS 1999, p. 38).

2.2.2 Methods

Secondary analyses of the 2000 and 2010 Census microdata were conducted using SPSS Statistics 22.0 and Microsoft Excel 2011 software. Direct and indirect demographic techniques (UNDESA 1970, Moultrie, Dorrington et al. 2013) were used to describe the scale, type, and demographic structure (e.g., age, marital status, religion) of contemporary female migration in Ghana and to assess the distribution of female migrants across age and geography. These methods and their assumptions are detailed in a technical appendix (Appendix 1).

In order to represent typical age patterns of migration, I fitted a Rogers-Castro multi-exponential model migration schedule to observed female migration data (Rogers and Castro 1981, Little and Dorrington 2013) (Appendix 1, Section A1.1). These schedules, which range from 7 to 13 parameters depending on the model’s complexity, depict the dependency between age and migration for use in population projections and in understanding migration dynamics (Little and Dorrington 2013). Whilst not all data will produce a shape compatible for the multi-exponential model migration schedule, researchers have successfully fitted the schedule to migration flows in North America, Europe, Asia, and Africa (Little and Dorrington 2013). To examine the effects of demographic indicators on the likelihood of a girl or woman migrating internally in 2000 and 2010, I conducted logistic regression analyses (Appendix 1, Section A1.2). Binary logistic regression modelled the effects of selected independent variables on whether or not

a girl or woman was identified in the census as ever having migrated internally. Selection of the independent variables was based on a literature review of push- and pull-factors of migration. Finally, I generated estimates of net internal female migration between sub-national regions from place of birth data (Dorrington 2013) (Appendix 1, Section A1.3). Whilst I considered estimates produced using the cohort component method (Spoorenberg 2015), the estimates of net internal migration from place of birth data appear more robust (Appendix 1, Section A1.4).

2.3 Results

After first identifying all migrants in the census data, I present analyses of the demographic structure of internal migrants. I then explore the demographic characteristics of female migrants, using regression analyses to explain internal migration status, with “internal migrant” as the dependent variable (yes/no). After examining who migrates, I analyse their migration destinations. The results conclude with analyses of interregional migration, including patterns and trends in the geographic distribution of internal migrants and estimates of interregional female migration between 2000 and 2010.

2.3.1 Identification of migrants

Migrants in the 2000 and 2010 Censuses were identified and classified according to the criteria in Table 2. The 2000 Census microdata identified a total of 359,960 female internal and international migrants (37.7% of the female population) and 371,577 male internal and international migrants (39.7% of the male population) (Appendix 2). In the 2010 microdata, the questions identified 487,376 female internal and international migrants (38.6% of the female population) and 447,485 male internal and international migrants (37.2% of the male population).

Of the female migrants identified in the 2010 microdata, international migrants comprised 3.1% of the sample (15,123). The 2000 Census permitted more refined identification of international migrants, since it collected data on place of usual residence at the time of the census and place of usual residence five years prior to the census. In the 2000 microdata, female migrants can be split into 62,929 international migrants (13.5%) and 402,146 internal migrants (86.5%). Between 2000 and 2010, the proportion of lifetime internal

migrants increased for both females and males (28.7% to 35.6% and 28.1% to 34.2% respectively). The relative increase in lifetime migration was greater for females during this period.

At the sub-national level, I identified interregional lifetime migration for both sexes using region of birth and region of residence at enumeration (Tables 3 and 4). This identification ignores any interim migration and only captures migration between region of birth and region of residence at enumeration.

Table 3: Female population classified by region of birth and region of enumeration, Ghana, 2000 and 2010

Region of birth	Region of enumeration										TOTAL
	Western	Central	Greater Accra	Volta	Eastern	Ashanti	Brong Ahafo	Northern	Upper East	Upper West	
A. Region of birth by region of enumeration at 2000 Census											
Western	642,460	16,760	28,380	2,920	8,000	21,060	5,560	1,880	1,600	1,410	730,030
Central	62,770	676,570	89,760	3,260	29,500	42,480	7,160	2,840	1,000	740	916,080
Greater Accra	11,700	15,640	809,900	13,850	27,230	17,310	6,220	3,420	2,230	1,420	908,920
Volta	22,260	13,250	125,930	725,740	54,130	23,840	13,520	8,610	780	810	988,870
Eastern	29,300	21,540	162,960	11,400	858,730	37,760	8,970	2,120	1,420	930	1,135,130
Ashanti	44,500	15,970	78,680	5,070	19,850	1,304,400	36,120	7,360	8,830	5,340	1,526,120
Brong Ahafo	28,420	3,300	16,980	2,130	5,150	35,620	683,910	5,640	2,310	3,390	786,850
Northern	8,870	3,020	23,010	14,910	5,600	31,620	27,290	821,860	4,020	2,660	942,860
Upper East	19,410	2,550	12,680	960	4,480	42,890	23,720	10,410	422,900	1,440	541,440
Upper West	12,370	1,890	9,710	810	3,860	22,890	40,210	12,700	2,200	264,120	370,760
TOTAL	882,060	770,490	1,357,990	781,050	1,016,530	1,579,870	852,680	876,840	447,290	282,260	8,847,060
B. Region of birth by region of enumeration at 2010 Census											
Western	909,160	30,970	43,610	3,640	11,730	40,980	10,090	1,210	1,600	1,540	1,054,530
Central	71,810	945,810	136,770	4,840	35,330	58,510	8,150	1,880	590	650	1,264,340
Greater Accra	15,150	43,100	1,188,210	19,930	37,770	25,650	7,480	3,620	2,510	1,480	1,344,900
Volta	23,340	22,980	180,300	1,000,130	63,580	26,720	15,900	8,660	880	710	1,343,200
Eastern	28,610	38,450	245,430	15,380	1,123,500	46,750	10,290	1,830	1,030	1,000	1,512,270
Ashanti	41,350	29,580	125,150	7,230	28,910	2,011,670	44,260	7,620	12,740	5,230	2,313,740
Brong Ahafo	27,870	7,730	32,930	3,850	8,780	77,220	943,410	6,700	2,550	5,170	1,116,210
Northern	18,190	6,950	49,480	17,280	10,890	61,570	40,740	1,190,720	5,970	3,620	1,405,410
Upper East	21,250	3,850	20,530	910	6,610	66,430	29,680	9,560	500,400	2,230	661,450
Upper West	13,370	2,050	9,910	610	4,170	28,600	50,520	11,820	2,770	334,880	458,700
TOTAL	1,170,100	1,131,470	2,032,320	1,073,800	1,331,270	2,444,100	1,160,520	1,243,620	531,040	356,510	12,474,750

Table 4: Male population classified by region of birth and region of enumeration, Ghana, 2000 and 2010

Region of birth	Region of enumeration										TOTAL
	Western	Central	Greater Accra	Volta	Eastern	Ashanti	Brong Ahafo	Northern	Upper East	Upper West	
A. Region of birth by region of enumeration at 2000 Census											
Western	613,470	14,430	26,760	2,620	7,390	19,710	5,580	1,750	1,870	1,440	695,020
Central	62,760	593,640	85,470	3,460	25,960	43,890	8,380	3,470	910	520	828,460
Greater Accra	13,890	15,600	769,250	14,930	27,750	19,980	7,480	3,620	2,480	1,200	876,180
Volta	25,450	13,360	122,100	665,010	52,970	26,210	14,590	9,030	1,090	780	930,590
Eastern	33,250	21,020	151,680	10,780	804,890	39,620	9,700	2,330	1,540	790	1,075,600
Ashanti	48,040	15,600	80,840	4,170	18,940	1,222,970	34,200	7,190	8,850	4,610	1,445,410
Brong Ahafo	30,760	3,690	17,350	2,210	5,170	35,070	647,860	5,340	2,530	2,600	752,580
Northern	10,710	3,630	23,200	14,170	7,260	35,630	32,400	796,510	3,680	2,510	929,700
Upper East	23,880	2,890	14,600	1,070	6,230	49,060	29,090	8,390	372,130	1,040	508,380
Upper West	13,780	1,940	8,700	1,060	5,310	27,470	49,760	12,530	2,090	242,230	364,870
TOTAL	875,990	685,800	1,299,950	719,480	961,870	1,519,610	839,040	850,160	397,170	257,720	8,406,790
B. Region of birth by region of enumeration at 2010 Census											
Western	874,870	25,780	38,060	2,790	10,360	37,300	11,550	1,070	1,730	1,640	1,005,150
Central	72,240	850,070	117,280	4,790	31,750	54,310	9,030	1,880	800	810	1,142,960
Greater Accra	20,080	41,520	1,137,810	20,680	36,550	27,510	9,220	3,800	3,370	1,700	1,302,240
Volta	27,770	25,350	164,370	922,570	63,920	31,140	18,380	8,050	1,240	700	1,263,490
Eastern	34,700	37,390	211,150	14,320	1,071,690	46,210	11,210	2,130	1,600	910	1,431,310
Ashanti	50,080	31,680	123,980	6,700	27,270	1,868,170	47,390	7,400	12,710	5,840	2,181,220
Brong Ahafo	32,480	9,420	29,570	3,330	9,300	66,940	895,440	6,250	2,480	4,430	1,059,640
Northern	21,890	7,840	45,020	16,990	13,680	61,050	47,070	1,172,660	5,250	4,200	1,395,650
Upper East	26,540	5,250	20,180	910	7,460	65,630	33,050	7,150	471,290	1,610	639,070
Upper West	14,880	2,650	7,240	680	6,190	27,940	55,620	10,430	1,820	315,410	442,860
TOTAL	1,175,530	1,036,950	1,894,660	993,760	1,278,170	2,286,200	1,137,960	1,220,820	502,290	337,250	11,863,590

Figures 2 and 3 condense these migration streams by sex into non-cumulative, stacked column charts that compare the totals (i.e., net lifetime migration) and their shares (i.e., lifetime out-migrants, lifetime in-migrants) (Appendices 3 and 4). Four regions experienced population gains in net lifetime migration streams by both sexes in 2000 and 2010: Greater Accra, Western, Ashanti, and Brong Ahafo. The remaining six regions experienced net losses by both sexes in 2000 and 2010.

Figure 2: Lifetime female migration streams, Ghana, 2000 (blue) and 2010 (red)

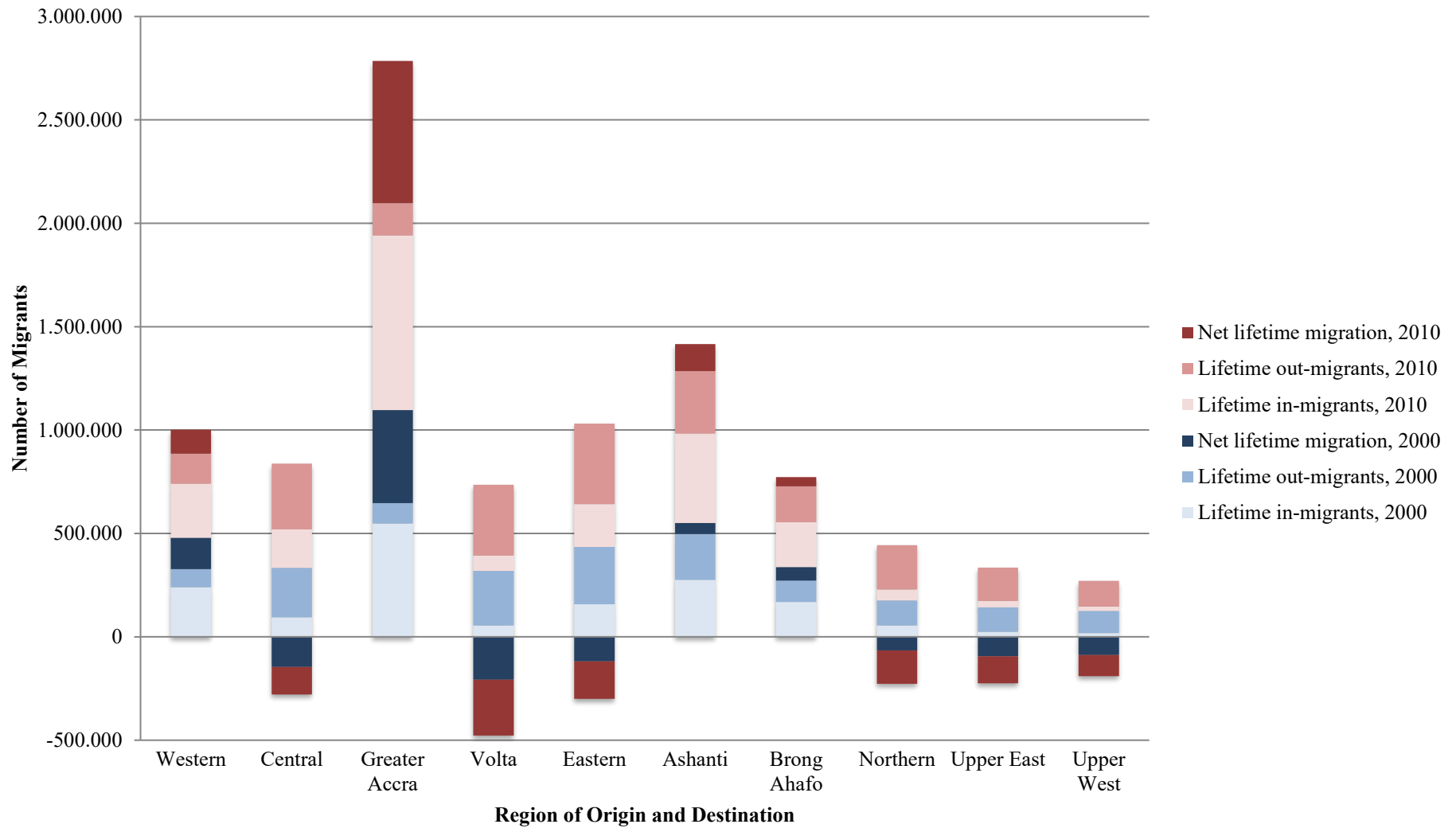
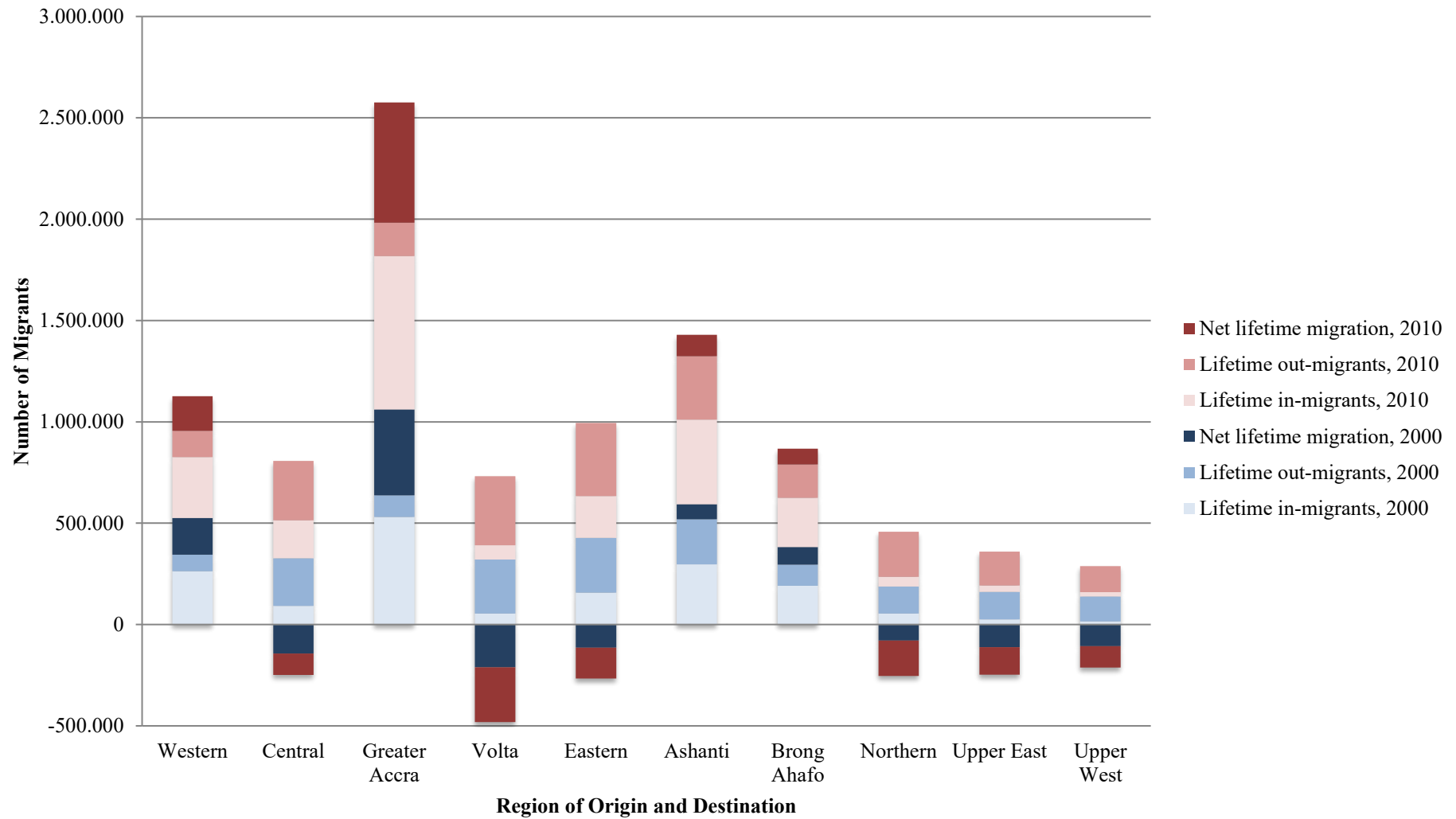


Figure 3: Lifetime male migration streams, Ghana, 2000 (blue) and 2010 (red)



2.3.2 Demographic structure of internal migrants

Disaggregating internal migrants by age and sex highlights changes between groups and over time. Though Ghanaians migrate at all ages, the mean age of internal migrants increased over time. From 2000 to 2010, the mean age of female internal migrants rose from 27.39 years (s.d. 18.86) to 29.71 years (s.d. 18.69). Males show a similar trend with the mean age of internal migrants increasing from 28.48 years (s.d. 19.57) to 29.71 years (s.d. 18.62) between 2000 and 2010.

Examining the distribution of migrants and non-migrants by five-year age group indicates growing relative migration between 2000 and 2010. In 2000, female non-migrants outweighed female migrants in each five-year age group (Figure 4, top). By 2010, the percentage of female migrants overtook female non-migrants among women aged between 25 and 49 years (Figure 4, bottom). For males in 2000, non-migrants comprised a greater percentage of each age group than migrants, with the exception of the age group 45–49 years (Figure 5, top). By 2010, male migrants outweighed male non-migrants among men aged between 30 and 59 years (Figure 5, bottom). Working-age migration was particularly pronounced in 2010 for both men and women.

Figure 4: Female population pyramid by migrant status, 2000 Census (top) and 2010 Census (bottom)

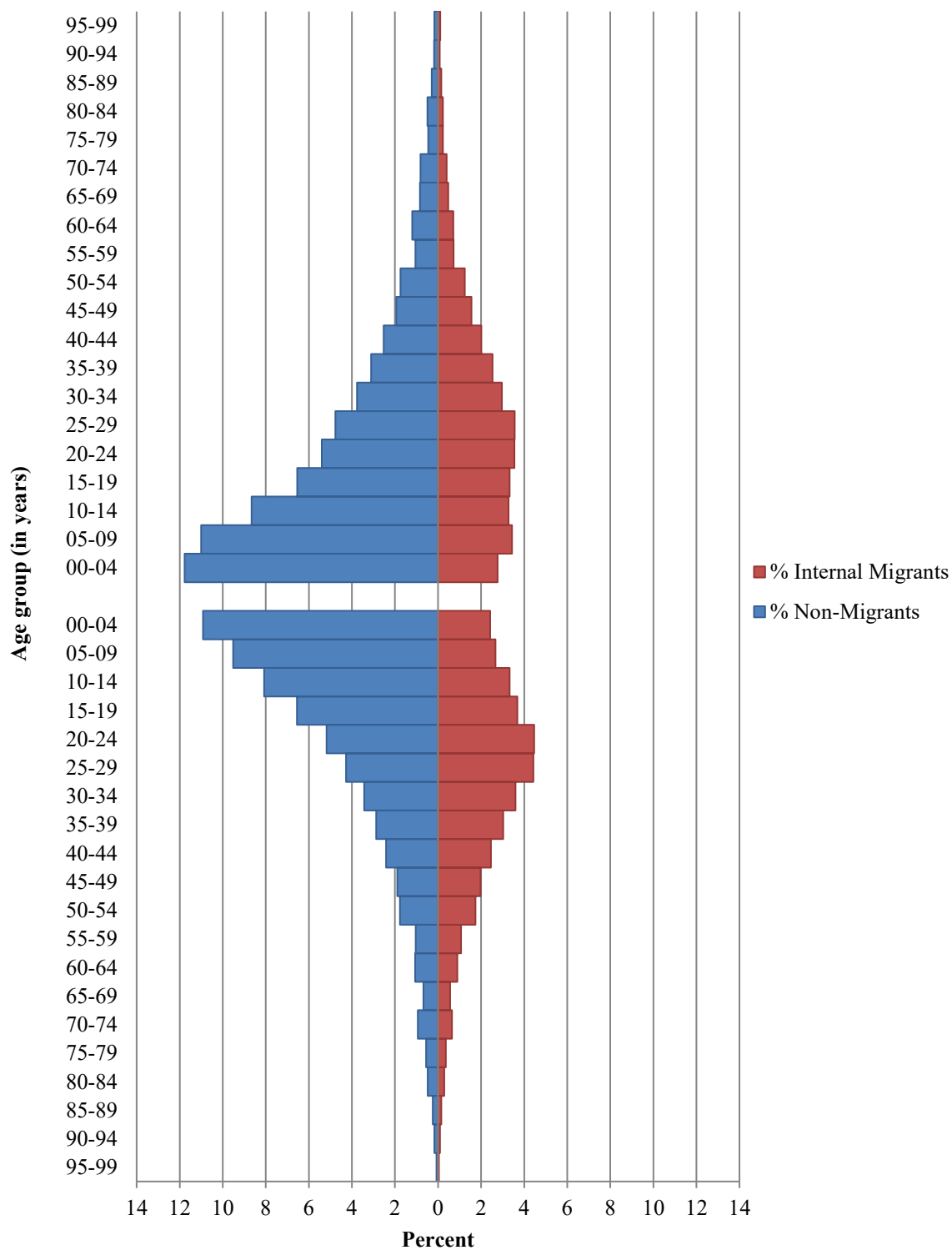
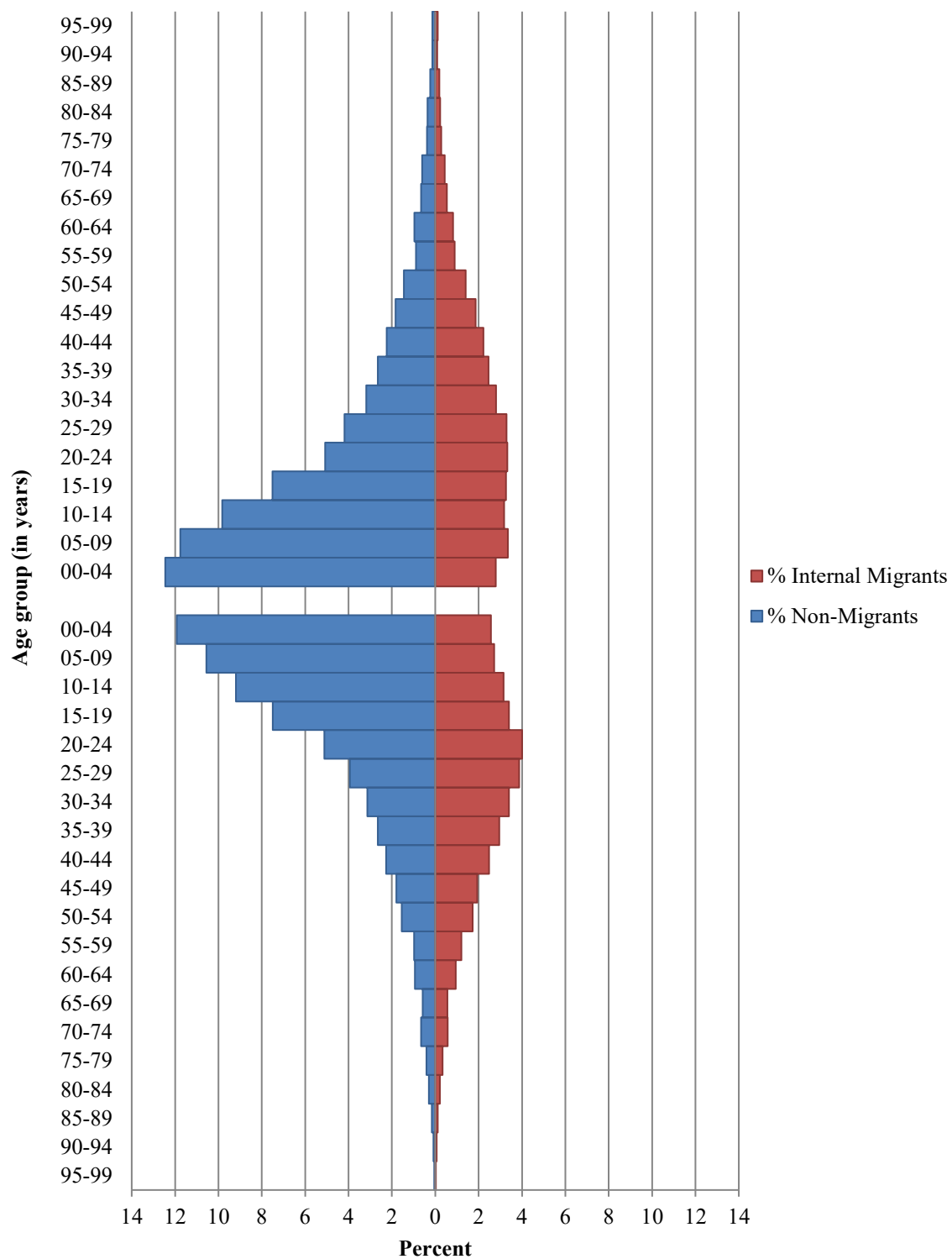
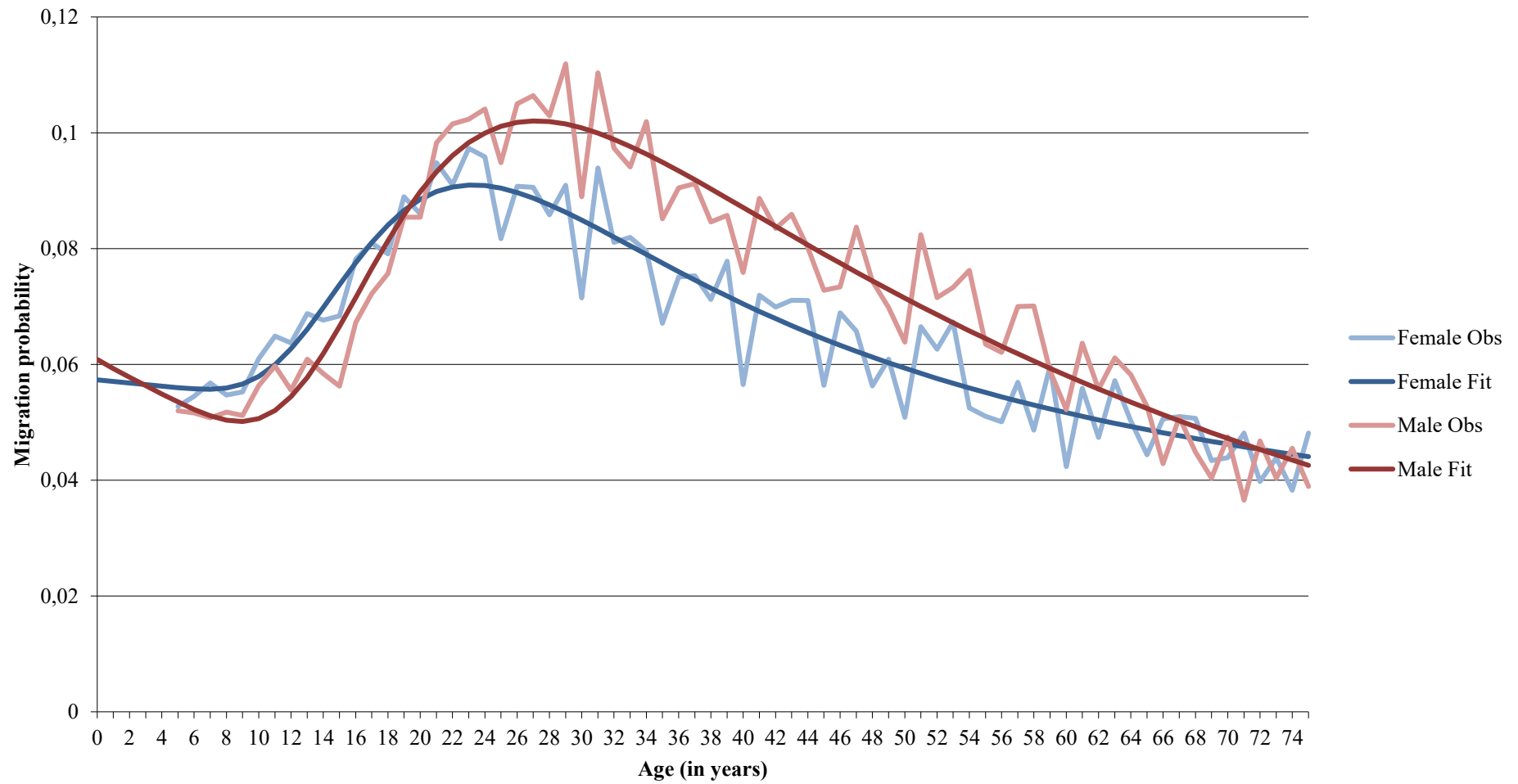


Figure 5: Male population pyramid by migrant status, 2000 Census (top) and 2010 Census (bottom)



The age-related distribution of female and male regional out-migrants was assessed in greater detail using multi-exponential model migration schedules (Figure 6) for age cohorts $x-5$ to x over the period 1995–2000. Since retirement was not concentrated among specific ages in these data and the data may exaggerate older ages (Little and Dorrington 2013), the standard 7-parameter model fit the observed data better than the 9-, 11-, or 13-parameter models, which account for more complex components such as retirement peaks and post-retirement up-slopes. The mean absolute per cent error statistic, 7% for both sexes, is within the boundaries for achieving a reasonable fit. The R-squared values for males (92%) and females (89%) are acceptable compared to the established threshold of 90%, indicating that the models reasonably fit the data (Little and Dorrington 2013). T-statistics are significant at the 0.05 level for all coefficients. For both sexes, the rate of ascent of the labour force component is greater than the rate of this component's descent. Female migration propensity rises sharply from the age of 10, peaking at 0.09097 at the age of 23 years. Male migration propensity peaks several years later at 0.10204 at the age of 27 years.

Figure 6: Regional out-migration by sex over the five-year interval, 1995–2000, and fitted with a 7-parameter model schedule, Ghana, 2000 Census 10% microdata



After identifying all female internal migrants in the microdata and examining migrant status by sex and age, I analysed the effects of demographic indicators on the likelihood of a girl or woman being identified as an internal migrant (Table 5). International migrants are excluded from these regression analyses. Age, in five-year age groups, and education status were non-significant predictors. These variables are excluded from the final models for 2000 and 2010, as they worsened or did not significantly improve the models' ability to predict internal migrant status. The model for 2000 accurately predicts 63.5% of cases, predicting non-migrants (85.1%) better than internal migrants (29.7%). The 2010 model improves the accuracy of predicting internal migrants (51.1%). It accurately predicts 65.7% of cases, including 75.5% of non-migrants. Difficulties in accurately determining migrant status based on census data likely affect the models' predictive abilities. Although both models have low R-squared values, they also have statistically significant predictors that can be used to draw conclusions about migrant status.

Table 5: Regression results explaining female internal migration status in Ghana, 2000 and 2010 Census microdata, with internal migrant as the dependent variable

Demographic characteristics (Independent variables)		2000			2010		
		Odds ratio	Std. error	95% C.I.	Odds ratio	Std. error	95% C.I.
Residence	Rural	Ref	-	-	Ref	-	-
	Urban	1.377	.006	1.362–1.393	1.602	.004	1.589–1.616
Marital status	Never married	Ref	-	-	Ref	-	-
	Married	.999	.009	.982–1.017	.981	.007	.967–.994
	Consensual union †	.937	.013	.914–.960	1.000	.011	.979–1.022
	Separated	.902	.021	.866–.940	.834	.016	.809–.860
	Divorced	.758	.014	.737–.780	.827	.012	.808–.847
	Widowed	.775	.014	.755–.796	.804	.010	.788–.821
Worked for pay, profit, or family gain	Did not work	Ref	-	-	Ref	-	-
	Worked	1.117	.006	1.104–1.130	1.097	.005	1.086–1.107
Relationship to head of household	Head	Ref	-	-	Ref	-	-
	Non-relative	1.952	.018	1.886–2.021	2.091	.009	2.024–2.161
	Temporary head ‡	1.355	.018	1.309–1.403	---	---	---
	Group quarters §	4.468	.074	3.861–5.169	1.320	.015	1.283–1.358
	Spouse	1.401	.010	1.375–1.428	1.271	.007	1.252–1.289
	Child	.519	.011	.508–.529	.356	.008	.350–.361
	Parent or parent-in-law	1.190	.021	1.142–1.241	1.017	.016	.986–1.049
	Daughter-in-law	1.055	.022	1.010–1.102	.758	.020	.729–.789
	Grandchild	.397	.019	.382–.412	.294	.012	.287–.300
	Sister ‡	---	---	---	.787	.011	.769–.804
	Step-child ‡	---	---	---	.547	.025	.521–.574
	Adopted/foster child ‡	---	---	---	.724	.031	.681–.769
	Other relative	1.156	.010	1.134–1.178	.914	.009	.898–.930

Demographic characteristics (Independent variables)		2000			2010		
		Odds ratio	Std. error		Odds ratio	Std. error	
Religion	No religion	Ref	-	-	Ref	-	-
	Catholic	.918	.014	.893–.944	1.178	.012	1.150–1.206
	Protestant	1.019	.014	.991–1.046	1.277	.012	1.248–1.307
	Pentecostal ¶	1.154	.014	1.124–1.185	1.561	.011	1.527–1.597
	Other Christian	1.033	.015	1.003–1.063	1.294	.012	1.263–1.326
	Muslim	.616	.015	.598–.634	.758	.012	.740–.776
	Ahmadi ‡	---	---	---	1.118	.029	1.057–1.182
	Traditional	.397	.017	.384–.410	.516	.015	.501–.532
	Other	1.158	.034	1.082–1.239	1.285	.025	1.223–1.350
Cox & Snell R ²		.067			.105		
Nagelkerke R ²		.090			.142		

† In 2010, this category included informal unions and living together.

‡ This response category is included in only one census.

§ Group quarters included members of non-household populations (e.g., nurses working the night shift) and referred to places such as hotels, orphanages, universities, prisons, and hospitals.

¶ In 2010, the category Pentecostal included respondents who identify as Charismatic.

Being a female migrant is significantly associated with residing in an urban area, indicating the prominence of rural-urban migration. Residing at a residence where relationship to the household head is group quarters, non-relative, temporary head, spouse, or parent/parent-in-law also increases a census respondent's odds of being identified as an internal migrant. Female migrants are more likely than non-migrants to report working for pay, profit, or family gain, suggesting that economic opportunity is a likely driver of migration. By 2010, female migrants are likelier to have never married than be married. Female census respondents are substantially less likely to be identified as internal migrants in 2000 and 2010 if they practice a traditional religion or Islam and if they are the children of the household head.

2.3.3 Interregional female migration

Key features of Ghanaian female internal migration include the high concentration of intraregional migration within all regions and out-migration from the Volta, Central, Northern, Upper East, and Upper West Regions, with no significant in-migration. The Greater Accra Region exhibited significant in-migration from all but three regions (Upper West, Upper East, and Brong Ahafo).

The importance of the Greater Accra and Ashanti Regions as internal migration destinations is further underscored by examination of interregional female migration streams between 1995 and 2000. Using five-year fixed-interval data from the 2000 Census, I calculated interregional female migration streams between 1995 and 2000 in Ghana in the population aged five years and older. Table 6 depicts destination-specific out-migration rates for each of Ghana's regions, producing a five-year migration rate for females who survived the period 1995–2000. Three of the five highest migration rates are amongst females migrating to Greater Accra from the Volta (0.0180), Eastern (0.0172), and Central Regions (0.0138). The highest rate is amongst females in the Western Region migrating to the Central Region (0.0218). The highest rates of migrants to the Ashanti Region are amongst females migrating from the Upper East (0.0129) and Brong Ahafo (0.0119) Regions.

Table 6: Female interregional migration rates in 2000 as proportions of survivors of the 1995 population, female population aged five years and older

Region of residence, 1995	Region of residence at census, 2000										TOTAL
	Western	Central	Greater Accra	Volta	Eastern	Ashanti	Brong Ahafo	Northern	Upper East	Upper West	
<i>Western</i>	--	0.0218	0.0067	0.0025	0.0041	0.0099	0.0037	0.0007	0.0019	0.0023	0.0537
<i>Central</i>	0.0098	--	0.0138	0.0016	0.0052	0.0065	0.0012	0.0005	0.0005	0.0002	0.0394
<i>Greater Accra</i>	0.0038	0.0080	--	0.0170	0.0086	0.0043	0.0014	0.0009	0.0011	0.0040	0.0490
<i>Volta</i>	0.0032	0.0028	0.0180	--	0.0081	0.0029	0.0015	0.0014	0.0006	0.0005	0.0390
<i>Eastern</i>	0.0032	0.0043	0.0172	0.0046	--	0.0066	0.0016	0.0005	0.0006	0.0008	0.0394
<i>Ashanti</i>	0.0058	0.0033	0.0072	0.0016	0.0036	--	0.0085	0.0012	0.0017	0.0062	0.0391
<i>Brong Ahafo</i>	0.0053	0.0015	0.0042	0.0016	0.0022	0.0119	--	0.0037	0.0023	0.0037	0.0365
<i>Northern</i>	0.0018	0.0007	0.0046	0.0028	0.0017	0.0058	0.0044	--	0.0018	0.0015	0.0251
<i>Upper East</i>	0.0079	0.0020	0.0043	0.0011	0.0021	0.0129	0.0055	0.0041	--	0.0008	0.0408
<i>Upper West</i>	0.0077	0.0008	0.0043	0.0008	0.0016	0.0092	0.0128	0.0058	0.0010	--	0.0441

Note: Interregional migration rates over 0.0100 are emphasized in **bold**.

Regional estimates of the net number of interregional female in-migrants from 2000 to 2010 (Appendix 5) show that Greater Accra received the largest number of female migrants among all age groups. Of Ghana's estimated 804,365 total female in-migrants (Table 7), nearly half (43.56%) migrated into Greater Accra, with the Ashanti Region, home to Ghana's second largest city, receiving 22.47% of female in-migrants. The lowest levels of in-migrants are in northern Ghana, with a net number of 662 girls and women migrating into the Northern Region (0.08%) and 6,823 migrating into the Upper East Region (0.85%). The Upper West Region is the only region to experience overall negative net in-migration (-11,844) as indicated by the negative numbers in Table 7 and Appendix 5. Net in-migration in the Upper West Region for 2000 and 2010 is positive only among girls aged 0–4 years.

Table 7: Estimates of overall net female out-migrants, in-migrants, and migration streams, Ghana, 2000 to 2010

Region of origin and destination	Net in-migrants		Net out-migrants		Overall net migration
	Total	%	Total	%	
Western	42,208	5.25	55,919	6.83	-13,711
Central	91,774	11.41	107,894	13.19	-16,121
Greater Accra	350,391	43.56	50,179	6.13	300,213
Volta	8,186	1.02	109,747	13.41	-101,561
Eastern	70,757	8.80	141,887	17.34	-71,130
Ashanti	180,774	22.47	79,344	9.70	101,431
Brong Ahafo	64,635	8.04	79,573	9.73	-14,939
Northern	662	0.08	109,747	13.41	-109,085
Upper East	6,823	0.85	54,035	6.60	-47,212
Upper West	-11,844	-1.47	29,890	3.65	-41,734
TOTAL	804,365	100	818,215	100	-13,849

Regional estimates of the net number of female out-migrants (Appendix 6) show that the net out-migration was highest in the Eastern Region. Of Ghana's 818,215 total female out-migrants (Table 7), 17.34% migrated out of the Eastern Region, followed by the Northern and Volta Regions (13.41% each). Net out-migration was smallest in the Upper West Region with 29,890 female out-migrants (3.65%), followed by Greater Accra with 50,179 female out-migrants (6.13%).

Negative numbers in Appendix 6, such as among girls aged 5–14 years in the Upper West Region, indicate negative net out-migration. Among young girls in the Volta, Upper East,

and Upper West Regions, the negative out-migration suggests that these children are likely to be returning home with a parent who was working outside the region. Among women aged 55 years and older in the Greater Accra, Western, Northern, Upper East, and Upper West Regions, negative out-migration suggests return migration of retiring workers.

Combining estimates of net in-migration and net out-migration reveals that net out-migration exceeds net in-migration in eight of Ghana's ten regions. Only the Greater Accra and Ashanti Regions have positive net overall migration (Table 7). By contrast, overall net migration is lowest in the Northern and Volta Regions, with more girls and women moving out of the regions than moving into them.

2.4 Discussion

Our analyses reveal that the overwhelming focus of previous research on male internal migrants is misplaced. Internal migration in Ghana involves both sexes and warrants greater attention to sex-disaggregated analyses. Our analyses reveal that recent migration in Ghana is sex-balanced, according to the 47–53% typology put forth by Donato and Gabaccia (2015). Ghanaian girls and women migrate at all ages, and approximately 40–50% of these migrants are within age groups excluded from non-census sources of national migration data (e.g., GDHS). Working-age migration is a key feature of migration for both sexes, peaking at earlier ages for females than males. Being a female migrant is significantly associated with residing in an urban area and working for pay, profit, or family gain. These findings suggest that economic opportunity is an important driver of female migration.

Advancing our understanding of gender and migration requires paying greater attention to examining differences between the migration patterns of women and men. The historical narrative of the “passive” female migrant has no place in today's evidence. The regression results indicate increased mobility and independence among female migrants, as reflected in their living situations. Female migrants exhibit greater odds of residing in group quarters, in a household where they are the temporary head of household, or in a household with a non-relative head of the household. Moving with a spouse is no longer a precursor to female migration. By 2010, married women were less likely to migrate than peers who had never married.

Only the Greater Accra and Ashanti Regions, home to Ghana's two largest cities, have positive net overall migration. With net out-migration exceeding net in-migration in eight of Ghana's ten regions, productive female labour losses may have a negative impact on local development efforts and local economies. The prominence of the Greater Accra and Ashanti Regions as destinations for female migrants suggests that interventions are needed in Ghana's more rural regions to reduce poverty and develop greater economic opportunities for girls and women.

Ghana's *kayayei* have become a visible sign of changing internal migration patterns. This growing population represents the face of female north-south, rural-urban migration in Ghana with most migrant female youth taking up this occupation upon arrival in Accra (Kwankye and Addoquaye Tagoe 2009). Though *kayayei* exist in Ghana's second and third largest cities, Kumasi and Tamale, their presence in the capital has generated particular policy concerns (Parliament, 2016). There are no accurate and reliable data on the number of *kayayei*; estimates range from 2,300 to 160,000 in Accra (Kearney 2013, Parliament, 2016). Such variation in the estimates reveals a need for improved data on and reporting of female internal migration if policymakers are to address development-related issues in the sending and receiving communities.

These analyses highlight the valuable information that census data provide on migration's demographic structure, patterns, and trends. Recent collaborations between GSS and the International Organization for Migration suggest that future data collection activities in Ghana will pay greater attention to migration; however, existing census data present an incomplete picture of contemporary female migration. Resource constraints in census offices, the expense of implementing a census, the balance of interests among census committee members, and political priorities frequently limit the number of migration questions in census questionnaires. Censuses also miss capturing migrants' underlying motivations and migration experiences.

Census analyses reveal a need for researchers to bring a gendered lens to issues such as drivers of migration, impacts of migration, and links between migration and health. Census data reveal nothing about migrants' and non-migrants' opportunities or their perceptions of the costs and gains of migration. Breastfeeding infants may migrate with their mothers out of necessity, and girls from large families may be fostered out to aunties or other relatives.

Pre-adolescent girls may independently decide to migrate in search of ways to pay their school fees. Censuses also miss the social and economic contributions that migrants make to their families and communities. Too often the lack of data on female migrants' contributions reinforces the out-dated stereotype that girls and women take passive roles in migration. Ad hoc sub-national surveys and in-depth interviews can address these aspects of migration in greater depth, complementing national-level census analyses and presenting a more complete picture of contemporary migration.

The 2000 and 2010 Censuses have several limitations. Since the post-enumeration survey data collected after the 2000 Census are unavailable, it is impossible to assess the quality of the 2000 Census and whether the results require adjustment. Furthermore, the microdata from the 2000 Census are less representative of the national population than the microdata from the 2010 Census. Whilst the post-enumeration survey conducted after the 2010 Census revealed no need to adjust the final results, the 2010 Census reportedly struggled to enumerate highly-mobile populations like the *kayayei* (Daily Express 2010). It is possible that such migrant groups may be under-represented, particularly if enumerators attempted to enumerate them during working hours or were unprepared to capture mobile populations' large numbers. Additional data limitations include possible reference period error for the question asking about place of residence five years prior, potential uncertainty about exact geographic boundaries, and problems reporting age.

One particular conceptual challenge is that the census questionnaires' understanding and measuring of migration do not capture contemporary migration patterns identified via other sources of migration data. Most movements between place of birth and current residence are missing. The censuses fail to capture cyclic and short-term migrations, which are commonplace in Ghana, as well as seasonal or repeat migrations and migration histories. The censuses also struggle to capture migration duration and meaningful data on intra-regional migration, which is more common than interregional migration. These challenges have implications for the type of migrants and migrations that are identified and included in national analyses. Identifying these types of migration patterns in the census would significantly strengthen the predictive ability of regression models examining determinants of migration, as well as sex-specific differences between migrants.

The analyses conducted in this study provide a rich source of information on female migration across the lifespan that complements sub-national migration studies and may have relevance in other low- and middle-income countries. Addressing the measurement and impact of female migration is an issue of importance for researchers, policymakers, and nongovernmental organizations working in the development sector. In order to better meet the varied needs of female migrants of all ages and to plan for changing population distribution within Ghana, the following recommendations are made for future research and reviews:

- Data collection and analyses of female migration cannot afford to exclude migrants outside 15–49 years of age. Female migrants have unique age-specific needs, such as integrating into a new school or ensuring that appropriate support systems exist to assist with challenges brought on by ageing. Data are needed on female migrants at all ages, not just those of reproductive age or working age.
- Whilst multiple surveys measure migration at the national level, the questions they use infrequently permit comparative analyses across time or across surveys. Standardizing questions on migration would allow for more comprehensive analyses of national trends.
- Survey questions on migration should expand upon basic demographic data to include migrants' underlying motivations, migration experiences, and economic contributions.
- Net out-migration in the Volta Region and northern Ghana (Upper West, Upper East, and Northern Regions) may negatively affect local economies and local development efforts. Policymakers concerned about the impact of this productive female labour loss should consider focused interventions in these rural regions to reduce poverty and develop greater economic opportunities for girls and women.

Ultimately, female migration is a dynamic process with inextricable links to development, affecting factors such as the development of communities, the delivery of social services, and the impact of remittances. Should current trends continue, female migration within Africa will rise, particularly to regions offering economic opportunities. The planning of

development programs requires far better data sources than those currently existing, as well as greater attention to analyses using a gendered lens.

2.5 Contributors

Chapter 2 is based on a manuscript that I co-authored with my advisors at the London School of Economics, Ernestina Coast and Tiziana Leone, and with Philomena Nyarko at Ghana Statistical Service. I obtained the data, conducted the analyses, interpreted the findings, and prepared the first draft of the manuscript. Ernestina Coast, Tiziana Leone, and Philomena Nyarko provided input on the study design and draft manuscript. They also approved the final manuscript.

2.6 Summary

This chapter provided a national overview of contemporary female migration in Ghana. These national trends and discussions of migration's gendered dimensions will assist readers in situating the forthcoming original research among northern *kayayei* migrants who migrated to Accra. The next chapter, Chapter 3, presents the quantitative and qualitative methods that I used to collect primary data in Ghana during fieldwork. Chapter 3 supplements the shorter methodology sections that appear in Chapters 4 and 5.

Chapter 3. Fieldwork methodology

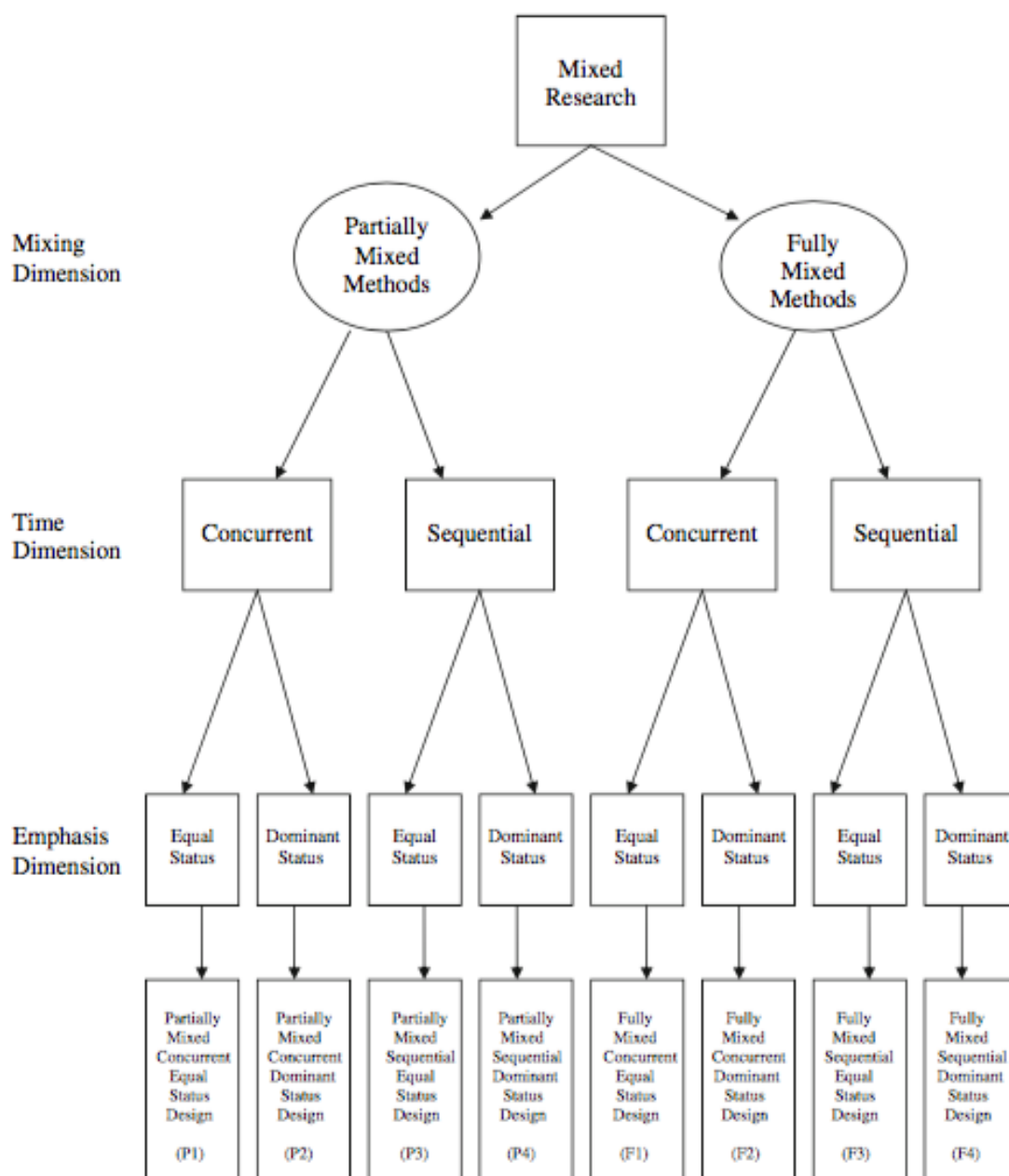
In order to understand the health and migration of female migrants working as *kayayei* in Accra, I conducted secondary analysis of census data (Chapter 2) and mixed-methods fieldwork involving a primary survey and in-depth interviews. This chapter details the methodology and its rationale for my fieldwork conducted in Ghana over a period of seven months. Its purpose is to add depth to the shorter methodology sections that appear in Chapters 4 and 5.

3.1 Use of mixed methods

Variation in the definition and use of mixed methods is well documented, with definitions varying around what is mixed, where or when the mixing occurs, the research's breadth, why mixing occurs, and the orientation of the methods (Johnson, Onwuegbuzie et al. 2007, Creswell 2011). In defining my use of mixed methods, my research mixes both qualitative and quantitative methods during data collection and analysis in order to corroborate findings and generate a deeper understanding of migration and women's health among *kayayei*. In mixing methods, I seek to develop a fuller picture of contemporary north-south female migration in Ghana and enhance our understanding of this phenomenon.

Within the mixed methods research design typology categorized by Leech and Onwuegbuzie, my study employs a fully mixed concurrent equal status design as depicted in Figure 7 (Leech and Onwuegbuzie 2007). I mix qualitative and quantitative methods across my research objectives, type of data, type of analysis, and type of inference. Both methods are used at approximately the same point in time and receive equal emphasis in my approach to answering the research questions.

Figure 7: Mixed method research design typologies (Leech and Onwuegbuzie 2007)



My research employs key informant interviews, field journals, “accidental ethnography,” survey data (that are both quantitative and qualitative), and in-depth interviews. These data allow me to analyse issues in women’s health and migration from the national level to the individual level. In my analyses, I integrate both quantitative and qualitative data thematically. To address validity and reliability of my results as well as to mitigate the biases arising from single-method research, I triangulate the results across methods to

indicate where findings converge or diverge, enabling me to have greater confidence in my interpretations (Denzin 1978, Jick 1979).

The first component of my research focused on secondary analysis of quantitative data from Ghana's 2000 and 2010 Population and Housing Censuses to examine current trends in female migration and identify areas warranting greater attention. Details of the methods, analyses, and results appear in Chapter 2.

The second component of my research involved collecting predominately quantitative primary survey data on 625 migrant *kayayei* living in Accra using respondent driven sampling. I hired and trained a team of seven data collectors who identified as *kayayei* to assist me in administering the surveys. I designed this research to occur concurrently, beginning with a quantitative survey that examined women's health, families, employment, and migration. Once a data collector finished administering her survey to a participant, I immediately reviewed the survey to purposively select participants for follow-up in-depth interviews based on their responses to a question inquiring about recent illness or injury. Linking the interviews to survey data allowed me to test the validity of several survey questions, elaborate on survey findings, and expand upon the participants' recent experience of illness or injury to discuss care-seeking behaviours and the linkages between migration and health.

The third component of my research involved conducting in-depth interviews that are linked to the survey. Through a translator, I interviewed 48 purposively selected *kayayei* who reported a recent illness or injury in the survey. The interviews explore migration histories and use of health services. They also examine sexual and reproductive health knowledge and perceptions in greater detail and elucidate how migration might influence them. In-depth interviews comprise the bulk of my qualitative data, though I also relied upon key informant interviews, my field journal, and observations from unplanned moments occurring outside these structured methods that may be considered "accidental ethnography" (Fujii 2015).

3.2 Ethics

The London School of Economics and Political Science (LSE) Research Ethics Committee (Appendix 7) and the University of Ghana's Noguchi Memorial Institute Institutional Review Board (Appendix 8) reviewed and approved this research. I also consulted the community in advance of beginning the research and sought approval from local community members (Section 3.3.4).

As part of the data collector training, ethics and safety information were imparted to the whole team. We discussed the need for and importance of confidentiality, and data collectors signed confidentiality agreements (Appendix 9) in which they agreed not to disclose any information to others.

Informed consent, discussed later in this chapter, was required from all participants before they could begin the survey or interview. As this study explores women's health and migration, it was possible that questions in the survey and interview could lead some participants to disclose negative experiences from their past, such as sexual abuse or rape. For some participants, re-living such an experience could lead to distress; other participants could find sharing their experiences of violence to be beneficial (WHO 2001). This study design includes several features aimed at reducing potential distress among participants.

Firstly, the data collector training raised awareness of the effects specific questions could have on respondents. Data collectors practiced how to best monitor and respond to respondents' distress, offering respondents time to collect themselves and terminating the interview if deemed necessary by the data collector (WHO 2001). The training also emphasised the importance of ending interviews on a positive note with data collectors reminding participants about their own coping strategies and reminding participants that this research will be used to help other *kayayei* (Parker and Ulrich 1990).

Secondly, the use of respondent driven sampling means that survey respondents (with the exception of the initial seeds) were recruited through their social networks. Any individual who did not want to discuss sexual and reproductive health and migration with researchers could choose to not accept the coupon from her peer; she could also accept the coupon but then choose to not redeem it. This sampling method means that women for whom

discussing these issues could be stressful or emotional risky could opt out before ever interacting with the research team.

Thirdly, during the informed consent process, participants were reminded that their participation was voluntary. At any point in the survey or interview, participants were able to skip a question or stop their participation.

Lastly, since some respondents disclosing past experiences may require local services and support, I worked through the Kayayei Youth Association office. In collaboration with local partners, the Kayayei Youth Association helps link *kayayei* with resources such as health services, social services, legal services, and training opportunities. Working through the Kayayei Youth Association office facilitated the linking of participants needing additional support with the appropriate partner. As recommended by the World Health Organization (2001), data collectors verbally shared these resources with all participants at the end of the interview regardless of what information the participants disclosed.

3.3 Preliminary fieldwork

Before implementing my survey and conducting in-depth interviews with *kayayei*, I visited Ghana twice to conduct a scoping trip and to arrange the logistics required to conduct this research. On my third trip to Ghana, I began community outreach and finalized the setting where I would implement my study. During this third trip, I also collected the data. I discuss these preparations in the following sections.

3.3.1 Scoping trip

Having previously lived and conducted research in Accra (Greater Accra Region) and Bolgatanga (Upper East Region) I know Ghana rather well. Whilst I inevitably brought preconceptions to this fieldwork based on those experiences and my doctoral researcher “academic lens,” I tried to consciously maintain awareness of my positionality to this research and to the *kayayei* participants. By taking a participatory approach, working with *kayayei* data collectors, and working through the Kayayei Youth Association, I sought to better understand and incorporate their perspectives and voices into both the fieldwork and my analyses.

By the time I began designing this research project, several years had passed since I was last in Ghana. As part of my research preparations, I conducted a one-month scoping trip in January 2014 to meet with key informants and to re-connect with relevant organizations. These conversations, including discussions about current and forthcoming data sources, helped me narrow the scope of this research and tailor my plans so that my work would complement rather than duplicate existing evidence. I did not identify any duplicate existing evidence, and this trip reaffirmed that my research would add to the evidence base for the health and migration of *kayayei* in Ghana. Following this trip, I completed my research proposal and submitted my study to the LSE Research Ethics Committee for their review and approval.

3.3.2 Fieldwork preparations

In September and October 2014, I began my fieldwork preparations in Ghana. During this period, I obtained census data from Ghana Statistical Service (GSS) and assessed the feasibility of implementing a multi-component research project among female migrants in Agbogbloshie, Accra. By conducting the research in Accra rather than the north, I hoped to attract migrants from multiple northern regions who are part of the country's north-south migration phenomenon.

As I started laying the groundwork for data collection, it became clear that beginning such a large project was less than ideal given the timing. Accra was at the epicentre of Ghana's worst cholera outbreak since 1982 (WHO Country Office Ghana 2014), and in response to the nearby Ebola epidemic, the United Nations (UN) established its Mission for Ebola Emergency Response in Accra. Cholera and Ebola took centre stage with billboards and radio programmes raising awareness in tandem. Models predicted Ghana would most likely be the next country to experience the arrival of Ebola with a probability of case importation above 50% by 22 September 2014 (Gomes, Pastore y Piontti et al. 2014). There was a cautious optimism that Ghana would be spared from Ebola but also a sense of fear. When I extended my hand to shake upon finalizing payment for research materials, for example, the shopkeeper looked horrified. Others with whom I interacted had no such concern of Ebola and continued their lives normally.

To collect quantitative and qualitative data on over 600 migrant girls and women, I envisioned working with eight data collectors in Agbogbloshie, where the high population density and lack of sanitation frequently lead to the spread of diseases. Urban informal human settlements or slums, like Agbogbloshie, were deemed the “elephant in the room” in international discourse on the Ebola outbreak (Snyder, Marlow et al. 2014). Bringing over 600 *kayayei* to a central office during this time period seemed too risky to me, as I did not want to risk their health or the health of the data collectors if anyone was ill. I decided to pause my fieldwork until the direction of the cholera and Ebola epidemics became clearer. With limited funds to conduct this research, I also wanted to prevent any false starts with regards to data collection.

By January 2015, the case incidence of Ebola was declining in Guinea, Liberia, and Sierra Leone; and the World Health Organization (14 January 2015) considered Ghana a “high priority” country as opposed to a “highest priority” country. It seemed less likely that Ebola would arrive in Ghana, so I resumed my preparations, finalizing my partnership with the Kayayei Youth Association, seeking in-country approval for my research from the community and the Noguchi Memorial Institute for Medical Research’s (NMIMR) Institutional Review Board, and advertising for data collectors, among other tasks.

3.3.3 Key informant interviews

As part of the formative assessment phase of my research, I conducted 16 key informant interviews with individuals purposively selected from a variety of organizations (Table 8). In addition to these individual interviews, I conducted a group interview at the Kayayei Youth Association with seven *kayayei* community leaders affiliated with the Association. All participants provided verbal informed consent. The purpose of these interviews was to develop my background knowledge of *kayayei*, discuss the research topics, assess the appropriateness of respondent driven sampling, and evaluate respondent driven sampling implementation factors. Based on the purpose of these interviews, I opted to take handwritten notes during the interviews. These interviews informed my thinking and the implementation of my survey and in-depth interviews. I did not require direct quotations from these interviews and felt comfortable paraphrasing from my notes when using these interviews to guide my research decisions.

Table 8: Key informant interviews (n = 23)

Key informant categories	Number of interviews
<i>Group interview</i>	
<i>Kayayei</i> community leaders	7
<i>Individual interviews</i>	
Researchers and academics	9
Employees at nongovernmental organizations	3
Government officials	3
Employee at a for-profit organization	1

3.3.4 Community observations and outreach

Prior to implementing the survey, I spent six weeks volunteering with the Kayayei Youth Association. In addition to helping write funding proposals, I spent time learning about the Kayayei Youth Association's projects, visiting the community, meeting community members, asking questions, and observing. During this period, I discussed my research plans with members of the community. I sought and received approval from the Kayayei Youth Association's Board of Directors (Appendix 10), the Director of Social Welfare (Appendix 11), and the chief of Yam Market to whom I was introduced via the Kayayei Youth Association. Much business in Ghana is still conducted orally and sealed with a handshake. A photo of the Yam Market chief and I together is the only evidence that I have of his blessing to conduct this research. Whilst he is a chief, he does not have official letterhead like the Kayayei Youth Association or Department of Social Welfare on which to write his approval. I received his approval in the form of 20 kilograms of yams. Chief Say also asked for my assistance in purchasing a new camera. I researched several models that were available for purchase in Accra and shared my findings with him. After he selected his favourite, he gave me money to return to the store and purchase the camera for him.

I also held a pre-implementation meeting with 12 *kayayei* community leaders and Kayayei Youth Association board members to introduce the study, seek input, and answer questions. I sought input on factors necessary for implementation of respondent driven

sampling, such as appropriate incentives, *kayayei*'s personal network sizes, hours and days during which to conduct the study, coupon design, the survey instrument, and *kayayei*'s prior experiences with researchers/outside/census enumerators. I also used this time to verify my understanding of the research population and the community. People were unfamiliar yet intrigued with the idea of using coupons to recruit and participate. I answered questions about how the coupons work and how the process would work when *kayayei* come to participate. When I explained the research, they said I could make the survey tool even longer. "*Kayayei* will come and do it," they told me. Provided participants received an appropriate incentive, I could expect them to sit for at least 45 minutes to complete the survey.

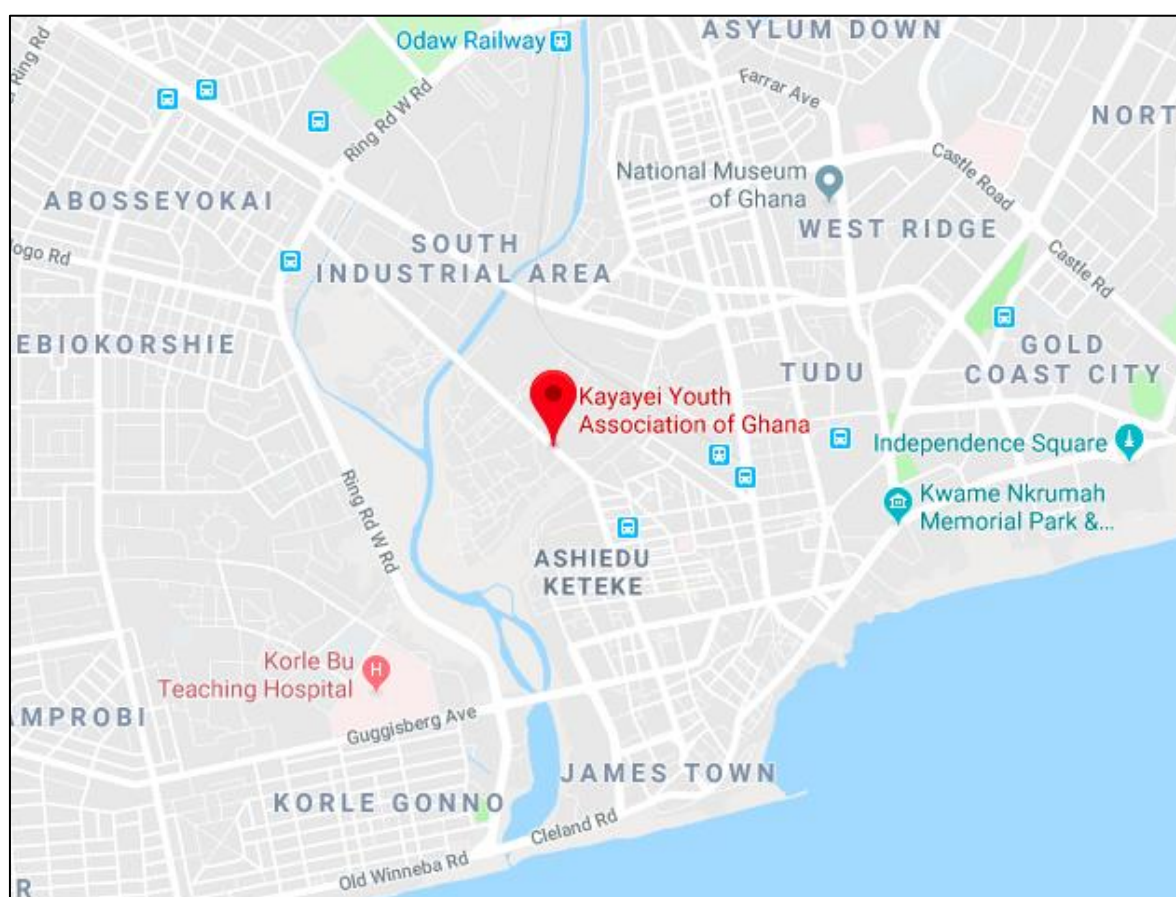
During my time with the Kayayei Youth Association, the project coordinator requested that I take photos of the community for the organization to use on a website it was building. When taking photos of people in the community who volunteered to be "snapped," I had the photographs printed in Accra and gave them to the subjects in the photos as a gift. Receiving a printed photo was valued and special. Towards the end of my research once *kayayei* in the community were familiar and comfortable with me, they would occasionally stop by the office to have their picture taken.

3.3.5 Setting

The research took place in Agbogbloshie and Old Fadama, Accra's largest informal settlement. Old Fadama is home to approximately 80,000 residents from across Ghana and nearby countries with 72.4% of residents migrating from Ghana's three northern regions (Housing the Masses 2010). Located on a former wetland by the Korle Lagoon, the settlement also goes by the nickname 'Sodom and Gomorrah' due to its harsh living conditions, crime, and pollution. Heavy, thick smoke rises continuously from the riverbanks, where residents process and burn electronic waste, earning the community a place in Blacksmith Institute's "World's Worst 2013: The Top Ten Toxic Threats" (Blacksmith Institute and Green Cross Switzerland 2013). In addition to processing electronic waste, the local economy is based on produce markets selling onions, yams, and tomatoes.

Initially, I considered multiple field sites in order to minimize participants' need for transport and to better capture the geographical dispersal of *kayayei* across Accra; however, the complexity of such an endeavour was infeasible given financial and personnel resource constraints. Working out of one field site also permitted me to better maintain data quality. After discussing potential sites with various stakeholders, including *kayayei*, I decided to work out of the Kayayei Youth Association office (Figure 8) near Yam Market. This central location and close proximity to multiple major markets made the Kayayei Youth Association office an ideal location. As previously mentioned in the section on ethics (Section 3.2), I also valued that working out of the Kayayei Youth Association's office would raise awareness of the Association among *kayayei* and would facilitate the linking of *kayayei* with the Kayayei Youth Association's services provided in collaboration with partners like Marie Stopes Ghana, the Domestic Violence & Victim Support Unit, and the Society for Women and AIDS in Africa.

Figure 8: In Accra, the Kayayei Youth Association office is situated on the Old Fadama side of Hansen Road with Agbogbloshie located just opposite



[Map data © 2018 Google]

The Kayayei Youth Association's large, covered front patio served as the hub around which our research activities revolved. Given the on-going energy crisis in Ghana, the Kayayei Youth Association office was without power for the majority of the fieldwork, making electronic data collection unfeasible. The office became unbearably hot, so the data collectors, participants, and I worked out front on the patio in plastic chairs. The Kayayei Youth Association patio is quite public, since it is located near Yam Market. Yam Market is one of the primary markets for *kayayei* working in Old Fadama and Agbogbloshie. Given feelings of unease and scepticism about research among the study population, situating the research in a place where our efforts were visible to anyone walking by also served to allay the fears of potential recruits who could observe our activities from a comfortable distance before deciding to participate. When appropriate, such as a participant needing additional privacy or needing a quiet place to audio record interviews, activities moved inside the office.

3.4 Methodology for primary survey

Once I completed my formative assessment and was prepared to implement my primary data collection in Accra, I implemented respondent driven sampling to survey over 600 migrant *kayayei*. The scale of this task necessitated my hiring and training of a team of seven data collectors who identified as *kayayei*. These *kayayei* data collectors assisted me in administering the surveys that examined topics such as women's health, families, employment, and migration. The following sections detail the methodology by which I conducted this phase of my research.

3.4.1 Survey design

I designed the survey after reviewing previous findings on *kayayei*, the Ghana Living Standards Survey (GLSS), and the Ghana Demographic and Health Survey (GDHS). Whilst I did not have access to the research tools used in prior studies on the *kayayei*, I did have the GLSS and GDHS questionnaires. My survey questionnaire includes some questions from the GLSS and GDHS to allow for comparability of certain elements. I also sought feedback on the questionnaire from my supervisors at the LSE and the University of Ghana, the Kayayei Youth Association, data collectors, and *kayayei* leaders. Their input,

and the input resulting from the pilot testing, resulted in several changes to the final questionnaire. The most noteworthy changes appear in Table 9.

In order to ensure high quality of the data, the research team pre-tested and piloted the questionnaire in the field over a period of two weeks at the beginning of March 2015 to verify the questionnaire structure, formulation of questions, appropriate language and terminology, completion times, range of variation in response variables, and respondent understanding. I asked data collectors which questions they were dreading asking participants and why. I asked them which questions would be difficult to ask. I also asked data collectors if there is something I should be asking that was not in the current questionnaire. The training helped ensure appropriate phrasing, response categories, and skip patterns. I incorporated all of these findings into the final version.

Table 9: Noteworthy changes to the original survey questionnaire

Question(s)	Type of change	Why?
Questions 315–316: Do participants pay taxes to AMA (Accra Metropolitan Authority) ticket collectors? How much money do you pay in taxes? How often do you pay tax?	Addition	<i>Kayayei</i> key informants and data collectors reported that tax collectors representing the Accra Metropolitan Authority taxed <i>kayayei</i> on a daily basis. Even children working as <i>kayayei</i> were required to pay this fee or risk potential abuse.
Question 104: From the number you just told me, how many of these <i>kayayei</i> would you consider inviting to this study?	Addition	<i>Kayayei</i> reported during the formative assessment that other <i>kayayei</i> within their networks were highly mobile, sceptical of participating in research, and might believe the coupons were a scam. Based on this information, I included question 104 which I thought would provide a more accurate measure of personal network size than question 103 (the more typical way in which studies using respondent driven sampling phrase and measure participants' personal network sizes). I also placed all of the questions measuring a participant's personal network size onto cover page to emphasize the importance of collecting these data.
Question 321: Have you ever experienced the following while working as <i>kayayei</i> ? (Read all answers. Circle all that apply.)	Addition	Many <i>kayayei</i> informants and data collectors reported being treated as if they were second-class citizens. It became apparent during the formative assessment that job-related abuse was an issue, so I added a question to measure job-related harassment and abuse.
In your opinion, how truthful was the information that the participant told you?	Addition	I added this question to the data collector's post-survey reflection page in response to a recommendation from my supervisors at the LSE. Data collectors reported that most participants were "high truth" or "medium truth" in the survey. The two surveys in which data collectors felt participants were lying were classified as "low truth" and excluded from final analyses.
Any question or response referring to "sister"	Edit	During the pilot, it became apparent that the term "sister" was causing confusion among data collectors. Since "sister" is often used to refer to a close female friend in this setting, I changed the term to "biological sister" in the survey as a reminder of the distinction and to prevent confusion.

The resulting survey tool consisted of a 25-page printed questionnaire (Appendix 12) with ten modules asking a total of 236 possible questions (Table 10). The survey captured primarily quantitative information, though several questions in modules two, three, and ten also capture qualitative information.

Table 10: Questionnaire composition

Module number	Description	Number of questions
1A	Coordinator verification	1
1B	Participant information	4
1C	Data collector information	5
1D	Personal network size	4
2	Demographic characteristics	46
3	Employment	31
4	Reproduction	32
5	Recent illness or injury	20
6	Health insurance	18
7	Relationships	26
8	Family planning	16
9	Sexually transmitted infections	28
10	Interviewer observations	5

Both the survey and this research use the term “family planning” rather than “contraception.” Whilst I acknowledge the “family planning” versus “contraception” debate over terminology (Rodríguez, Say et al. 2014, Trinitapoli, Verheijen et al. 2014), I use the term “family planning” in this research since it is the preferred term within Ghana and is more widely understood among the study population.

3.4.2 Selection of the data collection team

English is Ghana’s official language, but there are 11 government-sponsored languages and over 70 tribal dialects. As an outsider who spoke none of the northern dialects, I required the assistance of a team of “kaya data collectors” (as termed by the research team) who spoke the participants’ languages and who were familiar with their cultures. Moreover, this research team would be the public face of the fieldwork, verbally administering the survey, managing participant relationships, conducting interviews, and facilitating my learning about what it means to be *kayayei*.

Based on key informant discussions with other researchers in Ghana, I originally advertised for data collectors and a project assistant at the University of Ghana. In particular, I had hoped to attract recent Master's graduates from the University's School of Public Health. Whilst several candidates applied, it became increasingly apparent that despite having strong research skills, the applicants were "outsiders" to the *kayayei* like myself and would not be able to connect with the study population. Moreover, having only received applications from highly educated southern men, I was concerned about creating hierarchies between data collectors and participants. Given the sensitive nature of both the survey and interviews, it was important to me that I not only gender-match so as to encourage rapport and free discussion between participants and data collectors (Oakley 1981) but that I also hire data collectors who identify as "insiders" who could assist the study population in feeling at greater ease and who could minimize social distance. My discussions with *kayayei* key informants reaffirmed this need.

Through word of mouth by the Kayayei Youth Association office, I put out a job request for local *kayayei* with a high school education who could read and write in English. I had also met a young man through a Kayayei Youth Association contact who I thought could assist me with the tracking forms and coupons for respondent driven sampling. Nine potential applicants, including the young man, were invited to participate in the paid training that served as a trial period in which to evaluate the data collectors' skills and team dynamics. At the end of the training, I hired seven multi-lingual data collectors for the duration of the fieldwork. I declined to hire two data collectors, one of whom was the young man, because I did not have confidence in their ability to collect high-quality data. I felt they did not take the research or its objectives seriously, and they did not appear to understand the research tools. Two of the hired data collectors had previous experience collecting data for the Kayayei Youth Association. They captured *kayayei*'s basic bio-data on a one-page form that the office used to create *kayayei* identity cards. All data collectors migrated to Accra from the north, residing in Accra from between two months and four years. Among them, they spoke nine of the most common northern dialects (Table 11). Their familiarity with the northern cultures, languages, and personal *kayayei* experience helped bridge the social distance between participants and myself.

Table 11: Characteristics of *kaya* data collectors

Age	Home region	Tribe	Languages spoken (apart from English)	Length of time living in Accra	Religion	Has children	Highest level completed in school
20	Northern	Nanumba	Dagbani, Mampruli	2 months	Muslim	No	Senior High School
21	Upper East	Frafra	Frafra, Mosi	3 months	Catholic	No	Senior High School
34	Northern	Mampruli	Mampruli, Twi, Sisaala, Dagbani, Kusaal, Frafra	4 years	Christian	Yes (three)	Senior High School
30	Northern	Mampruli	Mampruli, Dagbani, Twi, Kusaal, Frafra	3 years	Christian	Yes (two)	Junior High School
20	Northern	Mampruli	Mampruli, Twi, Dagbani, Kusaal	4 months	Muslim	No	Senior High School
29	Northern	Dagbani	Dagbani, Ewe, Twi	5 months	Christian	No	Senior High School
21	Northern	Dagbani	Dagbani	3 months	Muslim	No	Senior High School

3.4.3 Training of the data collection team

In order to ensure quality of the data generated, I trained the research assistants and piloted the tools and techniques with them prior to beginning data collection. Research assistants also received training in ethics and safety. Whilst the bulk of training took place over two weeks, training was on going and continued during the data collection period. At times when there was a lull in participants, we reviewed survey questions as a group and reflected on achievements and challenges.

The group training included an introduction to the research project, discussion of team-driven research values (Appendix 13), introduction to research ethics, the informed consent process, review and modification of the survey tool, survey practice, review of site logistics, and modification and practice of the recruitment script (Appendix 14) used when distributing recruiting coupons to participants after they completed the survey.

Part of training was dedicated to clearly defining and carefully testing the four survey questions (numbers 101–104) used to elicit participant information about personal network size. Analysing data from respondent driven sampling relies on collecting the personal network size variable that measures the number of eligible people in each participant's personal network (Johnston, Rodriguez et al. 2014). In training, we discussed what is means to “know” someone and different ways of phrasing this expression, such as “someone who would recognize you at the market.” We decided to limit the estimation period to two weeks (question 103), so as to reduce recall bias and to fit the initial window for redeeming coupons. I decided to add a final personal network size question (number 104) that asked respondents, “How many of these *kayayei* [the northern *kayayei* girls and women whom she knows and has seen at least once in Accra during the last two weeks] would you consider inviting to this study?”

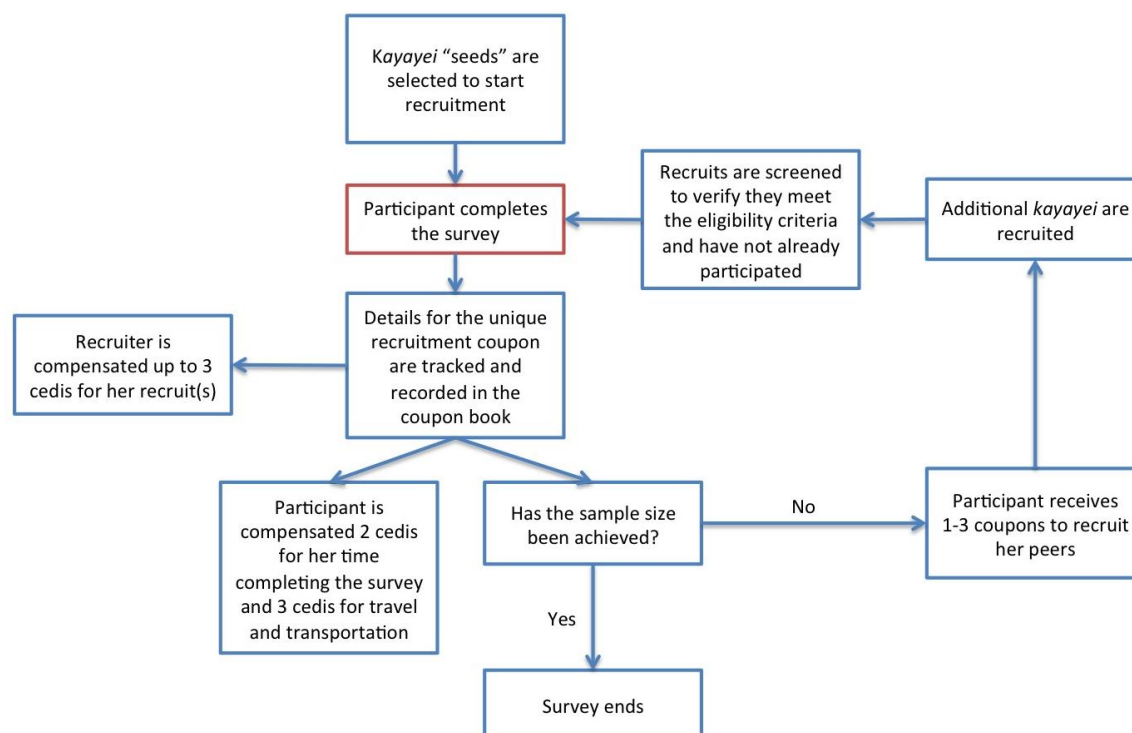
In reviewing the survey during training, it became evident that the data collectors lacked knowledge on family planning, Human Immunodeficiency Virus (HIV), and AIDS. Without this information, they struggled to ask the survey questions about different contraceptive methods. If a training respondent described a contraceptive method without naming it, data collectors could not recognize which method the respondent described. It was also important to me that data collectors had accurate knowledge of family planning and HIV/AIDS should participants ask questions on those subjects following the survey. Using flip charts developed by Marie Stopes and United States Agency for International Development, I spent an afternoon teaching data collectors and refreshing their knowledge of these topics. Data collectors took the family planning and HIV/AIDS flip charts home for further study.

3.4.4 Sampling of participants

Respondent driven sampling, a variation on chain-referral sampling methods like snowball sampling, was originally developed in the United States as a method to sample “hidden” populations such people living with HIV/AIDS and injection drug users (Heckathorn 1997). In migration research, respondent driven sampling is increasingly used as a tool to sample “hard-to-reach” migrant populations like undocumented immigrants, foreign migrants, and newly arrived migrants (Tyldum and Johnston 2014). Unlike chain-referral methods that lead to statistical difficulties making inferences from the sample, respondent driven sampling includes a mathematical model to account for the non-random way in which the sample was collected (Heckathorn 1997). By applying this model, respondent driven sampling leads to a weighted sample that has been proven to be unbiased for samples of meaningful size regardless of how the researcher selects the initial “seeds” (Salganik and Heckathorn 2004).

As a hard-to-reach population whose members are stigmatized in the larger population and for whom a sampling frame is not available, I used respondent driven sampling to recruit *kayayei* through their social networks. The process started when I selected a small number of initial “seeds” for recruitment into the study (Salganik and Heckathorn 2004). The *kayayei* selected as “seeds” then in turn recruited other study participants in their social network, and the process continued until the sample size was reached. Figure 9, that I adapted from Heckathorn’s approach, outlines this process (Heckathorn 1997).

Figure 9: Flowchart to describe use of respondent driven sampling to sample survey participants



Whilst there is no exact method for selecting seeds, prior studies often selected 1–20 seeds that reflect diversity (Kubal, Shvab et al. 2014). I started my study with ten seeds (Table 12), selected in collaboration with the Kayayei Youth Association, after reviewing other studies with sample sizes comparable to my estimated sample size. My earlier analyses of census data and previous studies on *kayayei* indicated that most north-south female *kayayei* migrants are from the Northern Region and Muslim, so I was comfortable selecting a higher proportion of seeds that reflected these characteristics. I selected seeds to ensure variety across other characteristics that I thought might be important such as the current length of time she had spent in Accra, the number of migrations she made to Accra, where she works in Accra, and whether or not the seed was homeless. Four seeds failed to generate sufficient recruitment chains. Two of those failed seeds identified as Mole-Dagbani, an ethnic group that was well represented in the remaining seeds. The other two failed seeds represented ethnic groups that I felt were important to include as seeds. Since the remaining six seeds were growing sufficiently, I recruited only two replacement seeds that matched the ethnicities of failed seeds eight and nine.

Table 12: Characteristics of seeds

Seed number	Age	Region of origin	Ethnic group	Current length of time in Accra	Number of migrations to Accra	Primary market of work	Highest level of school completed	Religion	Homeless
<i>Original Seeds</i>									
1	32	Northern	Mampruli	7 years	1	Makola	None	Muslim	Yes
2	15	Northern	Mole-Dagbani	4 months	1	Konkomba	Primary	Muslim	No
3	25	Northern	Mole-Dagbani	8 months	5	Konkomba	None	Muslim	Yes
4	15	Northern	Mole-Dagbani	1 year	1	C.M.B.	Primary	Muslim	Yes
5	28	Northern	Mole-Dagbani	8 months	3	<i>roams around</i>	None	Muslim	No
6 ¹⁴	12	Northern	Mole-Dagbani	2 months	1	Tema Station	Primary	Muslim	No
7 ¹	13	Northern	Mole-Dagbani	1 year	1	Makola	None	Muslim	No
8 ¹	20	Upper East	Frafra	7 months	2	Agbogbloshie	Middle	Catholic	No
9 ¹	22	Upper West	Sissala	1 year	1	Plantain Market	None	Muslim	No
10	19	Upper East	Kusasi	4 months	2	Darkuman	Primary	Muslim	Yes
<i>Replacement Seeds</i>									
11	30	Upper West	Sissala	7 years	4	Agbogbloshie	None	Muslim	No
12	27	Upper East	Frafra	3 years	4	Konkomba	None	Presbyterian	No

¹⁴ These seeds failed to generate long recruitment chains and required the later addition of two replacement seeds to generate sufficient growth.

3.4.5 Sample size estimation

The population parameters, including the final sample size and sample stability, are calculated using the Respondent Driven Sampling Analysis Tool (RDSAT) software version 7.1 (Volz, Wejnert et al. 2012). Estimating sample size for respondent driven sampling cannot be directly calculated *a priori* since the estimation depends on the network structure data collected during sampling, data that are used to then calculate sampling weights (Heckathorn 2002); however, by calculating the sample size for simple random sampling and then adjusting the calculation for the design effect of respondent driven sampling, researchers may generate sampling estimates to assist in planning and implementing their studies (Wejnert, Pham et al. 2012).

In order to estimate the sample size I would use to plan this study, I had to choose a design effect (*deff*). In respondent driven sampling, the design effect measures increased variation of the estimates, and the literature recommends a figure between two and ten in order to achieve the same power as a simple random sample (Salganik 2006, Goel and Salganik 2010, Wejnert, Pham et al. 2012). For this study, I was not willing to accept higher standard errors that researchers might accept when keeping sample size low in an attempt to conserve resources. I took a more conservative approach and use a design effect of ten. The resulting sample was thus ten times as large as a simple random sample in order to achieve the same statistical power.

Since this study examines health behaviours and knowledge, I sought to locate *kayayei* who had recently experienced an illness or injury in the last two weeks. The prevalence of interest (P_A), females in Accra aged 20–49 years who report suffering from an illness or injury in the previous two weeks, is 16.0% based on data from GSS (GSS 2008). Finally, I desired a standard error (*se*) of no greater than 0.05 for reasonable precision in my results.

With respondent driven sampling, it is the case that:

$$V(\widehat{P}_A) = deff \cdot \frac{P_A(1 - P_A)}{n}$$

Thus, solving for the required sample size (n) is:

$$n = def f \cdot \frac{P_A(1 - P_A)}{(se(\widehat{P}_A))^2}$$

Based on these figures, the required sample size for this study can be found as follows:

$$n = 10 \cdot \frac{0.16(1-0.16)}{(0.05)^2} = 537.6$$

We aimed to survey 538 *kayayei* and ended with a final sample of 625 *kayayei* using respondent driven sampling.

3.4.6 Eligibility criteria

Recruits were invited to participate in the study if they met the following selection criteria:

1. Girl or woman
2. Currently working as a *kayayoo* in Accra
3. Migrated to Accra from one of the three northern regions (Upper East Region, Upper West Region, or Northern Region)
4. Hold a valid study participation coupon as required by respondent driven sampling

Whilst this research aimed to learn about sexual and reproductive health, the survey was not restricted to women of reproductive age (15–49 years). *Kayayei* girls and women of any age were eligible to participate. Previous literature on child migrants in Accra has highlighted that child migrants experience a variety of sexual and reproductive health risks and that sexual activity among young migrants happens at earlier ages than the national population (Badasu, Frempong-Ainguah et al. 2009, Kwankye and Addoquaye Tagoe 2009, Quartey and Yambilla 2009). Among migrants less than 15-years-old, Badasu et al. (2009) reported an average age of 11.4 years at first sexual intercourse. If a participant recruited someone less than 15-years-old, the recruit was not turned away based on age alone.

The literature increasingly recognizes the valuable contribution that children and young people can make to research through sharing their perspectives and experiences as well as the right of these populations to do so (van Blerk and Ansell 2006, Porter, Hampshire et al. 2010); yet, it is widely acknowledged that researchers working with these populations must tread cautiously so that children and youth's involvement does not cause them additional harm or distress (Barker and Weller 2003, Robson, Porter et al. 2009, Day 2014). By choosing to migrate south in search of opportunities, *kayayei* have demonstrated a great deal of agency. The research detailed here respected their agency and their ability to make informed decisions about their potential participation.

In line with Ghana's Children's Act of 1998, this research considered people under 18-years-old to be children (The Parliament of the Republic of Ghana 1998). The Children's Act stipulates several additional points relevant to this research, particularly those regarding child labour laws and hazardous employment.¹⁵ It also discusses parental duty and responsibility (Point 6), requiring parents to protect and provide for their children. In the parents' absence, they are required to ensure that a competent person cares for the child. Yet, the parental stipulations set forth in the Children's Act appear to be loosely followed by parents of child migrants. Researchers working with Ghanaian children made a similar observation when they highlighted the apparent disconnect between Ghana's role as the first country to ratify the UN Convention on the Rights of the Child and Ghana's in-country implementation and beliefs around these concepts (Porter, Hampshire et al. 2010).

Previous research on child migrants in Ghana reveals that in practice, child migrants may move without a parent or adult. The literature refers to these unaccompanied child migrants as "independent" child migrants and notes that "it is important to stress that such categories of vulnerable children are not synonymous with independent child migrants," (Anarfi and Appiah 2009, p. 50). Many independent child migrants fulfil the characteristics of "emancipated minors," having freed themselves of control from their parents as a result of child marriage, parental abandonment, parental abuse, or the independent decision to migrate. This research makes no distinction between accompanied (dependent) and unaccompanied (independent) child migrations with regards to eligibility criteria; however,

¹⁵ The minimum age for child labour is 15 years, but children aged 13 years and older may engage in "light work" that does not harm their health, development, or ability to attend and benefit from school. The portering of heavy loads, considered hazardous work, is restricted to adults.

this information altered the way in which we obtained consent from child migrants, as I will discuss shortly.

3.4.7 Ineligibility criteria

Whilst most *kayayei* come from the north, key informant interviews during the formative assessment phase revealed that *kayayei* might also come from Ghana's other regions and Togo. Even female petty traders in Accra from the southern Ga tribe might turn to head porter work from time to time, if they are struggling to make enough money trading. Since one of the objectives of this study is to examine north-south female migration, recruits were ineligible to participate if they met any of the following criteria:

1. Is not from the Upper East, Upper West, or Northern Regions
2. Does not work as a *kayayoo*
3. Holds an expired coupon
4. Has already participated
5. Is a boy or a man

When someone was ineligible to participate, I tracked her in the ineligibility form (Appendix 15). The research team then thanked the ineligible participant for their interest and kept the participation coupon. The five ineligible participants in this study were beggars who the *kayayei* data collectors were able to identify as non-*kayayei*.

3.4.8 Informed consent

To improve informed consent practices in developing country settings, guidelines recommend: consulting the community and community leaders about the research before enrolling participants, obtaining consent at both the community and individual levels, providing information through individuals whom participants would feel comfortable asking questions (e.g., female health workers rather than physicians), obtaining informed consent from illiterate participants in the presence of a witness, viewing informed consent as a process, training fieldworkers in ethics and communication skills, and simplifying the wording in informed consent forms (NCOB 2002). After obtaining consent at the community level and training data collectors, the data collection team ensured that all potential participants received the required study information prior to participation. Data

collectors provide this information in a manner that was understandable to potential participants so that consent was obtained without coercion or undue influence.

Due to the likelihood of low literacy levels among the study population and suspicion over signing documents, participants were offered the options of verbal consent (with a thumbprint) or written consent. Offering verbal consent also assisted in reducing potential of embarrassment among illiterate participants and highlighted their agency. In line with other research studies on young people in Africa, as well as the GDHS, participants were offered the option of verbal consent in which the researchers followed a set script (Evans and Becker 2009, GSS, GHS et al. 2009, Day 2014). Sixteen participants opted for written consent, and the rest opted for verbal consent with a thumbprint.

As part of the informed consent process, study staff informed potential participants of:

1. the study's title and purpose;
2. the study procedures;
3. potential risks/discomfort;
4. potential benefits;
5. reimbursement;
6. confidentiality;
7. their rights to withdraw from the study at any time;
8. alternatives to participation;
9. the identity of the investigators and contact information for study staff in case they have any questions about the study;
10. information about participants' rights (e.g., participation is voluntary); and
11. contact information for the ethics committees that reviewed the study.

No participant could start the survey or interview without having first consented to participating. As part of the consent process, the coordinator first determined which consent form the participant must fill. For participants under 18 years of age, the coordinator also inquired about whether the participant migrated to Accra with a parent or guardian or if she was an "emancipated minor" who migrated to Accra alone. Adults (those aged 18 years and older) and independent child migrants (emancipated minors under 18 years of age) received the standard consent form (Appendix 16). Children under 18 years of age who resided in Accra with a parent or guardian received the child assent form

(Appendix 17). In these 13 instances, we asked children to bring their parent or guardian to the office to complete a parental consent form (Appendix 18) before the child could participate in the survey. The child and her parent or guardian must have both given consent before we allowed the child to continue with the study. For each consent form, two forms were filled in duplicate. The participant received one completed form, and I kept the other form. Participants were told that the form included my contact information and the contact information for the NMIMR Institutional Review Board. If they had questions or concerns after participating, they could contact us. All participants received these forms, regardless of whether they were literate, since illiterate participants could ask a literate person to help read the form at a later date.

At any point in the research, a participant could refuse to participate. She could refuse to participate whilst being told information about the study, or she could refuse to participate after having started answering the survey questions. We tracked participant refusals in the refusal form (Appendix 19). Only one participant refused to participate. After consenting, she had to wait for the next available data collector, as all the data collectors were currently with other participants. The waiting participant decided that she was too busy to wait and left the office to return to work.

3.4.9 Relationship between the participants and me

I was a highly visible outsider in Old Fadama, even when wearing my Kaya Data Collector T-shirt. One of my three names in Ghana reflects this position: *Obruni* (a Twi word meaning ‘foreigner’ or ‘white person’). I responded to *Obruni* along with the names Adjoa (my Akan name signifying that I was born on a Monday) and Sadia (my Islamic name given to me by the people in Yam Market). The fact that I seem to collect names may suggest people’s desire to understand or make sense of me in their frame of reference.

Certain people in the community, such as the market women, were not intimidated by my status as an outsider and immediately started conversations with “Adjoa.” At other times, my status as an outsider brought unwanted attention, especially from young men. Whilst most people seemed interested to know why I was there, *kayayei* initially observed me from afar. Apart from the *kayayei* associated with the Kayayei Youth Association, my initial interactions with *kayayei* were limited to several instances in which I was seen

carrying items to the office. Several *kayayei* approached me about carrying my items in exchange for payment, but I hesitated to employ anyone lest I set unrealistic expectations or a precedent that affected recruitment.

Each morning, after opening the office around 8:30am, I stood on the front patio until work began around 9:00am. As *kayayei* walked past with their loads, I smiled. Initially, most did not make eye contact with me, observing me in their peripheral vision from afar. Even after meeting me several times, some participants were too shy or nervous to make eye contact. Working in a group and situating myself within the Kaya Data Collectors helped minimize nerves among *kayayei* who were hesitant to interact with me. In these instances, the data collectors could serve as buffers. Thankfully, my presence did not bring any of the participants to tears, though my presence occasionally caused participants' babies and small children to cry if they had not seen an *obruni* before. The children's reactions largely resulted in laughter from participants and served as an icebreaker between participants and myself.

Several times during the fieldwork, my position as an outsider came to the assistance of *kayayei*. In one instance, a woman beaten unconscious needed immediate medical care. We took her to Accident and Emergency at Korle Bu Teaching Hospital. I knew that *kayayei* experience stigma in Accra, but I found the degree to which this unconscious woman was stigmatized at Ghana's largest hospital particularly shocking. When it became apparent that her treatment would be delayed or withheld due to an assumed inability to pay—they also initially assumed her to be a thief—I inserted myself into the situation along with the Kayayei Youth Association Director and paid her medical bills to ensure that she received appropriate medical attention.

3.4.10 Data collection

After consenting to participate, participants were assigned to a data collector who shared the same language. Respondents were anonymously identified with a unique identity number that was used on their recruiting coupon, all forms, and notes. Trained data collectors administered the 45-minute survey over four weeks in March and April 2015 under close supervision. I was present for all the data collection and immediately reviewed the surveys for quality once data collectors completed administering the questionnaires.

When I noticed questionable responses, I asked for verification from the data collector and participant before the participant received her compensation and departed. Building this review into the process helped minimize missing data and led to several important realizations during data collection, such as data collector confusion over the ethnic categories Dagomba (an ethnic group from the Northern Region), Dagbani (the English translation of Dagomba), and Dagaba (a different ethnic group from the Upper West Region).

3.4.11 Coupons and coupon tracking

Coupons were designed in consultation with the research team and included all of the necessary study information (Figure 10). I printed the coupons in English, as English is the primary language of instruction in Ghana's schools. Given low levels of education and literacy among the study population, many participants would likely be unable to read the coupons. To minimize issues with using coupons among a largely illiterate population for whom the coupons would serve as a visible token of potential participation, data collector training emphasized the importance of concise oral recruitment instructions that were imparted to each participant at the end of her participation (Appendix 14). Participants were encouraged to return to the office if they had questions about the coupon details. Additionally, if illiterate participants sought assistance from someone outside the office, whoever read the coupon would have learned to read English in school. The coupons also included telephone numbers on two different phone networks, but only two recruits called.

Figure 10: Front (top) and back (bottom) of an un-numbered recruitment coupon

Migration and Women's Health Study
- Recruitment Coupon -

We are open from
Monday to Saturday
9:00 AM to 5:00 PM
(Closed on Sunday)

We are looking for kayayei
girls and women in Accra from
the Upper West, Upper East,
and Northern Regions.

This coupon may only be used from _____ until _____.

You must bring this coupon to the Kayayei Youth Association Office in order to participate!
Questions? Please call 0206932101 or 0554266192.

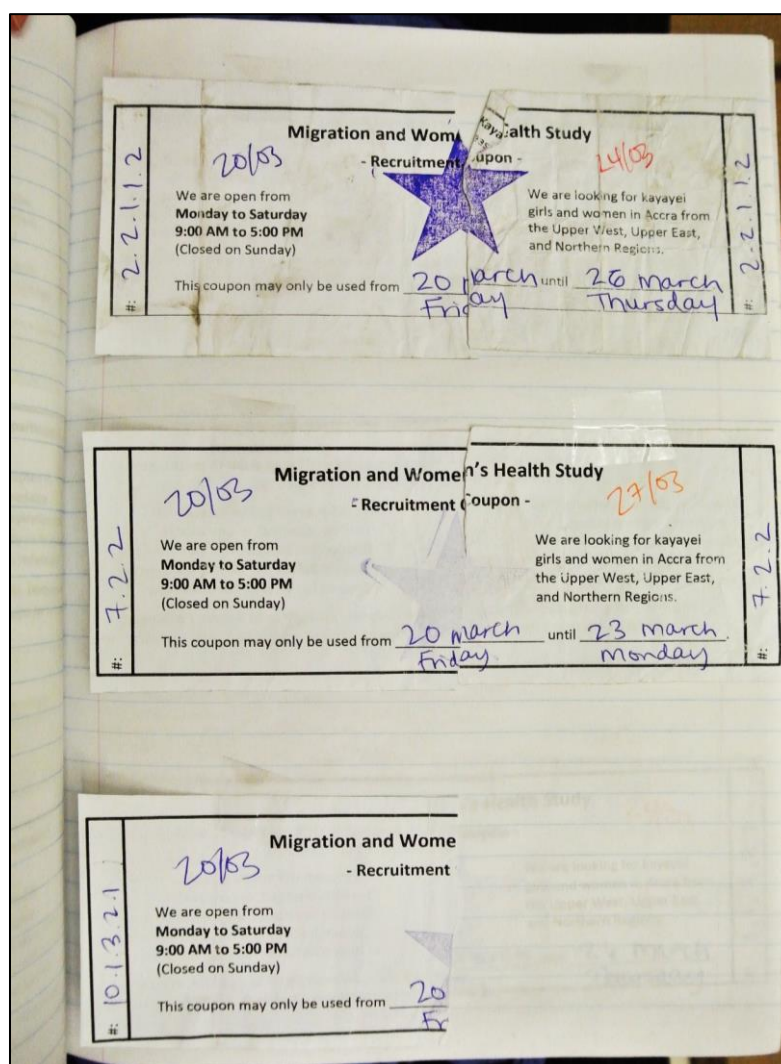
<p>Kayayei Youth Association Office Yam Market, Agboghoshie Abose-Okai Road By Makola No. 2 Opposite Domod Building</p>	<p>This coupon will not be accepted if:</p> <ul style="list-style-type: none"> - Torn up, changed, or unreadable - Coupon has passed the expiration date - Coupon holder has already participated - Coupon has already been redeemed
--	--

If eligible to participate, you can receive at least 5 cedis and possibly up to 8 cedis. Participants receive 2 cedis for completing the survey, 3 cedis for transportation, and up to 3 cedis for recruiting participants.

[Photograph by the author]

When an eligible participant brought her coupon to participate, the coordinator ripped the coupon in half through the purple star and gave me left side. The coordinator returned the right half of the coupon to the participant, instructing her to keep this half and bring it back with her to claim her recruiting bonus. I then entered each coupon into the coupon tracking form (Appendix 20) with one form used for each seed. The left half of the coupon was saved in the coupon book (Figure 11) to verify the participant's participation when she returned to collect her recruitment bonus. When a participant returned to collect her recruitment bonus, we matched the right half of the coupon to the left half taped into the book for verification. Computer software exists to monitor and track participation in studies using respondent driven sampling, but the lack of reliable electricity in this setting required a low-tech option (i.e., the development of many paper tracking forms that appear in the Appendices).

Figure 11: The coupon book



[Photograph by the author]

On multiple occasions, girls and women stopped by the office attempting to participate without coupons. We thanked them for their interest, spoke to them about the importance of reporting abuse, gave them a report abuse flyer, and turned them away.

3.4.12 Participant compensation

Respondent driven sampling requires a dual incentive system whereby the respondent is compensated not only for their participation but also for their involvement in recruiting additional study participants. This incentive is meant to recognize a participant's time and trouble. As such, its value should not be great enough to encourage participants from

outside the target population or to coerce someone into participation (Heckathorn 1997). When conducting research in developing countries, ethics guidelines also recommend that discussions with community members and the local research ethics committee should guide the selection of an appropriate incentive (NCOB 2002).

Previous studies among the *kayayei* have not compensated participants for their time, making it unlikely that the *kayayei* would participate in conversations lasting over five minutes long (Opore 2003). Given that administering the informed consent process and survey questionnaire required 45 to 75 minutes of a *kayayoo*'s time, this dual incentive system recognized the value of the *kayayei*'s work and the fact that their participation required them to be unavailable for work. Based on discussions during the formative research phase, participants received two Ghana cedis (GH¢) (approximately £0.34 as of 13 November 2017) for participating in the survey and GH¢ 3 (approximately £0.51 as of 13 November 2017) to recognize their time spent traveling to and from the field site. To put these figures into context, survey participants later reported earning an average of GH¢ 12.52 (approximately £2.13 as of 13 November 2017) on "good" market days and an average of GH¢ 5.35 (approximately £0.91 as of 13 November 2017) on "bad" market days. We sought to make participation a positive experience, offering participants sachet water and eventually biscuits after welcoming many undernourished participants.

Financial log sheets (Appendix 21) track the payments made to each participant along with the number of recruiting coupons and the expiration date for these coupons to manage the flow of participants and ensure that no one attempted to participate once the study ended. In addition to receiving monetary compensation, participants also received information on the importance of reporting abuse to police or a champion such as the Kayayei Youth Association. Marie Stopes International Ghana produced the fliers for its *kayayei* program in collaboration with United States Agency for International Development, People's Dialogue, and Society for Women and AIDS in Africa. Given the levels of stigma that participants experienced, two instances suggest that this information on reporting abuse was meaningful and well received. Former participants came to the office twice during the fieldwork to report serious violence against *kayayei* community members. One of the attacks, previously mentioned, greatly upset the research team and participants. We suspended our activity that afternoon so that we could assist the victim in seeking emergency medical attention and report the instance to police.

Participants occasionally inquired about access to sexual and reproductive healthcare and were interested in learning more about family planning and HIV/AIDS. One of the data collectors, a sexual and reproductive health peer educator for Marie Stopes Ghana, managed referrals to Marie Stopes or IPAS.

3.4.13 Non-response data

When a participant returned to the study site to collect her recruitment payment, she was asked if anyone refused to accept one of her coupons. For each person who refused to accept the participant's recruiting coupon, the research team administered the non-response form (Appendix 22). In addition to asking why the person refused a coupon, the form asked basic demographic information about the person who refused and her relationship to the participant.

3.4.14 Quality control

To ensure quality, I incorporated checks into the survey and participant flow. At the end of each survey, data collectors rated the perceived truthfulness of the information they received from participants (high truth, medium truth, or low truth). I then reviewed the survey on site for completeness and accuracy. We resolved any inconsistencies or skipped questions with the participant before she received her payment and recruitment instructions. The in-depth interviews provided another opportunity to verify selected survey data. Reflections on data quality appear later in this thesis.

3.4.15 Data processing

Questionnaires were first edited manually in the field as part of the quality review. Records identified participants by their respondent driven sampling coupon numbers. Documents containing names and personal identifiers, such as the signed informed consent forms, were locked in a drawer and kept separate from records using coupon numbers. I took completed surveys home with me every evening to secure the data, particularly from the very real threat of fire that had already caused us to evacuate the office one afternoon. I manually entered all surveys into SPSS 22.0 away from the field site. Once data collection ended, I spent a week scanning all questionnaires into PDFs to create an electronic,

password-protected, encrypted backup of the data. This digital backup proved useful when the United States Postal Service lost one day's bundle of surveys that I had shipped home. I did not ship or pack the signed informed consent forms. To transport the informed consent forms, I kept them in a sealed envelope in my carry-on bag that never left my sight.

3.4.16 Safety

During training, I stressed that the office be a safe and pleasant place for data collectors to work and for participants to visit. Data collectors were informed to report any incidents (e.g., injury, problem, fight, argument, theft) immediately to me. In the case of serious illness or injury, data collectors were advised to seek medical attention immediately. In the case of violence or theft, police would be involved. The data collection proceeded quite smoothly. The supervisor received two field incident reports (Appendix 23) from data collectors regarding personnel issues. The issues were resolved immediately with support from the Kayayei Youth Association, and data collection proceeded.

The “report abuse” message that participants received along with compensation was taken to heart. On multiple occasions, participants or friends of participants came to the Kayayei Youth Association office to report abuse. As a champion for *kayayei*, Kayayei Youth Association staff was able to link participants with health services and police.

3.4.17 Procedure for quantitative data analysis

The papers in this thesis involve two types of primary quantitative data analyses. The first set of analyses, reported in Chapters 4 and 5, uses RDSAT Version 7.1 (Volz, Wejnert et al. 2012) to assess the sample's population parameters, including the final sample size and sample stability. I conducted partition analysis for categorical and continuous variables in RDSAT using the following recommended options for optimal accuracy and the most stable estimates: dual component estimate for average network size with a mean cell size of 12, enhanced data-smoothing algorithm type, $\alpha = 0.025$, and 16,000 re-samples for Bootstrap (Heckathorn 2007, Spiller, Cameron et al. 2012). In addition, I assessed prevalence estimation and equilibrium, or the point at which the sample distribution within variables has stabilized and results in a sample independent of the non-random *kayayei* migrant seeds (Heckathorn 1997, Heckathorn 2002). For estimates of the number of waves

required for equilibrium, I used a recommended convergence radius of 0.02 and the Markov chain process to calculate transition probabilities (Spiller, Cameron et al. 2012). Seeds are included only in the analyses of recruitment productivity; they are excluded from additional analyses.

The second set of analyses involves logistic regression analyses using SPSS 22.0 software. Binary logistic regression in Chapter 5 modelled the effects of selected independent variables on whether or not a recently ill/injured participant ($n = 239$) sought health care. I selected the independent variables from a literature review of barriers and determinants of care (Addai 2000, Nanda 2002, Ensor and Cooper 2004) and from participant-reported factors in the survey and in-depth interviews (e.g., money earned on a bad day, taking time away from work, no translator at the health facility).

3.5 Methodology for in-depth interviews

Once the surveys were underway, I started the third component of my research involving semi-structured in-depth interviews among a subset of girls and women ($n = 48$) who participated in the survey. I conducted the interviews in order to collect additional in-depth data on recent use (or non-use) of health services, migration, and sexual and reproductive health knowledge and perceptions. As part of the selection criteria, all interview participants reported a recent illness or injury in the last two weeks, as I sought to minimize recall bias when discussing recent experiences seeking medical care. This final section of my fieldwork methodology chapter details the way in which I conducted these interviews.

For this part of the research, I worked with two of the data collectors who had experience collecting data for the Kayayei Youth Association and who have a wide command of the northern dialects. Lariba reviewed interviews for translation quality. Gifty, who had impressed me with her ability to connect with survey participants, served as translator for the interviews. It was through her role as a translator that I interviewed participants. I selected Gifty to translate the interviews because it became apparent during the survey that she had the necessary skills. Participants opened up to her. Gifty's warm and welcoming demeanour put participants at ease. After completing the survey, one participant confided in Gifty that she left her abusive husband in the north and fled to Accra. She became

pregnant after he raped her, and she was in immediate need of sexual and reproductive healthcare but did not know how to obtain those services in Accra. We connected the participant with an external peer educator from Marie Stopes who helped the participant obtain medical care. The participant was so delighted that she returned to the office days later to show us her medications.

3.5.1 Setting

We conducted interviews inside the Kayayei Youth Association office on Sundays and at times when the office was closed for business in order to provide a quiet and private setting. Sundays also tend to be quieter market days, so many *kayayei* have time to rest. After completing the survey, interviewees received interview coupons for assigned appointments at scheduled times so that Gifty and I could ensure breaks between participants to discuss and reflect upon interviews. The office can be cosy, as evident in Figure 12, so we pushed the furniture to the back of the room. With more space, Gifty, the participant, and I could sit together without a desk between us. Several participants brought their babies or young children with them to the interviews, and the children napped or entertained themselves in the office whilst we talked. We offered water sachets and biscuits to all participants and children.

Figure 12: Inside the Kayayei Youth Association office



[Photograph by the author]

3.5.2 Semi-structured interview guide

I conducted the interviews with Gifty as a translator and used a semi-structured interview guide (Appendix 24) in order to have flexibility to explore issues unique to respondents. Stakeholder discussions and piloting the guide helped to formulate the final interview guide. These discussions also helped ensure that the guide included questions that would be appropriate and that would generate information of use to both the study and to the community. The guide includes both open-ended and close-ended questions that cover the following topics: demographics, migration history, sexual and reproductive health knowledge, use of health services, fertility, assimilation, health messaging, and ties to family/friends in the north. The interviews lasted approximately 60 minutes and were linked to the participants' surveys using each participant's unique identification number.

In order to ensure high quality of the data, Gifty and I piloted the interview guide prior to the study's commencement. These six exploratory interviews explored appropriate language and terminology, assessed validity of the survey questions, tested the flow of the

questions, and formulated the final interview guide. When we started interviewing participants, I initially led the inquiry with Gifty translating between the participant and me. Towards the end of the data collection period, Gifty started anticipating my follow up questions and would ask them, simultaneously translating back into English.

3.5.3 Sampling strategy

Determining the number of interviews one must conduct for qualitative research is such a frequent question that the National Council on Research Methods (NCRM) in the United Kingdom approached 14 renowned social scientists and five early career researchers for an answer. Ultimately, the experts concluded that “it depends,” (Baker and Edwards 2012). According to Harry Wolcott, “in general the old rule seems to hold that you keep asking as long as you are getting different answers, and that is a reminder that with our little samples we can’t establish frequencies but we should be able to find the RANGE of responses,” (Baker and Edwards 2012, pp. 3-4). Given the exploratory nature of qualitative research, many of the NCRM-approached experts recommend sampling until saturation occurs; however, others encouraged set figures for doctoral research. Patricia Adler and Peter Adler advise that candidates sample between 12 and 60 individuals (with 30 being the mean) (Baker and Edwards 2012). Alan Bryman suggests that in order to be published, qualitative studies require a minimum of 20–30 interviews; among doctoral theses in Great Britain and Ireland, the mean (31) and median (28) number of interviews comply with this recommendation (Baker and Edwards 2012). Whilst having a set figure can be useful for writing proposals and planning one’s research, sample size is ultimately affected by factors such as the research questions and the population’s heterogeneity.

In my research, I selected the qualitative sample from survey participants using a non-probabilistic stratified purposive sampling approach. This approach allows for comparisons between subgroups whilst displaying variation on migration and reproductive health (Patton 2002). Not only must the sample have “symbolic representation,” but it must also illustrate the diversity within the population’s boundaries (Ritchie, Lewis et al. 2003).

Based on these requirements and characteristics suggested by the literature, I selected survey participants based on the sampling matrix depicted in Table 13 that captures whether or not the participant sought medical care for her recent illness/injury, number of

migrations to Accra, and age group (younger half of the sample or older half of the sample). Access to participants' demographic information in their surveys allowed for refined sampling. Based on my review of the surveys upon completion, I selected informants based on the sampling characteristics until saturation occurred at 48 interviews. This figure includes the six pilot interviews, as these interviews did not result in significant changes to the interview guide or method by which we conducted the interviews.

Table 13: Qualitative sampling matrix

Sought care for recent illness/injury	Number of migrations to Accra	Age group
Yes	1	Young
		Older
	2	Young
		Older
	3+	Young
		Older
No	1	Young
		Older
	2	Young
		Older
	3+	Young
		Older

Nine survey participants obtained appointments but did not appear for their interviews. Unfortunately, we could not locate these nine participants to follow up. It is possible that they forgot the appointment, were too busy to leave work, returned to the north, or were disinterested in participating.

3.5.4 Ethics, informed consent, and participant compensation

The ethics and informed consent for the interviews mirrored the process described for the surveys. No participant could start the interview without having first consented to participating. As part of the informed consent process, we used separate consent forms for adults, minors, and guardians that were modified to reflect the details for the interviews as opposed to the surveys. Adults (those aged 18 years and older) and children who migrated to Accra alone without their parent or guardian (emancipated minors) received the standard consent form (Appendix 25). Children under 18 years who resided in Accra with a parent

or guardian received the child assent form (Appendix 26), and their parent or guardian had to visit to the office to complete a parental consent form (Appendix 27) before the child could participate in the interview. For each interview consent form, two forms were filled in duplicate. The participant received one signed form, and the research team kept one signed form. At any point in the interview, a participant could refuse to participate.

Girls and women participating in the in-depth interviews, lasting approximately 60 minutes, received compensation of GH¢ 5 (approximately £0.85 as of 13 November 2017) to recognize the time costs of their participation and travel to and from the office. Stakeholders confirmed this value before the interviews began.

3.5.5 Translation and transcription

Though English is one of Ghana's official languages, it is rarely spoken in the rural north. There, only school children tend to learn English. Ghanaian English differs from American English or British English. When I am in Ghana, I find that my English changes and takes on more characteristics of Ghanaian English. In particular, I have found differences in annunciation, dropping prepositions, and cultural adaptations. Translation from one of Ghana's many dialects into English is never straightforward and depends on many factors. Though I conducted a couple of the interviews in English, I relied on Gifty during parts of those interviews to help translate Ghanaian English to American English. The final transcripts reflect the best English that Gifty knows and are shaped by her work and experience as a *kayayoo*, albeit one of the few with a high school education.

Gifty and I worked as a team, recording our interviews using an Olympus WS-822 GMT voice recorder. I then transcribed interviews verbatim into Microsoft Word using ExpressScribe Pro, indicating pauses, interruptions, distractions, laughter, and other noteworthy characteristics.

3.5.6 Quality control

One in every four interviews was selected for verification to ensure translation quality. Lariba, one of the multi-lingual *kayayei* data collectors, listened to the 12 recordings and wrote down the instances in which she disagreed with the translation. Lariba agreed with

Gifty's complete translations for nine of the 12 interviews. In three interviews, Lariba offered additional insight. Several of her comments were not to indicate mistranslations but rather to add information beyond what the participant and Gifty provided, such as converting old currency into new currency, determining the name of a hospital based on the location, and calculating the specific month of a child's birth. Of the two interviews containing passages in which Lariba disagreed with Gifty's translations, one discrepancy had to do with a mistranslation of the number of children a woman had. I have corrected the transcript to indicate that the passage should reflect that the woman has two children. The second and more substantive correction reflects a discrepancy in how the term for sickness differs between Frafra and Mampruli. The participant did not understand the word that Gifty used, and this word choice caused temporary confusion among the participant. Lariba did not feel it was necessary to review additional transcripts given these findings, and I feel confident with her assessment of the translation quality.

The interviews also proved a useful tool for checking the validity of the survey and quality in data collection. These findings and discussions are included in the transcriptions. As was to be expected, reported age varied considerably among participants. The majority of participants do not know their birthday, and uncertainty in age appeared in both the surveys and interviews. The interviews also uncovered that several survey questions were understood poorly among data collectors and participants, and these questions (e.g., question 240 regarding whether a participant offers services or work in exchange for rent) have been excluded from final analyses. When an interview revealed a discrepancy with the survey, I spoke with the research team and/or survey data collector to uncover the details around the discrepancy and clarify the points of confusion going forward.

3.5.7 Data security

I stored all study-related information securely at home. Records identify participants by identification numbers in order to maintain their confidentiality. The signed informed consent forms that contain names or other personal identifiers are locked in a drawer and kept separate from records using identification numbers. Audio files and interview transcripts do not include identifying information.

I conducted data entry on-site in Accra on a password-protected computer. Since the respondent's voice is a potential identifier, only the study team has access to the audio files. Electronic data are stored on password-protected computers. Any data transmitted electronically will not contain any identifying information. Data are backed up on password-protected external hard drives and a password-protected cloud account. Whilst my supervisors, regulatory agencies, study monitors, and auditors may have access to study records if requested, the participants' identities will remain confidential.

3.5.8 Procedure for qualitative data analysis

Following transcription, I loaded interviews from Microsoft Word into NVivo 10 software for thematic coding and analysis. Influenced by grounded theory, the initial analysis was guided by a skeleton codebook of five thematic codes based on themes emerging from the pilot study. Gifty, Lariba, and I independently gathered emerging themes identified in interviews. We met several times to review and discuss our themes. I added new codes as themes and patterns arose in the reflexive memos and the text. Chapter 5 documents the crosscutting themes and individual experiences of participants who reported experiencing recent illnesses and/or injuries.

3.6 Limitations

As discussed in greater detail in Chapters 4 and 5, the use of respondent driven sampling warrants caution with respect to its methodological validity. Despite numerous revisions, researchers critique respondent driven sampling's assumptions, population estimates, confidence intervals, and recruitment biases (Gile and Handcock 2010, Goel and Salganik 2010, Rudolph, Fuller et al. 2013). Recruitment biases in particular may affect the primary data in this thesis. Respondent driven sampling requires participants to recruit both strong and weak connections from among their networks. Most participants in this sample (96.3%), however, reported knowing their recruiter very well. Since the final sample is biased towards well-connected respondents, these connections may have restricted cross-group recruitment and equilibrium, biasing the population proportions generated by respondent driven sampling.

Analyses indicate that the sample distribution within most variables had stabilized or reached equilibrium, indicating that the selection of “seeds” or participants from whom the sample originated did not bias the final sample with regards to these variables (Heckathorn 1997, Heckathorn 2002). Generalizations are strongest for variables pertaining to health (e.g., ever given birth, ever had a health problem caused by kayayoo work) and migration behaviours (e.g., send remittance(s), recommend kayayoo work to friend in the north) that obtained equilibrium. This study did not obtain equilibrium for ethnic group or the closely related variables religion, region of birth, and place of residence in Accra. Thus, the data for these particular variables cannot be generalised to the larger *kayayei* population.

General survey limitations, such as non-response bias and measurement errors, also affect these quantitative data. Based on the non-response data generated by respondent driven sampling, contributing factors to non-response include having no time to participate, fearing research, and lacking interest in the study.

Regarding the qualitative data collected using in-depth interviews, it seems probable that participants’ work-related obligations or disinterest in the study may have contributed to 15.8% of potential in-depth interview participants not appearing for their interview appointments. Their true reasons for not participating remain unknown, as we had no way to call or locate these potential interview participants. Among participants who completed the interviews, social desirability bias may affect participants’ responses to questions on sexual and reproductive health. I attempted to overcome this potential source of bias by conducting interviews with a data collector who distinguished herself during the survey as a trusted confidant among survey participants.

3.7 Summary

This chapter detailed the quantitative and qualitative methods that I used to collect primary data in Ghana over seven months of fieldwork. This detail supplements the shorter methodology sections in each of my papers that appear in the following chapters. The next chapter, Chapter 4, builds upon this methodological discussion to examine my use of respondent driven sampling in greater detail, evaluating the strengths and weaknesses of this method when used in a limited-resource setting among a hard-to-reach migrant population that is largely illiterate.

Chapter 4. Collecting data from migrants in Ghana: Lessons learned using respondent driven sampling

4.1 Background

The 2030 Agenda for Sustainable Development marks the first time that the global development framework includes migration. Migration's relevance and contribution to development is reflected throughout the Agenda in goals and targets such as protecting labour rights of migrant workers, ending human trafficking, and implementing planned and well-managed migration policies (United Nations 2015). Monitoring progress of these goals demands high-quality, timely data on migrants and migration. Population registers or administrative systems can generate migration data; however, these data are primarily collected within Europe (UNDESA 2013). High-quality, timely data on migrants and migration in low- and middle-income countries is sparse. In low- and middle-income countries, migration data come primarily from decennial population censuses and ad hoc population surveys that are expensive to implement. Ad hoc sub-national surveys and research on migration tend to be localised and small-scale; data are rarely representative or generalizable.

To better understand migration and migrants' lives in low- and middle-income countries, researchers require better techniques to reach and sample migrant populations. Techniques must simultaneously minimize potential sources of bias and be resource (i.e., time, money, labour) efficient. Health and Demographic Surveillance Systems can be expensive to operate and may struggle to provide timely data (Ye, Wamukoya et al. 2012). Limited resources may prevent the development of sampling frames, resulting in challenges to obtaining representative samples of highly mobile populations. Contextual factors and available tools for data collection may further impede researchers' efforts to survey migrants. Xenophobia, for instance, can lead to migrants being denied or deterred from health facilities, biasing facility-based surveys (Crush and Tawodzera 2014). Respondent driven sampling, a technique originally developed to sample hard-to-reach populations in high-income countries, may offer an improved approach for surveying hard-to-reach internal migrants in low- and middle-income countries. What modifications, if any, are

required to implement respondent driven sampling successfully in limited-resource settings? What lessons implementing respondent driven sampling among migrants in Ghana may be relevant in other low- and middle-income countries? Using rural-urban female internal migrants in Accra, Ghana as a case study, the objectives of this paper are to: (1) assess respondent driven sampling recruitment productivity, network size and ties of internal migrants; (2) test for homophily; and (3) detail the successes of and challenges to implementing respondent driven sampling in Ghana and how these lessons can be applied in other low- and middle-income countries.

4.1.1 Surveying migrants with respondent driven sampling

Respondent driven sampling, a variation on chain-referral sampling methods like snowball sampling, originated in the United States of America as a method to sample “hidden” populations such as people living with HIV/AIDS and injecting drug users (Heckathorn 1997). Traditional chain-referral methods may generate biased samples through the oversampling of cooperative participants with larger networks, for example. Such biases would negatively impact inferences from the sample. Respondent driven sampling, however, employs a mathematical model rooted in Markov chain and biased network theories to account for the non-random way in which the sample was collected and to generate a weighted sample (Heckathorn 1997). This weighted sample has been proven to be unbiased for samples of meaningful size regardless of how the researcher purposively selects the initial “seeds” who initiate the recruitment process (Heckathorn 1997, Salganik and Heckathorn 2004). Respondent driven sampling also relies upon a dual-incentive structure whereby participants are rewarded for both participating in the study and for recruiting additional members of the target population via the distribution of uniquely numbered recruitment coupons. For respondent driven sampling to succeed, the population of interest must be well networked with individuals recognizing one another as part of a social group. Additionally, researchers must record each participant’s personal network size (the number of eligible participants within each participant’s social network).

Use of respondent driven sampling, and evidence generated from this technique’s samples, has grown rapidly since the mid-1990s, with over 460 studies in 69 countries (White, Hakim et al. 2015). The methodology has been revised over the years, leading to adjustments such as the calculation of standard errors, new estimators, a bootstrap method

for constructing confidence intervals, and larger design effects (Heckathorn 2002, Salganik 2006, Heckathorn 2007, Volz and Heckathorn 2008, Wejnert, Pham et al. 2012). Despite these revisions, the validity of respondent driven sampling's methodology warrants caution and may be inappropriate for certain studies. Simulations find that the assumptions for respondent driven sampling, discussed later in Section 4.2.4, may be unrealistic and can produce biased estimates (Gile and Handcock 2010). Public health researchers in particular may find these estimates and respondent driven sampling's "misleadingly narrow" confidence intervals unsuitable for disease surveillance (Goel and Salganik 2010). Biases may also exist around recruitment, causing several researchers to inquire about willingness to participate or ability to recruit (Carballo-Diéguez, Balan et al. 2011, Liu, Li et al. 2012, Rudolph, Fuller et al. 2013). A small but growing body of respondent driven sampling literature addresses the need to "identify potential recruitment biases so that they can be either acknowledged as potential limitations or corrected for in the analysis," (Rudolph, Fuller et al. 2013, p. 5).

Researchers have used respondent driven sampling most frequently in the United States of America, China, India, Mexico, and South Africa (White, Hakim et al. 2015). Though four of the five most common countries for respondent driven sampling studies are classified as low- and middle-income countries, the use of respondent driven sampling in migration research is often restricted to sampling "hard-to-reach" international migrant populations in high-income countries (Tyldum and Johnston 2014). There is a small but growing body of evidence that uses respondent driven sampling to sample migrants in lower-middle income countries (e.g., Ukraine, Morocco, Kenya) and upper-middle income countries (e.g., South Africa, China, and Thailand) (International Organization for Migration 2010, Khamsiriwatchara, Wangroongsarb et al. 2011, Tyldum and Johnston 2014, Okal, Raymond et al. 2016). In the limited evidence on the use of respondent driven sampling for migrant populations outside of high-income countries, there is little detailed methodological reflection – either positive or negative – on the suitability of this technique for migrant populations in low- and middle-income countries and the lessons learned.

Researchers have implemented respondent driven sampling within migrant populations to study issues such as sexual violence among sub-Saharan migrants in Morocco; HIV risk behaviours among undocumented immigrant women in Texas, United States of America; and the health of adolescent migrants in Shanghai, China (Montealegre, Risser et al. 2013,

Decker, Marshall et al. 2014, Keygnaert, Dialmy et al. 2014). These studies contribute to a nascent body of evidence within the migration literature that documents efforts to ground respondent driven sampling in local cultures and settings. Keygnaert et al. (2014) adopt a community-based participatory research approach with a community advisory board that contributes to the study design and helps identify community-based researchers in Morocco. Montealegre et al. (2013) incorporate extensive formative evidence in the design of respondent driven sampling among Central American immigrant women in the United States of America that includes in-depth interviews with women to assess the acceptability of respondent driven sampling, to examine social network characteristics, and to pilot the survey questionnaire. Decker et al.'s (2014) five-country (United States of America, Nigeria, South Africa, India, China) comparative study of disadvantaged 15 to 19-year-olds also incorporates an extensive formative phase to inform respondent driven sampling design and implementation, including community mapping, in-depth interviews and focus group discussions with the target population, and key informant interviews.

Some studies using respondent driven sampling with migrants have reported challenges from slow recruitment, lack of connectedness to the target group, small network size, and reluctance to refer new participants. A study among Pakistani and Polish migrants who recently arrived in the United Kingdom, for example, struggled with chain referral; as a result, researchers developed and implemented an alternative sampling approach in which they led the chain referral process, rather than participants themselves (Platt, Luthra et al. 2015). This study also found a lack of connectedness of the target populations as well as participant reluctance to refer additional participants (Platt, Luthra et al. 2015). Among socially marginalized young people in Sydney, Australia, Bryant (2014) found that respondent driven sampling sampled the target population inefficiently, leading to a high proportion of ineligible participants. Compared to other studies using respondent driven sampling, the recruitment rate was low, and participants had small and disparate networks (Bryant 2014).

These documented challenges implementing respondent driven sampling shed important light on some of the pitfalls involved in using this sampling method for migrant populations. Taken as a whole, they suggest a need to more fully ground respondent driven sampling in formative research prior to sampling and to share lessons learned from applying respondent driven sampling in various settings. Involving members of the target

population in the design of respondent driven sampling might help minimize potential implementation challenges such as inappropriate incentives; cultural attitudes towards research participation and peer-recruitment; and whether or not sufficient, direct links exist between members of the target social group. Feedback from the target population and stakeholders may also indicate that respondent driven sampling may be an inappropriate survey tool in certain settings or within certain populations. In Moscow, Russia, preliminary fieldwork revealed that irregular female migrants were unable or unwilling to refer participants via respondent driven sampling; thus, the researchers modified their initial plans and implemented an alternative sampling method (Agadjanian and Zotova 2012).

Little evidence has been published regarding the nuances and practicalities of implementing respondent driven sampling among migrants in low- and middle-income countries. With inconsistent documentation of experiences implementing respondent driven sampling, it is difficult to assess where and why respondent driven sampling is working or failing. The use of respondent driven sampling in such settings warrants better understanding of factors leading to its successful implementation.

4.1.2 Sampling female migrants in Ghana

This case study uses data collected during the implementation of respondent driven sampling among a sub-population of female internal migrants in Ghana. These migrants are identified by their occupation as market porters who carry loads on their heads (*kayayei*¹⁶ [plural], *kayayoo* [singular]). They represent the face of contemporary female north-south, rural-urban migration in Ghana with most migrant female youth taking up this work upon arrival in Accra (Kwankye and Addoquaye Tagoe 2009). Yet, head porter work is not limited to female migrants from northern Ghana. *Kayayei* may come from Ghana's other regions and from Togo. Ga petty traders in Accra may even work occasionally as head porters if they cannot make enough money trading (Salifu 2015). In Accra and Kumasi, Ghana's two largest cities, authorities and local residents alike often view *kayayei* as outsiders, since the majority of *kayayei* migrated from rural areas in Ghana's northern

¹⁶ *Kayayei* and *kayayoo* are compound words formed from the Hausa and Ga languages. *Kaya* is often translated from Hausa as "load" or "burden." In Ga, *yei* means "women," and *yoo* means "woman." Participants in this study most often used the single Hausa term *kaya* to refer to their work, as in "I carry *kaya*."

three regions. *Kayayei* are highly stigmatized due to a combination of their menial work and northern ethnicities, and they may regard strangers and authority figures with fear and suspicion (Daily Graphic 2010).

These internal *kayayei* migrants tend to be missed or excluded from household- and institution-based (e.g., school, health facility) surveys since they are mobile, occasionally homeless, and have low levels of formal education. Though vulnerable to sexual and reproductive health risks and violence, migrant *kayayei* seek formal health services infrequently (Anarfi and Appiah 2009, Kwankye and Addoquaye Tagoe 2009), excluding the possibility of facility-based sampling methods to research health-related issues. This population has become a growing concern for the government, nongovernmental organizations, and civil society organizations. The growing migration of girls and women from northern Ghana seeking *kayayei* work to avoid poverty highlights a need for greater development in the north. Large numbers of teenagers working as *kayayei* challenge Ghana's efforts to combat child labour. The increasing number of adolescents and young adults in Accra places additional pressure on social services and employment opportunities. Despite consensus that the total number of *kayayei* in Accra is increasing, the exact figure remains unknown: estimates range from 2,300 to 160,000 (Kearney 2013, Parliament of the Republic of Ghana 2016).

Researchers have identified multiple challenges gathering data on Ghana's *kayayei*, including a lack of incentives to participate, language barriers, and sampling and survey approaches. Without compensating participants for their time, Opare (2003) found *kayayei* unlikely to participate in research lasting over five minutes. In the country's 2010 Population and Housing Census, the number of *kayayei* was higher than anticipated and required more than one day to enumerate (Daily Express 2010). According to media reports and formative interviews with *kayayei* leaders, census implementation efforts were further challenged by attempts to enumerate *kayayei* whilst they were working and by waking up sleeping homeless *kayayei* in an effort to enumerate them (Daily Graphic 2010). Given the stigma that these migrants experience in Accra and political discussions about forcibly sending migrant *kayayei* back north, many migrant *kayayei* migrants hesitate to interact with unknown people such as census enumerators who represent authority. Convenience sampling of *kayayei* in the market workplace, for example, would cause an unwelcome interruption to participants' work, especially during busy market times when

research participation could result in the loss of potential customers. In order to have large networks in Accra, migrant *kayayei* would likely have resided in Accra for a long time or have migrated multiple times; therefore, with chain-referral methods like snowball sampling, recruiting migrant *kayayei* with the largest networks would likely lead to bias.

Despite the methodological and implementation limitations of respondent driven sampling, this method offers an opportunity to overcome previously documented *kayayei* sampling challenges (e.g., declining to participate when interrupted at work, lack of a sampling frame) and an opportunity to generate stronger population-level inferences than prior studies employing non-random sampling methods. By design, respondent driven sampling features (e.g., peer recruiting, coupons) could also help facilitate participant willingness and availability that have hindered prior efforts to sampling migrant *kayayei*. Ghana's migrant *kayayei* meet the criteria to sample using respondent driven sampling. Migrant *kayayei* can be clearly defined, recognize one another as part of the group, and have the characteristics of a social group (i.e., they identify and interact with each other) (Friberg and Horst 2014). Formative discussions with key informants, including members of the Kayayei Youth Association and *kayayei* leaders, indicated that *kayayei* migrants would have sufficiently dense network ties to facilitate chain referral. Organizations in Accra offer events and programmes (e.g., community health outreach programmes, skills training, activities organized by the Kayayei Youth Association) to *kayayei* regardless of ethno-linguistic group, providing opportunities for *kayayei* to meet and interact with members of different tribes. North-south migration in Ghana is a highly network-driven phenomenon with migrant *kayayei* linked by kinship, friendship, community, and tribe. *Kayayei* are directly linked to one another, and these connections impact their migration. For girls and women in the north considering migrating to Accra, relationships with current migrants influences choice of destination. *Kayayei* migrants work together in groups, sleep together outside or in a shared room, watch over each other's children, and support one another.

4.2 Data and methods

Quantitative data were collected using respondent driven sampling over four weeks in March and April 2015 as part of a larger mixed-methods study on migration and women's health among female migrants in Ghana. Given this larger study's focus on north-south migration, the quantitative survey was limited to *kayayei* in Accra who migrated from

Ghana's three northern regions. The study was conducted at the Kayayei Youth Association office in Agbogbloshie, Accra near several of the capital's largest markets and Accra's largest informal settlement. Based on previous researchers' experiences of attempting to interview *kayayei*, the choice of research location was identified a priori as critical to the success of respondent driven sampling. Situating the research out of the Kayayei Youth Association office, where the research team was visible to anyone walking by, also served to allay the fears of potential recruits who could observe the research team's activities from a comfortable distance before deciding to participate. In addition, working out of the Kayayei Youth Association's office allowed the research team to link participants needing additional support with services that the Kayayei Youth Association provides in collaboration with partners (e.g., Marie Stopes Ghana, United States Agency for International Development, Society for Women and AIDS in Africa). In recognition of the diverse roles that female migrants play, including that of mother and caregiver, the office was a child-friendly place. Infants and young children accompanied participants on a daily basis.

4.2.1 Formative research

Before implementing the survey, I spent two months in the community conducting formative research and volunteering with the Kayayei Youth Association. Formative activities identified as critical prior to implementing respondent driven sampling included meetings with a wide range of stakeholders (e.g., *kayayei* community leaders, potential seeds who would initiate the study, Kayayei Youth Association board members) to introduce the study, seek their input, and answer questions about the research. The formative research generated evidence on factors necessary for implementation of respondent driven sampling, including appropriate incentives; participants' personal network sizes; hours and days during which to conduct the study; coupon design; the survey instrument; participants' languages; and participants' prior experiences with researchers, outsiders, and census enumerators. People were unfamiliar yet intrigued by the idea of using coupons to recruit and to participate. Formative discussions about the use of coupons revealed that, so long as the incentives were appropriate, *kayayei* migrants would participate in longer interviews. Provided participants received an appropriate incentive that compensated them for missed work and travel, key informants expected that participants would sit for at least 45 minutes to complete the survey.

Since the Kayayei Youth Association office was open to participants on Mondays to Saturdays from 9:00am to 5:00pm when many *kayayei* migrants were working, participants received monetary incentives relative to a *kayayoo*'s average daily wage. The office's location near large markets made it feasible for *kayayei* to participate in research during breaks and at times when slow markets produced little demand for their services. Stakeholders, including the Kayayei Youth Association and working *kayayei*, assisted with identifying the most appropriate incentive values during the formative research period. Incentives, a key feature of the methodology for respondent driven sampling, functioned as both economic compensation for participation and as motivation for participants to recruit additional respondents (Tyldum, Rodriguez et al. 2014). Survey respondents received a total of 5 Ghanaian cedis (GH¢) (approximately £0.85 as of 13 November 2017): GH¢ 2 for participation and GH¢ 3 for travel and transportation. Respondents were eligible to receive a bonus of up to GH¢ 3 (approximately £0.51 as of 13 November 2017) for referring up to three additional participants.

To accurately measure personal network size, the number of eligible participants within each participant's social network, the formative assessment phase explored what it meant to know someone in this setting and piloted ways in which to ask participants these questions. Capturing each participant's personal network size is crucial for analysing data using respondent driven sampling and requires: (1) a clear definition of the target population, (2) a defined meaning of what it means to know someone, (3) a geographic parameter, and (4) a time frame (Johnston, Rodriguez et al. 2014).

The critical importance of interviewer identities also emerged during the formative work. Key informants recommended hiring local data collectors who identified as "insiders" rather than "outsiders" and could thus minimize social distance (Driedger and Peters 1977) and put the study population at greater ease. Additionally, *kayayei* data collectors would be well positioned to confirm eligibility criteria and to rule out potential imposters, such as beggars, who might attempt to participate for the incentive. Seven data collectors from northern Ghana who self-identified as *kayayei* and who had a high school education were selected and trained to administer the survey questionnaire to participants. Data collectors spoke English, Twi, Dagbani, Frafra, Mampruli, Kusaal, and Sisaala. Like the *kayayei* community leaders consulted during the formative research phase, all data collectors were bilingual or multi-lingual, speaking two ($n = 2$), four ($n = 2$), or five languages ($n = 3$). The

number of data collectors was based on linguistic needs as well as sampling estimates that assisted in study planning and implementation (Wejnert, Pham et al. 2012). Conservative calculations revealed that an estimated a sample of 538 *kayayei* was required to achieve the same statistical power as a simple random sample one-tenth as large (Lattof 2018).

4.2.2 Recruitment of seeds and participants

Following this formative work and a review of studies with comparable estimated sample sizes, ten seeds were initially identified in collaboration with the Kayayei Youth Association. Whilst no exact method exists for selecting seeds, prior studies have often selected 1–20 seeds that reflect diversity (Kubal, Shvab et al. 2014). My analyses of census data as well as prior studies on *kayayei* indicate that most north-south female *kayayei* migrants are Muslims from the Northern Region, so a higher proportion of seeds reflected these characteristics. Seeds were selected to ensure variety across additional characteristics, such as the current length of time spent in Accra, the number of migrations made to Accra, primary worksite in Accra, and homelessness. Four seeds failed to generate sufficient recruitment chains, producing an insufficient number of referrals to generate a final sample independent from these four seeds. Two of those failed seeds identified as Mole-Dagbani, an ethnic group that was well represented among the remaining seeds. The other two failed seeds identified as Sissala and Frafra, warranting replacement seeds that identified similarly to ensure sufficient representation. The remaining six seeds were growing sufficiently and their recruitment chains continued to generate new recruits, so only two replacement seeds were added to the study.

In consultation with stakeholders, coupons were designed and printed in English, the primary language of instruction in Ghana's schools. Given low levels of education and literacy among the study population, many participants would likely be unable to read the coupons. If illiterate participants sought assistance from someone outside the office, whoever read the coupon would have learned English in school. To minimize issues with using coupons among a largely illiterate population for whom the coupons would serve as a visible token of potential participation, data collector training emphasized the importance of concise oral recruitment instructions to each participant after the survey. Participants were encouraged to return to the office if they had questions about the coupon details. Participants received three recruitment coupons until their recruitment chain reached the

third wave, at which point the number of coupons was reduced to two. In the last week of the study, the number of recruiting coupons was gradually reduced to zero. Initially, coupons expired within one week in order to minimize coupon degradation and maximize the possibility that recruiters would correctly recall the recruitment instructions. It became apparent after the first week that a shorter referral window would lead to less coupon deterioration and fewer reports of coupons being taken north with potential recruits returning home. The coupon validity period was reduced to three days for the remainder of the survey.

Recruits who held a valid coupon were invited to participate in the study if they met the following selection criteria:

1. Female
2. Currently working as a kayayoo in Accra
3. Migrated to Accra from one of the three northern regions (Upper East Region, Upper West Region, or Northern Region)
4. Has not already participated

Assigning participants to data collectors based on shared ethnic group and/or shared language increased the likelihood that any ineligible returning participants would be re-interviewed and identified by their original data collector. Whilst data collectors were advised to be aware of the possibility of repeat participants and were encouraged to report suspected repeat participants, they identified no cases.

The data collection team ensured that prior to participation all participants received the required study information in a manner that was understandable, so that consent was obtained without coercion or undue influence. Due to low literacy levels among the study population and suspicion over signing documents, verbal consent was preferable to written consent so as to reduce the potential of embarrassment and underscore the participants' agency. Participants were offered the option of verbal consent in which the researchers followed a set script (Evans and Becker 2009, GSS, GHS et al. 2009, Day 2014). Among participants under 18 years of age, the data collectors inquired about whether the participants migrated to Accra with a parent or guardian or if they were “emancipated minors” who migrated to Accra alone. Adults (those aged 18 years and older) and

independent child migrants (emancipated minors under 18 years of age) received the standard consent form. Children under 18 years who resided in Accra with a parent or guardian were asked to bring their parent or guardian to the office to complete a parental consent form and child assent form before participating. The London School of Economics and Political Science Research Ethics Committee (on 18 November 2014) and the University of Ghana's Noguchi Memorial Institute Institutional Review Board (protocol number 065/14–15) approved this research. In addition, I sought approval from *kayayei* community leaders, the Kayayei Youth Association's Board of Directors, the Director of Social Welfare, and the local chief.

4.2.3 Data collection

The research team pre-tested and piloted the questionnaire during the formative research period in order to verify the questionnaire structure, formulation of questions, appropriate language and terminology, completion times, range of variation in response variables, and respondent understanding. Data collectors uncovered that the term “sister” was causing confusion, since in this setting “sister” is often used to refer to a close female friend. All survey references to “sister” were thus changed to “biological sister.” Data were recorded in a 25-page questionnaire with ten modules (personal network size, demographic characteristics, employment, reproduction, recent illness or injury, health insurance, relationships, family planning, sexually transmitted infections, and data collector observations). Though the majority of training concluded before the study started, I continued on-the-job training during survey implementation.

Since analysis of respondent driven sampling data relies on the collection of the personal network size variable that measures the number of eligible people in each participant's personal network who are members of the study's target population (Johnston, Rodriguez et al. 2014), data collector training emphasized what it means to know someone and different ways of phrasing this expression, such as “someone who would recognize you at the market.” These relationships between recruiters and participants should include strong and weak ties in order to sample a wide range of participants from the target population and reduce the likelihood of recruitment bottlenecks (Johnston, Rodriguez et al. 2014). Data collectors obtained participants' personal network size from three questions at the start of the survey. The first question defines the target population and what it means to

know someone (#101). In order to prevent the recruitment of strangers, this question also references time spent together (e.g., carrying loads together for the same customer, sharing a room, sitting together on a break). Subsequent questions on personal network size limit the survey's geographic boundary to Accra (#102) and the estimation period to two weeks (#103) to reduce recall bias:

101. How many *kayayei* do you know who are from the northern three regions: Upper East, Upper West, and Northern Region? By 'know,' I mean you know them and they know you. You know their name, and they know your name. They are people you have spent time with who would recognize you in the market.

102. How many of these girls and women currently work in Accra as *kayayei*? Please give an exact number.

103. How many of these northern *kayayei* girls and women have you seen at least once in Accra during the last two weeks? Please take your time to count so that you can give me an exact number.

The answer to this third question is considered to be the participant's personal network size and is used in analyses to weight the data and assess sample bias. It is from this network that respondents ideally recruit at random; however, *kayayei* migrants reported during the formative assessment phase that their networks were highly mobile, sceptical or fearful of participating in research, and might believe the coupons were a scam. Respondent driven sampling permits data capture on non-respondents when participants return to collect their recruiting bonuses, shedding light on specific factors that affect a population's willingness to participate. Based on this information and evidence in the literature on recruitment biases (Liu, Li et al. 2012, Rudolph, Fuller et al. 2013), a fourth question on personal network size was added to the survey questionnaire in an attempt to acknowledge participants' inherent existing biases and more accurately measure personal network size. When compared to question 103, this fourth question on personal network size may help identify or minimize the potential effects of participants not recruiting individuals within their networks randomly (e.g., not recruiting individuals who plan to migrate soon, recruiting someone who needs money, not discussing the research with sceptical

individuals who might decline a coupon). The fourth question emphasizes which contacts in a respondent's network she would consider inviting to participate in this research:

104. From the number you just told me, how many of these *kayayei* would you consider inviting to this study?

Quality checks were built into the survey and participant flow. Once the data collector finished administering a survey, I reviewed the survey on site for completeness and accuracy and resolved any inconsistencies or skipped questions with the participant before she received her payment and recruitment instructions. A subset of purposively selected survey participants ($n = 48$) completed in-depth interviews to discuss their migration histories and their experiences with illness/injury in the two weeks preceding the survey. I conducted these interviews with a translator whose was identified from amongst the data collectors when her skill at connecting with participants became apparent during the survey. The interviews, recorded and transcribed in English, also serve as an important indirect source of information on participants' reasons for participating in social science research.

4.2.4 Analyses

Analyses of the population parameters, including the final sample size and sample stability, were conducted using Respondent Driven Sampling Analysis Tool (RDSAT) Version 7.1 (Volz, Wejnert et al. 2012). Apart from analyses of recruitment productivity, seeds were excluded from additional analyses. Partition analysis for categorical and continuous variables in RDSAT used the following recommended options for optimal accuracy and the most stable estimates: dual component estimate for average network size with a mean cell size of 12, $\alpha = 0.025$, enhanced data-smoothing algorithm type, and 16,000 re-samples for Bootstrap (Heckathorn 2007, Spiller, Cameron et al. 2012). Prevalence estimation and equilibrium, or the point at which the sample distribution within variables has stabilized and results in a sample independent of the non-random *kayayei* migrant seeds (Heckathorn 1997, Heckathorn 2002), were also assessed in RDSAT. As recommended in the RDSAT 7.1 User Manual, estimates of the number of waves required for equilibrium used the default convergence radius of 0.02 (Spiller, Cameron et al. 2012). Results are reported based on the criteria in the Strengthening the Reporting of

Observational Studies in Epidemiology for Respondent Driven Sampling Studies (STROBE-RDS) checklist (White, Hakim et al. 2015).

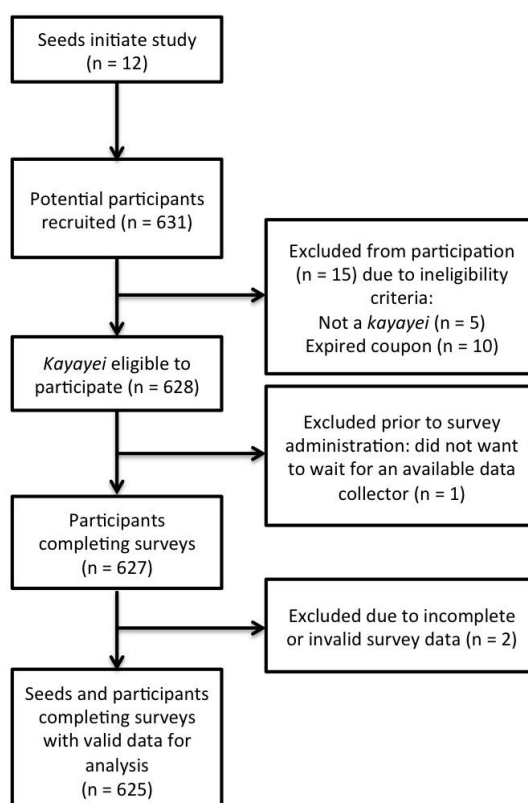
These analyses are based on six assumptions about respondent driven sampling: (1) respondents have reciprocal relationships with one another; (2) respondents' social networks are dense enough to sustain a chain-referral process; (3) each respondent recruits a single peer; (4) respondents recruit randomly from their networks; (5) respondents can accurately report their personal network sizes to data collectors; and (6) sampling occurs with replacement (Salganik and Heckathorn 2004, Heckathorn 2007). Pre-implementation discussions with *kayayei* generated confidence in the first three assumptions. The fourth assumption (respondents recruit randomly from their networks) is difficult to ensure since factors such as the incentives, study location(s), ethno-linguistic identity, and research topic may influence to whom participants give their coupons (Heckathorn 2007). The researcher discussed these factors with key informants during the formative research period when assessing the appropriateness of respondent driven sampling and selecting both the study location and incentives. Whilst this fourth assumption is a limitation of respondent driven sampling that cannot currently be rectified, the survey questionnaire included a fourth question on participants' personal network sizes in an attempt to minimize potential violation of the fourth assumption, specifically potential recruitment biases underlying the recruiter-recruit relationship. This question and the fifth assumption (accurately reporting personal network size) were tested extensively during data collector training. Most studies using respondent driven sampling violate the sixth assumption (sampling occurs with replacement) since, by design, participants cannot participate again. Biases from violating this particular assumption remain poorly understood (Volz and Heckathorn 2008, Goel and Salganik 2009). Among samples that are relatively small compared to the total population's size, the sixth assumption is relaxed (Volz and Heckathorn 2008).

4.3 Results

Of 643 potential participants recruited using respondent driven sampling, including 12 seeds, a total of 625 participants completed the survey (Figure 13). Participants represented fifteen different ethnic groups and had a mean age of 25.2 years (s.d. 8.1 years). One in ten participants completed the survey in Twi, a southern dialect of Akan, and 4.0% of participants completed the survey in English. In-depth interview participants reported

learning Twi as quickly as possible upon arrival in Accra in order to communicate with customers and obtain work.

Figure 13: Participant flow diagram of *kayayei* migrants in Accra, Ghana (March-April 2015)



Nearly all participants (97.6%) cited employment as a primary reason for migrating to Accra, and 93.0% of participants knew that they would work as *kayayei* before migrating. Over half of participants (56.0%) migrated to Accra alone. Participants reported migrating to Accra between one and seven times. One-third of participants were on their first migration, and one-third of participants were on their second migration. The remaining third of participants migrated to Accra three or more times. Of the 544/625 participants who recommended *kayayei* work to someone in the north, 541 participants (99.6%) reported that the individuals to whom they recommended *kayayei* work later migrated south. Only 3.2% of participants had prior *kayayei* experience outside of Accra: three participants previously worked as *kayayei* in Kumasi (Ashanti Region), and 17 participants previously worked as *kayayei* in Tamale (Northern Region).

4.3.1 Recruitment productivity

An average of 156 recruits completed the survey each week. Excluding the 12 seeds recruited into the study without coupons, participants redeemed 613 of the 915 recruitment coupons (67.0%) distributed. This coupon return rate exceeds that of other studies using respondent driven sampling among migrants; these studies generally report coupon redemption rates from 30.0% to 45.0% among migrant populations in Australia, Albania, and Kenya (International Organization for Migration 2010, Johnston, Thurman et al. 2010, Bryant 2014). The high rate of return achieved in this study is more comparable to studies examining adolescent health among non-migrant populations in Ibadan, Nigeria (53.7%) and Delhi, India (75.0%) (Decker, Marshall et al. 2014).

Seeds two, three, and eleven generated the largest numbers of linked recruits (Table 14). The longest recruitment chain consisted of 11 waves. Four of the ten initial seeds failed to generate recruitment trees. The youngest seeds (#6 and #7) (aged 12 and 13 years, respectively) recruited no one. Age may be a critical factor when selecting seeds, though the most productive seed (#2) was 15 years old. Seed nine recruited only one participant. These three unproductive seeds (#6, #7, and #9) failed to recruit for reasons that remain unknown. Seed eight recruited two participants before that recruitment tree failed. After that tree stopped generating new recruits, the seed informed us that one of her recruits who accepted a coupon had returned to the Upper East Region with the coupon. Seed eight mentioned that her other two successful recruits had given out all their coupons, but then people in the community told these potential recruits that they were being fooled and should not participate. It is possible that the younger seeds also received such “advice” from older community members who felt they were acting in the seeds’ best interests. In response to these failed seeds, two older replacement seeds (#11 and #12) were recruited. At the end of the study, eight of the 12 seeds generated recruitment chains of sufficient length for analysis.

Table 14: Characteristics of seeds sorted by increasing recruitment productivity

Seed characteristics											Seed recruitment productivity		
#	Original or replacement seed	Age in years	Ethnic group	Region of origin	Number of migrations to Accra	Current length of time in Accra	Worksite in Accra	Homeless	Highest level of school completed	Religion	Number of seed's direct recruits	Number of waves linked	Total number of recruits linked (%)
6	O	12	Mole-Dagbani	Northern	1	2 months	Tema Station	No	Primary	Muslim	0	0	0 (0.0)
7	O	13	Mole-Dagbani	Northern	1	1 year	Makola Market	No	None	Muslim	0	0	0 (0.0)
9	O	27	Sissala	Upper West	1	1 year	Plantain Market	No	None	Muslim	1	1	1 (0.16)
8	O	20	Frafra	Upper East	2	7 months	Agbogbloshie	No	Middle	Catholic	2	1	2 (0.33)
12	R	27	Frafra	Upper East	4	3 years	Makola Market	No	None	Presbyterian	3	11	45 (7.34)
5	O	28	Mole-Dagbani	Northern	3	8 months	Roams around	No	None	Muslim	3	9	51 (8.32)
1	O	32	Mampruli	Northern	1	7 years	Makola Market	Yes	None	Muslim	3	9	53 (8.65)
4	O	14	Mole-Dagbani	Northern	1	1 year	C.M.B.	Yes	Primary	Muslim	3	10	58 (9.46)
10	O	19	Kusasi	Upper East	2	4 months	Darkuman	No	Primary	Muslim	3	8	61 (9.96)
11	R	30	Sissala	Upper West	4	7 years	Agbogbloshie	No	None	Muslim	2	10	97 (15.82)
3	O	25	Mole-Dagbani	Northern	5	8 months	Konkomba Market	Yes	None	Muslim	3	10	117 (19.09)
2	O	15	Mole-Dagbani	Northern	1	4 months	Konkomba Market	No	Primary	Muslim	3	10	136 (22.19)

The recruiter-recruit relationship was tracked with a series of nine questions that were incorporated into the survey. Participants most often reported that their recruiters were friends (58.6%) or biological sisters (25.8%). The majority of participants (95.0%) saw their recruiters every day and knew them very well (96.3%), indicating strong pre-existing networks. Three in five participants had known their recruiter for one or more years. Two in five participants knew their recruiter for ten months or less. The survey also asked recruits what type of work their recruiters did for further verification that the recruiters were indeed *kayayei* migrants.

Data collectors asked participants returning to collect recruitment payments if anyone declined to accept a participation coupon. Participants provided non-response data for 16 potential recruits who ranged in age from 16 to 40 years. Participants had strong relationships with these potential recruits and saw them nearly every day. About one third of non-respondents declined a participation coupon on the grounds that they were too busy to participate. Fear of research was the second most common reason (25.0%) for declining a coupon, followed by a reported lack of interest (18.8%).

4.3.2 Network size and ties

To compare the effect of different questions capturing personal network size, this section reports outcomes calculated from both the standard question on personal network size (#103) and the fourth question on personal network size (#104) added in an attempt to provide a potentially more robust measure in this setting. Participants' mean network size of 22.73 *kayayei* (s.d. 13.55, min. 1, max. 99) decreased to 9.66 *kayayei* (s.d. 6.68, min. 1, max. 50) when asked to specify how many individuals in their network they would consider inviting to this study (Table 15). Network size increases as participants become more educated and as the number of migrations to Accra increases (Table 16). Homeless participants reported larger networks than participants who were not homeless.

Table 15: Comparison of questions on personal network size and participants' mean network sizes

Question on personal network size	Question's aim	Participants' mean network size (s.d.)
101. How many <i>kayayei</i> do you know who are from the northern three regions: Upper East, Upper West, and Northern Region? By 'know,' I mean you know them and they know you. You know their name, and they know your name. They are people you have spent time with who would recognize you in the market.	Define the target population and what it means "to know" someone	88.03 (51.43)
102. How many of these girls and women currently work in Accra as <i>kayayei</i> ? Please give an exact number.	Limit the survey's geographic boundary to Accra	49.04 (26.50)
103. How many of these northern <i>kayayei</i> girls and women have you seen at least once in Accra during the last two weeks? Please take your time to count so that you can give me an exact number.	Limit the estimation period to two weeks to reduce recall bias	22.73 (13.55)
104. From the number you just told me, how many of these <i>kayayei</i> would you consider inviting to this study?	Help identify or minimize the potential effects of participants not recruiting individuals within their networks randomly	9.67 (6.68)

Ethnic group and religion, two variables that did not obtain equilibrium, appear to have restricted some respondents from participating. Ethnic ties remain strong for many participants. Homophily indices (Table 16), a measure of cross-group recruitment ranging from -1 (preference for recruiting from outside one's group) to +1 (preference for recruiting from within one's group) (Heckathorn 2002), show that participants belonging to Mampruli, Sisaala, Mole-Dagbani, and Frafra tribes were unlikely to recruit across ethnic group; these participants strongly preferred to recruit members of their own tribes. This unwillingness to recruit across ethnic group may be rooted in linguistic differences. It could also reflect a desire to share resources (i.e., the respondent driven sampling incentives) internally with close friends and family. Homophily indices below 0.4 indicate cross-group recruitment, whereby participants with a particular characteristic are willing to

recruit participants without that particular characteristic. Participants recruited freely across characteristics like education level, homelessness, age, and recent illness/injury.

Table 16: Effect of personal network size questions on network sizes and homophily for key demographic characteristics

Characteristic	Q103 personal network size		Q104 personal network size	
	Adjusted average network size	Homophily index	Adjusted average network size	Homophily index
Education level				
None	12.147	-0.015	5.065	0.015
Primary	16.230	0.208	6.932	0.214
Middle/JSS	19.103	0.066	5.347	0.042
Secondary/SSS	22.133	0.132	11.130	0.145
Age group (in years)				
10–14	11.502	0.176	4.189	0.161
15–19	10.762	0.057	5.123	0.087
20–24	14.001	0.097	5.465	0.085
25–29	13.570	0.007	5.464	0.002
30–34	12.388	0.084	5.096	0.077
35–39	18.920	0.047	8.432	0.076
40–44	18.920	0.026	6.560	0.018
45–49	16.347	-1.000	8.737	-1.000
50+	9.019	-1.000	3.540	-1.000
Homeless				
Yes	19.441	0.169	6.463	0.144
No	12.349	-0.042	5.212	-0.013
Current migration to Accra				
1st	12.734	0.057	5.223	0.063
2nd	12.585	0.022	5.450	0.057
3rd	12.961	0.011	5.100	0.002
4th	17.036	0.041	5.208	0.024
5th	17.450	-1.000	8.055	-1.000
6th	16.984	-1.000	6.781	-1.000
7th	18.837	-1.000	8.291	-1.000
Religion				
Catholic	22.911	0.566	10.011	0.567
Anglican	18.374	-0.999	11.201	-0.999
Methodist	19.773	-0.995	12.593	-0.991
Presbyterian	28.160	0.067	11.622	0.067
Pentecostal/Charismatic	24.977	-0.999	9.968	-0.999
Muslim	12.502	0.489	5.093	0.461
Traditional/Spiritualist	7.000	0.140	2.000	0.138

Characteristic	Q103 personal network size		Q104 personal network size	
	Adjusted average network size	Homophily index	Adjusted average network size	Homophily index
Illness or injury in last two weeks				
Illness	18.034	0.207	8.908	0.254
Injury	17.915	0.028	6.231	0.026
Both	28.713	-0.999	11.591	-0.999
Neither (Healthy)	11.545	-0.084	4.439	-0.134
Ethnic group				
Mampruli	17.208	0.739	7.486	0.740
Sissala	16.232	0.917	7.284	0.917
Ashanti	20.000	0.066	15.000	0.066
Guan	20.000	-0.997	8.000	-0.997
Mole-Dagbani	11.530	0.766	4.620	0.747
Grussi	24.262	0.179	9.698	0.179
Gruma	25.714	-0.987	8.699	-0.989
Konkomba	6.173	-1.000	4.432	-1.000
Dagaba	40.000	0.066	29.000	0.066
Kusasi	21.951	0.165	10.313	0.166
Mandé	55.000	0.066	7.000	0.066
Frafra	27.552	0.724	11.928	0.724
Walla	30.000	-0.970	20.000	-0.950
Gonja	30.000	-0.990	9.000	-0.992
Hausa-Dagomba	11.000	0.064	2.000	0.061

To understand how changes in capturing personal network size affect the analyses, I calculated the prevalence of recent illness and/or injury. The prevalence of illness and/or injury in the past two weeks among *kayayei* migrants in Accra is 27.4% (confidence interval 23.6% to 33.1%) using the personal network size data captured in the standard (three-part) question on personal network size. This figure declines to 23.1% (confidence interval 19.6% to 28.1%) when analysed using the more conservative data on personal network size that incorporate the fourth question.

In addition to changes in prevalence, differences in capturing personal network size result in subtle changes to estimated population proportions (Table 17). For age group (in years), asking a narrower question on personal network size (#104) reduced the waves needed for equilibrium from five to four, meaning that after four waves, the sample distribution within

age group stabilized and produced a sample independent of the age groups of the initial non-random migrant *kayayei* seeds (Heckathorn 1997, Heckathorn 2002). Upon further inspection of the data, a decline in waves required for equilibrium also appeared for respondents' primary source of drinking water; however, an opposite trend appeared for respondents' relationship to their recruiter and place of residence in Accra. Both variables required one additional wave to reach equilibrium when estimates used question #104. Asking question (#104) in an attempt to exclude any known or perceived non-responders from the recruiter's network calculation certainly did not harm the population estimates.

The majority of variables achieved equilibrium in five waves or fewer. Ethnic group, however, was a notable exception. Achieving equilibrium for this variable would have required running the survey for an average of 54 waves (min 48, max 80), exceeding the resources of this study. It was also not possible to achieve equilibrium for religion or place of residence in Accra, two variables that are closely affiliated with ethnic group in this setting.

Table 17: Sample proportions for demographic characteristics versus population estimates by personal network size question

Characteristic	Sample population proportions	Q103 personal network size		Q104 personal network size			
		Estimated population proportions (95% CI)	Standard error	Waves required	Estimated population percentages (95% CI)	Standard error	Waves required
Education level				3			3
None	73.3	79.8 (74.8, 84.1)	0.024		78.3 (73.1, 82.7)	0.025	
Primary	17.3	13.8 (10.0, 18.3)	0.021		13.2 (9.8, 17.2)	0.019	
Middle/JSS	7.4	5.1 (3.4, 7.0)	0.009		7.4 (4.6, 10.9)	0.016	
Secondary/SSS	2.1	1.3 (0.5, 2.3)	0.005		1.0 (0.4, 1.8)	0.004	
Age group (in years)				5			4
10–14	6.9	8.0 (4.8, 12.6)	0.020		8.9 (5.4, 13.0)	0.020	
15–19	15.0	18.9 (13.6, 25.0)	0.029		16.2 (12.2, 21.3)	0.023	
20–24	25.9	24.9 (19.3, 29.0)	0.024		26.1 (20.9, 30.6)	0.024	
25–29	19.5	18.7 (14.5, 23.8)	0.024		19.0 (14.8, 23.9)	0.023	
30–34	18.9	19.6 (14.5, 25.2)	0.027		19.6 (15.3, 25.1)	0.025	
35–39	5.6	3.8 (2.2, 5.8)	0.009		3.4 (2.2, 5.2)	0.008	
40–44	6.2	4.2 (2.7, 6.2)	0.009		4.9 (2.8, 6.0)	0.008	
45–49	1.1	0.8 (0.2, 1.9)	0.005		0.6 (0.1, 1.3)	0.003	
50+	0.8	1.1 (0.1, 2.6)	0.007		1.2 (0.1, 2.6)	0.006	
Homeless				2			2
Yes	17.6	11.9 (9.0, 15.1)	0.016		14.4 (11.4, 18.4)	0.018	
No	82.4	88.1 (84.9, 91.0)	0.016		85.6 (81.6, 88.6)	0.018	
Current migration to Accra				2			2
1st	33.4	34.8 (28.6, 40.8)	0.031		34.8 (29.4, 40.6)	0.028	
2nd	35.4	37.2 (31.0, 42.9)	0.030		35.1 (29.0, 39.7)	0.027	
3rd	17.1	17.4 (13.5, 22.8)	0.024		18.2 (14.2, 23.5)	0.024	
4th	7.0	5.2 (3.4, 7.7)	0.011		6.9 (4.4, 10.1)	0.015	
5th	3.4	2.4 (1.1, 4.3)	0.008		2.1 (0.1, 3.5)	0.006	
6th	2.9	2.4 (1.1, 4.0)	0.007		2.4 (1.3, 3.9)	0.007	
7th	0.8	0.5 (0.1, 1.2)	0.003		0.5 (0.1, 1.2)	0.003	

Characteristic	Sample population proportions	Q103 personal network size			Q104 personal network size				
		Estimated proportions	population (95% CI)	Standard error	Waves required	Estimated proportions	population (95% CI)	Standard error	Waves required
Religion					17				17
Catholic	8.6	3.6 (1.6, 7.1)		0.014		3.4 (1.5, 6.6)		0.013	
Anglican	0.5	0.3 (0.0, 0.8)		0.002		0.2 (0.0, 0.5)		0.001	
Methodist	0.3	0.2 (0.0, 0.6)		0.002		0.1 (0.0, 0.4)		0.001	
Presbyterian	1.4	0.5 (0.1, 1.1)		0.003		0.5 (0.1, 1.1)		0.003	
Pentecostal/Charismatic	0.8	0.3 (0.0, 0.7)		0.002		0.3 (0.0, 0.7)		0.002	
Muslim	88.2	94.8 (90.5, 97.5)		0.019		95.0 (91.0, 97.6)		0.021	
Traditional/Spiritualist	0.2	0.4 (0.0, 1.2)		0.008		0.5 (0.0, 1.7)		0.014	
Ethnic group					56				56
Mampruli	5.9	4.3 (1.1, 8.6)		0.020		4.0 (1.0, 8.0)		0.018	
Sissala	13.3	7.6 (0.5, 20.2)		0.058		6.9 (0.5, 18.7)		0.057	
Ashanti	0.2	0.1 (0.0, 0.5)		0.001		0.1 (0.0, 0.4)		0.004	
Guan	0.2	0.1 (0.0, 0.4)		0.001		0.1 (0.0, 0.4)		0.001	
Mole-Dagbani	67.2	84.7 (69.8, 93.8)		0.075		85.9 (71.7, 94.4)		0.073	
Grussi	1.8	0.3 (0.0, 1.1)		0.010		0.4 (0.0, 1.2)		0.008	
Gruma	0.5	0.1 (0.0, 0.3)		0.005		0.1 (0.0, 0.4)		0.005	
Konkomba	0.5	0.9 (0.0, 3.0)		0.008		0.5 (0.0, 1.8)		0.005	
Dagaba	0.2	0.0 (0.0, 0.4)		0.010		0.0 (0.0, 0.4)		0.003	
Kusasi	0.6	0.2 (0.0, 0.4)		0.012		0.1 (0.0, 0.5)		0.011	
Mandé	0.2	0.0 (0.0, 0.3)		0.001		0.1 (0.0, 0.4)		0.001	
Frafra	9.1	1.2 (0.0, 3.9)		0.035		1.1 (0.0, 3.7)		0.034	
Walla	0.2	0.0 (0.0, 0.3)		0.007		0.0 (0.0, 0.3)		0.001	
Gonja	0.2	0.1 (0.0, 0.3)		0.001		0.1 (0.0, 0.4)		0.001	
Hausa-Dagomba	0.2	0.3 (0.0, 0.9)		0.008		0.6 (0.0, 1.7)		0.009	

Characteristic	Sample population proportions	Q103 personal network size			Q104 personal network size				
		Estimated proportions	population (95% CI)	Standard error	Waves required	Estimated proportions	population (95% CI)	Standard error	Waves required
Illness or injury in last two weeks					2				2
Illness	35.2	25.9 (22.1, 31.3)		0.024		21.3 (18.0, 26.1)		0.021	
Injury	2.6	1.4 (0.5, 2.7)		0.006		1.6 (0.6, 3.2)		0.007	
Both	0.6	0.1 (0.0, 0.4)		0.001		0.1 (0.0, 0.4)		0.001	
Neither (healthy)	61.6	72.6 (66.9, 76.4)		0.024		76.9 (71.9, 80.4)		0.022	

* Population proportions are reported per 100 individuals.

4.3.3 Successes and challenges implementing respondent driven sampling

The study population perceived respondent driven sampling as a feasible, well-received sampling method, based on feedback from participants and key informants. Primary advantages of this method include: empowering potential participants to participate, if interested, at a time of their choosing; employing data collectors from the study population who participants trusted; and recognising participants' missed work opportunities through participation incentives. Participant clustering and rapid coupon deterioration may limit successful implementation of respondent driven sampling in similar settings. Exploring these factors during a formative research phase with support from community members will ultimately assist in successful implementation.

4.3.3.1 Coupons and recruitment

Key informants and participants perceived respondent driven sampling's peer recruitment and coupon features as a means to give participants control over whether or not to participate and the timing of their participation. Participants could complete the survey when it suited their schedules, such as periods when the markets were slow or on breaks. During the first week of data collection, data collectors noted occasional stress caused by participant clustering. Participants often waited to redeem their coupons in groups (e.g., those who share a room, friends who work at the same market) around lunchtime and in the afternoon.

Lesson learned: To manage participant flow, suggest that participants encourage their recruits to come at times when the office is known to be quieter with shorter waiting times. Offer water and snacks to participants waiting to be surveyed, and provide approximate wait times to participants during busy hours.

The use of paper coupons was difficult in Agbogbloshie, where paper deteriorates quickly. Multiple participants and potential participants reported coupons being burned in building fires. Some potential participants reported that their coupons, stored with their money, had been stolen when thieves robbed them at night. The rainy season also soaked multiple coupons until the participant numbers were nearly illegible.

Lesson learned: Laminating coupons or choosing a thicker paper with indelible ink could help mitigate coupon deterioration under similar circumstances. Shortening expiration dates to two or three days can also help mitigate coupon deterioration to a degree; however, some coupon deterioration and loss is unavoidable in settings with similar climates and among populations that are homeless or reside in informal settlements.

Among a largely illiterate study population, continued participation relied crucially on oral recruitment instructions. Most participants remembered the oral instructions well and were able to share them with their recruits, though recruits came by the office occasionally to ask questions and inquire about the validity of their coupons. One data collector served as the first point of contact for participants and potential participants. She managed all inquiries, along with the informed consent process and linguistic matching of participants with data collectors. During opening hours, this process ran quite smoothly. However, there was one instance in which two young girls misunderstood the recruitment instructions from their recruiter. These participants appeared at the office to participate in the early morning and reportedly waited around for two hours until the office opened. In the last days of data collection, data collectors informed participants that the study was concluding at the end of the week. The office remained open for one week after the study ended in order to pay out recruitment bonuses and answer any questions about the study, but only one participant returned to collect her recruiting bonus. No potential participants attempted to redeem expired coupons once the study ended, suggesting that the oral participation instructions were well received and understood.

Lesson learned: When conducting respondent driven sampling among a largely illiterate population, keep recruiting instructions concise. Encourage recruiters and recruits to visit the study site if they forget oral participation details. Establish a member of the research team at the place of interview as a visible first point of contact for participants and potential participants seeking additional information.

4.3.3.2 Kaya data collectors

Hiring and training *kayayei* with a high school education to work as data collectors was a valuable recommendation from the formative assessment period. The *kayayei* data

collectors were integral to the success of this research. They minimized participants' fears of participating in research and put participants at ease. Data collectors repeatedly mentioned that *kayayei* said they participated because data collectors could speak their languages and identify with the group. Data collectors also reported multiple participants saying that they only spoke truthfully since the data collector spoke the same language. In addition, *kayayei* data collectors were well positioned to identify ineligible participants (e.g., beggars) who might have attempted to participate using fabricated responses to obtain the incentive.

Lesson learned: Identify appropriate data collectors with input from the study's target population, especially when populations have reported negative prior experiences with researchers, outsiders, and census enumerators. Hiring data collectors who identify as "insiders" could assist the study population in feeling at greater ease and minimize social distance. For surveys of a sensitive nature, gender-matching may further encourage rapport and free discussion between participants and data collectors (Oakley 1981).

4.3.3.3 Incentives

Incentives are increasingly used in research to motivate and recruit participants. The potential of incentives to coerce or to exert undue influence participation is understandably controversial, particularly in studies where the research is risky and degrading (Grant and Sugarman 2004, Singer and Couper 2008). For minimal-risk, non-degrading human-subjects research that fulfils the usual ethical criteria, like this study, incentives often pose no ethical problems (Grant and Sugarman 2004, Singer and Couper 2008).

In practice, the initial participation incentive (GH¢ 5) operated as compensation for the actual and potential missed work that participants could be expected to forego in order to participate in this study. To make participation worthwhile, the participation incentive had to compensate participants for their time spent participating in the study (GH¢ 2) as well as for the time involved in traveling to the office and any potential transportation expenses (GH¢ 3). This incentive did not appear to be excessive. Only five ineligible people attempted to participate, and the data collection team heard no reports of people selling or bartering coupons. Data collectors did not identify any repeat participants. When asked to

evaluate the quality of information that participants shared, data collectors assessed 97.0% of participants as providing high quality information, 2.1% as providing fair quality information, and 1.0% as providing low quality information. Data collectors reported that participants assessed as providing fair or low-quality information tended to be shy, did not know their exact age, or needed to have questions repeated. No data collectors reported that they suspected the incentive affected participants' responses, leading to lower quality data.

Lesson learned: Compensating participants for their time spent completing the survey may insufficiently motivate working individuals to participate. The participation incentive may need to include compensation for time traveling to the office and transportation expenses. The formative research phase should address these factors.

To ensure continued recruitment, the maximum recruitment bonus remained at GH¢ 3 throughout the study. Participants receiving three coupons would receive GH¢ 1 per recruit, those with two recruiting coupons would be paid GH¢ 1.5 per recruit, and those with one recruiting coupon would be paid GH¢ 3 for successful recruitment. Of the 575 participants who received recruiting coupons, 68.4% returned to the office to collect payment for successfully recruiting additional participants. It is possible that those who did not return for their recruiting bonuses migrated elsewhere, deemed the bonus too low to justify time away from work to collect it, or were waiting for confirmation from their recruits that their recruits had completed the study.

Participants also identified non-financial reasons for participation. They reported participating because the research team treated them with respect that they seldom received in Accra:

You see us to be human beings, like you. [...] How they [in Accra] open their mouths to insult us, they don't see us to be human beings like the way you see us to be human beings.

- Participant, from the Upper East Region, 20s

Others valued the opportunity to have their voices heard and to advocate for increased development and economic opportunities in northern Ghana. Whilst the in-depth interviews focused on participants' migration histories and their use of health services for recent illness/injury, interview respondents frequently discussed their motivations for participating in the survey research. Many participants were hopeful that the findings from this research would translate into help:

God give you people more knowledge so that you people will help us at the north.

- Participant and respondent driven sampling seed, from the Northern Region, 20s

Now when they are telling us what is the problem, they know that it will go outside to USA or London so that they [outsiders] will know their [kayayei's] problems.

- Translator, from the Northern Region, 30s

The theme of beneficence emerged among respondents who hoped that the study would benefit their families and their communities. Some participants asked for assistance in paying the school fees of their children or siblings, for example. Whilst financial assistance was not provided by this research project, conducting the study out of the Kayayei Youth Association office enabled the research team to raise awareness of local initiatives by nongovernmental organizations and to link participants with appropriate, albeit limited, services.

Lesson learned: During the formative research phase, gather information about local initiatives and services that may be relevant to the study population. Have details of these services available during the study to assist participants in connecting with necessary services.

4.4 Discussion

Sampling *kayayei* migrants using respondent driven sampling required a nuanced understanding of both the participants' experiences and the local community to ensure successful implementation and sufficient recruitment. Compared to other studies collecting

data on *kayayei*, this study generated the most comprehensive dataset to date. It overcame many challenges and limitations reported in previous studies (Table 18) and permitted the collection of more data in a shorter timeframe.

Prior studies on *kayayei* report concerns with the representativeness of their samples (Opare 2003, Yeboah 2010, Addai 2011, Oberhauser and Yeboah 2011, Agyei, Kumi et al. 2016). To improve representativeness in this study and to minimize known sources of non-participation bias, the formative research phase discussed past studies' sampling challenges (Table 18) and potential solutions. By using respondent driven sampling rather than a sampling frame generated from phone numbers, for example, this study included 64.8% of respondents who would have been excluded from prior research (Yiran, Teye et al. 2015). Instead of requiring participants speak Twi (Addai 2011), *kayayei* data collectors accommodated participants in multiple dialects. The *kayayei* data collectors also facilitated greater participation among individuals who were suspicious of outsiders, reducing that barrier to participation (Baah-Ennumh, Amponsah et al. 2012).

By design, respondent driven sampling minimized prior challenges with participant availability and willingness to take time away from work to engage in extended conversations (Opare 2003, Awumbila and Ardayfio-Schandorf 2008, Yeboah 2010). This study remained unaffected by the high degree of mobility that challenged others' efforts to track participants and to collect data (Opare 2003, Yeboah and Appiah-Yeboah 2009, Yeboah 2010, Addai 2011), since participation required visiting a central office. Basing the research in a central office will have restricted potential recruits working and living outside the central business district; however, the surveys captured participants living in 29 communities and working in 44 places within Accra.

Lesson learned: For widely dispersed and highly mobile populations, multiple field sites will minimize participants' need for transportation and will better capture their geographical distribution. If financial and personnel resource constraints make such an endeavour unfeasible, select the most appropriate site in close collaboration with stakeholders, including members of the target population.

Table 18: Sampling challenges/limitations among studies of *kayaye* in Ghana and how respondent driven sampling performed against these approaches

Author (year)	Study date(s)	<i>Kayaye</i> population	Data collection tools	Sampling method	Reported sampling challenges/limitations	How respondent driven sampling performed against this approach
(Addai 2011)	July to Sept. 2009	209 <i>kayaye</i> migrants in Kumasi	Survey	Key informant sampling using <i>kayaye</i> fluent in Twi to survey respondents	Concerns with sample representativeness; unreliable/ unknown population size preventing mathematical determination of sample size; no residential addresses from which to sample	Larger sample collected in a shorter time frame; sampling frame unnecessary; multilingual data collectors surveyed <i>kayaye</i> in northern dialects; sampling estimates could be generated in advance to assist in study planning and implementation; respondent driven sampling produced a weighted sample proven to be unbiased for samples of meaningful size; non-response data available
(Agyei, Kumi et al. 2016)	July and Aug. 2014	45 <i>kayaye</i> in Makola and Agboghloshie Markets, Accra	Semi-structured questionnaires, interviews	Mix of snowball sampling and convenience sampling relying upon assistance of local leaders	Concerns with sample representativeness; unreliable/unknown population size preventing mathematical determination of sample size; over-representation from one ethnic or linguistic group	Larger sample collected in a similar time frame; multilingual data collectors accommodated participants in seven different languages; sampling estimates could be generated in advance to assist in study planning and implementation; respondent driven sampling produced a weighted sample proven to be unbiased for samples of meaningful size; non-response data available
(Awumbila and Ardayfio-Schandorf 2008)	2004 to 2005 (survey data)	100 young female porters or <i>kayaye</i> in the central business district of Accra	Questionnaires, key informant interviews, case studies, life histories, focus group discussions, participant observation	Purposive sampling of working participants	Participant availability and willingness to take time away from work	Participants were willing to take time away from work when given control over the timing of their participation and an incentive recognizing missed work; larger sample collected in a shorter time frame; non-response data available

Author (year)	Study date(s)	<i>Kayayei</i> population	Data collection tools	Sampling method	Reported sampling challenges/limitations	How respondent driven sampling performed against this approach
(Baah-Enumh, Amponsah et al. 2012)	--	100 female head porters in Kumasi	Semi-structured questionnaires and interview guides	“Intuitive” selection of participants using snowball sampling	Lack of a sampling frame; unreliable/unknown population size preventing mathematical determination of sample size; population’s unwillingness to communicate with strangers out of suspicion	Sampling frame unnecessary; peer-recruitment enabled recruits to discuss study with known recruiter before participating, minimizing potential fears of research; sampling estimates could be generated in advance to assist in study planning and implementation; non-response data available
(Oberhauser and Yeboah 2011)*	Six months in 2005	Survey of 80 female and 40 male porters in Accra; further in-depth interviews with 15 female and ten male porters	Survey containing semi-structured and structured questions, in-depth interviews, focus group discussions	Snowball sampling	Concerns with sample representativeness	Larger sample collected in a shorter time frame; respondent driven sampling produced a weighted sample proven to be unbiased for samples of meaningful size; non-response data available
(Opare 2003)	--	700 young women and teenage girls	Unstructured interviews (in groups and exclusive), personal observation	Non-random convenience sample at markets and places where <i>kayayei</i> take breaks	Participant availability and willingness to take time away from work; lack of a sampling frame due to highly mobile population; concerns with sample representativeness	Participants were willing to take time away from work when given control over the timing of their participation and an incentive recognizing missed work; sampling frame unnecessary; respondent driven sampling produced a weighted sample proven to be unbiased for samples of meaningful size; non-response data available

Author (year)	Study date(s)	<i>Kayayei</i> population	Data collection tools	Sampling method	Reported sampling challenges/limitations	How respondent driven sampling performed against this approach
(Shamsu-Deen 2013)	June 2011 to Jan. 2012	400 female porters in Accra	Questionnaire, focus group discussions, in-depth interviews, life histories, case studies, key informant interviews	Purposive sampling in selected markets	Unreported	Larger sample collected in a shorter time frame; non-response data available
(Tufeyru 2014)	--	15 migrant women porters in Accra	Semi-structured interviews	Purposeful sampling based on registered members of the Kayayo Youth Association	Unreported	Non-response data available
(Wilson and Mittelmark 2013)	--	8 female porters aged 20–25 years from the north with \geq six months of experience	Interviews and observations	A purposive sampling technique combined with snowball sampling	Sampling method did not produce intended sample of well-adjusted participants	Non-response data available
(Yeboah 2010)*	Mid-June to mid-Dec. 2005	Survey of 80 female and 40 male porters in Accra; in-depth interviews with 15 female and ten male porters	Survey, in-depth interviews, observations, field notes, focus group discussions	Convenience sampling at four selected sites in Accra	Lack of a sampling frame due to highly mobile population; participant availability and willingness to take time away from work; potential bias from convenience sampling; non-generalizable data; concerns with sample representativeness	Participants were willing to take time away from work when given control over the timing of their participation and an incentive recognizing missed work; larger sample collected in a shorter time frame; respondent driven sampling produced a weighted sample proven to be unbiased for samples of meaningful size; non-response data available

Author (year)	Study date(s)	<i>Kayayei</i> population	Data collection tools	Sampling method	Reported sampling challenges/limitations	How respondent driven sampling performed against this approach
(Yeboah and Appiah-Yeboah 2009)*	Mid-June to mid-Dec. 2005	Survey of 80 female and 40 male porters in Accra; in-depth interviews with 15 female and ten male porters	Survey questionnaires, in-depth interviews, observations, focus group discussions	Primarily snowball sampling	Lack of a sampling frame due to highly mobile population; non-generalizable data	Sampling frame unnecessary; larger sample collected in a shorter time frame; non-response data available
(Yiran, Teye et al. 2015)	--	70 female head porters at two markets in Accra who were pregnant or nursing	Survey questionnaire, in-depth interviews	Ad hoc listing exercise collected <i>kayayei</i> 's phone numbers; researchers selected participants from this sampling frame using simple random sampling; administered questionnaires in northern languages	Unreliable/unknown population size preventing mathematical determination of sample size	Mobile phone ownership was not a prerequisite for participating in this study; sampling estimates could be generated in advance to assist in study planning and implementation; non-response data available

* Analyses using this sample are reported in the following studies: Oberhauser and Yeboah 2011, Yeboah 2010, and Yeboah and Appiah-Yeboah 2009.

Whilst the data from this study permit stronger generalizations and population-level inferences than those from prior studies employing non-random sampling methods, not all results are generalizable. Despite discussing languages and cross-group recruitment during the formative research phase, this study did not obtain equilibrium for ethnic group or the closely related variables religion, region of birth, and place of residence in Accra. Such data cannot be generalised to the larger *kayayei* population. For the majority of *kayayei* migrants, linguistic differences between ethnic groups likely restricted cross-group recruitment and equilibrium. Though the survey did not capture all languages a participant spoke, the survey recorded the language of the interview. Ultimately, a minimum of one in seven participants spoke at least two languages. English- and Twi-speaking participants would have been well positioned to recruit across ethnic group, as would other multi-lingual participants who the survey questionnaire could not identify. It is possible that the sample's bias towards well-connected respondents also restricted cross-group recruitment and equilibrium. Generalizations are stronger for variables pertaining to health (e.g., ever given birth, ever had a health problem caused by *kayayoo* work) and migration behaviours (e.g., send remittances, recommend *kayayoo* work to friend in the north) that obtained equilibrium.

Lesson learned: It is unclear whether participants' preference to recruit within ethnic group resulted from linguistic barriers, from a preference to share resources (i.e., the incentives) internally, and/or from other factors. If this preference results from linguistic barriers, more than one in seven members of the target population would likely need to identify as bilingual or multi-lingual to achieve equilibrium for the variable ethnic group. Future studies involving migrant populations comprised of multiple ethno-linguistic groups should consider capturing participants' languages to better assess the impact of linguistic differences on delaying or preventing achievement of equilibrium. Whilst respondent driven sampling routinely collects non-response data from participants returning for their recruiting bonuses, researchers could also ask returning participants why they selected the recruit(s) to whom they gave their coupons to uncover recruiting barriers and preferences.

Several sources of potential bias or imprecision affect respondent driven sampling and these data. In addition to the previously mentioned methodological limitations and assumptions, Estimates from respondent driven sampling are particularly sensitive to errors in reported

personal network size (Mills, Johnson et al. 2014). This study refined the question on personal network size in an attempt to minimize such errors, and data collectors encouraged participants to spend time counting specific individuals in their networks before answering questions on personal network size. Participants are supposed to recruit both strong and weak ties, but the majority of participants (96.3%) reported knowing their recruiter “very well.” The final sample appears biased towards well-connected respondents, which may lead to biased population proportion estimates. Yet, among participants who knew their recruiter for three weeks or less ($n = 35$), 57.1% of participants reported knowing these new contacts “very well.” Participants may have inflated the strength of their recruiter-recruit relationships, leading to an overestimation of strong ties.

Non-response bias and measurement errors also affect these survey data. Whilst participants returning to collect their recruitment payments provided non-response data for 16 potential recruits who declined coupons, 302 distributed recruitment coupons (33.0%) were unredeemed. Having no time to participate, fearing research, and lacking interest in the study contributed in part to non-responses; however, the actual number of non-responses is likely much lower than the number of unredeemed coupons. Informal discussions with participants revealed that coupon theft, coupon deterioration, and return migrations contributed to non-response. Quality checks built into the survey and participant flow process uncovered measurement errors, specifically non-sampling errors, that occurred on several known occasions when data collectors and respondents misunderstood survey questions. These errors were immediately discussed with the research team and corrected before the participant departed.

4.5 Conclusion

This study expands the evidence base for the use of respondent driven sampling among migrant populations in low- and middle-income countries and demonstrates that it is feasible to quickly and efficiently collect extensive data from a large sample of migrants. Respondent driven sampling will not be appropriate for all migrant populations. The migrant *kayayei* are a clearly defined social group that recognizes one another as part of the group; however, *kayayei* come from multiple northern tribes. Ethnic ties remained strong for most participants. In countries with numerous ethnic groups and dialects, researchers may struggle to recruit a population of internal migrants defined by factors such as occupation or health condition.

Ethno-linguistic differences between internal migrants may result in recruiting preferences or barriers that restrict some respondents from participating, thus delaying or preventing achievement of equilibrium. In such cases, researchers should consider alternative sampling methods or should consider narrowing their population to a group with ethno-linguistic overlap. Implementing respondent driven sampling among a specific ethno-linguistic migrant group would likely facilitate achieving equilibrium with fewer waves. It is possible that these barriers may be weaker when implementing respondent driven sampling among international migrants who originate from the same country if national identity supersedes intra-national identity, helping facilitate recruitment across ethnic groups.

Researchers studying migrants in low- and middle-income countries should consider respondent driven sampling, if formative research indicates that the method is likely to be appropriate and well received by the study population. Formative research with members of the target population, community leaders, and key stakeholders was integral to the successful implementation of respondent driven sampling in this study. This research included assessing logistical factors pre-implementation (e.g., appropriate incentives, coupon design, whether personal networks are sufficient); however, the formative research also expanded upon the logistics of implementing respondent driven sampling in order to identify specific factors regarding both the population and the place that could potentially affect implementation (e.g., *kayayei* are resistant to speak with outsiders given past experiences with census enumerators and talk of forcibly sending *kayayei* back north; participants may need to bring children with them in order to participate).

Respondent driven sampling may allow researchers in low- and middle-income countries to stretch limited resources, as it has been found to be faster, less expensive, and easier to implement than other methods for examining hard-to-reach populations (Semaan, Lauby et al. 2002, Salganik and Heckathorn 2004). Future studies implementing respondent driven sampling among migrant populations in such settings should include members of the study population as data collectors and as advisors throughout the study to advise on the appropriateness and feasibility of implementing respondent driven sampling. Although non-financial incentives may motivate potential recruits to participate in the study, incentives must recognize participants' time, including participation as well as travel to and from the study site. In settings where a high rate of coupon deterioration may occur, coupon design must consider this factor.

Employing members of the target population to collect data was critical in building trust in the research. It ultimately resulted in high-quality data that would likely have been more difficult to collect with data collectors who identified as outsiders. By incorporating these accommodations into the respondent driven sampling implementation process, there was no need to significantly adapt respondent driven sampling to maximize the sample, as others have done (Platt, Luthra et al. 2015). This research achieved a large sample size ($n = 625$) with a relatively small team ($n = 8$) and budget. Respondent driven sampling quickly and efficiently produced the most comprehensive dataset on a migrant population that conventional survey and census efforts have struggled to capture. The lessons learned from this case study illustrate that whilst respondent driven sampling it is not a one-size-fits-all solution for sampling hard-to-reach migrants in low- and middle-income countries, it can be a powerful tool to uncover and recruit hard-to-reach migrant populations.

4.6 Summary

This chapter examined my use of respondent driven sampling in greater detail, evaluating the strengths and weaknesses of this method when used in a limited-resource setting among a hard-to-reach migrant population. Respondent driven sampling proved to be an effective tool for recruiting migrant *kayayei*. This sampling technique resulted in 627 completed surveys each capturing a total of 236 possible questions, thus producing the most comprehensive dataset on migrant *kayayei* to date. In Chapter 5, I present empirical findings from this dataset that examine participants' health insurance status and care-seeking behaviours.

Chapter 5. Health insurance and care-seeking behaviours of female migrants in Accra, Ghana

5.1 Introduction

As international migration and internal migration grow in scope and complexity, migrants are at risk of exclusion from universal health coverage (UHC). In recognition of the links between health and development, the Sustainable Development Goals recognize UHC as underpinning and balancing all health targets (WHO 2015). UHC ensures that everyone can access affordable, quality, essential health services and requires regular monitoring of progress in order to adapt UHC to local demographic, epidemiological, and technological conditions (WHO and World Bank 2015).

The inclusion of international migrants in regional health insurance schemes, such as the European Health Insurance Card, moves some UHC systems closer towards providing truly universal care; however, many world regions lack such schemes, leaving international migrants poorly served by national health strategies or excluded all together. Internal migrants may also become excluded from UHC or discriminated against when seeking health care. Pricing health insurance and health care expenses based on geography rather than a sliding socioeconomic scale, for example, may price rural-to-urban migrants out of health services.

In Africa, most national health strategies integrate UHC as a goal, yet progress towards achieving UHC has been uneven. Critical gaps remain in health service coverage, and out-of-pocket health payments push 11 million Africans into poverty annually (World Bank 2016). Among African countries leading UHC implementation, Ghana is noted for its efforts to reduce financial barriers for the poor (World Bank 2016). Before establishing the National Health Insurance Scheme (NHIS) in 2003, Ghana's health system was based on user-fees that were often a barrier to care for the poor. With the NHIS, basic health care became available to all citizens after a processing fee and an initial premium determined by each district's health insurance scheme. Value-added tax funds most (~70%) of the centrally funded scheme with additional contributions from the formal sector Social Security and National Insurance

Trust (SSNIT) (20–25%), non-SSNIT contributor out-of-pocket premiums (5%), and other sources (~2–5%) (Odame, Akweongo et al. 2014). Access to health care has improved; however, Ghana's efforts to achieve UHC remain challenged by financing and equity (Garshong and Akazili 2015). Health service use and access to care remain inequitable with poor people burdened disproportionately by the processing fees and premiums.

NHIS membership has been found to be positively associated with urban residence, higher educational attainment, and higher socioeconomic status (Akazili, Welaga et al. 2014). Three in five Ghanaians reported that they are unable to afford the insurance renewal payment, and 71.6% of the uninsured report that they cannot afford the premium (Jehu-Appiah, Aryeetey et al. 2012). Although several categories of people may receive an exemption from the premiums (e.g., children, elderly, indigents, pregnant women), many Ghanaians have not utilized these exemptions (Derbile and van der Geest 2013). Individuals receiving premium exemptions must pay the processing or renewal fee unless exempt due to pregnancy, mental disorder, or poverty. NHIS enrolment of people working in Ghana's informal sector remains low. Without clear guidelines/criteria for identifying "indigents" and without detailed costing analysis data, few benefit from the indigent exemption (Jehu-Appiah, Aryeetey et al. 2010, Kotoh and Van der Geest 2016).

Annual NHIS premiums range from GH¢ 7.20–48.00 (US\$ 1 = GH¢ 4.14 as of 1/1/17) depending on individual socioeconomic status, though most districts set a flat rate due to challenges in assessing socioeconomic status. This flat rate premium and variable processing fee (GH¢ 4 or more) may disproportionately burden members of Ghana's informal sector. The informal sector employs two-fifths of employed Ghanaians aged 15 years and older; sex-disaggregated data reveal that the informal sector employs a larger percentage of currently employed females (47.8%) than males (35.5%) (GSS 2014b).

In low- and middle-income countries, relatively little is known about disadvantages arising from informal sector employment, migrant status, and gender. Migrant girls and women from northern Ghana who work in the capital as head porters (*kayayei* [plural], *kayayoo* [singular]) report challenges to obtaining insurance and accessing health care (Sabutey 2014) as do other members of Ghana's informal sector (Alfers 2013). Whilst impoverished, young, and pregnant migrant populations may qualify for NHIS exemptions, they still struggle to access formal health services (Yiran, Teye et al. 2015). These struggles occur within the context of

increasing urbanization. Ghana's capital, Accra, is one of the fastest growing cities in West Africa (African Development Bank Group 2014). Two in five current residents in the Greater Accra Region migrated from one of Ghana's other nine regions, and inter-regional migration is expected to continue as Ghana's economy grows (GSS 2013b). Such difficulties accessing health services warrant greater attention to the interplay between migration, informal sector employment, and gender.

The aim of this paper is to determine the ways in which health insurance status affects female migrants' care-seeking behaviours, using the migrant *kayayei* in Accra as a case study. Why do female migrants working in the informal sector (not) use health services in Accra? What role does health insurance play in female migrants' decision and ability to access care?

5.2 Methods

5.2.1 Study design and setting

This study examined contemporary north-south migration in Ghana at the national level and among a population of female migrants working as *kayayei* in Accra. The primary data were gathered using a fully mixed concurrent equal status design (Leech and Onwuegbuzie 2007) to collect quantitative and qualitative data in Agbogbloshie/Old Fadama, Accra between March and April 2015. The Agbogbloshie/Old Fadama area is Accra's largest informal settlement and home to approximately 80,000 residents from inside and outside of Ghana; 72.4% of residents migrated from Ghana's three northern regions (Housing the Masses 2010). The research involved collecting primary survey data on 625 migrant *kayayei* living in Accra using respondent driven sampling.

Seven data collectors who self-identified as *kayayei* were hired and trained to administer questionnaires that included questions on women's health, families, employment, and migration. After each questionnaire was completed, I immediately reviewed the survey for quality and to purposively select participants ($n = 48$) for an in-depth interview based on responses to a question about illness/injury within the two weeks preceding the survey (hereafter "recent illness/injury").

I conducted in-depth interviews, with translation facilitated by one of the data collectors, among 48 *kayayei* who experienced a recent illness/injury. These interviews explore migration histories, experiences of recent illness/injury, and use of health services. Quantitative and qualitative data are integrated thematically in the analyses. To address validity and reliability of these results as well as to mitigate the biases arising from single-method research, I triangulated the results across methods to indicate where findings converge or diverge (Jick 1979).

The London School of Economics Research Ethics Committee (18 November 2014) and the University of Ghana's Noguchi Memorial Institute Institutional Review Board (Protocol Number 065/14–15) reviewed and approved this research. Approval was also received from local community members, including the Board of Directors of the Kayayei Youth Association, *kayayei* leaders, the Director of Social Welfare, and the chief of Yam Market. No participant could participate without informed consent.

5.2.2 Methodology for survey

The survey questionnaire included some questions from the Ghana Living Standards Survey 6 (GLSS6) and the Ghana Demographic and Health Survey to allow for selected item comparability. Researchers at the London School of Economics and the University of Ghana, the Kayayei Youth Association, data collectors, and *kayayei* leaders provided feedback on a draft of the questionnaire. The research team pre-tested and piloted the questionnaire in the field in March 2015 to verify the questionnaire structure, formulation of questions, appropriate language and terminology, completion times, range of variation in response variables, and respondent understanding. The pilot study revealed that the term “sister” was causing confusion among data collectors, since in this setting “sister” is often used to refer to a close female friend. All survey references to “sister” were changed to “biological sister” to prevent confusion. The resulting survey tool consisted of a 25-page printed questionnaire with ten modules asking a total of 236 possible questions. It generated primarily quantitative data, with a limited number of open-ended questions.

As a hard-to-reach population whose members are stigmatized and for whom a sampling frame is not available, *kayayei* were recruited through their social networks using respondent driven sampling. Respondent driven sampling, a variation on chain-referral sampling

methods like snowball sampling, was originally developed in the United States as a method to sample “hidden” populations such as people living with HIV/AIDS and injecting drug users (Heckathorn 1997). Unlike chain-referral methods that lead to statistical difficulties making inferences from the sample, respondent driven sampling includes a mathematical model to account for the non-random way in which the sample was collected (Heckathorn 1997). It leads to a weighted sample that has been proven to be unbiased for samples of meaningful size regardless of how the researcher selects the initial “seeds” who initiate the study (Salganik and Heckathorn 2004).

Researchers have revised the methodology for respondent driven sampling to adjust components such as the calculation of standard errors, new estimators, a bootstrap method for constructing confidence intervals, and larger design effects (Heckathorn 2002, Salganik 2006, Heckathorn 2007, Volz and Heckathorn 2008, Wejnert, Pham et al. 2012). Even with these revisions, the methodology for respondent driven sampling validity warrants caution and is not appropriate for all studies. Simulations find that the assumptions for respondent driven sampling, discussed in the limitations section below, may be unrealistic and can lead to biased estimates (Gile and Handcock 2010). Other simulations critique respondent driven sampling’s “misleadingly narrow” confidence intervals that public health researchers might find unsuitable for disease surveillance (Goel and Salganik 2010).

Formative research conducted in advance of the survey generated evidence on crucial factors for implementing respondent driven sampling including: appropriate incentives; participants’ personal network sizes; hours and days during which to conduct the study; coupon design; the survey instrument; and participants’ prior experiences with researchers, outsiders, and census enumerators. This formative research also confirmed that Ghana’s migrant *kayayei* meet the criteria to sample using respondent driven sampling: they can be clearly defined; they recognize one another as part of the group; and, they have the characteristics of a social group (i.e., *kayayei* both identify and interact with each other) (Friberg and Horst 2014). In addition, key informants revealed that *kayayei* migrants had sufficiently dense network ties to facilitate chain referral.

Based on this formative research and a review of studies with comparable estimated sample sizes, I identified ten seeds with support from the Kayayei Youth Association (Kubal, Shvab et al. 2014). Seeds were selected to ensure diversity across characteristics such as the current

length of time spent in Accra, the number of migrations made to Accra, primary worksite in Accra, and homelessness. Prior studies indicate that most north-south female *kayayei* migrants are from the Northern Region and Muslim, so a higher proportion of seeds reflected these characteristics. Four seeds failed to generate sufficient recruitment chains. Since the remaining six seeds were growing sufficiently, only two replacement seeds were added to the study.

Recruits were invited to participate in the study if they:

1. Were a girl or woman
2. Currently worked as a *kayayoo* in Accra
3. Migrated to Accra from one of the three northern regions (Upper East Region, Upper West Region, or Northern Region)
4. Held a valid study participation coupon as required by respondent driven sampling

Recruits were ineligible to participate if they:

1. Were not from the Upper East Region, Upper West, or Northern Regions
2. Did not work as a *kayayoo*
3. Did not have a coupon or held an expired coupon
4. Had already participated

Estimating sample size for respondent driven sampling cannot be directly calculated *a priori*, as sample size depends on the collected network data that are then used to calculate sampling weights (Heckathorn 2002). However, researchers may generate sampling estimates to assist in planning and implementing their studies by calculating the sample size for simple random sampling and then adjusting the calculation for the design effect of respondent driven sampling (Wejnert, Pham et al. 2012). To achieve the same power as a simple random sample, the respondent driven sampling literature recommends selecting a design effect (*deff*) between two and ten that measures increased variation of the estimates (Salganik 2006, Goel and Salganik 2010, Wejnert, Pham et al. 2012). This study used a more conservative design effect of ten and a standard error (*se*) of 0.05. Since one of this study's goals was to examine the prevalence of illness or injury in the last two weeks among *kayayei* migrants in Accra, I calculated sample size (*n*) for cases involving estimation of prevalence (Salganik 2006):

$$V(\widehat{P}_A) = deff \cdot \frac{P_A(1 - P_A)}{n}$$

which can be re-written to solve for the required sample size (n):

$$n = deff \cdot \frac{P_A(1 - P_A)}{(se(\widehat{P}_A))^2}$$

This study selected a prevalence of interest (P_A) based on data from the fifth Ghana Living Standard Survey that reported a 16.0% prevalence of illness or injury in the last two weeks among females aged 20–49 years in Accra (GSS 2008). I planned for an estimated sample of 538 *kayayei* that was thus ten times as large as a simple random sample in order to achieve the same statistical power.

5.2.3 Analyses for survey

Analyses were conducted using the Respondent Driven Sampling Analysis Tool (RDSAT) Version 7.1 (Volz, Wejnert et al. 2012). Partition analyses for categorical and continuous variables in RDSAT used the recommended options for optimal accuracy: dual component estimate for average network size with a mean cell size of 12, enhanced data-smoothing algorithm type, alpha = 0.025, and 16,000 re-samples for Bootstrap (Heckathorn 2007, Spiller, Cameron et al. 2012). The analyses are based on six assumptions about respondent driven sampling: (1) respondents have reciprocal relationships with one another; (2) respondents' social networks are dense enough to sustain a chain-referral process; (3) each respondent recruits a single peer; (4) respondents recruit randomly from their networks; (5) respondents can accurately report their personal network sizes to data collectors; and (6) sampling occurs with replacement (Salganik and Heckathorn 2004, Heckathorn 2007). Formative research with *kayayei* produced confidence in the first three assumptions. Factors such as incentives, study location(s), and research topic may influence to whom participants give their coupons, thus affecting the fourth assumption (Heckathorn 2007). I discussed these factors with key informants during the formative research period in an attempt to minimize potential violation of the fourth assumption. Data collectors also encouraged participants to recruit randomly when giving oral recruitment instructions. The research team tested the fifth assumption extensively during data collector training. Most studies using respondent driven sampling violate the sixth assumption, since participants cannot participate again by design.

Biases from violating this particular assumption remain poorly understood (Volz and Heckathorn 2008, Goel and Salganik 2009), though this assumption is relaxed among samples that are relatively small compared to the total population's size (Volz and Heckathorn 2008).

All surveys were manually entered into SPSS 22.0 software for logistic regression analyses. Binary logistic regression modelled the effects of selected independent variables on whether or not a recently ill/injured participant ($n = 239$) sought health care. Selection of the independent variables was based on a literature review of barriers and determinants of care as well as participant-reported factors from the survey and in-depth interviews.

5.2.4 Methodology for in-depth interviews

The translator and I conducted interviews inside the Kayayei Youth Association office on Sundays and at times when the office was closed for business in order to provide a quiet, private setting. The in-depth interviews involved a semi-structured interview guide on: demographics, migration history, experience (not) seeking care for recent illness/injury, health knowledge, use of health services, fertility, and ties to family/friends in the north. Interviews averaged 59 minutes and were linked to the participants' surveys using each participant's unique respondent driven sampling identification number. Six exploratory pilot interviews explored appropriate language and terminology, assessed validity of the survey questions, tested the flow of the questions, and formulated the final interview guide. As these pilot interviews did not result in significant changes to the interview guide or interview method, they are included in the final sample.

The in-depth interview sample ($n = 48$) was selected from survey participants using a non-probabilistic stratified purposive sampling approach. This approach allows for comparisons between subgroups whilst displaying variation on migration and reproductive health (Patton 2002). Not only must the sample have "symbolic representation," but it must also illustrate the diversity within the population's boundaries (Ritchie, Lewis et al. 2003). Based on these requirements and characteristics suggested by the literature, I selected survey participants based on whether or not the participant sought medical care for her recent illness/injury, number of migrations to Accra, and age group (younger half of the sample or older half of the

sample). Access to participants' demographic information in their surveys permitted refined sampling.

All interviews were audio recorded and, when not in English, translated into English during the interview. English content was then transcribed verbatim in transcripts that were entered into NVivo 11 software for thematic coding and analysis. Where translation was required, the final transcripts reflect the best English that the translator knows and are shaped by her work and experience as a *kayayoo*, albeit one of the few with a high school education. To ensure translation quality, one in every four interviews was selected for verification. A second multi-lingual data collector listened to the 12 interview recordings and documented the instances in which she disagreed with the translation. The second data collector approved of the translation quality, noting several minor differences that she believed did not warrant re-translation. For three interviews, she offered additional insight beyond what the participant and translator provided (e.g., determining the name of a hospital based on the location's description).

Influenced by grounded theory, initial analyses were guided by a codebook based on themes emerging from the pilot study and subsequent interviews. Analyses presented here focus on the ways in which health insurance and other factors affect female migrants' care-seeking behaviours. The anonymised, illustrative quotations in this paper come from a range of interviews to explore heterogeneity.

5.3 Results

5.3.1 Sample characteristics

The migrant *kayayei* in this study had a mean age of 25.2 years (s.d. 8.1 years); four out of five migrants were aged 15–34 years (Table 19). Most practiced Islam (88.2%) and were married or living with a partner (60.2%). Approximately two-thirds of survey participants identified as Mole-Dagbani from the Northern Region, followed by 13.3% as Sissala from the Upper West Region and 9.1% as Frafra from the Upper East Region. One-third of survey participants were in Accra on their first migration. One-third of participants had returned to Accra on a second migration, and one-third had migrated to Accra three or more times. In

stark contrast to girls and women in Accra (0.4%), 73.3% of *kayayei* migrants had not completed any formal schooling.

Table 19: Demographic characteristics of recently ill/injured participants compared to the entire study sample and to GLSS6 data on females residing in Accra

Characteristic	Recently ill/injured participants (n = 239)	Entire sample (n = 625)	GLSS6 data* (n = 3,466)
Highest educational attainment**			
Kindergarten	--	--	31.9%
Primary	20.9%	17.3%	14.7%
Middle/junior secondary school	8.8%	7.4%	28.2%
Secondary/senior secondary school	2.9%	2.1%	13.2%
Vocational/technical/commercial	--	--	4.1%
Teacher training/nursing	--	--	1.5%
Post-secondary diploma	--	--	2.7%
Bachelor's degree	--	--	2.8%
Post-graduate degree	--	--	0.5%
None	67.4%	73.3%	0.4%
Age Group (in years)			
0-4	--	--	10.8%
5-9	--	--	9.9%
10-14	4.6%	6.9%	11.3%
15-19	13.0%	15.0%	10.2%
20-24	25.9%	25.9%	9.3%
25-29	19.2%	19.5%	10.2%
30-34	19.2%	18.9%	8.3%
35-39	8.8%	5.6%	7.1%
40-44	7.9%	6.2%	6.3%
45-49	0.8%	1.1%	4.7%
50+	0.4%	0.8%	11.9%
Homeless			
Yes	10.5%	17.6%	--
No	89.5%	82.4%	--
Number of migrations to Accra			
1	31.4%	33.4%	--
2	35.1%	35.4%	--
3	18.0%	17.1%	--
4	6.7%	7.0%	--
5	3.8%	3.4%	--
6	3.8%	2.9%	--
7	1.3%	0.8%	--

Characteristic	Recently ill/injured participants (n = 239)	Entire sample (n = 625)	GLSS6 data* (n = 3,466)
Ethnic group			
Mamprusi	8.4%	5.9%	0.4%
Sissala	15.5%	13.3%	0.3%
Ashanti (Asante)	--	0.2%	7.8%
Guan	0.4%	0.2%	0.3%
Mole-Dagbani, Dagomba	51.9%	67.2%	1.7%
Grussi	4.6%	1.8%	0.3%
Gruma	1.3%	0.5%	0.1%
Konkomba	0.8%	0.5%	0.0%
Dagaba***	0.4%	0.2%	0.7%
Kusasi	0.8%	0.6%	0.6%
Mandé	0.4%	0.2%	--
Frafra	15.1%	9.1%	1.2%
Walla***	0.4%	0.2%	--
Gonja	--	0.2%	0.6%
Hausa-Dagomba	--	0.2%	--
All other tribes originating in Ghana	--	--	83.9%
Other tribes originating outside Ghana	--	--	2.1%
Religion			
Catholic	15.5%	8.6%	5.7%
Anglican	1.3%	0.5%	--
Methodist	0.8%	0.3%	--
Presbyterian	2.5%	1.4%	--
Pentecostal/Charismatic	1.3%	0.8%	51.9%
Muslim	78.2%	88.2%	11.0%
Traditional/Spiritualist	0.4%	0.2%	0.8%
Protestant	--	--	19.0%
Other Christian	--	--	10.1%
None	--	--	1.4%
Marital status			
Never married	25.9%	28.6%	40.9%
Engaged to be married	3.8%	3.8%	--
Married or living with partner	60.3%	60.2%	43.3%
Separated	2.1%	1.8%	3.3%
Divorced	1.3%	0.6%	4.8%
Widowed	6.7%	5.0%	7.6%

*Comparison data in this table come from a 10% microdata sample of the GLSS6 and are limited to girls and women residing in the Greater Accra Region.

**GLSS6 data on highest educational attainment is for household members aged three years or older.

***GLSS6 data combine the ethnicities Dagaba, Walla, and Lobi into one group. These joint data are reported once in this table under Dagaba.

Participants cited numerous triggers to migration, including the need to pay for health care. Family medical expenses drove several participants' migrations in search of work to repay loans and hospital bills:

So when the car knocked my husband [in a hit-and-run accident], I was taking care of my husband. I sold all my property. My cloth, my bowls. I sold it all to take care of him at the hospital. So when he was healthier, he said that I should come to Accra so that maybe I can get something good to bring back. It's better than all of us sitting in the house.

- Mole-Dagbani woman aged 30, mother of six children

What brought me to Accra is because of money, and the serious reason is one of my brothers was sick with his leg. They wanted to cut the leg, so they sent him around to hospital. When they sent him, he didn't get good treatment, so they went to some place again for hospital and they said they can treat him, but the bill is 500 cedis. That's an issue. [...] My family, all of them they are poor. So I said I would come [to Accra for work] because I'm younger than all of them. I will come and work so that they can treat my junior brother.

- Mole-Dagbani woman aged 25, one of five siblings

Four in five survey respondents assessed their pre-migration health status, referring to their health status prior to the most recent migration, as good or very good (Table 20). Upon moving to Accra, self-reported health status declined for many *kayayei*. One in three participants considered their post-migration health status as bad or very bad, and 38.4% of participants reported a recent illness/injury.

Table 20: Sample population proportions and population proportion estimates for key health variables

	Sample population proportions	Estimated population proportions (95% C.I.)
Illness or injury in last two weeks		
Illness	35.2	21.5 (17.8, 25.8)
Injury	2.6	1.6 (0.6, 3.1)
Both	0.6	0.1 (0.0, 0.3)
Neither (Healthy)	61.6	76.8 (72.2, 80.7)
Current self-reported health status (Accra)		
Very good	9.6	9.6 (6.4, 13.5)
Good	35.4	46.2 (40.7, 52.5)
OK	19.0	20.5 (15.7, 25.1)
Bad	20.3	12.7 (9.9, 15.9)
Very bad	15.7	10.9 (8.0, 14.0)
Pre-migration self-reported health status (North)		
Very good	38.9	35.0 (30.1, 40.0)
Good	43.2	42.8 (37.4, 48.5)
OK	5.3	6.2 (3.2, 9.9)
Bad	9.3	13.3 (9.2, 17.5)
Very bad	3.4	2.8 (1.4, 4.3)

Population proportions are reported per 100 individuals.

5.3.2 Care-seeking for recent illness/injury

Among survey respondents who reported experiencing a recent illness/injury, less than half sought care. Seeking care included consulting with a formal health practitioner (e.g., doctor, nurse, pharmacist) or an informal provider (e.g., peddlers in the market). Qualitative and quantitative evidence show that lack of money was the main barrier to seeking care. In the survey, 95.8% of recently ill/injured participants reported lack of money as a “big problem” to seeking care.

Interviewer: *If the neck pain is bad enough that it stops you from working, why did you not get care?*

Respondent: *I want to. I want to get money enough so that I can go and do the national health insurance so that I will go to hospital.*

- Sissala woman aged 19

Interviewer: *Why did you not go get medical care for the cut on your foot?*

Respondent: *I don't have money to go.*

Interviewer: *Could you have borrowed the money?*

Respondent: *If I want to go, they will not give me [money]. Nobody will give me.*

Interviewer: *Do you have health insurance?*

Respondent: *Yes.*

Interviewer: *Could you have used your health insurance to go to hospital?*

Respondent: *I didn't bring it here.*

Interviewer: *Why did you not bring it?*

Respondent: *I forgot it.*

- Mole-Dagbani girl aged 14

To live and work in Accra, participants paid daily living expenses that included a market tax to the Accra Metropolitan Assembly ticket collectors (GH¢ 0.50), water for drinking and bathing (median GH¢ 1.00), and use of the toilet (median GH¢ 0.50). Four in five participants rented shelter, paying a daily median of GH¢ 0.43 for space in a shared room. Any remaining income beyond these expenses was used for food, medical expenses, and remittances. Having no money was the largest barrier to seeking care (97.2%) among participants who did not consult anyone for their conditions. Over half of recently ill/injured participants did not seek a consultation (Table 21). Among ill/injured *kayayei* migrants who sought care, the majority consulted drug/chemical sellers (53.3%) or doctors (31.4%).

Table 21: Sample population proportions and population proportion estimates for key health consultation variables

	Sample population proportions	Estimated population proportions (95% C.I.)
Consult for recent illness		
Yes	43.5	39.2 (29.5, 54.8)
No	56.5	60.8 (45.2, 70.5)
Who consulted first		
Doctor	31.4	19.8 (6.9, 33.4)
Nurse	8.6	17.1 (1.7, 38.3)
Pharmacist	6.7	10.5 (0.0, 16.5)
Drug/chemical seller	53.3	53.3 (39.7, 72.4)
Why no consult		
No money	97.2	97.8 (92.8, 1.0)
Health insurance expired	2.8	2.2 (0.0, 7.2)

Population proportions are reported per 100 individuals.

Seeking medical care for a recent illness/injury (Table 22) was significantly associated with the amount of money an ill/injured participant reported earning on a bad day, such as when the market was slow. On bad market days, participants reported earning an average of GH¢ 5.35 with 6.1% of participants reporting no income. In contrast, participants reported earning an average of GH¢ 12.52 on good market days. Good market days, however, appeared far less frequently than bad market days, according to participants. With each Ghana cedi that an ill/injured participant earned on a bad day, her odds of seeking health care increased 1.301 times ($B = 0.263$; $p = .005$). Ill/injured participants were substantially less likely to seek health care if they considered taking time away from work ($B = -1.490$; $p = .028$) and lack of a translator as problems ($B = -3.179$ $p = .001$). Arm or leg pain increased participants' odds of seeking medical care by 7.119 times ($B = 1.963$; $p = .017$) whereas participants experiencing fever were significantly less likely to seek medical care ($B = -3.786$; $p = .041$).

Table 22: Summary of logistic regression analysis for variables predicting whether a recently ill or injured survey participant (n = 239) sought medical care

Independent Variables		<i>B</i>	S.E. <i>B</i>	p-value	Exp(<i>B</i>)
Age (in years)		0.004	0.036	0.919	1.004
Highest level of school completed	Never attended school			0.810	
	Primary	0.326	0.630	0.605	1.386
	Middle/JSS*	-0.460	0.912	0.614	0.632
	Secondary/SSS**	-1.063	1.647	0.518	0.345
Type of illness or injury	Neck and/or back pain			0.100	
	Stomach pain	-0.102	0.957	0.915	0.903
	Arm or leg pain	1.963	0.823	0.017	7.119
	Full body pain	20.416	15603.022	0.999	735545361
	Fever	-3.786	1.850	0.041	0.023
	Headache	1.333	0.739	0.071	3.793
	Chest pain	0.699	0.722	0.333	2.012
	Eye problem	20.113	27862.283	0.999	543260199
	Starvation and/or dehydration	-0.309	2.861	0.914	0.734
Money earned in Accra on a bad day		0.263	0.094	0.005	1.301
Taking time away from work to seek care		-1.490	0.676	0.028	0.225
No translator at facility		-3.179	0.928	0.001	0.042
Do you hold a valid health insurance card?	Yes			0.011	
	Yes, card in Accra not seen/lost	-0.339	0.883	0.701	0.713
	No, expired	-0.354	0.787	0.653	0.702
	Yes, card left in North	1.139	0.672	0.090	3.124
	No, never registered	-2.195	1.280	0.086	0.111
Current self-reported health status in Accra	Very good			0.239	
	Good	0.109	1.354	0.936	1.115
	OK	1.576	1.360	0.246	4.835
	Bad	0.100	1.315	0.939	1.105
	Very bad	-0.543	1.427	0.704	0.581
Pre-migration self-reported health status in the north	Very good			0.097	
	Good	1.651	0.682	0.016	5.210
	OK	0.862	1.475	0.559	2.367
	Bad	-1.103	1.186	0.352	0.332
	Very bad	-18.522	40192.970	1.000	0.000
Constant		0.888			
Cox & Snell R ²		0.545			
Nagelkerke R ²		0.732			

This model accurately predicts 87.8% of cases.

*Junior Secondary School

**Senior Secondary School

Prior experiences with the formal health system, including stigma and discrimination, may lead participants to seek informal care outside of health facilities. Providers perceived *kayayei* migrants as being unable to afford services, which migrants perceived as affecting their quality of care:

When I went to the doctor, they were complaining, “that’s why you kayayoo people, that’s why you people if you’re sick and you don’t have money, you’ll be coming here and disturbing people.”

- Frafra woman aged 21

In the north, because they know that that is my town, I’m staying there, they know that oh, I am also part of the community in the area. So if you go to the hospital because even north, if you have the national health insurance, they look after you free. But because of here, even if you go there, they recognize that we are kayayoo people. So they are not serious to take care of us. They will just, because they know that “oh, if I just call you come inside [for treatment], you don’t have money.”

- Mole-Dagbani woman aged 30

As a result of large out-of-pocket expenses not covered by national health insurance or prescriptions requiring purchase outside the health facility, ill/injured participants often sought less expensive informal care or declined care:

The health insurance help is the most important for the operation side and water [fluid therapy] side. But for them to give you a good medicine, they will not give you. They will rather write it for you to go and buy.

- Frafra woman aged 25

Interviewer: *Why did your health insurance not cover it [Hepatitis B]?*

Respondent: *I used it. I used the health insurance.*

Interviewer: *They still took money?*

Respondent: *Yes. That is why if I get sick, I will go to the drugstore. Because if you use the health insurance, they will still collect some money from you.*

Interviewer: *Even with health insurance, they were going to take 130 cedis?*

Respondent: *Yes. For the [Hepatitis B] labs. Sometimes they don't want to give you this thing. They don't want to tell you to bring the money. They will write the medicine they are supposed to give you and they give it to you to go and buy. If you don't have money, how can you do that?*

- Mole-Dagbani woman aged 32,
diagnosed with Hepatitis B during antenatal care

The interviewee above with Hepatitis B declined to seek additional treatment for her illness due to the out-of-pocket expenses she would incur. She went on to deliver twins, one of whom died in the days following childbirth.

With hospitals perceived as the most expensive places to seek care, even with health insurance, ill/injured participants sought less expensive forms of care from pharmacies and roaming petty traders. Migrants used local community pharmacies and drugstores that were easily accessible on foot and where vendors might speak northern dialects. Petty-traders provided a source of even less expensive care, though the quality of medicines they offered was unknown. Migrants weighed this risk against a lack of money and relied upon prayers, personal experiences, and friends' recommendations to select medications and vendors.

Because I know that the hospital money is very costly, that is why sometimes I buy medicine from those who are roaming. So that if I just take some medicine and it cool me, I will work again. When it [the pain] starts again, I will go and buy the medicine. But it's not nicer than the hospital because they [roaming vendors] cannot check you. But because I don't have money, that is always why I buy the small small drugs outside.

- Mole-Dagbani woman aged 41

Respondent: *The people who are at the drugstore, sometime if you go, the medicine price is high. And those who are going round, sometimes their medicine price is low. So that is why sometimes you buy from them.*

Interviewer: *I've heard that sometimes the medicine they sell is expired. It's old, or it is fake. Have you heard that?*

Respondent: *We hear that. We hear all this but because our money is not enough, we are always praying to god that if we take this medicine, we will be healthy.*

- Grussi woman aged 22

5.3.3 Health insurance status

Most participants had been insured through Ghana's NHIS at least once in their lives (Table 23). Whilst health insurance can help minimize health expenditures, only 58.2% of all participants (n = 625) were currently insured. Of those currently insured, 17.4% reported holding a valid health insurance card. Women reported that health insurance cards were occasionally burned in room fires or stolen along with the contents of women's purses. Participants also reported losing their cards or forgetting them when migrating, restricting access to formal health care in Accra.

Table 23: Sample population proportions and population proportion estimates for key health insurance variables

	Sample population proportions	Estimated population proportions (95% C.I.)
Ever insured		
Yes	77.4	76.5 (71.4, 81.2)
No	22.6	23.5 (18.8, 28.6)
Currently insured		
Yes	58.2	52.7 (46.3, 61.2)
No	41.8	47.3 (38.8, 53.7)
Hold a valid insurance card		
Yes	17.4	10.8 (6.6, 15.6)
No (card is lost, expired, or left in north)	82.6	89.2 (84.4, 93.4)

Sample population proportions are reported per 100 individuals.

Leaving a health insurance card in the north was common, particularly if the card was expired. Long processing delays to renew an expired card also meant that participants migrated south without their health insurance cards, as the need to start earning money outweighed waiting for their cards. Others forgot their cards accidentally when packing. One participant who migrated south to leave an abusive relationship reported that she left her health insurance card at her husband's house because of the fighting. There was also

uncertainty about whether health insurance and insurance cards from the north would work in the south:

Because I did it at the north, I was thinking if I bring it here, will it work here, or it will it not work? I left it in the north. I said maybe in the north is different and Accra is different.

- Mole-Dagbani woman aged 33

Nearly all participants without health insurance recognized the value of having health insurance. A lack of money, however, prevented them from registering in the north or in Accra. Some participants were unaware of the costs and believed that they needed to save GH¢ 80–100 before they could register with the NHIS in Accra; these figures greatly exceed the GH¢ 25–30 that other *kayayei* report spending on health insurance in Accra. This perception of health insurance costing more in Accra extended to maternity care services that are supposed to be exempt from fees:

Because north, they give everything free to us. Card, antenatal care, and what they give is free. But here, they don't give us free.

- Mole-Dagbani woman aged 24

Some participants perceived that paying for medical expenses out of pocket would result in better quality and more timely care than using national health insurance:

If you go without the health insurance, they will treat you well. So you get better care if you have no health insurance. Because they know you can pay.

- Frafra woman aged 25

Even the national health insurance, they know they will not collect plenty money. They will let you sit down [wait] and they will take those who don't have national health insurance.

- Mole-Dagbani woman aged 41

Most participants without insurance or with expired insurance lacked the money to register or renew their policies. One participant reported that a nongovernmental organization in Accra

came to enrol *kayayei* in the NHIS for free, taking their photographs and completing the forms. The organization never returned with health insurance cards. A similar situation was reported in the north, where a pregnant woman was told NHIS employees would visit her village hospital to register local residents; she reported that the registration never happened.

Among participants who had ever given birth (70.6%), more than four-fifths (88.9%) registered for health insurance the last time they were pregnant. Women who did not register when pregnant most often reported that they were unable to afford insurance (4.6%), did not think it was for them (3.0%), or did not know about it (1.9%). Under the NHIS guidelines that include free antenatal and childbirth care, pregnant women are exempt from both the health insurance premium and registration fee. Some mothers reported, however, that they had to pay for health insurance when pregnant or that the cost of health insurance when pregnant led them not to seek insurance. However, the majority of participants reported no problems registering under the pregnancy exemption or accessing free maternity services, apart from the fact that the free policy ends shortly after childbirth:

When I was pregnant and they give me the national health insurance, everything they were doing for me free. Medicine and these things. When I was going to give birth, free. When I give birth, it finished. That is all the national health insurance. I have to go and do another one.

- Mole-Dagbani woman aged 26

Health insurance exemption for pregnant women ends when the infant is three months old; mothers must purchase new policies for themselves and also pay the card processing and annual renewal fees for their babies who are exempt from premiums until age 18 years. Over half of mothers (54.3%) report being currently insured; however, only 13.6% of these currently insured mothers report holding valid insurance cards needed to access care. Whilst some mothers can afford to pay health insurance expenses for themselves and their children, many poor mothers with limited resources find themselves in a position where they have to choose whom to cover. Parents may prioritize their children's insurance, as reported by one insured participant whose husband is also uninsured:

Interviewer: *Why do you have health insurance for your children but not for yourself?*

Respondent: *The children are getting sick just like that. They are small, and they are sick. That is why [my husband and I] do it for them.*

- Frafra woman aged 30, mother of three

5.4 Discussion

Kayayei suffer from greater illness or injury than the general female population in Accra. Both the sample proportion (38.4%) and population estimates (23.2%) generated by this study exceed the 10.0% prevalence of illness/injury reported among females in Accra the two weeks preceding the GLSS6 (GSS 2014a). Whilst recently ill/injured participants desired health care, less than half reported seeking care. Participants were more likely to seek medical care for illnesses/injuries that affected their ability to carry a load, such as arm or leg pain, than for illnesses like fever. Accessing formal health services in Accra requires money, time away from work, and for many migrants from northern Ghana, a translator who speaks Twi and/or English. An inability to offer patients the services of a translator in multilingual countries like Ghana can effectively exclude from care those internal migrants who do not speak the dominant language(s) at their destination.

A faster, easier, and less expensive alternative is to seek care and medication directly from informal providers. Women are aware that such an approach involves a certain degree of risk, but a lack of financial resources restricts choices of safer options. The safety and efficacy of unlicensed medication sold by a peddler is unknown, and chemical shop employees may not be appropriately trained to prescribe drugs.

Financial barriers overwhelmingly limit *kayayei* migrants from seeking health care, influencing migrants' decisions to seek no care or influencing from whom/where migrants seek care. Estimates suggest that approximately half of *kayayei* migrants in Accra are currently insured; yet, only 10.9% are estimated to have a health insurance card with them. Nearly four times as many members of Ghana's population (39.0%) are valid card holding members in the NHIS (National Development Planning Commission 2015). A lack of money prevents *kayayei* migrants from registering with the NHIS or renewing expired health insurance policies. This inability to access health insurance is compounded by the fact that *kayayei* migrants find it difficult to receive insurance exemptions.

Insured *kayayei* migrants may struggle to utilize their health insurance when cards are forgotten in the north or lost to fire and theft in Accra. For migrants who forgot or lost their insurance cards and those who cannot afford replacement cards, biometric and fingerprint data collected by Ghana's National Health Insurance Agency (NHIA) may have the potential to confirm insurance status and permit access to health care at health facilities; such data is already used by the NHIA to improve identity checks. Fingerprint identification systems have also been implemented in Ghana as a method for linking community data from the Kintampo Health and Demographic Surveillance System to hospital data (Odei-Lartey, Boateng et al. 2016) and as a method for verifying voters by the Electoral Commission (Yakubu and Adjei 2014); however, these experiences suggest that fingerprint identification works best when combined with other identification methods.

A lack of money also restricts both insured and uninsured migrants from seeking formal health services due to the unpredictable nature of out-of-pocket expenses. Out-of-pocket health expenditures push approximately 380,000 Ghanaians into poverty each year (Garshong and Akazili 2015), including participants in this study for whom these expenses served as a trigger to migrate. Ghana's NHIS has the potential to mitigate such catastrophic health expenses, but information about the health insurance scheme needs to be better communicated. Some migrants were unaware that health insurance purchased in the north would work in the south. Others did not know that lost or forgotten health insurance cards could be replaced for a fee without purchasing a new policy. Pregnant women and children are perceived to benefit more from health insurance exemptions than the poor, in part due to an unclear definition of "indigents" in the NHIS policy (Agyepong, Abankwah et al. 2016). The NHIS indigent exemption is implemented inadequately and excludes many impoverished citizens. With *kayayei* migrants experiencing homelessness in Accra and underemployed or unemployed on slow market days, the indigent exemption in Accra needs to be revisited.

This research updates the discussion on health status and health insurance among migrants employed in Ghana's informal sector and may be generalizable to other migrant groups working in Ghana's informal sector. Women employed in cross-border trading, casual agricultural labourers migrating south from northern Ghana and Burkina Faso, and female and child miners employed in artisanal and small-scale gold mining may experience similar barriers to health care and health insurance. These hazardous occupations may also place these populations at greater risk of illness or injury than the general population. Like *kayayei*,

women employed in cross-border trading are concerned with survival needs; these traders may self-medicate using over-the-counter medications due to difficulty taking time away from work and limited access to nearby health facilities (Wrigley-Asante 2013).

The findings from this study complement findings from elsewhere. A cross-sectional study among migrant workers in China found that migrants' inability to pay for health care resulted in lower levels of inpatient care utilization (Mou, Cheng et al. 2009). Much like *kayayei* migrants, the China study's young, low-paid, less educated female migrants were more likely to be uninsured and to pay for health care out of pocket (Mou, Cheng et al. 2009). In Viet Nam, a cross-sectional study among migrants and non-migrants found lower levels of health care utilization among migrants than non-migrants with the lowest levels of utilization reported among seasonal migrants (Le, Vu et al. 2015). Seasonal migration is common among *kayayei* migrants who may migrate on school holidays or between harvests.

In Indonesia, where national health insurance expansion efforts have struggled to insure informal sector workers through contributory or subsidized schemes, recent research stresses the importance of understanding how socio-demographic factors, health behaviours, and health status affect health insurance coverage (Idris, Satriawan et al. 2017). These factors affect health insurance coverage among *kayayei* migrants in Ghana and even workers in high-income countries like the Czech Republic, where linguistic barriers and a lack of awareness about public health insurance have excluded eligible immigrants from the public health insurance system (Dzúrová, Winkler et al. 2014). Equal access to health care requires better understanding determinants of health insurance coverage among migrant populations, raising greater awareness of health insurance and its costs, and in the case of Ghana, clarification that health insurance cards work nationwide. Similarities in health-related disadvantages arising from informal sector employment, migrant status, and gender reported by studies in Ghana and elsewhere suggest that the findings among *kayayei* migrants are likely generalizable to other migrant groups within Ghana and within other low- and middle-income countries.

Health insurance is crucial for accessing care, but migrant-friendly services also help improve service uptake. In Thailand, the public health ministry developed a model for insured and uninsured migrants that uses volunteer community health workers, mobile clinics for migrant communities, bilingual signs and information, and workplace outreach services (Tangcharoensathien, Thwin et al. 2017). This model has promoted health

awareness among migrants and improved service uptake by helping migrants navigate health services (Tangcharoensathien, Thwin et al. 2017).

5.4.1 Limitations

For analyses of data collected by respondent driven sampling, the sample distribution within most variables had stabilized or reached equilibrium, indicating that the selection of “seeds” or participants from whom the sample originated did not bias the final sample with regards to these variables (Heckathorn 1997, Heckathorn 2002); however, ethnicity and religion were two notable exceptions. Achieving equilibrium for ethnic group would have required running the survey for an average of 54 “waves” (rounds of people recruited from the initial seed), exceeding the resources of this study. Religion, a variable closely linked to ethnic group in this setting, would have similarly required extensive waves. The final sample of *kayayei* may be biased with regards to religion and ethnic group. Census data, however, suggests that the potential for sampling bias might not be that significant. Ethnic and religious distributions among northern female migrants in Accra from the census data are comparable to the population in this study.

5.5 Conclusion

It is paradoxical that migrants from northern Ghana, where the concentration of health facilities is lowest, cannot and do not access formal health services in Accra, where Ghana’s concentration of health facilities is highest. Financial barriers to health care services continue to burden *kayayei* migrants in Accra, even among migrants who report being insured under Ghana’s NHIS or who qualify for insurance exemptions. Linguistic differences between providers and patients further restrict migrants’ access to health care. These barriers led participants to seek no care or to seek care from informal providers.

In order to better meet migrants’ health care needs, the findings from this study support the following policy recommendations:

- Policymakers should revisit implementation of the NHIS’s indigent exemption and should consider broadening the eligibility criteria. Developing an official mechanism for community organizations like the Kayayei Youth Association to provide District

Mutual Health Insurance Scheme Managers with lists of poor individuals who most need exemptions could help ensure that the indigent exemption is effectively applied to those most in need.

- To improve equity, policymakers should consider mandating that the poorest districts enrol higher percentages of individuals receiving “core poor” or indigent exemptions than the national average. Such an approach would likely benefit many participants in this study, particularly those who cited family medical expenses as a driver of their migration.
- The formal health system must better incorporate culturally appropriate care into the provision of health services. For example, targeted training of health care professionals at medical facilities near informal settlements/slums could help reduce xenophobia and biases, such as providers assuming that migrant patients were beaten in response to theft. Providing trained interpreters would also facilitate improved communication and understanding between providers and migrant patients.

It is time to better design health systems to help migrants, poor people, and the informal sector access health care. Achieving UHC requires increased focus on equity as well as demographic adaptations to ensure access to affordable, quality health services across domestic borders. Migrants are uniquely positioned to test the strengths and weaknesses of UHC across internal and international borders. Their efforts to access care in multiple districts or regions can illustrate points of weakness within the system but also points of intervention for stronger health systems. With internal migration on the rise in many settings, health systems must recognise the varied needs of populations in multi-ethnic and multilingual countries if countries are to achieve health coverage that is truly universal.

5.6 Summary

This chapter showed that access to formal health care in Accra remains largely inaccessible to *kayayei* migrants who suffer from greater illness/injury than the general female population in Accra. Financial barriers restrict *kayayei* migrants from seeking health care, registering with the NHIS, renewing their expired health insurance policies, or taking time away from work to manage their health. Chapter 6, the next and final chapter, concludes the thesis by pulling

together findings from my three papers (Chapters 2, 4, and 5) and highlighting the contributions that these findings have on understandings of contemporary female migration and migrant health in Ghana.

Chapter 6. Conclusion

This research aimed to improve understandings of contemporary female migration in Ghana, to contribute to improved data collection methods for hard-to-reach migrant populations, and to examine whether a vulnerable migrant population can access health services and relevant social safety nets like insurance fee exemptions. In this final chapter, I summarize the findings from my three empirical chapters (Chapters 2, 4, and 5) and situate their contributions within the research on female migration and health. Finally, I reflect upon the research's strengths and limitations, present implications for policy and further research, and outline future publications.

6.1 Summary of findings

The analyses in Chapter 2 present the first detailed comparative analyses of female migration using microdata from Ghana's 2000 and 2010 Censuses. These analyses reveal that the overwhelming focus of previous research on male internal migrants is misplaced. Between 2000 and 2010, census microdata reveal that the proportion of female internal migrants rose from 31.1% to 37.4%, and the proportion of male internal migrants rose from 30.4% to 35.7%. Working-age migration is particularly pronounced in Ghana in 2010 for both sexes. In addition to migrating during working-age years, female migrants are significantly more likely than non-migrants to reside in urban areas and work for pay, profit, or family gain. These findings suggest that economic opportunity is an important driver of female migration. It is thus unsurprising that only the Greater Accra and Ashanti Regions, home to Ghana's two largest cities, have positive net overall migration.

Though working-age migration is an important feature of contemporary female migration, Chapter 2 shows that Ghanaian girls and women migrate at all ages. Approximately 40–50% of these internal migrants captured by the census are excluded from other sources of national migration data. These new analyses of census data provide a rich source of information on female migration within Ghana. This information expands the evidence base for contemporary female migration and refutes the out-dated stereotype that girls and women do not participate in migration.

Census data provide robust insight on migration's demographic structure, patterns, and trends. These data, however, present an incomplete picture of contemporary female migration when analysed in isolation. The limited number and scope of migration questions included in most census questionnaires constrain understandings of aspects such as migrants' motivations and migration experiences, migration's costs and gains, and migrants' social and economic contributions to their families and communities. Ad hoc sub-national surveys and in-depth interviews can add valuable insight to national-level census analyses by examining migration through multiple lenses from multiple angles.

To supplement my national-level analyses of contemporary female migration in Ghana, I conducted a mixed-methods study to examine female migration and health amongst a population of migrant girls and women who work as *kayayei* in Accra. Chapter 4 expands the evidence base for the use of respondent driven sampling among migrant populations in low- and middle-income countries and provides lessons learned to assist other researchers implementing respondent driven sampling in low- and middle-income countries. My study that used respondent driven sampling generated the most comprehensive data set on *kayayei* to date. Respondent driven sampling was well received among the study population, leading to quick and efficient data collection. Involving members of the target population as advisors and data collectors was critical to respondent driven sampling's success recruiting success. Moreover, respondent driven sampling permitted sampling a larger swath of the target population than conventional survey and census efforts. For example, 64.8% of participants in my study would have been excluded from participating in prior research on *kayayei* simply because they did not own a mobile phone.

The methodological contributions in Chapter 4 illustrate that whilst respondent driven sampling is a powerful tool to uncover and recruit hard-to-reach migrants, it is not a one-size-fits-all solution. Ethnic group membership is an important determinant of recruitment, with certain groups preferring to recruit internally. Defining a migrant population by factors such as occupation may delay or prevent the achievement of equilibrium in settings with numerous ethnic groups and dialects. Before employing respondent driven sampling in these instances, researchers should thoroughly assess linguistic abilities and overlap between ethnic groups. Any barriers to cross-group recruitment warrant consideration of alternative sampling methods or narrowing the study population to a group with ethno-linguistic overlap to facilitate quicker equilibrium.

Chapter 5 analysed this comprehensive *kayayei* data set in greater detail and showed that migrant *kayayei*'s odds of seeking health care are directly related to their informal sector earnings on a bad market day. Whilst recently ill/injured *kayayei* participants (38.4%) desired health care, less than half (43.5%) sought health care. Financial barriers overwhelmingly limit *kayayei* migrants from seeking health care, from taking time away from work, from registering with the National Health Insurance Scheme (NHIS), and from renewing their expired health insurance policies. Health insurance exemptions are largely inaccessible outside of pregnancy. Both insured and uninsured migrants did not seek formal health services due to the unpredictable nature of out-of-pocket expenses.

My analyses in Chapter 5 show that catastrophic and impoverishing medical expenses functioned as drivers of migration, pushing participants to migrate in search of work to repay loans and hospital bills. Health insurance can help minimize these expenditures, but only 17.4% of currently insured participants (58.2%) reported holding a valid health insurance card in Accra. The others lost their cards or forgot them when migrating. For many *kayayei* migrants, accessing healthcare in Accra also requires the services of a translator who speaks English or Twi. This combination of financial and linguistic barriers makes access to formal health care largely inaccessible to a population that suffers from greater illness/injury than the general female population in Accra.

6.2 Findings in context and contributions to the literature

My findings both complement and challenge existing research on migration and migrant health. Ghana joins a growing list of sub-Saharan African countries where recent internal migration is sex-balanced, according to Donato and Gabaccia's 47–53% typology (2015). The census analyses in Chapter 2 reinforce the notion that experiences of gender impact migration's patterns, causes, and impacts (Awumbila 2015). Like female migrants in South Africa, rural Ghanaian girls and women are highly mobile and do not necessarily represent the residentially stable population (Camlin, Snow et al. 2014). Young Ghanaian women in particular migrate in greater numbers than young men, a pattern also evidenced in Malawi (Beegle and Poulin 2013). Growing social acceptance of female independence and mobility contributes to this increase in female migration. Migration streams in the Democratic Republic of Congo, for example, exhibit fewer gender differences than migration streams in Senegal, where stronger patriarchal norms limit female mobility and economic productivity

(Toma and Vause 2014). Rising female migration in Ghana between 2000 and 2010 suggests rising female empowerment and a loosening of traditional and patriarchal norms, as Ghanaian girls and women become increasingly independent. These gender relations and power dynamics affect internal migrants throughout migration's phases.

The determinants of female internal migration, assessed in Chapter 2, complement a small but growing body of literature on determinants of internal migration in Ghana (Boakye-Yiadom and McKay 2007, Ackah and Medvedev 2012, Abdulai 2016). Nowhere in the literature have researchers conducted sex-disaggregated analyses of determinants of internal migration. To the best of my knowledge, my analyses are the first to examine determinants of internal migration that are sex-specific and that use census data. Prior research has assessed determinants of internal migration using data from the Migrating Out of Poverty dataset (2013) collected by researchers at the University of Ghana and Sussex University (Abdulai 2016) and data from the Ghana Living Standards Surveys (1998–1999, 2005–2006) (Boakye-Yiadom and McKay 2007, Ackah and Medvedev 2012). Whilst these data sets offer greater detail on migration than the census, census data still include important demographic determinants of migration. Educational attainment, for instance, was not a significant determinant of internal migration in my analysis of census data or in Abdulai's analysis (2016). Yet, analyses of the Ghana Living Standards Surveys found that educational attainment was a significant determinant of internal migration (Boakye-Yiadom and McKay 2007, Ackah and Medvedev 2012). It is possible that this discrepancy reflects a difference between migrants captured in older and newer datasets or that aggregated data mask sex-specific differences.

Health can serve as both a determinant and a consequence of migration. A recent study examining health insurance among *kayayei* in Kumasi, Ghana strengthens my confidence in the population proportions of ever insured and currently insured *kayayei* reported in Chapter 5; however, findings from these two studies diverge when assessing utilisation of the NHIS when ill. Of the 392 migrant *kayayei* purposively sampled in Boateng et al.'s study (2017), 92.2% reported using the NHIS whenever they were ill. This large figure contradicts my findings and the findings by Yiran et al. who report that 27.2% of *kayayei* in Accra used health insurance to finance maternal health services (2015). Among participants in my study who reported an illness/injury in the two weeks prior to participating, less than half of participants (43.5%) sought formal or informal medical care. This two-week window for

reporting an illness/injury required participants to report actual health behaviours rather than health intentions or generalizations. One reason that participants in my study were less inclined to seek formal health care is that only 17.4% of currently insured participants (58.2%) reported holding a valid health insurance card in Accra. Enrolment in the NHIS is not synonymous with holding a valid health insurance card, overlooked by Boateng et al. My research highlights the importance of utilising data collection tools adapted for migrant populations. In this instance, my survey and in-depth interviews captured unique migration-related factors that affected participants' ability to access medical care and utilise the NHIS. Migrant populations, including participants in my study, may forget their health insurance cards at their place of origin or lose the cards at their place of destination due to problems with unsecure housing (e.g., fires, flooding, theft). Without valid health insurance cards in their possession, migrants effectively experience similar financial barriers to care as uninsured migrants.

Whilst the literature indicates that female migrants experience poorer health more often than male migrants (Adanu and Johnson 2009), the literature on the health outcomes of female migrants compared to non-migrants exhibits greater variation. In Chapter 5, I reported that migrant *kayayei* report experiencing a higher prevalence of illness/injury than Accra's general female population. Both the sample population prevalence (38.4%) and the estimated population prevalence (23.2%) exceed the prevalence of recent illness/injury among the general female population in Accra (10.0%) (GSS 2014a). In Zambia, rural-to-urban migrant women also reported poorer health outcomes than urban non-migrant women along with higher levels of illiteracy and lower levels of advanced education (Chinkoyo 2002). In contrast, other studies report improved health among female migrants. For example, female internal migrants in Myanmar reported better health outcomes than non-migrants (Sudhinaraset, Diamond-Smith et al. 2016). Upon closer inspection, migrants in the Myanmar study were significantly more likely than non-migrants to be from a higher socioeconomic status. Increasing women's incomes can translate into improved health outcomes (Ross, Zereyesus et al. 2015). These differences between studies in Ghana, Zambia, and Myanmar illustrate the weakness of examining health outcomes solely as a result of migrant status. Migration's impact on health is affected by the interplay of factors such as socioeconomic status, occupation, and educational attainment. These factors may influence migrants' health more or less than migration status influences health, depending on the particular migrant population and the setting.

In addition to poor health outcomes, migrant women are disadvantaged and excluded from the health care system. Based on findings from my research and from the literature, some of this exclusion appears self-imposed. Migrants may be so concerned with survival needs that they prioritise self-care since they cannot afford to take time away from work. They may use temporary fixes to address the health problem until the problem is so serious that they can no longer work (Anthony, Martin et al. 2010). This disadvantage and exclusion may also come directly from the health system. Migrants experience unique barriers to care, including harassment and real or perceived discrimination (Arnold, Theede et al. 2014). As I noted in Chapter 5, migrant-friendly health services have a role to play in minimizing migrants' barriers to formal health care. Thailand's model for migrant health care has successfully included migrants in the health care system by promoting health awareness, assisting migrants in navigating health services, employing volunteer community health workers, translating information, and providing mobile clinics and workplace outreach (Tangcharoensathien, Thwin et al. 2017).

Among urban women, research indicates that a lack of formal education and low-income affect health status adversely (Hill, Darko et al. 2007). For rural-urban migrant women working in low paying occupations, such as *kayayei*, these characteristics contribute to vulnerabilities beyond adverse health outcomes. Migrant women experience vulnerabilities as a result of their gender and of their ability to access to resources. Female migrants are more likely than male migrants to experience lack of food, labour abuse, sexual abuse, and inadequate health services (Regassa and Yusufe 2009). In many settings, migrant women are more likely to engage in high-risk sex and are at greater risk of sexually transmitted infections than non-migrant women or migrant men (Brockhoff and Biddlecom 1999, Yang and Xia 2008, Wang, Wei et al. 2010). This sex may be transactional or forced, especially if female migrants lack proper housing and spend their nights on the streets.

The work presented in this thesis has broader implications for female migration beyond female migrants' exclusion from the formal health care system and the vulnerabilities they experience as a result of their gender, migrant status, and work in the informal sector. Female migrants tolerate far more risk than female non-migrants, and this difference in risk tolerance is especially notable when compared to males (Balaz and Williams 2011). Every participant in my research risked something to migrate to Accra and work as *kayayei*. For some participants, this risk taking resulted in greater hardships, including difficulty parenting

remotely, starvation, rape, theft, and illness. For other participants, this risk taking returned dividends in the form of accumulating money to send remittances home or to pay for school fees for the next term.

In an almost universal expression, migrant *kayayei* cited employment as their primary driver of migration. Opportunity for employment and greater earnings in Accra minimized the potential risks of north-south, rural-urban female migration. Female mobility increasingly shapes household-level economics. Research indicates that migrant women working in the informal sector enhance the livelihoods of their households (Thao 2013). Participants in my research confirm this finding. Returned migrant women also contribute to changes in gender ideology by taking a larger role in making decisions about their households' livelihood strategies (Tufuor, Sato et al. 2016). Female migrants' risk-taking behaviours, contributions to household-level livelihoods, and changing patterns in sex-disaggregated migration increasingly present a contemporary picture of migration with female migrants as active and valued contributors.

6.3 Strengths and limitations

Detailed comparative analyses of female migration using microdata from Ghana's 2000 and 2010 Censuses have not previously been conducted. These analyses reflect a start to disaggregate sex-specific patterns, trends, and determinants of migration and to understand the gendered dimensions of internal migration in Ghana at the national level. At the sub-national level, my use of respondent driven sampling quickly and efficiently produced the most comprehensive dataset on migrant *kayayei* to date. Conventional survey and census efforts have struggled to capture this hard-to-reach migrant population. Respondent driven sampling succeeded at uncovering and recruiting hard-to-reach migrants, making this sampling technique a valuable tool for researchers studying migration. My analyses and reflections implementing respondent driven sampling help further methodological discussions on implementing respondent driven sampling among migrant populations in low- and middle-income countries.

The findings from this research also expand the evidence base for female migrants' health and their access to health care. My use of mixed-methods and my research tools captured unique migration-related factors that affected participants' ability to access health care and

utilise Ghana's NHIS. To the best of my knowledge, my research is the first to show links between health care expenses and internal migration in Ghana. The NHIS has not fully removed the financial barrier that out-of-pocket medical expenses present to its low-income members. Insured and uninsured study participants noted that an inability to cope with catastrophic and impoverishing medical expenses was both a driver and a consequence of their migrations. Finally, this research produced a wealth of additional data on topics that have yet to be fully explored.

Despite these strengths, several conceptual and methodological limitations affect my analyses. In Chapter 2, the microdata from the 2000 Census appear to be more affected by over/under reporting of the national population than the microdata from the 2010 Census; however, assessing the quality of the 2000 Census data in detail is challenging. The literature included no assessment of the census data, and post-enumeration survey data collected after the 2000 Census are missing. Another methodological limitation, this time involving the 2010 Census, is that census enumerators reportedly struggled to enumerate highly-mobile populations like the *kayaye* (Daily Express 2010). Highly mobile, vulnerable migrant groups like *kayaye* migrants may be under-represented in the 2010 Census. Additional limitations with census data include possible reference period error for the question inquiring about place of residence five years prior, potential uncertainty about exact geographic boundaries, and problems reporting age.

One key conceptual limitation with my analyses in Chapter 2 is that the understanding and measurement of migration in Ghana's census questionnaires overlooks contemporary migration patterns identified via other sources of migration data. Cyclic and short-term migrations are commonplace in Ghana as are seasonal or repeat migrations. Yet, the censuses miss capturing these migration patterns. Intra-regional migration, more common than interregional migration, lacks meaningful data. Most movements between place of birth and current residence are missing, as are data on migration duration. Overlooking these migration patterns affects both the type of migrants and the type of migrations that are identified and included in analyses of census data. To minimize these limitations and present a more rounded image of contemporary migration, I complement my national-level census analyses with primary analyses of mixed-methods data collected during fieldwork in Accra.

As previously discussed in Chapters 3–5, multiple limitations accompany my use of respondent driven sampling to collect primary data and the reporting of these data. My primary analyses of migration and health variables involved data collected by respondent driven sampling in which the sample distribution had reached equilibrium. Thus, my selection of “seeds” or participants from whom the sample originated did not bias the final sample with regards to these variables (Heckathorn 1997, Heckathorn 2002). For these types of variables, I can make stronger generalizations and population-level inferences than studies employing non-random sampling methods. Unfortunately, my final sample of migrant *kayayei* may be biased with regards to religion and ethnic group since these variables did not obtain equilibrium. I cannot soundly estimate population proportions for these demographic characteristics and am limited in the conclusions that I can draw from these variables. Any generalizations from these data would be similar to generalizations made from a convenience sample.

6.4 Implications for policy and further research

The findings in this thesis have implications for policies and research regarding migration, development, and health. With respect to migration and development, productive female labour losses in eight of Ghana’s ten regions may negatively impact local development efforts and local economies. This negative impact may further drive girls and women to migrate in search of opportunities. The Greater Accra and Ashanti Regions, Ghana’s only regions experiencing positive net overall migration, are particularly attractive destinations for female migrants seeking employment. Migrant *kayayei* come to Kumasi and Accra in such great numbers that the media and politicians label them an “urbanisation crisis” or “menace” (Parliament of the Republic of Ghana 2016, Quansaha 2017). Political promises to alleviate poverty and eradicate the *kayayei* “menace” have gone largely unfulfilled (Quansaha 2017). Government offices and nongovernmental organizations in Accra provide intermittent training programmes for *kayayei*, but these training programmes have not reduced the flow of urban-rural migrants. Without greater attention to development policy and interventions in Ghana’s more rural regions to reduce poverty and develop economic opportunities for girls and women, it is possible that out-migration in northern Ghana will rise even higher as climate change continues to negatively impact northern Ghana’s agricultural industry.

Growing urbanisation places continued stress on the infrastructure in Accra and Kumasi, including the availability and delivery of healthcare services. In a multi-ethnic and multilingual country like Ghana, health systems must recognise the changing needs resulting from rising internal migration. Given the ease with which infectious diseases like cholera and Ebola spread during this fieldwork, the health of mobile migrant populations is both a public health issue and national security issue. To ensure that internal migrants can access affordable, quality health services across domestic borders, the formal health system must better incorporate culturally appropriate care into the provision of health services. For example, policymakers could implement targeted cultural awareness training of health care professionals to help reduce xenophobia at medical facilities near informal settlements or slums. Policymakers could also assist migrants in overcoming language barriers to care by providing trained interpreters at health facilities. Patient understanding, compliance with medical instructions, and satisfaction would likely improve with better communication and understanding between providers and migrant patients.

Internal migrants are uniquely positioned to evaluate the delivery of universal health care (UHC) across internal borders. Ghana is still struggling to achieve the NHIS's goal of UHC due to members' failure to renew their policies annually (Agyepong, Abankwah et al. 2016). If the scheme is serious about improving equity, then policymakers must revisit implementation of the NHIS's indigent exemption and consider demographic adaptations to ensure access to affordable, quality health services across domestic borders. Migrant *kayayei* in my study migrated to Accra from districts with higher percentages of poor residents than the national average. Mandating that Ghana's poorest districts enrol higher percentages of individuals under the indigent exemption would benefit many migrant *kayayei*, especially those who could not afford to renew their insurance policies and those who cited family medical expenses as a driver of their migration. Policymakers could also improve equity by strengthening mechanisms for community organizations to provide District Mutual Health Insurance Scheme Managers with lists of poor individuals who most need exemptions. Community organizations like the Kayayei Youth Association are well positioned to help ensure that the indigent exemption is effectively applied to those most in need.

Financial barriers and a lack of health insurance exclude migrant workers from utilising health care not only in Ghana but also in China and Viet Nam (Mou, Cheng et al. 2009, Le, Vu et al. 2015). Young, low-paid, less educated female migrants in China were likely to be

uninsured and to pay for health care out of pocket, much like migrant *kayayei* (Mou, Cheng et al. 2009). To address these barriers and ensure equal access to health care between migrant and non-migrant populations, health insurance is crucial. Yet, research from Thailand suggests that improving access to care and service uptake requires more than health insurance. Reinforcing the point above about incorporating culturally appropriate care into the provision of health services, migrant-friendly health services can improve health service uptake and health awareness among migrants by helping migrants navigate health services (Tangcharoensathien, Thwin et al. 2017). Policymakers should consider implementing similar public health models for insured and uninsured migrants that use volunteer community health workers, mobile clinics for migrant communities, bilingual signs and information, and workplace outreach services (Tangcharoensathien, Thwin et al. 2017).

Employees at a prominent nongovernmental organization in Accra revealed during my formative research phase that they struggled to obtain donor funding for a *kayayei* health outreach programme because of limited data on the population and its issues. Researchers, policymakers, and nongovernmental organizations working in the public health and development sectors must address the measurement and impact of female migration. Improved data and knowledge are crucial to achieving the Sustainable Development Goals' migration and health targets by 2030. Surveys frequently use differing questions on migration, restricting comparative analyses across time and/or across surveys. Standardizing migration questions between research groups and across survey rounds would allow for more comprehensive analyses of national trends. Researchers implementing surveys collecting migration data should also consider expanding upon basic demographic data to include questions about migrants' underlying motivations, migration experiences, and socioeconomic contributions. Furthermore, this research cannot afford to exclude migrants outside the ages of 15–49 years. Data collection and analyses of female migration must go beyond women's reproductive years, as data are needed on female migrants at all ages.

6.5 Future publications

The analyses in this thesis employ only a small fraction of my primary dataset collected during fieldwork in Accra. To ensure that participants' voices are more fully heard, much work remains. The survey and interview data on migration histories and experiences, employment in the informal sector, relationships, maternal health, violence and abuse, sexual

and reproductive health, and post-migration aspirations all warrant future attention. Below, I outline two forthcoming publications, though I intend for more to follow. These mixed-methods publications will draw upon primary data on female migration and health from my survey and in-depth interviews.

6.5.1 Sexual and reproductive health among Ghana's migrant kayayei

Sexual initiation among young migrants in Ghana occurs at earlier ages than the national population (Kwankye 2007). Despite their growing urban presence, the migrant *kayayei* are a vulnerable population exposed to sexual and reproductive health risks including rape, unintended pregnancies, sexually transmitted infections, and unsafe abortion. Does the agency and independent decision making that *kayayei* have demonstrated by migrating in search of economic opportunities extend to their decisions pertaining to sexual and reproductive health care? How, and in what ways, do rural-urban female migrants deal with unintended pregnancy and abortion? How does migration influence sexual and reproductive health status and behaviours? Quantitative and qualitative analyses in this manuscript will examine migrant *kayayei's* sexual and reproductive health status and health behaviours, including motivations for the use of sexual and reproductive health services.

Preliminary analyses among *kayayei* who had ever given birth ($n = 441$) reveal that one-third of mothers did not want to get pregnant at the time of their last pregnancy. Yet, only 11.8% reported currently using family planning. In a largely illiterate population where the majority has never attended school, *kayayei's* first introduction to family planning is most likely to occur at infant weighing visits after they have already given birth:

When I was pregnant and I go give birth, I hear it [family planning] from the hospital. I wanted to learn family planning before giving birth. I wanted my mother to teach me all this so that I would not be pregnant.

- Frafra mother aged 22 years

Unintended pregnancy is a concern for *kayayei* in Accra and also for *kayayei* in their home communities in northern Ghana. Despite Ghana's relatively liberal abortion law, safe abortion is inaccessible for most girls and women. Unsafe abortion is commonplace:

Interviewer: *Do you know people who have died from abortion?*

Participant: *Oh, so many. I can't even count them.*

- Frafra woman aged 25 years

Nearly all participants reported barriers to accessing safe abortion services. Whilst participants disclosed that they had considered abortion after instances of rape and domestic violence, social and familial pressures as well as the threat of dying from an unsafe abortion led many of these young women to ultimately keep their unintended pregnancies. For rape survivors, migration presented an opportunity for a new beginning. In polygamous families, single parent families, and families where the husband or partner was ill or disabled, pregnancy pushed mothers into the role of primary breadwinner. Pregnancy drove migration, as mothers moved in search of employment to support their babies and to pay for children's school fees:

I knew that if I didn't start taking care of my children, they wouldn't be in a good position in the future. That is why I think about it and I say I will come and be doing it [kayayei]. I will come and find money and go back and be selling things. It will be good for us. Good for me to take care of my children for the school.

- Mole-Dagbani mother aged 32 years

Most *kayayei* girls and women have demonstrated their ability to make independent decisions regarding their futures, as evidenced by their decisions to migrate; however, this degree of personal agency only extends partially to decisions regarding unintended pregnancies. *Kayayei's* lack of education, combined with their vulnerability to sexual violence, impedes this population's ability to make their own sexual and reproductive health decisions and

access sexual and reproductive health services. Valued information about family planning arrives too late.

Religious, social, and familial influences largely dictate and limit the health-related behaviours of participants following unintended pregnancy and rape. Participants' migration decisions and behaviours, however, appear exempt from such external pressures and restrictions. Families and communities consider female economic migration beneficial and even necessary. Whilst sexual and reproductive health risks accompany migration, migration also presents sexual and reproductive health benefits. Migrating without one's partner or spouse can serve as a form of long-distance birth control, enabling participants to have greater control over the timing and spacing of their pregnancies.

As indicated by these findings and the literature, rural constraints on sexuality are more restrictive for women than men, particularly for unmarried women (Anglewicz, VanLandingham et al. 2014). Stigma also constrains women's willingness to discuss their reproductive health care and reproductive experiences (Ayanore, Pavlova et al. 2017). Furthermore, women are less likely to access and use maternal health care services in communities where gender norms tolerate violence against women (Adjiwanou and LeGrand 2014). Whilst rural women, including participants in my study, may experience limited agency and decision-making abilities with regards to sexual and reproductive health, migration offers an increasingly acceptable method by which girls and women can exert control over their lives. This control extends to sexual and reproductive health, as migration changes relationships, gender roles, fertility decisions, and use of family planning (Maternowska, Estrada et al. 2010). In this regard, migration may provide a more socially acceptable way for girls and women to exert greater agency over their sexuality and fertility.

Growing female migration from northern to southern Ghana has the potential to reduce higher fertility levels in Ghana's northern regions. According to the literature, this fertility reduction can happen in different ways. Regarding migration, patterns of female migration influence the timing of the first birth and post-migration fertility (Ortensi 2015). Regarding the labour force, increases in female participation in paid labour lead to a reduction in fertility (Canning and Schultz 2012). The implications of this literature suggest that with continued north-south female migration in Ghana, the northern regions will experience a future reduction in fertility.

This paper will conclude with policy and programmatic recommendations, such as:

- Subsidise and facilitate girls' education in the rural North, as many girls are still prevented from a basic education
- Include comprehensive sexual and reproductive health education in public schools
- Provide information about family planning and maternity care services, including safe abortion, at the village level
- Increase awareness of and improve access to National Health Insurance exemptions for children, pregnant women, and the poor

6.5.2 Expectations and consequences of remittances among Ghana's migrant kayayei

The contributions of *kayayei* to Ghana's economy are substantial. Many of the migrant girls and young women who perform this laborious work earn above Ghana's minimum daily wage, sending home significant remittances more frequently than males (Abdul-Korah 2011). The objectives of this paper are: (1) to describe migration and remittance behaviours among migrant *kayayei*; and (2) to identify characteristics of remitters who remit in excess of the norm. Among participants who remitted money and goods back north, qualitative and quantitative analyses will explore strategies for saving money, motivations for sending remittances back north, and determinants of remittance behaviour.

Kayayei who send remittances north ($n = 299$) remitted an average of GH¢ 84.15 (approximately £14.32 as of 13 November 2017) per month, a value equivalent to working approximately 12 days at the 2015 National Daily Minimum Wage of GH¢ 7 (approximately £1.19 as of 13 November 2017). Some *kayayei* remit as much as GH¢ 50 (approximately £8.51 as of 13 November 2017) per week; yet, homelessness among *kayayei* is endemic. In this setting, homelessness is not synonymous with unemployment but is rather a financial strategy for saving earnings from head portering.

Participants' mothers ($n = 225$) most frequently received these funds. Notably, nearly half of participants' mothers ($n = 110$) provided childcare to participants' children whilst participants were away in Accra. Participants' children ($n = 51$), fathers ($n = 34$), and siblings ($n = 17$) also received remittances. In order to save money, 92.6% of participants had foregone shelter,

food, healthcare, and/or new clothing. Foregoing shelter and sleeping outside to accumulate greater savings was a particularly risky behaviour, as noted in the qualitative findings. It exposed *kayayei* to dangers such as rape, theft, malaria, and inclement weather.

Employment is the primary reason that *kayayei* reported migrating to Accra. Qualitative insights revealed that many participants found themselves taking up the role of provider in response to family changes: deaths, separation/divorce, and illness. In polygamous families, these changes often included a husbands' inability to support multiple wives and their children. Poor farming harvests also pushed participants to diversify household income by seeking employment in Accra. Sending remittances in these instances provided crucial family support. Participants' motivations to remit also included supporting younger siblings and children with regards to the payment of school fees. Investing in siblings and children was perceived as a way to secure *kayayei*'s own futures:

I cannot go back to school because my family are no more there. We're left with only me and my junior sisters, two. They are going to school. If I go back to school, who will take care of all of us? [...] I left Bolga and I came here [to Accra] because in Bolga, there is no work for me to get money to support my junior sisters to go to school. I want to help my junior sisters because I did not get anybody to help me go to school. And I am the senior. So I decided to work and help them so that maybe one day, one day when I grow, they will also take care of me or they will take care of my children.

- Frafra woman aged 21 years, who remits GH¢ 107 monthly

Binary logistic regression analyses will examine the relationship between a participant's likelihood to remit and demographic variables (e.g., age, type of residence). The duration (hours per day and days per week) a *kayayoo* works and the amount of money she makes on good and bad days do not significantly affect her likelihood of remitting or not. Rather, the likelihood of remitting is dependent on variables such as the type of dwelling (e.g., shared room, kiosk, outside) in which a *kayayoo* resides.

Kayayei's remittances provide crucial support to struggling families and to in-school dependents. Long-term social and familial consequences of not remitting money or goods

may be considered a greater risk than short-term health and safety risks that accompany savings strategies such as voluntary homelessness. Since the primary reason that girls and women migrate from northern Ghana to Accra is to seek paid employment as *kayayei*, this migration phenomenon is likely to continue in the absence of significant economic development in northern Ghana.

The findings in this paper counter depictions of female migrants as passive, invisible players in migration (Caldwell 1969, Findley 1989). They also reinforce the literature on female-centred remittance flows, where migrant women are more likely to remit to other women (Dannecker and Sieveking 2009, Pickbourn 2016). Households where women primarily receive remittances spend more than double on education than households where men primarily receive remittances (Pickbourn 2016). The experiences and motivations of migrant *kayayei* reinforce this literature, as providing for their children's education is a key factor influencing *kayayei*'s decisions to migrate and remit. For many families, including participants in my study, female participation in the migrant workforce is an economic necessity. Yet, the costs of this participation can be quite high when mothers migrate alone. Prolonged maternal absence can potentially harm child wellbeing even though many migrant mothers intend for their migrations to improve their families' quality of life (Contreras and Griffith 2012, Xu, Wu et al. 2018). Based on this literature, the childhood impact of mothers migrating independently to work as *kayayei* warrants greater attention.

After indicating how this research will contribute to the literature on female-centred remittance flows and the impact of remittances on families, this paper will conclude with a discussion of the remittance-related implications of current efforts to stop female migrants from working as *kayayei* and efforts to decrease north-south migration in Ghana. Instead of providing vocational training to migrant *kayayei* in Accra, the Ghanaian government might consider investing these resources in its education system. By providing primary and secondary education that is truly free, it is possible that Ghana would see a reduction in north-south female migration.

6.6 Summary

The analyses conducted in this thesis provide a valuable source of information on female migration and health, complementing and offering relevance to other migration studies in

low- and middle-income countries. Female migration within Africa will rise should current trends persist, and female migrants will predominately seek out regions offering economic opportunities. Planning for and managing this changing population distribution requires improved data sources and data collection methods as well as greater knowledge about the links between migration and women's health.

References

- Abdulai, A.-M. (2016). "Internal Migration Determinants: Evidence from Northern Region of Ghana." Ghana Journal of Development Studies **13**(1): 1-17.
- Ackah, C. and D. Medvedev (2012). "Internal migration in Ghana: determinants and welfare impacts." International Journal of Social Economics **39**(10): 764-784.
- Adanu, R. M. and T. R. Johnson (2009). "Migration and women's health." International Journal of Gynecology & Obstetrics **106**(2): 179-181.
- Adanu, R. M., J. Seffah, J. K. Anarfi, N. Lince and K. Blanchard (2012). "Sexual and reproductive health in Accra, Ghana." Ghana Medical Journal **46**(2): 58-65.
- Addai, I. (2000). "Determinants of use of maternal-child health services in rural Ghana." Journal of Biosocial Science **32**(1): 1-15.
- Addai, I. (2011). "Estimating Remittances in the Informal Sector Labour Market in a Developing Economy: A Micro-Level Evidence on Kayayoo Migrants in Kumasi, Ghana." The Social Sciences **6**(4): 313-317.
- Addoquaye Tagoe, C. and S. O. Kwankye (2009). Returning Home and Re-Integrating as an Independent Child Migrant in Ghana. Independent Migration of Children in Ghana. J. K. Anarfi and S. O. Kwankye. Ghana, Sundel Services: 206-247.
- Adjiwanou, V. and T. LeGrand (2014). "Gender inequality and the use of maternal healthcare services in rural sub-Saharan Africa." Health & Place **29**(0): 67-78.
- African Development Bank Group (2014). Tracking Africa's Progress in Figures. Tunis, Tunisia, African Development Bank.
- Agadjanian, V. and N. Zotova (2012). "Sampling and Surveying Hard-to-Reach Populations for Demographic Research: A Study of Female Labor Migrants in Moscow, Russia." Demographic Research **26**(5): 131-150.
- Agyei, J. and E. Ofosu-Mensah Ababio (2009). Historical Overview of Internal Migration in Ghana. Independent Migration of Children in Ghana. J. K. Anarfi and S. O. Kwankye. Ghana, Sundel Services: 9-44.
- Agyei, Y. A., E. Kumi and T. Yeboah (2016). "Is better to be a kayayei than to be unemployed: reflecting on the role of head portering in Ghana's informal economy." GeoJournal **81**(2): 293-318.
- Agyepong, I. A., D. N. Y. Abankwah, A. Abroso, C. Chun, J. N. O. Dodoo, S. Lee, S. A. Mensah, M. Musah, A. Twum, J. Oh, J. Park, D. Yang, K. Yoon, N. Otoo and F. Asenso-Boadi (2016). "The "Universal" in UHC and Ghana's National Health Insurance Scheme: policy and implementation challenges and dilemmas of a lower middle income country." BMC Health Services Research **16**(1): 504.
- Akazili, J., P. Welaga, A. Bawah, F. S. Achana, A. Oduro, J. K. Awoonor-Williams, J. E. Williams, M. Aikins and J. F. Phillips (2014). "Is Ghana's pro-poor health insurance scheme

really for the poor? Evidence from Northern Ghana." BMC Health Services Research **14**(1): 637.

Alfers, L. (2013). The Ghana National Health Insurance Scheme: Barriers to Access for Informal Workers. WIEGO Working Paper (Social Protection). Manchester, UK, Women in Informal Employment: Globalizing and Organizing (WIEGO).

Anarfi, J. K. and J. Agyei (2009). To Move or Not to Move: The Decision-Making Process of Child Migrants from Northern to Southern Ghana. Independent Migration of Children in Ghana. J. K. Anarfi and S. O. Kwankye. Ghana, Sundel Services: 101-131.

Anarfi, J. K. and M. Appiah (2009). The Phenomenon of Independent Child Migration in Ghana in the Context of a Globalised World. Independent Migration of Children in Ghana. J. K. Anarfi and S. O. Kwankye. Ghana, Sundel Services: 45-70.

Anarfi, J. K. and S. O. Kwankye, Eds. (2009). Independent Migration of Children in Ghana. Legon, Ghana, Sundel Services.

Anglewicz, P., M. VanLandingham and D. Phuengsamran (2014). "Rural-to-Urban Migration and Sexual Debut in Thailand." Demography **51**(5): 1955-1976.

Anthony, M. J., E. G. Martin, A. M. Avery and J. M. Williams (2010). "Self Care and Health-Seeking Behavior of Migrant Farmworkers." Journal of Immigrant & Minority Health **12**(5): 634-639.

Arnold, C., J. Theede and A. Gagnon (2014). "A qualitative exploration of access to urban migrant healthcare in Nairobi, Kenya." Social Science & Medicine **110**: 1-9.

Awumbila, M. (2007). Internal Migration, Vulnerability and Female Porters in Accra, Ghana. Population Association of America. New York.

Awumbila, M. (2015). "Women Moving Within Borders: Gender and Internal Migration dynamics in Ghana." Ghana Journal of Geography **7**(2): 132-145.

Awumbila, M. and E. Ardayfio-Schandorf (2008). "Gendered poverty, migration and livelihood strategies of female porters in Accra, Ghana." Norsk Geografisk Tidsskrift-Norwegian Journal of Geography **62**(3): 171-179.

Ayanore, M. A., M. Pavlova, R. Biesma and W. Groot (2017). "Stakeholder's experiences, expectations and decision making on reproductive care: An ethnographic study of three districts in northern Ghana." PLOS ONE **12**(11): e0186908.

Baah-Enumh, T. Y., O. Amponsah and M. O. Adoma (2012). "The Living Conditions of Female Head Porters in the Kumasi Metropolis, Ghana." Journal of Social and Development Sciences **3**(7): 229-244.

Badasu, D., F. Frempong-Ainguah and S. N. A. Codjoe (2009). Child Care Strategies Among Young Migrants at Destination Areas. Independent Migration of Children in Ghana. J. K. Anarfi and S. O. Kwankye. Ghana, Sundel Services: 171-205.

Baker, S. E. and R. Edwards (2012). How many qualitative interviews is enough? National Centre for Research Methodological Review Paper, National Centre for Research Methods: 3-4.

Balaz, V. and A. M. Williams (2011). "Risk attitudes and migration experience." Journal of Risk Research **14**(5): 583-596.

Barker, J. and S. Weller (2003). "Geography of methodological issues in research with children." Qualitative Research **3**(2): 207-227.

Bawah, A. A., P. Akweongo, R. Simmons and J. F. Phillips (1999). "Women's fears and men's anxieties: The impact of family planning on gender relations in northern Ghana." Studies in Family Planning **30**(1): 54-66.

Beegle, K. and M. Poulin (2013). "Migration and the Transition to Adulthood in Contemporary Malawi." Annals of the American Academy of Political and Social Science **648**(1): 38-51.

Beiser, M. (2005). "The Health of Immigrants and Refugees in Canada." Canadian Journal of Public Health **96**: S30-44.

Blacksmith Institute and Green Cross Switzerland (2013). *The World's Worst 2013: The Top Ten Toxic Threats*. New York, Blacksmith Institute.

Boakye-Yiadom, L. and A. McKay (2007). *Migration between Ghana's Rural and Urban Areas: The Impact on Migrants' Welfare*. PEGNet Conference. Berlin, Germany.

Boateng, S., P. Amoako, A. A. Poku, A. Baabereyir and R. M. Gyasi (2017). "Migrant female head porters' enrolment in and utilisation and renewal of the National Health Insurance Scheme in Kumasi, Ghana." Journal of Public Health **25**(6): 625-634.

Brockerhoff, M. and A. E. Biddlecom (1999). "Migration, Sexual behavior and the risk of HIV in Kenya." International Migration Review **33**(4): 833-856.

Bryant, J. (2014). "Using respondent-driven sampling with 'hard to reach' marginalised young people: problems with slow recruitment and small network size." International Journal of Social Research Methodology **17**(6): 599-611.

Caldwell, J. C. (1969). African rural-urban migration: the movement to Ghana's towns. London, C. Hurst & Co.

Camlin, C. S., R. C. Snow and V. Hosegood (2014). "Gendered Patterns of Migration in Rural South Africa." Population Space and Place **20**(6): 528-551.

Canning, D. and T. P. Schultz (2012). "The economic consequences of reproductive health and family planning." Lancet **380**(9837): 165-171.

Carballo-Diéguez, A., I. Balan, R. Marone, M. A. Pando, C. Dolezal, V. Barreda, C.-S. Leu and M. M. Ávila (2011). "Use of Respondent Driven Sampling (RDS) Generates a Very Diverse Sample of Men Who Have Sex with Men (MSM) in Buenos Aires, Argentina." PLoS ONE **6**(11): e27447.

Chen, J. J., H. Y. Liu and Z. M. Xie (2010). "Effects of Rural-Urban Return Migration on Women's Family Planning and Reproductive Health Attitudes and Behavior in Rural China." Studies in Family Planning **41**(1): 31-44.

Chinkoyo, S. (2002). Characteristics and reproductive health needs of female 'Rural to Urban' migrants in Zambia. Master of Medicine in Obstetrics and Gynaecology, University of Zambia.

Contreras, R. and D. Griffith (2012). "Managing Migration, Managing Motherhood: The Moral Economy of Gendered Migration." International Migration **50**(4): 51-66.

Creswell, J. W. (2011). Controversies in mixed methods research. Handbook of qualitative research. N. K. Denzin and Y. S. Lincoln. Thousand Oaks, California, USA, SAGE: 269-284.

Crush, J. and G. Tawodzera (2014). "Medical Xenophobia and Zimbabwean Migrant Access to Public Health Services in South Africa." Journal of Ethnic & Migration Studies **40**(4): 655-670.

Daily Express (2010). "Kayayei" numbers higher than anticipated. Daily Express. Accra, Ghana.

Daily Graphic (2010). Hectic time for census teams. Daily Graphic. Accra, Ghana, Myjoyonline.com.

Dannecker, P. and N. Sieveking (2009). Gender, Migration and Development: An Analysis of the Current Discussion on Female Migrants as Development Agents. COMCAD Arbeitspapiere - Working Papers. T. Faist. Bielefeld, Germany, Centre on Migration, Citizenship and Development.

Day, C. (2014). Giving the vulnerable a voice: ethical considerations when conducting research with children and young people. Fieldwork in the Global South: Ethical challenges and dilemmas. J. Lunn. Oxon, UK, Routledge: 192-205.

Decker, M. R., B. D. Marshall, M. Emerson, A. Kalamar, L. Covarrubias, N. Astone, Z. Wang, E. Gao, L. Mashimbye, S. Delany-Moretlwe, R. Acharya, A. Olumide, O. Ojengbede, R. W. Blum and F. L. Sonenstein (2014). "Respondent-Driven Sampling for an Adolescent Health Study in Vulnerable Urban Settings: A Multi-Country Study." J Adolesc Health **55**(6s): S6-s12.

Denzin, N. K. (1978). The research act: a theoretical introduction to sociological methods. London, McGraw-Hill.

Derbile, E. K. and S. van der Geest (2013). "Repackaging exemptions under National Health Insurance in Ghana: how can access to care for the poor be improved?" Health Policy and Planning **28**(6): 586-595.

Dixon, J., I. N. Luginaah and P. Mkandawire (2014). "Gendered Inequalities within Ghana's National Health Insurance Scheme: Are Poor Women Being Penalized with a Late Renewal Policy?" J Health Care Poor Underserved **25**(3): 1005-1020.

Donato, K. M. and D. Gabaccia (2015). Gender and International Migration. New York, Russell Sage Foundation.

Dorrington, R. (2013). Estimation of migration from census data. Tools for Demographic Estimation. T. Moultrie, R. E. Dorington, A. G. Hill et al. Paris, International Union for the Scientific Study of Population.

Driedger, L. and J. Peters (1977). "Identity and social distance: towards understanding Simmel's 'The Stranger'." Canadian Review of Sociology **14**(2): 158-173.

Dzúrová, D., P. Winkler and D. Drbohlav (2014). "Immigrants' Access to Health Insurance: No Equality without Awareness." International Journal of Environmental Research and Public Health **11**(7): 7144.

Elias, J. (2010). "Making migrant domestic work visible: The rights based approach to migration and the 'challenges of social reproduction'." Review of International Political Economy **17**(5): 840-859.

Ensor, T. and S. Cooper (2004). "Overcoming barriers to health service access: influencing the demand side." Health Policy Plan **19**(2): 69-79.

Evans, R. and S. Becker (2009). Children caring for parents with HIV and AIDS: Global issues and policy responses. Bristol, UK, Policy Press.

Findley, S. E. (1989). Les migrations féminines dans les villes africaines : une revue de leurs motivations et expériences. L'insertion urbaine des migrants en Afrique. P. Antoine and S. Coulibaly. Paris, France, ORSTOM: 55-70.

Fink, G., R. Arku and L. Montana (2012). "The health of the poor: women living in informal settlements." Ghana Medical Journal **46**(2): 104-112.

Ford, K. and V. Hosegood (2005). "Aids mortality and the mobility of children in Kwazulu Natal, South Africa." Demography **42**(4): 757-768.

Frempong-Ainguah, F., D. M. Badasu and S. N. A. Codjoe (2009). North-South Independent Child Migration in Ghana: The Push and Pull Factors. Independent Migration of Children in Ghana. J. K. Anarfi and S. O. Kwankye. Ghana, Sundel Services: 71-100.

Friberg, J. H. and C. Horst (2014). RDS and the Structure of Migrant Populations. Applying Respondent Driven Sampling to Migrant Populations: Lessons from the Field. G. Tyldum and L. Johnston. London, Palgrave Pivot: 17-26.

Fujii, L. A. (2015). "Five stories of accidental ethnography: turning unplanned moments in the field into data." Qualitative Research **15**(4): 525-539.

Garshong, B. and J. Akazili (2015). Universal Health Coverage Assessment: Ghana. Ghana, Global Network for Health Equity.

Ghana Ministry of Health (September 2007). National health policy: Creating wealth through health.

Ghana Statistical Service, Ghana Health Service and ICF Macro (2009). Ghana Demographic and Health Survey 2008. Accra, Ghana.

Gile, K. J. and M. S. Handcock (2010). "Respondent-Driven Sampling: An Assessment of Current Methodology." Sociological methodology **40**(1): 285-327.

Goel, S. and M. J. Salganik (2009). "Respondent-driven sampling as Markov chain Monte Carlo." Statistics in Medicine **28**: 2202-2229.

Goel, S. and M. J. Salganik (2010). "Assessing respondent-driven sampling." Proceedings of the National Academy of Sciences **107**(15): 6743-6747.

Gomes, M., A. Pastore y Piontti, L. Rossi, D. Chao, I. Longini, M. Halloran and i. A. Vespignani (2014). "Assessing the International Spreading Risk Associated with the 2014 West African Ebola Outbreak." PLOS Currents Outbreaks.

Grant, R. W. and J. Sugarman (2004). "Ethics in Human Subjects Research: Do Incentives Matter?" Journal of Medicine and Philosophy **29**(6): 717-738.

GSS (1995). Migration Research Study in Ghana. K. A. Twum-Baah, J. S. Nabila and A. F. Aryee. Accra, Ghana, Ghana Statistical Service. **Volume 1: Internal Migration**.

GSS (1999). Government of Ghana 2000 Population and Housing Census: Enumerator's Manual. Accra, Ghana, Ghana Statistical Service.

GSS (2003). 2000 Population and Housing Census Administrative Report. Accra, Ghana, Ghana Statistical Service.

GSS (2008). Ghana Living Standard Survey Report of the Fifth Round (GLSS 5). Accra, Ghana., Ghana Statistical Service.

GSS (2012). 2010 Population and Housing Census Post Enumeration Survey Report. Accra, Ghana, Ghana Statistical Service.

GSS (2013a). 2010 Population & Housing Census: Children, Adolescents & Young People. Accra, Ghana, Ghana Statistical Service: 1-130.

GSS (2013b). 2010 Population & Housing Census Regional Analytical Report: Greater Accra Region. N. Bentsi-Enchill. Accra, Ghana, GSS: 1-134.

GSS (2013c). 2010 Population & Housing Census: National Analytical Report. K. Awusabo-Asare. Accra, Ghana, Ghana Statistical Service: 1-409.

GSS (2014a). Ghana Living Standard Survey Round 6 (GLSS 6): Main Report. Accra, Ghana, Ghana Statistical Service.

GSS (2014b). Ghana Living Standards Survey Round 6 (GLSS 6): Labour Force Report. Accra, Ghana., Ghana Statistical Service.

GSS (2014c). 2010 Population & Housing Census Report: Fertility. J. F. Amoako. Accra, Ghana, Ghana Statistical Service: 1-55.

GSS, GHS and DHS Program (2015). Ghana Demographic and Health Survey 2014. Accra, Ghana, Ghana Statistical Service, Ghana Health Service, and the DHS Program.

GSS, GHS and ICF Macro (1994). Ghana Demographic and Health Survey 1993. Accra, Ghana, Ghana Statistical Service, Ghana Health Service, and ICF Macro: 1-127.

GSS, GHS and ICF Macro (2009). Ghana Demographic and Health Survey 2008. Calverton, Maryland, Ghana Statistical Service, Ghana Health Service, and ICF Macro: 1-512.

GSS and IRD (1989). Ghana Demographic and Health Survey 1988. Accra, Ghana, Ghana Statistical Service, Institute for Resource Development/Macro Systems Inc.: 1-190.

GSS and Macro International (1999). Ghana Demographic and Health Survey 1998. Accra, Ghana, Ghana Statistical Service, Macro International Inc.: 1-249.

GSS, NMIMR and ICF Macro (2004). Ghana Demographic and Health Survey 2003. Calverton, Maryland, Ghana Statistical Service, Noguchi Memorial Institute for Medical Research, and IFC Macro: 1-403.

Guo, M., N. W. S. Chow and L. A. Palinkas (2011). "Circular Migration and Life Course of Female Domestic Workers in Beijing." Asian Population Studies 7(1): 51-67.

Heckathorn, D. (2007). "Extensions of respondent driven sampling: analyzing continuous variables and controlling for differential recruitment." Sociological Methodology 37(1): 151-207.

Heckathorn, D. D. (1997). "Respondent-Driven Sampling: A New Approach to the Study of Hidden Populations." Social Problems 44(2): 174-199.

Heckathorn, D. D. (2002). "Respondent-Driven Sampling II: Deriving Valid Population Estimates from Chain-Referral Samples of Hidden Populations." Social Problems 49(1): 11-34.

Hill, A. G., R. Darko, J. Seffah, R. M. Adanu, J. K. Anarfi and R. B. Duda (2007). "Health of urban Ghanaian women as identified by the Women's Health Study of Accra." International Journal of Gynecology & Obstetrics 99(2): 150-156.

Hofmann, E. T. and C. J. Buckley (2012). "Cultural Responses to Changing Gender Patterns of Migration in Georgia." International Migration 50(5): 77-94.

Housing the Masses (2010). Final Report to People's Dialogue on Human Settlements on Community-Led Enumeration of Old Fadama Community, Accra - Ghana. Accra, Ghana, Housing the Masses and People's Dialogue on Human Settlements.

Idris, H., E. Satriawan and L. Trisnantoro (2017). "Determinant of Health Insurance Ownership in the Informal Sector: A Panel Study from Indonesia Family Life Survey." Advanced Science Letters 23(4): 3582-3585.

IMPACT Project (2005). Implementation of free delivery policy in Ghana.

International Organization for Migration (2010). Integrated Biological and Behavioural Surveillance Survey among Migrant Female Sex Workers in Nairobi, Kenya. Nairobi, International Organization for Migration.

Jehu-Appiah, C., G. Aryeetey, I. Agyepong, E. Spaan and R. Baltussen (2012). "Household perceptions and their implications for enrollment in the National Health Insurance Scheme in Ghana." Health Policy and Planning **27**(3): 222-233.

Jehu-Appiah, C., G. Aryeetey, E. Spaan, I. Agyepong and R. Baltussen (2010). "Efficiency, equity and feasibility of strategies to identify the poor: An application to premium exemptions under National Health Insurance in Ghana." Health Policy **95**(2-3): 166-173.

Jick, T. D. (1979). "Mixing Qualitative and Quantitative Methods: Triangulation in Action." Administrative Science Quarterly **24**(4): 602-611.

Johnson, R. B., A. J. Onwuegbuzie and L. A. Turner (2007). "Toward a Definition of Mixed Methods Research." Journal of Mixed Methods Research **1**(2): 112-133.

Johnston, L., L. Rodriguez and J. Napierala (2014). Measuring Personal Network Size in RDS. Applying Respondent Driven Sampling to Migrant Populations: Lessons from the Field. G. Tyldum and L. Johnston. London, Palgrave Pivot: 27-36.

Johnston, L., T. Thurman, N. Mock, L. Nano and V. Carcani (2010). "Respondent-driven sampling: A new method for studying street children with findings from Albania." Vulnerable Children and Youth Studies **5**(1): 1-11.

Kearney, H. (2013). Ghana's female porters get family planning advice. Guardian.

Kenny, C. and A. Sumner (2011). How 28 poor countries escaped the poverty trap. Guardian. London.

Keygnaert, I., A. Dialmy, A. Manco, J. Keygnaert, N. Vettenburg, K. Roelens and M. Temmerman (2014). "Sexual violence and sub-Saharan migrants in Morocco: a community-based participatory assessment using respondent driven sampling." Globalization and Health **10**: 16.

Khamsiriwatchara, A., P. Wangroongsarb, J. Thwing, J. Eliades, W. Satimai, C. Delacollette and J. Kaewkungwal (2011). "Respondent-driven sampling on the Thailand-Cambodia border. I. Can malaria cases be contained in mobile migrant workers?" Malaria Journal **10**(1): 1-11.

Kotoh, A. M. and S. Van der Geest (2016). "Why are the poor less covered in Ghana's national health insurance? A critical analysis of policy and practice." International Journal for Equity in Health **15**: 34.

Kubal, A., I. Shvab and A. Wojtynska (2014). Initiation of the RDS Recruitment Process: Seed Selection and Role. Applying Respondent Driven Sampling to Migrant Populations: Lessons from the Field. G. Tyldum and L. Johnston. London, Palgrave Pivot: 37-48.

Kwankye, S. (2007). Migration and, sexual and reproductive behaviour among young women in Ghana. Union for African Population Studies: Fifth African Population Conference. Arusha, Tanzania.

Kwankye, S. O. and C. Addoquaye Tagoe (2009). City Life Outside the Home: The Experiences of Independent Child Migrants in Ghana. Independent Migration of Children in Ghana. J. K. Anarfi and S. O. Kwankye. Ghana, Sundel Services: 132-170.

Lattof, S. R. (2018). "Health insurance and care-seeking behaviours of female migrants in Accra, Ghana." Health Policy and Planning **33**(4): 505-515.

Le, A. T. K., L. H. Vu and E. Schelling (2015). "Utilization of health care services among internal migrants in Hanoi and its correlation with health insurance: A cross-sectional study." Tap chi y te cong cong **3**(2): 44-56.

Leech, N. L. and A. J. Onwuegbuzie (2007). "A typology of mixed methods research designs." Quality & Quantity **43**(2): 265-275.

Little, J. and R. Dorrington (2013). The multi-exponential model migration schedule. Tools for Demographic Estimation. M. TA, R. Dorrington, A. Hill et al. Paris, International Union for the Scientific Study of Population.

Liu, H., J. Li, T. Ha and J. Li (2012). "Assessment of Random Recruitment Assumption in Respondent-Driven Sampling in Egocentric Network Data." Social networking **1**(2): 13-21.

Llácer, A., M. V. Zunzunegui, J. del Amo, L. Mazarrasa and F. Bolúmar (2007). "The contribution of a gender perspective to the understanding of migrants' health." J Epidemiol Community Health **61**(Suppl 2): ii4-ii10.

Malmusi, D., C. Borrell and J. Benach (2010). "Migration-related health inequalities: Showing the complex interactions between gender, social class and place of origin." Social Science & Medicine **71**(9): 1610-1619.

Maternowska, C., F. Estrada, L. Campero, C. Herrera, C. D. Brindis and M. M. Vostrejs (2010). "Gender, culture and reproductive decision-making among recent Mexican migrants in California." Culture Health & Sexuality **12**(1): 29-43.

Mills, H. L., S. Johnson, M. Hickman, N. S. Jones and C. Colijn (2014). "Errors in reported degrees and respondent driven sampling: implications for bias." Drug Alcohol Depend **142**: 120-126.

Montealegre, J., J. Risser, B. Selwyn, S. McCurdy and K. Sabin (2013). "Effectiveness of Respondent Driven Sampling to Recruit Undocumented Central American Immigrant Women in Houston, Texas for an HIV Behavioral Survey." AIDS & Behavior **17**(2): 719-727.

Mou, J., J. Cheng, D. Zhang, H. Jiang, L. Lin and S. M. Griffiths (2009). "Health care utilisation amongst Shenzhen migrant workers: does being insured make a difference?" BMC Health Services Research **9**: 214-214.

Moultrie, T., R. E. Dorrington, A. G. Hill, K. Hill, I. M. Timæus and B. Zaba (2013). Tools for Demographic Estimation. Paris, International Union for the Scientific Study of Population.

Nanda, P. (2002). "Gender dimensions of user fees: Implications for women's utilization of health care." Reproductive Health Matters **10**(20): 127-134.

National Development Planning Commission (2015). Implementation of the Ghana shared growth and development agenda (GSGDA) II, 2014–2017: 2014 annual progress report. Accra, Ghana, NDPC.

National Health Insurance Authority (2014). 2013 Annual Report. Accra, Ghana, National Health Insurance Authority.

NCOB (2002). The ethics of research related to healthcare in developing countries. London, Nuffield Council on Bioethics.

Nyonator, F. and J. Kutzin (1999). "Health for some? The effects of user fees in the Volta Region of Ghana." Health Policy and Planning **14**(4): 329-341.

Oakley, A. (1981). Interviewing Women: A Contradiction in Terms. Doing Feminist Research. H. Roberts. London, Routledge and Kegan Paul: 31-61.

Oberhauser, A. M. and M. A. Yeboah (2011). "Heavy burdens: Gendered livelihood strategies of porters in Accra, Ghana." Singapore Journal of Tropical Geography **32**(1): 22-37.

Odame, E. A., P. Akweongo, B. Yankah, F. Asenso-Boadi and I. Agyepong (2014). "Sustainability of recurrent expenditure on public social welfare programmes: expenditure analysis of the free maternal care programme of the Ghana National Health Insurance Scheme." Health Policy and Planning **29**(3): 271-279.

Odei-Lartey, E. O., D. Boateng, S. Danso, A. Kwarteng, L. Abokyi, S. Amenga-Etego, S. Gyaase, K. P. Asante and S. Owusu-Agyei (2016). "The application of a biometric identification technique for linking community and hospital data in rural Ghana." Glob Health Action **9**: 29854.

Okal, J., H. F. Raymond, W. Tun, H. Musyoki, S. Dadabhai, D. Broz, J. Nyamu, D. Kuria, N. Muraguri and S. Geibel (2016). "Lessons learned from respondent-driven sampling recruitment in Nairobi: experiences from the field." BMC Research Notes **9**(1): 1-13.

Opare, J. A. (2003). "Kayayei: The Women Head Porters of Southern Ghana." Journal of Social Development in Africa **18**(2): 33-48.

Ortensi, L. E. (2015). "Engendering the fertility-migration nexus: The role of women's migratory patterns in the analysis of fertility after migration." Demographic Research **32**(53): 1435-1468.

Parker, B. and Y. Ulrich (1990). "A protocol of safety: research on abuse of women. Nursing Research Consortium on Violence and Abuse." Nurs Res **39**(4): 248-250.

Parliament of the Republic of Ghana (2016). Parliamentary Debates: Official Report. Department of Official Report. Accra, Ghana, Parliament House. **93**.

Patton, M. Q. (2002). Qualitative Research and Evaluation Methods. Thousand Oaks, CA, SAGE.

Pickbourn, L. (2016). "Remittances and Household Expenditures on Education in Ghana's Northern Region: Why Gender Matters." Feminist Economics **22**(3): 74-100.

Platt, L., R. Luthra and T. Frere-Smith (2015). "Adapting chain referral methods to sample new migrants: Possibilities and limitations." Demographic Research **33**(24): 665-700.

Porter, G., K. Hampshire, M. Bourdillon, E. Robson, A. Munthali, A. Abane and M. Mashiri (2010). "Children as Research Collaborators: Issues and Reflections from a Mobility Study in Sub-Saharan Africa." American Journal of Community Psychology **46**(1/2): 215-227.

Quansaha, H. N.-B. (2017). Kayayei still urbanisation crisis. GhanaWeb. Accra, GhanaWeb.

Quartey, P. and E. Yambilla (2009). The Costs and Benefits of Child Migration in Ghana: The Case of Child Migrants From Northern Ghana. Independent Migration of Children in Ghana. J. K. Anarfi and S. O. Kwankye. Ghana, Sundel Services: 248-291.

Rabiu, F. B. (2013). "Ghana's Kayayei – Carrying the family load." Prospects Retrieved 4 April 2014, from <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:23394672~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html>.

Regassa, N. and A. Yusufe (2009). "Gender Differentials in Migration Impacts in Southern Ethiopia." Anthropologist **11**(2): 129-137.

Resurreccion, B. P. (2009). "Female Migration and Social Reproduction in the Mekong Region." Asian and Pacific Migration Journal **18**(1): 101-122.

Ritchie, J., J. Lewis and G. Elam (2003). Designing and Selecting Samples. Qualitative Research Practice: A Guide for Social Science Students and Researchers. J. Ritchie and J. Lewis. London, SAGE Publications: 77-108.

Robson, E., G. Porter and K. Hampshire (2009). ""Doing it right?" Working with young researchers in Malawi to investigate children, transport and mobility." Children's Geographies **7**(4): 467-480.

Rodríguez, M. I., L. Say and M. Temmerman (2014). "Family planning versus contraception: what's in a name?" The Lancet Global Health **2**(3): e131-e132.

Rogers, A. and L. J. Castro (1981). Model Migration Schedules. Laxenburg, Austria, International Institute for Applied Systems Analysis.

Rokicki, S., L. Montana and G. Fink (2014). "Impact of Migration on Fertility and Abortion: Evidence From the Household and Welfare Study of Accra." Demography **51**(6): 2229-2254.

Ross, K. L., Y. A. Zereyesus, A. Shanoyan and V. Amanor-Boadu (2015). "The Health Effects of Women Empowerment: Recent Evidence from Northern Ghana." International Food and Agribusiness Management Review **18**(1): 127-144.

Rudolph, A. E., C. M. Fuller and C. Latkin (2013). "The Importance of Measuring and Accounting for Potential Biases in Respondent-Driven Samples." AIDS and Behavior **17**(6): 2244-2252.

Sabutey, V. S. (2014). Celebrating International Women's Day: a Look at the Plights of Ghanaian Female Porters (Kayayei). Joy Online.

Salganik, M. (2006). "Variance Estimation, Design Effects, and Sample Size Calculations for Respondent-Driven Sampling." Journal of Urban Health **83**(1): 98-112.

Salganik, M. J. and D. D. Heckathorn (2004). "Sampling and Estimation in Hidden Populations Using Respondent-Driven Sampling." Sociological Methodology **34**: 193-239.

Salifu, M. I. (2015). Interview with the Director and Founder of Kayayei Youth Association of Ghana. S. R. Lattof.

Semaan, S., J. Lauby and J. Liebman (2002). "Street and Network Sampling in Evaluation Studies of HIV Risk-Reduction Interventions." AIDS Rev **4**: 213-223.

Shamsu-Deen, Z. (2013). "Migrattion [sic] and Health Nexus: a Case of Female Porters (Kayayei) in Accra, Ghana." Research on Humanities and Social Sciences **3**(3): 103-109.

Singer, E. and M. P. Couper (2008). "Do Incentives Exert Undue Influence on Survey Participation? Experimental Evidence." Journal of Empirical Research on Human Research Ethics **3**(3): 49-56.

Snyder, R. E., M. A. Marlow and L. W. Riley (2014). "Ebola in urban slums: the elephant in the room." The Lancet Global Health **2**(12): e685.

Spiller, M. W., C. Cameron and D. D. Heckathorn (2012). RDS Analysis Tool 7.1: User Manual. Ithaca, New York, USA, Cornell University.

Spoorenberg, T. (2015). Population Estimation. Regional workshop on the production of population estimates and demographic indicators. Addis Ababa, Ethiopia, United Nations, Department of Economic and Social Affairs, Population Division.

Sudhinaraset, M., N. Diamond-Smith, M. M. Thet and T. Aung (2016). "Influence of internal migration on reproductive health in Myanmar: results from a recent cross-sectional survey." BMC Public Health **16**: 246.

Tangcharoensathien, V., A. A. Thwin and W. Patcharanarumol (2017). "Implementing health insurance for migrants, Thailand." Bull World Health Organ **95**(2): 146-151.

Thao, V. T. (2013). "Making a Living in Rural Vietnam from (Im)mobile Livelihoods: a Case of Women's Migration." Population Space and Place **19**(1): 87-102.

The Parliament of the Republic of Ghana (1998). The Children's Act. Act 560. Accra, Ghana.

Thiel, A. and M. Stasik (2016). "Market men and station women: changing significations of gendered space in Accra, Ghana." Journal of Contemporary African Studies **34**(4): 459-478.

Toma, S. and S. Vause (2014). "Gender Differences in the Role of Migrant Networks: Comparing Congolese and Senegalese Migration Flows." International Migration Review **48**(4): 972-997.

Trinitapoli, J., J. Verheijen, S. Watkins and S. Yeatman (2014). "Keeping the family in family planning." The Lancet Global Health **2**(7): e383.

Tufeiru, A. (2014). "The Nexus of Female Capital and North–South Labor Migration in Ghana: A Potential Remedy from Microfinance." Journal of Developing Societies **30**(1): 91-114.

Tufuor, T., A. Niehof, C. Sato and H. van der Horst (2015). "Extending the moral economy beyond households: Gendered livelihood strategies of single migrant women in Accra, Ghana." Women's Studies International Forum **50**(0): 20-29.

Tufuor, T., C. Sato and A. Niehof (2016). "Gender, households and reintegration: everyday lives of returned migrant women in rural northern Ghana." Gender, Place & Culture **23**(10): 1480-1495.

Tunçalp, Ö., M. J. Hindin, K. Adu-Bonsaffoh and R. Adanu (2012). "Listening to Women's Voices: The Quality of Care of Women Experiencing Severe Maternal Morbidity, in Accra, Ghana." PLoS ONE **7**(8): e44536.

Tyldum, G. and L. Johnston (2014). Applying Respondent Driven Sampling to Migrant Populations: Lessons from the Field. London, Palgrave Pivot.

Tyldum, G., L. Rodriguez, I. Bjørkhaug and A. Wojtynska (2014). Deciding on and Distributing Incentives in RDS. Applying Respondent Driven Sampling to Migrant Populations: Lessons from the Field. G. Tyldum and L. Johnston, Palgrave Pivot.

UN General Assembly (2015). Resolution adopted by the General Assembly on 25 September 2015: 70/1. Transforming our world: the 2030 Agenda for Sustainable Development Geneva, United Nations.

UNDESA (1970). Manual VI: Methods of Measuring Internal Migration. New York, United Nations.

UNDESA (2013). Cross-national comparisons of internal migration: An update on global patterns and trends. New York, USA, United Nations Department of Economic and Social Affairs.

UNDESA (2014). World Urbanization Prospects: The 2014 Revision, Highlights. New York, United Nations.

United Nations (2015). Transforming our World: The 2030 Agenda for Sustainable Development. Geneva, United Nations.

van Blerk, L. and N. Ansell (2006). "Children's experiences of migration: moving in the wake of AIDS in southern Africa." Environment and Planning D: Society and Space **24**: 449-471.

Volz, E. and D. D. Heckathorn (2008). "Probability Based Estimation Theory for Respondent Driven Sampling." Journal of Official Statistics **24**(1): 79-97.

Volz, E., C. Wejnert, C. Cameron, M. Spiller, V. Barash, I. Degani and D. D. Heckathorn (2012). Respondent-Driven Sampling Analysis Tool (RDSAT). Ithaca, NY, Cornell University. **Version 7.1**.

Wang, W., C. Wei, M. E. Buchholz, M. C. Martin, B. D. Smith, Z. J. Huang and F. Y. Wong (2010). "Prevalence and risks for sexually transmitted infections among a national sample of migrants versus non-migrants in China." International Journal of STD & AIDS **21**(6): 410-415.

Wejnert, C., H. Pham, N. Krishna, B. Le and E. DiNenno (2012). "Estimating Design Effect and Calculating Sample Size for Respondent-Driven Sampling Studies of Injection Drug Users in the United States." AIDS and Behavior **16**(4): 797-806.

White, R. G., A. J. Hakim, M. J. Salganik, M. W. Spiller, L. G. Johnston, L. Kerr, C. Kendall, A. Drake, D. Wilson, K. Orroth, M. Egger and W. Hladik (2015). "Strengthening the Reporting of Observational Studies in Epidemiology for respondent-driven sampling studies: "STROBE-RDS" statement." J Clin Epidemiol **68**(12): 1463-1471.

WHO (14 January 2015). Ebola Situation Report. Geneva, World Health Organization.

WHO (2001). Putting Women First: Ethical and Safety Recommendations for Research on Domestic Violence Against Women. Geneva, Switzerland, World Health Organization.

WHO (2015). Health in 2015: from MDGs to SDGs. Geneva, World Health Organization.

WHO (2018). Global Health Observatory data repository: Life tables by country: Ghana. Geneva, World Health Organization.

WHO and World Bank (2015). Tracking Universal Health Coverage: First Global Monitoring Report. Geneva, WHO.

WHO Country Office Ghana (2014). Situation Report on Cholera Outbreak in Ghana. Accra, Ghana, World Health Organization: 4 pp.

Wilson, A. and M. B. Mittelmark (2013). "Resources for Adjusting Well to Work Migration: Women from Northern Ghana Working in Head Portage in Greater Accra." Africa Today **59**(4).

Witter, S., S. Adjei, M. Armar-Klemesu and W. Graham (2009). "Providing maternal health care: Ten lessons from an evaluation of the national delivery exemption policy in Ghana." Global Health Action **2**.

Witter, S., D. K. Arhinful, A. Kusi and S. Zakariah-Akoto (2007). "The experience of Ghana in implementing a user fee exemption policy to provide free delivery care." Reproductive Health Matters **15**(30): 61-71.

Witter, S., A. Kusi and M. Aikins (2007). "Working practices and incomes of health workers: Evidence from an evaluation of a delivery fee exemption scheme in Ghana." Human Resources for Health **5**: 2.

World Bank (2016). Universal Health Coverage (UHC) in Africa: a framework for action. Washington, D.C., World Bank Group.

Wrigley-Asante, C. (2013). "Unraveling the health-related challenges of women in the informal economy: accounts of women in cross-border trading in Accra, Ghana." GeoJournal **78**(3): 525-537.

Xu, D., X. Wu, Z. Zhang and J. Dronkers (2018). "Not a zero-sum game: Migration and child well-being in contemporary China." Demographic Research **38**(26): 691-726.

Yakubu, O. and O. Adjei (2014). "Reliability of Fingerprint Verification in Ghana." International Journal of Computer Applications **107**(10): 9-13.

Yang, X. S. and G. M. Xia (2008). "Temporary migration and STD/HIV risky sexual behavior: A population-based analysis of gender differences in China." Social Problems **55**(3): 322-346.

Ye, Y., M. Wamukoya, A. Ezech, J. B. O. Emina and O. Sankoh (2012). "Health and demographic surveillance systems: a step towards full civil registration and vital statistics system in sub-Sahara Africa?" BMC Public Health **12**(1): 741.

Yeboah, I., F. Dodoo, S. Kwankye, P. Nyarko, D. Badasu and C. Biavaschi (2010). Development on the Move: Measuring and Optimising Migration's Economic and Social Impacts. Legon, Ghana, Regional Institute for Population Studies (RIPS) at the University of Ghana and Miami University.

Yeboah, M. A. (2010). "Urban Poverty, Livelihood, and Gender: Perceptions and Experiences of Porters in Accra, Ghana." Africa Today **56**(3): 42-60.

Yeboah, M. A. and K. Appiah-Yeboah (2009). "An Examination of the Cultural and Socio-Economic Profiles of Porters in Accra, Ghana." Nordic Journal of African Studies **18**(1): 1-21.

Yiran, G.-S., J. Teye and G. B. Yiran (2015). "Accessibility and Utilisation of Maternal Health Services by Migrant Female Head Porters in Accra." Journal of International Migration and Integration **16**(4): 929-945.

Zimmerman, C., L. Kiss and M. Hossain (2011). "Migration and Health: A Framework for 21st Century Policy-Making." PLoS Med **8**(5): e1001034.

Zlotnik, H. (1995). "Migration and the family: the female perspective." Asian Pac Migr J **4**(2-3): 253-271.

Zlotnik, H. (2003). "The Global Dimensions of Female Migration." Migration Information Source Retrieved 17 November, 2017, from <https://www.migrationpolicy.org/article/global-dimensions-female-migration>.

Appendices

Appendix 1: Demographic methods

This technical appendix accompanies my analyses of census data in Chapter 2 (Contemporary Female Migration in Ghana: Analyses of the 2000 and 2010 Censuses) and justifies the methods I used to analyse female migration. It also details the assumptions, applications, and limitations of these methods.

A1.1 Rogers-Castro multi-exponential model migration schedule

Following the instructions detailed in *Tools for Demographic Estimation*, I fitted a Rogers-Castro multi-exponential model migration schedule to observed migration data in order to represent typical age patterns of migration (Rogers and Castro 1981, Little and Dorrington 2013). These migration schedules range from 7 to 13 parameters, depending on the model's complexity, and depict the dependency between age and migration (Little and Dorrington 2013). Checking the “shape” or age distribution of migrant flows by fitting a model migration schedule also permitted me to check my estimates of net internal female migration in Section A1.3 below.

Before applying this method, I obtained migration rates for single ages, examined the population's age structure, and examined the relative completeness of the census counts. I assumed that (1) the census accurately counted the population by sub-national region and place of birth and (2) the census identified people who moved from one region to another in the time period of interest (1995–2000).

The first step in applying this method is to prepare a schedule of the observed rates. I used census data that gave the numbers of migrants who survived the five-year migration interval 1995–2000. From this data, it is possible to calculate one-year age propensities by back-casting census respondents to the region where they reported living in 1995. The age-specific out-migration propensity is calculated for each one-year age group as the ratio of migrants to the number at risk of migrating over the time period (Little and Dorrington 2013).

The second step is to decide which multi-exponential model best fits the data. As previously noted in Chapter 2, since retirement is not concentrated among specific ages in these data and

the data may exaggerate older ages (Little and Dorrington 2013), I adopted the standard 7-parameter model rather than the more complex 9-, 11-, or 13-parameter models.

For the third step, fitting the model using Solver, I obtained an Excel Workbook for fitting model migration schedules directly from Professor Rob Dorrington at the University of Cape Town.

Then, in step four, I evaluated the model's fit using the mean absolute per cent error statistic. At 7% for both sexes, it is within the boundaries for achieving a reasonable fit. I also calculated the R-squared values for males (92%) and females (89%). Both values are acceptable compared to the established threshold of 90%, indicating that the models reasonably fit the data (Little and Dorrington 2013). T-statistics are significant at the 0.05 level for all coefficients. I then checked that the age-specific migration rates were visually compatible with the Rogers-Castro model and looked for extreme values that could distort the parameters in my model.

Since I employed census data for these models, they experience the limitations of census data detailed in Chapter 2. Furthermore, a limitation of this method is that without accurate, well-behaved data, it is possible that the model may be over-parameterised if the model does not produce a close fit (Little and Dorrington 2013). Since the lowest parameter model best fit the data, I am not concerned about over-parameterisation.

A1.2 Logistic regression analyses

To examine the effects of demographic indicators on the likelihood of a girl or woman migrating internally in 2000 and 2010, I conducted logistic regression analyses using SPSS Statistics 22.0 software. Binary logistic regression modelled the effects of selected independent variables on whether or not a girl or woman was identified in the census as ever having migrated internally. International migrants were excluded. Selection of the independent variables was based on a literature review of push- and pull-factors of migration. I examined the following independent variables: age (in one-year and five-year age groups), education status (ever attended or attending school), marital status, religion, ethnicity, residence (urban, rural), work status (worked for pay, profit, or family gain; did not work), and relationship to household head.

These analyses assume that the census correctly identify all girls and women who have migrated within Ghana and that my dependent variable (ever having migrated internally) can be measured on a dichotomous scale (yes/no). I know, however, that the census questionnaires' understanding and measuring of migration do not capture contemporary migration patterns identified via other sources of migration data. Most movements between place of birth and current residence are missing, leading to a likely undercount of internal migrants. Improving the census's ability to capture contemporary migration patterns (e.g. cyclic migration, seasonal migration) would significantly strengthen the predictive ability of this regression model.

A1.3 Estimates of net internal female migration from place of birth data

To generate estimates of net internal female migration from census data, I followed the instructions detailed in *Tools for Demographic Estimation* for estimating sub-national regional net in- and out-migration from place of birth data (Dorrington 2013). This estimation required the number of females, in five-year age groups, by sub-national region in 2010 and by sub-national region at the preceding census in 2000. For estimating deaths in this period, I calculated survival factors using model life tables from GSS (GSS 2013c).

My assumptions are as follows:

1. Ghana's censuses correctly identify region of birth and accurately count the population by sub-national region.
2. I can accurately estimate the mortality of people moving between two regions in Ghana.

Before applying the method, Dorrington (2013) warns demographers to examine the data's age structure of the population and the data's relative completeness. As noted in Chapter 2, I assessed data quality and completeness by (1) reviewing the post-enumeration surveys conducted to assess coverage and content errors (GSS 2003, GSS 2012) and by (2) comparing key variables between the microdata and censuses. The microdata sample from the 2010 Census more accurately reflects the complete census than the microdata sample from 2000 in which the age structure differs slightly (Table 1). Unfortunately, the 2000 Census's post-enumeration survey data are physically missing, preventing analysis of

whether or not the final census results required adjustment. The 2010 Census required no adjustments based on the low net coverage error of 1.8% at the national level (GSS 2012). Whilst these data are imperfect, they are the best currently available for estimating net internal migration in Ghana.

Dorrington (2013) also warns demographers that the estimations are sensitive to census quality: for example, inaccurately recorded place of birth (e.g., respondent may be unaware of boundary changes or may be unaware of person's place of birth), inability to completely identify all migrants and from where they migrated (i.e., undercount), and net migration's underestimation of migrant flows into and out of a region.

The first step in estimating net internal migration between sub-national regions from place of birth data is to decide on survival factors. Whilst I considered survival factors generated by the 2005 life table for Ghana from the World Health Organization's (WHO) Global Health Observatory data repository (WHO 2018) (Table A1.1), I ultimately used survival factors derived from the Urban Females and Rural Females model life tables produced by Ghana Statistical Service (GSS) (2013c). Since I had reason to believe that mortality differed between regions, using the Urban Females and Rural Females life tables produced by GSS permitted me to better match the mortality profiles of each region. Ten-year survival factors determined by the Urban Females model life table were used to generate migration estimates for the Greater Accra (see " ${}_5S_{x+10}$ " in the fifth column of Table A1.2) and Ashanti Regions, where the majority of girls and women reside in urban areas (90.5% and 59.6% respectively) (Figure 1). I used GSS's Rural Females model life table to generate ten-year survival factors used in the estimates for the other eight regions, where the rural population exceeded the urban population (see " ${}_5S_{x+10}$ " in the fifth column of Table A1.3). The second step is to use these survival factors to estimate the number of deaths that occurred between the 2000 and 2010 Censuses. The third step is to estimate the net number of in-migrants or out-migrants.

Table A1.1: Comparison of overall net migration estimates based on changes to survival factors

Region	Overall Net Migration		% difference
	As estimated with constant survival factors for all regions, based on the WHO 2005 life table for Ghana	As estimated with separate survival factors for predominately rural or urban regions, based on Ghana's 2010 Census life tables	
Western	-13,332	-13,711	-1.40
Central	-18,117	-16,121	5.83
Greater Accra	318,278	300,213	2.92
Volta	-105,237	-101,561	1.78
Eastern	-74,510	-71,130	2.32
Ashanti	106,929	101,431	2.64
Brong Ahafo	-12,627	-14,939	-8.39
Northern	-111,108	-109,085	0.92
Upper East	-47,941	-47,212	0.77
Upper West	-41,916	-41,734	0.22

Table A1.2 works through these steps for estimating the net number of female in-migrants. The second and third columns show the number of girls and women living in the Greater Accra Region who were born outside the region, as counted by the 2000 and 2010 Censuses. I calculated the ten-year survival factors (${}_5S_{x+10}$) in the fifth column using data from the GSS (2013c) Urban Females model life table. The seventh column (Do) is the number of estimated deaths of in-migrants who were born outside that occurred in the ten years between censuses (n). I estimated deaths of people born outside the region (denoted by the superscript O) aged between x and $x + 10$ years at the time of the first census (t), ${}_5D_x^O$, of those aged $A-n$ and older at the first census, ${}_{\infty}D_{A-n}^O$, and of those born between the censuses, D_B^O , as follows:

For those born between the two censuses:

$$\begin{aligned}
 D_B^O &= \frac{1}{2} ({}_5N_0^O(2010)) \times ((1/S_{B,10}) - 1) \\
 &= \frac{1}{2} (34,950 \times \left(\left(\frac{1}{0.92534} \right) - 1 \right)) \\
 &= 1,410
 \end{aligned}$$

For those aged 65 years and older at the time of the first census:

$$\begin{aligned}
 {}_{\infty}D_{65}^O &= \frac{1}{2} ({}_{\infty}N_{65}^O(2000) \times {}_{\infty}S_{65,10} + {}_{\infty}N_{75}^O(2010)) \times ((1/{}_{\infty}S_{65,10}) - 1) \\
 &= \frac{1}{2} ((6,630 + 4,260 + 9,520) \times 0.62448 + 14,730) \times \left(\left(\frac{1}{0.62448} \right) - 1 \right) \\
 &= 8,261
 \end{aligned}$$

For all other age groups, such as those aged 30–34 years at the time of the first census:

$$\begin{aligned}
 {}_5D_{30}^O &= \frac{1}{2} ({}_5N_{30}^O(2000) \times {}_5S_{30,10} + {}_5N_{40}^O(2010)) \times ((1/{}_5S_{30,10}) - 1) \\
 &= \frac{1}{2} (53,230 \times 0.93040 + 57,480) \times \left(\left(\frac{1}{0.93040} \right) - 1 \right) \\
 &= 4,002
 \end{aligned}$$

where ${}_5N_x^O(t)$ represents the number of people born outside the region (by age group) according to the census at time t who were aged between x and $x + 10$ years.

The final column (Net M (born out)) shows the net numbers of female migrants into the Greater Accra Region who were born in regions other than the Greater Accra Region for each five-year age group. From 2000 to 2010, a total of 371,632 girls and women born outside the Greater Accra Region moved to the Greater Accra Region (after excluding those who moved out).

Table A1.2: Estimation of the net number of female in-migrants of those born outside by age group, Greater Accra Region, Ghana, 2000–2010

Age	2000	2010	x	${}_5S_{x+10}$	Age at 2nd census	Do	Net M (born out)
			B	0.92534			
0–4	30,390	34,950	0	0.98072	0–4	1,410	36,360
5–9	38,460	40,280	5	0.98272	5–9	1,625	11,515
10–14	46,270	60,730	10	0.97981	10–14	890	23,160
15–19	63,980	79,870	15	0.97245	15–19	1,034	34,634
20–24	68,690	117,250	20	0.96188	20–24	1,675	54,945
25–29	69,260	119,690	25	0.94706	25–29	2,576	53,576
30–34	53,230	93,920	30	0.93040	30–34	3,170	27,830
35–39	45,660	74,330	35	0.91571	35–39	3,910	25,010
40–44	35,430	57,480	40	0.90525	40–44	4,002	15,822
45–49	26,190	44,490	45	0.89823	45–49	3,972	13,032
50–54	19,130	39,350	50	0.88747	50–54	3,738	16,898
55–59	12,360	25,560	55	0.86645	55–59	2,781	9,211
60–64	9,170	19,100	60	0.83183	60–64	2,287	9,027
65–69	6,630	11,640	65+	0.62448	65–69	1,722	4,192
70–74	4,260	10,740			70–74	1,857	5,967
75+	9,520	14,730			75+	8,261	9,211
Total	538,630	844,110			Total	44,911	350,391

Table A1.3 works through the steps for estimating the net number of female out-migrants. The second and third columns show the number of girls and women living in regions other than Ghana's Upper East Region who were born in the Upper East Region, as counted by the 2000 and 2010 Censuses. I calculated the survival factors (${}_5S_{x+10}$) in the fifth column using data from the GSS Rural Females model life table (2013c). The seventh column (Di) is the number of estimated deaths of out-migrants who were born inside that occurred in the ten years between censuses. It is calculated in the same manner as the deaths of in-migrants who were born outside of the region (Do). The final column (Net M (born in)) shows the net numbers of female out-migrants of those born in the Upper East Region (i.e., the number of girls and women born in the Upper East Region who moved out, less those who have returned). From 2000 to 2010, a total of 54,966 girls and women born in the

Upper East Region moved out of the Upper East Region (after excluding those who moved in).

Table A1.3: Estimation of the net number of female out-migrants of those born inside by age group, Upper East Region, Ghana, 2000–2010

Age	2000	2010	x	${}_5S_{x+10}$	Age at 2nd census	Di	Net M (born in)
			B	0.92197			
0–4	10,900	8,030	0	0.96465	0–4	340	8,370
5–9	12,660	9,050	5	0.98064	5–9	383	-1,467
10–14	11,270	12,680	10	0.98033	10–14	425	445
15–19	12,240	16,370	15	0.96941	15–19	284	5,384
20–24	14,640	25,790	20	0.95095	20–24	370	13,920
25–29	14,630	23,970	25	0.93235	25–29	565	9,895
30–34	11,390	17,340	30	0.92103	30–34	806	3,516
35–39	9,160	13,470	35	0.91866	35–39	984	3,064
40–44	5,900	9,240	40	0.91618	40–44	846	926
45–49	4,680	6,670	45	0.90422	45–49	668	1,438
50–54	3,330	5,570	50	0.86801	50–54	502	1,392
55–59	2,160	2,560	55	0.78906	55–59	360	-410
60–64	2,050	2,770	60	0.66829	60–64	430	1,040
65–69	1,300	1,880	65+	0.32150	65–69	479	309
70–74	1,100	2,290			70–74	908	1,898
75+	2,110	3,370			75+	5,086	5,246
Total	119,520	161,050			Total	13,436	54,966

After estimating net female in-migration and out-migration for each of Ghana's ten regions, I combined these estimates in Chapter 2. Whilst these estimations are currently the most accurate available based on existing data, they have several limitations. As previously mentioned, the quality of census data affects these estimates. Censuses may not identify all migrants and may suffer from an undercount. Additionally, place of birth and place of residence data are affected by misreporting if boundaries change between rounds or if respondents are ignorant of the boundaries.

A1.4 Estimates of net female migration using the cohort component method

To strengthen confidence in my estimates of net internal female migration from census data (Section A1.2), I compared these estimates to those generated by the cohort component method (Spoorenberg 2015). This estimation required me to first forward-project the female population enumerated in the 2000 Census to 2005, based on estimated levels of age-specific fertility and mortality rates. I then forward projected the estimated female population in 2005 to compare it with the actual female population enumerated in the 2010 Census. Without accurate vital registration statistics on fertility and mortality during these periods, I relied on estimations. For estimating fertility, I used age-specific fertility rates (ASFRs) for women aged 15–49 years (in five-year age groups) produced by the 2003 Ghana Demographic and Household Survey (GDHS) (GSS, NMIMR et al. 2004) and the 2008 GDHS (GSS, GHS et al. 2009). I applied the urban ASFRs to the Greater Accra and Ashanti Regions, and I applied the rural ASFRs to the eight remaining regions. For estimating deaths in this period, I calculated survival factors using WHO model life tables for Ghana (WHO 2018). For 2000–2005, I used the life table for 2003. For 2005–2010, I used the life table for 2008.

My assumptions are as follows:

1. Life table survival rates are representative of mortality conditions during the intercensal period, and I can accurately estimate mortality.
2. Fertility rates are representative of fertility during the intercensal period, and I can accurately estimate fertility.
3. Female migrants have the same fertility and mortality levels as the enumerated population.
4. The distribution of net migrants is equal across years during the intercensal period.
5. Differences between my projected population in 2010 and the population enumerated in the 2010 Census result from migration.

The first step in estimating net migration using this method was to forward-project the females enumerated in the 2000 Census five years to 2005 (Table A1.4). Next, I estimated the total number of surviving female births from 2000–2005 (Table A1.5). Then, I repeated

the process by forward-projecting the projected female population in 2005 to 2010 and estimating surviving female births from 2005 to 2010. Finally, I compared my estimated female population in 2010 to the actual enumerated female population in 2010. Differences between these figures imply in-migration or out-migration.

Table A1.4, below, works through the steps for forward-projecting the female population in the projection intervals. The first column after age group shows the female population (in five-year age groups) residing in the Upper East Region, as counted by the 2000 Census. The next column lists the five-year survival factors that I derived from the WHO life table for Ghana in 2003. The product of these two columns is the projected population in 2005; however, there is one exception. The projected population for the age group 0–4 years comes from Table A1.5, in which I estimated female births surviving the projection interval 2000–2005. I repeat these steps once more to project the 2005 population forward to 2010. Finally, I estimate net female migration by subtracting the projected population in 2010 from the population enumerated in the 2010 Census. From 2000 to 2010, the Upper East Region experienced negative net migration with a total of 75,346 girls and women moving out of the region.

Table A1.4: Estimating net intercensal female migration by age (birth) cohorts, according to the cohort component method, in the Upper East Region, Ghana, 2000–2010

Age group (in years)	Population, 2000 Census	Five-year life table survival ratio	Projected population, 2005	Five-year life table survival ratio	Projected population, 2010	Population, 2010 Census	Estimated net migrants
	(1)	(2)	(3) = (1) x (2)	(4)	(5) = (3) x (4)	(6)	(7) = (6) - (5)
0–4	66,440	0.93043	85,338	0.93923	96,152	68,450	-27,702
5–9	75,250	0.97342	61,818	0.97818	80,152	73,600	-6,552
10–14	51,260	0.98795	73,250	0.99020	60,469	64,850	4,381
15–19	40,840	0.99121	50,643	0.99181	72,532	54,020	-18,512
20–24	33,840	0.98779	40,481	0.98901	50,228	42,050	-8,178
25–29	35,770	0.97855	33,427	0.98357	40,036	37,640	-2,396
30–34	29,190	0.96822	35,003	0.97475	32,878	32,840	-38
35–39	26,830	0.96136	28,262	0.96519	34,119	29,180	-4,939
40–44	23,800	0.95851	25,793	0.96027	27,278	26,570	-708
45–49	21,870	0.95902	22,813	0.96067	24,769	20,340	-4,429
50–54	18,020	0.95498	20,974	0.95746	21,915	19,450	-2,465
55–59	11,990	0.94552	17,209	0.94846	20,081	11,510	-8,571
60–64	13,240	0.91340	11,337	0.92161	16,322	14,580	-1,742
65–69	8,980	0.85251	12,093	0.86934	10,448	9,350	-1,098
70+	19,670	0.61137	19,681	0.62723	22,858	30,460	7,602
Total	476,990		538,121		610,236	534,890	-75,346

Note: Figures in **bold** were produced using the estimation method for female births surviving the projection interval, as shown in table A1.5.

Table A1.5, below, works through the steps for estimating female births surviving the projection intervals. The first column shows the female population aged 15–49 years (in five-year age groups) residing in the Upper East Region, as counted by the 2000 Census. The second column shows the projected female population in 2005, based on my calculations in Table A1.4. The third column calculates the mid-period female population as an average of the sum of the populations in columns one and two. ASFRs in the fourth column come directly from the 2003 GDHS, in this example, and are those used for rural areas. The final column, estimated births (2000–2005), is the product of the female mid-period population and the ASFRs multiplied by five (years) to account for the period 2000–2005. For the first interval (2000–2005), I used a sex ratio of 105.0 for both urban and rural areas based on the 2000 Census report (GSS 2003). For the second interval (2005–2010), I used rural (103.1) and urban (101.2) sex ratios from the 2010 Census report on fertility (GSS 2014c). I generated newborn five-year survival ratios using the WHO 2003 and 2008 life tables for Ghana (WHO 2018). From 2000 to 2005, I estimated 85,338 surviving female births in the Upper East Region. This figure goes into the first row (age group 0–4 years) of the fourth column (Projected population, 2005) in Table A1.4.

Table A1.5: Estimation of female births surviving the projection interval, Upper East Region, Ghana, 2000–2005

Age group (in years)	Female population, 2000 census	Female population, 2005 projected	Female population, mid-period	Age- specific fertility rates	Estimated births (2000–2005)
			(3) = ((1) + (2)) / 2		
	(1)	(2)		(4)	(5) = 5 x ((3) x (4))
15–19	40,840	50,643	45,741	0.113	25,844
20–24	33,840	40,481	37,161	0.225	41,806
25–29	35,770	33,427	34,598	0.256	44,286
30–34	29,190	35,003	32,096	0.213	34,183
35–39	26,830	28,262	27,546	0.179	24,654
40–44	23,800	25,793	24,797	0.095	11,778
45–49	21,870	22,813	22,341	0.049	5,474
Total births					188,024
Proportion of female births (sex ratio, rural = 105.0)					0.488
Total female births (2000–2005)					91,719
Average five-year survival ratio of newborns					0.930
Expected deaths among female births (2000–2005)					6,381
Total surviving female births					85,338

The estimates produced using the cohort component method have several limitations beyond the quality of census data. This method is incredibly sensitive to my estimated fertility and mortality rates. Using ASFRs from the GDHS and censuses produced drastically different estimates (Table A1.6). ASFRs from the GDHS produced overall net out-migration in six of Ghana's ten regions, whereas ASFRs from the censuses produced overall net out-migration in only two of Ghana's ten regions. Since measures between the 2008 GDHS and 2010 Census indicate misreporting of births in the census and census fertility data of questionable reliability, I felt the GDHS ASFRs produced more robust estimates. The mortality rates illustrated less significant swings in the estimates produced using the cohort component method, depending on from where I generated the survival rates. For this reason, I consider my estimations of sub-national regional net in- and out-migration from place of birth data (Section A1.3) to be more robust, as they are affected only by mortality estimates.

Table A1.6: Comparison of estimates of net female migration in Ghana produced using different methods

Region	Overall Net Female Migration			
	As estimated with the cohort component method using ASFRs from the 2000 and 2010 Censuses	As estimated with the cohort component method using ASFRs from the 2003 and 2008 GDHS	As estimated with the cohort component method using ASFRs from the 2003 and 2008 GDHS with additional modifications*	As estimated with place of birth data (Section A1.3)
Western	332	-80,102	-80,102	-13,711
Central	118,650	51,291	33,360	-16,121
Greater Accra	367,656	308,633	308,633	300,213
Volta	54,411	-13,143	-13,143	-101,561
Eastern	27,725	-57,576	-57,576	-71,130
Ashanti	456,663	389,721	389,721	101,431
Brong Ahafo	42,939	-33,492	-33,492	-14,939
Northern	132,650	70,086	-44,247	-109,085
Upper East	-40,570	-75,346	-75,346	-47,212
Upper West	-24,367	-47,997	-47,997	-41,734

*Women in the Northern Region have the highest total fertility rate (TFR) in Ghana, with 7.0 children per woman in 2003 and 6.8 children per woman in 2008 (GSS, NMIMR et al. 2004, GSS, GHS et al. 2009). The Central Region also experiences above average fertility with TFRs of 5.0

children per woman in 2003 and 5.4 children per woman in 2008 (GSS, NMIMR et al. 2004, GSS, GHS et al. 2009). To improve the accuracy of my migration estimates using the cohort component method, I adjusted the ASFR upwards when estimating births in these two regions. For estimating births from 2005–2010, I multiplied the rural ASFRs by a factor of 1.39 for the Northern Region and a factor of 1.10 for the Central Region. These factors are the ratio of each region's TFR to Ghana's overall rural TFR of 4.9. For estimating births from 2000–2005, I adjusted the Northern Region's ASFRs upward using a factor of 1.25.

Appendix 2: Migrants identified by Ghana census questions on migration, 2000 and 2010 (10% microdata)

2000 Census Questions	Migrants Identified in 2000 (%), by sex	2010 Census Questions	Migrants Identified in 2010 (%), by sex
P06a BORN IN THIS TOWN / VILLAGE: Was (NAME) born in this town or village? If YES go to P07. [Note: Only asked of respondents who were Ghanaian by birth.]	335,951 of 955,504 females (35.2%) Ghanaian female migrants = 274,167 (81.6%) International foreign female migrants = 61,784 (18.4%) 349,023 of 935,654 males (37.3%) Ghanaian male migrants = 262,911 (75.3%) International foreign male migrants = 86,112 (24.7%)	P05 BIRTHPLACE: Was [NAME] born in this village/town? If Yes, go to P07.	450,071 of 1,262,598 females (35.6%) 412,035 of 1,203,691 males (34.2%)
P06b BIRTHPLACE OUTSIDE THIS TOWN / VILLAGE: In what region or country was (NAME) born? [Note: Only asked of respondents who were Ghanaian by birth.]	274,167 of 274,167 females (100%) Female internal migrants = 265,153 (96.7%) Female (Ghanaian) international migrants = 9,014 (3.3%) 262,911 of 262,911 males (100%) Male internal migrants = 254,048 (96.6%) Male (Ghanaian) international migrants = 8,863 (3.4%)	P06 BIRTHPLACE: In what region or country was [NAME] born?	450,071 of 450,071 females (100.0%) Female internal migrants = 434,948 (96.6%) Female international migrants = 15,123 (3.4%) 412,035 of 412,035 males (100.0%) Male internal migrants = 394,703 (95.8%) Male international migrants = 17,332 (4.2%)

2000 Census Questions	Migrants Identified in 2000 (%), by sex	2010 Census Questions	Migrants Identified in 2010 (%), by sex
P07 USUAL PLACE OF RESIDENCE: In what district is (NAME'S) usual residence?	28,679 of 955,504 females (3.0%) Female internal migrants = 28,329 (98.8%) Female international migrants = 350 (1.2%) 29,797 of 935,654 males (3.2%) Male internal migrants = 29,338 (98.5%) Male international migrants = 459 (1.5%)	P07 LIVING IN THIS VILLAGE / TOWN: Has [NAME] been living in this village or town since birth? If Yes, go to P09.	478,783 of 1,262,598 females (37.9%) 439,930 of 1,203,691 males (36.5%)
P08 PLACE OF RESIDENCE 5 YEARS AGO: IF (NAME) IS 5 YEARS OR OLDER – In what district was (NAME'S) usual place of residence 5 years ago?	187,027 of 816,989 females (19.6%) Female internal migrants = 185,228 (99.0%) Female international migrants = 1,799 (1.0%) 189,490 of 935,654 males (20.3%) Male internal migrants = 187,194 (98.8%) Male international migrants = 2,296 (1.2%)	P08 NUMBER OF YEARS LIVED IN THIS VILLAGE / TOWN: For how long has [NAME] been living in this village or town?	451,686 of 1,262,598 females (35.8%) 413,681 of 1,203,691 males (34.4%)
<i>Total number of migrants identified in 2000 microdata, by sex:</i>	359,960 of 955,504 females (37.7%) Female internal migrants = 297,031 (31.1%) of females Female international migrants = 62,929 (6.6%) of females 371,577 of 935,654 males (39.7%) Male internal migrants = 284,269 (30.4%) of males Male international migrants = 87,308 (9.3%) of males	<i>Total number of migrants identified in 2010 microdata, by sex:</i>	487,376 of 1,262,598 females (38.6%) Female internal migrants = 472,253 (37.4%) of females Female international migrants = 15,123 (1.2%) of females 447,485 of 1,203,691 males (37.2%) Male internal migrants = 430,153 (35.7%) of males Male international migrants = 17,332 (1.4%) of males

Appendix 3: Lifetime female in-migrants by region of origin, out-migrants by region of destination, and net lifetime migration streams, Ghana, 2000 and 2010

Region of origin and destination	2000 Census			2010 Census		
	Lifetime in-migrants	Lifetime out-migrants	Net lifetime migration	Lifetime in-migrants	Lifetime out-migrants	Net lifetime migration
Western	239,600	87,570	152,030	260,940	145,370	115,570
Central	93,920	239,510	-145,590	185,660	318,530	-132,870
Greater Accra	548,090	99,020	449,070	844,110	156,690	687,420
Volta	55,310	263,130	-207,820	73,670	343,070	-269,400
Eastern	157,800	276,400	-118,600	207,770	388,770	-181,000
Ashanti	275,470	221,720	53,750	432,430	302,070	130,360
Brong Ahafo	168,770	102,940	65,830	217,110	172,800	44,310
Northern	54,980	121,000	-66,020	52,900	214,690	-161,790
Upper East	24,390	118,540	-94,150	30,640	161,050	-130,410
Upper West	18,140	106,640	-88,500	21,630	123,820	-102,190
Total	1,636,470	1,636,470	0	2,326,860	2,326,860	0

**Appendix 4: Lifetime male in-migrants by region of origin, out-migrants by region of destination, and net lifetime migration streams,
Ghana, 2000 and 2010**

Region of origin and destination	2000 Census			2010 Census		
	Lifetime in- migrants	Lifetime out- migrants	Net lifetime migration	Lifetime in- migrants	Lifetime out- migrants	Net lifetime migration
Western	262,520	81,550	180,970	300,660	130,280	170,380
Central	92,160	234,820	-142,660	186,880	292,890	-106,010
Greater Accra	530,700	106,930	423,770	756,850	164,430	592,420
Volta	54,470	265,580	-211,110	71,190	340,920	-269,730
Eastern	156,980	270,710	-113,730	206,480	359,620	-153,140
Ashanti	296,640	222,440	74,200	418,030	313,050	104,980
Brong Ahafo	191,180	104,720	86,460	242,520	164,200	78,320
Northern	53,650	133,190	-79,540	48,160	222,990	-174,830
Upper East	25,040	136,250	-111,210	31,000	167,780	-136,780
Upper West	15,490	122,640	-107,150	21,840	127,450	-105,610
Total	1,678,830	1,678,830	0	2,283,610	2,283,610	0

Appendix 5: Estimates of the net number of female in-migrants of those born outside by age group, Ghana, 2000–2010

Age	Net In-Migration by Region									
	Western	Central	Greater Accra	Volta	Eastern	Ashanti	Brong Ahafo	Northern	Upper East	Upper West
0–4	14,435	12,723	36,360	6,209	10,905	22,305	12,166	4,150	2,973	2,028
5–9	-4,145	4,389	11,515	-202	1,934	-2,869	383	-1,771	234	-1,753
10–14	-3,555	6,799	23,160	-338	3,252	7,882	532	-2,841	-82	-2,158
15–19	-996	12,709	34,634	-362	8,352	18,632	4,793	-275	1,324	-1,561
20–24	11,244	12,676	54,945	71	7,763	34,082	11,923	656	196	-374
25–29	8,227	10,342	53,576	747	7,080	28,664	10,100	771	825	-1,482
30–34	1,106	6,620	27,830	368	3,714	17,041	4,532	-195	324	-1,117
35–39	2,434	6,133	25,010	-255	4,713	13,139	3,773	-531	416	-1,602
40–44	1,112	4,223	15,822	633	4,970	9,440	3,183	-115	176	-1,048
45–49	3,190	3,853	13,032	-110	4,104	6,666	2,561	-383	46	-552
50–54	3,690	4,033	16,898	876	4,687	7,931	3,306	518	233	-438
55–59	-505	1,237	9,211	-404	985	2,741	-34	-459	-70	-461
60–64	1,930	2,191	9,027	475	2,364	4,056	2,304	359	208	-115
65–69	98	796	4,192	-351	189	577	-136	-141	14	-337
70–74	1,776	1,470	5,967	409	2,371	4,894	2,968	347	79	-229
75+	2,166	1,579	9,211	419	3,624	5,592	2,280	571	-72	-643
TOTAL	42,208	91,774	350,391	8,186	71,007	180,774	64,635	662	6,823	-11,844

Appendix 6: Estimates of the net number of female out-migrants by region of birth and age group, Ghana, 2000–2010

Age	Net Out-Migration by Region									
	Western	Central	Greater Accra	Volta	Eastern	Ashanti	Brong Ahafo	Northern	Upper East	Upper West
0–4	8,804	15,223	14,731	14,866	17,387	17,114	10,317	11,588	8,436	6,051
5–9	1,376	244	2,739	-1,250	1,899	577	3,340	2,173	-1,392	-1,762
10–14	4,221	4,451	2,044	3,305	6,238	2,865	4,857	5,955	380	-1,272
15–19	7,113	8,556	5,448	8,451	9,453	5,384	7,094	14,071	5,542	3,033
20–24	9,215	14,769	6,808	14,832	18,058	14,897	13,556	20,691	14,284	7,567
25–29	6,734	13,343	5,101	17,184	21,035	11,459	12,956	16,897	10,333	6,055
30–34	3,871	7,619	2,524	9,009	11,223	4,429	6,432	11,386	3,884	2,276
35–39	3,505	9,254	3,189	7,274	9,337	4,314	6,513	6,710	3,375	2,110
40–44	1,939	6,155	3,170	5,856	8,351	2,910	3,993	5,775	1,204	817
45–49	1,814	4,646	2,108	5,289	7,786	2,959	3,616	3,260	1,741	441
50–54	2,407	7,506	1,588	7,300	9,104	5,416	3,108	3,467	1,661	1,265
55–59	1,490	2,234	-79	2,327	4,471	1,080	1,273	291	-264	271
60–64	1,470	3,902	420	4,105	5,750	2,693	816	1,911	1,078	1,268
65–69	176	1,311	-332	1,511	1,843	265	454	-26	189	-95
70–74	3,006	3,362	783	3,917	4,193	1,859	694	2,202	1,463	1,037
75+	-1,221	5,320	-63	5,769	5,758	1,124	556	3,396	2,120	828
TOTAL	55,919	107,894	50,179	109,747	141,887	79,344	79,573	109,747	54,035	29,890

Appendix 7: Approval from the LSE Research Ethics Committee



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■

Houghton Street
London WC2A 2AE
United Kingdom

tel: +44 (0)20 7106 1202
email: rescon@lse.ac.uk

www.lse.ac.uk

Research Division

Sam Latoff
Department of Social Policy

18th November 2014

Dear Sam

Re: Migration and Reproductive Health Among *Kayayei* in Ghana

I am writing with reference to the above research proposal and can confirm that I have reviewed the application in my capacity as Chair of the School's Research Ethics Committee.

Having considered the original documentation, together with the additional assurances provided in your addendum date 17 November 2014, I am satisfied that the ethical issues raised by the proposed research have been properly taken into account and that appropriate safeguards have been put in place. I am content to approve the application under Chair's action.

I would like to take this opportunity to wish you well with your research project.
If you have any further queries, please feel free to contact Lyn Grove, Research Division.



Yours sincerely,

A handwritten signature in black ink, appearing to read 'H. Dean', written in a cursive style.

Professor Hartley Dean
Chair of the Research Ethics Committee

cc. Lyn Grove, Research Division

Appendix 8: Approval from the Noguchi Memorial Institute for Medical Research

NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH <i>Established 1979</i>		<i>A Constituent of the College of Health Sciences</i> University of Ghana
INSTITUTIONAL REVIEW BOARD		
Phone: +233-302-916438 (Direct) +233-289-522574 Fax: +233-302-502182/513202 E-mail: nirb@noguchi.mimcom.org Telex No: 2556 UGL GH		Post Office Box LG 581 Legon, Accra Ghana
My Ref. No: DF.22 Your Ref. No:		
		4 th March, 2015
ETHICAL CLEARANCE		
FEDERALWIDE ASSURANCE FWA 00001824		IRB 00001276
NMIMR-IRB CPN 065/14-15		IORG 0000908
On 4 th March 2015, the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB) at a full board meeting reviewed and approved your protocol titled:		
TITLE OF PROTOCOL	: Migration and Reproductive Health among Kayayei in Gha	
PRINCIPAL INVESTIGATOR	: Samantha Latof, MSc.	
Please note that a final review report must be submitted to the Board at the completion of the study. Your research records may be audited at any time during or after the implementation.		
Any modification of this research project must be submitted to the IRB for review and approval prior to implementation.		
Please report all serious adverse events related to this study to NMIMR-IRB within seven days verbally and fourteen days in writing.		
This certificate is valid till 3 rd March, 2016. You are to submit annual reports for continuing review.		
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> Signature of Chair: </div> <div style="flex: 1; text-align: center;">  </div> </div> <div style="text-align: center; margin-top: 5px;"> Mrs. Chris Dadzie (NMIMR – IRB, Chair) </div>		
cc: Professor Kwadwo Koram Director, Noguchi Memorial Institute for Medical Research, University of Ghana, Legon		

Appendix 9: Research confidentiality agreement for data collectors

RESEARCH CONFIDENTIALITY AGREEMENT

Title of Research Project: Migration and Reproductive Health among Kayayei in Ghana

Principal Investigator: Samantha Lattof

Data Collector: _____

As a member of this research team, I understand that I may have access to confidential information about study sites and participants. By signing this statement, I am indicating my understanding of my responsibilities to maintain confidentiality and agree to the following:

- I understand that names and any other identifying information about study sites and participants are completely confidential.
- I agree not to divulge, publish, or otherwise make known to unauthorized persons or to the public any information obtained in the course of this research project that could identify the persons who participated in the study.
- I understand that all information about study sites or participants obtained or accessed by me in the course of my work is confidential. I agree not to divulge or otherwise make known to unauthorized persons any of this information in any form or format (e.g. disks, tapes, recordings, transcripts), unless specifically authorized to do so by the principal investigator acting in response to applicable law or court order, or public health or clinical need.
- I agree to keep all research information in any form or format secure while it is in my possession.
- I agree to return all research information in any form or format to the principal investigator when I have completed the research tasks.
- I understand that I am not to read information about study sites or participants, or any other confidential documents, nor ask questions of study participants for my own personal information but only to the extent and for the purpose of performing my assigned duties on this research project.
- I agree to notify the principal investigator immediately should I become aware of an actual breach of confidentiality or a situation which could potentially result in a breach, whether this be on my part or on the part of another person.

Signature of data collector

Date


Printed name

Signature of principal investigator

Date

Printed name

Appendix 10: Approval from the Kayayei Youth Association's Board of Directors



KAYAYEI ASSOCIATION

*Motto: Save Today's Mother
To Save Future Leaders*

KAYAYEI YOUTH ASSOCIATION (GH)

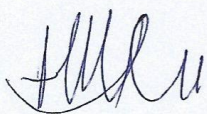
P.O. Box 16661, Accra North Tel: 0302-975253, 0246709054,
Loc: Bimbila Station, old Fadame Email: kayaghana@gmail.com

9 March 2015

Letter of Agreement

We the board of the Kayayei Youth Association of Ghana have agreed for this data on migration and reproductive health to be collected by Ms. Samantha Lattot. We are satisfied that the ethical issues raised by this research have been properly taken into account. I, Mr. Mohammed I. Salifu, as a member of the board of directors and the founder of this Association, have also agreed for approval of this agreement so that the data will be collected.

Sincerely,



Mr. Mohammed I. Salifu
Director and Founder
Kayayei Youth Association of Ghana

Appendix 11: Approval from the Department of Social Welfare

*In case of reply the
Number and date of this
Letter should be quoted*

Our Ref. No: *DSW/HA/KP/07*

Your Ref. No:



REPUBLIC OF GHANA

Department of Social Welfare
Post Office Box MB. 230
ACCRA-GHANA

Tel: - 0302-684536
0302-684543
0302-684552
0302-684547

Fax:- 0302-663615

E-Mail:- dsocwel@yahoo.com

19th February, 2015

TO WHOM IT MAY CONCERN
RE: SAM LATOFF

Sam Latoff is a Student in the London School of Economics and Political Science who is pursuing her Doctorate Degree.

As part of her Academic pursuit she has chosen to undertake her research in Migration and Reproductive Health among the Kayayie in Ghana.

Miss Sam has applied to the Department of Social Welfare, Head Office, Accra to seek clearance to work with Kayayie Youth Association (NGO)

The Chairman of the Research Ethics Committee, Professor Harley has written to the Department of Social Policy, University of Ghana to supervise her research while in Ghana.

The Kayayie Youth Association (NGO) in collaboration with Miss Sam Latoff have selected Agblobloshi and Dorkoman to carry out the research chosen. The Department of Social Welfare has examined all the documents of Miss Sam Latoff and it is satisfied.

The Department therefore recommends any individuals, groups or Organizations that Miss Sam may need their help or collaboration to give the needed co-operation to enable her achieve her desired goal.

Thanks.

PETER AMOS TWENEBOAH-KODUA
DEPUTY DIRECTOR, COMMUNITY CARE
For Ag ; DIRECTOR OF Social WELFARE

Appendix 12: Survey questionnaire

MIGRATION AND WOMEN'S HEALTH SURVEY 2015

COORDINATOR VERIFICATION	PARTICIPANT INFORMATION
<p>1. WAS THE COUPON VALIDATED? 2. WAS THE COUPON RECORDED AND HALF SAVED? 3. IS THE PARTICIPANT ELIGIBLE TO PARTICIPATE? 4. HAS THE PARTICIPANT GIVEN HER CONSENT?</p> <p>I, THE COORDINATOR, HAVE COMPLETED THE STEPS ABOVE. THE PARTICIPANT IS READY FOR THE SURVEY.</p> <p>_____</p> <p>(COORDINATOR'S NAME)</p>	<p>COUPON NUMBER _____</p> <p>NUMBER _____</p> <p>INTERVIEW DATE</p> <p>DAY <input type="text"/> <input type="text"/> MONTH <input type="text"/> <input type="text"/> YEAR 2015</p>

DATA COLLECTOR INFORMATION
<p>DATA COLLECTOR'S NAME _____ DATA COLLECTOR ID NUMBER <input type="text"/></p> <p>LANGUAGE OF QUESTIONNAIRE: <input type="text"/> 1 LANGUAGE OF INTERVIEW: <input type="text"/> LANGUAGE OF PARTICIPANT <input type="text"/></p> <p>LANGUAGE CODES: ENGLISH = 1, TWI/FANTI = 2, GA-DANGME = 3, EWE = 4, NZEMA = 5, DAGBANI = 6, FRAFRA/GRUSI = 7, WAALE/DAGAARE = 8, KASEM = 9, GONJA = 10, ANUFO/CHOKOSI = 11, BULI = 12, BIMOBA = 13, BIRIFOR = 14, BASSARI = 15, KONKOMBA = 16, CHUMBURUNG = 17, HANGA = 18, KUSSAL = 19, KOMA = 20, MAMPRULI = 21, NAWURI = 22, SISAALA = 23, TAMPULMA = 24, VAGLA = 25, WALI = 26</p> <p>OTHER = 98 _____ (SPECIFY) _____ TRANSLATOR USED: <input type="text"/> (YES = 1, NO = 2)</p>

ASK PARTICIPANT ABOUT HER SOCIAL GROUP SIZE!
<p>101. How many kayayei do you know who are from the northern 3 regions: Upper East, Upper West, and Northern Region? By 'know,' I mean you know them and they know you. You know their name, and they know your name. They are people you have spent time with who would recognise you in the market.</p> <p>WRITE THE NUMBER <input type="text"/> <input type="text"/> <input type="text"/> (MUST BE GREATER THAN 0)</p>
<p>102. How many of these girls and women currently work in Accra as kayayei? Please give an exact number.</p> <p>WRITE THE NUMBER <input type="text"/> <input type="text"/> <input type="text"/> (MUST BE GREATER THAN 0)</p>
<p>103. How many of these northern kayayei girls and women have you seen at least once in Accra during the last two weeks? Please take your time to count so that you can give me an exact number.</p> <p>WRITE THE NUMBER <input type="text"/> <input type="text"/> <input type="text"/> (MUST BE GREATER THAN 0)</p>
<p>104. From the number you just told me, how many of these kayayei would you consider inviting to this study?</p> <p>WRITE THE NUMBER <input type="text"/> <input type="text"/> <input type="text"/></p>

IMMEDIATE REVIEW BY	DETAILED REVIEW BY	DATA ENTRY BY
<p>NAME _____ INITIALS <input type="text"/></p> <p>DATE _____ <input type="text"/> <input type="text"/></p>	<p>NAME _____ INITIALS <input type="text"/></p> <p>DATE _____ <input type="text"/> <input type="text"/></p>	<p>DAY <input type="text"/> <input type="text"/> MONTH <input type="text"/> <input type="text"/> INITIALS <input type="text"/></p>

MIGRATION AND WOMEN'S HEALTH SURVEY 2015

SECTION 2: BACKGROUND

NO.	QUESTIONS	ANSWERS	SKIP
201	RECORD THE TIME. (USE 24 HOUR TIME)	HOUR <input type="text"/> <input type="text"/> MINUTES <input type="text"/> <input type="text"/>	
202	In what day, month, and year were you born? DAY <input type="text"/> <input type="text"/> MONTH <input type="text"/> <input type="text"/> YEAR <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> DON'T KNOW DAY . 98 DON'T KNOW MONTH . 98 DON'T KNOW YEAR . 98		
203	How old were you at your last birthday?	AGE IN COMPLETED YEARS . . <input type="text"/> <input type="text"/>	
204	In which region were you born?	UPPER EAST 1 UPPER WEST 2 NORTHERN 3 OTHER _____ 98 (SPECIFY)	
205	What is your marriage status?	NEVER MARRIED 1 ENGAGED TO BE MARRIED 2 MARRIED OR LIVING WITH A PARTNER . 3 SEPARATED 4 DIVORCED 5 WIDOWED 6	→ 208
206	At what age were you first married?	AGE AT FIRST MARRIAGE . . . <input type="text"/> <input type="text"/>	
207	When you were married, did you want to get married at that time, or did you want to get married earlier or later?	GET MARRIED AT THAT TIME 1 GET MARRIED EARLIER 2 GET MARRIED LATER 3	
208	What is the highest level of school that you have completed: primary, middle/JSS, secondary/SSS, or higher?	PRIMARY 1 MIDDLE / JSS 2 SECONDARY / SSS 3 HIGHER 4 NEVER ATTENDED SCHOOL 5	
209	Why did you stop going to school?	GRADUATED 1 LACK OF SUPPORT FROM PARENTS . 2 COULD NOT AFFORD SCHOOL FEES . . 3 LACK OF TEXTBOOKS OR STATIONERY . 4 LACK OF TRANSPORT TO SCHOOL . . 5 COST OF TRANSPORT TO SCHOOL . . 6 GOT MARRIED 7 OTHER _____ 98 (SPECIFY)	
210	Do you listen to the radio at least once a week, less than once a week, or not at all?	ONE OR MORE TIMES A WEEK 1 LESS THAN ONE TIME A WEEK 2 NOT AT ALL 3	
211	Do you read a newspaper or magazine at least once a week, less than once a week, or not at all?	ONE OR MORE TIMES A WEEK 1 LESS THAN ONE TIME A WEEK 2 NOT AT ALL 3	
212	Do you watch television at least once a week, less than once a week, or not at all?	ONE OR MORE TIMES A WEEK 1 LESS THAN ONE TIME A WEEK 2 NOT AT ALL 3	
213	Do you own your own mobile phone?	YES 1 NO 2	

NO.	QUESTIONS	ANSWERS	SKIP
214	What is your religion?	CATHOLIC 1 ANGLICAN 2 METHODIST 3 PRESBYTERIAN 4 PENTECOSTAL OR CHARISMATIC 5 MOSLEM 6 TRADITIONAL OR SPIRITUALIST 7 NO RELIGION 8 OTHER _____ 98 (SPECIFY)	
215	To which ethnic group or tribe do you belong?	MAMPRULI 1 SISSALA 2 ASHANTI 3 GUAN 4 MOLE-DAGBANI 5 GRUSSI 6 GRUMA 7 KONKOMBA 8 DAGABA 9 TALENSI 10 KUSSASI 11 BIMOBA 12 MANDE 13 FRAFRA 14 OTHER _____ 98 (SPECIFY)	
216	In which region did you live before moving to the Greater Accra Region?	UPPER EAST 1 UPPER WEST 2 NORTHERN 3 BRONG AHAFO 4 VOLTA 5 ASHANTI 6 EASTERN 7 WESTERN 8 CENTRAL 9	
217	Just before you moved here, did you live in a city, in a town, or in the countryside?	CITY 1 TOWN 2 COUNTRYSIDE 3	
218	How long have you been living continuously in Accra? DAYS <input type="text"/> <input type="text"/> MONTHS <input type="text"/> <input type="text"/> YEARS <input type="text"/> <input type="text"/> DON'T KNOW DAYS . 98 DON'T KNOW MONTHS . 98 DON'T KNOW YEARS . 98		
219	How many times have you migrated to Accra?	NUMBER OF TIMES <input type="text"/> <input type="text"/>	
220	Where in Accra do you live? _____		
221	What is your relationship to the person who referred you to this study, that is, the person who gave you the coupon?	FRIEND 1 SISTER 2 COUSIN 3 AUNT 4 MOTHER 5 DAUGHTER 6 GRANDMOTHER 7 STRANGER 8 OTHER _____ 98 (SPECIFY)	

NO.	QUESTIONS	ANSWERS	SKIP
222	How often do you see the person who gave you the coupon?	EVERY DAY 1 A FEW DAYS A WEEK 2 ONCE A WEEK 3 ONCE EVERY TWO WEEKS 4 ONCE A MONTH 5 LESS THAN ONCE A MONTH 6	
223	How long have you known this person who gave you the coupon? DAYS <input type="text"/> <input type="text"/> MONTHS <input type="text"/> <input type="text"/> YEARS <input type="text"/> <input type="text"/> DON'T KNOW DAYS . 98 DON'T KNOW MONTHS . 98 DON'T KNOW YEARS . 98		
224	How well do you know the person who gave you the coupon?	VERY WELL 1 SOMEWHAT WELL 2 NOT VERY WELL 3 DO NOT KNOW HER 4	
225	How old is the person who gave you the coupon? (MUST ANSWER. ASK: WHAT AGE IS YOUR BEST GUESS?)	AGE IN COMPLETED YEARS . . <input type="text"/> <input type="text"/>	
226	How many times have you seen this person in the last two weeks?	NUMBER OF TIMES SEEN . . <input type="text"/> <input type="text"/>	
227	What type of work does the person who gave you the coupon do?	KAYAYEI 1 NOT KAYAYEI 2 DONT KNOW 3	
228	What types of things do you talk about with this person? (WRITE DOWN EVERYTHING EXACTLY AS TOLD TO YOU.) _____ _____ _____ _____		
229	Do you ever talk about your health with this person?	YES 1 NO 2	
230	How would you describe your health status when you lived in the north?	VERY GOOD 1 GOOD 2 OK 3 BAD 4 VERY BAD 5	
231	How would you describe your current health status in Accra?	VERY GOOD 1 GOOD 2 OK 3 BAD 4 VERY BAD 5	
232	In your opinion, what are the major problems with health service delivery for people in your home community in the north? (WRITE UP TO 3 REASONS.) 1ST <input type="text"/> 2ND <input type="text"/> 3RD <input type="text"/>	NO PROBLEMS 1 LACK OF HEALTH FACILITIES 2 LACK OF QUALIFIED HEALTH STAFF 3 CANNOT PAY FOR HEALTH SERVICES 4 HEALTH CENTRE TOO FAR 5 TRANSPORTATION TOO EXPENSIVE 6 LACK OF MEDICINE AND SUPPLIES 7 POOR HEALTH FACILITIES 8 POOR QUALITY OF CARE 9 OTHER _____ 98 (SPECIFY)	

NO.	QUESTIONS	ANSWERS	SKIP
233	Do you think that your living conditions in Accra are better, worse, or the same as your living conditions in your home community in the north?	BETTER 1 WORSE 2 SAME 3	
234	Who most influenced your decision to move to Accra? (ASK: ANYONE ELSE?) (LIST UP TO THREE IN ORDER OF IMPORTANCE.) 1ST 2ND 3RD <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	ME (PARTICIPANT) 1 HUSBAND OR PARTNER 2 MOTHER 3 FATHER 4 SISTER 5 BROTHER 6 AUNT 7 UNCLE 8 GRANDPARENT 9 FRIEND 10 OTHER _____ 98 (SPECIFY)	
235	What was the main reason for moving from your home region to Accra? (ASK: ANY OTHER REASON?) (LIST UP TO THREE IN ORDER OF IMPORTANCE.) 1ST 2ND 3RD <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	SEEK EMPLOYMENT 1 ACCOMPANY A PARENT 2 ACCOMPANY A HUSBAND OR PARTNER 3 GET MARRIED 4 EARN MONEY FOR MARRIAGE 5 FLOOD, FAMINE, OR DROUGHT 6 POLITICAL REASONS 7 LEAVE FAMILY CONFLICT 8 FURTHER EDUCATION 9 AVOID ARRANGED MARRIAGE 10 AVOID WAR OR CONFLICT 11 AVOID FEMALE GENITAL CUTTING 12 RELIGIOUS REASONS 13 OTHER _____ 98 (SPECIFY)	
236	Who did you move to Accra with? (ASK: ANYONE ELSE?) (CIRCLE ALL THAT APPLY.)	ALONE (UNACCOMPANIED) 1 CHILD 2 HUSBAND OR PARTNER 3 PARENT 4 BROTHER 5 SISTER 6 AUNT 7 UNCLE 8 GRANDPARENT 9 FRIEND 10 OTHER _____ 98 (SPECIFY)	
237	Do you consider yourself to be homeless?	YES 1 NO 2	
238	In what type of dwelling do you live?	OUTSIDE STOREFRONT 1 MARKET 2 LORRY PARK 3 SHELTER SHARED ROOM 4 SEMI-DETACHED HOUSE 5 SEPARATE HOUSE 6 FLAT OR APARTMENT 7 UNCOMPLETED BUILDING 8 IMPROVISED HOME (E.G. KIOSK) 9 OTHER _____ 98 (SPECIFY)	

MIGRATION AND WOMEN'S HEALTH SURVEY 2015

SECTION 3: EMPLOYMENT

NO.	QUESTIONS	ANSWERS	SKIP
301	What things do you do to earn money, that is, what kind of work do you do? If kayayei, what do you carry or sell? (WRITE DOWN EVERYTHING EXACTLY AS TOLD TO YOU.)		
302	Do you currently work as a kayayoo?	YES 1 NO 2	→ END
303	What does it mean to be 'kayayei'? How would you describe or define 'kayayei'?		
304	How many hours each day do you work as kayayei?	HOURS PER DAY <input type="text"/> <input type="text"/>	
305	How many days each week do you work as kayayei?	DAYS PER WEEK <input type="text"/> <input type="text"/>	
306	For how long have you been working as kayayei?	MONTHS <input type="text"/> <input type="text"/> YEARS <input type="text"/> <input type="text"/>	
307	Where in Accra do you most often work as a kayayoo?		
308	Do you mostly work at only one area in Accra, or do you move around multiple places in the city for work?	WORK AT ONE AREA 1 MOVE AROUND (ROAM) 2	
309	In which cities in Ghana have you worked as a kayayoo? (CIRCLE ALL THAT APPLY.)	ACCRA 1 KUMASI 2 TAMALE 3 OTHER _____ 9 (SPECIFY)	
310	Would you like to continue working as a kayayoo, or would you like to change your work?	CONTINUE AS KAYAYOO 1 CHANGE TYPE OF WORK 2 DON'T KNOW 8	→ 312
311	What type of work would you prefer to do, or what trade or skill would you like to learn?		
312	For how much longer do you think that you will work as a kayayoo?	DAYS <input type="text"/> <input type="text"/> WEEKS <input type="text"/> <input type="text"/> MONTHS <input type="text"/> <input type="text"/> YEARS <input type="text"/> <input type="text"/> DON'T KNOW . . . 98	

NO.	QUESTIONS	ANSWERS	SKIP
313	On a good day, how much money do you receive for your work as a kayayoo?	AMOUNT IN CEDIS <input type="text"/>	
314	On a bad day, how much money do you receive for your work as a kayayoo?	AMOUNT IN CEDIS <input type="text"/>	
315	Do you pay taxes to AMA ticket collectors?	YES 1 NO 2	→ 317
316	How much money do you pay in taxes? How often do you pay tax?	AMOUNT IN CEDIS <input type="text"/> DAILY 1 WEEKLY 2 OTHER _____ 8 (SPECIFY)	
317	Did you know you would work as a kayayoo when you decided to migrate to Accra?	YES 1 NO 2	
318	Have you ever recommended to someone in your home community that she migrate south to work as a kayayoo?	YES 1 NO 2	→ 320
319	Has anyone you recommended it to actually migrated south to work as a kayayoo?	YES 1 NO 2	
320	In the last month, did you have any of the following health problems because of your work as a kayayoo? (READ ALL ANSWERS. CIRCLE ALL THAT APPLY.)	SMALL CUTS OR OPEN WOUNDS . . . 1 FRACTURES 2 DISLOCATIONS OR SPRAINS . . . 3 NECK OR BACK PAIN 4 BURNS 5 BREATHING PROBLEMS 6 EYE PROBLEMS 7 SKIN PROBLEMS 8 STOMACH PROBLEMS 9 FEVER 10 EXTREME FATIGUE 11 ASSAULT (PHYSICAL) 12 RAPE (SEXUAL ASSAULT) 13 ABUSE 14 OTHER _____ 97 (SPECIFY) NONE 98	
321	Have you ever experienced the following while working as kayayei? (READ ALL ANSWERS. CIRCLE ALL THAT APPLY.)	CONSTANTLY SHOUTED AT 1 REPEATEDLY INSULTED 2 BEATEN OR PHYSICALLY HURT . . . 3 SEXUALLY HARASSED 4 NOT PAID FOR CARRYING LOAD . . . 5 OTHER _____ 9 (SPECIFY)	
322	Do you use a susu?	YES 1 NO 2	
323	Do you have your own bank account?	YES 1 NO 2 NO, HAVE A SHARED ACCOUNT . . . 3	
324	Do you use micro-credit or micro-loan?	YES 1	

NO.	QUESTIONS	ANSWERS	SKIP
		NO 2	
325	What type of work does your mother do? <input type="text"/> <input type="text"/> (WRITE NUMBER) What type of work does your father do? <input type="text"/> <input type="text"/> (WRITE NUMBER)	FARMING 1 FISHING 2 TRADING 3 HANDICRAFT 4 MINING 5 GOVERNMENT 6 KAYAYEI 7 CONSTRUCTION 8 HOUSEWIFE 9 UNEMPLOYED 10 DECEASED 97 OTHER _____ 98 (SPECIFY)	
326	Do you send home remittances?	YES 1 NO 2	→ 401
327	To whom do you send remittances? (ASK: ANYONE ELSE? CIRCLE ALL THAT APPLY.)	HUSBAND OR PARTNER 1 FATHER 2 MOTHER 3 GRANDPARENT 4 AUNT OR UNCLE 5 CHILD 6 OTHER _____ 9 (SPECIFY)	
328	How much money do you send, and how often do you send this money?	AMOUNT IN CEDIS <input type="text"/> WEEKLY 1 MONTHLY 2 QUARTERLY 3 HALF-YEARLY 4 YEARLY 5 OTHER _____ 9 (SPECIFY)	
329	Why do you send home remittances? (CIRCLE ALL THAT APPLY.)	ASKED TO BY FAMILY 1 IMPORTANT TO SUPPORT FAMILY 2 HAVE EXTRA MONEY 3 FEEL PRESSURE TO REMIT 4 OTHER _____ 9 (SPECIFY)	
330	Is the person who receives remittance from you satisfied with the amount of remittance you send?	YES 1 NO, WISHES FOR MORE 2 DON'T KNOW 9	
331	Have you ever gone without any of these items in order to save more money to remit? (READ ALL ANSWERS. CIRCLE ALL THAT APPLY.)	FOOD 1 SHELTER 2 CLOTHING 3 HEALTHCARE 4 OTHER _____ 9 (SPECIFY)	

MIGRATION AND WOMEN'S HEALTH SURVEY 2015

SECTION 4: REPRODUCTION

NO.	QUESTIONS	ANSWERS	SKIP								
401	Now I would like to ask about all the births you have had during your life. Have you ever given birth?	YES 1 NO 2	→ 411								
402	When you were last pregnant, did you want to get pregnant at that time?	YES 1 NO 2	→ 405								
403	Did you want to have a baby later on, or did you not want any (more) children?	LATER 1 NO MORE 2	→ 405								
404	How much longer did you want to wait?	MONTHS <table border="1" style="display: inline-table; width: 40px; height: 20px;"><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> YEARS <table border="1" style="display: inline-table; width: 40px; height: 20px;"><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> DON'T KNOW . . . 98									
405	Do you have any sons or daughters to whom you have given birth who are currently living with you here in Accra?	YES 1 NO 2	→ 407								
406	How many sons live with you here in Accra? And how many daughters live with you here in Accra? (IF NONE, WRITE '00'.)	SONS AT HOME <table border="1" style="display: inline-table; width: 40px; height: 20px;"><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> DAUGHTERS AT HOME <table border="1" style="display: inline-table; width: 40px; height: 20px;"><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>									
407	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you here in Accra?	YES 1 NO 2	→ 411								
408	How many sons are alive but do not live with you here in Accra? And how many daughters are alive but do not live with you here in Accra? (IF NONE, WRITE '00'.)	SONS ELSEWHERE <table border="1" style="display: inline-table; width: 40px; height: 20px;"><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> DAUGHTERS ELSEWHERE <table border="1" style="display: inline-table; width: 40px; height: 20px;"><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>									
409	Did you leave your child or children in the north when you came to Accra?	YES 1 NO 2									
410	Who cares for your child or children for you while you are working in Accra?	PARTICIPANT'S HUSBAND OR PARTNER . 1 CO-WIFE 2 PARTICIPANT'S SISTER 3 PARTICIPANT'S BROTHER 4 PARTICIPANT'S MOTHER 5 PARTICIPANT'S FATHER 6 PARTICIPANT'S AUNT 7 PARTICIPANT'S UNCLE 8 OTHER _____ 98 (SPECIFY)									
411	Have you ever given birth to a boy or girl who was born alive but later died? IF NO, ASK: Any baby who cried or showed signs of life but did not survive?	YES 1 NO 2	→ 413								
412	How many boys have died? And how many girls have died? (IF NONE, WRITE '00'.)	BOYS DEAD <table border="1" style="display: inline-table; width: 40px; height: 20px;"><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> GIRLS DEAD <table border="1" style="display: inline-table; width: 40px; height: 20px;"><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>									
413	Are you pregnant now?	YES 1 NO 2 UNSURE 8	→ 417								
414	How many months pregnant are you? (WRITE NUMBER OF COMPLETED MONTHS.)	MONTHS <table border="1" style="display: inline-table; width: 40px; height: 20px;"><tr><td></td></tr></table>									

NO.	QUESTIONS	ANSWERS	SKIP
415	When you got pregnant with your current pregnancy, did you want to get pregnant at that time?	YES 1 NO 2	→ 417
416	Did you want to have a baby later, or did you not want any (more) children?	LATER 1 NO MORE 2	
417	To confirm, have you ever given birth to a baby that lived or given birth to a baby that was born alive but later died?	YES 1 NO 2	→ 425
418	Did you see anyone for antenatal care (maternity care) for your last pregnancy?	YES 1 NO 2	→ 421
419	How many times did you go for antenatal care (maternity care)?	NUMBER OF TIMES <input type="text"/> <input type="text"/>	
420	Whom did you see for antenatal care (maternity care)? (ASK: ANYONE ELSE?) (CIRCLE ALL PEOPLE MENTIONED.)	HEALTH PERSONNEL DOCTOR 1 NURSE OR MIDWIFE 2 AUXILIARY MIDWIFE 3 OTHER PERSON TRADITIONAL BIRTH ATTENDANT 4 COMMUNITY OR VILLAGE HEALTH WORKER 5 TRADITIONAL HEALER 6 OTHER _____ 98 (SPECIFY)	For all answers, skip to → 422
421	Why didn't you go for antenatal care? (LIST UP TO THREE IN ORDER OF IMPORTANCE.) 1ST <input type="text"/> 2ND <input type="text"/> 3RD <input type="text"/>	CAN'T AFFORD 1 DISTANCE TOO FAR 2 NOT NECESSARY 3 NO PERMISSION FROM HUSBAND OR FAMILY 4 DON'T TRUST HEALTH PERSONNEL 5 HEALTH PERSONNEL NOT FRIENDLY 6 OTHER _____ 98 (SPECIFY)	
422	Who assisted with the birth of your last child? Anyone else? (CIRCLE ALL PEOPLE MENTIONED.) (IF PARTICIPANT SAYS NO ONE ASSISTED, ASK TO DETERMINE IF ANY ADULTS WERE PRESENT AT THE DELIVERY.)	HEALTH PERSONNEL DOCTOR 1 NURSE OR MIDWIFE 2 OTHER PERSON TRADITIONAL BIRTH ATTENDANT 3 RELATIVE 4 FRIEND 5 OTHER _____ 6 (SPECIFY) NO ONE ASSISTED 7	
423	Where did you give birth to your last child? ASK TO IDENTIFY THE TYPE OF SOURCE (PUBLIC OR PRIVATE). IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PARTICIPANT'S HOME 1 OTHER HOME 2 OUTSIDE 3 PUBLIC SECTOR (GOVERNMENT) GOVERNMENT HOSPITAL 4 GOVERNMENT HEALTH CENTRE 5 OTHER _____ 6 (SPECIFY) PRIVATE SECTOR PRIVATE HOSPITAL 7 PRIVATE CLINIC 8 OTHER _____ 9 (SPECIFY)	

NO.	QUESTIONS	ANSWERS	SKIP
424	Did you register for health insurance the last time you became pregnant?	YES 1 NO, COULD NOT AFFORD IT 2 NO, DID NOT THINK IT NECESSARY 3 NO, WAS ALREADY INSURED 4 NO, DID NOT KNOW ABOUT IT 5 NO, DID NOT THINK IT WAS FOR ME 6	
425	Have you ever had a pregnancy that you did not want?	YES 1 NO 2	
426	Have you ever had a pregnancy that you did not plan to have at the time you became pregnant?	YES 1 NO 2	
427	Have you ever had a pregnancy that miscarried and was lost before the baby was born?	YES 1 NO 2	
428	Have you ever had a pregnancy that ended in a stillbirth and the baby was born dead?	YES 1 NO 2	
429	Have you ever done anything to end a pregnancy?	YES 1 NO 2	
430	Have you ever had an abortion to end a pregnancy?	YES 1 NO 2	
431	Now I have a question about the future. Would you like to have (a/another) child in the future, or would you prefer not to have any (more) children?	HAVE (A / ANOTHER) CHILD 1 NO MORE OR NONE 2 SAYS SHE CAN'T GET PREGNANT 3 UNDECIDED 4 DON'T KNOW 8	
432	What is the total number of children you would like to have in your lifetime?	NUMBER OF DESIRED CHILDREN <input type="text"/> <input type="text"/>	

MIGRATION AND WOMEN'S HEALTH SURVEY 2015

SECTION 5: RECENT ILLNESS OR INJURY

NO.	QUESTIONS	ANSWERS	SKIP																														
501	During the last two weeks, have you suffered from either an illness or an injury? (WRITE NAME(S) OF ILLNESS AND / OR INJURY.)	ILLNESS (SPECIFY, WRITE NAME) 1 INJURY (SPECIFY, WRITE NAME) 2 BOTH (SPECIFY, WRITE NAMES) 3 NEITHER 9	→ 519																														
502	Was this illness or injury caused by your work as a kayayoo?	YES 1 NO 2																															
503	During the last two weeks, did you have to stop your usual kayayei work or your household work because of this condition?	YES, STOPPED KAYAYEI WORK 1 YES, STOPPED HOUSEHOLD WORK . . . 2 YES, STOPPED BOTH TYPES OF WORK . 3 NO 4	→ 505																														
504	For how many days (1-14) did you have to stop your usual work?	NUMBER OF DAYS . <input type="text"/> <input type="text"/>																															
505	During the last two weeks, have you consulted a health practitioner, visited a health facility, or consulted a traditional healer for this condition?	YES 1 NO 2	→ 518																														
506	On the most recent visit, whom did you consult?	DOCTOR 1 DENTIST 2 NURSE 3 MEDICAL ASSISTANT 4 MIDWIFE 5 PHARMACIST 6 DRUG OR CHEMICAL SELLER 7 TRADITIONAL HEALER 8 TRAINED TRADITIONAL BIRTH ATTENDANT 9 UNTRAINED TRADITIONAL BIRTH ATTENDANT 10 SPIRITUALIST 11 OTHER _____ 98 (SPECIFY)																															
507	What was the main reason for your most recent visit?	ILLNESS _____ 1 (SPECIFY) INJURY _____ 2 (SPECIFY) FOLLOW UP 3 CHECK UP 4 ANTENATAL (MATERNITY) CARE . . . 5 CHILDBIRTH 6 POSTNATAL (POST-PREGNANCY) CARE . 7 FAMILY PLANNING 8 VACCINATION 9 OTHER _____ 98 (SPECIFY)																															
508	Where did your most recent visit take place?	<table border="0"> <tr> <td>PUBLIC SECTOR (GOVERNMENT)</td> <td>PRIVATE HEALTH SECTOR</td> <td>MEDICAL ALTERNATIVE</td> </tr> <tr> <td>TEACHING HOSPITAL . . 1</td> <td>HOSPITAL 21</td> <td>TRADITIONAL</td> </tr> <tr> <td>REGIONAL HOSPITAL . . 2</td> <td>CLINIC 22</td> <td>HEALER'S HOME . . 31</td> </tr> <tr> <td>DISTRICT HOSPITAL . . 3</td> <td>MATERNITY HOME . . 23</td> <td>PATIENT'S HOME . . 32</td> </tr> <tr> <td>POLYCLINIC 4</td> <td>CHEMICAL STORE . . 24</td> <td></td> </tr> <tr> <td>HEALTH CENTER . . . 5</td> <td>MISSION CHARITY</td> <td>OTHER _____ 33</td> </tr> <tr> <td>MATERNITY HOME . . . 6</td> <td>HOSPITAL OR CLINIC . 25</td> <td>(SPECIFY)</td> </tr> <tr> <td>CHILDREN'S HOSPITAL . 7</td> <td>PHARMACY 26</td> <td></td> </tr> <tr> <td>OTHER _____ 8</td> <td>OTHER _____ 27</td> <td></td> </tr> <tr> <td>(SPECIFY)</td> <td>(SPECIFY)</td> <td></td> </tr> </table>	PUBLIC SECTOR (GOVERNMENT)	PRIVATE HEALTH SECTOR	MEDICAL ALTERNATIVE	TEACHING HOSPITAL . . 1	HOSPITAL 21	TRADITIONAL	REGIONAL HOSPITAL . . 2	CLINIC 22	HEALER'S HOME . . 31	DISTRICT HOSPITAL . . 3	MATERNITY HOME . . 23	PATIENT'S HOME . . 32	POLYCLINIC 4	CHEMICAL STORE . . 24		HEALTH CENTER . . . 5	MISSION CHARITY	OTHER _____ 33	MATERNITY HOME . . . 6	HOSPITAL OR CLINIC . 25	(SPECIFY)	CHILDREN'S HOSPITAL . 7	PHARMACY 26		OTHER _____ 8	OTHER _____ 27		(SPECIFY)	(SPECIFY)		
PUBLIC SECTOR (GOVERNMENT)	PRIVATE HEALTH SECTOR	MEDICAL ALTERNATIVE																															
TEACHING HOSPITAL . . 1	HOSPITAL 21	TRADITIONAL																															
REGIONAL HOSPITAL . . 2	CLINIC 22	HEALER'S HOME . . 31																															
DISTRICT HOSPITAL . . 3	MATERNITY HOME . . 23	PATIENT'S HOME . . 32																															
POLYCLINIC 4	CHEMICAL STORE . . 24																																
HEALTH CENTER . . . 5	MISSION CHARITY	OTHER _____ 33																															
MATERNITY HOME . . . 6	HOSPITAL OR CLINIC . 25	(SPECIFY)																															
CHILDREN'S HOSPITAL . 7	PHARMACY 26																																
OTHER _____ 8	OTHER _____ 27																																
(SPECIFY)	(SPECIFY)																																

NO.	QUESTIONS	ANSWERS	SKIP
509	How much did you pay for the registration, card, and folder at the health facility?	CEDIS <input type="text"/>	
510	How much did you pay for the consultation?	CEDIS <input type="text"/>	
511	How much did you pay for diagnosis (x-ray, lab, etc.)?	CEDIS <input type="text"/>	
512	How much did you pay for drugs and treatment?	CEDIS <input type="text"/>	
513	How much did you pay in total for all the treatment or services received?	CEDIS <input type="text"/>	
514	Did you make any other payment apart from what is stated before? If yes, what was the amount? Specify what the payment was for. (SPECIFY) _____	CEDIS <input type="text"/>	
515	How much did you pay to travel there and return?	CEDIS <input type="text"/>	
516	How much time did it take you to travel to and from the facility?	HOUR <input type="text"/> MINUTES <input type="text"/>	
517	How much time did you spend at the health facility?	HOUR <input type="text"/> MINUTES <input type="text"/>	→519
518	Why did you not consult a health practitioner, visit a health facility, or consult a traditional healer for this illness/injury?	NO MONEY 1 NO TIME 2 TOO FAR 3 NO PERMISSION FROM HUSBAND OR FAMILY 4 DON'T TRUST HEALTH PERSONNEL 5 COULD MANAGE ON OWN 6 LACK OF TRANSLATOR 7 OTHER _____ 9 (SPECIFY)	
519	When you need to pay for your health expenses, who pays the largest portion? (READ ALL ANSWERS. CIRCLE ONE.)	PARTICIPANT 1 RELATIVE 2 HEALTH INSURANCE 3 GOVERNMENT 4 EMPLOYER 5 CHARITY 6 OTHER _____ 9 (SPECIFY)	
520	Many different factors can prevent women from getting medical advice or treatment for themselves. When you are sick and want medical advice or treatment, is each of the following a big problem or not? (ASK ALL QUESTIONS. CIRCLE AN ANSWER FOR EACH QUESTION.) A. Getting permission to go to the doctor? B. Getting money needed for advice or treatment? C. The distance to the health facility? D. Not wanting to go alone? E. Having to take transport? F. Concern that there may not be a female health provider? G. Concern there may be no drugs available? H. Taking time away from work I. Finding care for your children while you are away? J. Cultural differences between patient and provider? K. Lack of a translator?	BIG NOT A BIG PROB- PROB- LEM LEM PERMISSION TO GO . . . 1 . . . 2 GETTING MONEY 1 2 DISTANCE 1 2 GO ALONE 1 2 TRANSPORT 1 2 NO FEMALE 1 2 NO DRUGS 1 2 TIME AWAY FROM WORK . . 1 2 CHILDCARE 1 2 CULTURAL FACTORS . . . 1 2 NO TRANSLATOR 1 2	

MIGRATION AND WOMEN'S HEALTH SURVEY 2015

SECTION 6: HEALTH INSURANCE

NO.	QUESTIONS	ANSWERS	SKIP
601	Have you ever had health insurance?	YES 1 NO 2	→ 615
602	Are you currently covered by any health insurance?	YES 1 NO 2	
603	What type of health insurance are or were you covered by? (CIRCLE ALL MENTIONED.)	NATIONAL OR DISTRICT HEALTH INSURANCE (NHIS) 1 HEALTH INSURANCE THROUGH EMPLOYER 2 SOCIAL SECURITY 3 OTHER PRIVATELY PURCHASED COMMERCIAL HEALTH INSURANCE 4 MUTUAL HEALTH ORGANISATION/ COMMUNITY-BASED HEALTH INSURANCE 5 OTHER _____ 98 (SPECIFY)	→ 615
604	Have you benefited from the national health insurance?	YES 1 NO 2	
605	Did you pay your national health insurance membership yourself?	YES, PAID MYSELF 1 YES, PAID BY A RELATIVE OR FRIEND 2 YES, PAID BY EMPLOYER OR SSNIT 3 NO, EXEMPT AS INDIGENT (POOR) 4 NO, EXEMPT AS PREGNANT 5 NO, EXEMPT AS CHILD 6 NO, OTHER _____ 98 (SPECIFY)	
606	How much did you pay for the premium and for the processing fee? PREMIUM (in CEDIS) <input type="text"/> PROCESSING FEE (in CEDIS) <input type="text"/> DON'T KNOW . . . 98		
607	Do you hold a valid national health insurance card? (IF 'YES,' REQUEST TO SEE THE CARD.)	YES, CARD SEEN 1 YES, CARD NOT SEEN OR LOST 2 NO 3	→ 609
608	Why do you NOT have a valid national health insurance card?	REGISTERED, NOT PAID FULLY 1 REGISTERED, CARD NOT RECEIVED 2 REGISTERED, WAITING PERIOD 3 NOT RENEWED REGISTRATION 4 LOST THE CARD 5 CANNOT AFFORD PREMIUM 6 DO NOT TRUST 7 WAS NOT ILL OR INJURED 8 INSURANCE DOES NOT COVER HEALTH SERVICES I NEED 9 COVERED BY OTHER ALTERNATIVES 10 NO CONFIDENCE IN OPERATORS OF THE SCHEME 11 OTHER _____ 98 (SPECIFY)	→ 610
609	How many weeks did it take you to obtain your national health insurance card?	WEEKS <input type="text"/> <input type="text"/> DON'T KNOW 98	

NO.	QUESTIONS	ANSWERS	SKIP
610	Do you plan to renew your national health insurance card?	YES 1 NO 2 NOT SURE OR DON'T KNOW 8	→ 612
611	Why do you NOT want to renew the national health insurance card? (ASK: ANYTHING ELSE?) (CIRCLE ALL MENTIONED.)	HAVE NOT BEEN SICK 1 PREMIUM EXPENSIVE 2 STILL PAY OUT OF POCKET 3 WORSE QUALITY OF CARE WITH CARD 4 LONG WAITING TIME FOR CARD 5 USED SERVICES NOT COVERED 6 DID NOT USE ANY HEALTH SERVICES 7 USE CLINICS OR TRADITIONAL PRACTITIONERS WHO ARE NOT COVERED 8 OTHER _____ 98 (SPECIFY)	
612	Do you have to pay out of pocket for drugs and services, including treatment and the appointment?	YES 1 NO 2 SOMETIMES 3	
613	Are there any services that you need from a health provider that are not covered by national health insurance?	YES 1 NO 2	→ 616
614	What are these services? (ASK: ANYTHING ELSE?) (CIRCLE ALL MENTIONED.)	FAMILY PLANNING 1 LABORATORY INVESTIGATIONS 2 ANTENATAL (MATERNITY) CARE 3 POSTNATAL (POST-PREGNANCY) CARE 4 CARE FOR NEWBORN FOR UP TO 3 MONTHS 5 OTHER _____ 98 (SPECIFY)	For all answers, skip to → 616
615	Why have you never registered with the National Health Insurance Scheme (NHIS)? (CIRCLE ALL MENTIONED.)	HAVE NOT HEARD OF IT 1 CANNOT AFFORD PREMIUM 2 DO NOT TRUST 3 DO NOT NEED HEALTH INSURANCE 4 DOES NOT COVER HEALTH SERVICES I NEED 5 DO NOT KNOW WHERE TO REGISTER 6 REGISTRATION OFFICE TOO FAR 7 NO CONFIDENCE IN OPERATORS OF THE SCHEME 8 COVERED BY OTHER OPTIONS 9 OTHER _____ 98 (SPECIFY)	
616	In your opinion, do national health insurance card holders get better service, the same service, or worse service than others?	BETTER 1 SAME 2 WORSE 3 NOT SURE OR DON'T KNOW 8	
617	In your opinion, did you receive good service the last time you were treated at a clinic or hospital?	YES 1 NO 2	→ 701
618	In your opinion, why did you not receive good service the last time you were treated at a clinic or hospital?	WAITING TIMES TOO LONG 1 STAFF NOT POLITE 2 DID NOT RECEIVE ENOUGH INFORMATION ABOUT ILLNESS OR TREATMENT 3 OTHER _____ 98 (SPECIFY)	

MIGRATION AND WOMEN'S HEALTH SURVEY 2015

SECTION 7: RELATIONSHIPS

NO.	QUESTIONS	ANSWERS	SKIP
701	How many brothers and sisters do you have who were born to your mother? (IF NONE, WRITE '00')	NUMBER OF BROTHERS . . . <input type="text"/> NUMBER OF SISTERS . . . <input type="text"/>	
702	Including your mother, what is the total number of multiple wives or live-in partners that your father has ever had?	TOTAL NUMBER OF WIVES AND LIVE-IN PARTNERS . . . <input type="text"/> DON'T KNOW 98	
703	Including you and your brothers and sisters, how many total children does your father have with all his wives? (YOU + ALL BROTHERS + ALL SISTERS = TOTAL)	TOTAL NUMBER OF CHILDREN . . . <input type="text"/> DON'T KNOW 98	
704	Are you currently married, living together with a man as if married, or in a relationship?	YES, CURRENTLY MARRIED 1 YES, LIVING WITH A MAN 2 YES, IN RELATIONSHIP 3 NO, SINGLE 4	→ 707
705	Have you ever been married or lived together with a man as if married?	YES, FORMERLY MARRIED 1 YES, LIVED WITH A MAN 2 NO 3	→ 716
706	What is your marital status now: are you widowed, divorced, or separated (taking a pause or break without a legal divorce)?	WIDOWED 1 DIVORCED 2 SEPARATED 3	→ 708
707	Is your (husband or partner) living with you now or is he staying elsewhere? _____ (SPECIFY NAME OF REGION)	LIVING WITH HER 1 STAYING ELSEWHERE IN GREATER ACCRA 2 STAYING ELSEWHERE IN ANOTHER REGION (SPECIFY) . . . 3	
708	How old was your (husband or partner) on his last birthday? (ASK: WHAT IS YOUR BEST GUESS?)	AGE IN COMPLETED YEARS . . <input type="text"/>	
709	Did your (last) (husband or partner) ever attend school?	YES 1 NO 2	→ 711
710	What was the highest level of school he completed: primary, middle / JSS, secondary / SSS, or higher?	PRIMARY 1 MIDDLE / JSS 2 SECONDARY / SSS 3 HIGHER 4 DON'T KNOW 9	
711	Does your (husband or partner) want the same number of children that you want, or does he want more or fewer children than you want?	SAME NUMBER 1 MORE CHILDREN 2 FEWER CHILDREN 3 DON'T KNOW 9	
712	Does your (husband or partner) have other wives, or does he live with other women as if married?	YES 1 NO 2 DON'T KNOW 9	→ 715
713	Including yourself, in total, how many wives or live-in partners does your husband or partner have?	TOTAL NUMBER OF WIVES AND LIVE-IN PARTNERS . . . <input type="text"/> DON'T KNOW 98	
714	Are you the first, second, ... wife?	RANK <input type="text"/>	

NO.	QUESTIONS	ANSWERS	SKIP
715	Have you been married or lived with a man only once or more than once?	ONLY ONCE 1 MORE THAN ONCE 2	
716	Now I would like to ask some questions about sexual activity in order to gain a better understanding of important life issues. Please remember that the information you tell me is private. Your name is not attached to it. How old were you when you had sexual intercourse for the very first time?	NEVER HAD SEXUAL INTERCOURSE (VIRGIN) 00 → 801 AGE AT FIRST SEX (IN YEARS) <input type="text"/> <input type="text"/>	
717	When was the <u>last</u> time you had sex with anyone? IF LESS THAN 12 MONTHS, ANSWER MUST BE RECORDED IN DAYS, WEEKS OR MONTHS. IF 12 MONTHS (ONE YEAR) OR MORE, ANSWER MUST BE RECORDED IN YEARS.	DAYS AGO <input type="text"/> <input type="text"/> WEEKS AGO <input type="text"/> <input type="text"/> MONTHS AGO <input type="text"/> <input type="text"/> YEARS AGO <input type="text"/> <input type="text"/>	
718	What was your relationship to this person with whom you had sex? IF BOYFRIEND: Were you living together as if married? IF YES, CIRCLE '2'. IF NO, CIRCLE '3'.	HUSBAND 1 LIVE-IN PARTNER 2 BOYFRIEND NOT LIVING WITH PARTICIPANT 3 CASUAL ACQUAINTANCE 4 CLIENT OR PROSTITUTE 5 NO RELATIONSHIP (ASSAULT) 6 → 721 OTHER _____ 9 (SPECIFY)	
719	How old is this person? (ASK: WHAT AGE IS YOUR BEST GUESS?)	AGE OF PARTNER <input type="text"/> <input type="text"/> DON'T KNOW 98	
720	Was a condom used the last time you had sex?	YES 1 NO 2	
721	Could you ask your (husband or partner) to use a condom if you wanted him to?	YES 1 NO 2 → 723 DEPENDS OR NOT SURE 9	
722	On what does it depend, or why are you not sure? (WRITE DOWN REASON EXACTLY AS IT IS TOLD TO YOU.) _____ _____		
723	Would you say that using family planning is mainly your decision, mainly your (husband's or partner's) decision, or did you both decide together?	MAINLY PARTICIPANT 1 MAINLY HUSBAND OR PARTNER 2 JOINT DECISION TOGETHER 3 OTHER _____ 9 (SPECIFY)	
724	Can you say no to your (husband or partner) if you do not want to have sex?	YES 1 NO 2 → 726 DEPENDS OR NOT SURE 9	
725	On what does it depend, or why are you not sure? (WRITE DOWN REASON EXACTLY AS IT IS TOLD TO YOU.) _____ _____		
726	In total, with how many different people have you had sex in your lifetime? (IF ANSWER IS NOT A NUMBER, ASK HER TO ESTIMATE A NUMBER. THEN WRITE IT IN THE ESTIMATE BOX.)	KNOWN NUMBER OF PARTNERS IN LIFETIME <input type="text"/> <input type="text"/> ESTIMATED NUMBER OF PARTNERS IN LIFETIME <input type="text"/> <input type="text"/> DON'T KNOW 98	

MIGRATION AND WOMEN'S HEALTH SURVEY 2015

SECTION 8: FAMILY PLANNING

NO.	QUESTIONS	ANSWERS	SKIP
801	Now I would like to talk about family planning - the various ways or methods that a couple can use to delay or avoid a pregnancy. Have you ever heard of (READ EACH METHOD BELOW):		
801A	Female Sterilization. ASK: Women can have an operation to avoid having any more children.	YES 1 NO 2	
801B	Male Sterilization. ASK: Men can have an operation to avoid having any more children.	YES 1 NO 2	
801C	IUD (Loop). ASK: Women can have a loop or coil placed inside them by a doctor or a nurse.	YES 1 NO 2	
801D	Injectables. ASK: Women can have an injection by a health provider to prevent becoming pregnant for one or more months.	YES 1 NO 2	
801E	Implants. ASK: Women can have one or more small rods placed in their upper arm by a doctor or nurse that can prevent pregnancy for one or more years.	YES 1 NO 2	
801F	Pill. ASK: Women can take a pill every day to avoid becoming pregnant.	YES 1 NO 2	
801G	Condom. ASK: Men can put a rubber cover on their penis before sex.	YES 1 NO 2	
801H	Female Condom. ASK: Women can place a sheath in their vagina before sex.	YES 1 NO 2	
801I	Lactational Amenorrhea Method (LAM). ASK: Women not menstruating who are fully breastfeeding.	YES 1 NO 2	
801J	Rhythm (Calendar) Method. ASK: To avoid pregnancy, women do not have sex on the days of the month they think they can get pregnant.	YES 1 NO 2	
801K	Withdrawal. ASK: Men can be careful and pull out their penis before climax.	YES 1 NO 2	
801L	Emergency Contraception. ASK: As an emergency measure, within three days after they have unprotected sex, women can take special pills to prevent pregnancy like Lydia Post-Pil.	YES 1 NO 2	
801M	Diaphragm. ASK: Women can place a thin flexible disk in their vagina before sex.	YES 1 NO 2	
801N	Foam or Jelly. ASK: Women can place a suppository, jelly, or cream spermicide in their vagina before sex.	YES 1 NO 2	
801 O	Have you heard of any other ways or methods that women or men can use to avoid pregnancy? (IF YES, WRITE THE NAME OF THE METHOD(S).)	YES (SPECIFY METHOD) 1 NO 2	
802	In the last month have you: A. Heard about family planning on the radio? B. Seen anything about family planning on the television? C. Read about family planning in a newspaper/magazine? D. Attended a family planning education event or program? E. Been visited by a family planning peer educator? F. Seen a family planning poster or advertisement?	YES NO RADIO 1 . 2 TELEVISION 1 . 2 NEWSPAPER OR MAGAZINE . . . 1 . 2 EVENT OR PROGRAM 1 . 2 PEER EDUCATOR 1 . 2 POSTER OR ADVERT 1 . 2	
803	Are you currently doing something or using any method to delay or avoid getting pregnant?	YES 1 NO 2 NO BECAUSE VIRGIN 3	→ 805 → 811

NO.	QUESTIONS	ANSWERS	SKIP
804	Which method are you using? (CIRCLE ALL MENTIONED.)	FEMALE STERILIZATION 1 MALE STERILIZATION 2 IUD (LOOP OR COIL) 3 INJECTABLES 4 IMPLANTS 5 PILL 6 CONDOM 7 FEMALE CONDOM 8 DIAPHRAGM 9 FOAM OR JELLY 10 LACTATIONAL AMEN. METHOD 11 RHYTHM METHOD 12 WITHDRAWAL 13 ABSTINENCE 14 OTHER _____ . 98 (SPECIFY)	For all answers, skip to → 807
805	Have you ever used anything or tried in any way to delay or avoid getting pregnant?	YES 1 NO 2	→ 811
806	Which method did you previously try? (CIRCLE ALL MENTIONED.)	FEMALE STERILIZATION 1 MALE STERILIZATION 2 IUD (LOOP OR COIL) 3 INJECTABLES 4 IMPLANTS 5 PILL 6 CONDOM 7 FEMALE CONDOM 8 DIAPHRAGM 9 FOAM OR JELLY 10 LACTATIONAL AMEN. METHOD 11 RHYTHM METHOD 12 WITHDRAWAL 13 ABSTINENCE 14 OTHER _____ . 98 (SPECIFY)	
807	Were you ever told by a health or family planning worker about side effects or problems you might have with the method?	YES 1 NO 2	
808	Were you told what to do if you experienced side effects or problems with the method?	YES 1 NO 2	
809	Were you ever told by a health or family planning worker about other methods of family planning that you could use?	YES 1 NO 2	
810	Where did you obtain (CURRENT OR PREVIOUS METHOD) the last time? (ASK TO IDENTIFY THE TYPE OF SOURCE.) (CIRCLE ALL THAT APPLY.) IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PUBLIC SECTOR (GOVERNMENT) GOVT. HOSPITAL 1 GOVT. HEALTH CENTER 2 FAMILY PLANNING CLINIC 3 MOBILE CLINIC 4 FIELDWORKER 5 PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL OR CLINIC 6 PHARMACY 7 MOBILE CLINIC 8 FIELDWORKER 9 FRIEND OR RELATIVE 10 OTHER _____ . 98 (SPECIFY)	
811	Do you know of a place where you can obtain a method of family planning?	YES 1 NO 2	→ 813

NO.	QUESTIONS	ANSWERS	SKIP
812	<p>Where is that?</p> <p>Any other place?</p> <p>ASK TO IDENTIFY EACH TYPE OF SOURCE.</p> <p>IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE.</p> <p>_____</p> <p>(NAME OF PLACE(S))</p>	<p>PUBLIC SECTOR (GOVERNMENT)</p> <p>GOVT. HOSPITAL 1</p> <p>GOVT. HEALTH CENTER 2</p> <p>FAMILY PLANNING CLINIC 3</p> <p>MOBILE CLINIC 4</p> <p>FIELDWORKER 5</p> <p>OTHER PUBLIC SECTOR _____ 6</p> <p>(SPECIFY)</p> <p>PRIVATE MEDICAL SECTOR</p> <p>PRIVATE HOSPITAL OR CLINIC 7</p> <p>PHARMACY 8</p> <p>MOBILE CLINIC 9</p> <p>FIELDWORKER 10</p> <p>OTHER PRIVATE MEDICAL SECTOR _____ 11</p> <p>(SPECIFY)</p> <p>OTHER SOURCE</p> <p>SHOP 12</p> <p>FRIEND OR RELATIVE 13</p> <p>OTHER _____ 98</p> <p>(SPECIFY)</p>	
813	Is it alright for a wife to use family planning without her husband's knowledge?	<p>YES 1</p> <p>NO 2</p> <p>DEPENDS / NOT SURE 9</p>	<p>→ 815</p>
814	On what does it depend, or why are you not sure? (WRITE DOWN REASON EXACTLY AS IT IS TOLD TO YOU.)		
815	Do you think you will use a family planning method to delay or avoid pregnancy at any time in the future?	<p>YES 1</p> <p>NO 2</p> <p>DON'T KNOW 8</p>	<p>→ 901</p>
816	<p>CHECK IF THE PARTICIPANT WANTS A/ANOTHER CHILD.</p> <p>WANTS TO HAVE A CHILD OR ANOTHER CHILD <input type="checkbox"/></p> <p>You have said that you do not want (a/another) child soon. Can you tell me why you are not using a method to prevent pregnancy?</p> <p>ASK: Any other reason?</p> <p>(CIRCLE ALL REASONS MENTIONED.)</p> <p>WANTS NO MORE/ NONE <input type="checkbox"/></p> <p>You have said that you do not want any (more) children. Can you tell me why you are not using a method to prevent pregnancy?</p> <p>ASK: Any other reason?</p>	<p>NOT MARRIED 11</p> <p>FERTILITY-RELATED REASONS</p> <p>NOT HAVING SEX 21</p> <p>INFREQUENT SEX 22</p> <p>MENOPAUSE OR HYSTERECTOMY 23</p> <p>CAN'T GET PREGNANT 24</p> <p>NO MENSES SINCE LAST BIRTH 25</p> <p>BREASTFEEDING 26</p> <p>UP TO GOD 27</p> <p>OPPOSITION TO USE</p> <p>PARTICIPANT OPPOSED 31</p> <p>HUSBAND OR PARTNER OPPOSED 32</p> <p>RELIGION FORBIDS 33</p> <p>LACK OF KNOWLEDGE</p> <p>KNOWS NO METHOD 41</p> <p>KNOWS NO SOURCE 42</p> <p>METHOD-RELATED REASONS</p> <p>SIDE EFFECTS / HEALTH CONCERNS 51</p> <p>LACK OF ACCESS OR TOO FAR 52</p> <p>COSTS TOO MUCH 53</p> <p>PREFERRED METHOD UNAVAILABLE 54</p> <p>NO METHOD AVAILABLE 55</p> <p>INCONVENIENT TO USE 56</p> <p>INTERFERES WITH BODY 57</p> <p>OTHER _____ 61</p> <p>(SPECIFY)</p> <p>VIRGIN 71</p> <p>DON'T KNOW 98</p>	

MIGRATION AND WOMEN'S HEALTH SURVEY 2015

SECTION 9. SEXUALLY TRANSMITTED INFECTIONS

NO.	QUESTIONS	ANSWERS	SKIP
901	Now I would like to talk about something else. Have you ever heard of an illness called HIV / AIDS?	YES 1 NO 2	→ 916
902	Can people reduce their chance of getting the HIV / AIDS virus by having just one uninfected sex partner who has no other sex partners?	YES 1 NO 2 DON'T KNOW 8	
903	Can people get the HIV / AIDS virus from mosquito bites?	YES 1 NO 2 DON'T KNOW 8	
904	Can people reduce their chance of getting the HIV / AIDS virus by using a condom every time they have sex?	YES 1 NO 2 DON'T KNOW 8	
905	Can people get the HIV / AIDS virus by sharing food with a person who has HIV / AIDS?	YES 1 NO 2 DON'T KNOW 8	
906	Can people get the HIV / AIDS virus because of witchcraft or other supernatural means?	YES 1 NO 2 DON'T KNOW 8	
907	Is it possible for a healthy-looking person to have the HIV / AIDS virus?	YES 1 NO 2 DON'T KNOW 8	
908	Can the virus that causes HIV / AIDS be transmitted from a mother to her baby: A. During pregnancy? B. During delivery? C. By breastfeeding?	YES NO DON'T KNOW DURING PREGNANCY . 1 . 2 . 8 DURING DELIVERY . 1 . 2 . 8 BREASTFEEDING . 1 . 2 . 8	
909	I don't want to know the results, but were you ever tested for the HIV / AIDS virus?	YES 1 NO 2	
910	I don't want to know the results, but did you get the results of the test and know your HIV status?	YES 1 NO 2	
911	What would you do to prevent yourself from being infected with the virus that causes HIV / AIDS? (WRITE UP TO 3 ANSWERS.) 1ST 2ND 3RD <input type="text"/> <input type="text"/> <input type="text"/>	ABSTAIN FROM SEX 1 BE FAITHFUL TO PARTNER 2 USE A CONDOM 3 LIMIT NUMBER OF SEXUAL PARTNERS . 4 AVOID SEX WITH PROSTITUTES . . . 5 AVOID SEX WITH PERSONS WITH MANY PARTNERS 6 AVOID SEX WITH HOMOSEXUALS . . . 7 AVOID SEX WITH PERSONS WHO INJECT DRUGS 8 AVOID BLOOD TRANSFUSIONS 9 AVOID INJECTIONS 10 AVOID SHARING RAZORS OR BLADES . 11 AVOID KISSING 12 AVOID MOSQUITO BITES 13 SEEK PROTECTION FROM TRADITIONAL HEALER 14 OTHER _____ 15 (SPECIFY) DON'T KNOW 98	
912	Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had the HIV / AIDS virus?	YES 1 NO 2 DEPENDS OR NOT SURE 9	

NO.	QUESTIONS	ANSWERS (SPECIFY)	SKIP								
925	Now I would like to ask you some questions about your health in the last 12 months. During the last 12 months, have you had a disease that you got through sexual contact?	YES 1 NO 2 DON'T KNOW 8	<div>→ 928</div>								
926	When you had that sexual health issue, did you seek any kind of advice or treatment?	YES 1 NO 2	<div>→ 928</div>								
927	Where did you go? Any other place? (ASK TO IDENTIFY EACH TYPE OF SOURCE.) IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR (GOVERNMENT) GOVT. HOSPITAL 1 GOVT. HEALTH CENTER 2 FAMILY PLANNING CLINIC 3 MOBILE CLINIC 4 FIELDWORKER 5 OTHER PUBLIC SECTOR _____ 6 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL 7 PRIVATE CLINIC 8 PHARMACY 9 MOBILE CLINIC 10 FIELDWORKER 11 OTHER PRIVATE SECTOR _____ 12 (SPECIFY) STORE 13 OTHER _____ 98 (SPECIFY)									
928	RECORD THE TIME. (USE 24 HOUR TIME)	HOUR <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> MINUTES <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>									

MIGRATION AND WOMEN'S HEALTH SURVEY 2015

TO BE FILLED IN BY DATA COLLECTOR AFTER COMPLETING SURVEY

SURVEY RESULT CODES (TO BE FILLED AT END OF SURVEY):		RESULT <input type="checkbox"/>						
1 COMPLETED	4 OTHER _____							
2 PARTLY COMPLETED	(SPECIFY)							
3 REFUSED PARTICIPATION								
In your opinion, how was the truthfulness of the information that the participant told you? <table> <tr> <td>HIGH TRUTH</td> <td>. 1</td> </tr> <tr> <td>MEDIUM TRUTH</td> <td>. 2</td> </tr> <tr> <td>LOW TRUTH</td> <td>. 3</td> </tr> </table>			HIGH TRUTH 1	MEDIUM TRUTH 2	LOW TRUTH 3
HIGH TRUTH 1							
MEDIUM TRUTH 2							
LOW TRUTH 3							

YOUR COMMENTS ABOUT PARTICIPANT (e.g. Was she answering questions truthfully? Was she interested? Was she shy or nervous?):

YOUR COMMENTS ON SPECIFIC QUESTIONS (e.g. Which questions caused difficulty? Which questions surprised the participant?):

ANY OTHER COMMENTS (e.g. What questions did she ask you? Is there anything important to share? If she stopped taking the survey, why?):

SUPERVISOR'S OBSERVATIONS

NAME OF SUPERVISOR: _____ DATE: _____

Appendix 13: Research team values

During the training, we agreed upon some values and rules that we will follow during the research:

1. The people we survey are more important than the research. We must always respect them and be careful not to upset them.
2. We value giving kayayei an opportunity to share their stories and have their voices heard.
3. People we survey and interview must be free to participate or not to participate. They must also be free to end their participation at any time.
4. We must explain what the research is about and who we are before we start any survey or research activity.
5. If you have a question, ask it! There are no bad questions.
6. We must not raise false expectations about the research or make promises that we cannot keep.
7. We must think how we are going to cope when the participants have serious problems. Help prevent further abuse of kayayei. Seek out the Director of Kayayei Youth Association if a participant could benefit from learning about Kayayei Youth Association's links with the police and Domestic Violence and Victim Support Unit (DOVVSU). The office can link participants with information needed for reporting problems like rape, abuse, and assault.
8. We must not pretend to fill out the forms.
9. We will contribute to a positive work place in order to make everyone feel welcomed and valued.
10. Be a team player. Go team Kaya Data Collectors!

Appendix 14: Recruitment script

Recruitment Script to Read When Distributing Coupons

Instructions: Please read this script when explaining the recruitment process to a study participant and giving her recruitment coupons.

Thank you for your participation in this study.

Here are _____ coupons for you to use to recruit other kayayei you know and who know you. Let's go back to the question about how many kayayei from the northern regions you know who are currently working in Accra who you have seen in the past two weeks. These are the kayayei who know your name and you know their name. You would recognize each other in the market. The number you gave was (check survey question 103). Can you think of _____ people you thought of in that question to whom you can give your coupons? If possible, please try to give the coupons to different types of kayayei you know (e.g. different ages, different lengths of time living in Accra, working in different places in Accra, from different northern regions). *Please do not give any coupons to strangers*, and please do not give any coupons to people who have already participated in this study.

Only you can give your coupons to people to recruit them for this study. If you have another person give your coupons away for you, then you will become ineligible to receive your recruiting payment. For each person you recruit who is eligible and completes a survey, you will receive 1 cedi. You can come back to this office to claim your recruiting payment after the date of expiration on your recruiting coupons. (Show her the expiration date on her recruiting coupons). You must bring your half of your coupon back to this office to claim your payment for recruiting.

Thank you again for your participation. Do you have any questions?

Appendix 15: Ineligibility form

Ineligibility Form

To be completed by the coordinator.

Instructions: Please complete a row on this form for each person you meet who does NOT meet the inclusion criteria to participate in the study. Keep the entire coupon and do not give it back to the person.

Ineligibility Codes					
1	2	3	4	5	6
Is not from the Upper East, Upper West, or Northern Region	Does not work as a kayayoo	Coupon has expired	Has already participated	Is a boy/man	Other, specify. (Speak with Sam to determine ineligibility.)

No.	Coupon number (Take away the coupon and write the coupon number in this column.)	Date	Reason for non-eligibility (See the code numbers above. Write the number in this column.)	If other (6), write the specific reason	Name of coordinator
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Appendix 16: Survey consent form for adults and emancipated minors

CONSENT FORM – SURVEY

Title: Migration and Reproductive Health among Kayayei in Ghana

Principal Investigator: Samantha Lattof

Addresses: Centre for Social Policy Studies, University of Ghana, P.O. Box LG 25, Legon, Accra, Ghana
Department of Social Policy, London School of Economics, Houghton Street, London, WC2A 2AE United Kingdom

General Information about Research

This study is part of a research project that is being conducted in Accra over the next three months by a student at the University of Ghana in Legon and the London School of Economics in the United Kingdom. This study wants to learn more about the health of *kayayei* in order for us to better understanding the different health challenges that *kayayei* might face in Accra. There may be some words that you don't understand or things that you want me to explain more about because you are interested or concerned. Please ask me to stop at anytime, and I will explain.

I am asking you to help us understand more about the experiences of *kayayei* and their health. Since you are a *kayayoo* in Accra, I am going to give you information and invite you take part in the research study. You can decide if you want to participate or not. Before you decide, you can talk to anyone you feel comfortable with about the research. If you decide to participate in this research, I would like to ask you some questions for a survey that will take about 30 to 45 minutes of your time.

Possible Risks and Discomforts

It is possible that answering questions about your health and reasons for migrating to Accra might cause you discomfort. If you become distressed, you can take some time to collect yourself. You can also stop your participation at any time.

Possible Benefits

The intention of this study is to contribute towards understanding the health of *kayayei* in Ghana. By participating in this research, you will be providing information that will be useful in designing more effective policies and programmes for *kayayei* and their health.

Confidentiality

All the information that you provide during the survey will remain anonymous, which means that no one will be able to know who you are. This conversation usually takes around 30 to 45 minutes but sometimes takes shorter or longer. I may ask you to share some information that is personal. The information you provide is confidential and will be kept private. I will not share personal information about you with anyone. The information you share will have a number on it instead of your name. Only I, the research assistant, and Samantha Lattof will know what your number is. Findings from the research may be published, but no details from which you could be identified will be shared with anyone. All data from this project will be stored securely.

Compensation

We will give you 2 cedis at the end of the survey to compensate you for your time and 3 cedis to compensate you for your travel.

Voluntary Participation and Right to Leave the Research

Your participation in the study is entirely voluntary. It is your choice whether to take part or not. If you choose not to take part, there will be no negative consequences. You may change your mind later and stop taking part even if you agreed earlier. You do not have to give reasons for choosing not to take part. If you would like time to think before you decide whether to take part, you can tell us and come back at a later date. If you agree to participate, we will ask you to consent to the information shared in this form to show that the study has been explained to you and that you agree to be part of it. You will have the option to give your approval by whatever method you prefer: signature, thumbprint, or verbal consent with a witness. You may decide to end your participation in the survey at any time if you don't feel comfortable about continuing.

Contacts for Additional Information

If you have any questions, you can ask them now or later. If you want to ask questions later, you can contact us using the following details: Samantha Lattof's telephone number 0206932101 or email s.lattof@lse.ac.uk.

Your Rights as a Participant

This research has been reviewed and approved by the Research Ethics Committee at the London School of Economics and the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your rights as a research participant you can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email addresses: nirb@noguchi.mimcom.org.

VOLUNTEER AGREEMENT**1. Instruction to Interviewer: Ask respondent the following:**

'Are you willing to participate in a survey to discuss the issues that I've just mentioned? Please remember that you do not have to participate if you do not want to.'

	YES	NO
I give my consent to participate in this study.		

2. Instruction to Interviewer: Ask respondent the following:

'Do we have your permission to include your information, without your name, in our research findings that will be shared and published? Do you have any questions about the information that I just shared with you?'

	YES	NO
I give permission to include my information, without my name, in your research findings that will be shared and published.		
I have been given an opportunity to ask any questions I may have, and all such questions or inquiries have been answered to my satisfaction. I have been informed orally and in writing of whom to contact in case I have questions.		

The above document describing the benefits, risks, and procedures for the research entitled "Migration and Reproductive Health among Kayayei in Ghana" has been read and/or explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

Date Name of volunteer Signature or mark of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks, and procedures were read to the volunteer. All questions were answered, and the volunteer has agreed to take part in the research.

Date Name of witness Signature of witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual. I have received the participant's consent to participate according to the components agreed.

Date Name of person who obtained consent Signature of person who obtained consent

Appendix 17: Survey assent form for children

CHILD ASSENT FORM - SURVEY

Title: Migration and Reproductive Health among Kayayei in Ghana

Principal Investigator: Samantha Lattof

Address: Centre for Social Policy Studies, University of Ghana, P.O. Box LG 25, Legon, Accra, Ghana
Department of Social Policy, London School of Economics, Houghton Street, WC2A 2AE U.K.

Introduction

My name is Samantha Lattof, and I am from the University of Ghana and the London School of Economics. I am conducting a research study in Accra over the next three months entitled “Migration and Reproductive Health among Kayayei in Ghana.” I am asking you to take part in this research study because I am trying to learn more about the experiences of *kayayei* and their health. This survey will take about 30 to 45 minutes of your time. There may be some words that you don’t understand or things that you want me to explain more about because you are interested or concerned. Please ask me to stop at anytime, and I will explain.

General Information

If you agree to be in this study, you will be asked to answer questions for a survey about your migration to Accra, your work as a *kayayoo*, and your health.

Possible Benefits

Your participation in this study will contribute towards understanding the health of *kayayei* in Ghana. By participating in this research, you will be providing information that will be useful in designing more effective policies and programmes for female migrants’ health. We will give you 2 cedis to compensate you for your time spent completing the survey and 3 cedis to compensate you for your travel.

Possible Risks and Discomforts

The possible risks are that you might feel discomfort while being asked questions or talking about your health and reasons for migrating to Accra. If you become distressed, you can take some time to collect yourself. You can also stop your participation at any time.

Voluntary Participation and Right to Leave the Research

You can stop participating at any time if you feel uncomfortable. No one will be angry with you if you do not want to participate.

Confidentiality

Your information will be kept confidential. No one will be able to know your name or how you responded to the questions. Your information will be anonymous, which means that no one will be able to know who you are.

Contacts for Additional Information

You may ask me any questions about this study. You can call me at 0206932101 or talk to me the next time you see me. Please talk about this study with your parent before you decide whether or not to participate. I will also ask permission from your parent before you are enrolled into the study. Even if your parent says “yes,” you can still decide not to participate.

Your Rights as a Participant

This research has been reviewed and approved by the Research Ethics Committee at the London School of Economics and the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your rights as a research participant, you

can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email address: nirb@noguchi.mimcom.org

VOLUNTARY AGREEMENT

By making a mark or thumb print below, it means that you understand and know the issues concerning this research study. If you do not want to participate in this study, please do not sign this assent form. You and your parent will be given a copy of this form after you have signed it.

Instruction to Interviewer: Ask respondent to confirm the following:

	YES	NO
I have been given an opportunity to ask any questions I may have, and all such questions or inquiries have been answered to my satisfaction. I have been informed orally and in writing of whom to contact in case I have questions.		
I give my consent to participate in this study.		
I give permission to include my information, without my name, in your research findings that will be shared and published.		

This assent form that describes the benefits, risks, and procedures for the research entitled “Migration and Reproductive Health among Kayayei in Ghana” has been read and/or explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate.

Date

Name of Child

Child's Mark or Thumbprint

Date

Name of Person Who Obtained Consent

Signature of Person Who Obtained Consent

Appendix 18: Survey consent form for parents of participants

PARENTAL CONSENT FORM – SURVEY

Title: Migration and Reproductive Health among Kayayei in Ghana

Principal Investigator: Samantha Lattof

Addresses: Centre for Social Policy Studies, University of Ghana, P.O. Box LG 25, Legon, Accra, Ghana
Department of Social Policy, London School of Economics, Houghton Street, London, WC2A 2AE United Kingdom

General Information about Research

This study is part of a research project that is being conducted in Accra over the next three months by Samantha Lattof who is a student at the University of Ghana in Legon and the London School of Economics in the United Kingdom. This study wants to learn more about the health of *kayayei* in order for us to better understanding the health issues that *kayayei* face in Accra. There may be some words that you don't understand or things that you want me to explain more about because you are interested or concerned. Please ask me to stop at anytime, and I will explain.

We are asking your child to help us understand more about the experiences of *kayayei* and their health. Since your child works as a *kayayoo* in Accra, I am going to give you both information and invite her to take part in the research study. You both can decide if she wants to participate or not. Before you decide, you can talk to anyone you feel comfortable with about the research. If your child participates in this research, I would like to ask her some questions for a survey that will take about 30 to 45 minutes of her time.

Possible Risks and Discomforts

It is possible that answering questions about her health and reasons for migrating to Accra might cause your child discomfort. If she becomes distressed, she can take some time to collect herself. She can also stop her participation in the survey at any time.

Possible Benefits

The intention of this study is to contribute towards understanding the health of *kayayei* in Ghana. By participating in this research, your child will be providing information that will be useful in designing more effective policies and programmes for *kayayei* and their health.

Confidentiality

We will protect information about your child to the best of our ability. Your child will not be named in any reports. Some staff of the University of Ghana and the London School of Economics may sometimes look at your child's research records. All the information that she provides will remain anonymous, which means that no one will be able to know who she is. I may ask her to share some information that is personal. The information she provides is confidential and will be kept private. I will not share personal information about her with anyone. Information about her will have a number on it instead of her name. Only I, the research assistant, and Samantha Lattof will know what her number is. Findings from the research may be published, but no details from which your child could be identified will be shared with anyone. All data from this project will be stored securely.

Compensation

Your child will receive 2 cedis at the end of the survey to compensate her for her time and 3 cedis to compensate her for her travel.

Voluntary Participation and Right to Leave the Research

Your child's participation in the study is entirely voluntary. If you and she choose not to take part, there will be no negative consequences. She may change her mind later and stop taking part even if she agreed earlier. She does not have to give reasons for choosing not to take part. If she would like time to think before she decides whether to take part, she can tell us and come back at a later date. If your child agrees to participate, we will ask you to consent to the information shared in this form to show that the study has been explained to you and that you agree for her to be part of it. You will have the option to give your approval by whatever method you prefer: signature, thumbprint, or verbal consent with a witness. Your child may decide to end her participation in the survey at any time if she doesn't feel comfortable continuing.

Contacts for Additional Information

If you have any questions, you can ask them now or later. If you want to ask questions later, you can contact us using the following details: Samantha Lattof's telephone number 0206932101 or email s.lattof@lse.ac.uk

Your rights as a Participant

This research has been reviewed and approved by the Research Ethics Committee at the London School of Economics and the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your child's rights as a research participant you can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email: nirb@noguchi.mimcom.org.

VOLUNTEER AGREEMENT**1. Instruction to Interviewer: Ask respondent the following:**

'Are you willing for your child to participate in a survey to discuss the issues that I've just mentioned? Please remember that she does not have to participate if you or she does not want to.'

	YES	NO
I give my consent for my child to participate in this study.		

2. Instruction to Interviewer: Ask respondent the following:

'Do we have your permission to include your child's information, without her name, in our research findings that will be shared and published? Do you have any questions about the information that I just shared with you?'

	YES	NO
I give permission to include my child's information, without her name, in your research findings that will be shared and published.		
I have been given an opportunity to ask any questions I may have, and all such questions or inquiries have been answered to my satisfaction. I have been informed orally and in writing of whom to contact in case I have questions.		

The above document describing the benefits, risks and procedures for the research title "Migration and Reproductive Health among Kayayei in Ghana" has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree that my child should participate as a volunteer.

Date

Name of parent or guardian

Signature or mark of parent or guardian

Name of child

If parent or guardian cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read to the child's parent or guardian. All questions were answered and the child's parent has agreed that his or her child should take part in the research.

Date

Name of witness

Signature of witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

Date

Name of person who obtained consent

Signature of person who obtained consent

Appendix 19: Refusal form

Refusal Form

To be completed by the coordinator.

Instructions: Please complete a row on this form for each person who meets the inclusion criteria but refuses to participate in the study.

Refusal Codes			
1	2	3	4
Didn't want to sign consent	Didn't want to answer questions	No time. <i>(Ask the participant if she would like to come back at a later time.)</i>	Other, specify. (Speak with Sam to refusal reason.)

No.	Coupon Number (Take away the coupon and write the coupon number in this column.)	Date	Reason for Refusal (See the code numbers above. Write the number in this column.)	If Other, Specify	Name of coordinator
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Appendix 20: Coupon tracking form

Coupon Tracking Form

Instructions: The coupon tracking form must be completed for each seed every day by the coordinator.

Seed Number: _____

No.	Date	Coupon Number	Referral Coupon 1	Referral Coupon 2	Referral Coupon 3
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

Appendix 21: Financial reporting form

Financial Reporting Form

Instructions: This form must be completed each day for each seed. On the day of the survey, record the payments made to the participant for completing the survey and transportation (T&T). For participants who completed an interview, record the interview payment. Include the number of recruiting coupons that the participant is given for new participants, and make sure to record the expiration date for these coupons. When the participant returns in the future to collect her recruiting incentive, record the date and the amount of the payment.

Seed Number: _____

[illegible]

Appendix 22: Non-response form

Non-Response Form

To be completed by the coordinator.

Instructions: *When a participant comes to collect her recruitment payment, she should be asked if anyone refused to accept one of her coupons. For each person who refused to accept the participant's recruiting coupon, please ask these questions. Use one form for each person who refused to accept a coupon from the participant.*

PARTICIPANT'S ID NUMBER: _____

Questions	Responses
What reason(s) did those who refused a coupon give for not taking the coupon? (CHECK ALL THAT APPLY.)	1. ____ Too busy 2. ____ Already had a coupon 3. ____ Already participated in the study 4. ____ Not kayayei 5. ____ Not from the Northern, Upper East, or Upper West Regions 6. ____ Not a girl or woman 7. ____ Site is too far away 8. ____ Not interested 9. ____ Afraid of participating in research 10. ____ Incentive is not worth the time 11. Other, specify: _____
Of the reasons above, what one reason was the main reason for refusing to accept a coupon? (WRITE THE NUMBER FROM THE RESPONSES ABOVE.)	_____
How would you describe your relationship to the person who refused your coupon? (CHECK ALL THAT APPLY.)	1. ____ Friend 2. ____ Roommate 3. ____ Grandmother 4. ____ Mother 5. ____ Sister 6. ____ Daughter 7. ____ Auntie 8. ____ Stranger 9. Other, specify: _____
How well do you know this person?	1. ____ Very well 2. ____ Somewhat well 3. ____ Not very well 4. ____ I do not know this person.
How often do you see this person?	1. ____ Every day 2. ____ A few times a week 3. ____ Once a week 4. ____ Once every other week 5. ____ Once a month 6. ____ Less than once a month
About how long have you known this person? (WRITE NUMBER AND CIRCLE THE TIME UNITS.)	_____ (weeks/months/years)
How old is she? (ASK: WHAT IS YOUR BEST GUESS?)	_____ (age in years)
What is the highest level of school she has completed? (ASK: WHAT IS YOUR BEST GUESS?)	1. ____ No school 2. ____ Primary school 3. ____ Junior high school 4. ____ Senior high school 5. Other, specify: _____
From which region is this person? (ASK: WHAT IS YOUR BEST GUESS?)	1. ____ Upper East Region 2. ____ Upper West Region 3. ____ Northern Region

Appendix 23: Field incident report form

Field Incident Report	
Project Site: _____	
Name of Person Filing Report: _____	
Position (check all that apply):	
<input type="checkbox"/> Supervisor <input type="checkbox"/> Screener / Coupon Manager <input type="checkbox"/> Surveyor <input type="checkbox"/> Interviewer <input type="checkbox"/> Other (Specify): _____	
Date of Incident (dd/mm/yy): ____ / ____ / 2015	
Time of Incident: ____ / ____ □□a.m. □□p.m.	
Description of Incident and Actions Taken: _____	

Incident reported locally to (check all that apply):	
<input type="checkbox"/> Supervisor <div style="margin-left: 40px;">Date: ____ / ____ / ____ Time: ____ / ____ □□a.m. □□p.m.</div>	
<input type="checkbox"/> Police <div style="margin-left: 40px;">Date: ____ / ____ / ____ Time: ____ / ____ □□a.m. □□p.m.</div>	
<input type="checkbox"/> Other (specify): _____ <div style="margin-left: 40px;">Date: ____ / ____ / ____ Time: ____ / ____ □□a.m. □□p.m.</div>	
Comments (other information relevant to the incident): _____	

Signature of Person Filing Report: _____ Date: ____ / ____ / 2015	
Please give this completed form to Sam Lattot.	

Appendix 24: Semi-structured in-depth interview guide

STRICTLY CONFIDENTIAL

Do not put any personal details on this paper

Migration and Reproductive Health Study

In-Depth Interview Guide

Participant ID: _____

Date: ____ / ____ / ____

Start time: ____: ____

End time: ____: ____

Language of interview: _____

Translator's name: Gifty

Facilitator's name: Sam

Have you already:

- Reviewed the participant's questionnaire for possible lines of questioning?
- Introduced yourself?
- Explained the study's objectives?
- Completed the informed consent procedure?
- Explained the interview process?

*Ask participant if she is still ok with audio recording the interview. If yes, **TURN ON THE RECORDER AND NOTE HER PARTICIPANT ID NUMBER.***

Migration History

Ask the participant about her migration history.

- Why did you leave your village? Who influenced your decision to migrate?
- Did you come directly to Accra from your village, or did you live anywhere else in between?
- When did you come to Accra? How old were you? (repeat for each migration made)
- Did you stop your schooling to come to Accra? IF YES, why? Would you have liked to stay in school?
- How do you find life in Accra compared to life in the north? Benefits? Challenges? Physical? Cultural? Linguistic? Employment?
- Living conditions? Residence? Homeless? If homeless, what happens at night?

Ask the participant about her work history.

- What did you do before coming to Accra?
- Why did you choose to work as a *kayayoo*? Did you know you would do this work when you came to Accra, or did you think you would be doing other work here? What other jobs did you consider?
- Work conditions? Hours? Environment? Wages?
- What are the benefits of working as a *kayayoo*? Challenges?

Ask the participant about her social network.

- Family/friends in Accra?
- Contact with family/friends in place of origin? Method? How often? Topics discussed?
- Do you send any money or items home? To whom? Why? What do you send? How often do you send it? What method do you use to send remittances (e.g. mobile money, with a friend)?

STRICTLY CONFIDENTIAL
Do not put any personal details on this paper

**Migration and Reproductive Health Study
In-Depth Interview Guide**

- Why have you recommended (or not recommended) work as *kayayei* to friends in the north? Did anyone come to Accra to work as *kayayei*?
- From whom do you seek general help or support? Community? Social services? When you have a health problem, from whom do you seek help or support?

Community

Ask the participant about *kayayei's health*

- How do people in Accra treat *kayayei*?
- What are the biggest health issues for *kayayei*? What are the biggest health issues for women in your village in the north?
- Do *kayayei* worry about not being able to pay for health care costs? Do these costs have any effect on where or when a woman chooses to seek care? What about care for your child(ren)?
- What barriers may prevent *kayayei* from receiving the care she desires? Social or cultural barriers? Financial barriers? Time loss barriers?
- What would make it easier for *kayayei* to receive the health care they desire? Do you have any recommendations?

Ask the participant about planning for children

- Do you think most people in your village in the north plan their pregnancies or when to have children?
- Do you think it is easy for women and/or men in the north to get accurate information on how to space their children and delay pregnancy? Why or why not?
- If participant has used family planning, why have you used family planning? What was your experience?
- If participant was not using family planning but indicated she wanted to delay her last pregnancy, why were you not using family planning? Will you use family planning in the future?
- Are unplanned pregnancies something that people worry about in your village? Are unplanned pregnancies something that *kayayei* worry about in Accra? Why or why not? Is it something that people talk about? Why or why not?
- Some women have become pregnant when they didn't want to be pregnant, and they have taken steps to end their pregnancy. Have you ever heard about women in your village or *kayayei* in Accra taking steps to end a pregnancy? What have you heard?
- What are the general views of other people in your village regarding abortion? Is it legal or illegal? How do people in your village talk about abortions? Where or how do people get information on abortion?
- Do you think access to abortion is easy or difficult for women in your village? For *kayayei* in Accra? Why to do you think that is?

Ask the participant about women's health risks in Accra.

- What types of women's health risks exist here? Are these risks for all women?
- What, if any, specific types of dangers or risks do *kayayei* face in Accra? Violence?
- How do you and your friends address these dangers or risks? Or avoid them? Or reduce them?
- How do these risks compare to those in your village in the north?

Ask the participant about her women's health thoughts.

- What does "women's health" mean to you? What about "reproductive health?"
- Who has the final say on your own health care? Respondent? Husband/partner? Family member?

STRICTLY CONFIDENTIAL
Do not put any personal details on this paper

**Migration and Reproductive Health Study
In-Depth Interview Guide**

- Does women's health in Accra differ from women's health at your place of origin?

Personal Health

Ask the participant about her sources of knowledge for health issues.

- Sources of health information? Radio? Adverts? NGOs? Health workers?
- Frequency of health messages? Compared to place of origin?
- Differences between health messages at origin versus in Accra?
- Where do you seek health information? What sources, in your opinion, are trustworthy?
- What kinds of women's health messages do you want more of? Less of?
- Who told you about family planning? AIDS? Pregnancy? When? Did you get this information at the right time, or would you have wanted to learn it earlier? From whom would you want to have learned it?

Ask the participant about her use of women's health information.

- When do you seek information? Why? How often? From whom?
- Do you talk to other people about women's health? Who? Why? Topics discussed? How did you feel when you talked with others? Who did you speak with about these issues at your place of origin? In Accra?

Ask the participant about her medical history.

- How has living in Accra influenced your health? Has your health gotten better, worse, or stayed the same since you migrated to Accra? Why?
- Any health conditions? Chronic illness or women's health issues? When? Possible reasons? Diagnosis? Treatment?
- At your current age, what is your biggest health priority? Your biggest health concerns? Why? Are these the same as your health priorities/concerns when you were living in the north? Why or why not?

Ask the participant about her use of health services in Accra.

- When were you last ill or injured?
- Did anyone or anything influence your decision to seek care or your decision to not seek care? (Probe: Husband/partner? Mother-in-law? Friend? Neighbor? Health care worker?)
- What services did you seek? Where? When? How often? Satisfaction?
- Any difficulties (i.e. language, accessibility, affordability, cultural differences)?
- Suggestions for improvement?
- How does your experience in Accra compare to your prior experiences in the north?

Ask the participant about health insurance.

- Do you have a current national health insurance scheme (NHIS) or a mutual health insurance scheme card?
 - IF YES, why did you enrol in the NHIS?
 - IF NO, why are you not enrolled in the NHIS? Have you ever been enrolled in the NHIS?
- The last time you were ill or injured, did you have NHIS?
 - IF YES, how much of the costs were covered by the NHIS? Which services did they cover? What, if any, services were not covered? Did you pay anything out-of-pocket? If so, how much did you pay? (Probe: Costs of transportation? Productive time lost?)

STRICTLY CONFIDENTIAL
Do not put any personal details on this paper

**Migration and Reproductive Health Study
In-Depth Interview Guide**

- IF NO, why did you not have NHIS during your most recent illness or injury? Would you have wanted to have NHIS? What factors, if any, prevented you from having NHIS? How much did you pay for care? Did anyone help you pay for these services? If so, who? How much? And for which services?

Future Plans

Ask the participant about her future family plans.

- And are you married? IF NO, do you have a partner/boyfriend?
- Do you have children? IF YES, how many children do you have?
- Would you like to have [children / more children someday]? Why or why not?
- IF SHE HAS A HUSBAND/PARTNER/BOYFRIEND, Would your husband/partner like [children / more children someday]? Why or why not?
- Do you worry about having [children / more children someday]? Why or why not?
- Are you [or your husband/boyfriend/partner] currently doing anything or using any method to avoid getting pregnant?
 - IF YES, what are you doing? What methods do you use to avoid pregnancy?
 - IF NO, why is that? Have you ever done anything in the past or used a method to avoid pregnancy?

Ask the participant about her future plans.

- Settle in Accra? Return to place of origin?
- Employment? Type? Education?
- What are your aspirations?
- If your (future) daughter told you that she was going to come to Accra to work as kayayei, what would you tell her?

Is there anything else you think I should know about kayayei? Is there anything else you think I should know about you or your story?

We've asked you a lot of questions. Do you have any questions for us, or do you any questions about the project?

Thank the participant for her time and process her compensation.

NOTES:

Appendix 25: Interview consent form for adults and emancipated minors

CONSENT FORM – IN-DEPTH INTERVIEW

Title: Migration and Reproductive Health among Kayayei in Ghana

Principal Investigator: Samantha Lattof

Addresses: Centre for Social Policy Studies, University of Ghana, P.O. Box LG 25, Legon, Accra, Ghana
Department of Social Policy, London School of Economics, Houghton Street, London, WC2A 2AE United Kingdom

General Information about Research

This study is part of a research project being conducted in Accra over the next three months by a student at the University of Ghana in Legon and the London School of Economics in the United Kingdom. This study wants to learn more about the health of *kayayei* in order for us to better understanding the different health challenges that *kayayei* might face in Accra. There may be some words that you don't understand or things that you want me to explain more about because you are interested or concerned. Please ask me to stop at anytime, and I will explain.

I am asking you to help us understand more about the experiences of *kayayei* and their health. Since you are a *kayayoo* in Accra, I am going to give you information and invite you take part in the research study. You can decide if you want to participate or not. Before you decide, you can talk to anyone you feel comfortable with about the research. If you decide to participate in this research, I would like to ask you some questions during an interview that will take about 45 to 60 minutes of your time.

Possible Risks and Discomforts

It is possible that answering questions about your health and reasons for migrating to Accra might cause you discomfort. If you become distressed, you can take some time to collect yourself. You can also stop your participation at any time.

Possible Benefits

The intention of this study is to contribute towards understanding the health of *kayayei* in Ghana. By participating in this research, you will be providing information that will be useful in designing more effective policies and programmes for *kayayei* and their health.

Confidentiality

All the information that you provide during the interview will remain anonymous, which means that no one will be able to know who you are. This conversation usually takes around one hour but sometimes takes shorter or longer. I may ask you to share some information that is personal. The information you provide is confidential and will be kept private. I will not share personal information about you with anyone. The recording and any other information about you will have a number on it instead of your name. Only I, the research assistant, and Samantha Lattof will know what your number is. Findings from the research may be published, but no details from which you could be identified will be shared with anyone. All data from this project will be stored securely.

Compensation

We will give you 3 cedis at the end of the interview to compensate you for your time and 2 cedis to compensate you for your travel.

Voluntary Participation and Right to Leave the Research

Your participation in the study is entirely voluntary. It is your choice whether to take part or not. If you choose not to take part, there will be no negative consequences. You may change your mind later and stop taking part even if you agreed earlier. You do not have to give reasons for choosing not to take part. If you would like time to think before you decide whether to take part, you can tell us and come back at a later date. If you agree to participate, we will ask you to consent to the information shared in this form to show that the study has been explained to you and that you agree to be part of it. You will have the option to give your approval by whatever method you prefer: signature, thumbprint, or verbal consent with a witness. You may decide to end your participation in the interview at any time if you don't feel comfortable about continuing.

Contacts for Additional Information

If you have any questions, you can ask them now or later. If you want to ask questions later, you can contact us using the following details: Samantha Lattof's telephone number 0206932101 or email s.lattof@lse.ac.uk.

Your Rights as a Participant

This research has been reviewed and approved by the Research Ethics Committee at the London School of Economics and the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your rights as a research participant, you can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email address: nirb@noguchi.mimcom.org.

VOLUNTEER AGREEMENT**1. Instruction to Interviewer: Ask respondent the following:**

'Are you willing to participate in a recorded interview to discuss the issues that I've just mentioned? Please remember that you do not have to participate if you do not want to.'

	YES	NO
I give my consent to participate in this study.		
I agree to participate in a recorded interview.		

2. Instruction to Interviewer: Ask respondent the following:

'Do we have your permission to include your information, without your name, in our research findings that will be shared and published? Do you have any questions about the information that I just shared with you?'

	YES	NO
I give permission to include my information, without my name, in your research findings that will be shared and published.		
I have been given an opportunity to ask any questions I may have, and all such questions or inquiries have been answered to my satisfaction. I have been informed orally and in writing of whom to contact in case I have questions.		

The above document describing the benefits, risks, and procedures for the research entitled "Migration and Reproductive Health among Kayayei in Ghana" has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

Date Name of volunteer Signature or mark of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks, and procedures were read to the volunteer. All questions were answered, and the volunteer has agreed to take part in the research.

Date Name of witness Signature of witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual. I have received the participant's consent to participate according to the components agreed.

Date Name of person who obtained consent Signature of person who obtained consent

Appendix 26: Interview child assent form

CHILD ASSENT FORM – IN-DEPTH INTERVIEW

Title: Migration and Reproductive Health among Kayayei in Ghana

Principal Investigator: Samantha Lattot

Address: Centre for Social Policy Studies, University of Ghana, P.O. Box LG 25, Legon, Accra, Ghana
Department of Social Policy, London School of Economics, Houghton Street, WC2A 2AE U.K.

Introduction

My name is Samantha Lattot, and I am from the University of Ghana and the London School of Economics. I am conducting a research study in Accra over the next three months entitled “Migration and Reproductive Health among Kayayei in Ghana.” I am asking you to take part in this research study because I am trying to learn more about the experiences of *kayayei* and their health. This interview will take about 45 to 60 minutes of your time. There may be some words that you don’t understand or things that you want me to explain more about because you are interested or concerned. Please ask me to stop at anytime, and I will explain.

General Information

If you agree to be in this study, you will be asked to complete an interview about your migration to Accra, your work as a *kayayoo*, and your health.

Possible Benefits

Your participation in this study will contribute towards understanding the health of *kayayei* in Ghana. By participating in this research, you will be providing information that will be useful in designing more effective policies and programmes for *kayayei* and their health. We will give you 3 cedis to compensate you for your time spent completing the interview.

Possible Risks and Discomforts

The possible risks are that you might feel discomfort while being asked questions or talking about your health and reasons for migrating to Accra. If you become distressed, you can take some time to collect yourself. You can also skip a question or stop your participation at any time.

Voluntary Participation and Right to Leave the Research

You can stop participating at any time if you feel uncomfortable. No one will be angry with you if you do not want to participate.

Confidentiality

Your information will be kept confidential. No one will be able to know your name or how you responded to the questions. Your information will be anonymous, which means that no one will be able to know who you are.

Contacts for Additional Information

You may ask me any questions about this study. You can call me at 0206932101 or talk to me the next time you see me. Please talk about this study with your parent before you decide whether or not to participate. I will also ask permission from your parent before you are enrolled into the study. Even if your parent says “yes,” you can still decide not to participate.

Your Rights as a Participant

This research has been reviewed and approved by the Research Ethics Committee at the London School of Economics and the Institutional Review Board of Noguchi Memorial Institute for Medical

Research (NMIMR-IRB). If you have any questions about your rights as a research participant, you can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email address: nirb@noguchi.mimcom.org

VOLUNTARY AGREEMENT

By making a mark or thumb print below, it means that you understand and know the issues concerning this research study. If you do not want to participate in this study, please do not sign this assent form. You and your parent will be given a copy of this form after you have signed it.

Instruction to Interviewer: Ask respondent to confirm the following:

	YES	NO
I have been given an opportunity to ask any questions I may have, and all such questions or inquiries have been answered to my satisfaction. I have been informed orally and in writing of whom to contact in case I have questions.		
I give my consent to participate in this study.		
I agree to participate in a recorded interview.		
I give permission to include my information, without my name, in your research findings that will be shared and published.		

This assent form that describes the benefits, risks, and procedures for the research entitled “Migration and Reproductive Health among Kayayei in Ghana” has been read and/or explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate.

Date

Name of Child

Child's Mark or Thumbprint

Date

Name of Person Who Obtained Consent

Signature of Person Who Obtained Consent

Appendix 27: Interview consent form for parents of participants

PARENTAL CONSENT FORM - IN-DEPTH INTERVIEW

Title: Migration and Reproductive Health among Kayayei in Ghana

Principal Investigator: Samantha Lattof

Addresses: Centre for Social Policy Studies, University of Ghana, P.O. Box LG 25, Legon, Accra, Ghana
Department of Social Policy, London School of Economics, Houghton Street, London, WC2A 2AE United Kingdom

General Information about Research

This study is part of a research project being conducted in Accra over the next three months by Samantha Lattof who is a student at the University of Ghana in Legon and the London School of Economics in the United Kingdom. This study wants to learn more about the health of *kayayei* in order for us to better understanding the health issues that *kayayei* face in Accra. There may be some words that you don't understand or things that you want me to explain more about because you are interested or concerned. Please ask me to stop at anytime, and I will explain.

We are asking your child to help us understand more about the experiences of *kayayei* and their health. Since your child works as a *kayayoo* in Accra, I am going to give you both information and invite her to take part in the research study. You both can decide if she wants to participate or not. Before you decide, you can talk to anyone you feel comfortable with about the research. If your child participates in this research, I would like to ask her some questions during an interview that will take about 45 to 60 minutes of her time.

Possible Risks and Discomforts

It is possible that answering questions about her health and reasons for migrating to Accra might cause your child discomfort. If she becomes distressed, she can take some time to collect herself. She can also stop her participation in the interview at any time.

Possible Benefits

The intention of this study is to contribute towards understanding the health of *kayayei* in Ghana. By participating in this research, your child will be providing information that will be useful in designing more effective policies and programmes for *kayayei* and their health.

Confidentiality

We will protect information about your child to the best of our ability. Your child will not be named in any reports. Some staff of the University of Ghana and the London School of Economics may sometimes look at your child's research records. All the information that she provides will remain anonymous, which means that no one will be able to know who she is. I may ask her to share some information that is personal. The information she provides is confidential and will be kept private. I will not share personal information about her with anyone. Information about her, including the audio recording of her interview, will have a number on it instead of her name. Only I, the research assistant, and Samantha Lattof will know what her number is. Findings from the research may be published, but no details from which your child could be identified will be shared with anyone. All data from this project will be stored securely.

Compensation

Your child will receive 3 cedis at the end of the interview to compensate her for her time.

Voluntary Participation and Right to Leave the Research

Your child's participation in the study is entirely voluntary. If you and she choose not to take part, there will be no negative consequences. She may change her mind later and stop taking part even if she agreed earlier. She does not have to give reasons for choosing not to take part. If she would like time to think before she decides whether to take part, she can tell us and come back at a later date. If your child agrees to participate, we will ask you to consent to the information shared in this form to show that the study has been explained to you and that you agree for her to be part of it. You will have the option to give your approval by whatever method you prefer: signature, thumbprint, or verbal consent with a witness. Your child may decide to end her participation in the interview at any time if she doesn't feel comfortable continuing.

Contacts for Additional Information

If you have any questions, you can ask them now or later. If you want to ask questions later, you can contact us using the following details: Samantha Lattof's telephone number 0206932101 or email s.lattof@lse.ac.uk

Your rights as a Participant

This research has been reviewed and approved by the Research Ethics Committee at the London School of Economics and the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your child's rights as a research participant you can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email: nirb@noguchi.mimcom.org.

VOLUNTEER AGREEMENT**1. Instruction to Interviewer: Ask respondent the following:**

'Are you willing for your child to participate in a recorded interview to discuss the issues that I've just mentioned? Please remember that she does not have to participate if you or she does not want to.'

	YES	NO
I give my consent for my child to participate in this study.		
I agree that my child may participate in a recorded interview.		

2. Instruction to Interviewer: Ask respondent the following:

'Do we have your permission to include your child's information, without her name, in our research findings that will be shared and published? Do you have any questions about the information that I just shared with you?'

	YES	NO
I give permission to include my child's information, without her name, in your research findings that will be shared and published.		
I have been given an opportunity to ask any questions I may have, and all such questions or inquiries have been answered to my satisfaction. I have been informed orally and in writing of whom to contact in case I have questions.		

The above document describing the benefits, risks and procedures for the research title "Migration and Reproductive Health among Kayayei in Ghana" has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree that my child should participate as a volunteer.

Date

Name of parent or guardian

Signature or mark of parent or guardian

Name of child

If parent or guardian cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read to the child's parent or guardian. All questions were answered and the child's parent has agreed that his or her child should take part in the research.

Date

Name of witness

Signature of witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

Date

Name of person who obtained consent

Signature of person who obtained consent