UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Coverage of maternal and child healthcare services in Ethiopia: Measuring progress towards universal health coverage using the Demographic Health Surveys

By: Aster Ferede Gebremedhin

A thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

under the supervision of Professor Andrew Hayen
Professor Angela Dawson

University of Technology Sydney

Faculty of Health

October 2022

CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Aster Ferede Gebremedhin, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Faculty of Health at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

This research is supported by the Australian Government Research Training Program.

Signature: Production Note:
Signature removed prior to publication.

Aster Ferede Gebremedhin

Date:31/10/2022

Manuscripts incorporated into the thesis

1. Aster Ferede Gebremedhin, Angela Dawson, Andrew Hayen. Determinants of continuum of care for maternal, newborn, and child health services in Ethiopia: Analysis of the modified composite coverage index using a quantile regression approach. PLoS One. 2023 Jan 20;18(1): e0280629, https://doi.org/10.1371/journal.pone.0280629
2. Aster Ferede Gebremedhin, Angela Dawson, Andrew Hayen: Inequalities in maternal, newborn, and child health coverage in Ethiopia: A decomposition analysis using 2000, 2005, 2011, and 2016 Demographic and Health Surveys
3. Aster Ferede Gebremedhin, Angela Dawson, Andrew Hayen, Evaluations of effective coverage of maternal and child health services: A systematic review, Health Policy and Planning, Volume 37, Issue 7, August 2022, Pages 895–914, https://doi.org/10.1093/heapol/czac034
4. Aster Ferede Gebremedhin, Angela Dawson, Andrew Hayen: Effective coverage of newborn postnatal care: measuring inequality and spatial distribution of quality-adjusted coverage (Under review for publication in PLos One journal)

Conference presentation

1. Faculty of Health Research Student Forum, University of Technology Sydney, Australia, 29 June 2022
2. Health in Preconception, Pregnancy, and Postpartum Early- and Mid-Career Researcher Collective (HiPPP EMR-C) International Conference, Australia, 17 November 2021
3. Faculty of Health Research Student Forum, University of Technology Sydney, Australia, 29 July 2020

Acknowledgments

I would like to take this opportunity to express my heartfelt gratitude to the numerous individuals and institutions who have provided unwavering support throughout my PhD journey. Firstly, I extend my sincere appreciation to my supervisors, Professor Andrew Hayen and Professor Angela Dawson, for their guidance, encouragement, invaluable feedback, and profound expertise at every stage of this endeavor. I am truly grateful to them for granting me the opportunity to fulfill one of my life goals. Working under their supervision has been an immense privilege, and I wholeheartedly admire their unwavering commitment and dedication in meticulously reviewing my manuscripts and thesis, as well as arranging productive meetings despite their demanding schedules.

I am profoundly indebted to my supervisors for placing their trust in me from the very first email exchange, thereby initiating my PhD journey, acquainting me with the academic environment at the University of Technology Sydney, and providing me with essential information. Their support, even prior to our in-person meeting, was immeasurable. The past two years of my PhD journey have been particularly challenging, and it is during these times that my supervisors have exhibited exceptional kindness, positivity, and care, always offering me emotional support. Without their unwavering encouragement, patience, and boundless assistance throughout my candidature, I would not have been able to complete my thesis. I am immensely grateful to them.

I would like to extend my gratitude to Professor Andrew Hayen for enabling me to undertake casual academic work during my time at the University of Technology Sydney. It was an invaluable experience that enriched my knowledge and skills.

Furthermore, I would like to acknowledge the Australian Government and the University of Technology Sydney for affording me the opportunity to enroll in the PhD program, as well as for the International Research Training Program (IRTP) scholarship grant. My appreciation also goes to the Faculty of Health at the University of Technology Sydney for their unwavering support. I would like to express my heartfelt thanks to the diligent librarians at the University of Technology Sydney Library for their invaluable assistance during the systematic review search strategy development. Additionally, I would like to extend my gratitude to Andrea Delgado from the University of Technology Sydney for her kind support in translating the literature for my study.

I am grateful to the Demographic and Health Surveys program for granting me access to their data for my PhD research. I would also like to acknowledge the support provided by Debre Markos University during my application stage.

Last but not least, I am deeply appreciative of my friends and colleagues for their continuous encouragement and motivation. I am fortunate to have very kind and caring friends who are studying with me at both UTS and Western Sydney University. They have consistently looked after me like a little sister and embraced me as part of their family.

Finally, I would like to express my deepest gratitude and appreciation to my beloved parents, Ferede Gebremedhin W/ezgi and Semaynesh Belay Araya, my three amazing sisters, Fertuna Ferede, Wintana Ferede, and Eyerusalem Ferede, as well as my supportive extended family. Their unconditional love, support, and encouragement have been the foundation of my PhD journey. Their presence in my life is a constant reminder of the strength and love that surrounds me. This accomplishment is as much theirs as it is mine.

I am truly blessed to have such a loving and supportive family, and I will forever cherish the memories and the love we share.

"I can do all things through Christ who strengthens me." (Philippians 4:13)

Abbreviations

AABF	Age-appropriate breastfeeding
ANC	Antenatal Care
ARI	Acute respiratory infection
BCG	Bacille Calmette–Guérin
CAREP	Care seeking for pneumonia
CC	Crude coverage
CCI	Composite Coverage Index
COC	Continuum of care
CSA	Central Statistical Agency
DHS	Demographic Health Survey
DPT	Diphtheria–Tetanus–Pertussis
EA	Enumeration Area
EC	Effective Coverage
EDHS	Ethiopia Demographic and Health Survey
GPS	Global Positioning System
FMOH	Federal Ministry of Health of Ethiopia
FP	Family planning
HEP	Health Extension Program
HSDP	Health sector development program
HSTP	Health sector transformation program
LMICs	Low and middle-income countries
MCH	Maternal and child health
MSL	Measles

ORT	Oral rehydration therapy
PNC	Postnatal care
PNCM	Postnatal care for mothers
PNCN	Postnatal care for newborns
RMNCH	Reproductive, maternal, neonatal and child health
SBA	Skilled birth attendance
SDG	Sustainable Development Goals
SNNP	Southern Nations Nationalities and Peoples
SSA	Sub-Saharan Africa
TTN	Tetanus toxoid
UHC	Universal Health Coverage
WHO	World Health Organisation

Table of Contents

List of Tables

List of Figures

List of Appendices

Abstract

Background: In low and lower-middle-income countries, maternal and child health interventions have not been considered holistically. Evidence suggests that inequity in the coverage of services impedes progress in maternal and child health and conventional coverage measures do not account for quality. This research aimed to generate policy-relevant evidence by comprehensively assessing the coverage and inequalities in maternal, and child health interventions across the continuum of care in Ethiopia.

Methods: This research comprises a systematic review and three cross-sectional analyses of the Ethiopia Demographic and Health Surveys. The first study identified the determinants of the continuum of care in maternal and child health using quantile regression. The second study assessed inequalities in maternal and child health coverage along the continuum of care and the major contributors to the inequality. The third study presented a systematic review of studies evaluating effective coverage of maternal and child health services. Finally, the fourth study assessed the effective coverage of newborn postnatal care in Ethiopia.

Results: The results of the first study showed that the average composite coverage index was 39%. Postnatal care for newborns had the lowest coverage (12%). Further, individual, socioeconomic and reproductive factors influenced the continuum of care differently across levels of the composite coverage index. Findings from the second study revealed that the composite coverage index increased from 24% in 2000 to 42% in 2016. However, coverage was pro-rich, and the wealth quintile was the major contributor to the inequalities in all survey years.

The systematic review found (1) the effective coverage values were lower when the crude coverage estimates were adjusted to account for the quality of care; (2) quality

assessments addressed structural, process and outcome domains individually or combined; (3) the wealthiest quintile had a higher effective coverage of services than the poorest quintile. The fourth study found that the crude coverage of newborn postnatal care was 13% in Ethiopia, but 9% when adjusted for quality. Further, a spatial variation across regions and a pro-rich inequality in high-quality newborn postnatal care were demonstrated.

Conclusions: Ethiopian women and children are not receiving the best possible health benefits, and government efforts to address inequity are insufficient, underscoring areas for improvement. Tailored interventions are required that address the determinants of the continuum of care. Furthermore, the findings suggest that national policy and programming efforts should prioritise accessibility and high-quality care, particularly for disadvantaged sub-groups and geographical locations that lag behind.