INEQUITIES IN UNDER-FIVE MORTALITY IN ETHIOPIA: EXAMINING THE EFFECTS OF NON-MONETARY WEALTH AND PARENTAL EDUCATION

Nigatu Regassa Geda [1, 2]

[1] *Addis Ababa University, College of Development Studies, Addis Ababa, Ethiopia*
[2] *University of Saskatchewan, College of Pharmacy and Nutrition, Saskatoon, SK, Canada*

Abstract

Background: Despite significant reduction in Ethiopian under five mortalities over the last few decades, the prevalence remains alarmingly high. This study was conducted to examine the differential effect of non-monetary wealth and parental education on U5M in Ethiopia.

Methods: Data from three separate cycles of the Ethiopian Demographic and Health Surveys (EDHS 2005, 2011 and 2016) were used. Descriptive statistics, bivariate analysis, and regression-based measures (the slope index of inequality and relative index of inequality) were used.

Results: The findings portrayed a modest decline in U5M between the year 2005 and 2016. However, inequalities between population groups persist, favoring the higher socio-economic groups. Specifically, inequities in non-monetary wealth and parent's education, especially that of mothers, showed observable impacts on the prevalence of U5M ($p < 0.05$).

Conclusion: Given that most Ethiopian women are living in rural areas, have no education, and the majority are deprived of economic advantages, this study recommends aggressive intervention in promoting women's status at the grassroots level through community education and behavioral communication strategies that will eventually help to significantly reduce the huge disparity in early mortality in the population.

Keywords: *Ethiopia; Inequality; Non-monetary wealth; Parental education; Under five mortality*

INTRODUCTION

Both the Millennium Development Goals (MDGs) (The Millennium Development Goals Report, 2015), and Sustainable Development Goals (SDGs) (Levels and Trends in Child Mortality, 2013) have set clear targets for creating healthy lives and to promote well-being for all, including children. The SDGs outlined clear targets related to reproductive and child health (Rodin and de Ferranti, 2012; The Sustainable Development Goals Report, 2017). Despite significant reduction in the overall prevalence of under-five mortality around the world, U5M is still unacceptably high in some regions of the world (Levels and Trends in Child Mortality, 2013). Most notably, sub-Saharan Africa reports that one-in-nine children die before their fifth birthday in the region (The Sustainable Development Goals Report, 2017). Thus, for an increasing number of sub-Saharan African countries, including Ethiopia, addressing the issue of high U5M and its concomitant health inequalities has become an important priority and a major objective for their national development plans (Bryce and Harris, 2009; Padilha, 2011).

ORIGINAL ARTICLE

Studies indicate that some population groups (such as those with little education) experience relatively higher health inequalities and bear a disproportionately higher prevalence of disease and/or death (The Millennium Development Goals Report, 2011; Zere et al., 2007). In particular, income and education disparities are important drivers in causing inequalities in health and increasing child and maternal morbidity and mortality (Cutler et al., 2011; Goldman, 2001). The health demand theory posits that inequalities in health mainly stem from inequalities in income that lead to reduced healthcare utilization (Wagstaff, 2002). In fact, inequalities in the distribution of income in developing countries such as Ethiopia are strongly related to poor access to health services and a low level of health outcomes, with the lower socio-economic segments of the population experiencing significantly higher morbidity and mortality (Wirth et al., 2006).

However, in many developing countries income data are difficult to generate as a substantial portion of the population reside in rural areas and engage in informal activities with no formal and measurable income sources. This has led to the recent interest in the study of health inequalities based on the effects of non-monetary wealth as proxy measures of household income (Rutstein and Johnson, 2004). The non-monetary wealth status is commonly measured based on ownership of selected assets and housing characteristics such as roofing and flooring materials, presence or absence of windows, access to clean water, indoor plumbing, and adequate sanitation facilities (Dekker, 2006; Rutstein and Johnson, 2004).

A large epidemiological study used non-monetary wealth quantiles to analyze U5M trends in 18 LMIC countries and concluded that on average, a child born in households of the poorest quantile had a three times higher probability of death than a child living in the richest household (Minujin and Delamonica, 2004). A recent comparative study on early mortality in 53 LMICs reported significant social inequalities in infant mortality across the study countries (Hajizadeh et al., 2014). Another African based study (Cameroon, Nigeria, Malawi, Mozambique, and Uganda) reported significant differences in mortality rates between the poorest and richest households (McKinnon et al., 2014).

Parent's education is another major source of health inequalities for countries with relatively high child mortality rates. Caldwell (1989) reports a significant relationship between maternal education and child survival across countries/regions.

Previous studies in sub-Saharan Africa reported a strong association between parental education (especially maternal education) and survival outcomes (Målqvist et al., 2012). Studies also documented other indirect public health impacts of parental education: acquisition of capacities such as accurate knowledge about health and health behaviors such as nutrition, knowledge of hygiene and sanitation, and an understanding of contaminants as causes of diseases (Frost et al., 2005).

According to previous national surveys, U5M substantially declined between 1990 (216 deaths/1,000 live births) and 2016 (67 deaths per 1,000 live births) (CSA and ICF, 2016). Despite significant changes in the prevalence of U5M, unacceptably large inequalities in early mortality are observed among the different socio-economic subgroups (*i.e.*, poorest vs. richest, rural vs urban, and no education vs. higher education). Studies conducted on this topic are limited in scope (Health Equity and Financial Protection Datasheet – Ethiopia, 2013; Onarheim et al., 2012) and/or focused on a specific locality within Ethiopia (Ambel et al., 2015; Yesuf and Calderon-Margalit, 2013). Also, no studies in Ethiopia have addressed the differential impacts of paternal education on under five mortalities. Therefore, it is important to examine the national-level inequality dimensions of U5M in Ethiopia, so as to recommend the use of the scantly available resources in a manner that is most efficient and cost-effective. The purpose of this study was to examine the effect of non-monetary wealth and parental education on U5M in the country.

MATERIALS AND METHODS

The study context
With a total population of about 120 million, Ethiopia ranks second in population size among the African countries. Administrative-

ly, Ethiopia has a federal form of governance with 12 Regional States. The regions are further divided into zones, and then districts (*weredas*). The smallest administrative entity is *kebele* (Fig. 1). The country is one of the poorest in the world and heavily relies on an agrarian economy, where agriculture accounts for more than 60% of its GDP and employs nearly 85% of its population (FDRE, 2013). Nearly a third of its population still lives below the poverty line and two-thirds have no education and limited access to healthcare services (Ambel et al., 2015; FDRE, 2013). The country is experiencing one of the highest level of inequalities in child health services and outcomes.
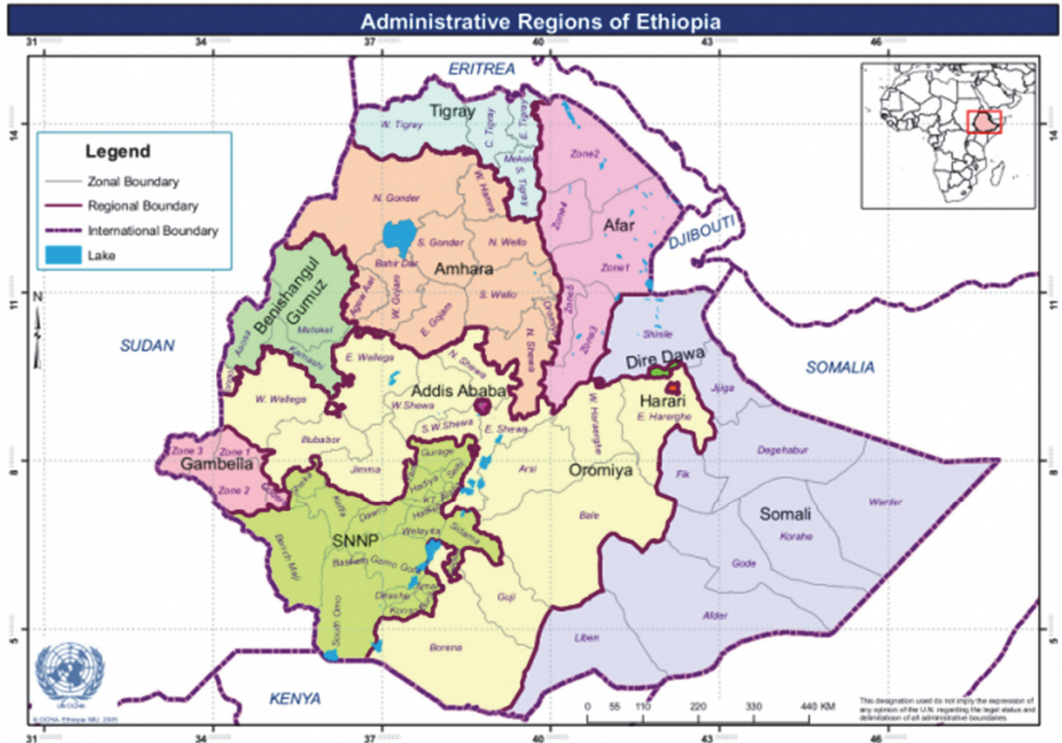

Fig. 1 – Regional administrative map of Ethiopia

Data sources
Ethiopia has conducted a series of Demographic and Health Survey (DHS) since the year 2000. The surveys are nationally representative. The present study used three consecutive cycles conducted in 2005, 2011, and 2016 with sample respondents of 11,163, 11,874, and 11,023 women, respectively. The analysis used the KIDS file (KR) which included a range of variables. The samples represented 6.9%, 6.9%, and 6.4% of the population aged 15–49 for the three surveys, respectively. The sampling also considered the proportion of the population aged 15–49 in each of regions. Nearly all the variables had complete data (with less than 5% missing values for each survey). The Central Statistics Authority (CSA) of Ethiopia imputed the data, and thus missing values were not a concern in the analysis. Due to unavailability of nationally representative data after 2016, the analysis of the present study is limited to data generated until 2016.

Variables and measures
In this study, socio-demographics, child and women health, and birth histories were considered. Our outcome variable was U5M and included all children who died in their first five years of life. Therefore, only women re-

spondents, who reported to have given birth at least once during the three years prior to the survey period, were considered. Mothers of dead children were asked to report the age at death in days and months, and then the U5M was calculated using the standard methodology recommended by DHS (Rutstein and Johnson, 2004). The outcome variable is binary coded as "1" if the index child had died, and recoded "0" if the child was alive on the interview date.

Household wealth (non-monetary) and parental education were used as key inequality indicator variables. While socioeconomic factors encompass a wide range of variables (such as family wealth, education, employment, degree of autonomy, employment, residence, gender), we only considered the wealth and education variables as these are the most important attributes of health behavior (Zere et al., 2007) with several pathways to affect health outcomes (Levels and Trends in Child Mortality, 2013). Preliminary analysis of the data also showed that the two variables have greater variability within the population. Household wealth was measured by the survey using ownership of assets forming an index variable, which was subsequently categorized into five quantiles: Q1 = the poorest 20% of households to Q5 = the richest 20% of households (Rutstein and Johnson, 2004). Parental education was measured as: no education, primary, secondary, and post-secondary education.

Statistical analysis

Data were analyzed using SPSS, version 26. The inequalities in U5M were estimated using the Slope Index of Inequality (SII) and the Relative Index of Inequality (RII). These inequality measures employ regression-based approaches to determine the beta coefficients. While the SII measures absolute inequalities, the RII is a relative measure of socioeconomic inequalities. Both measures have inherent advantages as they consider the size and diversity of the entire population (Wagstaff et al., 1991). Finally, inequalities were graphically represented using the Health Disparity Calculator (HD*CAL version 1.2.4, Information Management Inc., Calverton, USA).

In the present study, inequalities in non-monetary wealth and parental education were assessed by classifying each participat-

ing household into different economic and educational subgroups (on the basis of relevant information provided in the DHS data). The entire sample was ranked, followed by computing the U5M for each socio-economic subgroup within the population. The SII were computed via linear regression analysis, taking into account the relative rank in the cumulative distribution of the non-monetary wealth and parental education. Weighted analysis was conducted based on the DHS guideline (Rutstein and Johnson, 2004).

Ethical considerations

The EDHS survey followed approved standard protocols for data collection tools and procedures (Rutstein and Johnson, 2004). Ethics approval was done prior to data collection.

RESULTS

Table 1 depicts the distribution of study participants by selected characteristics. About two-thirds of the mothers were in the 20–34 age group. The majority of the parents had no formal education. There was evidence to suggest that mothers made greater strides in reducing their levels of illiteracy from 79.2% in 2005 to 66.1% in 2016. Most respondents were from rural areas and living in medium size households (4–7 members). The distribution of respondents by asset-based wealth index indicates that patterns of distribution have remained relatively consistent within each of the five quantiles from 2005 to 2016.

The results in Table 2 display the socio-economic characteristics and chi-square analysis for U5M in Ethiopia. Significantly higher U5M were observed among mothers and fathers comprising the poorest households and those who had no formal education. A significant amount of difference in U5M was also observed among participants of medium-sized households (4–7 members), who lived in rural areas and were in a monogamous relationship.

As Table 3 demonstrates, the absolute (SII) and relative (RII) measures of inequality for asset-based household wealth and parental education on U5M proved to be significant ($p < 0.05$). The inequality measures (both SII and RII) indicate a significant decline in U5M

Table 1 – Distribution of respondents by selected background variables

Characteristics	2005	2011	2016
	n (%)	*n* (%)	*n* (%)
Mothers' age			
15–24 years old	1370 (12.3)	492 (14.4)	2446 (22.2)
25–34 years old	6921 (62.0)	8502 (71.7)	5843 (53.0)
34+ years old	2872 (25.7)	2879 (23.9)	2734 (24.8)
Mothers' education			
No education	8838 (79.2)	8227 (69.3)	7284 (66.1)
Primary level	1855 (16.6)	3211 (27.0)	2951 (26.8)
Secondary and above	470 (4.2)	434 (3.7)	788 (7.1)
Fathers' education			
No education	6621 (59.3)	6046 (50.9)	5637 (51.1)
Primary level	3350 (30.0)	4867 (41.0)	4116 (37.3)
Secondary and above	1192 (10.7)	960 (8.1)	1270 (11.6)
Place of residence			
Urban	815 (7.3)	1528 (12.9)	1216 (11.0)
Rural	10348 (92.7)	10344 (87.1)	9807 (89.0)
Household size			
1–3 members	1069 (9.6)	1228 (10.3)	1156 (10.5)
4–7 members	5657 (50.7)	7807 (65.8)	5593 (50.7)
7+ members	4437 (39.7)	2837 (23.9)	4274 (38.8)
Wealth index			
Q1 = Poorest	2440 (21.9)	2710 (22.8)	2636 (23.9)
Q2 = Poorer	2356 (21.1)	2658 (22.4)	2520 (22.9)
Q3 = Middle	2486 (22.3)	2437 (20.5)	2280 (20.7)
Q4 = Richer	2222 (19.9)	2272 (19.1)	1999 (18.1)
Q5 = Richest	1660 (14.9)	1795 (15.1)	1588 (14.4)
Family structure			
Monogamous	9957 (89.2)	1248 (89.7)	9803 (89.9)
Polygamous	1206 (10.8)	10624 (10.3)	1219 (11.1)

as we move from the lowest to the highest non-monetary wealth and education groups. Specifically, the absolute effect of non-monetary wealth on U5M significantly decreased by 13% (in 2005), 23% (in 2011), and 19% (in 2016), as we move from poorest to richest quantiles ($p < 0.05$). The relative effect also decreased by 63%, 100%, and 67% for the 2005, 2011, and 2016 surveys, respectively.

The absolute effects of education of the mother on U5M were found to be significant ($p < 0.01$). The U5M decreased by 143% (in 2005), 112% (in 2011), and 107% (in 2016) as one goes from mothers with poor education to those with better education. The relative effect also decreased by 202%, 187%, and 190% for the 2005, 2011, and 2016 surveys, respectively (Fig. 3). The effect of paternal education on U5M was also significant ($p < 0.05$). The U5M declined by 96% (in 2005), 77% (in 2011), and 69% (in 2016), as one shifts from fathers with no education to those with higher education. In terms of relative effect, there was a drop of 185%, 175%, and 170% in 2016 for the 2005, 2011, and 2016 surveys, respectively (Table 3).

In Charts 1–3, the inequality in U5M was further depicted using Lorenz curve. If everyone has exactly the same value for the outcome variable, the Lorenz curve will take the shape of a 45-degree diagonal line (*i.e.*, line of equality). When under-five mortality is higher values among lower socioeconomic group, the curve would lie above the line of equality. Thus, the further away the curve is from the line of equality, the greater the inequality. There will not be any inequality when the Lorenz curve coincides with the line of equality. As can be observed from the figures, the curves are above the diagonal lines, indicating a higher prevalence of under-five mortality among the lower status groups. In fact, maternal education-based inequality is much greater than that of paternal education.

Table 2 – Key sociodemographic characteristics with chi-square analysis for under-five mortality in Ethiopia

Characteristics	2005			2011			2016		
	Total N (%)	Deaths N (%)	X^2	Total N (%)	Deaths N (%)	X^2	Total N (%)	Deaths N (%)	X^2
Mothers' education			23.8***			15.8**			5.6*
No education	8838 (79.2)	887 (84.2)		8228 (69.3)	617 (74.3)		7284 (66.21)	426 (70.4)	
Primary education	1855 (16.6)	146 (13.9)		3211 (27.0)	199 (24.0)		2951 (26.8)	144 (23.8)	
Secondary and above	470 (4.2)	20 (1.9)		434 (3.7)	14 (1.7)		788 (7.1)	44 (6.9)	
Fathers' education			33.2***			21.9***			4.0*
No education	6621 (59.3)	702 (66.7)		6046 (50.9)	483 (58.1)		5637 (51.1)	311 (51.4)	
Primary education	3350 (38.0)	282 (26.8)		4867 (41.0)	304 (36.6)		4115 (37.3)	239 (39.5)	
Secondary	1192 (10.7)	69 (6.6)		961 (8.1)	44 (5.3)		1270 (11.5)	55 (9.1)	
Place of residence			3.0*			2.5*			3.4*
Urban	815 (7.3)	63 (6.0)		1528 (12.9)	92 (11.1)		1216 (11.0)	53 (8.7)	
Rural	10348 (92.7)	991 (94.0)		10344 (87.1)	738 (88.9)		9807 (89.0)	553 (91.3)	
Household size			205.5***			133.5***			79.9**
1–3 members	1069 (9.6)	224 (21.3)		1228 (10.3)	180 (21.7)		1155 (10.5)	126 (20.8)	
4–7 members	5657 (50.7)	534 (50.7)		7807 (65.8)	513 (61.8)		5593 (50.7)	301 (49.8)	
7+ members	4437 (39.7)	296 (28.1)		2837 (23.9)	137 (16.5)		4274 (38.8)	178 (29.4)	
Wealth index			20.8***			32.3***			10.7**
Q1 = Poorest	2440 (21.9)	222 (21.1)		2709 (22.8)	233 (28.1)		2637 (23.9)	138 (22.8)	
Q2 = Poorer	2356 (21.1)	234 (22.2)		2658 (22.4)	214 (25.8)		2519 (22.9)	133 (21.9)	
Q3 = Middle	2486 (22.3)	276 (26.2)		2437 (20.5)	160 (19.3)		2280 (20.7)	121 (20.0)	
Q4 = Richer	2221 (19.9)	206 (19.5)		2272 (19.1)	114 (13.8)		1999 (18.1)	139(22.9)	
Q5 = Richest	1660 (14.9)	116 (11.0)		1795 (15.1)	108 (13.0)		1588 (14.4)	75 (12.4)	
Family structure			1.9*			9.85**			3.0*
Monogamous	9957 (89.2)	927 (88.0)		10624 (89.7)	716 (86.3)		9243 (89.9)	489 (85.9)	
Polygamous	1206 (10.8)	127 (12.0)		1248 (10.3)	114 (13.7)		1220 (11.1)	80 (14.1)	

Note: * Sig. at 0.05, ** Sig. at 0.01, *** Sig. at 0.001.

Table 3 – Measures of inequity for under-five mortality in Ethiopia

Variable	Absolute effects			Relative effects		
	SII	CI		RII	CI	
		Lower	Upper		Lower	Upper
2005						
Non-monetary wealth*	−13.194	−25.143	−1.244	−0.628	−1.197	−0.059
Maternal education**	−143.529	−163.270	−123.788	−2.022	−2.299	−1.743
Paternal education**	−96.421	−106.766	−86.076	−1.854	−2.053	−1.655
2011						
Non-monetary wealth*	−22.895	−52.286	−6.497	−0.995	−2.273	−0.283
Maternal education**	−112.418	−133.905	−90.932	−1.874	−2.232	−1.516
Paternal education*	−77.309	−129.836	−24.781	−1.757	−2.951	−0.563
2016						
Non-monetary wealth*	−18.776	−104.639	−67.087	−0.671	−3.737	−2.396
Maternal education***	−106.853	−113.714	−99.993)	−1.908	−2.031	−1.786
Paternal education*	−69.850	−101.139	−38.561	−1.704	−2.467	−0.941

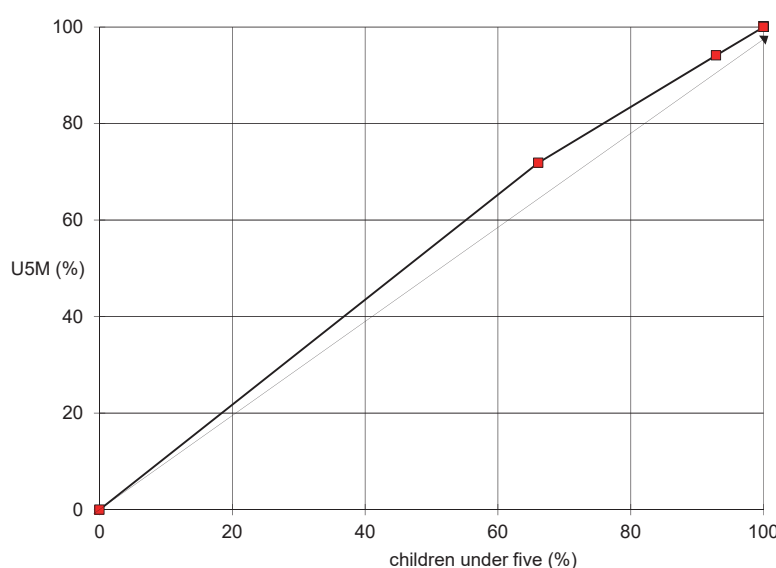*Note:* * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Chart 1 – Lorenz curve for inequality in U5M based on non-monetary wealth, Ethiopia, 2016

Table 4 presents the absolute (SII) and relative (RII) measures of inequality for wealth and parental education, based on the pooled samples (*i.e.*, the combined surveys). The absolute and relative effects of asset-based wealth on U5M significantly declined by 39% and 162%, respectively as we move from poorest to richest groups ($p < 0.01$). The preva-lence of U5M was down by 119% as one moves from mothers with no education to those with higher education. In terms of relative effect, there was a drop by 192%. Similarly, the prevalence of U5M dropped by 82% when moving from fathers with no education to those with higher education (Table 4).
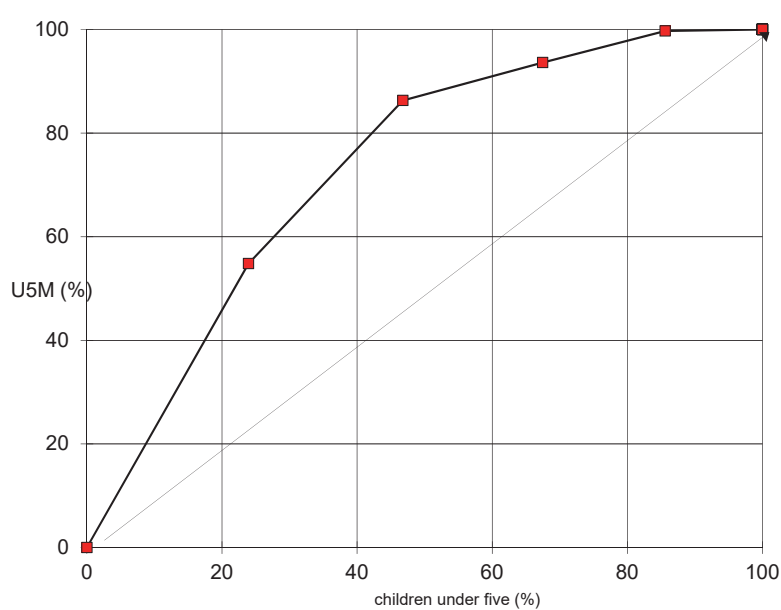
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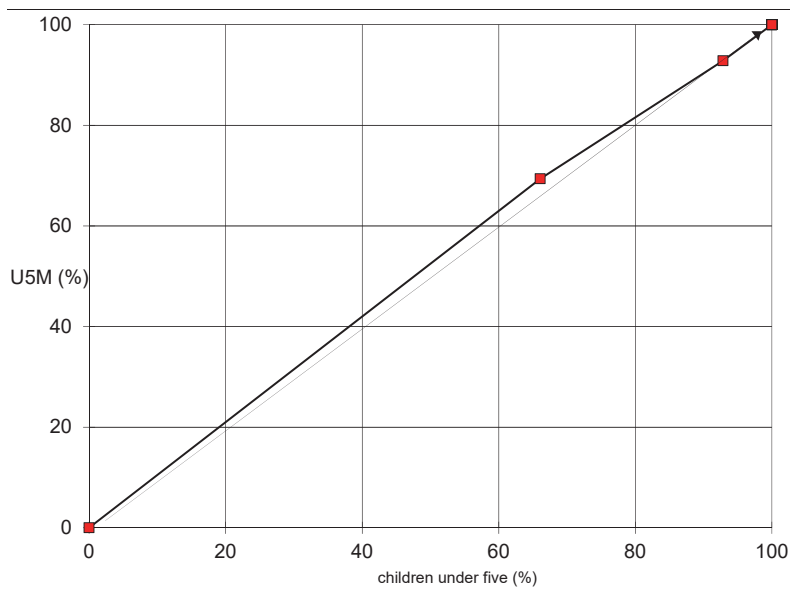**Chart 2 – Lorenz curve for inequality in U5M, based on mothers' education, Ethiopia, 2016**

Chart 3 – Lorenz curve inequality in U5M based on paternal education, Ethiopia, 2016

Table 4 – Measures of inequity for under-five mortality in Ethiopia for the pooled sample (2005–2016)

Variable	Absolute effects			Relative effects		
	SII	CI		RII	CI	
		Lower	Upper		Lower	Upper
Non-monetary wealth**	−38.829	−54.825	−22.834	−1.618	−2.284	−0.951
Maternal education***	−118.914	−120.845	−116.982	−1.918	−1.949	−1.887
Paternal education**	−81.933	−106.090	−57.776	−1.781	−2.306	−1.256

Note: ** $p < 0.01$; *** $p < 0.001$.

DISCUSSION

This study adds valuable insight and provides the most recent information on the trends, determinants, and levels of disparity impacting U5M in Ethiopia. There are several noteworthy findings.

The study found a modest decline in the trend of U5M inequalities (non-monetary wealth and parents' education) in Ethiopia from 2005 to 2016. The analysis based on the pooled sample has further witnessed statistically significant wealth based inequality in the prevalence of U5M. In the literature, studies examining this topic within the context of low-income countries are rare and their findings have been inconsistent (Baird et al., 2011; McKinnon et al., 2014; Minujin and Delamonica, 2004; Zere et al., 2012). A study of 24 LMIC countries concluded that wealth and education-based inequalities in U5M have been decreasing (McKinnon et al., 2014). However, another study using population-based survey data indicated that pro-wealth and education inequalities are common and have increased among 35 low- and middle-income countries (Victora et al., 2012). In this study, the improved trends in U5M in Ethiopia can be explained in part by the significant drop in the national poverty levels from 55% in 2000 to 28% in 2016 (Ambel et al., 2017; Khan et al., 2017; Skaftun et al., 2014). The Ethiopian government has launched the Health Sector Development Program (HSDP) to significantly increase access to maternal and child health services (Ambel et al., 2017; Ethiopia Poverty Assessment 2014 (2015)). It uses more than 38,000 Health Extension Workers who are primarily mandated to avail health information and services at grassroot level (Ambel et al., 2017; Wang et al., 2016).

Non-monetary wealth (both absolute and relative measures) was a significant determinant leading to inequalities in U5M. Previous national level studies in Ethiopia understated the impact of non-monetary wealth on U5M and mainly attributed improvements to increased access to healthcare services and health promotion interventions targeting the poor (Ambel et al., 2017; Skaftun et al., 2014). These studies found a weak association between household wealth and early mortality, leading to a small but noteworthy pro-rich bias (Ambel et al., 2017; Skaftun et al., 2014). Our study contradicts these findings and reports persistent non-monetary wealth disparities that seriously impact U5M, disadvantage the poor, and require systemic solutions. Despite the overall decline in U5M among all non-monetary wealth subgroups, the poor vs. rich gap has widened from 2005 to 2016. Therefore, a challenging task lies ahead for Ethiopia to improve the living conditions of the most vulnerable section of its population (women and children) and achieve equity.

Our finding on the effects of paternal education on the inequalities in U5M differs from previous studies (Caldwell, 1979; Minujin and Delamonica, 2004), most of which reported the effects of maternal education only. Our analysis concluded that while maternal education appears to exert the strongest effect on U5M, paternal education also had a significant role in leading to inequalities in U5M in Ethiopia during the study period. This can be explained by the fact that educated fathers have the chance to involve themselves in issues of diet/ nutrition, exercise, play, and parenting, which collectively contribute to the overall health and well-being of their young children (Garfield and Isacco, 2012; Vollmer et al., 2017). Additionally, educated fathers

may have a better household income, grant more freedom and support to their wives, and create conducing opportunities for their families (wives and children) to access healthcare services (Abate and Belachew, 2017; Allen and Daly, 2007). An interesting study conducted based on the national data from Indonesia (Breierova and Duflo, 2004) reported that both maternal and paternal education has an important role in child health.

The overall findings of our study strongly suggest that future reductions in U5M inequities would largely depend on our ability to decrease the proportion of non-educated parents (especially mothers) through the use of initiatives that emphasize community literacy programs and formal education. In Ethiopia, serious efforts are needed to help reduce the unacceptably high proportion of mothers (71%) with no education. First, opportunities to receive a basic education empower mothers to better access healthcare services and become informed decision-makers in matters related to their own and their children's health (Caldwell, 1994). Second, better educated mothers are known to have a preference for lower family sizes, which permits them to make more efficient use of their time and resources (Meara, 2001). Third, educated mothers are likely to marry later in life and experience longer birth intervals, which in turn may help reduce infant mortality risk (Bicego and Boerma, 1993; Verguet et al., 2017). Finally, our study revealed that the father's education also plays a critical role in influencing their children's U5M, and therefore, more research in this area is warranted.

Strengths and limitations
The strengths of the study are the use of the SII and RII, which permit us to sensitively measure the experience of the entire population across socio-economic groups, rather than only the differences between its two extreme groups (Q1 and Q5). Since the current study analyzed data from three successive and large surveys, it provides insight into the trends of U5M inequities in Ethiopia; a country perennially suffering from high child mortality ra-

tes. The findings could be useful in planning, targeting, and assessing the progress of the interventions in reducing U5M.

This study also has some methodological limitations. First, the DHS survey employed a cross- sectional design, which permits us to report on associations between the exposures and outcome of interest but cannot infer causality. Second, the absolute and relative measures used can only be used to measure variables that are ordered. Third, considering the sensitive nature of some of its questions and the self-report structure of the survey, there may be instances of recall bias and inaccurate reporting by mothers (many of whom are illiterate) on important information (age of death, age of birth, and other sociodemographic variables) leading to measurement errors and under- or over-reporting of child deaths.

CONCLUSION

Our study found an overall declining trend in U5M between 2005 and 2016. However, non-monetary wealth (modest) and parents' education (strong) continue to exert an effect on U5M outcomes. Given that most Ethiopian women are living in rural areas, have no education, and the majority are deprived of economic advantages, this study recommends aggressive intervention in promoting women's status at the grassroots level through community education and behavioral communication strategies that will eventually help to significantly reduce the huge disparity in early mortality in the population.

Ethical aspects and conflict of interests
The author has no conflict of interests to declare.

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⊟ **Contact:**

Nigatu Regassa Geda, Addis Ababa University, College of Development Studies,
Addis Ababa, Ethiopia
Email: negyon@yahoo.com