

Under five mortality and its predictors in Gilgel Gibe Health and Demographic Surveillance System site

Fasil Tessema, Assoc. Prof.

Gilgel Gibe Health and Demographic Surveillance System site

Jimma University, Ethiopia

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Introduction (1)

- MDG-4 commits the international community to reducing mortality in children aged younger than 5 years by two-thirds between 1990 and 2015 (Ahmad, 2000).
- Neonatal deaths accounted for 40% of all deaths among children under five worldwide, where the vast majority of infant deaths take place in developing countries (World health report, 2005, Lawn, 2005).
- In Ethiopia between 2000 and 2011, infant mortality declined by 39 percent from 97 to 59 deaths per 1,000 live births. Under-five mortality has also declined by 47 percent from 166 to 88 deaths per 1,000 live births (EDHS, 2011)

Introduction (2)

- Studies in Sudan and Nepal showed that lower maternal education and lowest family wealth levels associated with higher risk of under five mortality (Huda, 2007, Sreeramareddy, 2013).
- Another cross national analysis of developing countries showed that economic growth is associated with widening poor–rich disparities in under-5 mortality (Tanja, 2005).
- An analysis of the DHS data in Bangladesh identified place of residence and mother’s age significantly influence under-five mortality but not mother’s education, socio-economic status of families, source of drinking water and toilet facility (Abdul Hamid,2013).

Introduction (3)

- There was no detailed analysis done for the different event indicators including mortality. This lack of more in-depth analysis leads to the major aims of this study.
- The main objective of this analysis is to determine mortality rates during the first five years of life and identify potential predictors of under-five mortality

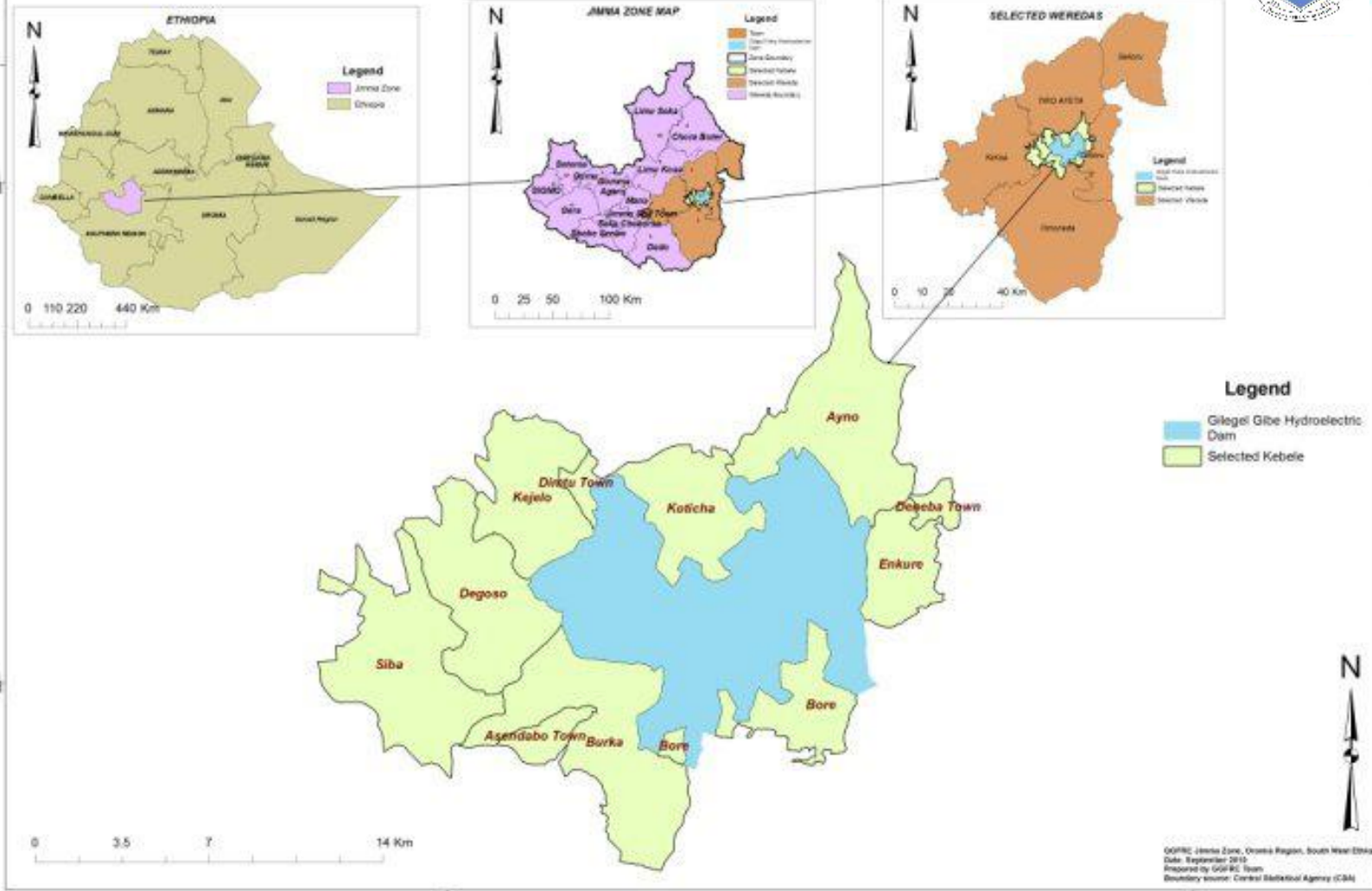
Methods (1)

The GGFRC HDSS is established in September 2005

Comprised of 11 (3 small towns and 8 rural) kebeles, surrounding the Gilgel Gibe I Hydroelectric dam, located within four neighboring districts in Jimma Zone, Oromia Regional State, Southwest Ethiopia.

The surveillance population was about 60,000 (70% rural) and characterized by high fertility, mortality and migration rates. Birth, death, in and out-migration rates were 37.4, 8.4, 20.3 and 23.4 per 1000 person years respectively

Gilgel Gibe Field Research Center (GGFRC)



Methods (2)

- Data for this analysis is extracted from the Gilgel Gibe Health and Demographic Surveillance System that employed an open-cohort design with biannual population update through the registration of birth, death and migration.
- In addition, household characteristics including household assets, monthly income, water, latrine and others were collected during the baseline and re-census times as well as in add on surveys.

Methods (3)

- All live births registered from 2006 to 2008 were recruited and followed for up to five years, or early death or moved out from the surveillance area with the last observation date being the end of 2013.
- Survival time from birth to death, or lost for follow-up, or 1824 days for survivors with death of a child before celebrating the fifth year birth day used as event of interest

Methods (4)

■ Factors considered:

- ❑ Residence, household socio-economic status based on reported monthly income,
- ❑ Literacy status and age at delivery of the mother and number of children ever born,
- ❑ number of birth for the index child (single or multiple),
- ❑ source of drinking water and presence of latrine facility
- ❑ presence of soap in the house at the time of the interview
- ❑ Sex of the child

Methods (5)

Data description and analysis

- Mortality rates were summarized by individual, household and community level factors.
- The Kaplan and Meier method was used to determine cumulative survival probabilities
- Cox proportional hazards model was used to identify potential determinants of under-five mortality using STATA 13 with step-by-step variable inclusion.

Results (1)

- 5,446 live births were registered and followed for 5 years, early death or lost for follow up, resulting in 554 (10.2%) deaths and 178 (3.3%) moved out (LFF)
- 16.8% of the births were from urban residents and
- mothers age < 20 were 12.9% and 11.3% were 35 and above
- 81.5% of the mother had no formal education.
- 2.0% of the births were from multiple birth and
- 13.9% of the mothers had only one and 38.6% had 5 or more live births

Results (2)

- Water and sanitation,
 - 77.5% of the households used drinking water from unprotected water source,
 - 33.5% had no any latrine facility and
 - 45.8% had no soap in the house at the time of the interview
- Mortality rates per 1000 person years
 - Early neonatal - 36.2 (95% CI: 31.5-41.5)
 - Neonatal - 44.8 (95% CI: 39.6-50.7)
 - infant - 75.6 (95% CI: 68.8-82.9) and
 - under-five - 104.2 (95% CI: 96.2-112.7)

Results (3)

- There was significant difference in neonatal, infant and under five mortality rates between
 - urban and rural residents,
 - multiple and single births and
 - children born from multiparous mothers versus those with 2-4 births.

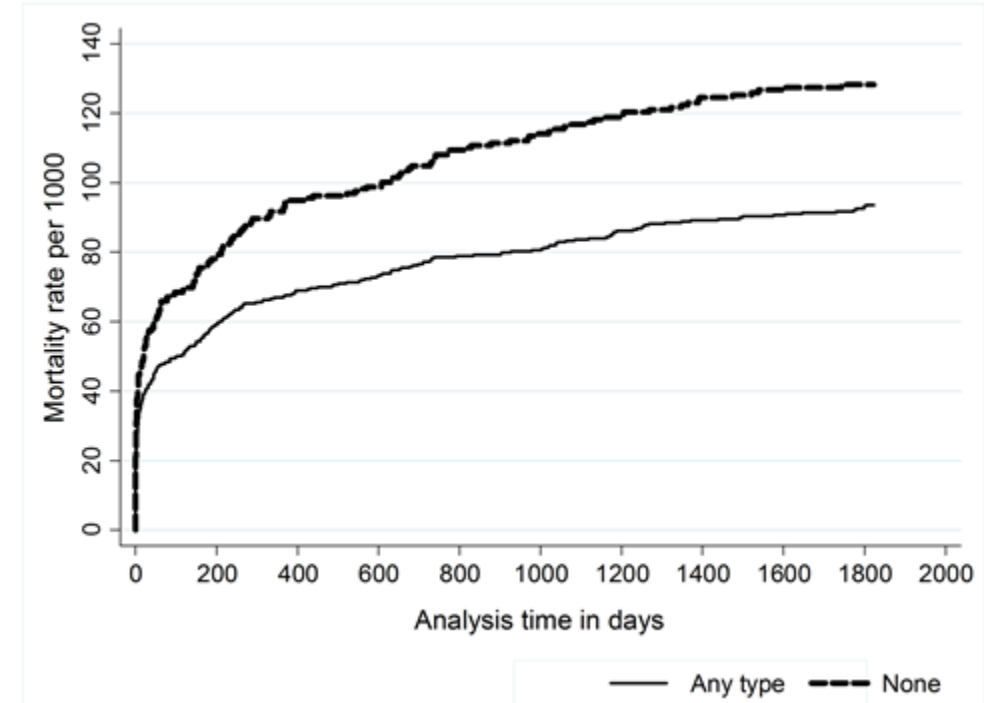
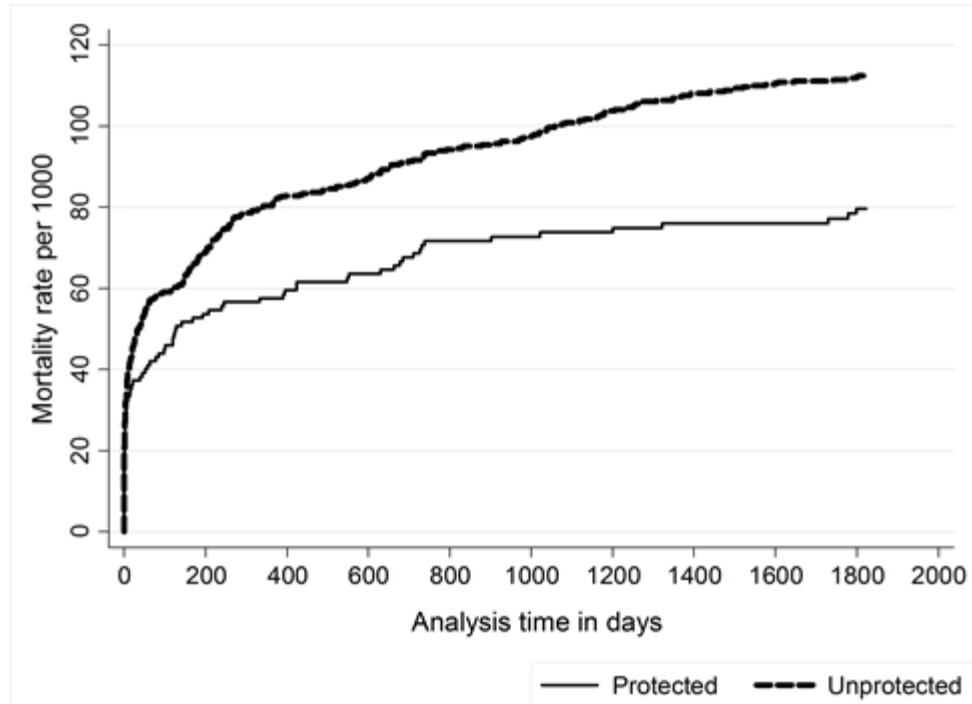
Results (4)

- On the other hand, infant and under-five mortality rates were significantly higher among
 - boys and
 - births to 35+ mothers compared to 25-29 year olds
 - significantly higher among those mothers who had no formal education compared to those who had at least one year of schooling and those with 30-34 year old compared to birth to 25-29 year olds

Results (5)

- In terms of water and sanitation,
 - under five mortality rate was significantly lower among households
 - who use protected water source,
 - have any form of latrine facility and
 - having soap in the house at the time of the interview

Mortality rates by household water source and latrine facility



Under five mortality factor models

Factors associated with under 5 Mortality.docx



Discussion and conclusion (1)

- The infant and under five mortality rates were 75.6 and 104.2 per 1000 person years which is relatively higher than low-income countries report.
- The effect of maternal education on under five mortality was not similar between studies
- Studies done in Sudan and Nepal showed low maternal education was significantly associated with high under-five mortality
- Whereas analysis of data from the DHS in Bangladesh didn't find effect of maternal education on under five mortality
- In our analysis also mother's education didn't maintain its significance when controlled for other factors

Discussion and conclusion (2)

- Studies showed family wealth levels and economic growth were significantly associated with under five mortality but in our study family socio-economic status indicator didn't show any significant effect on under-five mortality that is similar to the Bangladesh analysis
- Place of residence and mother's age significantly influenced under-five mortality in this study and that of Bangladesh

Discussion and conclusion (3)

- Source of drinking water and toilet facility didn't show significant effect on under-five mortality in Bangladesh but not having any toilet facility significantly increase under five mortality in our study
- The effect of not having soap in the house increased the risk of under-five mortality in our study.
- Larine facility and availability of soap in the house are both related to sanitation and personal hygiene which has a direct effect like diarrheal disease

Discussion and conclusion (3)

- Mortality rates in the first five years of life remained high in the surveillance community compared to the national report.
- Factors associated to under five mortality include:
 - being from rural area,
 - household with no latrine facility and no soap in the house,
 - age of mother at delivery being 30 or above years,
 - being multiple births and a boy

Limitations

- Some important variables like health service utilization in general and place of delivery and ANC in particular are not included in the analysis which could affect its completeness.

Recommendations

- Intervention programs targeted to reduce under-five mortality should prioritize rural families and children
- The other relatively simpler intervention is access to toilet facility to families including children together with soap as a detergent for person hygiene that could reduce the burden of communicable diseases including diarrhea, one of the most common causes of under-five deaths in poor societies.



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