

Introduction

The Federal Government of Ethiopia in 1998 established the Health Sector Development Programme (HSDP), which works towards the decentralization of health services; the development of preventive health care; capacity building within the health service system; equitable access to health services; self-reliance; promotion of inter-sectoral activities and participation of the private sector including non-governmental organizations (NGOs); cooperation and collaboration with all countries in general and neighboring countries in particular as well as between regional and international organizations. One of the main implementation modalities of the HSDP is the Health Extension Programme (HEP).

HEP was launched in 2004 to improve equitable access to preventive essential health services and select curative health interventions through the provision of community-based health services and thus creating the backbone to reach the government of Ethiopia's health related Millennium Development Goals. The aim of HEP is to create healthy environments and promote healthful living by making community based essential health services available at the *kebele* (i.e., community of about 5,000 people) level. HEP thus aims to improve equitable access to basic health services by focusing on sustained preventive health actions and increased health awareness.

In line with its aim, HEP established a health post and deployed two government-salaried female health extension workers (HEWs) in every *kebele* in the country. The HEWs are trained to provide basic and essential health interventions, such as communicable disease prevention and control, family planning, maternal and child health, immunization, nutrition, adolescent reproductive health, first-aid and emergency measures, hygiene and environmental sanitation, as well as health education and communication.

Seventy-five percent of their time, HEWs provide services through household visits and community outreach activities; they train families to adopt the desirable health practices and serve as 'models' in their neighborhood; and they organize community structures (e.g. *Idir*, *Equb*, *Mahber*) to participate in the expansion of HEP services.

HEWs are supported by community health promoters (CHPs); with one CHP assigned for every 25 to 30 households. The CHPs are model family members selected by the community to volunteer and help the HEWs to provide health messages for changing health practices in her neighborhood.

This study assesses the impact of the HEP on maternal, newborn and child health (MNCH) behavior and practices.

Methodology

Study design:

The natural variability in the changes in the scope and intensity of the HEP, between 2008 and 2010, across communities is used to seek dose-response relationship between changes in HEP intensity and changes in MNCH outcomes to measure impact. Areas of higher intensity of HEP are expected to be associated with better MNCH outcomes. The non-random program placement (or intensity) is the major source of bias for the dose-response relationship design when program placement factors are systematically associated with the health outcomes of the community then program effects would be over- or underestimated.

Data:

Community/*kebele* and individual level data from the Last Ten Kilometers Project (L10K) baseline survey (conducted in December 2008) and the midterm/follow-up survey (conducted in December 2010), which represent 115 districts in Amhara, Oromia, Southern Nations, Nationalities and Peoples' (SNNP), and Tigray—the four most populous regions of the country accounting for about 19% of the population in Ethiopia.

Measurements:

HEP exposure indicators (contextual variables)

- Percentage of women in the *kebele* visited by a HEW in the last 6 months.
- Percentage of women in the *kebele* visited by a CHP in the last 6 months.
- Percentage of women in the *kebele* who are from model families.
- Population to HEW ratio in a *kebele*.

Analysis:

Unmeasured program placement factors that are similar over time are removed using community level fixed-effects regression.

Impact is measured by the magnitude of the correlation between changes in exposure to HEP intensity between baseline and follow-up surveys with the changes in MNCH outcomes, netting out the influence of secular trends, age, education, marital status, parity, religion, distance to water source, distance to health facility, radio listenership, wealth quintile, distance to an Emergency Obstetric Care facility from the *kebele*, and time invariant unobserved program placement factors.

Results

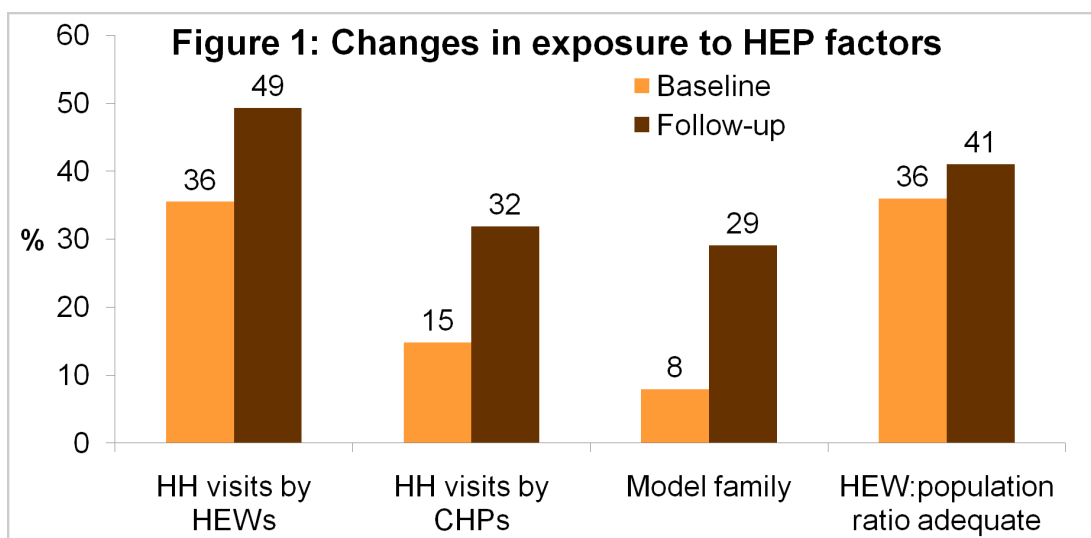
Only statistically significant ($P < 0.05$) results are discussed. Figure 1 shows the increases in the exposure to the HEP in the L10K midterm survey areas. Between December 2008 (baseline) and December 2010 (midterm), the percentage of respondents visited by a HEW in the last 6 months increased from 36% to 49%; the percentage of respondents visited by a CHP in the last 6 months increased from 15% to 32%; the prevalence of model family households increased from 8% to 29%; and the percentage of kebele with adequate HEWs to population density (i.e., at least one HEW for every 2,500 people) increased from 35 percent to 43 percent.

Corresponding to the increases in the exposure to HEP factors, there are increases in MNCH outcomes in the L10K midterm survey areas (Figure 2). Between the two survey periods, the contraceptive prevalence rate increased from 31% to 40%; receiving ANC, receiving two or more tetanus toxoid (TT2+) injections, and receiving PNC during last pregnancy among women with children 0 to 11 months increased respectively from 56% to 68%, from 41% to 45%, and from 7% to 21 percent.

Table 1: Sample sizes according to sampling strata and units

	Baseline	Follow-up
Districts	114	114
Communities/clusters/kebeles	213	339
No. of respondents	6,581	10,230
Women 15-49 yrs	4,260	4,260
Women with children 0-11 months	2,556	4,259
Women with children 12-23 months	2,130	2,248

The last delivery in an institution and the last delivery assisted by a health professional among women with children 0 to 11 months increased respectively from 8% to 11% and from 12% to 16%. The percentage of women with children 0 to 11 months who gave colostrums to their baby, delayed giving the first bath to the baby by more than 6 hours after birth, and exclusively breastfeeding their baby increased from 45% to 53%, from 24% to 41%, respectively; and from 64% to 81%. The percentage of children 12 to 23 months who were fully vaccinated increased from 46% to 53%.



Results Cont.

Next, whether the observed improvements in the MNCH indicators are attributable to the improvements in the exposure to HEP factors are analyzed using multivariate analyses. Improvements in the MNCH outcomes due to improvements in the exposure to HEP factors are given in Table 2. As expected, improvements in HH visits by a hew is associated with 1.2 fold improvements in the likelihood of contraceptive use; about 1.5 fold increases in ANC and TT2+; about 2.5 folds increase in PNC; about 1.1 time increase in colostrums given to baby; and 1.6 time improvements in fully immunized child. Similarly, the improvements in HH visits by CHPs and prevalence of model families in a kebele are associated with increased contraceptive use, ANC, TT2+, deliveries assisted by health professional, PNC, and fully immunized child. In addition the improvement in the prevalence of model family is associated with improvement in giving colostrums to the child. Improvement in the density of HEWs in the population is associated with the improvements in ANC, deliveries assisted by health professionals and PNC. The lack of the association between HEW density and MNCH outcomes is most likely due to the fact that the improvements in the HEW density during the analysis period in the study areas were relatively small (only sixpercentage-points).

Table 2: The impacts of HEP on selected MNCH indicators are presented as increased odds (i.e., odds ratio) due to HEP intensity measures

MNCH Indicator	HEW HH visit	CHP HH visit	Model family	HEW to population ratio
Contraceptive use	1.2	1.2	1.1	
ANC	1.5	1.6	1.4	+
TT2+ Injection during pregnancy	1.5	1.3	1.1	
Deliveries asst. health professional	1	1.2	1.2	+
Institutional deliveries	1	1	1	
PNC	2.5	1.8	1.4	++
Colostrums given to baby	1.1	1	1.2	
Delay bathing newborn	1	1	1	
Exclusive breastfeeding	1	1	1	
Fully immunized child	1.6	1.4	1.1	

Conclusion

The paper shows that, between 2008 and 2010, the HEP significantly contributed towards the observed improvements in MNCH health indicators (in the L10K midterm survey areas). However, influence of HEP factors on institutional deliveries and newborn care behaviors (e.g. delay bathing newborn) is not prominent. Although HEP significantly influences deliveries assisted by health professionals, it is still less than optimum. Interestingly the significant increase in exclusive breastfeeding is not associated with HEP factors.

Recommendations

- Target low performing areas to improve household visits by HEWs and CHPs, and increase the prevalence of model families.
- Newborn healthcare practices should be part of the HEW's refresher training.
- Strategies to improve institutional deliveries and deliveries assisted by health professional should be identified, tested and scaled up.



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