



Measuring the Effectiveness of Large-scale Reproductive, Maternal, Newborn, and Child Health Program

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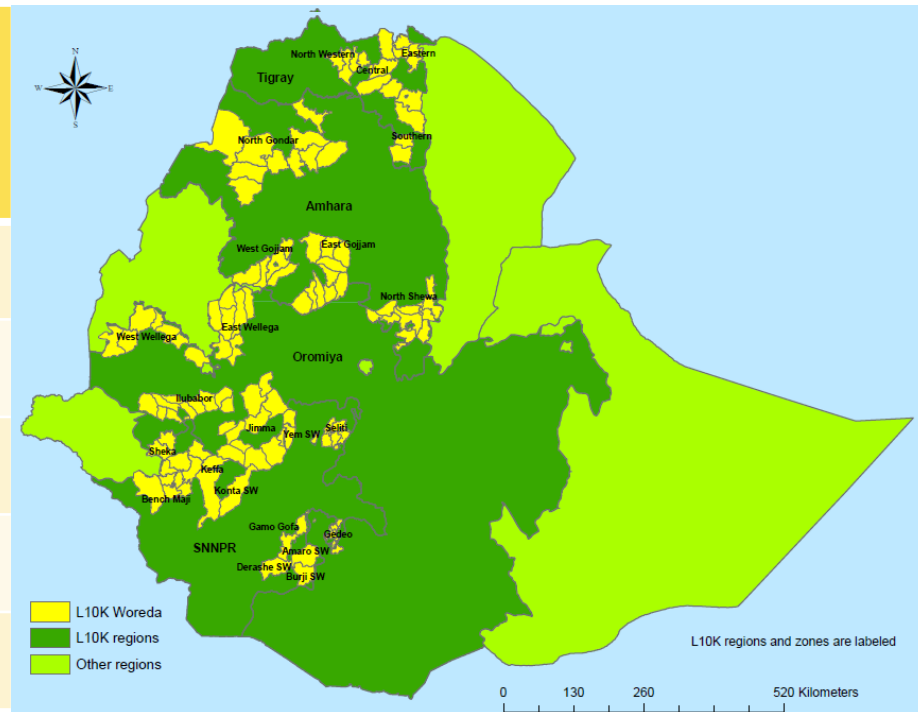
Addis Ababa, Ethiopia

Background

- The Last Ten Kilometers Project (L10K) implements community-based reproductive, maternal, newborn, and child health (RMNCH) strategies at scale, covering 115 rural districts of Ethiopia
- L10K is a Bill & Melinda Gates Foundation funded learning project: required effectiveness evaluation
- Challenges:
 - Interventions areas were not selected randomly
 - Other programs that also influences RMNCH outcomes were present in non-L10K areas

L10K Coverage

Region	Woredas	Pop. (in millions)	% of Total Pop.
Amhara	35	4.7	27
Oromiya	35	3.6	13
SNNP	30	3.0	20
Tigray	15	1.7	40
Total	115	13.0	20



Methods

Study Design

- Internal comparison group design
- Takes advantage of the variability in the intensity of program implementation across administrative areas and compares program outcomes in low program intensity areas with those in higher program intensity areas
- Dose-response relationships between program intensity and outcomes of interest are sought

Intervention Period 2008 to 2010

Health Extension Program (HEP)

Two female health extension workers (HEWs) with 1 year training provide mainly preventive and selected curative care to a community (kebele) with about 1,000 households (i.e., 5,000 people)

Spend 75% of their time on outreach activities

Train 'model families'

Organize community health promoters (CHPs)

Provide health education to households (HHs) using Family Health Cards (FHCs)

L10K Interventions

Facilitated the development of FHC

Enhance the skills of HEWs to provide essential newborn care

Support HEWs to organize CHPs to promote the utilization of services provided by HEP

Facilitate local institutions to support HEP to sustain RMNCH outcomes

Provide regular supportive follow-up

Program review meetings



L10K Effectiveness Evaluation Framework



Data

- Two-stage cluster surveys in December 2008 & December 2010
- At first stage kebeles were selected using probability proportionate to size
- At 2nd stage respondents from three target groups were selected based on 30 by 7 EPI cluster method
- Tools: 1 community and 3 HH questionnaires
- Field methods
- Ethical clearance obtained from EPHA

Sample Size

	Baseline (Dec 2008)	Midterm (Dec 2010)
District	67	67
Communities/clusters	137	214
Women 15-49 yrs	2,740	2,568
Women with children 0-11 months	1,644	2,568
Women with children 12-23 months	1,370	2,568

HEP Outreach Intensity

- Scale with 4 items
 - Kebele-level prevalence of HH visits by HEWs
 - Kebele-level prevalence of HH visits by CHPs
 - Kebele-level prevalence of model family HHs
 - Kebele-level prevalence of HHs with FHCs
- Alpha 0.77

L10K Support Intensity

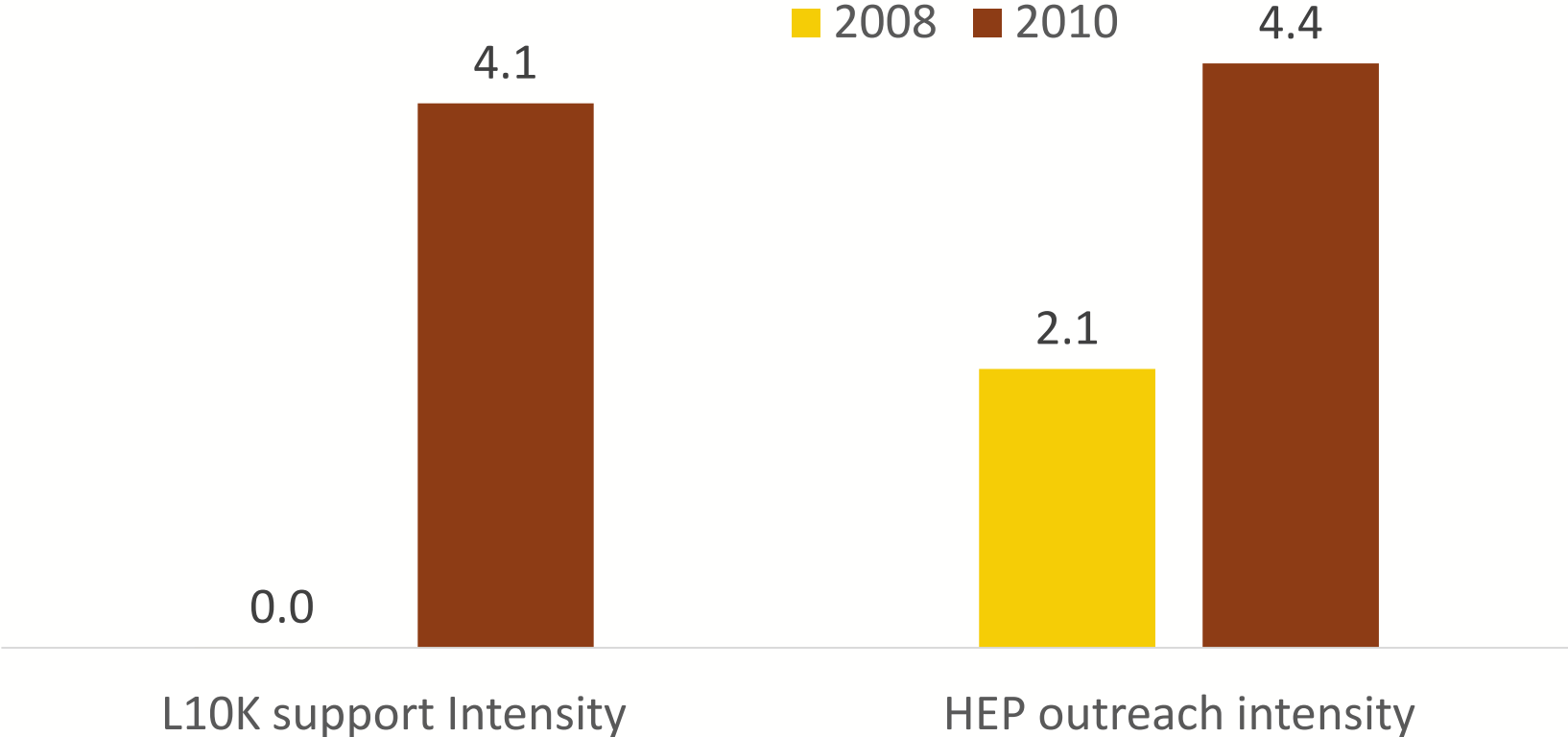
Each kebele was assigned a L10K program intensity score based on HEW responses regarding their perceptions of L10K support for 11 RMNCH components (EPI, nutrition, essential newborn care, ANC, delivery, referral, PNC, breastfeeding, complementary feeding, family planning, and follow-up CHP). Each RMNCH component was assigned a score: a score of 0 if the component was not supported by L10K; a score of 1 if it was supported by L10K but with no training or supportive supervision; 2 if the component was supported with training by L10K but no post training follow-up; and 3 if the component was supported with both training and post training follow-up visits. The 11 component scores were given equal weights and simply added to create the L10K support intensity index. Possible scores on the raw L10K intensity index ranged from 0 to 33. The index was then rescaled to range between 0 and 10. The internal reliability (i.e., Cronbach's alpha) of the items composing the L10K support intensity index was 0.95

Statistical Methods

- Multi-level mixed effect logit models
 - Outcomes are measured at household level while program exposures are measured at the kebele/cluster level
 - Fixed effects: interaction between HEP outreach intensity & L10K support intensity, secular trend, maternal education & age, marital status, child age, distance to drinking water source, distance to health facility, radio listenership, wealth quintiles, and other NGO
 - Random effects: kebeles nested in districts
- Sensitivity analysis
- Counterfactual analysis was done to assess the effect of L10K support intensity on RMNCH outcomes; holding HEP intensity score at mean

Results

Mean Program Intensity Score



L10K Support Intensity Effects

Indicator	2008	2010	%-point change	% of change att. to L10K
CPR	30.0	41.6	11.6	27.6
ANC 4+	22.4	31.3	8.9	0.0
Any ANC	60.0	74.1	14.1	42.6
TT2+	42.1	49.3	7.2	63.9
Birth preparedness	71.0	77.8	6.8	73.5
SBA	10.5	11.6	1.1	0.0
HEW assisted delivery	4.0	8.5	4.5	40.0
PNC in 48 hrs	0.9	6.0	5.1	23.5
Any PNC	4.4	21.4	17.0	34.7

L10K Support Intensity Effects

Indicator	2008	2010	%-point change	% of change att. to L10K
Dry & wrap baby after birth	73.0	70.5	-2.5	204.0*
Delay bathing the baby	26.6	48.2	21.6	0.0
Maintain skin-to-skin contact	72.0	80.4	8.4	0.0
Apply nothing on cord	63.7	73.8	10.1	35.6
Tie cord with sterile thread	61.8	67.9	6.1	91.8
Give baby colostrum	44.5	61.3	16.8	27.4
Put baby to breast after birth	48.9	60.0	11.1	29.7
Fully vaccinated child	51.6	58.9	7.3	117.8*
Penta dropout rate	22.5	17.9	-4.6	97.8

*Negative change were observed in areas with no L10K support; as such, %-point change due to L10K was higher than the overall observed % change

Conclusions

- L10K supported HEP was associated with improved RMNCH outcomes
- Similarly, HEP outreach intensity was associated with improved RMNCH outcomes (analysis not shown; see Karim et al. PLOS ONE)
- Early L10K strategies were not effective in improving skilled birth attendants
- Validity of the program intensity scales were reasonable (items had construct validity; high reliability coefficient; and the indices predicted program outcomes in the expected direction)
- Internal comparison group is a promising method for effectiveness evaluation of large-scale programs
- The study demonstrates a useful method to evaluate multiple interventions that complement each other

Study Limitations

- 30 by 7 EPI cluster survey method for selecting respondents often over-estimates program coverage; nevertheless, because the sampling method was consistent between the surveys, the biases do not affect the internal-validity
- Recall bias: which if present, would be in an unknown direction, leading to spurious relationships between program exposure and the expected behavioral outcomes. Since the program intensity score systematically predicted the maternal and newborn care practices in the expected direction, it is unlikely that the recall bias was critical.
- Program placement bias