

# Integrated Periodic Outreach Strategy to Improve Maternal and Child health Service Access Among Hard- to-Reach Areas in Ethiopia

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## Research Article

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## Abstract

## Background

The inequities that exist in healthcare for hard-to-reach areas have serious implications on the prevention and control of diseases. Rural populations who are pastoralists, seasonally mobile, or simply live far from facilities within the national infrastructure are among the hard-to-reach population groups. The USAID Transform: Primary Health Care Activity initiated the integrated periodic outreach service (IPOS) strategy to address inequities in healthcare. The aim of this assessment was to identify the contributions of the IPOS strategy on facilitating access to healthcare for hard-to-reach areas.

## Methods

A managerial and health facility level cross-sectional study employing both qualitative and quantitative data collections were carried out.

## Results

The average number of hard-to-reach kebeles among IPOS implementing higher tier health facilities (HFs) was found to be 6, and from these 87% were targeted for the IPOS strategy. Having no HFs nearby, shortage of transport services, security issues, and the nature of pastoralist communities are some of the potential reasons for the requirement of IPOS. Preparatory activities like training, microplanning, and community mobilization were conducted before the actual implementation of the sessions. Integrated reproductive, maternal, newborn, child and adolescent health-nutrition (RMNCAH-N) services were then provided for women and children. There was community acceptance for all services provided and service utilization was high. There has been a progressive improvement of coverage of maternal and child health services between 2017 and 2020 among IPOS implementing districts (woredas) and HFs. Lack of adequate transport and logistical constraints are among the major challenges of IPOS implementation. Forty percent of districts and 20% of health centers (HCs) have since conducted IPOS using their own budgets.

## Conclusion

IPOS has contributed to the improvement of maternal and child health services in hard-to-teach communities and scale up of the strategy is recommended. Lack of transport is a major barrier to IOPS implementation and support for districts is necessary. Ensuring the sustainability and ownership of IPOS implementation by making it part of annual district-based planning exercises is recommended. Community engagement is also critical for the effective implementation of IPOS.

## Background

Inequalities in access to health services are unfair and can end in avoidable differences in people's health across different social and population groups. Health inequalities are caused in part by inequalities in income, power, and wealth, distance from facilities, and geography (1). Inequalities in health occur along several axes of social stratification including socioeconomic, political, ethnic, cultural, and gender (2).

The 2005 Ethiopian child survival strategy was designed to address 90% of causes of child mortality and was an important component of the health sector transformation plan (HSTP). The health extension program (HEP) is a main pillar of the strategy (3). Prior to this, the HEP could not provide full coverage of some of the high impact child health interventions. Hence, the enhanced outreach strategy (EOS) was introduced in drought prone districts in 2004 and was conducted every six months focusing on vitamin A supplementation (VAS), de-worming, and screening of children and pregnant and

lactating women (PLW) (4). Before this strategy, 'child health days' had been implemented since the early 2000s in several sub-Saharan African countries, including Ethiopia, but were a part of routine services rather than through campaigns (5).

Ethiopia has achieved the millennium development goal (MDG) 4. Improvements in nutritional status of the population prevented about 50% of child deaths, vaccination programs 23% of deaths, treatment of pneumonia and diarrhea 14% of deaths, and improved sanitation and use of insecticide treated nets (ITNs) also contributed (6, 7).

The global vaccine action plan (GVAP) seeks to achieve its vision through enabling equitable access to immunization as well as utilizing immunization systems for delivery of other primary healthcare programs. Inequities in accessing hard-to-reach areas have serious implications on the prevention and control of vaccine-preventable diseases. Rural populations that are pastoralists, seasonally mobile, or live far from facilities within the national infrastructure meaning they make no contact with routine immunization services are among the 'unreached' population groups (8).

Following the initial success of the expanded program on immunization (EPI), routine immunization coverage in many countries has stalled due to difficulties of reaching traditionally under vaccinated subpopulations. The under-vaccination of these subpopulations threatens the attainment of overall vaccination goals (9).

In Ethiopia, notable progress has been made in coverage of immunization, but vaccination inequity persists with wide regional variations. Only 43% of children received all basic vaccinations and 19% of them did not receive any vaccination at all. A high number of unimmunized children exist, with the majority (82%) residing in three of the regions in the country (10). According to the Ministry of Health (MoH), limited outreach services in hard-to-reach communities are among the major challenges to the EPI (11).

A study conducted in a rural district in Uganda indicated that barriers to access were among the major reasons for ineffective provision and uptake of immunization. Some caretakers must travel long distances to reach immunization centers and health workers must also travel long distances to provide outreach services—all of which pose access challenges when transport is inadequate and in areas with difficult topographies (12).

In countries where the health system is not strong enough, the use of community outreach sessions has been recommended to ensure high uptake of vaccinations (13). The MoH initiated the periodic intensification of routine immunization (PIRI) strategy in 2018 to improve immunization performance coverage, reduce dropouts and the transmission of vaccine-preventable diseases, and improve equity in reaching every child with available and new vaccines. PIRI activities (a combination of routine immunization and campaign-style strategies) have been used to improve routine immunization in low performing districts and regions. However, one limitation of the PIRI approach is the absence of systems to track children reached by the strategy. Moreover, evaluations of services delivered through PIRI have not yet been conducted and no evidence has been gathered on its effectiveness. The USAID Transform: Primary Health Care initiated IPOS to address health inequities in underserved communities. IPOS uses a similar strategy but focuses more on the integration of RMNCAH-N programs. IPOS is expected to augment and not disrupt routine health services (9).

The aim of this study is to describe the contribution of the IPOS strategy among the hard-to-reach intervention districts where RMNCAH-N service access is low.

## Methods

**Study setting period:** USAID Transform: Primary Health Care is supporting 425 districts in six regions of the country (Amhara, Oromia, Sidama, South Nations Nationalities and Peoples'/SNNP, Southwest, and Tigray) with a goal of preventing maternal and child deaths. There are hard-to-reach districts within these regions whose health system is not strong enough in regards to the provision of the required RMNCAH-N services. Based on set selection criteria, 27 districts were selected for the implementation of IPOS. The data collection period was from December 15 to 30, 2020.

## Study design

The study employed a mixed-method approach, consisting of a pre-post intervention and qualitative perception studies.

## Source and study population

All the 27 IPOS intervention districts and catchment HFs were the source population. The study was conducted on health managers, healthcare providers, and service delivery reports.

## Sampling and sample size

This study used a multi-stage criterion based purposive sampling technique to select the districts, HCs, and health posts (HPs). The sampling procedure followed is depicted in Table 1. All primary data of the quantitative and qualitative studies were collected from the sampled districts and facilities. The secondary data collection for the pre-post study included all the districts and facilities selected at step one. The qualitative study focused on health managers at district level, service providers at the HC level, and health extension workers at the HP level.

Table 1  
Sampling by region.

Steps	Oromia	SNNP	Total
Total number of IPOS districts	15	12	27
Step 1: Number of districts with a minimum of two rounds of IPOS implementation	4	6	10
Total number of HCs	18	20	38
Total number of HPs	73	138	211
Step 2: Number of randomly selected districts	2	3	5
Step 3: Number of randomly selected HCs	2	3	5
Step 4: Number of randomly selected HPs	2	3	5

## Inclusion criteria

Intervention districts which implemented IPOS for a minimum of two rounds.

## Exclusion criteria

Intervention districts which have implemented IPOS for less than two rounds.

## Data collection and instruments

The study used three different instruments to capture data from health managers, health service providers, and service delivery reports (Table 2).

Table 2  
Data collection instruments.

Instrument	Data collection level	Source	Coverage
Service delivery report reviews	Districts, HCs and HPs	MoH's district health information system 2 (DHIS2)	5 districts, 5 HCs and 5 HPs
District, HC, and HP assessment tools	Districts, HCs, and HPs	District and HC maternal, newborn, and child health focal persons, health extension workers (HEWs) at HPs	5 districts, 5 HCs and 5 HPs
Key informant interviews (KII)	Districts, HCs and HPs	District heads, HC heads, and HEWs	15 key informant interviews

Five Activity staff were used to collect data from all levels of data sources and two supervisors were involved. People who participated in IPOS implementation were not involved either as data collectors or supervisors.

**Data quality:** A one-day orientation was given for the data collectors and supervisors on the objectives of the study and data collection instruments during which field testing was conducted. Supervisors reviewed the completeness and consistency of collected data daily. Discussions were held with data collectors at the end of each day and in the mornings to minimize errors during data collection and take timely corrective actions. All survey data was inspected for completeness upon collection to minimize missing data.

**Data analysis:** The quantitative data were entered into the EpiData version 3.1 database and then exported to SPSS version 25 for statistical analysis. Descriptive statistics were formulated and presented as graphs and tables. A paired t-test was used to examine pre-intervention versus post-intervention changes in service coverage. Qualitative data were transcribed and translated into English. The key informant interview (KII) data obtained in response to open-ended items were analyzed qualitatively for content and emerging themes, coded, and categorized using Microsoft Excel.

**Ethical clearance:** Ethical clearance was granted from JSI's institutional review board with IRB REFERENCE: IRB #20-29E. Heads of the selected intervention districts, HCs, and HPs were asked for consent. The health information technology professionals who provided data during the data collection were also asked for consent. No personal identifiers were captured and all methods were performed in accordance with relevant guidelines and regulations.

## Results

The response rate was 100% for both the KIIs and service-related data collection. IPOS implementing districts had an average of 33 technical and 20 support staff. The average number of hard-to-reach kebeles in the IPOS implementing districts were 9, and 86% of them were targeted for IPOS.

The IPOS implementing districts reported that they required the strategy due to lack of access in providing RMNCAH-N services, as there were almost no HFs nearby, and they were troubled by shortage of transport services, long distances of HFs from communities, security challenges, and pastoralist communities that move from place to place. According to their report, IPOS was conducted three times per year and integrated services were provided to improve service coverage and save lives.

The average numbers of health and administrative staff interviewed in HCs were 17 and 13, respectively. There were six hard-to-reach kebeles per HC, and 87% of them were targeted for IPOS implementation. HC staff mentioned the same reasons as district health office staff for the initiation of IPOS in their catchment areas. The implementation of IPOS in HCs also occurred about three times a year, which was the same frequency as reported by district staff.

In districts with HPs, the average number of health extension workers were found to be two. The duration of the implementation of IPOS and the potential reasons for the implementation were the same as that of the districts and HCs.

## Implementation status

All the assessed districts, HCs and HPs reported that preparatory activities like training, microplanning, and community mobilization were conducted before the actual implementation of the sessions. However, training was provided only for 60% of HPs, and adequate community mobilization activities were conducted in 80% of the HPs during the last sessions.

Only 60% of the districts and 20% of HCs had adequate transport facilities to support IPOS implementation. During the IPOS sessions, integrated RMNCAH-N services including antenatal care (ANC), family planning (FP), vaccination, nutrition, and sick child and malaria treatments were provided to clients. In addition, some social and behavior change communication (SBCC) activities were also integrated to promote key health and nutrition messages.

IPOS activities were conducted regularly in 80% of districts, 60% of HCs, and 80% of HPs. The same findings were reflected by managers at different levels of the health system during KIIs. The managers of the district health offices commented,

Some kebeles in our districts were found to be hard-to-reach and had difficult terrains, making it challenging to provide services on a routine basis. Therefore, the implementation of quarterly IPOS was very important to improve service access for our communities.

Guidelines and protocols were utilized during service provision in all districts, HCs, and HPs, and the services were being properly recorded during the sessions at all levels.

Service tracking mechanisms were found to be universal at HCs, but only 40% of districts and 60% of HPs had the systems. Eighty percent of districts and HCs, and 60% of HPs experienced shortages of logistics and supplies while they were conducting the last two sessions of IPOS. The common shortage in commodities during IPOS implementation were Implanon, iron folate, Coartem, rapid diagnostic tests (RDTs) and dispersible amoxicillin (Table 3).

Table 3

Preparatory activities and implementation status of IPOS at USAID Transform: Primary Health Care intervention areas, 2017–2020.

Indicators	Districts		Health centers		Health posts	
	Session 1	Session 2	Session 1	Session 2	Session 1	Session 2
Preparatory activities						
Training/ orientation provided for staff before the sessions	100%	100%	100%	100%	100%	60%
Microplanning before the sessions	100%	100%	100%	100%	100%	100%
Adequate community mobilization before the sessions	100%	100%	100%	100%	100%	80%
Sessions						
Adequate transport facility for staff and transport to IPOS sites			60%		20%	
ANC provided during IPOS	100%	100%	80%	80%	100%	100%
FP services provided during IPOS	100%	100%	100%	100%	100%	100%
EPI services provided during IPOS	100%	100%	100%	100%	100%	100%
Nutrition services provided during IPOS	100%	100%	100%	100%	100%	100%
Sick child services provided during IPOS	80%	80%	80%	80%	100%	100%
Malaria services (RDT testing and treatment) provided during IPOS	100%	100%	100%	100%	100%	100%
SBCC activities conducted during IPOS	80%	80%	100%	100%	100%	100%
IPOS activities conducted regularly			80%		60%	80%
Guidelines and protocols utilized for services during IPOS	100%	100%	100%	100%	100%	100%
IPOS services properly recorded during the sessions	100%	100%	100%	100%	100%	100%
Presence of mechanisms to track services delivered during IPOS			80%		100%	60%
Shortage of logistics and supplies during the last two sessions	80%	80%	80%	80%	60%	60%

## Progress monitoring

All IPOS implementing districts had a mechanism to supervise IPOS activities implementation. In addition, the districts had a mechanism to monitor the contribution of IPOS on the improvement of RMNCAH-N programs. Eighty percent of IPOS implementing districts conducted review meetings to review progresses and related challenges in the process of IPOS implementation.

### **Ownership and sustainability**

Management teams were informed about the strategy and had assigned focal persons to coordinate activities in 80% of the IPOS implementing districts, and 40% of their catchment HCs. Forty percent of the districts implementing IPOS allocated budgets for the regular implementation of the strategy, and 20% of the HCs conducted IPOS using their own budgets.

According to the reflections of all HC heads, IPOS is a useful strategy to address service inequity and improve performance. All districts were willing to continue IPOS implementation at their respective districts and have plans to allocate budgets for the implementation of the strategy in the future. The participants of the KIIs also indicated that as partners' projects have their own lifetime and will phase out, it will be the responsibility of the government to sustain the program. A participant commented,

*“USAID Transform: Primary Health Care has shown us how to [conduct the initiative] and we have seen the contribution of IPOS in terms of improving access. It will therefore be the responsibility of the HC to allocate resources and continue its implementation”.*

Eighty percent of district administration offices were willing to allocate budgets for IPOS implementation and 80% of district health offices had a plan to expand HFs to the remote kebeles in the future to improve service access.

### **Community engagement and participation**

All IPOS implementing districts and HFs were engaging and involving community leaders/volunteers in the process of IPOS implementation. The community had accepted all the packages of services being provided during IPOS, and service utilization was found to be good based on the testimonies given by the EPI focal of the public sector and coverage indicators. According to the participants of the KIIs, district managers, health workers, community volunteers, and other sectors were engaged and playing key roles in the implementation of IPOS among the intervention districts.

### **Maternal and child health services**

This study delved into the trends of key maternal and child health service progress—comparing the coverages before and after the implementation of IPOS. Below are trends in some of the key maternal and child health services before (2017) and after (2018 to 2020) the implementation of IPOS in the intervention districts.

#### **Immunization services**

There was progressive improvement in immunization coverages among IPOS implementing districts and HFs. Antigens like Penta 1, Penta 3, MCV1, and full immunization have shown significant increment among IPOS implementing districts and HFs over the years, (2017–2020). The average yearly increment for Penta 3 was 7%, 18%, and 13% in districts, HCs, and HPs, respectively (Fig. 1).

Most of the participants of the KIIs said that,

*“IPOS helped to serve the hard-to-reach community, i.e., the community got better access to health services which improved health service coverage, especially in RMNCAH-N services, including EPI”.*

A paired sample t-test was used to determine whether there was a statistically significant mean difference on immunization service indicators before and after the IPOS implementation. The assumption of normality was not violated, as assessed by the Shapiro–Wilk test, Penta 1 ( $p = .130$ ), Penta 3 ( $p = .151$ ), MCV1 ( $p = .166$ ), and fully immunized ( $p = .238$ ). Facilities performed better after IPOS implementation as compared to before (Table 4), with a statistically significant increase of 29.357 (95% CI, 12.561 to 46.153) for Penta 1, 29.443 (95% CI, 15.944 to 42.942) for Penta 3, 33.914 (95% CI, 20.002 to 47.827) for MCV1, and 34.136 (95% CI, 20.079 to 48.192) for full immunization (Table 4).

Table 4  
Immunization performance Indicators, USAID Transform: Primary Health Care IPOS intervention areas, 2017–2020.

	Pre-intervention (N = 14)		Post-intervention (N = 14)		t	df	Sig. (2-tailed)	Mean difference	Std. error	95% confidence interval of the difference	
	Mean	SD	Mean	SD						Lower	Upper
	Penta 1	81.57	28.04	110.93						20.37	3.776
Penta 3	70.46	30.35	99.90	30.75	4.712	13	.000	29.443	6.248	15.944	42.942
MCV1	68.82	21.88	102.74	20.30	5.266	13	.000	33.914	6.440	20.002	47.827
Full immunization	61.01	27.07	95.14	29.36	5.246	13	.000	34.136	6.507	20.079	48.192

### Nutrition services

The proportion of children 6–59 months old supplemented with vitamin A and deworming services increased in the years between 2017 to 2020. Prior to the intervention, the average annual increment of children 6–59 months old supplemented with vitamin A had been about 10% and 19% for deworming. Nutritional screening coverage for under-five children as well as PLW has also shown significant improvement over the years (Table 5).

Table 5  
Trends in nutrition services provided at USAID Transform: Primary Health Care  
IPOS intervention areas, 2017–2020.

Indicators	2017	2018	2019	2020
Vitamin A supplementation (6–59 months)				
Districts	52.8	76.6	77.2	87.4
HCs	67.8	52.8	54.5	68.4
HPs	66.2	58.4	110.4	97.0
Deworming (2–5 years)				
Districts	32.1	67.8	60.6	76.0
HCs	3.3	40.8	28.0	62.4
HPs	28.6	35.2	99.4	86.6
Screening (< 5 years)				
Districts	70.4	71.0	85.2	81.2
HCs	112.5	121.3	151.0	159.4
HPs	98.6	103.8	178.2	170.4
Screening (PLW)				
Districts	80.4	117.2	97.2	106.2
HCs	32.0	74.0	94.0	105.4
HPs	55.2	44.0	80.8	90.2

### Maternal health services

ANC 1 visits have shown significant improvement over the years at all levels of the health system with an average increment of 5%, 15%, and 10% among the intervention districts, HCs, and HPs, respectively. The proportion of ANC 4 plus visits have also shown improvement over the years in all of the intervention areas with the exception of two districts. The proportion of pregnant women that received the recommended doses of iron supplements (three months and above) had improved across the years from 2017 to 2020, at all levels of the health system. The average annual increment for the structures included in this assessment was over 20%. The percentage of women that had received FP services, both short and long acting, has also shown improvement, (Table 6).

Table 6  
Maternal health services provided at USAID Transform: Primary Health Care IPOS intervention areas, 2017–2020.

Indicators	2017	2018	2019	2020
ANC 1				
Districts	90.8	104.2	105.6	105.2
HCs	66.5	89.0	112.4	112.4
HPs	33.7	34.8	73.8	62.8
ANC 4				
Districts	69.4	81.2	64.4	65.8
HCs	44.2	59.4	74.8	73.6
HPs	25.4	24.0	46.4	44.8
Fefol supplementation for pregnant women ( $\geq 3$ months)				
Districts	20.8	39.4	76.7	102.2
HCs	19.8	47.6	80.7	87.6
HPs	14.4	21.4	84.8	84.4
FP				
Districts	39.8	45.2	52.2	54.4
HCs	72.7	79.6	89.4	89.8
HPs	33.7	36.0	80.4	79.4
Long-acting reversible contraceptives				
Districts	20.4	27.4	36.6	38.2
HCs	20.7	16.8	34.0	46.8
HPs	20.7	21.8	35.6	44.6
Short-acting FP				
Districts	53.2	49.0	49.0	50.4
HCs	81.0	92.2	88.4	85.6
HPs	40.0	45.0	86.4	80.6

### Sick child treatment

The proportion of sick children seeking pneumonia treatment with antibiotics and children with diarrhea that received oral rehydration therapy (ORT) and zinc has increased across the years, from 2017 to 2020. At the HP level, the average increment was 12% and 5% for pneumonia and diarrhea, respectively (Table 7).

Table 7  
Trends in treatment for sick children at USAID Transform: Primary Health Care IPOS intervention areas, 2017–2020.

Indicators	2017	2018	2019	2020
Antibiotics given to under-five children with acute respiratory infection				
Districts	28.3	15.8	36.3	49.8
HCs	22.0	31.6	39.2	47.6
HPs	14.1	20.2	36.2	51.2
ORT and zinc given to under-five children with diarrhea				
Districts	19.6	24.8	40.6	48.6
HCs	9.5	34.6	53.0	86.0
HPs	24.4	40.4	32.0	38.4

## Cost analysis of IPOS

The cost analysis was based on the estimates collected from district coordinators and logistics personnel. The manpower required to conduct one session of IPOS includes nurses, midwives, health officers, HEWs and community volunteers, and the average duration of one session of IPOS implementation is seven days. The average cost of human resources (HR) required to conduct one session of IPOS was 32,485 Ethiopian birr (ETB) (equivalent to \$825.55, December 2020), and the estimate cost of materials was 127,200.81 ETB (equivalent to \$3,232.61, December 2020). The overall cost of one session of IPOS was found to be 159,684.81 ETB (equivalent to \$4,058.16, December 2020) as shown in Tables 8 and 9.

Table 8  
Human resource cost of one session of IPOS at USAID Transform: Primary Health Care intervention areas, 2017–2020.

HR type	Average # of staff required per session	Monthly payment per staff	Daily payment per staff (S/30)	Total # of days required per session	Total payment per session
Nurse	2	14,974.88	499.16	7.8	3,893
Midwife	2	16,652.40	555.08	7.8	4,330
Health officer	1	15,187.93	506.26	7.8	3,949
BSc nurse	1	6,396.60	213.22	6.6	1,407
HEW	6	37,668.56	1,255.62	7.8	9,794
Community mobilizer	4	-	150.00	7.8	4,680
Organizer	2	12,222.72	407.42	7.8	3,178
Others	1	8,177.45	272.58	4.6	1,254
Total = 32,485 ETB					

Table 9

Material costs of one session of IPOS at USAID Transform: Primary Health Care IPOS intervention areas, 2017–2020.

Service	Average # of clients served per session	Total costs per client	Total costs per session
Penta 1	95	40.28	3,835.37
Penta 3	55	40.28	2,208.71
Measles	81	93.14	7,554.02
ANC 1	45	86.75	3,885.04
ANC 4	23	15.00	348.50
Postnatal care (PNC) 1	10	15.00	147.00
PNC 4	0	15.00	-
Short-acting FP	72	36.00	2,579.40
LARC	14	224.31	3,076.81
VAS	598	139.33	83,264.73
Deworming	411	15.04	6,182.05
Screening < 5years	647	13.00	8,405.80
PLW	154	13.00	1,998.32
Under-five treatment		-	-
Malaria	6	82.00	490.63
Pneumonia	22	28.80	636.00
Diarrhea	30	52.00	1,558.27
Adult treatment		-	-
Malaria	12	76.00	938.60
Pneumonia	2	29.00	71.05
Diarrhea	4	5.00	20.50
Total = 127, 200.8 ETB			

## Discussion

Considering the need for diversified skills in relation to integrated services, all the assessed districts, HCs and HPs conducted some preparatory activities like training and microplanning before the implementation of IPOS sessions. According to findings of the reviewed literatures on integrated delivery of health services during outreach visits, limited evidence exists regarding training and supervision of health workers for the provision of integrated outreach services. Owing to the importance of providing feasible and scalable strategies for capacity building of frontline workers in delivering integrated outreach services, some programs have used existing platforms such as monthly workers' meetings, to provide ongoing training on a variety of topics, including tracking of children and FP counseling (9).

This assessment revealed that lack of adequate transport facilities, required commodities, and HR were among the major challenges for the implementation of IPOS. This finding was substantiated by the KIIs conducted at district and HF levels. Similarly, in a study conducted in a rural district in Uganda to assess barriers to effective uptake and provision of

immunization, several health workers pointed out that transport was an issue that impacts effective immunization programs, as was the case for IPOS implementation among selected hard-to-reach intervention districts in this study (12).

The study's findings also indicated improvements in immunization coverages, vitamin A supplementation of children, deworming, and nutritional screening of children and PLW in hard-to-reach areas after the implementation of IPOS. This finding is in line with studies conducted in Bangladesh and Nigeria, where combined/integrated interventions improved child immunization coverage in rural hard-to-reach settlements. According to results of a literature review of integrated outreach services, after the implementation of integrated outreach services for five years, the proportion of children aged 12–23 months who received full primary immunization increased by about 16 percentage points (11). A study conducted in hard-to-reach areas in Nigeria, to document the process and outcomes of conducting integrated mobile vaccination services also showed that oral polio vaccine 3 coverage among children under-one improved from 23% at baseline to 61%, and Penta 3 coverage increased from 22–55% (14).

As the benefits of integration may include rapid uptake of linked interventions and reduced competition for resources—during the implementation of IPOS, services like ANC, FP, vaccination, nutrition, treatment for sick children and malaria services, and SBCC activities were integrated. Integration of immunization and other critical interventions was recommended by the global immunization vision and strategy (GIVS). The current health system's policy climate also favors integration of services as a strategy for increasing the equity and efficiency of important health interventions. It is indicated in the government's comprehensive multi-year plan 2021–2025 that integration of additional child survival interventions with immunization should be pursued to leverage the potential for prevention of pneumonia and diarrhea (12). A desk review conducted to gather information on experiences with integrated outreach services suggests that integration of other services with immunization can contribute to increased immunization coverage because of community appreciation for the additional interventions. However, UNICEF's evaluation of its Immunization Plus program found that other than vitamin A supplementation, immunization and other sets of essential maternal and child health interventions remained largely separate, but the evaluation also concluded that policy-level directions on integrated outreach services, where present, were insufficient to guide field level planning and implementation (9).

Even though all districts are willing to continue IPOS and have a plan to allocate budgets in the future, most districts and HCs were not conducting IPOS using their own budgets at the time of the study. A cost and financing assessment for Ethiopia's national immunization program found that operational costs for integrated outreach services were consistently underfunded or not funded at all. However, the knowledge of district management teams and their willingness to sustain IPOS, as well as willingness of district administration offices to allocate budgets for IPOS, supplemented with the active engagement of communities to support the program can facilitate its sustainability (12, 14, 15).

Engagement of community leaders/volunteers in the process of IPOS implementation resulted in community acceptance of all packages of services being provided during IPOS and increased service utilization. USAID's assessment of the Reproductive and Child Health Alliance project in Cambodia identified volunteer support for integrated health outreach services as a major contributing factor to increased coverage. The American Red Cross' mid-term evaluation of the Integrated Child Health Project in Cambodia also reached a similar conclusion. Red Cross volunteers used monthly immunization outreach sessions as an opportunity to teach the value of vitamin A and local food sources. As a result, mothers in the study area displayed high levels of knowledge regarding foods rich in vitamin A. In Indonesia, the presence of health volunteers and an active women's organization at the village level have been credited with lowering fertility and improving child survival. Impressive health and nutrition gains in outreach sessions have also been demonstrated in Mozambique and in India's Bihar State, both of which assigned community volunteers to conduct monthly home visits to neighboring households (9, 16).

## **Limitations**

This study is not without limitations. Some of these are, data was collected by Activity staff because of resource constraints, and for some of the sampling frame, purposive sampling technique was used to obtain more reliable information on IPOS implementation.

## Conclusions

The IPOS strategy made significant contributions towards the improvement of both maternal and child health services among the hard-to-teach communities and scale up of the strategy for communities with similar settings is recommended. Lack of adequate transport was found to be one of the major barriers to IOPS implementation and therefore, transport support of implementing districts is recommended. Ensuring the sustainability and ownership of IPOS implementation by making it part of annual district-based planning exercises is also recommended. Community engagement and involvement are indispensable activities for effective implementation of strategies that aim to address equity gaps and improve access to RMNCAH-N services.

## Abbreviations

ANC

Antenatal Care

EPI

Expanded Program on Immunization

FP

Family Planning

HC

Health Center

HEP

Health Extension Program

HF

Health Facility

HP

Health Post

HR

Human Resource

IPOS-Integrated Periodic Outreach Strategy

KII

Key Informant Interview

MoH

Ministry of Health

ORT

Oral Rehydration Therapy

PIRI

Periodic Intensification of Routine Immunization

PLW

Pregnant and Lactating Women

RDT

Rapid Diagnostic Test

RMNCAH-N

Reproductive, Maternal, Neonatal, Child, Adolescent Health and Nutrition

SBCC  
Social Behavioral Change and Communication  
USAID  
United States Agency for International Development  
VAS  
Vitamin A Supplementation.

## Declarations

**Ethical approval and consent to participate:** Ethical clearance was granted from JSI's institutional review board with IRB REFERENCE: IRB #20-29E. A request for ethical clearance was made and granted by each of the intervention regions in which the assessment was conducted. Heads of the selected intervention districts, HCs, and HPs were also asked for consent to collect the before and after implementation data, system readiness, and perception related data. The health information technology professionals who gave information/data during data collection were also asked for consent. No personal identifiers were captured and all methods were performed in accordance with relevant guidelines and regulations.

**Consent for publication:** Consent for publication is not applicable for this research.

**Availability of data and materials:** The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

**Competing interests:** All the authors declare that they do not have any competing interests.

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**Authors' contributions:** ZTT, TS, and BFD were involved in the inception, concept note development, data collection, analysis, interpretation, and write up of the manuscript. IAB was involved in the data analysis and read the final manuscript. HSA validated the research findings and was involved in the write up of the manuscript. All authors have read and approved to the manuscript. HSA submitted the manuscript as a corresponding author.

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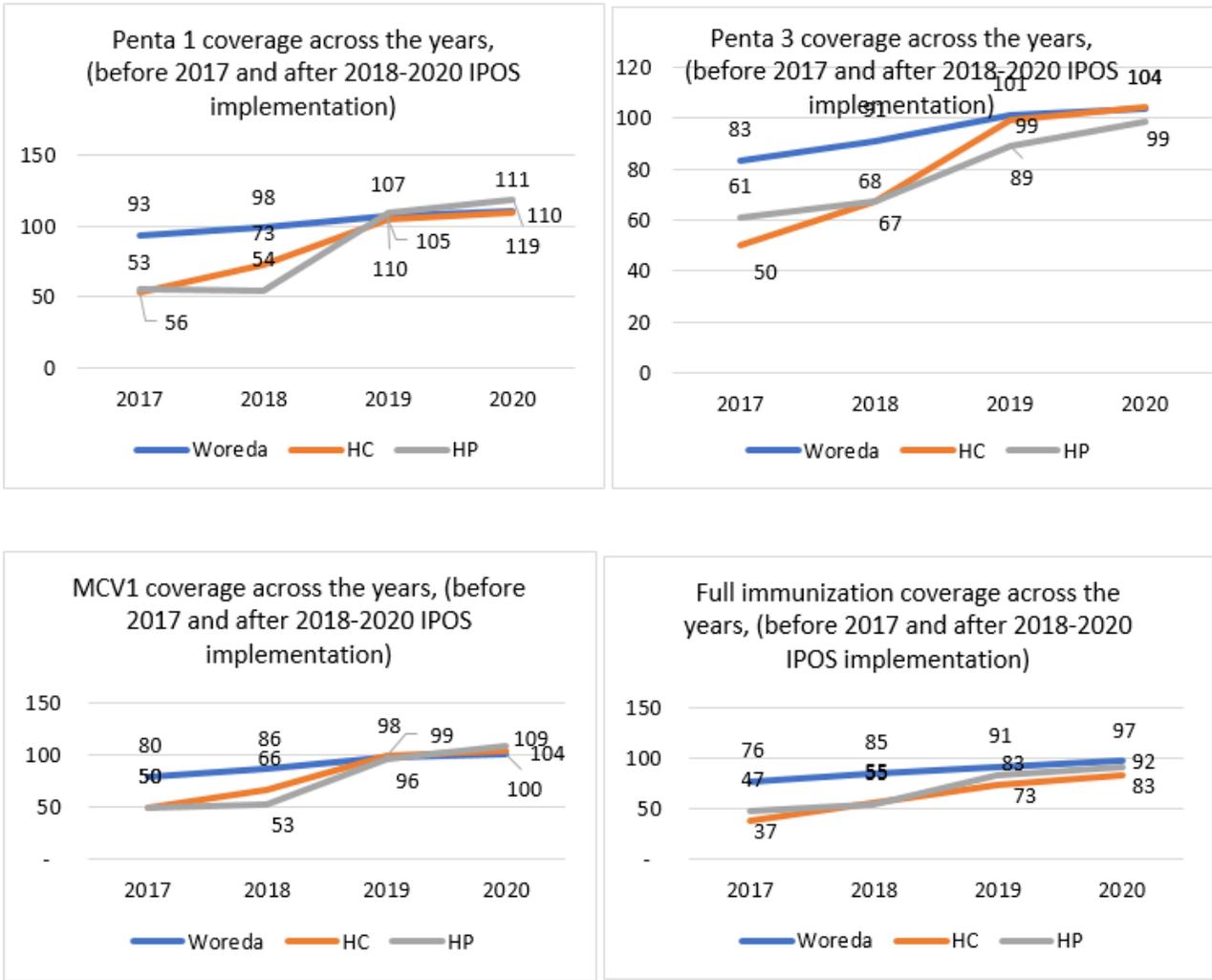
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## References

1. NHS Health Scotland. Economics of prevention. Inequality briefing 3, March 2016.
2. Christopher Garimoi Orach. Health equity: challenges in low-income countries. *African Health Sciences*, October 2009; Vol 9 Special Issue 2: S49–S51.
3. Family health department, Federal ministry of health of Ethiopia. July 2005. National strategy for child survival in Ethiopia, Addis Ababa, Ethiopia.
4. Federal Ministry of Health of Ethiopia. Integrating Enhanced Outreach Strategy (EOS) into Health Extension Program (HEP) Ethiopia, a transitional plan. Volume I: EOS to HEP transitional plan (2010/11-2014/15), final report, Addis Ababa, Ethiopia.
5. N.P. Oliphant et al. The contribution of child health days to improving coverage of periodic interventions in six African countries. *Food and nutrition bulletin* 2010, Volume 31, No. 3 (supplement), The United Nations university.
6. The United Nations Interagency Group for Child Mortality Estimation. Levels and Trends in Child Mortality, report 2013, estimates developed by the UN Interagency Group for Child Mortality Estimation (UNICEF, WHO, WB, UN).
7. Jenny Ruducha et al. How Ethiopia achieved Millennium Development Goal 4 through multisectoral interventions: a Countdown to 2015 case study. *Lancet Glob Health* November 2017; 5: e1142–51.
8. Department of Vaccines and Biologicals, World Health Organization (WHO). Sustainable outreach services (SOS): a strategy for reaching the unreached with immunization and other services. 2000, Geneva, Switzerland.
9. Tasnim Partapuri, Robert Steinglass, Jenny Sequeira, Integrated Delivery of Health Services During Outreach Visits: A Literature Review of Program Experience Through a Routine Immunization Lens, *The Journal of Infectious Diseases*, Volume 205, Issue suppl\_1, March 2012, Pages S20–S27.
10. Central statistics agency (CSA) [Ethiopia] and ICF. 2019. Ethiopian Mini-Demographic and Health Survey (EDHS). 2019. Addis Ababa, Ethiopia, and Rockville, Maryland, USA: CSA and ICF.
11. Ministry of Health of Ethiopia. EPI fact sheet, 2019. Addis Ababa, Ethiopia.
12. Malande OO, Munube D, Afaayo RN, Annet K, Bodo B, Bakainaga A, et al. (2019) Barriers to effective uptake and provision of immunization in a rural district in Uganda. *PLoS ONE* 14(2): e0212270. <https://doi.org/10.1371/journal.pone.0212270>.
13. Bart Jacobs, Magnus Lindelow, Phoxay Xayyavong & Philippa Sackett (2012). Building on community outreach for childhood vaccination to deliver maternal and child health services in Laos: a feasibility assessment, *Reproductive Health Matters*, 20:40, 112-121.
14. Bawa, S., Shuaib, F., Saidu, M. et al. Conduct of vaccination in hard-to-reach areas to address potential polio reservoir areas, 2014–2015. *BMC Public Health* 18, 1312 (2018).
15. Stevenson S, Candries B. Ethiopia national immunization program costing and financing assessment. 2002. [http://www.who.int/immunization\\_financing/analyses/en/wb\\_ethiopia.pdf](http://www.who.int/immunization_financing/analyses/en/wb_ethiopia.pdf). Accessed 21 January 2010.
16. Federal Ministry of Health. Ethiopia National Expanded Program on Immunization. Comprehensive Multi-Year Plan (cMYP) (2021-2025). July 2021, Addis Ababa, Ethiopia.

## Figures



**Figure 1**

*Trends in immunization services across the years in USAID Transform: Primary Health Care intervention areas, 2017 - 2020.*