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Coverage of child health services in rural districts of Ethiopia with the health services extension program

Mirkuzie Woldie[1]*, Sudhakar Narayan Morankar[2], Garumma T. Feyissa[2], Ronald Labonte[3] and David Sanders[4]

[1]Department of Health Services Management, Jimma University, Jimma, Ethiopia.
[2]Department of Health Education and Behavioral Sciences, Jimma University, Jimma, Ethiopia.
[3]Institute of Population Health, University of Ottawa, Ottawa, Canada.
[4]School of Public Health, University of the Western Cape, Cape Town, South Africa.

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Improving access to health care services has been advocated widely since the Declaration of Alma-Ata. Despite the efforts to realize this in Ethiopia, it is only in the year 2003 that the intention to take the package of essential health services to the kebele level (smallest administrative unit) was realized through the introduction of the Health Services Extension Program (HSEP). The objective of this study was to explore whether introduction of HSEP has improved the coverage of child health services in the rural areas of Jimma Zone. A cross sectional study was conducted in three randomly selected districts of Jimma Zone, Southwest Ethiopia. The data collection was undertaken during the months of May, June and July, 2009. A structured questionnaire was used to interview female heads of sampled households from nine kebeles randomly selected in three Woredas (districts). Data were collected on the socio-demographic characteristics, use of health posts, child vaccination and childhood diarrhea. Checklists were used for record review. Data obtained were analysed using statistical package for social sciences (SPSS) V14. Only 64.0% of the kebeles had functional health posts, although another 32.0% of the kebeles in the zone had health posts under construction. However, most (93.7%) of the kebeles in the zone already had two health extension workers (HEWs) assigned. Vaccination coverage as measured by DPT3 was 67.9%, and 10% of the under-two year old children included in this survey had diarrhoea during the past two weeks. Of the 34 (51.5%) mothers who sought help during diarrhoeal attacks, 12 (35.3%) of them went to the health post. The first places of treatment seeking were health centres and health posts, with equal proportion for both (43.5%). Treatment was sought within a day or two after commencement of diarrhoea for 70.6% of the children. Thirty nine (69.7%) of the 56 children who were given recommended fluids received oral rehydration solution (ORS) or homemade solution. In addition to continuing efforts to improve coverage, there is a need to ensure that activities are linked with follow up of vaccination, early treatment seeking and proper home management of diarrhoea.

Key words: Health services extension program, health extension workers, childhood diarrhoea, vaccination.

INTRODUCTION

The web page of the Global Health Observatory (GHO) stated that “6.6 million children under age five died in 2012, nearly 18,000 every day (GHO, 2014).” These deaths are mainly from preventable causes and occur mainly in the developing world. In 2002, 174 of every 1,000 children under the age of 5 died in sub-Saharan

Africa and two-thirds of deaths occur in just 10 countries (United Nations Children Fund (UNICEF), 2004). An Ethiopian child is 30 times more likely to die by his or her fifth birthday than a child in Western Europe (United Nations Children Fund, 2005). According to the demographic health survey (DHS) Ethiopia (Central Statistical Agency (CSA) and ORC Macro, 2006), the child mortality rate was 132 per 1000 live births, which is among the highest in the world.

More than 70.0% of about 7.8 million child deaths every year are attributable to six causes: diarrhoea, malaria, neonatal infection, pneumonia, preterm delivery, or birth asphyxia. Within the forty years period 1960 to 2002, a 50.0% reduction in under-five mortality has been observed. A major contributor is immunization program that have protected the lives of nearly 4 million children (United Nations Children Fund, 2005).

The Federal Government of Ethiopia realized that coverage of basic health services was poor and therefore introduced an innovative community-based approach. This approach aimed at creating a healthy environment as well as healthy behaviour by introducing Health services Extension Program (HSEP) as a sub-component of the Health Sector Development Program II (HSDP II, 2002 to 2005). The main objective of the HSEP is to improve equitable access to essential health interventions. This is achieved through community (kebele) based health services with a strong focus on sustained preventive health actions and increased health awareness. The core objective of HSEP is to identify and provide a list of essential health services to households, especially mothers and children, at the kebele level. The four major components of the package are disease prevention and control, family health services, hygiene and environmental sanitation, and health education and communication (Federal Ministry of Health, 2004a).

Health extension workers are employed by government and receive short vocational training (about a year) on 16 packages of health services which are under the four components of the HSEP. The health extension workers are all females who have at least completed grade 10 and who are residents of the kebele in which they work. The female sex was preferred based on the fact that they need to visit women at their houses. In most parts of Ethiopia it is not acceptable for a man to talk to a woman in the absence of her husband. The plan was to deploy two health extension workers per kebele and to construct and equip health posts (one health post per kebele) in an accelerated expansion of PHC facilities. These health extension workers offer key technical services such as immunization, family planning and health education to the approximately 5,000 inhabitants of each kebele. The workers are provided with a monthly salary of 565 Ethiopian Birr ($ 50) (Federal Ministry of Health, 2004b, 2005).

Village level health services such as the HSEP in Ethiopia have been developed in other countries. Pakistan introduced large-scale primary health-care programs and multipurpose community health workers where effects on mortality and life expectancy are discernable (Rhode et al., 2008; Haines et al., 2007). In Thailand, community volunteers play an important role in promoting behaviour change and providing selected maternal, newborn, and child health, nutrition services, and promoting immunization. Thailand still has more than 800,000 health volunteers for primary health care. This country was one of the first to offer injectable contraceptives at a community level, contributing to a high level of contraceptive prevalence even by the 1980s. During the 1990s, bolstered by a stronger economy, universal clean water and sanitation were achieved (Rhode et al., 2008).

A literature review of community health programs pointed that among other factors recognition and involvement by local and national government and community involvement (especially in recruitment and selection) are key factors in the design and implementation of community health programs in several countries (Shakir, 2010). Javanparast et al. (2012) reported that recognition of the community health workers and their training in the national health planning and financing “facilitates the implementation and sustainability” of village health services.

Such approaches aimed at community and family level health services are of paramount importance, especially in countries with restricted access to facility care or shortages of human resources for health, as is the case in Ethiopia. To track regional and worldwide trends of success or failure of these and other such programs national data are important. Importantly, such data should be used for appropriate action within countries and to ensure that governments are accountable for provision of services to the poorest citizens (Rhode et al., 2008).

For this reason, this study aimed to explore whether introduction of the health services extension program in Jimma Zone had improved coverage of child health care services delivered to the population in the rural areas of the Zone. Hence, the research question was: Did the introduction of the health services extension program in Jimma Zone improve coverage of child health care services in the population?

MATERIALS AND METHODS

Study area and period

The study was conducted in Jimma zone, one of the 17 zones

*Corresponding author. E-mail: mirkuzie@yahoo.com.

Table 1. Number of rural kebeles according to the time of introduction of the HSEP in districts of Jimma Zone, Southwest Ethiopia, May, 2009.

S/No.	Name of districts	Total number of rural Kebeles	Number of Kebeles according to the time of HSEP introduction		
			Latest (less than 1 year)	Medium (1-3 years)	Earliest (>3 years)
1	Chora Botor	30	15	13	2
2	Dedo	53	21	28	4
3	Gera	29	25	4	0
4	Gomma	36	12	23	1
5	Gumayi	14	6	6	2
6	Limmu Kossa	40	29	10	1
7	Limmu Seka	37	0	33	4
8	Manna	24	3	17	4
9	Nono Benja	19	6	13	0
10	Omo Nada	39	32	5	2
11	Kersa	30	9	13	8
12	Setemma	21	2	17	2
13	Seka Chokorsa	36	15	19	2
14	Shebe Sombo	20	6	12	2
15	Sigimo	19	0	19	0
16	Sokoru	36	0	32	4
17	Tiro Afeta	27	5	15	7
	Total	510	187 (36.8%)	282 (55.4%)	40 (7.8%)

in the Oromia Regional State, from May to August, 2009. The zone's capital, Jimma Town, is located about 350 km southwest of Addis Ababa, the capital city of Ethiopia. The zone has a total area of 18,412.54 km square. The population of the zone is estimated to be 2.6 million of which 11% are urban and 89% are rural dwellers. In Jimma Zone, an estimated 60 to 80% of the health problems are due to communicable diseases and nutritional problems. The health coverage of Jimma zone as measured by the ratio of health facilities to the population is about 52%. Currently, health care provision within the zone is carried out through 92 health centers, 459 health posts, and 3 hospitals. During the data collection, there were 35 different privately owned and NGO clinics that also rendered health services to the community.

Study design and participants

A cross sectional study design was employed. All households in rural areas of the 17 districts of Jimma Zone were eligible for the study, whereas sampled households of the selected rural kebeles of districts in Jimma Zone were taken as study population. Three districts out of the 17 rural districts of Jimma zone were randomly selected using lottery method. The kebeles in the 17 rural districts of Jimma zone were at different stages with respect to the introduction of the HSEP. The kebeles in the selected districts were grouped according to the period since the HSEP was initiated with the latest (within the past year), medium (within 1 to 3 years) and earliest (more than 3 years) (Table 1). The 9 kebeles included in the study (1 from each of the three strata of the 3 districts) were randomly identified using lottery method and the total sample of households was proportionally allocated to each of the kebeles. The unit of study was a household. To determine the number of households to be included in the study, single population proportion formula for sample size calculation was used. The diphtheria, pertussis and tetanus 3 (DPT 3) coverage in rural Ethiopia of 29% was used as the p in the sample size calculation (Central Statistical Agency (CSA) and ORC Macro, 2006). This was chosen since it provided the largest sample size as compared to proportions of interest in the study. Other assumptions in the calculation of the sample size included margin of error (d) of 0.05 and confidence interval of 95% (Birhanu et al., 2010).

$$n = \frac{z^2_{1-\alpha/2}\, p(1-p)}{d^2}$$

After multiplying by two to compensate for the design effect of cluster sampling and adding 10% for possible non-response, the final sample size was determined to be 695. Finally, the households from each kebele were selected by systematic sampling. The interval was obtained by dividing the required number of households by the total households in the kebele. Table 2 gives the list of the kebeles in the three districts categorized by time of HSEP introduction.

Study variables

The major outcome variable is coverage of child health care services. This was measured by availability of health post, number of health extension workers per kebele, distance from the nearest health post, utilization of health post, DPT 3 and measles coverage, and prevalence of childhood diarrhea. Time of introduction of the HSEP as expressed by the three categories of kebeles described above was the main independent variable.

Data collection instruments

A structured questionnaire and record review checklist were

Table 2. List of kebeles in three rural districts according to the time of introduction of HSEP, Jimma Zone, Southwest Ethiopia, May, 2009.

Name of the districts	Kebeles by time of introduction of HSEP		
	Latest (<1 year)	Medium (1-3years)	Earliest (>3 years)
Shebe Sombo	Sombo darruu, Hane Do'oo, Kishee, Machii, Atroo gafare, Yangaa duugamaa	Aloo godante, Angaccaa, Damma gamacho, Ganbo migira, Gasara qaqaro, Halo Sabbaaqqa, Lakku migira, Mirgano basoo, Sabbaqa dabiyyee, Shabee dasoo, Urgeyii, Waallaa kella	Anja ganbo, Sabbaqa walla
Kersa	Sunkule, Folla gubata, Gora Sariti, Mera kabericho, Showa Xoxobi, Adare dika	Tuqur Abulu, Balla Wajo, Bulbul, Gello, Ankaso, Girma, Gunjuu, Kalacha, Kitinbile, Kombolchaa, Kusaye beru, Osso, Qarsaa Sumee, Qujo muja, Siba, Wadiko	Tuqur balto, Babo, Bussa bacanee, Dogosoo, Karo gora, Marawwaa, Tolii Qarsu, Awaye sebu
Mana	Seyee bontuu, Biliiddaa, Baballaa kosaa	Urgeyyi, Buxuree, Dawaa, Doyyo tolii, Gubbee bosoqaa, Gubbee mullataa, Hunda qananii, Hudaa Tolii, Haroo, Ittisaa guddaa, Kellaa Gudda, kamisee waraabaa, Lemmii Lalisa, Meexii, Somoddoo, Baballaa karaa	Sombo manaa, Guddataa bulaa, Kenterii, Doyyo biqiilaa

Note: Kebeles in bold are those selected from the categories in each district.

prepared based on instruments used in similar studies (unpublished) and national and regional guidelines for the implementation of the HSEP (Federal Ministry of Health, 2004a, b). The structured questionnaire for the household survey had parts on household socio-economic characteristics, child vaccination status, childhood diarrhea and use of health post. The review checklist was designed to obtain date on the availability and status of health posts and number of health extension workers in the districts of Jimma Zone.

Data collection methods and procedures

Data were collected through review of relevant records at health posts, woreda (equivalent to district) health offices and the Jimma Zonal Health Department. Face to face interviews of the female heads in the sampled households were conducted using a structured questionnaire. Data were collected on socio-demographic characteristics, use of health posts, child vaccination and childhood diarrhea. In assessing vaccination status, data were obtained only for children in possession of a vaccination card at the time of interview. Individuals who completed grade 12, were trained and used as research assistants to collect the data

Data analysis

Data were cleaned and entered into SPSS version 14 to obtain summary figures and percentages. Chi-square test was applied to look for differences in the coverage of child health services among the three categories of kebeles.

Quality control

The instruments used in the study were pre-tested on a similar population (35 households: 5% of the actual sample size) which was not included in the study. The data collectors and supervisors were trained on the overall purpose of the research project and the tools for data collection. Continuous checking of the completed questionnaires (10% of the questionnaires completed each day) were carried out by the Principal Investigator. Incomplete questionnaires were referred back for completion.

Ethical considerations

The study protocol was approved by the ethical review committee of Jimma University. Each of the health managers received a letter from the Research and Publication Office of Jimma University requesting his/her cooperative participation. The importance of accessing relevant records was also mentioned in the letter to the health managers. Written informed consent was obtained from each of the respondents. The right to refuse to respond to any of the questions or refusal of participation by the respondents was respected. All data accessed have been kept confidential.

RESULTS

Characteristics of the respondents

As described earlier, the categories of the kebeles were latest, medium and earliest. The proportion of the respondents coming from latest, medium and earliest kebeles were: 35.7, 34.4 and 29.9%, respectively. A total of 683 households from the determined sample of 695 were included in this study giving a response rate of 98.3%. A majority of the women interviewed (86.7%) were in the child bearing age group. Married women comprised 609 (89.2%) of the respondents and the religion with the largest share was Islam, 535 (78.3%). The majority (79.9%) of the participants were Oromo by ethnicity. Five hundred and nineteen (76.0%) of the women were unable to read and write. About 17.0% of the women were literate and had formal education. More than three

Table 3. Origin and characteristics of the respondents, Jimma Zone, 2009 (n=683).

Variables	Number (%)
Age	
15-49	592 (86.7)
>49	91 (13.3)
Woreda	
Mana	240 (35.2)
Kersa	227 (33.2)
Shebe sombo	216 (31.6)
Kebele category	
Latest (<1 year)	244 (35.7)
Medium (1-3 years)	235 (34.4)
Earliest (>3 years)	204 (29.9)
Marital status	
Married	609 (89.1)
Widowed	43 (6.3)
Divorced	23 (3.4)
Never married	8 (1.2)
Ethnicity	
Oromo	545 (79.8)
Amhara	57 (8.3)
Yem	55 (8.2)
Kefa	26 (3.7)
Religion	
Muslim	535 (78.3)
Orthodox	131 (19.2)
Protestant	17 (2.5)
Educational status	
Unable to read and write	519 (76.0)
No formal education*	52 (7.6)
Have formal education	112 (16.4)
Grade attained	
1-8	98 (88.3)
9-10	10 (9.0)
11-12	3 (2.7)
Occupation	
Farmer	530 (77.6)
Trader	78 (11.4)
Housewife	38 (5.6)
Others**	37 (5.4)
Family size	
< 5	357 (52.3)
5-9	291 (42.6)
>9	35 (5.1)
Annual income ($)* (n=663)**	
<408	166 (25.0)
408-780	170 (25.7)
780.1-1266.0	163 (24.6)
>1266.0	164 (24.7)
Annual expenditure ($) (n=678)	
<150	179 (26.4)
150-300	231 (34.0)
300.1-500.0	138 (20.4)
>500	130 (19.2)

*Able to read and write but have no formal education. **Others include government employee and daily labourer. ***$1=10 Eth. Birr

quarters of the householders were subsistence farmers. The family size of 357 (52.3%) of the households surveyed was less than the average household size (5 individuals) of the Oromia Regional State (Table 3).

Availability and use of health posts and health extension workers

Within the 17 rural districts of the Jimma Zone, there are a total of 510 rural kebeles. As Table 4 demonstrate, 478 (93.7%) of the rural kebeles in the zone have got two health extension workers (HEWs) per kebele. An examination of the coverage of the rural kebeles with health posts reveals that 327 (64.1%) of the kebeles had a functional health post during the time of data collection. Also, 162 (31.8%) of the rural kebeles have got health posts in the process of construction while 21 (4.1%) do not have any (Table 4). However, 660 (96.6%) of respondents reported being aware of the health post in their kebele, with no statistically significant difference between the three kebele categories ($p > 0.05$).

Of the total 683 respondents in the survey 661 (96.8%) managed to make a rough estimate of the time taken to reach the nearest health post from their home. Five hundred and eighty eight (89.0%) of these respondents reported that a walk of less than an hour is adequate to reach their health post. The other 73 (11.0%) reported that it takes more than an hour to reach the health post. The differences were statistically significant ($p = 0.003$) and correlated with the timing of the introduction of the HSEP in the kebele (Table 5).

Six hundred and fifty eight (96.3%) of the respondents were able to answer the questions concerning use of the health post in their kebele. More than half (349) of these respondents said that they can ‘always’ use it any time if the need arises while 270 (39.5%) of them replied ‘sometimes’ and another 39 (5.7%) said ‘never’. The possibility of using the health post was significantly different among the three categories of kebeles implying an association with time of introduction of the HSEP ($p = 0.008$). However, the fact that health posts were the first place to seek help when a family member become ill was not shown to have statistically significant association with the time of introduction of the HSEP into the kebeles ($p = 0.053$) (Table 5).

Table 4. Availability of health extension workers (HEWs) and health posts in rural kebeles of Jimma Zone, Southwest Ethiopia, May 2009.

S/No.	Name of district	Total number of rural Kebeles	Availability of HEWs in the kebeles			Number of kebeles with health posts		
			Two per Kebele	Only One HEW	None	Available	On construction	Not available
1	Chora Botor	30	28	2	-	24	6	
2	Dedo	53	52	1	-	20	26	7
3	Gera	29	21	8	-	29	0	-
4	Gomma	36	34	1	1	16	14	6
5	Gumayi	14	13	1	-	10	4	-
6	Limmu Kossa	40	40	0	-	24	16	-
7	Limmu Seka	37	36	1	-	35	2	-
8	Manna	24	23	1	-	13	11	-
9	Nono Benja	19	16	3	-	15	2	2
10	Omo Nada	39	37	2	-	30	9	-
11	Kersa	30	30	0	-	18	12	-
12	Setemma	21	20	1	-	8	13	-
13	Seka Chokorsa	36	36	0	-	15	21	-
14	Shebe Sombo	20	19	1	-	14	4	2
15	Sigimo	19	18	1	-	16	3	-
16	Sokoru	36	33	3	-	21	11	4
17	Tiro Afeta	27	22	5	-	19	8	-
	Total	510	478 (93.7%)	31 (6.1%)	1 (0.2%)	327 (64.1%)	162 (31.8%)	21 (4.1%)

Table 5. Time of introduction of the HSEP with availability and use of the health posts in rural kebeles of Jimma Zone, Southwest Ethiopia, 2009.

Variables	Category of kebeles			p-value
	Latest (%)	Medium (%)	Earliest (%)	
HP* is available				
Yes	233 (95.5)	226 (96.2)	201 (98.5)	0.184
No	11 (4.5)	9 (3.8)	3 (1.5)	
Walking distance to the HP				
<1 h	213 (91.4)	189 (83.3)	186 (92.5)	0.003
>1 h	20 (8.6)	38 (16.7)	15 (7.5)	
Able to use the HP any time				
Always	112 (48.1)	123 (54.9)	114 (56.7)	
Sometimes	99 (42.5)	87 (38.8)	84 (41.8%)	0.008
Never	22 (9.4)	14 (6.3)	3 (1.5)	
Place of first help				
HEWs**	107 (43.9)	112 (50.0)	15 (6.1)	
Other health professionals	112 (47.7)	109 (46.3)	14 (6.0)	0.053
Non-health professionals	118 (57.9)	78 (38.2)	8 (3.9)	

*HP=health post, **HEWs=health extension workers

Child health services

Of the family health services component of the HSEP, this study concentrated on the child health measured by vaccination coverage and occurrence of diarrhoea and its management. In this survey, 118 (17.3%) of the households had at least one child in the age group of 0 to 23 months having a vaccination card. Vaccination status

Table 6. Vaccination status of children under the age of two years who had vaccination card at the time of the survey, Southwest Ethiopia, 2009.

Vaccine	Yes (%)	No (%)	Total
BCG	92 (82.1)	20 (17.9)	112
Polio 1	108 (93.9)	7 (6.1)	115
Polio 2	91 (81.2)	21 (18.8)	112
Polio 3	73 (66.4)	37 (33.6)	110
DPT 1	106 (93.0)	8 (7.0)	114
DPT 2	89 (80.9)	21 (19.1)	110
DPT 3	74 (67.9)	35 (32.1)	109
Measles	45 (39.8)	68 (60.2)	113

of these children is depicted in Table 6. As is usually the case, the proportion of children who received earlier doses are higher than those given at a later age, with children who received measles vaccination showing the lowest coverage (39.8%) (Table 6). Unlike other measures of the HSEP, there was no statistically significant association in vaccination coverage with the time of introduction of the HSEP into the respective kebeles.

Of the 683 households, 67 (10%) had at least one child 0 to 23 months old with diarrhoea during the 2 weeks preceding the survey. The presence of diarrhoea in the under-two year age group was not statistically associated with the time of introduction of the HSEP. With regard to management, more than one in four of the children were given nothing to drink during the diarrhoeal attack, while about 30% of the children received somewhat less than the amount of fluid they normally were given. On the other hand, about 18.0% of the children with a diarrhoeal episode were given the same amount of fluid as they usually took and 21.0% of them were provided more than the usual amount.

It was also found that about half of the mothers did not seek help from any source for the diarrhoeal episode. The chance of seeking help during the diarrhoeal episode was not statistically associated with the time of the introduction of HSEP. Of the 34 (51.5%) mothers who sought help during the diarrhoeal episode, 12 (35.3%) of them did so at the health post. However, the choice of a health post over other sources of treatment for diarrhoea did not show any statistical association with the time at which the HSEP had been introduced into the kebeles. The first places of treatment seeking were the health centres and the health post in equal proportion (43.5%), while private clinics and government hospitals received the remaining share. Treatment seeking for the diarrhoeal episode occurred within a day or two of its commencement in the majority (70.6%) of cases. About 15.0% of the children received help on the same day while the remaining proportion of the children received it 3 or more days after the attack. Thirty nine (69.7%) of the 56 children who were given recommended fluids during the attack received oral rehydration solution (ORS) or homemade sugar/salt solution. None of the parameters related with management of diarrhoea showed statistically significant difference with the time of introduction of the HSEP.

DISCUSSION

The Health Services Extension Program aims to improve primary health services in rural areas through an innovative community-based approach that focuses on prevention, healthy living and basic curative care. It introduced a new cadre of health worker, Health Extension Workers (HEWs), and defined a package of essential interventions for them to deliver from village health posts. This study has highlighted some of the early limitations and achievements of this innovative approach.

The average number of rural kebeles in a district is 30 with a minimum of 14 in Gumayi district and a maximum of 53 in Dedo district. The physical presence of health posts in the study kebeles falls short of the plan of the government to achieve 100% coverage. Only 64% of the kebeles had functional health posts although about 32% of the kebeles in the Jimma Zone had health posts under construction. Most (93.7%) of the kebeles in the Zone, however, already had two HEWs assigned. This approximates the plan of the government with regard to deployment of the HEWs in rural kebeles (Federal Ministry of Health, 2004b); 96.6% of the interviewees in the nine kebeles indicated the existence of a health post in their respective kebeles.

Close to 90.0% of the respondents said that a walk of less than an hour is adequate to reach the health post in their kebele. The maturity of the HSEP was statistically associated with the reported distance from the health post. This relates to the fact that construction of permanent health posts in each kebele happened slowly. As time goes by each of the kebeles and off course the households in the kebeles will have a health post located

at central locations accessible to the majority of the residents. For the same reason it was noted that there is significant association between the time of introduction of the program into a kebele and possibility of using the services at the health post by householders. However, health posts as the first place to seek help when a family member gets ill showed no difference among the three categories of kebeles. This fact may change as the program gets older and more mature.

Vaccination status of children as measured by DPT3 was 67.9%. This coverage is well below the national 76.8% reported in the 2005/06 health and health related indicators of the Ministry of Health. It is even lower than the pentavalent3 coverage (81.6%) reported for the years 2008/09 (Federal Ministry of Health, 2009). Taking both the findings of this study and the latest EPI coverage reported by the Ministry, Ethiopia in general and the study area in particular have a lower level of vaccination coverage than countries categorized to practice selective PHC in an earlier article (Rohde J. et al, 2008). However, this coverage is more than double of what was reported by the Ethiopian Demographic and Health Survey (EDHS) 2005 and 2011 for both the Oromia region (26.8 to 28.5%) and the country as a whole (31.9%) (CSA and ORC Macro, 2006; CSA and ICF International, 2012).

Dropout of those who have started taking the vaccinations was a problem in this study. We have noted that coverage of vaccinations included earlier (for example, OPV1) in the vaccination schedule have higher coverage than those scheduled later (e.g. measles). Similar pattern was picked up by a recent study from the North West part of Ethiopia (Debie and Taye, 2014). If the finding of the EDHS (2005) (28.5%) is taken as the baseline, it is plausible that the introduction of the HSEP has contributed substantially to the current level of 67.9% in the kebeles of Jimma Zone. This is significant, given the important role played by immunization in reducing under-five mortality. Earlier records also showed that globally a share of the 50% reduction in under-five mortality observed during the sixty years period (1960-2002) was due to immunization programs (United Nations Children Fund, 2005).

In our study, 10% of the under-two age group had diarrhoea, as reported by the householders. This figure is lower than that found in the EDHS (2005), which reported that 18% of under-five children had diarrhoea both nationally and in the Oromia region (CSA and ORC Macro, 2006). However, the EDHS (2011) reported a rate of 11.3% for the Oromia region (CSA and ICF International, 2012). More than 5 out of 10 mothers who had a child with diarrhoea sought some help from health care providers. The percentages of children with diarrhoea taken to a health facility were reported to be 23.3% and 35.3% in the 2005 and 2011 EDHS reports, respectively (CSA and ORC Macro, 2006; CSA and ICF International, 2012).

Assuming the 2005 EDHS to be baseline, treatment seeking behaviour for diarrhoea in children has shown notable changes. Similarly, those who were treated received oral rehydration therapy (ORS) or recommended homemade solutions in about 70.0% of the cases. This value is much higher than the 42.2% reported in the EDHS 2005 (CSA and ORC Macro, 2006). However, the chance of seeking help and using appropriate fluids during the diarrhoeal episodes were not significantly associated with the time of the introduction of HSEP.

The limitations of the current study are that some of the questions forwarded to respondents required appropriate recall of events. Difficulty in recall might have introduced recall bias in the data obtained. Moreover, including only those children who have a vaccination card may have resulted in selection bias.

CONCLUSION

The distribution of HEWs and availability of health posts throughout Jimma Zone has improved significantly since the introduction of the HSEP. There are only a few kebeles without health post/HEWs, most of which have at least HEWs and a health post under construction. The majority of the households reported that they are at ease of making use of the services at the health post. Access and coverage of child health services have significantly improved since the introduction of the HSEP. Coverage of DPT3 was found to be significantly increased following the HSEP. The rate of diarrhoea among under-two year children has fallen remarkably and more than half of the children with diarrhoea were taken to a health care provider some time during their illness. Moreover, the use of ORS and recommended homemade solutions was practiced by the majority of the mothers. Since vaccination coverage tends to be lower for later doses, follow up is required to make sure that children complete the recommended schedule. Home management of diarrhoea and treatment seeking behaviour should be given more emphasis during household visits conducted by the HEWs. This will ensure the sustainability of the current gains and further improvements in the management of diarrhoea. Moreover, health information provision methods should be designed in such a way that behavioural change is effected in the areas of health seeking for childhood diarrhoea.

Conflict of interest

The authors declare that they have no competing interests.

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