Original article

EPI coverage in Adami-Tullu Woreda

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Summary: EPI coverage survey was conducted in Adami-Tullu Woreda during February 1995. A total of 210 children aged 12-23 months, and the same number of mothers who have infants aged 011 months were studied using the EPI cluster survey questionnaire. Thirty-seven percent of the children were fully immunized, while 35.7% were not immunized at all. The coverage was significantly higher in urban areas (55.8%) compared to rural areas (26.3%), OR=3.54, 95% CI (1.88,6.70). The dropout rate was 39.0%, and the missed-opportunity rate was estimated to be 37.3%. Lack of information was an improtant reason for failure of immunization, reported more by rural residents 54 (40.6%), OR= 8.09, 95% CI (3.08,22.51). The coverage was much lower in rural areas partly due to lack of information, and accordingly more emphasis should be given to the expansion of health education and out-reach immunization services. The dropout rate and missedopportunity rate were remarkably high indicating the huge potential of raising the EPI coverage by minimizing these two rates. Health workers have always to be aware of the magnitude of these rates and try to reduce them. [*Ethiop. J. Health Dev.* 1997;11(2):109-113]

Introduction

In 1974 the World Health Assembly called for a crusade to immunize all of the world's children by 1990 against diphtheria, pertussis, tetanus, tuberculosis, polio and measles, diseases estimated to kill five million children and cause the same number of long-term disabilities each year. In response, the Expanded Program on Immunization (EPI) was established (1).

In subsequent years, the number of developing countries achieving the 80% immunization coverage has been increasing. Sixty-four developing countries achieved the target in 1990. Such being the case, the global target of 80% coverage for all antigens was reached by the end of 1990. This effort has reduced three million deaths from the six vaccine preventable diseases in 1990 only(2). While these global figures are promising, they hide the less optimistic reality in certain developing countries. Despite being one of the most powerful and cost-effective means of preventing disease, immunization remains tragically under-utilized in these areas (3).

When EPI was launched in Ethiopia in 1980, the immunization coverage rate was estimated to be less than 1% and the presumed goal was to provide immunization services to all children under the age of 2 years. It was thus believed that by increasing EPI coverage by 10% every year, Ethiopia would attain 100% coverage by 1990. That target was later revised to 75%, and the target age group was changed to under-one year in 1986. In 1990, immunization coverage for under-one children was reported to be 59.0% for DPT3 and the dropout rate from the schedule was 36%. In 1992 the DPT3 coverage declined to 13.0% and in 1994 to 37.0% (2,4,5,6,7).

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Missed opportunities to vaccination, high dropout rates, inaccessibility of the health services, deficiency in the surveillance system, and weakness exhibited in Information, Education and Communication (IEC) are some of the reasons for poor immunization coverage reported in different studies (2,8-14).

The countriy's Mid-Decade goal of 1995 has the objectives of increasing immunization coverage to 80% for all antigens in children under one year of age, and for TT2 in pregnant women and in women of child bearing age (2).

This study was, therefore, conducted with the objectives to obtain a baseline information indicating the current status of EPI coverage in Adami-Tullu Woreda and to identify reasons for immunization failure.

Methods

The study was conducted in Adami-Tullu Woreda (sub-district) during February 1995. The Woreda is one of the fourteen woredas in East Shewa Zone, Oromia Region and had an estimated population of 86,500 in 1994. The woreda is organized into 62 peasant associations and four urban dwellers' associations, each of which is further sub divided into various 'Zones'. Zeway town, capital of the woreda, is located 160 kms. south of Addis Ababa.

The Woreda has one health centre, one health station, one malaria control centre, one missionary clinic, four other governmental organization clinics, and twelve drug shops and rural drug vendors, all concentrated in the towns of Zeway and Bulbulla. Only the health centre, health station, and the Missionary clinic are known to render vaccination services. During the year preceding the study period, immunization services have been delivered through three static and 15-20 out-reach sites in the woreda. The static immunization services and the other components of MCH (Under fives' clinic, Antenatal Care, Famiy Planning, etc.) are delivered in separate rooms by different health workers.

Table 1: **Overall Immunization Status of Children in Adami-Tullu Woreda, February 1995**

Status	#	(%)
Not immunized	75	(35.7)
Partially immunized	57	(27.1)
Fully immunized	78	(37.1)

In this study the source population was children in the woreda in the age group of 12-23 months, and mothers with infants 0-11 months who were assessed for TT coverage. Households were used as sampling unit. Immunization cards were checked if available, and parents or other care takers of children were interviewed about the immunization status of the children. Children were also examined for the presence of a BCG-scar. In accordance with the EPI cluster sampling technique (17), a *"probability proportionate to size" (PPS)* cluster sampling method was employed. Eleven urban and 19 rural clusters were selected out of four urban dwellers' associations (sub-divided into 20 zones), and 62 peasant associations. After identification of the clusters on the basis of their population size, the first household in each cluster was identified randomly. Subsequent households were identified on the basis of their proximity to the preceding household. Seven children aged 1223 months were included from each cluster giving rise to a total of 210 children out of 30 clusters. Similarly, the same size of mothers with infants 0-11 months were selected to study the TT coverage. Vaccination of each of the antigens against the six vaccine-preventable diseases of children, as well as, vaccination of mothers with Tetanus toxoid vaccine was assessed through examination of children, interview with respondents and check-up of immunization cards.

Table 2: **Immunization Status of Children in Adami-Tullu Woreda, Februry 1995**

based on history Status (N=210)	*immun. card* # (%)	# (%)
BCG (Scar visible)	117 (55.7)	
BCG	128 (61.0)	57 (27.1)
DPT-1	131 (62.4)	57 (27.1)
DPT-2	120 (57.1)	53 (25.2)

DPT-3	97 (46.2)	45 (21.4)
OPV-1	128 (61.0)	57 (27.1)
OPV-2	122 (58.1)	52 (24.8)
OPV-3	99 (47.1)	45 (21.4)
Measles	84 (40.0)	39 (18.6)

In this study a child who received BCG (Bacillus Calmette Guerin), DPT-3, Polio-3 and Measles vaccines was considered as fully immunized and a child who received some of the vaccines but not completed all as partially immunized.

Defaulter rate was defined as the proportion of children who started the initial antigens (BCG) but have not completed the full course within the time frame.

Missed opportunity rate was defined as the proportion of children who made at least one visit to a health institution while at the age of below one year, but not received any vaccination.

The EPI Coverage Survey Questionnaire was applied through a house-to-house visit by eight final year medical students. Study subjects were informed about the purpose of the study as it relates to the six vaccine-preventable childhood diseases. Involvement into the study was on the basis of an informed consent. The study population was provided with health education on the importance of immunization and the possible dangers of the six vaccine-preventable childhood diseases, and advised to seek the services by the study team. Odds ratios were calculated and data were presented using tables.

Results

Among the 210 children included in the survey 58(27.7%) had immunization cards but the finding in this study is based mainly on reports from respondents (parents or other care takers of children). Accordingly, 78 (37.1%) of the children were fully immunized and 75 (35.7%) were not immunized at all. The coverage was 55.8% in urban areas and 26.3% in the rural areas. Apparently 128 children recieved BCG vaccination but only 78 of them are believed to have completed the course, giving rise to a dropout rate of 39.0% (Tables 1-3).

Table 3: **Some selected Determinants of Immunization Status of Children in Adami-Tullu Woreda, February 1995.**

Variable	Fully Imm. # (%)	O.R (95 % C.I.)
Residence		
Rural	35 (26.3)	1.00
Urban	43 (55.8)	**3.54 (1.88,6.70)**
Sex		
Male	38 (35.2)	1.00
Female	40 (39.2)	1.19 (0.65,2.16)

Among children not immunized at all, visit to a health centre or health station while at the age of less than a year was reported in 28 (37.3%) of them, indicating a high missed-opportunity rate. Similarly, 9 (8.7%) of mothers who have no Tetanus-toxoid immunization reported to have visited a health facility during their last pregnancy.

A few socio demographic characteristics were assessed for their association with the immunization status of children, and urban children were found to have a higher immunization status compared to their rural counterparts; OR=3.54, 95% CI (1.88,6.70). On the other hand, sex of children was not associated with their immunization status, OR=1.19, 95% CI(0.65,2.16) (Table 3).

Table 4: **Tetanus-Toxoid Immunization Status of Mothers in Adami-Tullu Woreda, Februry 1995.**

	based on history	*immun. card*
Status (N=210)	# (%)	# (%)

TT-1	105 (50.0)	25 (11.2)
TT-2	93 (44.3)	21 (10.0)
TT-3	55 (26.2)	8 (3.8)
TT-4	25 (11.9)	2 (1.0)
TT-5	18 (8.6)	1 (0.5)

Among 210 mothers assessed for their status of Tetanus-toxid (TT) immunization, 93 (44.3%) had two doses and 18 have completed five doses. In 93 (44.3%) of them, their infants were believed to be protected from neonatal tetanus (Table 4).

Among children not immunized at all, lack of awareness of the need for immunization was the most important reason accounting for 45 (60.0%) of the cases. Another 13 (17.3%) reported that place of immunization is too far. Among those partially immunized, inconvenient time of immunization, and place of immunization too far, were the two common reasons. Lack of information was an important reason for failure of immunization mainly in the rural areas 54 (40.6%), OR= 8.09, 95% CI (3.08,22.51) (Tables 5-6).

Table 5: **Reasons for Immunization Failure among Partially immunized and Unimmunized Children in Adami-Tullu Woreda. Feb., 1995.**

Reason	Partially immunized(N=57)	Not immunized(N=75)
Lack of information		
unaware of need for immunization unaware of need to return for	2 (3.5%)	45 (60.0)
2nd or 3rd. dose	7 (12.3%)	0
other	6 (10.5%)	1 (1.3%)
Lack of motivation		
postponed until another time	8 (14.0%)	3 (4.0%)
no faith in immunization	3 (5.3%)	3 (4.0%)
Obstacles		
place of immunization too far	9 (15.8%)	13 (17.3%)
time of immunization inconvenient	8 (14.0%)	3 (4.0%)
other obstacles	24.6%)	7 (9.3%)

Discussion

The 37.1% childhood immunization coverage rate (proportion of children that are fully immunized) in this study is higher than reported by other studies (14-15).

The 55.8% coverage in the urban areas of the woreda is closer to the report in another study (13) conducted in the same area. But the comparability of the two studies is limited due to differences in the methods employed.

Like in many other studies, (13-16) the dropout rate here is considerably high. The corresponding reasons indicated inconveniences due to far distance to immunization sites, time of immunization, and also lack of awareness for the need to return for second and third doses. Each of the above reasons is believed to be subject to interventions by the woreda health management.

The missed-opportunity rate is also high in both childhood immunizations and maternal TT immunizations. Similar rates were reported in other studies (14,15,16) showing that a considerable number of eligible children and mothers coming to health institutions return back without getting the necessary vaccines.

Owing to the existing limitations in the infrastructure capacity at Zeway Health Centre, (and possibly many others), rooms do not allow the provision of Maternal and Child Health (MCH) services all at a time. The different components of MCH services will have to be delivered in separate rooms by different health workers. As a result, there is bound to be an information gap between the different sections of MCH services. Thus, in the given situation, an efficient integration of MCH care requires a competent exchange of information between the health workers in the different rooms and with mothers and other care takers of children. This enables the provision of vaccinations to all eligible individuals at every opportunity of contact to a health institution, and also helps to minimize defaulting from immunization schedules.

Table 6: **Reasons for Immunization Failure by Residence, Adami-Tullu Woreda, February 1995**

Reason	# (%)	O.R (95 % C.I.)
Lack of Information		
Urban	6 (7.8)	1.00
Rural	54 (40.6)	**8.09 (3.08,22.51)**
Lack of Motivation		
Urban	10 (12.9)	1.00
Rural	8 (6.8)	0.49 (0.17,1.37)
Obstacles		
Urban	17 (22.1)	1.00
Rural	37 (27.8)	1.26 (0.63,2.55)

Urban residence was found to be associated with a better immunization status. In contrast, lack of information was reported by rural residents more. This is consistent with `place of immunization too far' mentioned as a reason for failure of immunization in 13 children not immunized at all, and another 9 children that were partially immunized. Similarly, in 45 (60%) of the children not immunized at all, lack of awareness for the need of immunization was the reason given by respondents. This demonstrates the fact that rural residents have little access to health information, as well as, to the actual services.

Adequate comparison to other studies was not possible due to lack of studies that applied the EPI cluster sampling method.

The EPI coverage in Adami-Tullu Woreda is about half as much as the Mid-Decade goal of 80%. The defaulter rate and missed-opportunity rate are major contributors for the existing low coverage. Lack of an effective coordination of activities between the different MCH clinics in transferring children and providing mothers and other care takers with the necessary information, appears to be the basic problem.

Reduction of dropouts from vaccination, and provision of vaccinations to all eligible individuals at every opportunity of contact to a health institution, have to be promoted through continued awareness of health workers about the magnitude of missed-opportunities and dropouts in immunization services. Establishing and/or maintaining a "***warm-chain***" of communication among health workers in MCH services and with mothers and other care takers of children enables to provide them with the necessary information as to the benefits of immunization, about the need for repeated doses of vaccines and related issues.

Poor access to health information, as well as, to the actual services has contributed much to failure of immunization, and accordingly, more emphasis should be given to the expansion of health education and out-reach immunization services.

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