

Endeavors to improve immunization uptake in Ethiopia

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In 1980, the Expanded Program on Immunization (EPI) was initiated by the Ministry of Health, with the objective of reaching 90% coverage among children under 1 year of age by the year 1990 (1). The vaccination schedule since then has been in accordance with that recommended by WHO for developing countries (2).

Vaccines are the most cost-effective interventions in public health. The introduction of vaccines has improved the health of children and adults greatly in the developing world. Although vaccines are at the core of any immunization program, an efficient immunization system and workforce are required to reach the people in need and provide good-quality vaccination services (3).

Immunization programs are becoming complex and wider in terms of the number of vaccines, technical capacity requirement, human development and logistics. Many new vaccines have been introduced into the immunization program, demanding well-informed health care providers equipped with up-to-date knowledge and strategies to provide good-quality immunization services (4). This can only be achieved by continued capacity building through focused training (5,6). Gaps were observed in relation to health service providers' knowledge, attitude and practice towards immunization which the different manuscripts in this special issue has addressed.

The delivery of good-quality and timely vaccination is important to ensure optimum protection. Most vaccines in the immunization schedule require two or more doses to stimulate adequate immune response. To attain optimal protection, vaccines must be administered with appropriate timing, with proper intervals between doses, and all scheduled vaccine doses need to be completed (7). Failing to do so can result in less than adequate immunity. As shown in one of the papers in this issue, nearly half (47.7%) of the children in this study received at least one vaccination dose before the recommended age.

In relation to vaccine intervals, a study conducted in 31 African countries identified invalid doses of 12.1%, 5.7%, and 15.5% for DTP1, DTP3 and MCV vaccinations, respectively (8). In our study, a substantial proportion (21.9%) of children received at least one dose of the antigen earlier than four weeks. This is high rate of invalid dose vaccine administered to children.

Ethiopia's health services decentralization policy provides an opportunity for the districts to mobilize EPI resources for low-level health institutions – health centers (HCs) and health posts (HPs) – to provide immunization services to end users (9). However, this

study finding showed that only 36.2% of HCs and 11.7% of HPs were observed providing the service during the survey period. This finding is nearly similar to the SARA study conducted in Ethiopia in 2016, which found that 51% of the HCs and 11% of the HPs provided child immunization service daily (10). Other Africa country SARA studies – conducted in Tanzania, Sierra Leone and Zambia – reported that 71%, 92% and 80% of the health facilities, respectively, offered the immunization services (11-13).

Most of the previous studies on the topic of readiness focused on the overall organizational change or specific activities of the health facilities (14-16). Findings in this special issue shows that the overall readiness level of immunization service provision in primary health care units (PHCUs) in hard-to-reach pastoral and semi-pastoral areas is generally low, with differences between HCs and HPs.

Ethiopia has achieved a significant increase in routine immunization coverage. However, there are disparities in immunization coverage related to geographic area, wealth, education and other markers, and as noted in the 2016 EDHS, full vaccination coverage was highest in Addis Ababa (89%) and lowest in Afar (15%). The reason for such disparities may not be mainly because of the absence of health facilities, but result from cold chain-related problems at health facility level, such as making vaccines available on time and in the right quantity, which affects vaccine service uptake in difficult and hard-to-reach areas (17-19).

The role of civil society organizations (CSOs) cannot be understated in increasing immunization uptake, especially in under-served, hard-to-reach and pastoral areas of our country. CSOs have been complimenting the efforts of government over the years.

study papers were affiliated to the Child Survival Collaborations and Resources Group (The CORE Group), a membership association of 70 US-based international NGOs, aims at improving the health and welfare of children and women globally. The CORE Group Polio Project (CGPP) was formed in 1999 to support and coordinate efforts of NGOs involved in polio eradication activities.

CGPP Ethiopia was started in Ethiopia in 2001, and is hosted by Consortium of Christian Relief and Development Association (CCRDA). CCRDA/CORE Group created a forum for partnership and collaborates with 11 partners (six international and five local) in 85 *woredas* (districts) in seven regional states. The project is funded by USAID. The Ethiopian project focuses on hard-to-reach areas inhabited by pastoral and mobile communities.

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