



Stepping Up Lady Health Worker (LHW) Program and Integrating the Electronic Immunization Record and Tracking System into the Program as a Pilot Project in the Underserved District of Quetta, Balochistan, Pakistan

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Abstract

Pakistan is one of those countries which are continuously struggling with providing essential primary healthcare services, especially in rural and underserved areas. To combat vaccine-preventable diseases, the Expanded Program on Immunization (EPI) has been active since 1978. Additionally, Lady Health Worker Program (LHWP) fits best with district health priorities of mother and child healthcare, family planning and National Immunization Days (NIDs). However, Pakistan faces many challenges. One is significant disparities in allocation and retention of LHW between provinces such as Punjab and Balochistan. Others are the lack of formal training and management of LHWs and a lack of immunization record system leading to vaccine wastage and broken logistics. How other low to middle-income countries (LMIC) are addressing these issues, is evident from Bangladesh and India. The Shasthya Shebika (SS) Program of Bangladesh is unique in having strategies for focused, structured training and retention of community health workers (CHWs) who receive small loans to establish funds, which they use to sell medical products to the community. To tackle the issue of lack of immunization data and vaccination wastage due to inadequate inventory, India has launched an Electronic Vaccination Intelligence Network (eVIN). The Ministry of Health, Pakistan has the potential to start a healthcare project to address the challenges mentioned above. The recommendations include allocation of 500 LHW (lady health workers) in the underserved district of Quetta in Balochistan with the implementation of retention strategies by funding LHW for small businesses, providing a formal educational structure and training and supervision of LHWs for innovative electronic immunization system. LHWs will have access to relevant educational materials and electronic devices such as tablets.

Introduction

Pakistan, located in South Asia, has a population of around 193 million people. According to WHO, life expectancy at birth for men is 66 years and for women is 67 years, and under-five mortality is 69 per 1000 live births. Pakistan has a

mixed health system that faces social, economic, political and cross-border challenges and is frequently disrupted. Total expenditure in health as a percentage of gross domestic product (GDP) in 2014 is 2.6 (1). The 'National Health Vision 2016-2025' recognizes universal health coverage (UHC) as a top priority

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among Pakistan's health objectives. It is aligned with national health programs such as the LHW program and National Immunization Days (2).

Vaccines are among the greatest success stories in public health. However, within a comprehensive analysis, nine countries were highlighted as having child mortality rates that were decreasing at a lower-than-expected rate. Pakistan is one such country (3). To provide primary and preventive healthcare services at the community level, the Government of Pakistan initiated the lady health workers program. The program now has 90,000 working LHWs in all districts of Pakistan. Currently, the LHWs are working harder and are more knowledgeable than in 2000 (4). However, there are many challenges the program is facing. There are consistent disparities in two provinces of Pakistan, Punjab and Balochistan. According to Pakistan Social and Living Standards Survey (PSLSS) in 2011, vaccination coverage of the pentavalent is 57 % in Balochistan as compared to 94% in Punjab, OPV coverage is 91% in Balochistan and 96% in Punjab, and Measles vaccination coverage is 55 % in Balochistan and 89% in Punjab (5). The LHW program has expanded over the past ten years. However, the population that remains underserved is significantly more disadvantaged still. According to a study, the average community health worker per 1000 population in Pakistan was 0.1 in 2015 (6). More importantly, the program does not have effective retention strategies to attract LHWs to work in rural areas. Also, the training of CHWs is not directly supervised due to lack of trainers and the facilities in underserved areas.

Additionally, LHWs are spending more of their time on National Immunization Days (NIDs). Consequently, nearly half of all LHWs are working outside their catchment area on this activity, which is against the program policy. The high commitment in time required by LHW for NIDs needs to be monitored to ensure that other core priorities are not displaced, as this has resulted in the disruption in the activities required to be performed by LHWs. Finally, the program needs to have a well-designed infrastructure with a clear role and responsibilities, along with the formal training series well supervised by a healthcare institution.

Coupled with its workforce situation, Pakistan is facing issues with vaccine logistics and lack of adequate inventory of immunizations at all district levels. The success of the EPI program is reliant on its

logistics and cold chain accounting for a supply chain responsible for annually handling vaccines worth \$ 150 million and delivery of immunization services to over 30 million children. EPI program is lacking in even fundamental stage of the inventory management, which has resulted in serious consequences such as wastage of millions of dollars-worth of vaccines and dealing out already expired vaccines. Additionally, the cases of vaccine stock-outs have been reported in provinces, while excessive stocks are lying in the federal warehouse. To address vaccine logistic issues, the Government of Pakistan has implemented Vaccine Logistics Management Information System (VLMIS) with the support of United States Agency for International Development (USAID). However, VLMIS is functional in few districts which restrict the inventory data. Also, VLMS does not cover fixed assets such as cold chain equipment (7).

Current Status and Challenges of Community Health Workforce; Identifying the Strategic Issues and Goals:

The Government of Pakistan has been actively involved in providing the maternal health services during the last two decades by augmenting the primary, secondary, and tertiary healthcare facilities which are used by the Lady Health Workers (LHWs). Pakistan is one of the 11 countries that have contributed to 65% of global maternal mortality rate (MMR) in 2008 (8). The situation is especially severe in rural areas and less developed provinces such as Balochistan. In Balochistan, the MMR is 750 per 100,000 live births as compared to 227, 314, and 275 in the provinces of Punjab, Sindh and Khayber Pakhtoon Khwan, respectively (9). Lack of retention strategies and training infrastructure in rural areas is a persistent problem. There has been a discrepancy in training in the past; for example, in Balochistan, 59% received refresher training on child health as compared to 83% in Punjab. There is also a lesser allocation of Lady Health Workers in Balochistan as compared to Punjab. For example, there were 52,381 Lady Health Workers in Punjab as compared to 5,800 in Balochistan in 2003-2008 (4).

LHWs are a vital resource for countries like Pakistan, so it is necessary to improve the procedural standards and guidelines that would facilitate a thriving program. The program needs to be monitored and evaluated to ensure that program goals are being met.

Current Status of Health IT in Pakistan; Time to Take Innovative Steps to Address the Vaccine Logistics Issues:

Pakistan is facing issues related to lack of infrastructure and provision of essential medicines in underdeveloped areas. Private hospitals are well-equipped, but poor people cannot afford them and are left with no option other than a government hospital, which is overcrowded and less well-equipped. Filling this gap, emerging healthcare startup initiatives in Pakistan are adding to the growth of the healthcare industry as internet access is spreading to the less developed parts of the country. An emerging trend in health information technology (IT) is evident from a startup healthcare initiative called 'doctHERs'. The main aim of this initiative is to establish clinics in underserved areas across Pakistan by using telemedicine in the clinics and connecting patients with online providers. Such projects demonstrate the potential to take innovative steps in improving healthcare services and immunization coverage (10). Implementation of health IT can boost the effectiveness of the Expanded Program on Immunization (EPI) program by managing vaccine logistics. According to the survey conducted in Pakistan by WHO and United Nations International Children's Emergency Fund (UNICEF) in 2014, vaccine distribution, stock management and information management were notably weak and required immediate improvement (11). The average score from the Effective Vaccination Management Assessment (EVMA) for Pakistan was 61% in 2014 with the goal of improving the score to 80% by 2020 in all EVM criteria. One of these strategic goals is aimed to implement a need-based distribution system with reliable transport for vaccines, efficient network design and route planning. A need-based distribution system is essential to strengthen immunization supply chains and is critical to reaching the 2020 immunization goals (12). Electronic immunization registration and tracking systems seem to be a necessary step in achieving this goal.

Bangladesh Community Health Workers; Benchmark Shasthya Shebika (SS) Program for Effective Retention and Training Strategies

Bangladesh has implemented its community health worker program since 1990. There were 1,080 Shasthya Shebikas (SSs) initially. Currently, there are approximately 100,000 SSs. The Shasthya Shebika

Program is focused on the need for female health workers in Bangladesh to overcome the local community's socio-cultural barriers to accessing health care services (13). The cardinal feature of this program is the effective retention strategy for health workers. SSs are given small loans to establish revolving funds. SSs use these funds to make money by selling healthcare products at a small markup. The products include contraceptives, iodized salt, oral rehydration solution, soap, safe delivery kits, sanitary napkins, sanitary latrines, and vegetable seeds. As a result of this, the SSs are satisfied with the benefits provided. Consequently, the program has grown as a self-sustaining healthcare system. The program has widely contributed to Bangladesh's remarkable progress in reducing under-five mortality and to its national tuberculosis control program. The Building Resources Among Communities (BRAC) also initiated a process by which SSs are eligible for micro-loans for other income-generating activities. Such measures were taken to ensure that they can obtain a livelihood and strive in the pluralistic health system (14).

SSs have formal training series that covers a broad range of healthcare issues. SSs receive four weeks of training from a local BRAC office on an array of health issues. The curriculum follows the international standards, such as a combination of the World Health Organization (WHO) *Guiding Principles for Complementary Feeding of the Breastfed Child* (2003) and WHO's *Infant and Young Child Feeding Counseling*, and *Essential Nutrition Actions training module*. The curriculum is delivered in a formal learning environment such as lectures, video, group discussion, role play, experience sharing, and more. Following this classroom training, the SSs receive on-site training in the field with master trainer supervision. To pass the training, under master trainer observation, the SSs must achieve the set goals. The examples of specific goals include counselling a mother with young children in 2-3 essential practices as well as help her to demonstrate recommended practices such as breast attachment, breastmilk expression, and food preparation for older infants (15). The well-organized structure of the SSs is a critical factor in the success of the program. BRAC has now expanded its CHWs training to its programs in Afghanistan and has so far trained and fielded over 3000 of them in several provinces (16). It is also planning to train CHWs in its expanded programs in Tanzania and Uganda (16).

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eVIN (Electronic Vaccination Intelligence Network) in INDIA; a Perfect Benchmark Project:

UNDP has supported the Universal Immunization Program in India through designing and implementing the Electronic Vaccine Intelligence Network (eVIN). The Ministry of Health and Family Welfare of India brings together technology, people and processes to strengthen the vaccine supply chain. This unique innovation has digitalized information on vaccine stocks and storage temperatures.

Currently, eVIN is active in more than 521 districts, across 21 states and union territories.

eVIN has achieved over 80% reduction in instances of vaccine stock-outs and ensured improved availability of adequate and potent Universal Immunization Program (UIP) vaccines to all targeted children and pregnant women. eVIN has resulted in active registration and tracking of the vaccines. As a result, India has achieved a reduction in the over-utilization of vaccines from 3,053 lakh doses in the pre-eVIN period to 2,149 lakh doses in post-eVIN period across the initial 12 eVIN states. Accounting of the wastage and mismanagement has led to making savings of approximately 900 lakh doses of vaccines. Systemized processes by initiating corrective action to revise the target population for cold chain points, improve vaccine storage infrastructure and encourage effective planning and distribution. Because of eVIN, now there is over 99% of vaccine availability rate at all cold chain points.

Location, stocks and proper storage are critical in vaccine logistics, India decided to tackle the issue with an innovative solution called eVIN. Previously vaccinations registry and distribution and receiving were recorded in paper registers. Now they use electronic eVIN, and it is improving the vaccine logistics as now they don't have to worry about stock-out, which was the main worry before. United Nations Development Program (UNDP) is working with **Global Alliance for Vaccines and Immunization (GAVI)**, The Vaccine Alliance and The Government of India to immunize 27 million new children each year. eVIN has reduced vaccine wastage. UNDP has covered over 11,000 vaccines storage points across the country and trained nearly 20,000 government cold chain handlers on eVIN (17).

eVIN has won the Public Health Initiative Silver Award at the India Health and Wellness summit 2017 because of all the achievements (18).

Incorporating the benchmark programs; relevance to hypothetical strategic project:

Following table summarizes the objectives of the hypothetical strategic project along with the expected outcomes:

| Objectives | Expected Outcomes |
|---|--|
| Additional CHWs (all females) will be recruited, trained, and supervised, in underserved areas. | Community-based CHWs will serve as a trusted resource for access to health and social services as well as health information and immunizations. |
| Design and administer a community health assessment to local residents. | A better understanding of the health needs and interests of community members will be achieved. Results will be used to inform the development of community health education sessions. |
| Design and implement an electronic immunization registration and tracking system. | Improve vaccination coverage and logistics in the underserved district of Quetta to address under report, vaccination wastage and missing doses that constitute a significant concern. |
| Distribute cell phones and tablets. Conduct training sessions on how to operate the application. | Build the confidence of LHW to operate the electronic system for immunization record. |
| Community health workers will be offered micro-loans for selling products of basic medical needs to the community with markups. | Implementation of effective retention strategies to attract LHWs to work in the underserved area of the district of Quetta. |

How the program is supposed to be evaluated:

15% of the project budget will be assigned for the evaluation of the project. The evaluation will be done by implementing ongoing assessments within the project, such as:

- a) The first evaluation will be carried out in the beginning of the project implementation. The community health assessment will be used to understand better the specific needs and interests of the community residents. The data from this assessment will be compiled by the Program Coordinator and collaboratively analyzed with the Program Director. The results will inform all aspects of the subsequent program development and implementation.
- b) The program's tracking and monitoring system by providing the continuous stream of data regarding program activities will allow management staff to evaluate the team's progress towards reaching program goals. Using a standardized checklist, CHWs will collect and submit data for the program's activities each week. The data will include details of the individual encounters and immunizations given. Data will consist of a sign-in sheet to track attendance. The Program Coordinator will review and analyze submitted data quarterly to monitor the progress towards reaching program goals and objectives.
- c) Additionally, the Program Coordinator will annually facilitate surveys, interviews, and focus groups with a sample of community members and stakeholders on the impact of the program and how it could be improved.
- d) The **User Version of the Mobile Application Rating Scale (uMARS)** is a simple tool that can be reliably used by end-users to assess the quality of electronic health applications (19). The rating scale will be applied after the second quarter to evaluate the electronic vaccination registration and tracking system.

Recommendations for hypothetical health project:

Funds for small businesses will be offered to attract and retain the workers:

Pros: The strategy will retain CHWs in the underserved areas. There would also be a beneficial impact in terms of delivery of basic medical products to the local communities.

Cons: Regular supervision of these small businesses would be needed to ensure the quality of the products

delivered. Local businesses in underserved areas tend to have poor quality control of the supplies, especially when there is a lack of education among costumers like in Quetta, Balochistan.

Training and supervision for the electronic system will be provided to CHWs:

Pros: Training of LHWs in electronic immunization registration and tracking system will build the confidence of CHWs and foster empowerment. The strategy will result in improved logistics and lesser wastage of vaccinations. LHWs would be able to track the missed doses and reach out to the parents and children for scheduled vaccinations.

Cons: Formal training sessions will be needed. Expert IT professionals are difficult to find in underserved rural areas. Maintenance in case of technical issues would be hard to manage if trained IT professionals are not available.

Distribution of electronic devices such as tablets and cell phones will be considered:

Pros: Distribution of electronic devices would make it easy for the community workers to perform data entry. The strategy will help in improving the immunization record system and vaccine logistics.

Cons: Power outage can affect the internet facilities in some rural areas and can halt the operations. Internet coverage would be an issue in such circumstances, leading to difficulty in operating the electronic immunization system. Also, IT experts and trainers are required for training the CHWs in underserved areas. Finding and hiring IT specialists in underserved areas would be a challenge.

Training of CHWs will be integrated into the formal training institutions, which will follow international guidelines in their training structures:

Pros: The strategy will improve the education structure. CHWs will be able to address a broad range of illnesses. Additionally, it will increase opportunities for the CHWs to advance their careers and grow professionally.

Cons: Rural and under-served areas typically lack formal training institutions. It would be hard to set a formal educational structure that could be integrated into the advanced training institutions for CHWs in underserved areas.

Conclusion

LHWs program in Pakistan is facing challenges such as disparities in allocation and retention issues in underserved areas such as the district of Quetta, Balochistan. Additionally, it is critical to improve vaccination logistics and coverage through electronic immunization and record system. The ministry of health, Pakistan has the potential to launch a health project to address these issues by following the benchmark strategies adopted by other countries such as Bangladesh and India, facing similar challenges.

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