Role of operational research in accelerating progress towards attainment of poliomyelitis targets in the African Region

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The African Region has achieved considerable progress towards attainment of the poliomyelitis target. Twelve countries in the African Region had active wild poliovirus transmission with a total of 337 cases in 2011, but these had decreased to only 16 cases in four countries by the end of July 2014. Previous importation countries have been able to contain importation and transmission of poliovirus. Angola, for instance, has remained poliovirus free since 7 July 2011. The last WPV case in Chad was recorded on 14 June 2012.

Operational research has contributed to this progress and is defined as the discipline of applying advanced analytical methods to help make better decisions in programme implementation. It is the search for knowledge on interventions, strategies or tools that can enhance the quality, effectiveness or coverage of programmes in which the research is being conducted. Operational research is increasingly recognized as the bedrock of evidence-based programming for targeted disease control and prevention activities. It has a key role in bridging the gap between what we know and what we do in terms of attaining programmatic goals. In the commercial sector, OR is widely used to improve service delivery.

The progress made in polio eradication has been due to implementation of four major strategies:

- High coverage in routine immunizations;
- Supplementary immunization activities (SIAs);
- Surveillance of acute flaccid paralysis (AFP) and;
- Mop-up activities.

However, the impact of these proven effective interventions was initially slow due to a number of challenges encountered in their implementation. The PEI responded to these challenges by embracing OR to identify mitigating solutions.

Much OR was conducted, especially in priority countries including Angola, Chad, Democratic Republic of Congo and Nigeria, not only to provide information on the key aspects of the epidemiology but also to generate evidence-based communication interventions to address the behavioural concerns encountered in the implementation of the four pillars of PEI. For instance, reporting on the independent review of polio communications research in Nigeria, Peters noted that Nigeria’s polio eradication programme has a wealth of research studies and data collected surrounding poliovirus, its transmission...
patterns, regional “hotspots”, and the mapping, logistics and cold chain for immunization campaigns. The programme relied on these studies to guide strategic decision-making and practice regarding communication and improvement of vaccination coverage in high-risk areas with low coverage rates.

The role of OR in accelerating progress towards attainment of poliomyelitis targets in the African Region has been fundamental, and there are many lessons to be learned from this experience. This article gives an overview of some of the studies conducted and the impact on the PEI strategies since the declaration of polio in Africa as programmatic emergency.

**OR in poliomyelitis eradication programme in the African Region**

Operational research in the PEI programme in the African Region has focused on two core areas, namely: optimization of the use of polio vaccines, and strengthening surveillance for AFP. These two areas are critical in the PEI considering that adequate immunization coverage is required to produce the desired herd immunity to break transmission of the virus, while sensitive AFP surveillance is required to evaluate the epidemiology. Although a number of important studies have been conducted along on two core areas, space only allows us present a few of them in this review.

**Case studies of OR in poliomyelitis eradication in the African Region**

**ANGOLA: Reasons and circumstance for late notification of AFP cases in health facilities**

Timely detection of AFP cases is important as stool samples have to be collected within two weeks to be able to detect poliovirus. The detection of poliovirus in such cases will trigger a cascade of intervention measures such as supplementary immunization in the affected community and beyond. A number of AFP cases were presented at health facilities way beyond the window period for investigating if poliovirus was the cause of the paralysis. This major gap in the PEI led to a study with the main objective to understand the reasons behind late notification of cases of AFP in health facilities.

Parents of the affected children were interviewed to elicit the reasons for reporting late via an in-depth interview guide. The health workers in the health facilities were also interviewed. The results of the study revealed that parents were ignorant and had the wrong perception of the etiology of AFP. They were also dissatisfied with the level of care at public health facilities. For these reasons, and given the anxiety associated with such dramatic paralysis of children, parents often opt for the quick and more responsive alternative approaches. Therefore, a majority of them sought alternative health care such as traditional healers and spiritualists. Unfortunately, these alternative health care providers were unaware of the AFP reporting and investigation procedures, hence the delay.

The few, who made it to public health units were faced with ill-equipped rural health workers who waited for the arrival of more qualified staff, which could take several days.

This study led to strengthening the AFP surveillance processes beyond the conventional health facilities, and the rate of AFP reporting and timing of stool sample collection have improved dramatically.

**CHAD: How to explain the refusal of some Chadian parents to vaccinate their children – an ethnocultural study**

Persistent outbreak of polio in localized areas in Chad led to the discovery of low vaccination coverage rates due to refusal of parents to allow vaccination. Following this finding a study was conducted to identify reasons behind parents’ refusal to get their children vaccinated during SIAs. This study used qualitative tools of inquiry, namely in-depth interviews and focus group discussions, for data collection. Religious and community leaders as well as local political chiefs were engaged via in-depth interviews to ascertain their disposition to childhood vaccination. Parents of children under five years were engaged in a series of focus group discussions to ascertain their perceptions of, and attitude to, childhood vaccination in the communities. The results revealed:

- A number of interrelated factors were involved such as rumours about the unclear intentions of government and vaccination officials;
- Doubt about efficiency given the repetitive nature of polio vaccination with even persons already vaccinated suffering paralysis of limbs;
- Belief in having more potent traditional ways of ensuring protection against diseases, which are as effective as modern-day vaccination; and
- Unprofessional conduct of the vaccinators, which discouraged a significant proportion of the population.

The results of this study helped in formulating appropriate communication messages that addressed these concerns of the community, and training for vaccinators. The impact was a dramatic reduction in the proportion of parents refusing vaccination for their children, and polio transmission has been interrupted since July 2012.

**NIGERIA: Vaccine perceptions – a comparative study of vaccine acceptors and refusals**

Nigeria had communities that differed slightly from Chad, by having both vaccine refusals and acceptors in the same communities. A study to determine vaccine perceptions in these two groups was conducted using in-depth interviews of 72 parents, including both groups and community leaders. The interview assessed vaccine acceptance, social and personality factors. Perceived benefits of vaccines as well as susceptibility to infection with poliovirus were found to influence OPV acceptance. Those who had experienced paralysis of any type in the family also showed positive disposition towards polio vaccines. The implications of this study include the investigation of vaccine acceptance in a high-risk population.

**NIGERIA: AFP awareness among health workers in Sokoto State**

Delayed arrival of AFP cases and stool samples were also observed in some states of Nigeria. Following the results from the Angola study described earlier, a study was conducted in Sokoto State, Nigeria, with the aim of ascertaining
The finding from this study led to massive training of clinicians in all the private health facilities in the state and beyond. Flyers and posters were distributed widely in both private and public health facilities as well as public places like churches, markets, mosques, etc. Encouragingly, the rate of delayed reporting of AFP cases and collection of stool samples dramatically reduced.

Discussion

The central theme of the Polio Eradication and Endgame Strategic Plan 2013–2018 includes sensitive and timely detection of circulating poliovirus and achieving high population immunity through vaccination with OPV. However, despite these initiatives poliovirus continued to circulate for longer than anticipated, which led to the question as to why these proven effective interventions were not working in this setting. The examples given above provided answers that addressed the challenges allowing a positive impact to be made. This clearly indicates the crucial role OR has played in accelerating progress towards attainment of poliomyelitis targets in the African Region.

Polio eradication requires much community participation to be successful. These studies identified factors that led to the development of communication strategies on these interventions, which improved community involvement in planning and participation in immunization. It also caused programme managers to adjust the planning of both routine immunization and SIAs, and warranted training/retraining of health professionals on how they conduct their duties.

Research for health has been, and will continue to be, the tool that provides solutions that improve delivery of health care services, including immunization. Interest in OR on immunization is growing, largely in recognition of the contribution it can make to maximizing the beneficial impact of immunization services. Unfortunately, the awareness and the essential skills to conduct OR are limited in the African Region. The impact of these studies presented above underscores the need to not only embrace OR in resolving operational issues but also embed OR in our programmes. It should also be remembered that in most cases the audience for this research in not another researcher but a non-specialist programme manager in need of clear, evidence-based analysis that can form the basis of decision-making. This calls for researchers and programme implementers to come together to generate important operational questions that need answers from research. With this approach, OR is best prioritized, designed and implemented, and the results translated into practise, when the point of view of programme officers and decision-makers is considered.

Various advisory bodies, including the Task Force on Immunization (TFI), have emphasized the need for OR in the African Region for the obvious reasons of better implementation of public health strategies. WHO has conducted a number of workshops and provided guidelines to support countries in undertaking OR to address the different challenges that they encounter in the implementation of their activities.

References


Figure 1. Awareness of AFP case definition in public and private polio-reporting facilities