



The impact of introducing new vaccines on the health system: Case studies from six low- and middle-income countries



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ABSTRACT

Objective: We aimed to explore the impacts of new vaccine introductions on immunization programmes and health systems in low- and middle-income countries.

Methods: We conducted case studies of seven vaccine introductions in six countries (Cameroon, PCV; Ethiopia, PCV; Guatemala, rotavirus; Kenya, PCV; Mali, Meningitis A; Mali, PCV; Rwanda, HPV). Interviews were conducted with 261 national, regional and district key informants and questionnaires were completed with staff from 196 health facilities. Routine data from districts and health facilities were gathered on vaccination and antenatal service use. Data collection and analysis were structured around the World Health Organisation health system building blocks.

Findings: The new vaccines were viewed positively and seemed to integrate well into existing health systems. The introductions were found to have had no impact on many elements within the building blocks framework. Despite many key informants and facility respondents perceiving that the new vaccine introductions had increased coverage of other vaccines, the routine data showed no change. Positive effects perceived included enhanced credibility of the immunisation programme and strengthened health workers' skills through training. Negative effects reported included an increase in workload and stock outs of the new vaccine, which created a perception in the community that all vaccines were out of stock in a facility. Most effects were found within the vaccination programmes; very few were reported on the broader health systems. Effects were primarily reported to be temporary, around the time of introduction only.

Conclusion: Although the new vaccine introductions were viewed as intrinsically positive, on the whole there was no evidence that they had any major impact, positive or negative, on the broader health systems.

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1. Introduction

The pace of new vaccine introductions in low- and middle-income countries has been accelerating in the past decade and will continue [1]. This has led to increased attention on their broader impact, with the possibility that they may either stress or

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Table 1
Details of the vaccine introductions studied.

Country	Vaccine studied	Date of introduction	Data collection period	Vaccine introduction process
Cameroon	PCV13	July 2011	May–June 2012	GAVI funded Planned for PCV7 in 2010 Switched to PCV13 when it became available, but supply issues delayed its introduction
Ethiopia	PCV10	November 2011	December 2012–January 2013	GAVI funded Catch up for <1 year olds
Guatemala	Rotavirus	February 2010	July 2011	Government funded Only limited introduction preparations; no introduction plan prepared Initially introduced Rotateq (two doses), then switched to Rotarix (three doses), then back to Rotateq Rotateq not purchased through PAHO revolving fund No national social mobilisation
Kenya	PCV10	February 2011	July–August 2011 and March–April 2012	GAVI funded. First sub-Saharan African GAVI country to introduce PCV Catch up for <1 year olds
Mali	Men A	September 2010–December 2011	July–August 2011 and January 2012	GAVI funded Introduction over three phases 10 days campaign, targeting 1–29 year olds Key role of WHO MSF implemented in a few districts
Mali	PCV13	March–December 2011	March–June 2011 and January 2012	GAVI funded Nationwide introduction phased over 10+ months
Rwanda	HPV	April 2011	August 2012	3 year donation from Merck First African country to introduce HPV Vaccination through school-based 2-day campaign for girls in 6th year of primary school. Some catch up in other grades during second and third year of campaigns. For girls not at school, 12 year olds were targeted at the nearest health centres Campaign ran three times per year

strengthen health systems in these countries. In 2010, the World Health Organization (WHO) set up an ad-hoc working group to explore the issue for their Strategic Advisory Group of Experts on Immunisation [1]. Members of the team for the present study participated in this group and our preliminary results informed the group's findings and recommendations [2].

There is a lack of research focusing on the impact of new vaccine introductions on countries' expanded programme of immunisation (EPI) or health system as a whole, particularly in low-income countries [3,4]. Previous research has typically focused either on the impact of vaccination campaigns on the routine immunisation service [5–8], or the impact of new vaccine introductions on specific elements of the health system, such as cold chain [9], logistics and supply [10,11] or coverage [12].

The EPI is traditionally a relatively vertical programme, although routine immunisation is arguably more integrated than vaccination campaigns. Research on the health system impact of other vertical health programmes, including vaccination campaigns, have identified both positive and negative effects [6,13–16]. It has also been noted that these impacts varied depending on the strength of the health system [6,15].

This study aimed to explore impact of new vaccine introductions on immunisation programmes and the broader health system. It did not aim to estimate the costs of new vaccine introductions as this would require a different type of methodology and has been the focus of another multi-country research project.

2. Methods

We conducted mixed-method case studies of seven vaccine introductions in six low- and middle-income countries (see Table 1

for details). The study team comprised staff from The London School of Hygiene and Tropical Medicine (LSHTM), as well as at least one collaborator per case study country. Data collection was conducted by both the country collaborators and LSHTM staff.

2.1. Case studies sampling frame

Countries were selected to include a range of vaccines, presentations, delivery strategies and financing mechanisms. Countries were eligible for inclusion if they planned to introduce a new vaccine in 2010 or 2011, in order for this introduction to be sufficiently recent at the time of data collection. Five of the seven vaccine introductions were funded by the GAVI Alliance; rotavirus in Guatemala and human papilloma virus (HPV) in Rwanda were the exceptions. In Mali and Rwanda, Meningitis A (Men A) and HPV vaccines were introduced respectively using a campaign-based approach. In Mali, the introduction was through a mass catch-up campaign organised in three separate phases and in Rwanda through a school-based delivery model that was part of the national immunisation schedule. In the remaining countries the new vaccines, pneumococcal vaccine (PCV) and rotavirus, were introduced into the routine, infant immunisation programme.

2.2. Within-country sampling

Within countries, two to four regions were selected based on their vaccination coverage (high, average and low compared to national figures). Two to three districts were selected purposively within each region, representing different vaccination coverage rates as well as both urban and rural areas.

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