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Outsourcing vaccine logistics to the private sector: The evidence and lessons learned from the Western Cape Province in South-Africa

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ABSTRACT

With few exceptions, immunization supply chains in developing countries continue to face chronic difficulties in providing uninterrupted availability of potent vaccines up to service delivery levels, and in the most efficient manner possible. As these countries struggle to keep pace with an ever growing number of vaccines, more and more Ministries of Health are considering options of engaging the private sector to manage vaccine storage, handling and distribution on their behalf. Despite this emerging trend, there is limited evidence on the benefits or challenges of this option to improve public supply chain performance for national immunization programmes. To bridge this knowledge gap, this study aims to shed light on the value proposition of outsourcing by documenting the specific experience of the Western Cape Province of South Africa. The methodology for this review rested on conducting two key supply chain assessments which allowed juxtaposing the performance of the government managed segments of the vaccine supply chain against those managed by the private sector. In particular, measures of effective vaccine management best practice and temperature control in the cold chain were analysed. In addition, the costs of engaging the private sector were analysed to get a better understanding of the economics underpinning outsourcing vaccine logistics. The results from this analysis confirmed some of the theoretical benefits of outsourcing to the private sector. Yet, if the experience in the Western Cape can be deemed a successful one, there are several policy and practice implications that developing countries should be mindful of when considering engaging the private sector. While outsourcing can help improve the performance of the vaccine supply chain, it has the potential to do the reverse if done incorrectly. The findings and lessons learnt from the Western Cape experience can serve as a step towards understanding the role of the private sector in immunization supply chain and logistics systems for developing countries.

1. Introduction

With few exceptions, immunization supply chains in developing countries continue to face chronic difficulties in providing uninterrupted availability of potent vaccines up to service delivery levels, and in the most efficient manner possible. Combined with the struggles to keep pace with an ever increasing number of vaccines to introduce, many government-managed systems remain crippled by inefficiencies [1–4]. Recent WHO and UNICEF assessments in 65 low and lower-middle income countries have revealed that few countries meet minimum standards for effective vaccine storage, distribution, handling, and stock management [5,6]. Without significant investments to upgrade government-run immunization supply chains that already tie up significant resources, the aspirations to strengthen routine immunization as a whole will remain quixotic at best. Another option to such large investments is for national government in developing countries to consider engaging the private sector to manage supply chain functions on their behalf. Supply chain theory postulates that, if managed correctly, the outsourcing of vaccine logistics to a 3rd party private sector logistics service provider can lead to a reduction in total delivery costs, better on-time delivery of vaccines, higher adherence to temperature thresholds, better vaccine management and handling practises, reduced inventory costs, and greater ability to increase volume and scale (volume flexibility) than a government managed supply chain system. While the theory suggests that outsourcing can be more cost-effective and lead to higher levels of service performance, there is limited evidence or published case studies in

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developing countries documenting the theory against the practice when it comes to vaccines.

This study aims to shed light on the value proposition of outsourcing immunization supply chain functions to the private sector by documenting the specific experience of the Western Cape Province of South Africa. Indeed, in 2005 the Western Cape decided to enter into a public private partnership with a private sector logistics service provider (LSP) known as the "*Distribution Agreement*" [7–9]. Enduring challenges of stock management, the lack of adequate cold chain storage facilities, and overall inefficiencies in the government run distribution system for vaccines, were the primary reason leading the Western Cape Department of Health (WCDH) to relegate certain supply chain functions previously managed "*in-house*", to a 3rd party logistics service provider that had a comparative advantage in storing, handling and transporting vaccines at lower costs and at higher levels of service. For a fee levied on the value of the vaccines procured, the outsourced private sector LSP was responsible for guaranteeing the cold chain storage and management of vaccines for the province, and their effective transport from their provincial warehouse directly to health centres. On the basis of two key assessments conducted, the findings show that outsourcing resulted in a better vaccine management and handling practises, and higher adherence to temperature thresholds in the cold chain. In addition, the analysis of the cost of the outsourcing arrangement point to lower costs than those that would be incurred is the same logistics function were done *"in-house"* by the provincial government. Lastly, key lessons learnt and policy and practice implications were teased out. From this experience, it is hoped that these findings will serve as a step towards understanding the potential role of the private sector in immunization supply chain and logistics systems for developing countries.

2. Methods

For this study, both qualitative and quantitative evidence was collect along the different vaccine supply chain segments in effect between the provincial vaccine store and health centres. One of the particularities was the presence of two types of supply chain segments that needed to be reviewed separately: a 2 tiered supply chain segment that was outsourced to the private sector LSP which covered the distribution of vaccines from provincial level to 47% of health centres in the province (or 131 Health Centres); and a 3 tiered supply chain segment where vaccines are managed by public sector district hospitals and where the district governments are responsible for storing and transporting vaccines the remaining 53% of health centres in the Western Cape Province (Fig. 1).

Data collection was carried out in both the 2 tiered (outsourced) and 3 tiered (government managed) supply chain segments during two key assessments. In addition to the provincial vaccine warehouse, a total of 10 sites were sampled for these two assessments, including 2 district hospitals and 8 health facilities. First, an *EVM assessment* was carried out using the standardized methodology and tool developed by WHO in order to determine whether vaccine management practices are up to international norms and standards, and to diagnose overall strengths and weaknesses in the vaccine supply chain according to eight key dimensions: temperature control in the cold chain; sufficient cold chain storage capacity; quality of the infrastructure; efficiency in the maintenance systems for the infrastructure; stock management processes; vaccine distribution practices; compliance with vaccine management policies; and use of a logistics management information systems (LMIS) to track and trace vaccines [10]. The EVM methodology aggregates the results so that each dimension is given a score between 0% and 100% at the end of the assessment. For the supply chain system to be considered up to standard on a dimension, a score of 80% or more is required [10]. Second, an in-depth *temperature monitoring assessment* was conducted to determine whether vaccines were being kept in the recommended temperature ranges, at all times during storage and transport to ensure that their potency was not compromised by damaging temperature excursions. The WHO study protocol for temperature monitoring in the vaccine cold chain was the basis of the methodology [11]. The temperature of

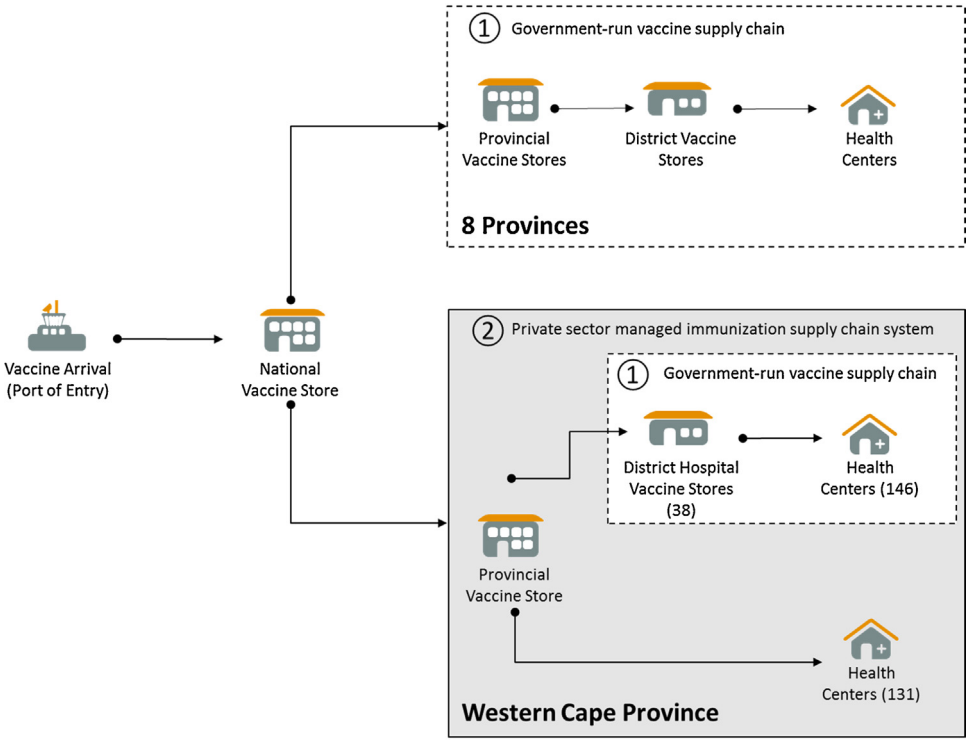

Fig. 1. Schematic of the supply chain network specific of the Western Cape Province.

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