Dedicated Logistics System

Vaccine and Rapid Diagnostic Tests Logistics and Vaccination Coverage Rate Study

Baseline Evaluation

Cabo Delgado and Niassa Provinces
2010
Introduction

• 2002-2007: VillageReach, FDC, and Cabo Delgado DPS implemented a support program to improve EPI services offered to the population in the province using a new system of vaccine logistics.

• In 2008 VillageReach published the results of a study that demonstrated significant impact of the new logistics system:
  • Increase in DPT3 rates from 68.9% in 2003 to 92.8% in 2008
  • The logistics system in Cabo Delgado was 17% more cost-effective than the system in the neighboring province of Niassa.

• In 2010, VillageReach began providing technical assistance to DPS in Cabo Delgado and Niassa provinces to implement and operate the Dedicated Logistics System for vaccines.

• In addition to vaccines, Rapid Diagnostics Tests (RDTs) for malaria, syphilis, and HIV are being integrated into the Dedicated Logistics System.
Dedicated Logistics System Objectives

• To improve child health in Mozambique by sustaining high vaccination coverage rates and low vaccination dropout rates;
• To improve the community’s knowledge of, trust in, and use of health services;
• To increase the cost-effectiveness and cost-efficiency of the logistics systems for vaccines, related commodities, and RDTs in Mozambique;
• To reduce stock outs of vaccines and RDTs in all health centers where system is implemented;
• To reduce interruptions in service delivery due to stock shortages, health worker absence, and lack of health worker time; and
• To integrate additional key commodities into the Dedicated Logistics System.
Research Objectives

• The main objective of this research is to establish baseline estimates for the outcome indicators associated with the Dedicated Logistics System objectives.
• A follow-up study will be conducted three years following the implementation of the Dedicated Logistics System for comparison.
• Results of the baseline evaluation will also be used to inform programmatic decisions.
Methodology

• The baseline evaluation studies were conducted by a third party consultancy group based in Mozambique, ANSA.
• The vaccination coverage rate studies used the methodology described by the WHO Reference Manual for Immunization Cluster Surveys (2005). The survey included households with children aged 12-23 months and was administered to the head of household or equivalent decision maker.
• In Cabo Delgado the sample consisted of 30 clusters of 7 households and Niassa the sample consisted of 10 clusters of 10 households in 6 districts.
• In addition to the household survey, a questionnaire was carried out in each health facility nearest to the selected cluster and conducted with the individual responsible for EPI and RDTs at the health facility.
Household Immunization Coverage Rate Study

Results
## General characteristics of the sample

<table>
<thead>
<tr>
<th></th>
<th>Cabo Delgado</th>
<th>Niassa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Districts included</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Total number of children aged 12-23 months</td>
<td>211</td>
<td>602</td>
</tr>
<tr>
<td>Average age of children included</td>
<td>18 months</td>
<td>19.3 months</td>
</tr>
<tr>
<td>Percent female children included</td>
<td>45.9%</td>
<td>46.6%</td>
</tr>
<tr>
<td>Percent of children with vaccination cards present</td>
<td>97.6%</td>
<td>92.2%</td>
</tr>
<tr>
<td>Average age of respondents</td>
<td>28 years</td>
<td>27 years</td>
</tr>
<tr>
<td>Average size of the household</td>
<td>6 persons</td>
<td>5.7 persons</td>
</tr>
<tr>
<td>Average number of children under two years in the household</td>
<td>1.6</td>
<td>1.7</td>
</tr>
<tr>
<td>Households with a female as head of household</td>
<td>25.1%</td>
<td>14.2%</td>
</tr>
</tbody>
</table>
Sample Characteristics
Mother’s Education Level

Cabo Delgado
- No education, 40.3%
- Some Primary, 36.0%
- Completed Primary, 13.3%
- Some Secondary, 10.4%

Niassa
- No education, 49.7%
- Some Primary, 36.5%
- Completed Primary, 8.0%
- Some Secondary, 5.3%
- Completed Secondary, 0.5%
DPT3 Coverage
(percent of children with third dose of DPT/Heb B by 12 months of age)

2010 estimates
• Cabo Delgado = 91.9%
• Niassa = 78.1%

DTP3 coverage over time

<table>
<thead>
<tr>
<th>Year</th>
<th>Cabo Delgado</th>
<th>Niassa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>28.9%</td>
<td>59.3%</td>
</tr>
<tr>
<td>2003</td>
<td>54.6%</td>
<td>54.6%</td>
</tr>
<tr>
<td>2008 (24-35 mo)</td>
<td>68.9%</td>
<td>70.0%</td>
</tr>
<tr>
<td>2008 (12-23 mo)</td>
<td>95.4%</td>
<td>92.8%</td>
</tr>
<tr>
<td>2010</td>
<td>91.9%</td>
<td>78.1%</td>
</tr>
</tbody>
</table>
# Vaccination Coverage

<table>
<thead>
<tr>
<th></th>
<th>Fully Immunized before 12 months</th>
<th>Fully Immunized before 23 months</th>
<th>Fully Vaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent of children who received all valid doses of vaccine before the age of 12 months according to vaccine schedule</td>
<td>Percent of children who received all valid doses of vaccine according to vaccine schedule before the age of 23 months</td>
<td>Percent of children who received all vaccines regardless of timing verified by card or by mother</td>
</tr>
<tr>
<td>Cabo Delgado</td>
<td>48.3%</td>
<td>48.8%</td>
<td>89.1%</td>
</tr>
<tr>
<td>Niassa</td>
<td>22.6%</td>
<td>34.5%</td>
<td>77.0%*</td>
</tr>
</tbody>
</table>

*Population adjusted (crude rate for sample is 80.4%)

**Fully Immunized Criteria:**
- BCG vaccination history and verified by scar and history, or by card;
- All three doses of polio vaccine received with a minimum of 28 days apart, as verified by card;
- All three doses of DTP/HepB received with a minimum of 28 days apart, as verified by card and;
- Measles vaccine received at or after 9 months of age as verified by card.
Trends in vaccination status over time:
Percent fully vaccinated

(1) in Cabo Delgado children aged 24-36 months in VR study, in Niassa results of 2008 MICS study (data from 2007)
(2) in Cabo Delgado children aged 12-23 months in VR study, in Niassa results of 2008 DPS study
## Compliance with vaccine schedule

(percent of children receiving vaccine not according to schedule)

<table>
<thead>
<tr>
<th></th>
<th>Cabo Delgado</th>
<th>Niassa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles vaccine received before 9 months of age</td>
<td>27.5%</td>
<td>15.8%</td>
</tr>
<tr>
<td>Measles vaccine after 12 months</td>
<td>9.5%</td>
<td>17.7%</td>
</tr>
<tr>
<td>Lack of 28 day interval between polio or DPT-Hep B doses</td>
<td>19%</td>
<td>26%</td>
</tr>
<tr>
<td>Missing at least one vaccine</td>
<td>11.4%</td>
<td>25.5%</td>
</tr>
<tr>
<td>Receiving at least one vaccine (other than measles) after 12 months</td>
<td>2%</td>
<td>6.4%</td>
</tr>
</tbody>
</table>
Reasons for immunization failure

Cabo Delgado
- Vaccine services are too far from home, 60.9%
- Not enough information about vaccines, 4.3%
- Concerned about vaccine side effects, 4.4%
- Family Problems, 13.0%
- Health worker absent, 11.1%
- Other causes, 5.40%

Niassa
- Vaccine services are too far from home, 17.9%
- Not enough information about vaccines, 24.9%
- Poor motivation, 17.9%
- Concerned about vaccine side effects, 4.4%
- Mother was too busy, 9.4%
- Vaccine not available, 13.4%
- Other causes, 5.40%
Knowledge of vaccines

- Had heard of vaccines
  - Cabo Delgado 94%
  - Niassa 77%
- Aware of the reason for vaccination
  - Cabo Delgado 49.5%
  - Niassa 32.9%
- Source of vaccine information
  - Community leaders: Cabo Delgado ~25%
  - Mobile brigade: Cabo Delgado ~36.5%  Niassa ~17%
  - Nurses and hospital staff: Cabo Delgado~33.5% Niassa ~60%
Access to vaccine services

- Mode of travel to the health facility
  - Foot
    - Cabo Delgado 91.5%
    - Niassa 92.8%
  - Bicycle
    - Cabo Delgado 7.6%
    - Niassa 6.2%
- Takes more than one hour to travel to the health facility
  - Cabo Delgado 62.1%
  - Niassa 58%
**Reasons for vaccine failure at the health facility**

<table>
<thead>
<tr>
<th>Health facility closed</th>
<th>Health worker not available</th>
<th>Vaccine services not offered</th>
<th>Stock out of vaccines</th>
<th>Don’t know</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delgado</td>
<td>2.4%</td>
<td>9.6%</td>
<td>22.9%</td>
<td>37.4%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Niassa</td>
<td>N/A</td>
<td>10.0%</td>
<td>N/A</td>
<td>56.6%</td>
<td>11.0%</td>
</tr>
</tbody>
</table>

*Overall, approximately 40% of respondents in both provinces claimed that they had visited a health facility for the purpose of vaccination but failed to receive a vaccine.*
Health Facility Survey

Results
## General sample characteristics

<table>
<thead>
<tr>
<th></th>
<th>Cabo Delgado</th>
<th>Niassa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of health facilities included in sample</td>
<td>29</td>
<td>47</td>
</tr>
<tr>
<td>• Health Post</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>• Health Center</td>
<td>25</td>
<td>41</td>
</tr>
<tr>
<td>• Hospital</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
## Health facilities experiencing a stock out

### Percnet of facilities with a vaccine stock out by type of vaccine

<table>
<thead>
<tr>
<th>Vaccine Type</th>
<th>CDG</th>
<th>Niassa</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG</td>
<td>9%</td>
<td>40%</td>
</tr>
<tr>
<td>Pentavalent (Hib-DTP-HepB)</td>
<td>100%</td>
<td>60%</td>
</tr>
<tr>
<td>Polio</td>
<td>14%</td>
<td>60%</td>
</tr>
<tr>
<td>Measles</td>
<td>13%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Tetanus</td>
<td>14%</td>
<td>40%</td>
</tr>
<tr>
<td>Any type of vaccine (other than pentavalent)</td>
<td>22%</td>
<td>67%</td>
</tr>
</tbody>
</table>
Vaccine Inventory Management

Average number of months until the expiration date of the vaccine (from the date of the interview)

<table>
<thead>
<tr>
<th>Location</th>
<th>Posto de Saude</th>
<th>Centro de Saude</th>
<th>Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabo Delgado</td>
<td>12.1</td>
<td>18.6</td>
<td>30.1</td>
</tr>
<tr>
<td>Niassa</td>
<td>7.2</td>
<td>14.5</td>
<td></td>
</tr>
</tbody>
</table>

Posto de Saude

Centro de Saude

Hospital
Response to vaccine stock out

- Go and search for vaccines: 71.4%
- Wait for vaccines to be delivered: 10.7%
- Communicate with the Department Chief: 17.9%

Note number of observations = 28
Cold Chain

• The majority of health facilities visited had a functioning refrigerator
  • Cabo Delgado 96.6%
  • Niassa 76%

Percent of health facilities by type of refrigerator
At the time of the survey 40% of health facilities in Niassa and 93% of health facilities in Cabo Delgado were out of stock of at least one type of RDT.
Conclusions

- The vaccination coverage rates in both provinces have increased in the last 10 years with Cabo Delgado maintaining high coverage rates compared to Niassa.

- However there remain opportunities for improvement:
  - There is poor adherence to the vaccine schedule resulting in children who are not fully immunized. This is the main barrier to increasing immunization coverage rates in the two provinces.
  - There are a number of lost opportunities and the most common cause is the lack of vaccines available.
  - There is a strong need for social mobilization and health promotion in the communities of Niassa

- Stock outs of vaccines are more common in Niassa than in Cabo Delgado

- In general, the distribution of RDTs is not regular in either province and needs significant improvement.

- Ensuring a regular distribution of RDTs will significantly reduce the occurrence of stock outs in health facilities.