

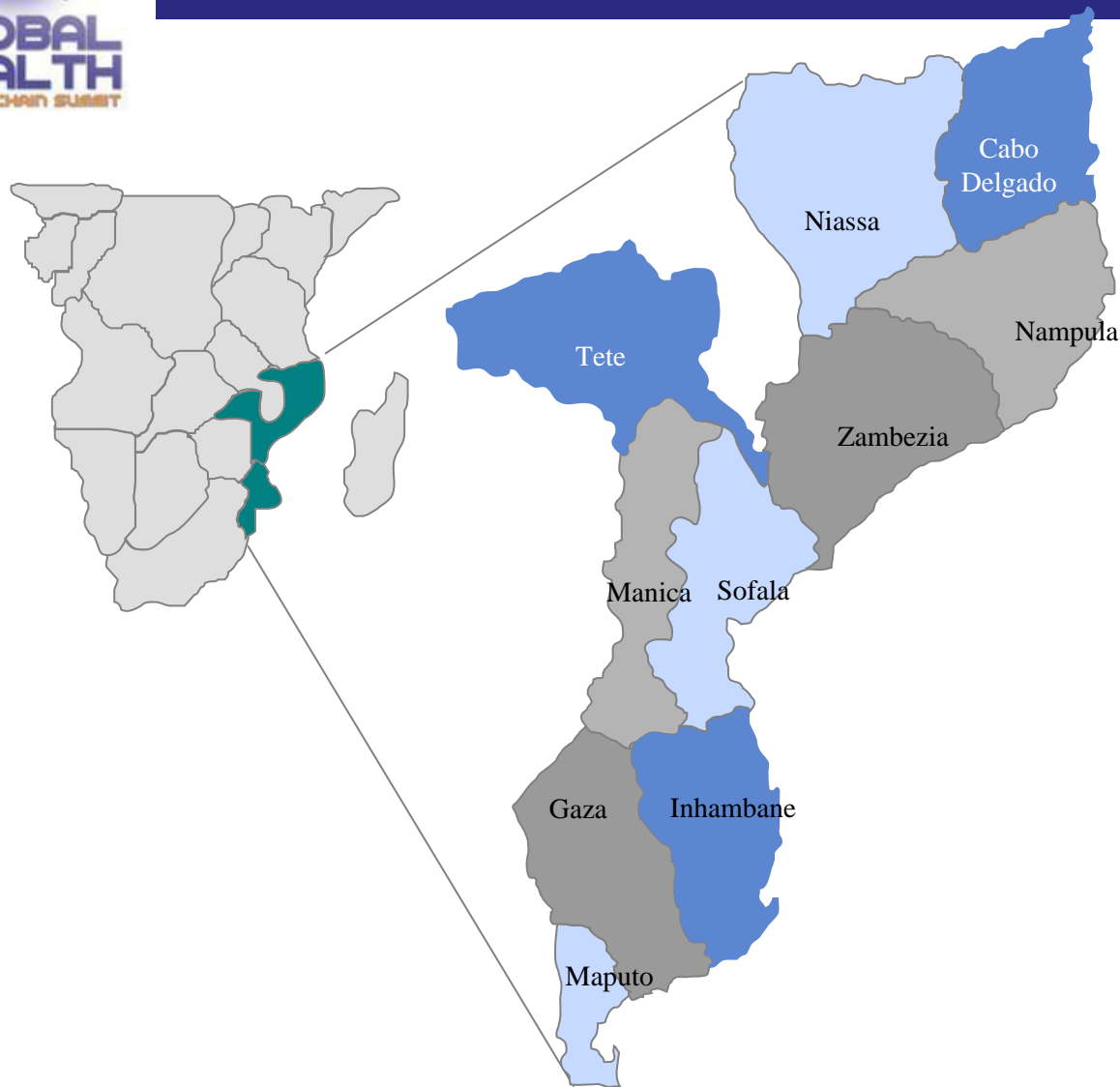


The Use of Data Analytics for Continuous  
Improvement Processes: An OpenLMIS Case  
Study from Mozambique  
Dianna Lourenco, VillageReach

Dakar, Senegal, November 2015



**GLOBAL  
HEALTH**  
SUPPLY CHAIN SUMMIT



- 11 Provinces; 148 districts
- Population 25.727.911
- Average annual population growth at 2.8% as of 2012.
- Illiteracy rate: 48.1%.
- 1700 Health Facility(HF)
- Ratio 1 HF:12,000 people



# Context

- Like other countries, Mozambique's Immunization Program struggles with the lack of HR personnel, accurate and timely data in the immunization supply chain

## **Challenges in traditional system**

- Health workers' work overload
- System is still paper based which requires a lot from the few health workers
- Lack of adequate training & supervision on data collection aggravated by high turn-over leads to poor quality data
- Low skills for analyzing data

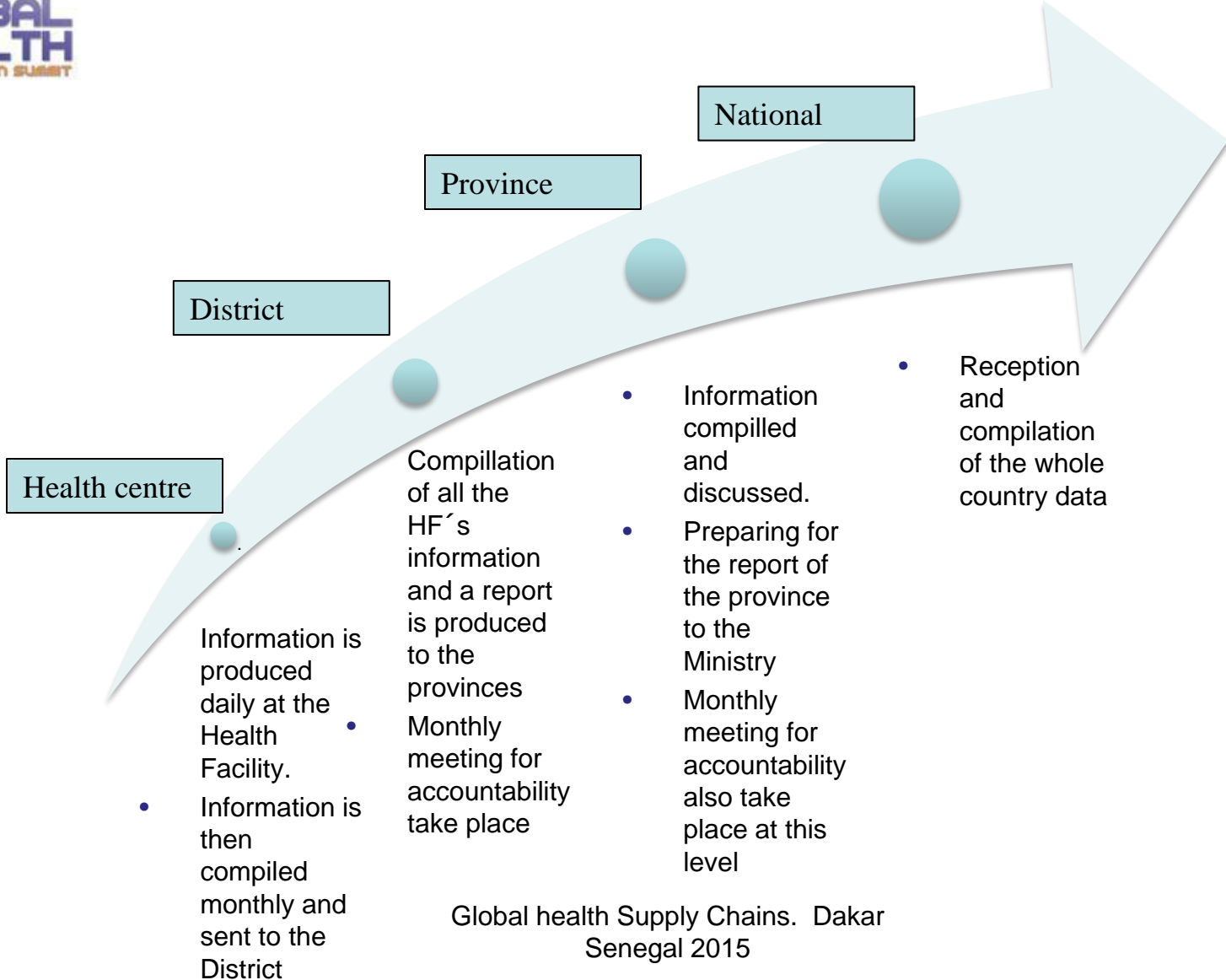


# Context

- Lack of data/information utilization culture
- With no report feedback loop – data is not used to learn and improve performance
- Immunization managers therefore have no accurate visibility on immunization supply chain performance
- Consequence poor decisions to reduce stock outs, wastage; cold chain downtime



# "Traditional" data flow





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# HF - Monthly summary report

REPÚBLICA DE MOÇAMBIQUE  
 Ministério da Saúde  
 Mod. SIS - A03-A

Província: TCFE  
 Distrito: Mocimboa do Batuque  
 US: Rede de Saúde  
 Mes: Novembro  
 Código: 2014  
 Ano: 2014

Data de Envio: 20/11/14  
 Data de Recepção:

Ficha de resumo mensal do PAV para nível da Unidade Sanitária - BCG, Polio, DPT-HepB-Hib, PCV, RV e Sarampo

Vacinas	Grupos Alvos	0-11 meses			Taxa de Cobertura	12-23 meses			Total vacinado	Frascos abertos	Taxa de desperdício
		Posto Fixo	Brigada Movel	Total		Posto Fixo	Brigada Movel	Total			
BCG	159	170	-	170		13	-	13	183	10	8.5%
Polio primario	159	170	-	170							
Polio 1ª Dose	155	183	-	183		1	-	17	200	34	2.3%
Polio 2ª Dose	-	204	-	204		1	-	8	212		
Polio 3ª Dose	-	233	-	233		1	-	19	252		
DPT-HepB 1ª Dose	155	183	-	183		17	-	17	200		
DPT-HepB 2ª Dose	-	204	-	204		8	-	8	212	67	21%
DPT-HepB 3ª Dose	-	233	-	233		19	-	19	252		
PCV 1ª Dose	155	183	-	183		17	-	17	200		
PCV 2ª Dose	-	204	-	204		8	-	8	212	332	80%
PCV 3ª Dose	-	233	-	233		19	-	19	252		
V 1ª Dose	-	-	-	-		-	-	-	-		
V 2ª Dose	-	-	-	-		-	-	-	-		
Sarampo	155	129	-	129		4	-	4	133	14	5%
Unidades completamente vacinadas	146	129	-	129							

Unidades completamente vacinadas	Posto Fixo	Brigada Movel	Total
13	14	15	16
meninos	73	-	73
mulheres	56	-	56
	129	-	129

# Provincial - Aggregated Report



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3	Provincia: NIASSA											
4	Período:01/2013 a 12/2013											
5	P A V - BCG, DPT - HepB, Polio e Sarampo											
7		<b>BCG</b>										
8		<b>Grupos</b>	<b>0-11 Meses</b>			<b>Taxa de</b>	<b>12-23 Meses</b>			<b>Total</b>	<b>Frascos</b>	<b>Taxa de</b>
9	<b>Distrito</b>	<b>Alvos</b>	<b>Posto Fixo</b>	<b>Bri.Móvel</b>	<b>Total</b>	<b>Cobertura</b>	<b>Posto Fixo</b>	<b>Brig.Móvel</b>	<b>Total</b>	<b>Vaciados</b>	<b>Abertos</b>	<b>Desperdício</b>
10	CIDADE DE LICHINGA	8,774	10,514	9	10,523	119.9 %	34		34	10,557	1,219	56.7 %
11	CUAMBA	10,339	12,346	323	12,669	122.5 %	68	9	77	12,746	2,258	71.8 %
12	LAGO	3,676	3,776	452	4,228	115.0 %	61	29	90	4,318	708	69.5 %
13	DISTRITO DE LICHINGA	4,380	4,421	310	4,731	108.0 %	98	46	144	4,875	676	63.9 %
14	MAJUNE	1,439	1,399	303	1,702	118.3 %	1		1	1,703	371	77.0 %
15	MANDIMBA	6,776	8,493	132	8,625	127.3 %	23	4	27	8,652	1,011	57.2 %
16	MARRUPA	2,605	3,537	487	4,024	154.5 %	4	2	6	4,030	516	60.9 %
17	MAÚA	2,402	2,549	131	2,680	111.6 %	21	2	23	2,703	530	74.5 %
18	MAVAGO	1,055	1,270	73	1,343	127.3 %		4	4	1,347	273	75.3 %
19	MECANHELAS	9,243	9,645	1,016	10,661	115.3 %	32	60	92	10,753	1,555	65.4 %
20	MECULA	520	634	59	693	133.3 %	28	9	37	730	183	80.1 %
21	METARICA	1,999	1,795	234	2,029	101.5 %		2	2	2,031	1,616	93.7 %
22	MUEMBE	1,428	1,972	80	2,052	143.7 %	1	5	6	2,058	339	69.6 %
23	NGAÚMA	3,532	3,873	543	4,416	125.0 %	23	4	27	4,443	639	65.2 %
24	NIPEPE	1,380	1,787	18	1,805	130.8 %	45	13	58	1,863	426	78.1 %
25	SANGA	2,581	3,328	206	3,534	136.9 %	36	21	57	3,591	498	63.9 %
26	<b>Total</b>	<b>62,129</b>	<b>71,339</b>	<b>4,376</b>	<b>75,715</b>	<b>121.9 %</b>	<b>475</b>	<b>210</b>	<b>685</b>	<b>76,400</b>	<b>12,818</b>	<b>70.2 %</b>



# Testing a new approach

- Based on an informed push model of vaccine distribution
- Immunization logistics and service delivery data collection responsibilities shifted from health center/district to provincial level logisticians
- Prov. Level logisticians use tablets/laptops running *Sistema Electrónico de Logísticas de Vacinas* (Electronic Vaccine Logistics System), an implementation of OpenLMIS
- Data collected directly from health centers whilst making monthly distribution runs





# Electronic Vaccine Logistics System (SELV) Reports

Key benefits of SELV include:

- Health center level data
- High reporting rates
- Close to real-time data (available monthly)
- Online data
- High accuracy
- Ability to analyze data over a selected timescale



# Electronic Vaccine Logistics System (SELV) Reports

Data collected enables the visualization of KPIs:

- Monthly Summary
- Cold Chain
- Vaccine Distribution Performance
- Data Completeness
- Delivery Interval
- Stock-Outs
- Stock Movement
- Utilization
- Child Coverage
- Open Vial Wastage
- Closed Vial Wastage
- District Scorecard
- Health Center Scorecard

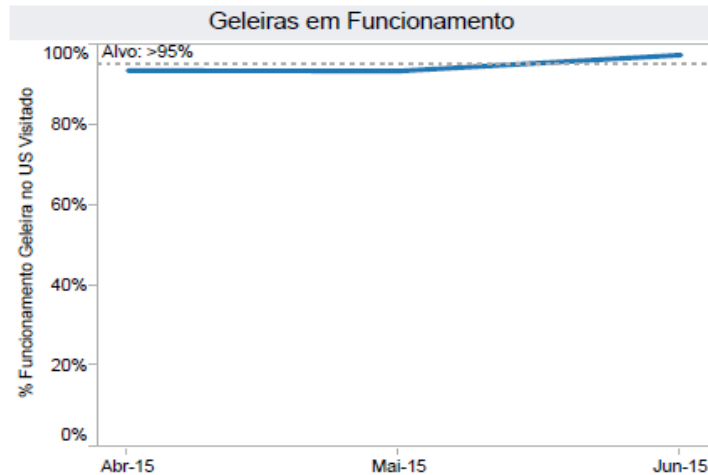


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# SELV - Report

Mês: Março de 2015 to Junho de 2015  
 Província: Maputo  
 Zona de Entrega: All  
 Distrito: All  
 Unidade Sanitárias (US): All

Estado de Cadeia de Frio				
Nº de US Visit..	Reportando	Funcionamento	Deficiente	Com Problema
228	225	213	31	1



Geleiras a funcionamento com um problema entre as visitas

US	Geleira ID	Alarmes Altos	Alarmes Baixos
Dibinduane, Namahacha	Electrolux1	0	0

Geleiras com Funcionamento Deficiente				
US	Geleira ID	Razão	Alarmes Altos	Alarmes Baixos
Agua De Map..	Dometic1	--		
Bedene, Matola	LG1	--		
	Super Gener..	--		
Chicutso, Ma..	Dometic1	--		
Chinhanguani..	Dometic1	--		
Dibinduane, ..	Electrolux1	--	0	0
Gueveza, Mat..	Dometic	--		
Kulula, Nama..	Dometic1	--		
Machubo, Ma..	Dometic1	--	0	0
Mafuiane, Na..	Electrolux1	--		
Mahel, Magude	Dometic1	Erro do Operador	0	0
	Naps1	--	0	0
Michafutane, ..	Electrolux1	--	0	0
Moine, Magude	Dometic1	--		
		Erro do Operador	0	0
Ndlavela, Matola	Fricon1	--		
	LG1	--	0	0



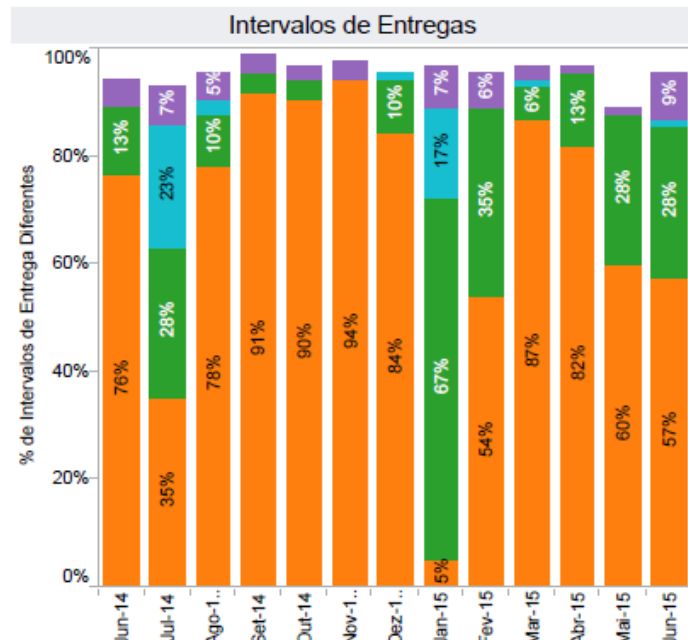
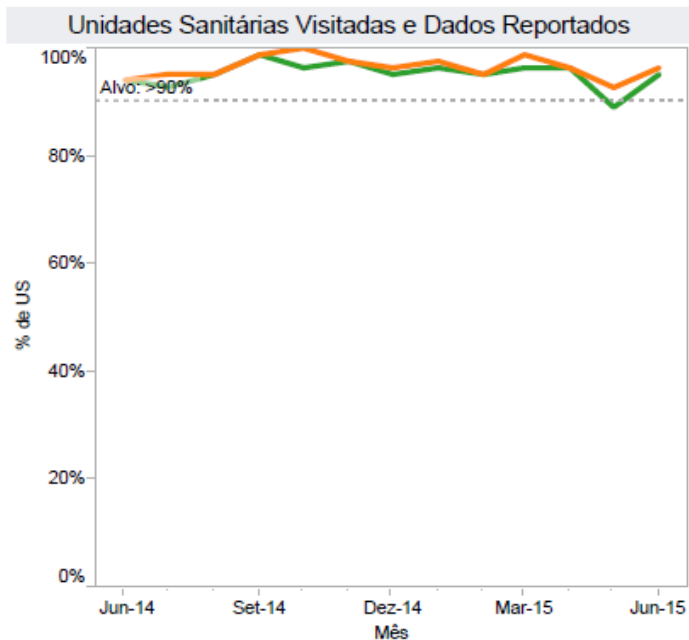
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# SELV - Report

Cobertura: 82

## Relatório de Distribuição de Vacinas

Mês: Maio de 2014 to Junho de 2015  
 Província: Maputo  
 Zona de Entrega: All  
 Distrito: All  
 Unidade Sanitárias (US): All

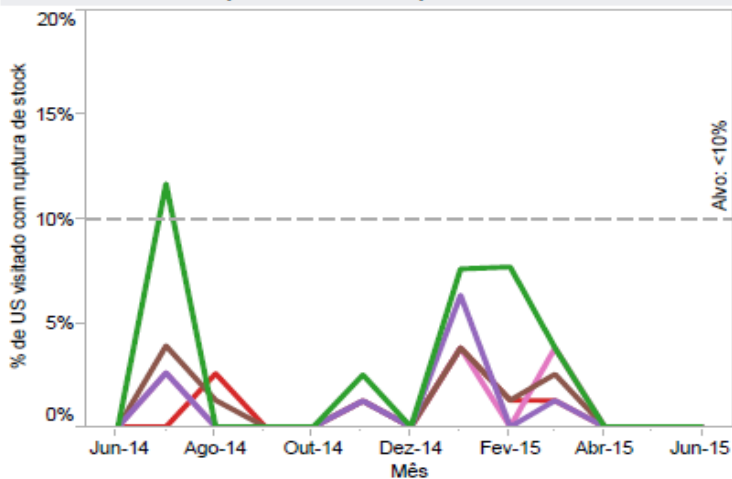




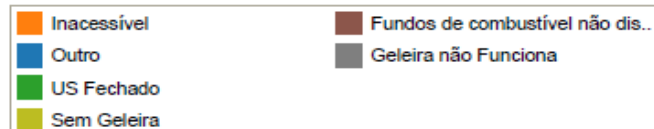
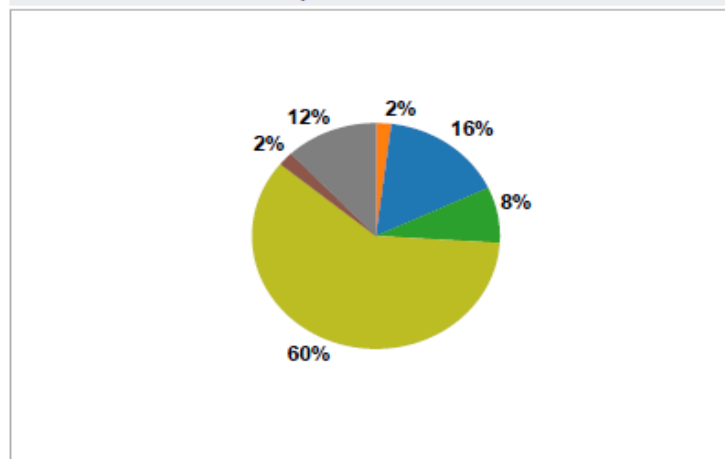
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SUPPLY CHAIN

# SELV - Report

Rupturas de Stock por Vacina



Motivo para nenhuma visita

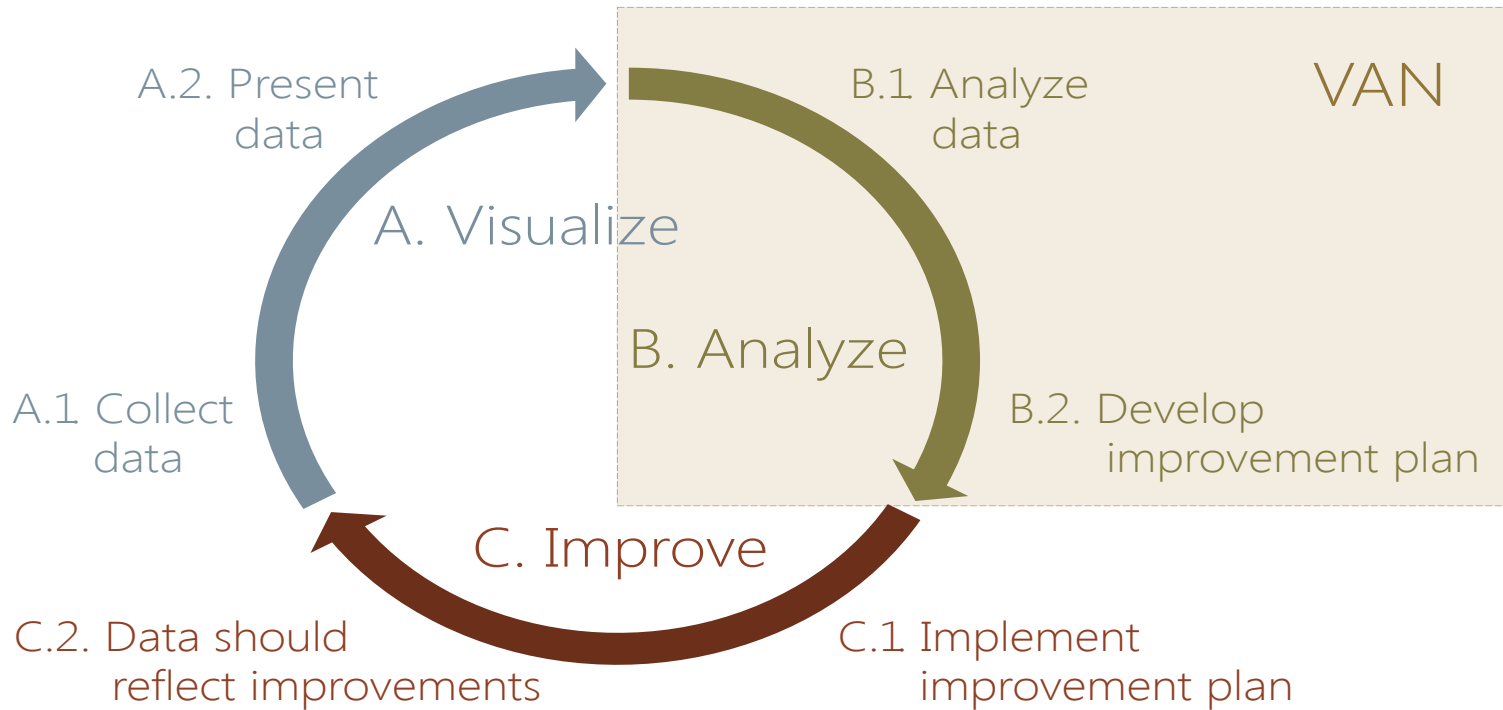


Sistema Electronica de Logistica de Vacinas

Para mais informação, [info@villagereach.org](mailto:info@villagereach.org)



# Visualize-Analyze-Improve



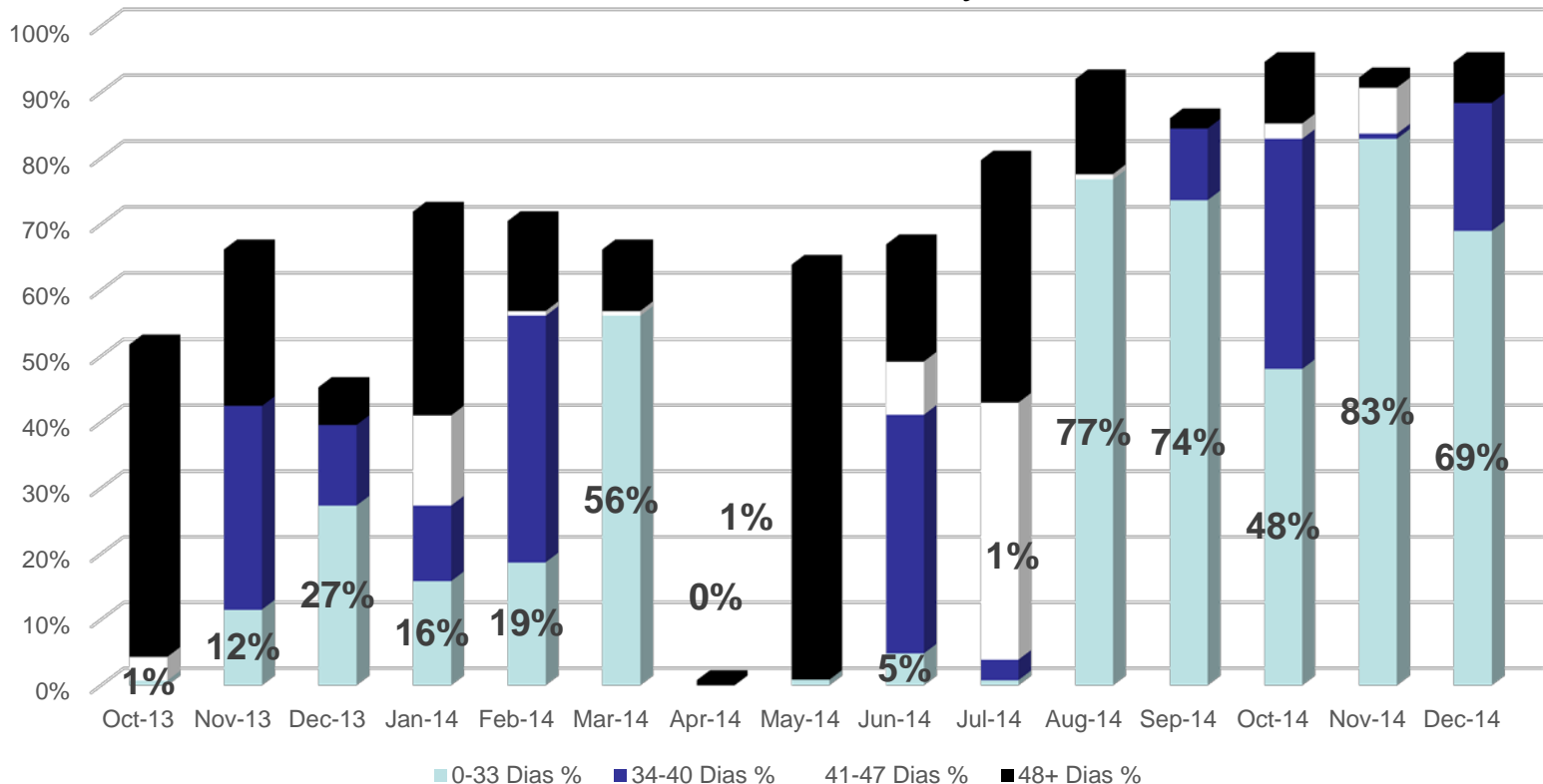


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# Niassa Province - DELIVERY INTERVALS

- Visualize:

Before introduction of SELV, delivery interval trend was far below the recommended 80% HF visited within 0-33 days.





# Niassa Province contd – DELIVERY INTERVALS

- **Analyze:**

Looking further using root cause analysis and reasons for delay – monthly vehicle maintenance scheduled too close to each month's distribution date.

Too often, maintenance not completed in time to meet schedule leading to cascading impact on delivery intervals.

- **Improve:**

Team's continuous improvement plan thus consisted of scheduling vehicle maintenance earlier in the month.

In the following months, Niassa's EPI team pleased to see success of the improvement plan reflected in the dashboard

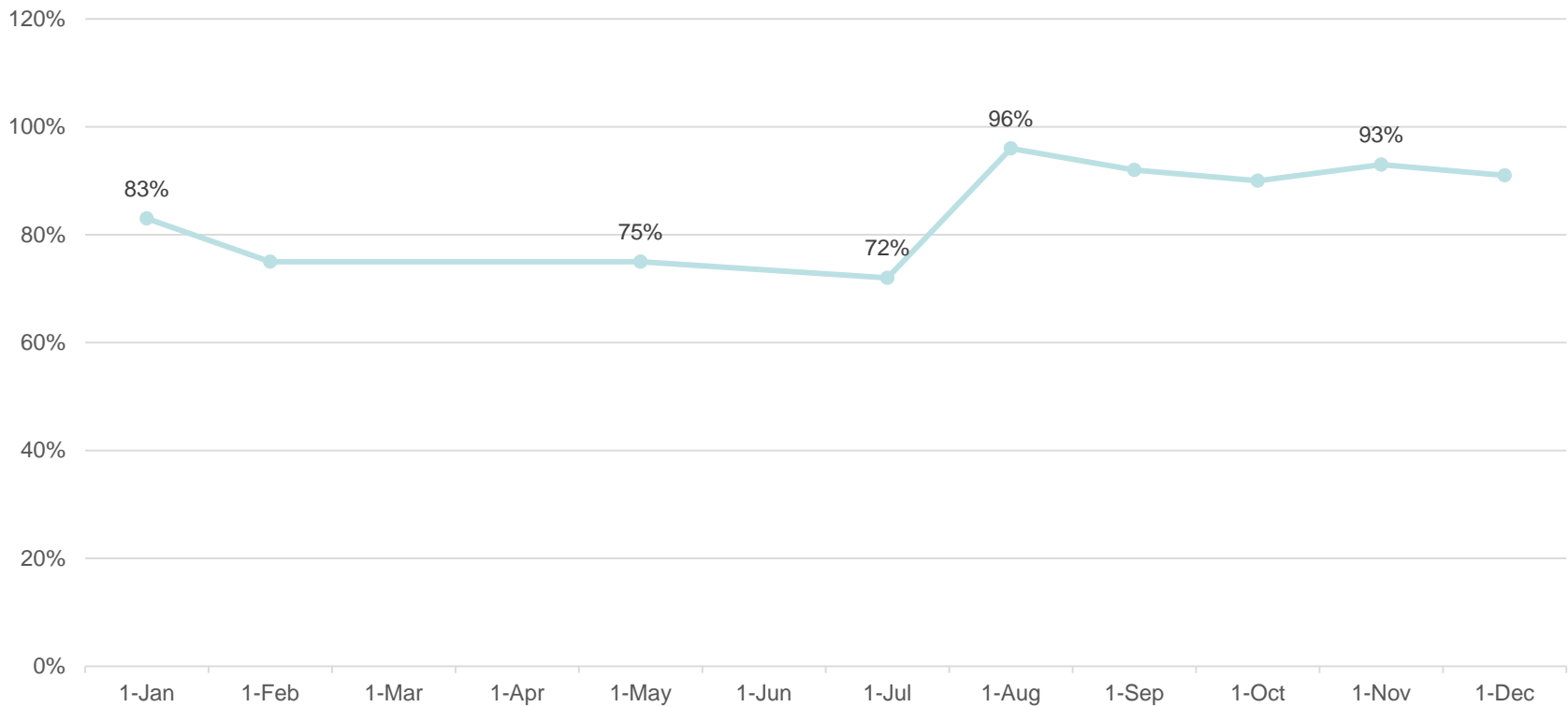




# Niassa Province – COLD CHAIN PERFORMANCE

- **Visualize:**

During the year of 2014 the team was able to identify deficiency in the cold chain performance.





# Niassa Province contd- COLD CHAIN PERFORMANCE

- **Analyze:**

The maintenance of fridges was deficient due to lack of resources as well as the deficiency of the system used previously which prevented them from seeing the real performance of the fridges:

- The information about the performance of the fridges would come in weeks delayed and their space for the intervention was minimal due to lack of resources (vehicles and funds)

- **Improve**

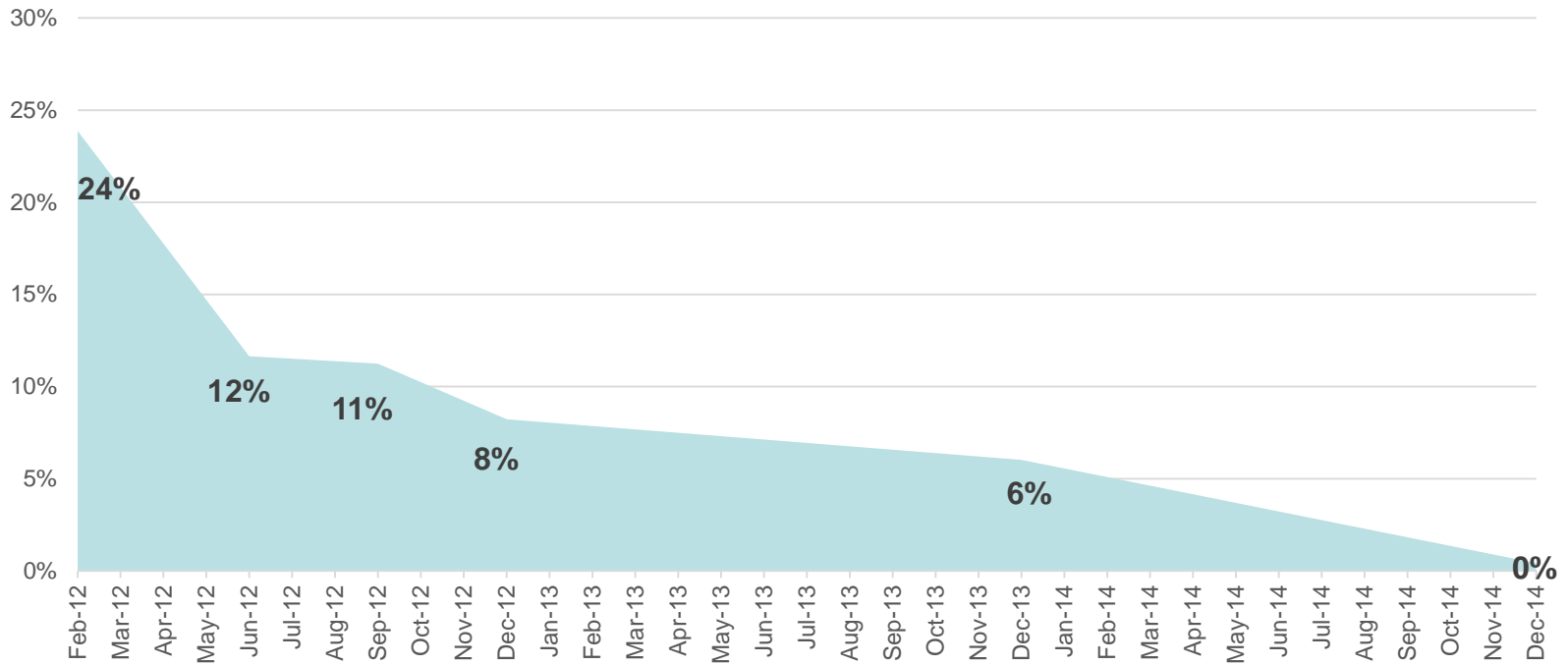
Improvement came with a plan that included the cold chain maintenance technician during the distributions to enable a more efficient maintenance plan that would include less funds and ensure regular visits.



# Gaza Province - STOCK OUT

- **Visualize**

In Feb 2012, 24% of HF had vaccines stock out and by Dec 2014, the trend reduced to 0%.





# Gaza Province contd- STOCKOUT

- **Analyze**

An exhaustive work took place all the way to the last mile to understand the data quality, doses administered, target population and number of times that the HF had to re-stock vaccines.

- **Improve**

Adjustments on vaccine ideal stock left at the Health Facility based on historic data drastically reduced stock-outs.



# What are the key take-aways?

- There is direct correlation between effective use of V-A-I and Key Performance Indicators (KPIs) performance
  - Regular visits correlate with cold chain uptime data
  - Regular visits correlate with decreased stock-outs
- Increased data/information **Visibility** and **Utilization** by officers is strategic for improved KPI performance and incentive for continued better data collection and reporting
- Simple and affordable technology enhancements revolutionize reporting processes for timely strategic decision making in a sustainable way.
- Additional enhancements of SELV will increase participatory organization of the people, processes, technology and policy from national to grassroots level -VAN.

