

Evaluating the Impact of Introduction of an Electronic Logistics Management Information System and a Logistics Management Unit



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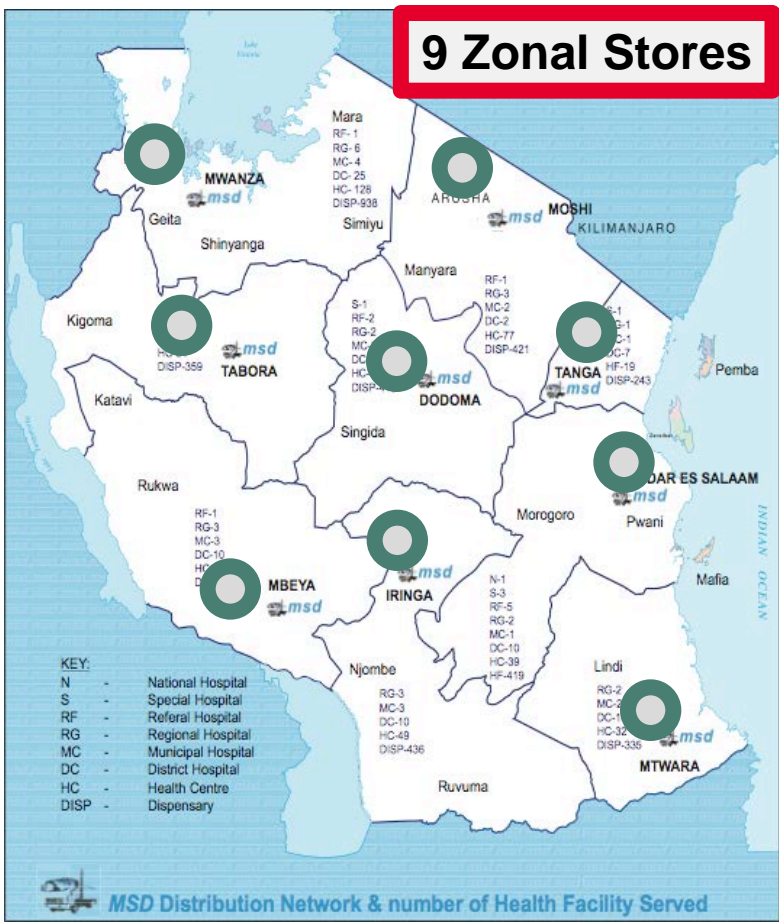
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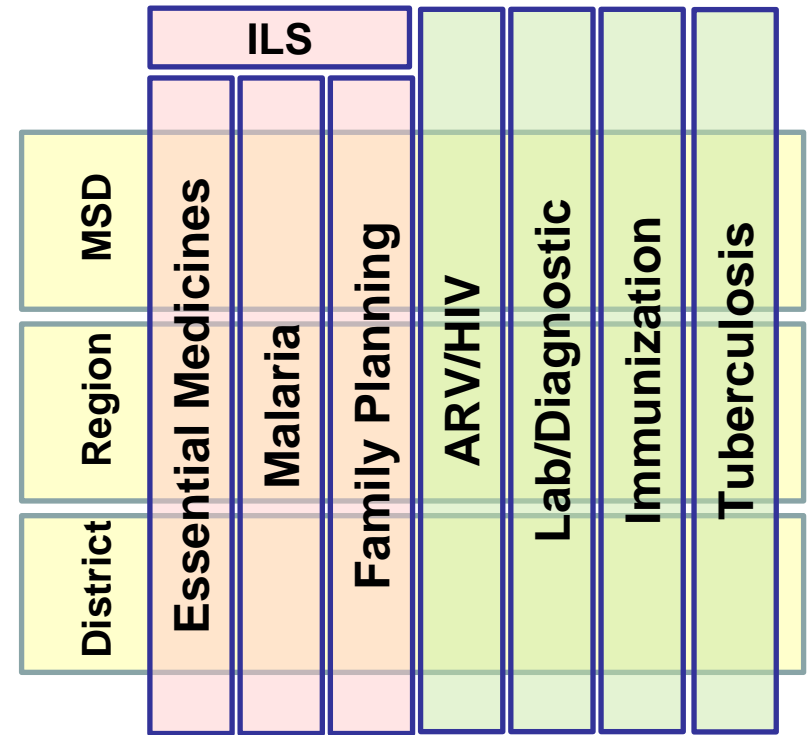
GLOBAL HEALTH
SUPPLY CHAIN SUMMIT

Introduction

Tanzania's public health supply chain delivers a range of products to over 5000 health facilities



Combined Total of appx. 800 Products



5000+ Health Centers & Dispensaries



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Introduction

Implementation approaches for the eLMIS and LMU

eLMIS requirements established



Sept 2011

Orientation of the LMU team begins



Oct 2013

LMU Implemented



Jan 2014

Nov 2012



TZM eLMIS software development launched

Nov 2013



eLMIS national roll out begins

Mar 2014



Orientation of LMU GF team

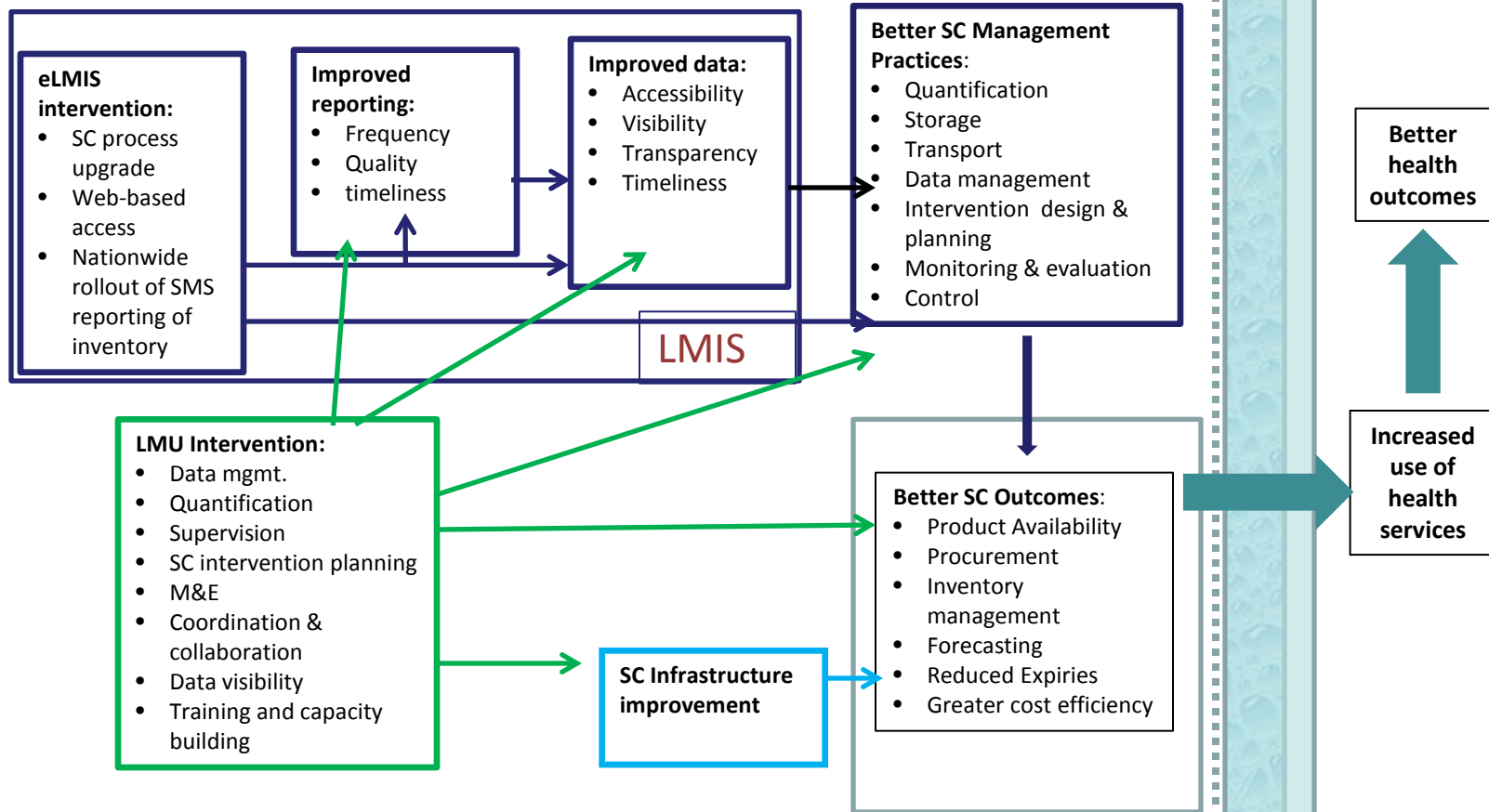
This conceptual framework shows the LMU/eLMIS pathways of influence

SDP eLMIS Implementation; LMU Stage 3 Implementation

District eLMIS Implementation; LMU Stage 2 Implementation

Central & Zonal eLMIS Implementation, LMU Stage 1 implementation

Management Upgrade Theory of Action





Introduction

This evaluation looks at the impact of **investment** in the eLMIS and LMU on **performance and cost**.

Compared to the previous management systems:

Are they more effective?



What do they cost?



Are they more efficient?



Are they saving money?





Methodology

The study design contemplates at least **three rounds** of data collection:

Type of observation	Baseline	Upgrades begin	Round 2	Round 3*
Performance data	O ₁	X	O ₂	O ₃
Cost data	O ₄	X	O ₅	O ₆
Timing of data collection	Aug-Nov 2013	Jan-April 2014	April-May 2015	May 2016

O = Observation (data collection); X = Intervention

* Round 3 data collection depends on availability of funding under the follow-on project.



Methodology

The study focuses on **HIV, EPI, and ILS** commodity groups:

Commodity group	Number of commodities
HIV	10
EPI	2
ILS	
Reproductive Health	9
Malaria	9
Other Essential	10
Total	40



Methodology

The data draws from a **nationally representative sampling** of facilities

Tool	Data Source	Program Focus	Measurement Focus	Data Collection Timing
EUV Survey-Modified	~220 health facilities (hospitals, health centers and dispensaries)	ARV, ILS, OI, TB, EPI	Cost and performance at facility level	Aug 2013, April 2015
Upstream SC Survey	17 districts, 9 MSD zonal stores, 10 regional vaccine stores, MSD HQ	ARV, ILS, OI, TB, EPI	Cost and performance at higher tiers of the SC	Oct 2013, May 2015
Stakeholder Surveys, Interviews, Document Review	MOH, Donors, Implementing Partners	ARV, ILS, OI, TB, EPI	Cost and performance at central management level	Nov 2013, May 2015



Methodology

Cost and throughput data is collected at **different levels** of the supply chain:

Category of data collected	Type of information collected	Level and instruments used for data collection		
		SDP	District Offices, District and Regional Vaccine Store	MSD HQ and Zonal Stores
Cost	Resource use	EUV – modified	Supply Chain Costing Tool (SCCT) – modified;	MSD financial records
	Prices	MOHSW records	MOHSW records	MSD financial records
Throughput	Quantities	ERP, LMIS, report review	ERP, LMIS, report review	ERP, MSD financial records
	Prices	MSD, donor financial records	MSD financial records	MSD financial records



Methodology

Performance indicators for comparison:



Data use

- Accessibility of data
- Visibility of data
- Timeliness of data
- Transparency of data



Reporting

- Frequency of reporting
- Timeliness of reporting
- Quality of reporting
- Reporting rates



Supply chain outcomes

- Product availability
- Inventory management
- Reduced expiries
- Forecast accuracy



Management practices

- | | |
|---------------------------|---------------------|
| Storage | General management |
| Inventory management | Quantification |
| Transport | Control and monitor |
| Logistics data management | Design and plan |



Methodology

Other **environmental factors** potentially affecting impact of the interventions:

- **MSD debt levels** have increased to ~\$56 million, hampering the organization's ability to effectively undertake operations including distribution of commodities to health facilities.
- With support from the project, MSD begins to optimize distribution routes, following the introduction of direct delivery, leading to improvements in lead time and cost savings of up to 30%.
- Pooled Procurement Mechanism (PPM) takes over the procurement of ARVs and anti-malarials from MSD and SCMS.
- Shift in the first line ART regimen to TLE, which experiences global shortages.

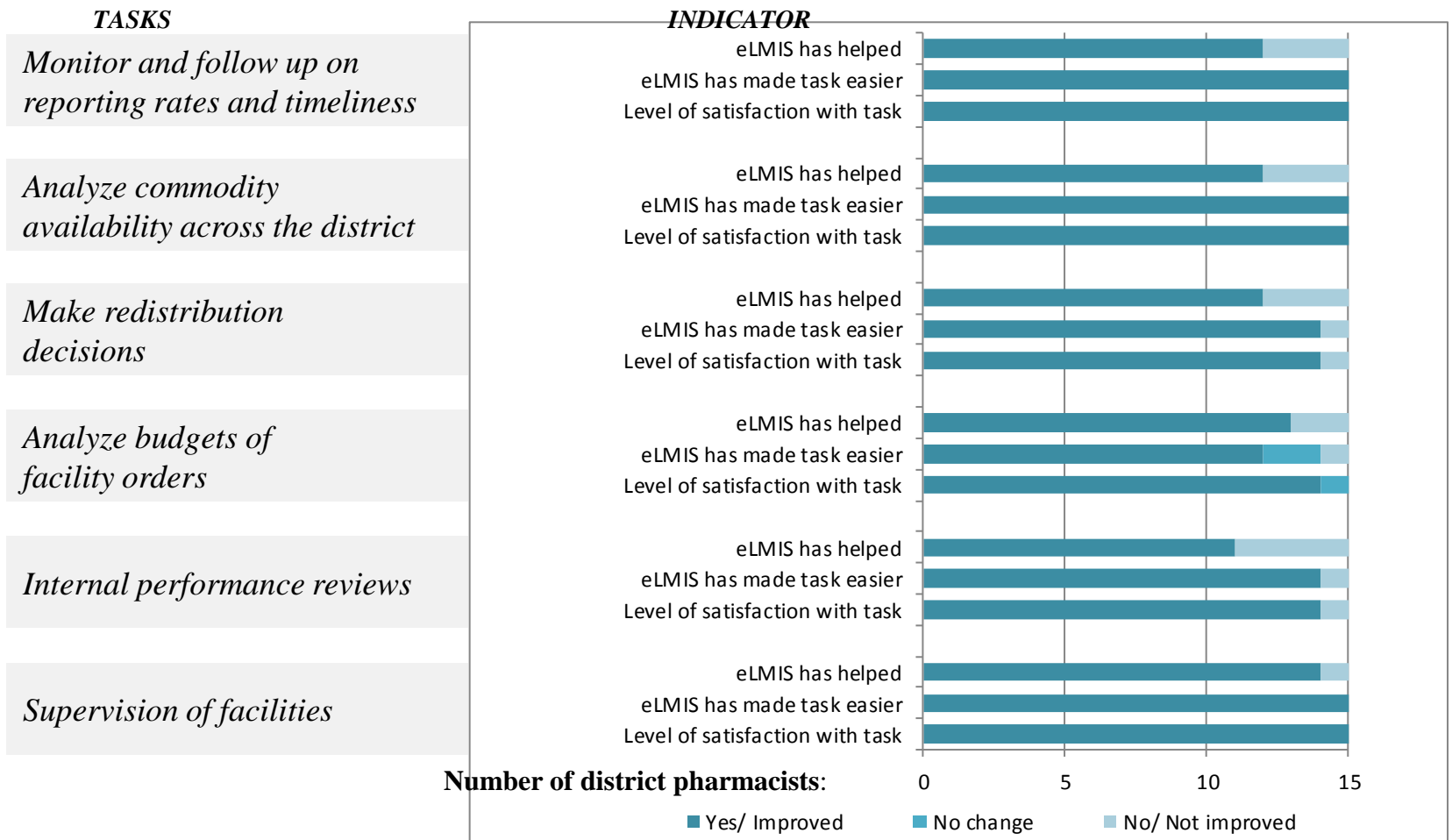


QUALITATIVE FINDINGS OF eLMIS AND LMU IMPLEMENTATION



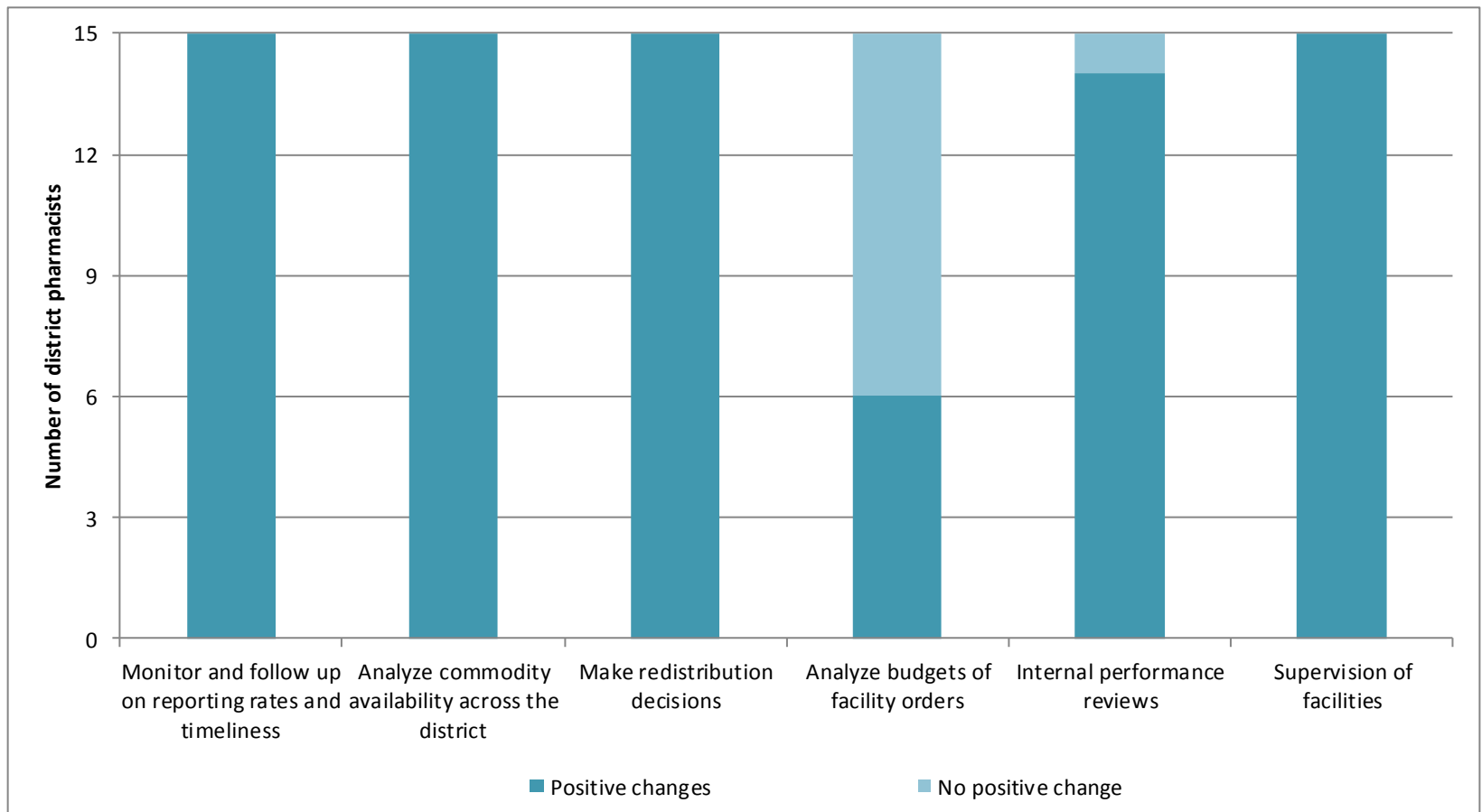
Qualitative findings of eLMIS and LMU implementation

In focus groups, district pharmacists reported reduced complexity and high levels of satisfaction with eLMIS:





The same group reported that the LMU has helped make positive changes





Anecdotal evidence points to generally positive changes

Supply Chain Performance	Reduction in stock outs; fewer reports (“complaints”) of stock outs to MSD
Management Practice	Data facilitating redistribution within and among districts; MSD reports fewer “push” orders
Reporting	Frequent reports of better and more timely reporting and ordering; more accountability at lower levels
Data Use	Orders more likely to be based on consumption or issues; ability to validate order quantities and inventory levels; ability to inform program commodity decisions
Other Mgmt Practices	More follow up with facilities that don’t order; ability to prioritize supervision needs



Results: Performance

Data use mostly **improved** on a range of dimensions:

Round 1 vs. Baseline	ARV	ILS-Malaria	ILS Essential Med	ILS Fam Plan & MNCH
Data Accessibility	Better	Same		Better
Data Visibility	Better	Better		Better
Data Timeliness	Same	Same		Better
Data Transparency	Same	Better	Better	Better

- **Data Accessibility:** Access to inventory and issues data from sites across supply chain by sponsors.
- **Data Visibility:** Appropriateness of both data quality and effort to access data for sponsors.
- **Data Timeliness:** Frequency and delay in updating data available to sponsors.
- **Data Transparency:** Whether sites across the supply chain generally share inventory and issues data centrally.



Results: Performance

Quantification and other management practices **showed improvement:**

Round 1 vs. Baseline	ARV	ILS-Malaria	ILS Essential Med	ILS Fam Plan & MNCH
Quantification	Same		Better	Same
Management Design & Planning	Better	Better		Same
Management Control & Monitoring		Better	Same	Better

•**Quantification:** Presence/Absence of Forecasting and Supply Planning process features.

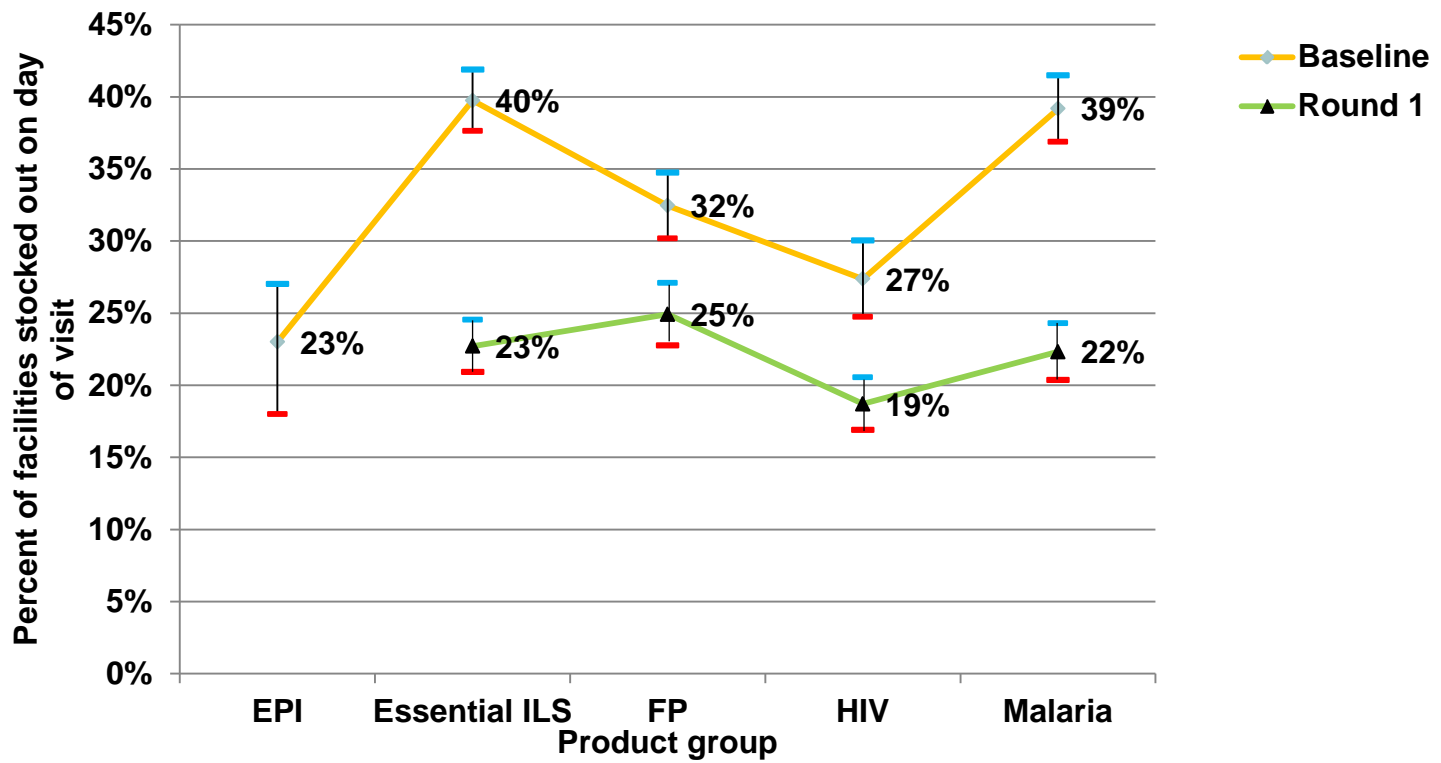
•**Management Design & Planning:** Presence/Absence of Supply chain intervention design and Supply Chain Coordination & Planning process features.

•**Management Control & Monitoring:** Presence/Absence of performance measuring and supervision process features.



Results: Performance

The **stockout rate fell** for all product groups:



Average across commodities:

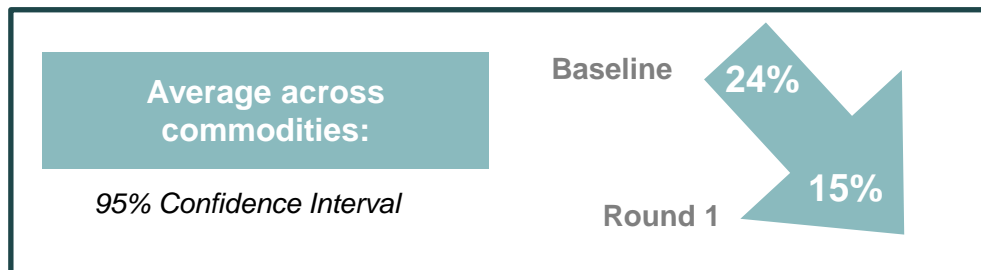
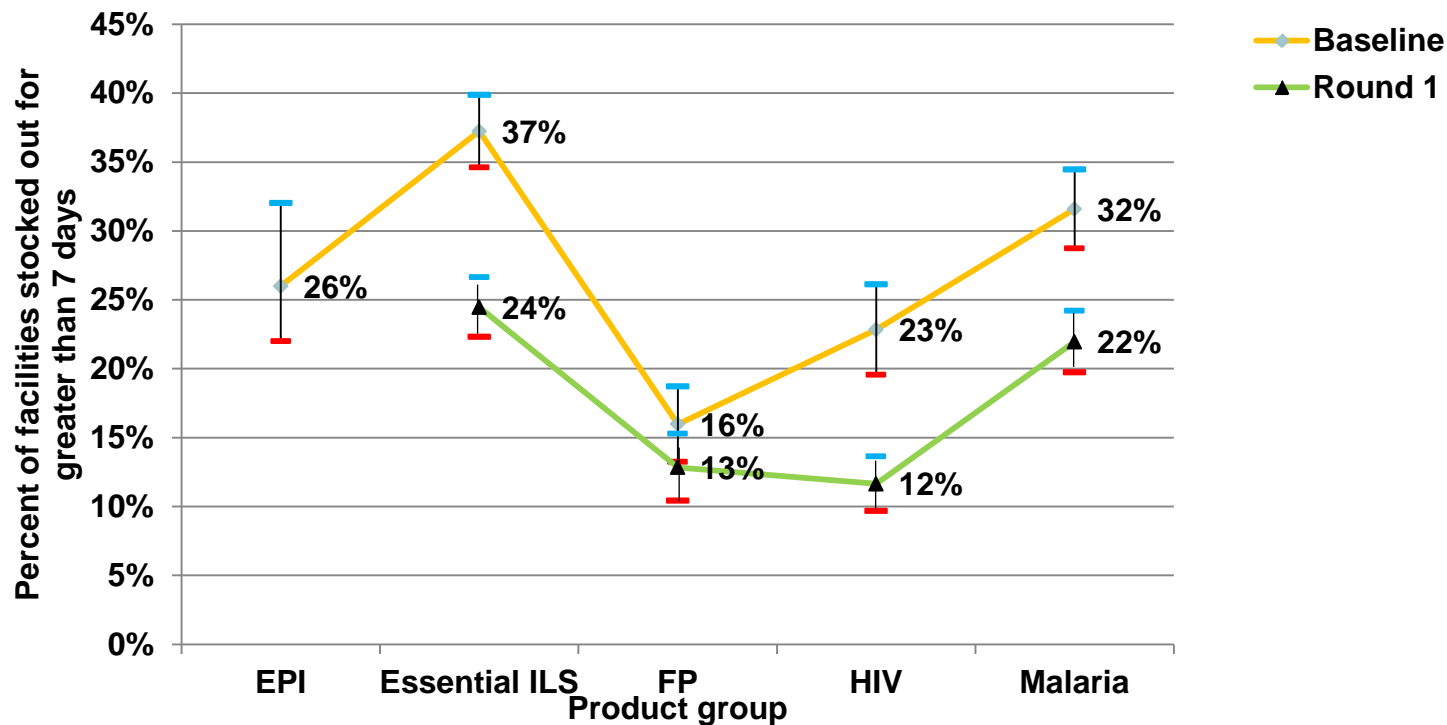
95% Confidence Interval

Baseline **32%**

Round 1 **23%**

Results: Performance

The **stockout duration** also fell:

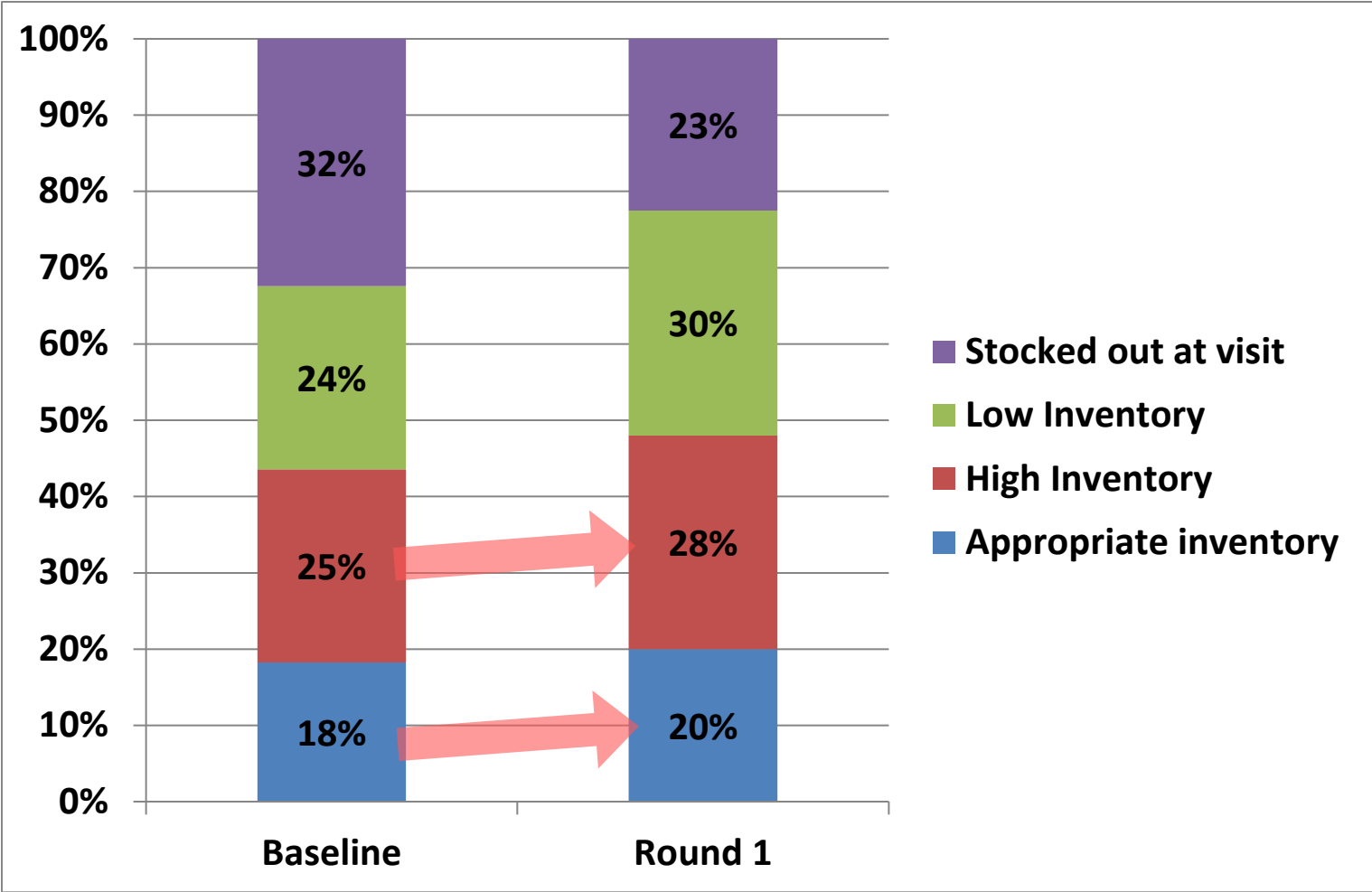




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Results: Performance

Levels of appropriate and high inventory **were similar** between baseline and round 1:





Expiry rates fell at SDPs, rose slightly for central and zonal

Change in expiry rate, baseline versus round 1

SDPs



Central and zonal



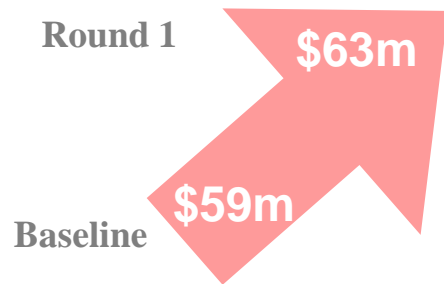


RESULTS: COST, COST-EFFECTIVENESS, AND COST-BENEFIT

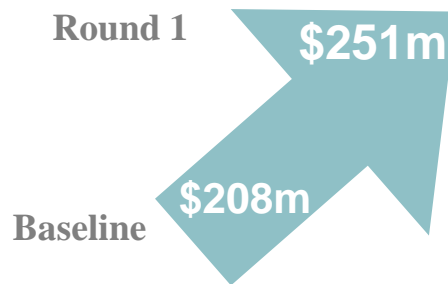


The upgraded system more costly, but also more effective and more efficient

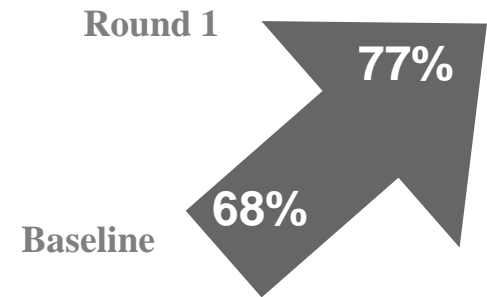
Total Annual Cost



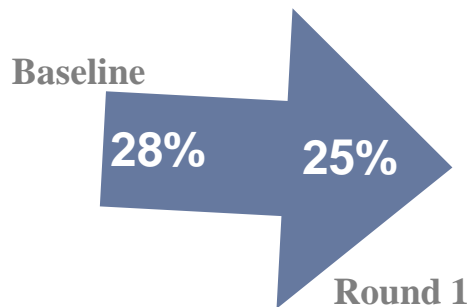
Value of Handled Commodities



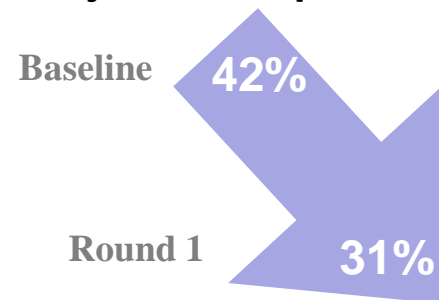
Supply Chain Performance



Cost per value of commodities



Cost per value of commodities, adjusted for performance





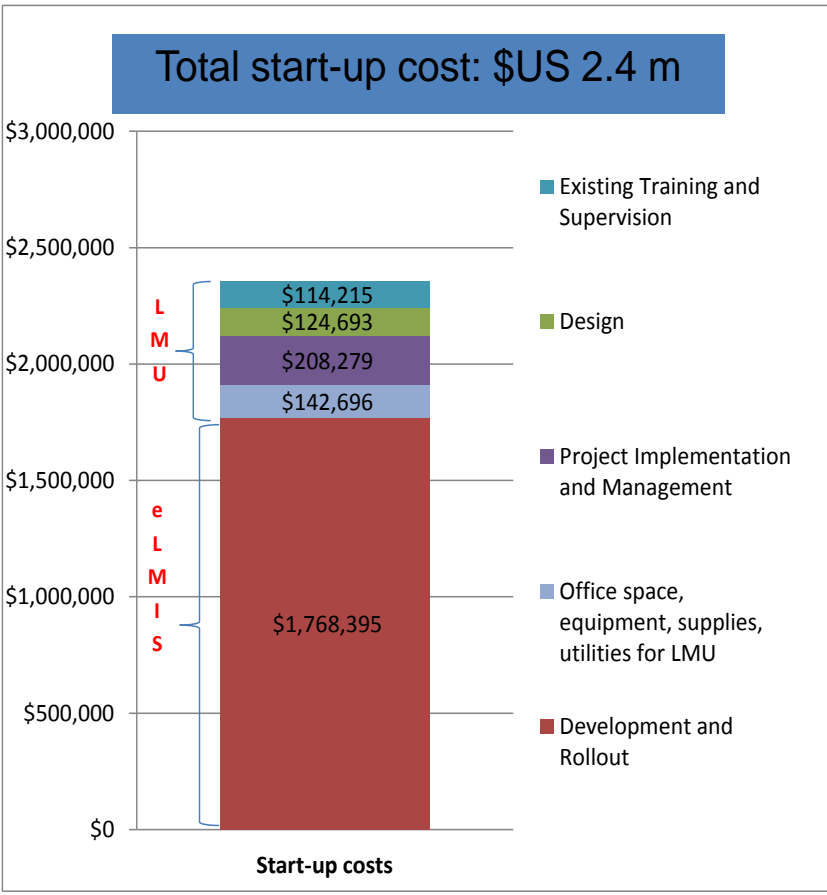
Cost-benefit analyses compares investment cost to system savings

- Investment costs
 - Start up cost for eLMIS and LMU
 - Yearly operating costs for eLMIS and LMU
- Ways that enhancements could generate system savings
 - Reduced cost of purchased drugs
 - Reduction in value of expired products
 - Absorption of staff and supervision costs

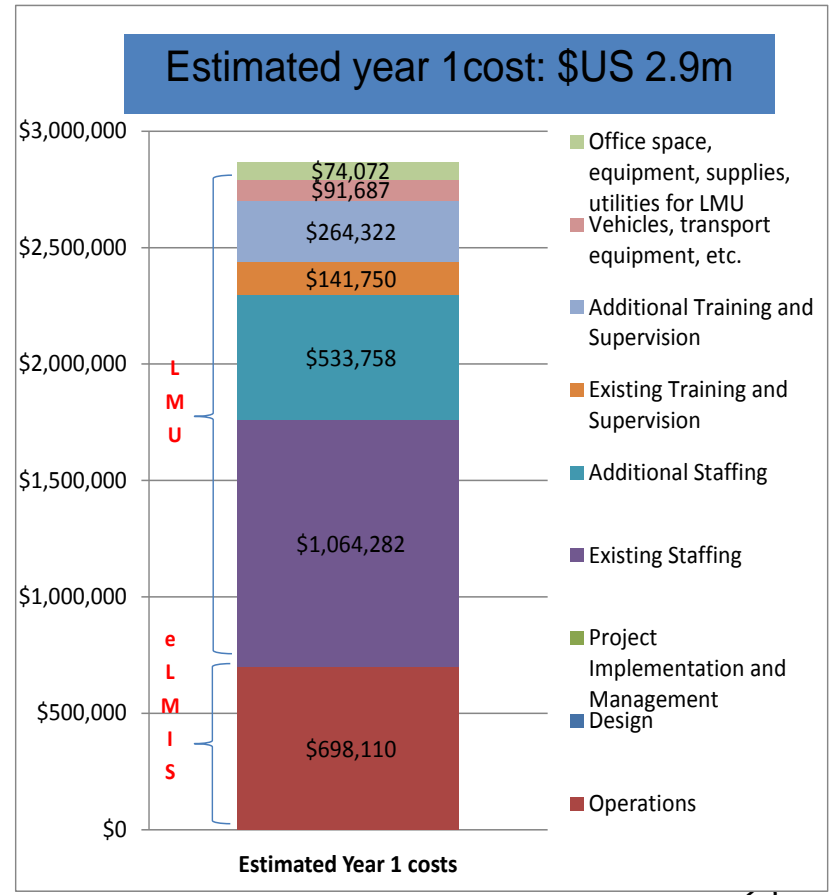


Investment costs for management upgrades

Total start-up cost: \$US 2.3 m

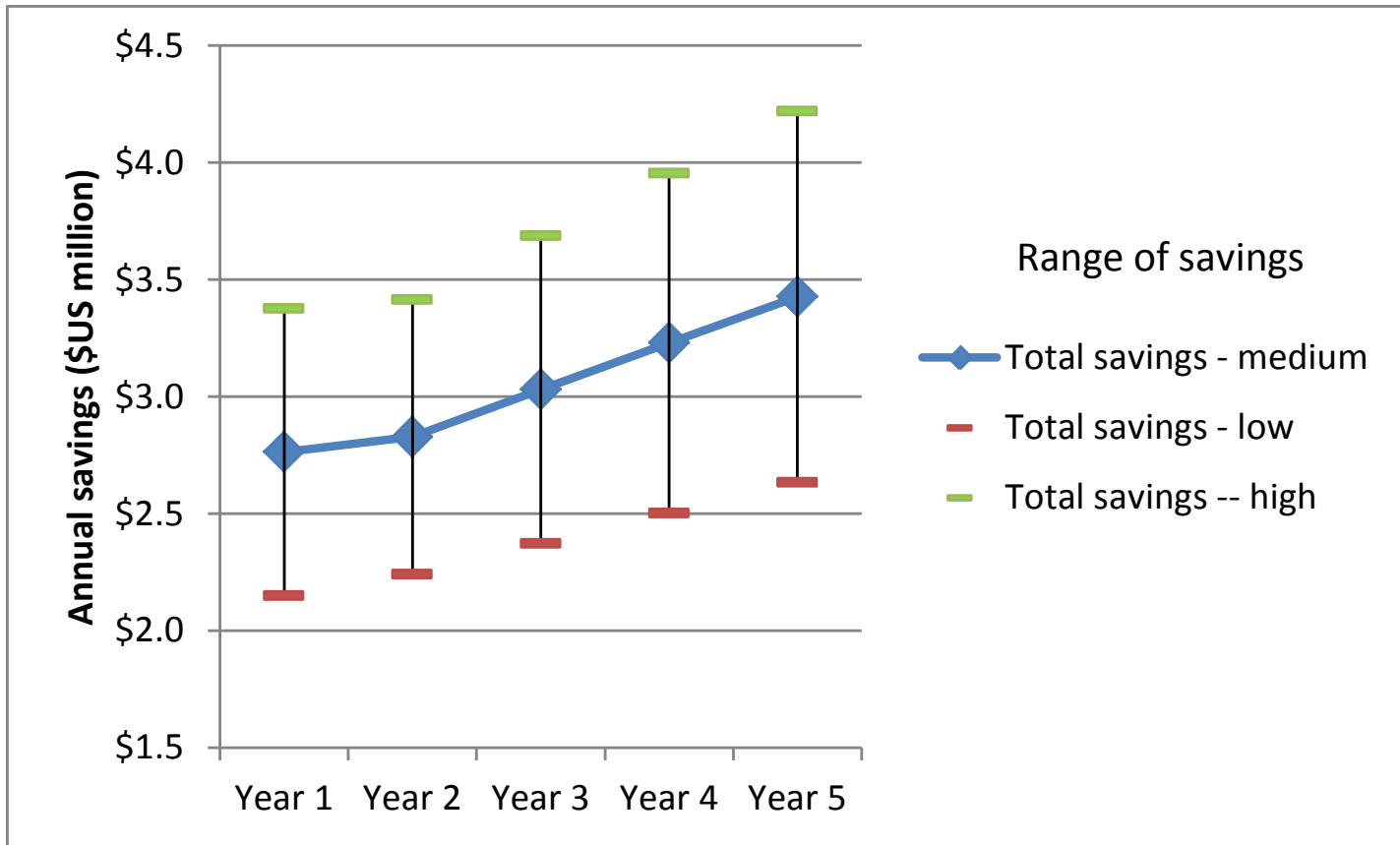


Estimated year 1 cost: \$US 2.9m



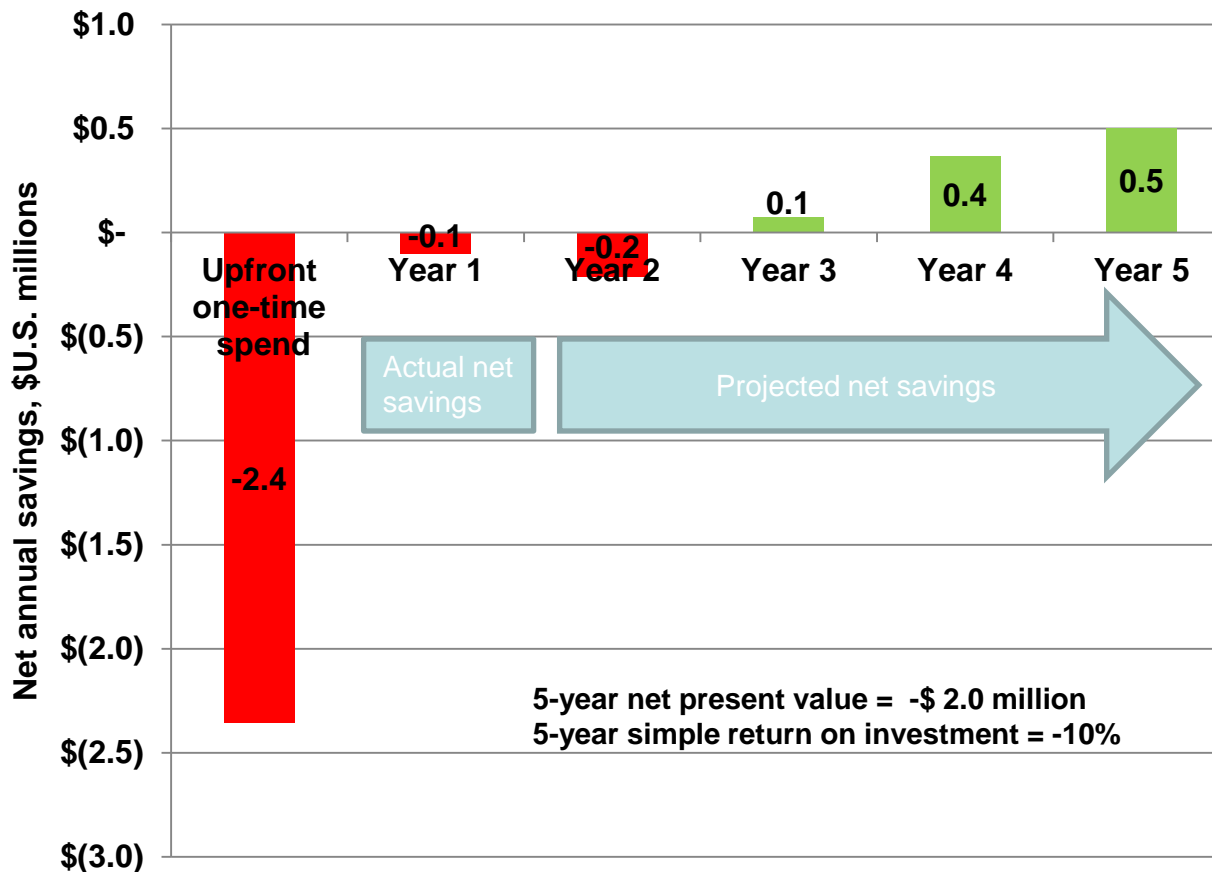


Cost savings due to improved system efficiencies are projected to grow over time





Cost Benefit Analysis





DISCUSSION



Discussion 1: Supply Chain Performance

- The upgrades had a positive impact on key supply outcomes, especially stockout rates.
- Similarly, stockout duration also fell.
- The decrease in stockouts is happening for the “right” reasons.
- Moreover, the upgrades also reduced overall expiry rates.
- Time series analysis appears to support these positive findings.





Discussion 2: the environment

- What is also notable is that these improvements—however modest--happened during a period in which the supply chain continued to confront many challenges.
- Moreover, we are measuring the impact of upgrades that are complex, and still relatively new. The full impact of these upgrades is likely still to be felt.



Discussion 3: cost and efficiency

- The upgraded system costs more but also is more efficient.
- The upgrades also appear to have generated significant savings to the government.





Discussion 4: What can we glean from the other findings that might explain these results?

- District pharmacy staff were very positive on the upgrades.
- Central level MOHSW staff also were positive.
- Other central level stakeholders, especially at the development partners and implementing agencies, expressed reservations



Discussion 5: What can we glean from the other findings that might explain these results?

- Data use indicators improved across a range of dimensions.
- Meanwhile, results from the comparison of reporting was ambiguous.
- There was little movement in some management practice indicators between baseline and round 1.
- On the other hand, some categories of management practice saw broad improvements.
- In sum, the explanation for the positive results is not simple.



Conclusions

- The upgrades generated improvement in key supply chain outcome indicators
- The upgrades—while not cheap—generated greater system efficiency and some savings.
- Additional measurements at 2 years and beyond would provide even greater insight into impact.

