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System Design leads to a more performant and equitable SC: The DRC model

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Le remodelage des systèmes permet une chaîne d’approvisionnement plus équitable et performante ; exemple de la province d’Equateur en RDC.
Goal:
To increase availability of medicines, health commodities & vaccines at service delivery points

Activities:
- HR: Leadership for Supply Chain
- Streamlined Distribution
- Data for Decision making
- Continuous Improvement
- Advocacy
VillageReach system design work is breaking from conventional one-size-fits-all systems and is focusing on integrating the unique logistical needs and constraints of each health structure from the provincial to the health facility level.
**The Problem**
What are we trying to solve?
Health products do not reach the last mile

**Our Solution**
Network Design
How are we solving the problem?

**Our Approach**
How do we implement the solution?
Addressing the weakest links

**Results**
What did we find after we implement the solution?
System re-design improved supply chain performance and reduced costs

**The Bottom Line**
What does it mean for us?
The Problem

What are we trying to solve?
Health products do not reach the last mile
We are trying to solve....

Last Mile Accessibility

Health facilities/workers do not receive timely and sufficient quality health products to reach the children
We are trying to solve....

Supply chain issues directly affect service delivery and ultimately harm progress towards achieving SDG 3

Optimally-operated SC  

Constrained SC

2018 Global Health Supply Chain Summit  
Lusaka, Zambia
The weak supply chain link can limit the effectiveness and efficiency of the entire supply chain.

“A supply chain is no stronger than its weakest link”
SC Constraints identification impacting delivery

Resource Constraints
- CCE
- Human resource utilization
- Equipment
- Transportation means
- Fuel
- Communication

Policy Constraints
- Fixed frequency
- Administrative boundaries
- Fixed buffer stocks
- Resupply policy
Discussing the Impact of policy constraint at health facility level

Bolomba Health Zone

2018 Global Health Supply Chain Summit
Lusaka, Zambia
1. Constraints determine the performance of a system. Constraints generate additional burden to health workers.

2. By targeting the constraints and weakest links, it is possible to remove limitations and increase overall system performance.

3. Our system design analysis addresses resource constraints and policy constraints.
Our Solution
How are we solving the problem?
System Design
<table>
<thead>
<tr>
<th>Implementers</th>
<th>MoH + VillageReach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geography</td>
<td>DRC, Subnational, <strong>Equateur Province</strong></td>
</tr>
<tr>
<td>Scope of Analysis:</td>
<td><strong>Network</strong> + Inventory (CCE) optimization</td>
</tr>
<tr>
<td>Intervention areas</td>
<td>Distribution + Inventory Control + Transportation + Organizational Capacity</td>
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<tr>
<td>SC Tiers</td>
<td>Province, Health Zones, Health facility</td>
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<tr>
<td>Problem solving</td>
<td>Baseline Analysis, Modeling, Segmentation, Theory of Constraints (TOC)</td>
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<td>approach</td>
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<tr>
<td>Phases</td>
<td><strong>Design</strong> + Small Scale Implementation + Evaluation</td>
</tr>
<tr>
<td>Results</td>
<td>Performance, Costs, Stocks Outs, Equity *,</td>
</tr>
</tbody>
</table>
Supply chain design analysis helped to answer these questions in DRC.

**Strategic Supply Chain Optimization**
How do we design the supply chain network to deliver the right demand at the lowest possible cost?

**Distribution Strategy Optimization**
What is the optimal distribution strategy given Equator province specific needs and constraints (75% of health facilities are accessible by water)?

**Transportation Strategy Optimization**
Given a logistics network and a defined distribution strategy, how can we best use my available transportation resources? Where are the needs and gap?

**Inventory Optimization**
Given demand variability and service level requirements, what is the optimal inventory replenishment plan and control to meet the needs? Where are the needs and gap?
03

Our Approach

How do we implement the solution?

Addressing the weakest links
ANALYSIS
Modeling (Llamasoft)

ANALYSIS
Segmentation
Province selection
Commodities Selection

SITE VISIT
Baseline in the 3 implementing health zones
04

Results

What did we get after implementing the solution?
Result 1: Vaccines, PDSS commodities & HIV commodities could be transported together in some zones

In Lolanga Mampoko and Mankanza, some SANRU (malaria) commodities could also be transported:

**Lolanga-Mampoko:**
+89% of SANRU volumes

**Mankanza:**
+28% of SANRU volumes

In Bolomba, additional boats would be required to transport other commodities

*when family planning products are distributed (biannually, volume of about 6 m³) an additional boat will be required for Mankanza. See annex for full assumptions.
Result 2: Improved availability of stocks at zonal warehouses

An independent study by Acasus showed zero stockouts in the 3 zonal warehouses supported by the NGCA Initiative.

- Bolomba
- Ntondo
- Basankusu
- Lotumbe
- Djombo
- Bolenge
- Lukolela
- Ingende
- Bomongo
- Monieka
- Irebu
- Lolanga-Mampoko
- Wangata
- Mbandaka
- Mankanza
- Bikoro
- Iboko
- Lilanga-Bobangi

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**Number of stockouts**

- January – July 2017
- July – December 2017

*Bolomba showed the most improvement in the province*
Result 3:
Stock availability has allowed for increased consumption

Average Monthly Consumption (Doses)

Month AMC was calculated (average for the previous 3 months)
Result 4:
System re-design led to reduced costs

Provincial Supply Chain Costs Over Time

$954,348 +2% $974,237 -34%

$642,627

(baseline pre-CCE deployment)*

(baseline post-CCE deployment)*

Sept. 2017-Jan. 2018
(endline post-NGCA)

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Lusaka, Zambia
Ineffective health systems rely on individual efforts of health workers, who already bear the most burden, to operate.

The burden is unequally distributed amongst health workers.

(In)Equity parameters at health facility level include distance, time, route conditions, electricity, communication network, funding, partners support, existing policies, seasonality, access)

Equity parameters can be used as optimization criteria at design time to ensure Health facilities/workers do receive timely and sufficient quality vaccines to reach the children in their respective areas.
Traditional multi-level supply chain

- **Demand**
  - Population-based
  - Consumption-based

- **Distribution**
  - Pull systems
  - Informed push

- **Stock levels**
  - Monthly to zones
  - Every 2 months to SDPs

- **Segmentation**
  - Siloed supply chains
  - Resource sharing

- **Network**
  - Administrative boundaries
  - Optimized network

- **Frequency**
  - One month policy
  - Resource sharing

- **Emergency**
  - Provincial stores
  - Local hubs with min. distance

- **Scheduling.**
  - Individual plans
  - Integrated distribution plans

- **SC Capability**
  - Limited
  - Reinforced at all levels
Next Steps: Replication | Expansion

- Products
- Geography
05 Bottom Line

What does this mean for us?

Importance of the work
Conclusions

SUMMARY

1. **Network optimization** can effectively improve last mile accessibility in the most constrained environments.

2. **System Design** is a core element of supply chain excellence.

3. The design of a supply chain determines its capabilities. Evidence showed an impact on costs, availability.

4. System design is entry point to **holistic supply chain transformation** across data, people, processes.

5. Inequities parameters can be used as optimization criteria for a fair and equitable SC for health workers.
Thank you

Questions?
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Chemonics
Development works here.

World Health Organization

logistimo

OPTEL

Logenix International

resolve Capacity

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