Health Supply Chains
Root causes of underperformance and agenda for reform

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Sections of this presentation are from
Yadav P, Health Product Supply Chains in Developing Countries: Diagnosis of the Root Causes of Underperformance and an Agenda for Reform.
Why worry about supply chains?

- The WB provided financing for pharmaceuticals and health commodities in over 100 HNP projects in all six regions.
- Procurement of pharmaceuticals and related health products under WB financed projects accounted for almost 36 percent of the procurement of goods in HNP.
- Ineffective or poorly functioning supply chains are the rate limiting step in many health programs, especially in the Africa region.
- Supply chains are the backbone of the health system—frequent stock-outs and high costs of commodity delivery can make health programs unsustainable.
- Facility level stockouts and poor availability of medicines are amongst the most common reasons for underperformance in health programs.
- Supply chain also plays a crucial role in obtaining information about coverage, needs, and many other information sets crucial for planning.
- Careful design can help create better supply chains and improve health outcomes with relatively small investments.
Supply chains?

- **Supply chain**: A system of organizations, people, technology, activities, information and resources involved in making a product reach the customer.

- Supply chain management is a well developed scientific discipline.

- Three interlinked flows:
  - Product
  - Financing
  - Information
Pharmaceutical distribution structure in OECD* countries

*Exceptions include Sweden pre-2009 (discussed later)
Pharmaceutical distribution structure in most developing countries

- Procurement
  - Central Medical Store
  - Regional Medical Store
  - Govt Health Facilities

- Purchasing
  - Importers/Distributors
  - Wholesalers
  - Retail pharmacy

Patients

Government monopoly on large parts of the supply chain
Evolving and Changing Role of the Central Medical Store
A frame to understand the factors that lead to poor availability

Typical structure. May not hold for all countries and programs. Corruption and infrastructure issues are additional structural barriers
Factors that led to poor availability-2

- Typically, multiple factors lead to poor availability of medicines and health products in public health facilities
  - Archaic procurement structures
  - Lack of incentives and information flows in the government run distribution system
  - Poor design of the overall system

- Each country may have a different lead factor. Bank staff and HNP program managers need to understand these
Factors that led to poor availability of medicines

- Uncertainties in timing of funds disbursement from MoF or external source

Suppliers -> Ministry of Health -> Distribution -> Clinics
Reducing and Managing Financing Uncertainties

- Pro-active planning of financing needs
  - The WB has best interfaces with finance, treasury, planning which can be leveraged for more predictable flows from Fin/Treasury to Health
- Bridge financing when all else fails
  - WB is not agile in providing short term financing. Could create a buffer fund
- Delinking disbursement for commodity financing from other factors. More frequent disbursements (e.g. Rashkova, Yadav, Atun and Gallien)
- Improved Pooled Procurement - Global Fund under the leadership of the new CPO is carrying out some of the activities
- Framework contracts for health commodity procurement within MOHs (Arney, Wilkerson, Miller and Yadav)
Factors that led to poor availability of medicines

- Delays in procurement due to archaic procurement processes
- Poor quantification and planning
- Long supply lead times
Reducing Lead Times

1. Better Global Demand Forecasting
   - Global Fund’s focus on global forecasts
   - Better country level forecasts (USAID funded teams provide TA)
   - Global ACT Forecasting Consortium

2. Risk sharing with manufacturers
   - Coordinated ordering across buying agencies
   - Long term forecast based orders

3. Stock buffers closer to demand nodes
   - PEPFAR/SCMS RDCs
   - Global Fund’s Rapid Supply Response Mechanism

4. Supplier selection metrics to include delivery lead time and the observed variability in historical delivery lead times
Long lead times and the curse of the forecasting trumpet

Longer lead times require longer horizon forecast and therefore decrease forecast accuracy
Demand and financing uncertainty leads to longer lead times

- Forecast Driven
  - Drug Substance Manufacturing
  - Co-formulating and Packaging
  - Pre-delivery Inspection
  - Shipping and Transport

- Order Driven
  - Final Product Inventory

Inventory /Order Interface


Particularly long lead times for selected TB medicines
Financiers and countries estimate annual purchasing volume for specified products.

1. Manufacturer ships products directly to countries.

2. MVG decides on volume of product and amount of risk to assume. Establishes master contracts with manufacturer based on volume / risk tolerance.

3. Countries place individual orders under master contract.

4. Manufacturer informs MVG of unused volume.

5. Sale or storage of any unused product; Risk sharing with manufacturers reduces lead-times.

6. Secondary Markets?

Source: Adapted from joint work with Dalberg Global Development Advisors
PEPAR approach of Holding Buffer Stock in Regional Hubs

Source: Partnership for Supply Chain Management

- Shorter lead time to national buyers
- Reduced inbound logistics costs

Vargas and Yadav (2008) did a rigorous evaluation of the benefits from the Regional Hubs and found significant savings in inventory holding, transport and stock-out related costs

Factors that led to poor availability

- State monopoly on distribution
- Too much complexity in distribution structure
- Weak incentives for performance improvement
- Poor information flows
The corrupting influence of too many layers in distribution

Number of babies are constant! How come there is such a variability in the demand for Pampers?
Complex multi tier distribution structure

- Central Medical Store
- Provincial Stores
- District Stores
- Health Facilities
- Village Health Posts
- Community Health Workers
The corrupting influence of distribution structure complexity

*Bull-whip effect*: Amplification in demand variability as it goes upstream in a multi-tiered distribution system
Fewer layers in the distribution system help remain in sync with actual demand
Fewer tiers: Results from a quasi-randomized field experiment in Zambia

Fewer layers in the distribution system help
- Supply remain in sync with actual demand
- Increase accountability

A large field experiment in 24 districts of Zambia rigorously demonstrates the value of this

1. Para-statal and better managed Central Medical Stores (CMS) e.g. Kenya

2. Fewer distribution tiers and Supply Chain Network Redesign
   - Zambia
   - Tanzania-MSD Direct Delivery
   - South Africa direct delivery pilot
   - Mozambique direct delivery
   - Llamasoft and HERMES (U Pitt/JHU)

3. Performance Incentives for the Central or Regional Medical Stores
   - Mozambique (USAID + World Bank?)

4. Outsourced, private sector run transport and distribution services
   - KEMSA
   - Malawi- Imperial Logistics+ CML
   - The Gambia- Rider for Health
   - CHAI + Coca Cola Mozambique pilot
Better Information Flows

1. Zambia e-ZICS
2. Village Reach + Partners: Open LMIS
3. USAID and JSI: multiple projects
4. Logistimo-mobile logistics system
5. Dimagi- Commtrack
6. SMS for Life
Frequency of replenishment and the curse of the forecasting trumpet

Higher frequency of shipments i.e. shorter resupply intervals between each stage in the system decrease forecast inaccuracy
Factors that led to poor availability

- State monopoly on distribution
- Weak incentives for performance improvement
- Last mile distribution challenges
- Poor information flows

• Weak staff capacity to manage inventory
• Poor or no consumption tracking
Coupling last mile delivery with information flow and requisitioning

1. Zimbabwe- DTTU- USAID/Deliver
2. Village Reach- DLS in Mozambique
3. Senegal- IPM
4. Nigeria- DDS pilot project
5. Others

- In systems with weak clinic level capacity for ordering/requisitioning and stock management functions it may be best to shift the loci of that decision making
- In systems with challenging last mile delivery it is effective and efficient to combine information collection and physical distribution
Three core principles that emerge

• Fewer layers in the supply chain are usually better

• Better information flow from the clinic level up

• More frequent ordering and replenishment at each stage reduces the reliance on longer horizon forecasts which are awlays less accurate than short term forecasts
Private sector distribution works (even in remote areas)

RBF to leverage downstream innovation

Complex and time consuming to reform
RBF to leverage downstream innovation

Can downstream incentives and creating more “operating space” for downstream actors lead to innovative models for overcoming upstream bottlenecks?
Defining a trajectory of improvement

- Redesign currently used government distribution system
  - Fewer tiers in the supply chain help create more streamlined product and information flows e.g. Zambia
- Strengthen private wholesaling (and retailing?) market so it can eventually become a quality source of supply: some easy, some more difficult
- Enhance ability of government to negotiate prices (including for use in private markets)
- Create framework contracts under which decentralized government facilities can purchase at standard prices and quality e.g. Ghana
- Strengthen drug regulatory authority: complex and messy
- Enhance transport and distribution contract management capacity in the government
We cannot meet the needs of supply chains without large infusion of private capital into the distribution market.
Why spend on rigorous evaluation of SC improvement programs?

• Our understanding of this area is weak and needs to be reinforced with strong evaluations of what works and when.

• Very often we encounter “But we know why the supply chain is failing. Let’s design a reform program.”

• Rigorous evaluation will give clearer answers.

• Rigorous evaluations also help IMMENSELY in the political economy of supply chain reform.

• A “knowledge product” can highlight the best supply chains models to pursue for evaluation and pilot.

• WB can become a knowledge specialist in this area for its clients.