

# Improving Medicine Availability in the South African Public Health Supply Chain



Jon Jensen

David Crewe-Brown

*USAID GHSC TA South Africa*

**56 million**  
the population of  
South Africa

**82%**  
of population  
dependent on  
public health (46  
million people)

**4.1%**  
Of GDP spent on  
public healthcare

**+3,900**  
Healthcare  
establishments in the  
public sector



**7.1 million**  
Patients are HIV positive



**134 million**  
units of medicine  
delivered per annum

**\$1,2 billion**  
Spent on medicines  
annually

**4.2 million**  
Patients receiving  
treatment for HIV

# The Public Health Supply Chain: Symptoms, Diagnosis & Treatment

## Symptoms



- Long patient waiting times
- Medicine shortages
- Poor health outcomes

## Diagnosis



- Poor visibility
- Limited resources - infrastructure and human resources
- Outdated processes, systems and infrastructure
- Multi-tiered and long supply chain

## Treatment



- Improve supply chain visibility
- Apply analytics to inform decision making
- Improve supply chain planning functions – Demand & Supply
- Optimise the distribution network
- Decant constrained health establishments

*“Supply chain planning functions are performed to ensure uninterrupted medicine availability in the right place, at the right time and in the right quantity, using models that are effective, agile, sustainable and resilient.”<sup>1</sup>*

Supply chain planning features three *separate but interrelated planning activities*:

## Demand

**Demand Planning:** Combining statistical forecasting techniques and judgment to construct demand estimates for health products or services to fulfil forecasted patient needs

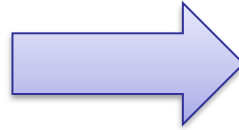
## Supply

**Supply Planning:** Coordinating inventory and orders to optimize the delivery of health products to meet patients’ needs

## Distribution

**Distribution Planning:** Planning for physical movement and storage of stock to meet the Supply Plan

Common Practice



Prior orders +10%

Why Forecast?





- Designed new demand planning process
- Reviewed & selected a COTS Forecasting tool
- Developed training materials



- Ran a pilot / proof of concept in Eastern Cape—*4th largest province, pop 6.5mil*



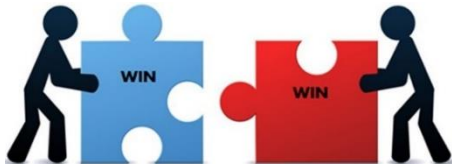
- Drafted Guideline & Policy documents
- Rolling out to other provinces: 3 month implementation & 3 month anchoring period

# Absolutely critical to create value from demand planning among key customers



**Senior management**

*Make **operational and financial trade-offs decisions***



**Bid Specification Committee**

*Shape **strategic sourcing & acquisitions strategy**: knowing the quantities of relevant products required for each new tender*



**Contract Oversight**

*Facilitate **supplier relationship management***



**Provincial Budget & Finance**

***Budget Execution**: year-to-go cashed up forecast vs. available budget  
**Budget Planning**: Establishing next year's budget*



**Supply Planners**

*Review the **ability to meet the demand plan, manage inventory, and plan replenishment***



# Overview of Statistical Forecasting Tool - Forecast Pro

Demand

- Provincial, contract, medicine & facility **visibility**
- Compares **new forecast vs. prior years**
- Add **adjustments & enrichments w/comments.**
- Supports **top down & bottom up** forecasting
- Cashes up the forecast to **show financial implications**

Gauteng Project - FP (Oct 2018)v1 - Forecast Pro TRAC

File Settings Operations Project View Window Help

Stat Forecast Unlocked 2016 1 through 2018 8 Holdout 0 Reset Units Default Bookmarks

GP

- HP06 Drops, Aerosols and Inhalers
- HP07 Ointments and creams
- HP08 Semi-solid dosage forms (syrups/suspensions)
- HP09 Solid dosage forms (tablets)
- HP10 Biologicals
- HP13 ARV
  - 180165395 ZIDOVUDINE SYRUP 50MG/5ML
  - 180205026 LAMIVUDINE ORAL SOLUTION 10MG/ML
    - ALEXANDRA HEALTH CENTRE
    - BEKKERSDAL WEST
    - BERTHA GXCOWA HOSPITAL-B
    - BRONKHORSTSPRUIT HOSPITAL
    - CARLETONVILLE HOSPITAL
    - CHARLOTTE MAXEKE JOHANNESBURG
    - CHIAWELO CLINIC SOWETO
    - CHRIS HANI BARAGWANATH HOSPITAL
    - CITY OF JOHANNESBURG METRO
    - CORO-LENASIA CLINIC
    - CULLINAN SORG EN REHABILITASIE SEP
    - DAWN PARK CLINIC
    - DIEPKLOOF CLINIC
    - DISCOVERERS HOSPITAL
    - DR YUSUF DADOO HOSPITAL
    - DR. GEORGE MUKHARI HOSPITAL
    - EDENVALE HOSPITAL
    - EIKENHOF CLINIC
    - EKURHULENI DHS REGIONAL PHARMACY
    - EKURHULENI HEALTH DISTRICT CHRONIC
    - ENNERDALE X9 CLINIC

GP > RT301 (HP02) Antibiotics and anti-infectives > 180056669 GEN

Gauteng Project - FP (Oct 2018)v1 - Forecast adjustments

180205026 LAMIVUDINE ORAL SOLUTION 10MG/ML;	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
History(2015-Sep - 2016-Aug)					5 258	7 778	4 968	12 198	7 945	5 522	6 788
History(2016-Sep - 2017-Aug)	8 294	9 429	3 644	8 216	7 602	14 616	7 376	14 314	8 892	12 909	11 424
History(2017-Sep - 2018-Aug)	8 201	18 798	13 526	12 497	8 467	11 276	6 081	14 476	16 201	12 299	11 328
Statistical	10 397	15 199	10 627	11 708	9 600	13 249	8 580	15 368	13 119	11 922	11 337
HIV Programme Team	1 040	1 520	1 063	1 171	960	1 325	858	1 537	1 312	1 192	1 134
Provincial Pharmacists					1 000		1 000				
Management											
Forecast	11 437	16 719	11 689	12 879	11 560	14 574	10 438	16 905	14 431	13 115	12 471
Costs	219 885	321 432	224 741	247 602	222 253	280 191	200 679	325 007	277 452	252 141	239 764

Formulas  Percent 10 Increment 1 Value 1 000 HIV Programme Commit Help

Comment: Smoothing out the profile History Year over year

Gauteng Project - FP (Oct 2018)v1 - Graph

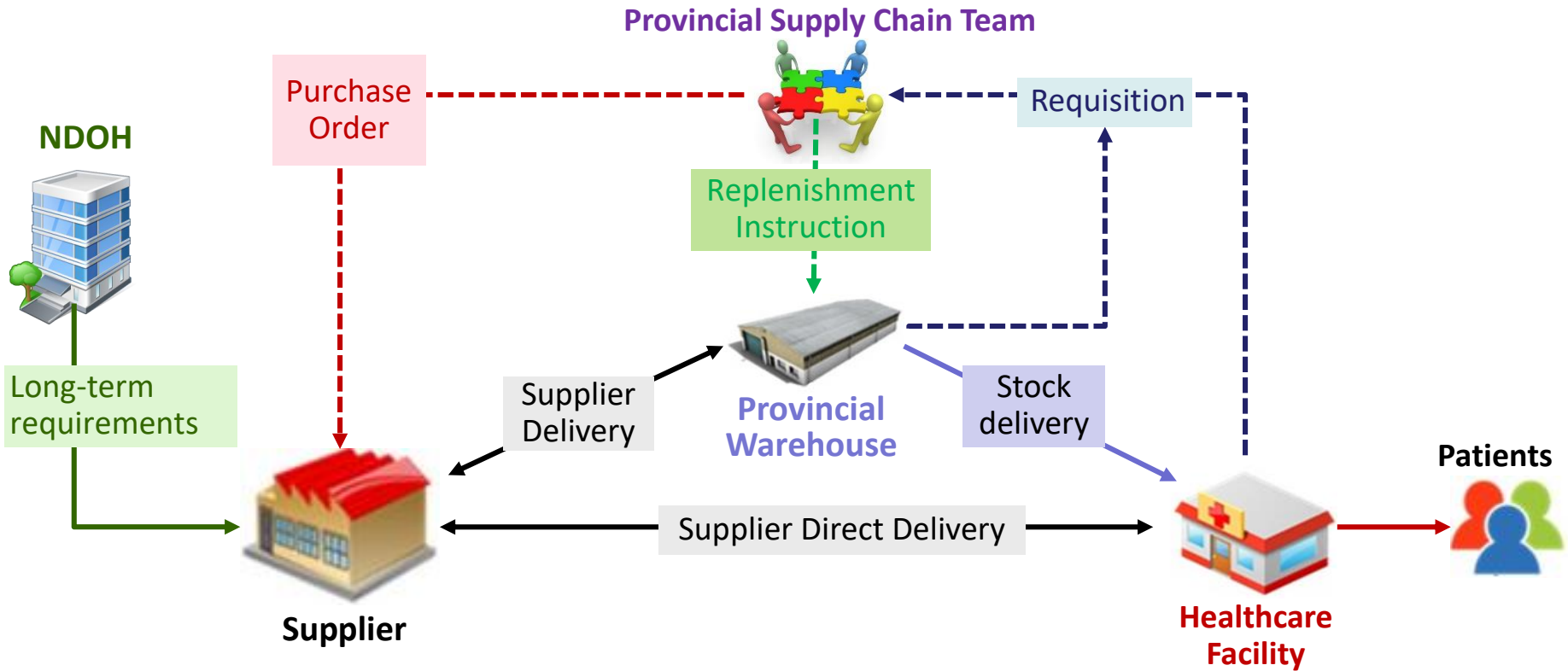
180205026 LAMIVUDINE ORAL SOLUTION 10MG/ML;240ML - Product

History Forecast



1. Get **buy-in** at multiple levels including customers
2. Establish Provincial **Demand Review Committees** early
3. Identify a **dedicated, skilled resource** to solely focus on demand planning
4. Involve **financial stakeholders** in the Demand Planning process.
5. Ensure **accountability of the forecast** from the owner of the volume
6. Develop a **detailed but iterative implementation plan**
7. Stress **provincial/local enrichment**
8. Make the **demand review a non-event**

NDOH plans to change South Africa's pharmaceutical supply chain from an **'Uninformed Pull'** system, to **'Informed Push'**.

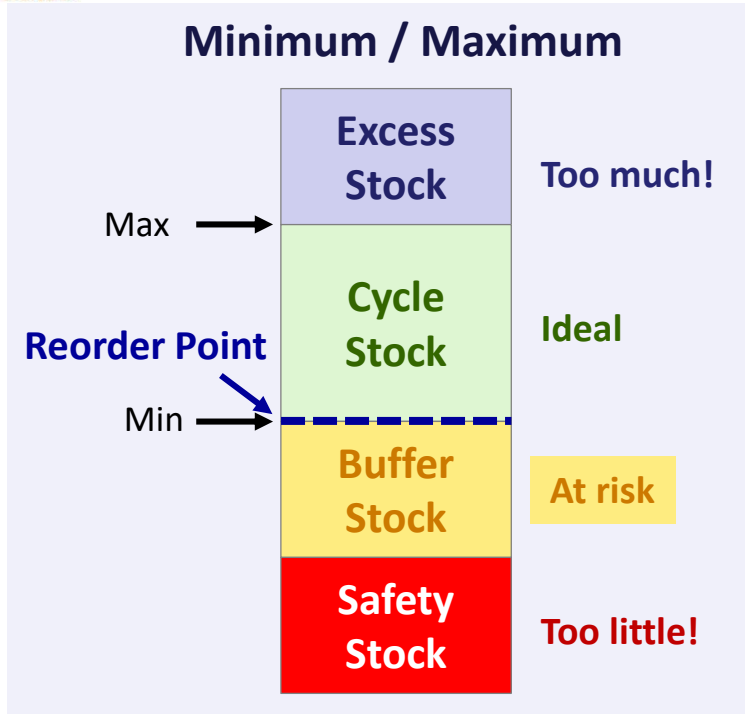


**Pull** – health facilities create replenishment orders

**Uninformed** – based on limited to no information

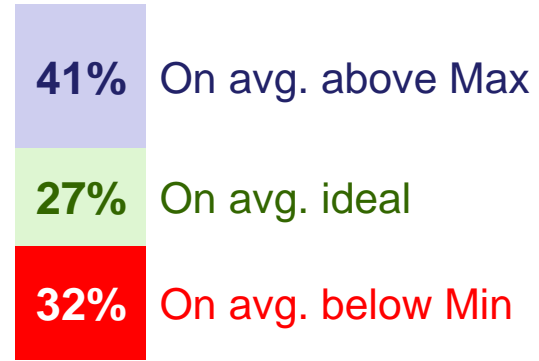
**Push** – centralised team creates a recommended replenishment order on behalf of facilities

**Informed** – technology enabled; based on stock levels, consumption data, supply plans & demand forecasts



## Clinic Example – North West Province

411 Stock items { 271 Pharmaceutical  
140 Surgical



### Segmentation

	Vol	Value
<b>A (first 80%)</b>	<b>40</b>	<b>6</b>
<b>B (15%)</b>	<b>61</b>	<b>44</b>
<b>C (4.5%)</b>	<b>92</b>	<b>90</b>
<b>D (0.5%)</b>	<b>78</b>	<b>131</b>

VEN	Count
<b>V</b>	<b>128</b>
<b>E</b>	<b>78</b>
<b>N</b>	<b>11</b>
<b>N/A</b>	<b>54</b>

	A	B	C	D
A	<b>5</b>	<b>20</b>	<b>14</b>	<b>1</b>
B	<b>1</b>	<b>18</b>	<b>32</b>	<b>9</b>
C	<b>0</b>	<b>6</b>	<b>41</b>	<b>43</b>
D	<b>0</b>	<b>0</b>	<b>3</b>	<b>59</b>
	A	B	C	D

Value

## Network

- 4 Districts
- 1 Provincial Warehouse located in Mafikeng
- 19 of 21 Hospitals act as Supply Points
- 10 of 41 Community Health Centers (CHC) & Subdistrict Pharmacies act as Supply Points
- 313 Clinics (PHC)
- 237 Pharmacists
- Fortnightly delivery schedule



- 33 people per km<sup>2</sup>
- 7<sup>th</sup> least densely populated province in South Africa

## Volumes

- 3.98m provincial population, ~3.6m served by NWDoH
- 245K persons on ARVs
- ~8,750 orders p.a. (36 p.d.) placed on Prov. Warehouse
- ~800 shipments p.a. (3 p.d.) Prov. Warehouse ➔ Hospitals

## Finances

Ave. Warehouse Inventory = ~R 130m

Logistics = ~R 13m

- Warehouse to Hospitals ~8.1m
- Hospitals to Clinics ~5.1m

## Background

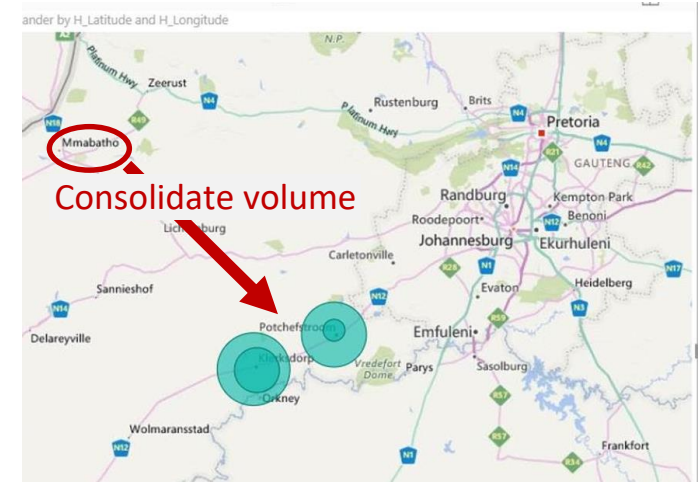
- Routing and scheduling was sub-optimal presenting an opportunity to better consolidate outbound shipments

## Approach

- Identified concentrations of high volume Hospitals that could be grouped and serviced by single shipments

## Projected Benefits

- Reduced transportation spend and warehouse workload



## Background

- Contracted rates for Provincial Warehouse to Hospital transportation were disproportionate:
- 8 ton trucks offer **100% capacity increase** over a 4 ton at a **165% increase in price**

## Approach

- Empower dispatch managers to shift to four ton trucks

## Projected Benefits

- Reduced transportation costs

Vehicle Type	Cost / km
1 ton truck	8.02
2 ton truck	10.33
4 ton truck	11.44
8 ton truck	30.35

Note the  $\Delta$



## Background

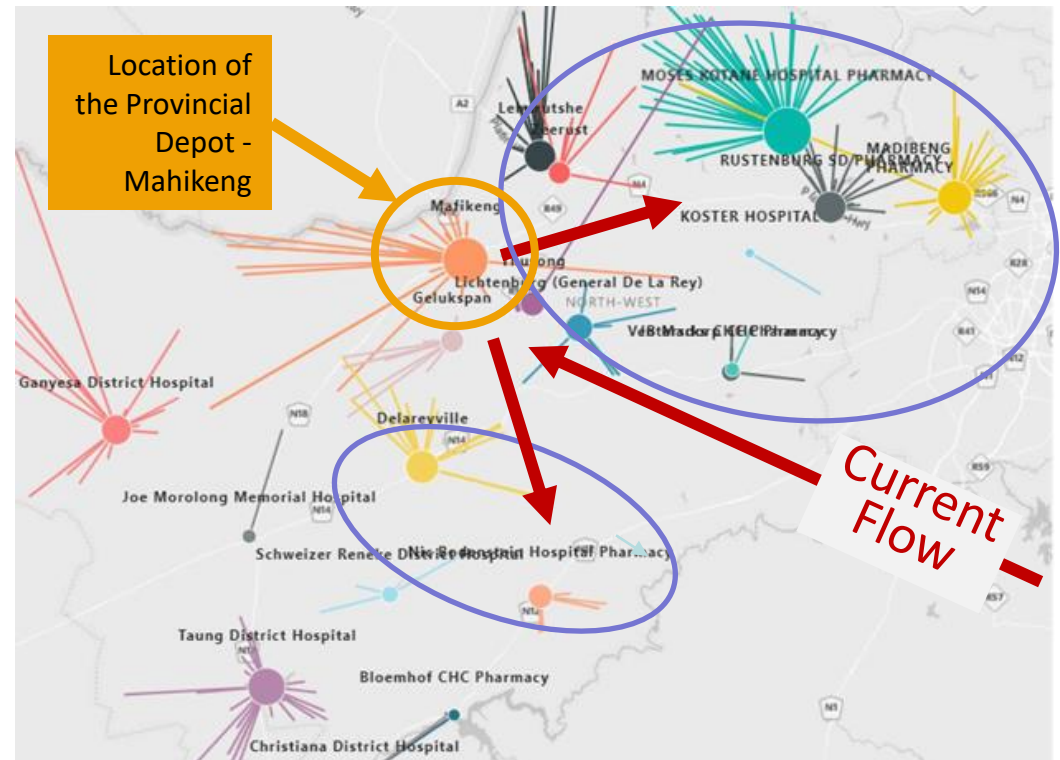
- Several **hospitals and clinics located between suppliers and the provincial warehouse**, e.g. Moretele, Moses Kotane, Tlhabane, Madibeng, Brits, Rustenburg
- 30% of annual volume serving ~115 (37%) of CHCs & PHCs

## Approach

- Shift identified Hospitals to **supplier direct delivery**

## Projected Benefits

- Reduced lead times
- Reduced transportation spend
- Reduced Provincial Warehouse workload
- Reduced Inventory
- Hospitals will have greater control over medicine availability
- Reduced potential for damage or leakage



Long queues!!!



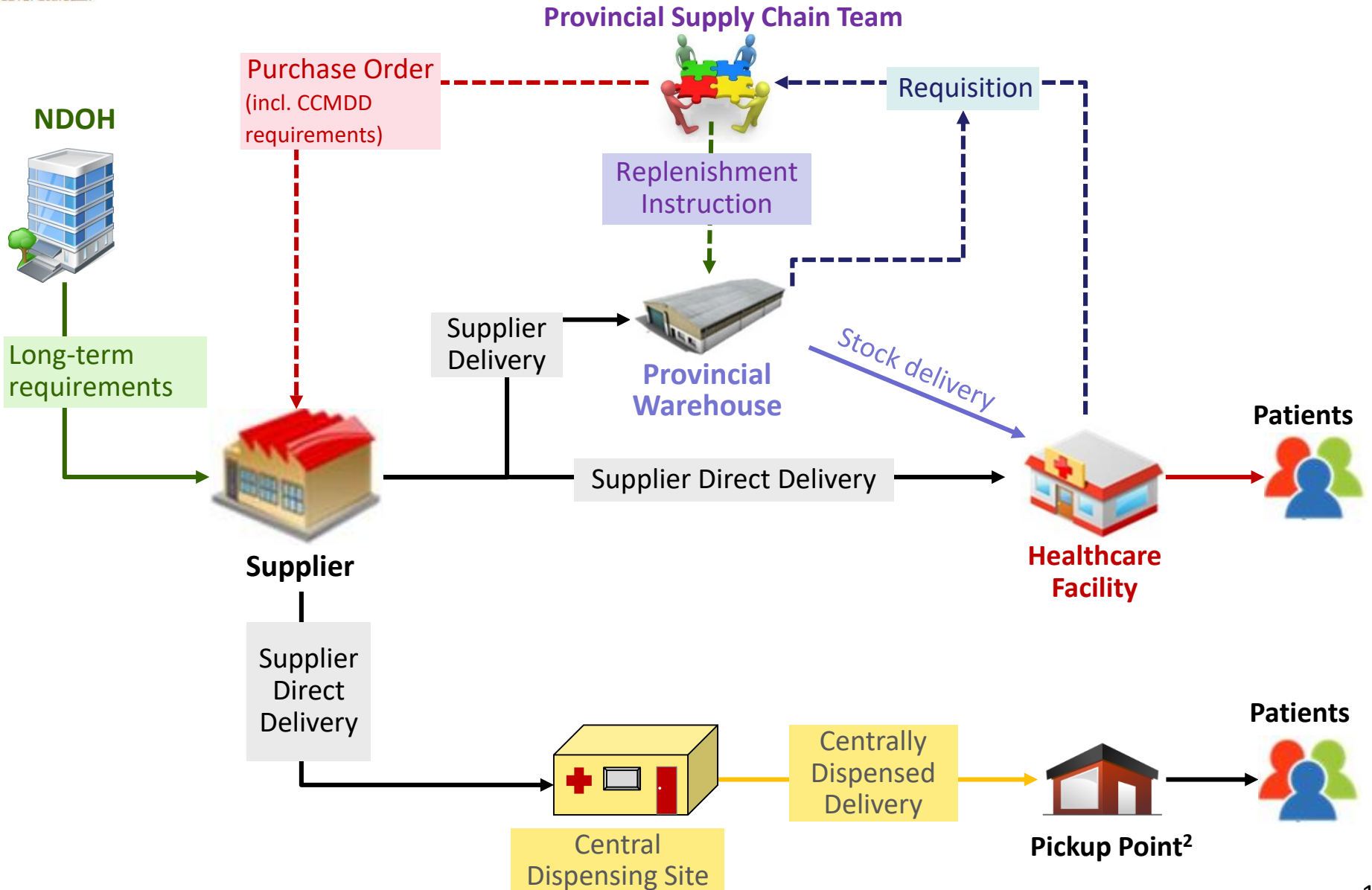
Long days!!!

Medicines shortages

Potential loss of income



Patients receiving chronic medicines deserved better access to chronic medications





# Alternative Distribution Models: Central Chronic Medicine Dispensing and Distribution (CCMDD) – A New Model

Distribution

## Traditional Care Model

### Current Situation

All patients forced through same process



## CCMDD Care Model

New Chronic;  
Sick Patients;  
Unstable Chronic;  
Stable Biannual

Hospital or Clinic



&

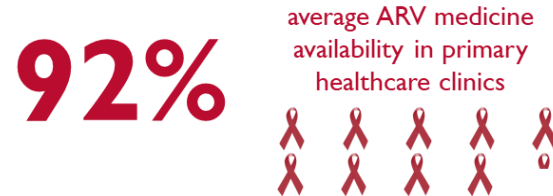
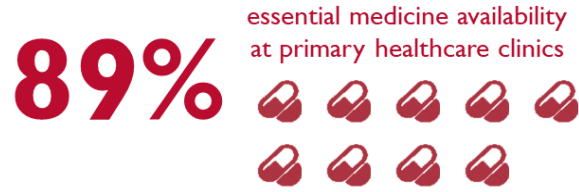
Pick up point



Stable Chronic  
Facility visits 2 / year  
PuP collections 4 / year



- **Decongested facilities**, freeing up staff time to see new patients and/or spend more time treating existing patients
- **Increased effective facility capacity** by 14% in 2017 & up to 24% in 2020
- Significantly **decreased non-adherence** rates
  - From 15-30 % in facilities down to 0.64% in CCMDD through making the medicine collection quicker (**reduced waiting time** by 5 patient days per year), a more convenient collection location and an **SMS collection reminder** system
- Significant **cost saving** opportunity – estimated 68% cost saving per patient per year
- Patient benefits – **1,5M patients enrolled** in the program allowing for collection of medicines at a more convenient pick up point.



\* Excluding specialist hospitals

# Thank You

*USAID GHSC TA South Africa*

Jon Jensen

[jon.jensen@za-scta.com](mailto:jon.jensen@za-scta.com)

David Crewe-Brown

[david.crewe-brown@za-scta.com](mailto:david.crewe-brown@za-scta.com)