

Centralised Chronic Medicines Dispensing & Distribution (CCMDD) supporting National Health Insurance (NHI) objectives to improve the supply of chronic medication to patients in the public sector

How public and private sector collaboration improves access to medication by applying best in class processes and technologies.

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Scope

The public health system has faced significant challenges in the past decade to support access to medical care for patients living with HIV and AIDS, as well as other chronic conditions. The strain on available resources contributes to increased waiting times, overcrowding of the public health facilities and decreased quality of medical care.

This white paper will cover the journey, from a logistics service provider's point of view, on the steps taken to set-up a world class solution for the public sector to dispense and distribute medication, and on how to support this process by using latest technology and adapting the solution to the change management requirements of the take-on of a new contractual agreement.

Background

In South Africa, the healthcare system is driven through the public and the private health sector. The systems operate in parallel with each other, although most of the population uses the public sector services.

The public healthcare system is chronically understaffed and faces funding challenges. Besides those factors, the South African public health sector has experienced an unexpected growth in patients with chronic conditions which leads to the following key requirements

- Increased access to long term therapies
- Universal access to antiretroviral therapy
- Steady increase in the proportion of the population with non-communicable diseases

Contributing factors demanding a new solution to service the people of South Africa, amongst others, are:

- Changing epidemiological profile
- Over extension of public sector health care facilities
- Enormous strain on available resources
- Medicine shortages
- Challenges in the quality of care provided.

Taking the above into consideration, the Department of Health, with its supporting partners and funders such as USAID and PEPFAR, has developed the Centralized Chronic Medicines Dispensing and Distribution (CCMDD) programme.

The Centralized Chronic Medicines Dispensing & Distribution programme¹

The CCMDD programme is designed for stable, chronic patients with certain conditions that do not require monthly clinical assessment and consultation. For such patients, a 6 months valid prescription

¹ As per NDOH Tender documentation for "centralized chronic medicines dispensing & distribution", 2017

is issued by the health care facility/tertiary hospital prescriber. The patient receives the first medication package (for 2 months medicine supply) from the clinic, the dispensing and distribution service provider will supply medicine packages for the remaining 4 months. The patient has the choice to select his/her preferred alternative collection point for the medication, which can be a private sector pharmacy, doctor's practice or conveniently located retail pharmacy.

The core functions to be performed by the service provider are:

- Prescription Collection, from health care facilities
- Prescription Management, assessment and validation of the prescriptions for compliance with legal and pharmaceutical requirements
- Dispensing Management, in compliance with pharmaceutical regulations on patient / prescription level
- Distribution Management, transporting the finalized patient medicine packs (PMP) to the selected pick-up/collection points as specified by the patient in time. The PMP should reach the collection point a minimum of three days prior to collection.

To enable these processes, the service provider provides following support processes:

- Inventory Management, including demand forecasting, purchase order placement, purchase order reconciliation and collation of the relevant supplier documentation for the department of health's supply control and payment processing
- Communication – call centre, to engage with patients, health care facilities and supporting partners to manage queries and provide information, including around any supply chain disruptions
- Medication Error Surveillance – following established procedures to manage medication dispensing errors which might affect a patient's health condition.
- Information management system, to establish data transfers between the Department of Health, the support partners and the other supply chain service providers.

DSV's history in chronic dispensing

DSV Healthcare has built up significant experience and expertise in the setup, management and running of CCMDD services.

DSV managed the Chronic Medicine Dispensary facility for the Western Cape which provides a CCMDD service for up to 380,000 prescriptions per month. This volume included the dispensing of anti-retroviral medication (ARVs) for 56,000 patients per month and up to 300,000 chronic prescriptions. This service was performed for all primary healthcare facilities across the entire Western Cape.

DSV Healthcare has developed unique dispensing methodologies which enable the dispensing of extremely high volumes of prescriptions and items without compromising quality, and more importantly, allow the most effective use of the required qualified professional Staff, a national scarce resource. Our operation has received recognition for this service and was awarded a Platinum Award at the 2014 Logistics Achievers Awards and was also nominated as a finalist in the 2015 Public Sector Innovation Awards.

DSV Healthcare dispensed over 14,4 million prescriptions to more than 255,000 chronic medicine patients through 150 state health facilities in the Western Cape while the project was live.

In addition, DSV has private sector experience relating to chronic medicines dispensing through Chronic Medicines Dispensary (trading then as UTi Specialist Pharmacy). This business was acquired by the group in September 2007 and traded for 7 years. Through CMD we provided a chronic medicine

dispensing service, representing a large number of the medical aids (including Discovery Health and GEMS). CMD dispensed close to 90% of the private sector/insured oncology chronic scripts, plus provided a dispensing service for a range of other specialized medication (e.g. HIV and Biologics) and general chronic medicines.

DSV's technological journey to chronic dispensing

Whilst DSV's business model can manage all the transport, collection and distribution related aspects, the process for chronic dispensing on a scale of 300,000 – 400,000 patients per month, required additional technological solutions to ensure

- Saleability
- Accuracy
- Efficiency

Hence a solution had to be built that required automation technology to be efficient and viable for operating a model with as limited resources as possible to ensure its financial viability and met the private sector's expectations on return on investment targets.

DSV's design process took the following principles into account:

- Pharmacy model - Traditional manual picking/labelling/checking in the usual pharmacy model
- Automated picking technology
 - A-frame picking with manual labelling and item checking
 - Pick by light technology – with manual labelling and item checking
- Integrated solutions, including
 - in line print and apply labelling
 - auto item sortation
 - auto checking and
 - in line bagging / packaging of items

The benefits and weaknesses were evaluated, and a decision was made to implement an integrated solution. The criteria supporting the decision can be reviewed in the following matrix:

Option	Standard Pharmacy Picking	Automated picking	Pick-to-light	Integrated solution
Description	- Each individual prescription picked manually '- items labelled one by one '- items checked against prescription individually '-parcels sorted and containerised alphabetically '-items packed manually into a bag	- Items picked using A-Frame picking solution '- items labelled one by one '- items checked against prescription individually '-parcels sorted and containerised alphabetically '-items packed manually into a bag	- Each individual prescription picked manually using pick-to-light system '- items labelled one by one '- items checked against prescription individually '-parcels sorted and containerised alphabetically '-items packed manually into a bag	-Items picked by product in bulk '-Items labelled by product utilising in-line print and apply technology '-Items consolidated per delivery point using sortation system '-Second sort to consolidate items by patient by facility '-Items verified using scanning/camera systems '- Items packed into bags through in-line vertical auto-baggers '-Parcels containerised alphabetically
Evaluation	At peak monthly volumes a minimum of 330 qualified staff required to perform above functions. High risk of errors.	A reduction of staff Of 130 achieved. High risk of error.	Staff reduction achievable of only 50. Lower risk of error	Staff reduction of 290 people. Lowest error rate achievable. Increased efficiencies - leading to lower daily hours
Conclusion				
Notes	Professional staff not available. Staff costs exorbitant. High risk of errors. Insufficient space to accommodate process	Professional staff not available. Staff costs exorbitant. High risk of errors. Insufficient space to accommodate process	Professional staff not available. Staff costs exorbitant. Lower risk of error. Insufficient space to accommodate process	High levels of efficiencies possible thus leading to lower head count and reduced hours of operation. Error risk significantly reduced through technology.

The final design solution incorporated the following supply chain principles:

- Pick items in bulk and not by script/order to achieve efficiencies in the bulk stock management
- Label individual medicine items at patient level by product/SKU, not by prescription/order
- Automatically sort labelled items to consolidate into delivery/collection points
- Perform a secondary sort process for each delivery point to patient level in alphabetical sequence
- Verify each patient's items using scanning technology
- Pack each patient's medicine into a medicine bag using in-line vertical auto baggers
- Pack medicine bags alphabetically into containers, including per container manifest, shortages and special instructions, for delivery to facilities

DSV's implementation & change management relating to the CCMDD tender

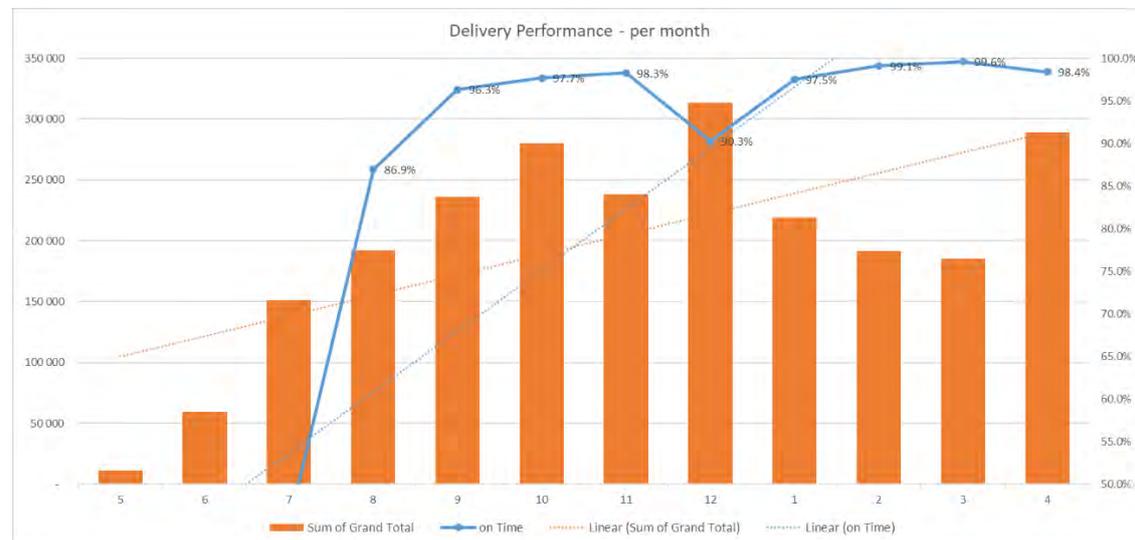
DSV participated in the National Tender for 8 provinces to enhance its service offering as well as make use of the existing technology and provide an efficient, quality and reliable service to the Department of Health outside the Western Cape.

The tender was awarded in a short time frame, during the end of March 2018, with the requirement to start collecting first prescriptions from the 1st of April 2018 and deliver the first medication by the 28th of May 2018.

Despite the extremely tight timeline, DSV's experience of operating a similar service provided a roadmap to setting up and rolling out the service. The project team encountered a requirement for change management and addressed this by following initiatives

- Develop training material specific to DSV's established processes
- Set-up new procedures to enable script collection processes to be implemented within 4 provinces and 1,600 health facilities in one month
- Roadshow to cover District and Sub-District management teams to train around 1,600 people in 1.5 months
- Distribute welcome packs, containing standard operating procedures, marketing and support materials as well as consumables to enable the prescription collection process
- Collect medicines from pharmaceutical depots for initial stock supply to enable the dispensing process
- Operationally, a system needed to be re-installed to cater for new process requirements, such as
 - Management of stock by individual provinces
 - Dispensing 2 months medication in one process/patient package every 56 days instead of 1 month's supply in one package every 28 days
 - Management of different prescribing protocols by provinces, e.g. different medicine inclusions/exclusions and protocols
 - Incorporate different lead times to different destination/medicine collection points
 - Limiting the use of consumables by consolidating parcels for a delivery/collection point into the minimum amount of containers
 - Incorporate the requirement to deliver on a nominated day of a week instead of daily deliveries, to reduce cost and improve efficiencies

These limited timelines, the size of the territory for delivery and collection, and the number of individual stakeholders that needed to be trained and consulted, challenged our ability to meet the service level expectations by the Department of Health in the beginning of the contract. Through consistent process re-engineering and innovation in the production process, DSV overcame these challenges and delivered a world class service with an average of 99% on-time delivery service.



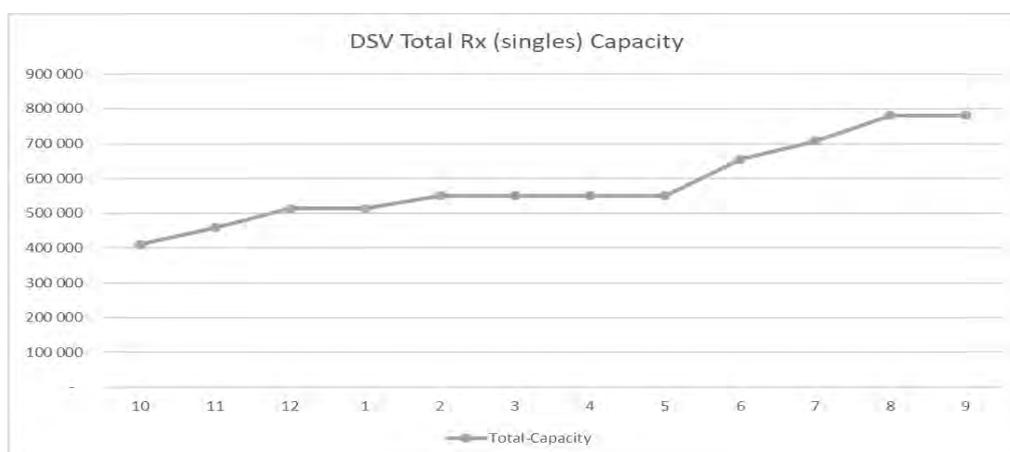
Future innovation & improvement ideas

The process designed and implemented by the Department of Health with its service providers can improve further to cover additional supply chain related improvements. This will allow partners and research organisations to further enhance the data accuracy and to leverage additional benefits from the programme. We will cover certain aspects that could be considered:

1. Prescription Management
 - Electronic dispensing systems to interface directly with the service provider and reduce the requirement to transport documentation around the country. Technological investments into IT Infrastructure and connectivity are the major stumbling blocks to accelerate this improvement
 - Review of policies relating to the technical requirements that a Prescription needs to adhere to
2. Stock Management
 - The stock procurement process could be simplified by managing a national stock level for all provinces instead of separate provincial stock management processes
 - The procurement from manufacturers causes possible stock and financial loss, due to minimum order quantities enforced by the contractual tender obligations, and further exacerbated by provincial stock management and procurement processes
3. Dispensing of ARV medication
 - DSV has developed a new dispensing process for specific medication being supplied in plastic bottles
 - DSV's newly designed packaging line allows the programme to be increased to cover remaining ARV patients that currently get serviced by the facilities
 - The packaging line is designed to allow for the following throughput:

Apply Label				
	bottles	UOM	items/PMP	PMPs
	2,700	per hour		
max	75	per minute	2	38
recom.	60	per minute	2	30
85%	21,420	per day	2	10,710
Flow Wrap	bags			PMPs
max	100	per minute		100
recom.	30	per minute		30
85%	10,710	per day		10,710

It enables DSV to increase capacities for Patient Medicine Packs to be dispensed by approximately 40%:



4. Distribution to collection points for Patient Medicine Packs
 - Apply production process concepts to enable improved cycle of deliveries
 - Rolling up production dates factoring lead times and nominated delivery days into the process
 - DSV estimates it can reduce packaging material requirements by around 30%, thus reducing carbon emissions and the ecological impact of the programme.

5. Deploy new technology for patients to collect PMPs outside retail stores or clinics, e.g. deploy solutions like the DSV Locker that
 - Mitigates the need for a patient to enter a retail store during opening hours for collection,
 - Patients can collect when it's convenient to them at any time of the day – safely and securely.
 - Delivery into and collection from a locker is digitally managed, there is a strict chain of custody and all transactions are recorded, allowing the Department of Health to enforce its stock management and reverse logistics requirements
 - Significantly reduces the 'avoidable' error rate, by parcels being uniquely stored and enhances the customer experience, ease of use and overall simplicity to collect a parcel



Opportunities to replicate and innovate

DSV's unique capability to develop ground-breaking, integrated solutions that innovate a specific supply chain have been, and could further be, replicated in other areas of supply chain management and specific industry sectors. To name a few, the following solutions / replications can be considered:

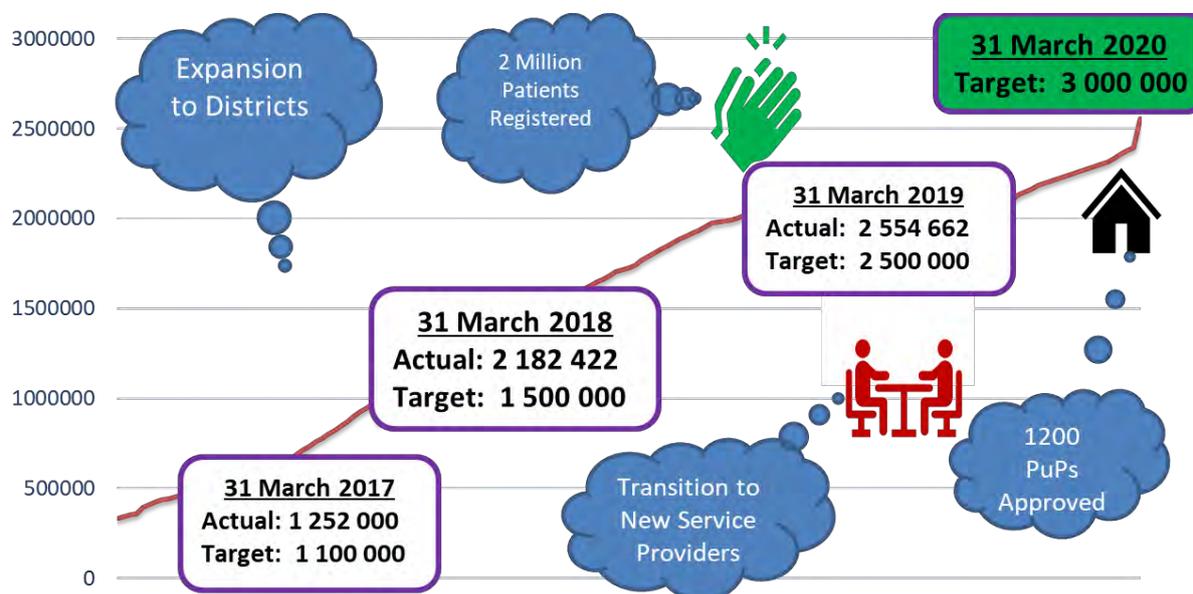
- Education sector
 - Delivery of books to schools
 - Delivery of exam papers to schools
- Medical sector
 - Delivery of medication to patients in the mining and correctional service sector
 - Delivery of medication to tertiary hospitals on patient level, to support the daily processes in hospital
 - Addition of other therapies such as Tuberculosis, Hepatitis, etc.
- Replication
 - Provide a similar service to other countries with chronic disease burdens, like hepatitis, ART therapy requirements or blood pressure conditions
 - Consider countries with metropolitan hubs and rural areas to be the focus countries
 - Consider less developed countries with challenging healthcare services and similar constraints

Outlook

Whilst a large scale, public private partnership initiative such as the CCMDD programme does have its implementation challenges, it is important to highlight the achievements and successes gained, such as

- Reduction of medication errors
- Improved service delivery for a percentage of the population used to long waiting times and who were often required to take leave to get medical care
- Reduction in stock losses and write-offs
- Improved adherence by patients due to reduced waiting times and simplified processes

In addition to the tangible points from a patient perspective, we can see a positive development for the programme. The Department of Health expects the number of registered patients to grow up to 3 million by March 2020.



² NDOH Statistics on the CCMDD Programme, provided through representatives of NDOH, 2019

In terms of future enhancements of the programme, the author suggests the following could be the most promising improvements in the future:

- IT and connectivity investments combined with the roll-out of electronic prescribing
- Procurement simplification to enhance stock availability and reduce administrative burdens
- Alignment of policies and partners

SPEAKER/S PROFILE/S + PHOTOGRAPH



Florian is a Professional Engineer with a master's degree in industrial engineering from the University of Applied Sciences in Mannheim (Germany), and is currently working at DSV Healthcare South Africa as a General Manager for Business Change Management. Florian heads up the business unit for centralized chronic medicine dispensing. He is registered with SAIEE and the Engineering Council of South Africa and has participated at SAPICs previously. In his capacity at DSV and in his previous employment, Florian was involved in the design and implementation of warehouses as well as specific processes in various industries, focussing on spare parts management as well as solutions in the medical devices warehousing and distribution. He is a LEAN and Six Sigma practitioner and well versed in the design of business and Warehouse Management System processes.

² NDOH Statistics on the CCMDD Programme, provided through representatives of NDOH, 2019

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References

- Presentation Material from NDOH
- Tender Documentation as per Bid_Pack_HSP01-20172018_CCMDD_20171110 .pdf
- DSV Healthcare operational data sources

Footnotes

