

FORECASTING IN A CRISIS

Using Demand Planning to Prevent Medicine Stock Outs in South Africa's Public Health Supply Chain During the Covid-19 Pandemic

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“Plan for the Worst – Hope for the Best!”

On March 5, 2020, South Africa recorded its first Covid-19 case. The number of cases escalated rapidly; by September 16, more than 663,000 Covid-19 cases had been diagnosed and more than 16,000 fatalities recorded. By January 5, 2021, there were 1,127,759 positive cases registered in the country and 30,524 deaths.¹

Faced with such a crisis, it was essential for South Africa to ensure its health system was up to the challenge. One of the most important components the country put into action was an enhanced demand planning process.

Demand planning is a supply chain management system of forecasting, or predicting, the future demand for products to ensure that plans can be made to meet the demand. It combines statistical forecasting techniques and judgment to construct demand estimates for health products or services across the supply chain from the suppliers' stocks to patients' needs.

The South African National Department of Health (NDoH), with the support of the United States Agency for International Development (USAID)-funded Global Health Supply Chain Program –

Technical Assistance (GHSC-TA), undertook the task of forecasting the country's medicine requirements during the Covid-19 pandemic.

South Africa has a two-tiered health system. Most of the population makes use of public health services. Medicines to treat most conditions are selected at a national level and form part of the Essential Medicines List. Standard Treatment Guidelines (STGs) are developed and continually reviewed to support the appropriate use of these medicines. The public sector awards contracts for medicines and other consumables at a national level, leveraging off economies of scale to bring costs down. These items are procured off contract by public hospitals and clinics. The NDoH's Affordable Medicine Directorate (AMD) executes processes relating to selection and contracting.

To prevent medicine shortages during the pandemic, the AMD undertook several important steps. First, AMD **set up a team of experts** to advise on medicine selection, rational medicine use, demand forecasting, procurement, and logistics. These experts **engaged with a broad group of stakeholders including critical care specialists** to determine the challenges on the

¹ [Covid-19 Corona Virus South African Resource Portal](#)

ground. Then, the AMD **established an engagement platform** to share information and enhance communication, **with regular meetings** to ensure all stakeholders were aligned. The AMD **received constant updates with new data, insights, and feedback from the field** to make planning more accurate. Through these efforts Covid-19 priority medicines were selected and demand forecasts developed.

Medicine Selection for Covid-19

At the beginning of the pandemic, not much was known about how to treat Covid-19 patients, nor what additional medical complications could arise from this infection. The AMD reviewed the STGs for possible disease states and complications that could be of potential concern during the Covid-19 outbreak and the medicines used to treat these conditions. A list of potential medicines was drawn up and refined through expert reviews.

The NDoH drafted a Covid-19 guideline for South Africa, which was updated through a rapid review process. All documents were published on the NDoH website for easy access and transparency. Other critical items were added to the list where security of supply was at risk, especially from products that had to be imported. This added 367 items to the list that was managed by the Covid-19 task team, and dubbed the “Covid-19 Priority List”.

Establishment of the Covid-19 Demand Forecast

The AMD and GHSC-TA team was fortunate to be able to work from existing demand planning processes that have been implemented over the last three years. The key question was to determine the additional volume of medicine that was going to be required to treat patients presenting with Covid-19. Baseline forecasts were available for each product at every health establishment across the country. This baseline provided an excellent starting point to which the Covid-19 volume lift was added. Constraints that would limit treatment, such as the number of beds, supplier shortages, and availability of medical staff, also had to be considered.

The second component of the demand planning process was a patient level forecast. The National Covid-19 EPI Modelling Consortium made up of statisticians, epidemiologists, virologists, and other experts was established by the NDoH to produce this forecast. They generated a model considering elements such as transmissibility, infection severity, treatment pathways, and public compliance to lock down measures, which resulted in mapping of multiple scenarios of patient numbers that would require treatment in primary health care clinics and hospitals, including intensive care units.

With input from the Covid-19 Priority List and the patient level forecast, the AMD and GHSC-TA team could establish the Covid-19 volume lift. The estimated additional items required to treat Covid-19 patients were added to the baseline forecasts to establish a **Covid-19 forecast**. Provincial and national role players would add input to adjust the forecast which was broken down per province in volume and value terms. This information was shared with the provincial pharmaceutical services teams, finance teams, and other key role players to help make sure that medicines were available where needed. Several months into the pandemic, the World Health Organization shared a forecasting tool to help countries forecast their Covid-19 medicine requirements. This aligned with the NDoH forecasting process, confirming that the project team was on the right track.

The demand planning team generated forecasts which were updated based on input from experts, provinces, and national and international research. Suppliers could use these forecasts to drive increase in their stock availability and provinces could make sure they ordered enough stock. All this was achieved because of a reliable forecast. GHSC-TA’s demand planning support ensured that AMD had a high level of stock availability throughout the Covid-19 peak period and that lifesaving medicines were available for patients at the right place at the right time.

