Monitoring of medicine availability during the COVID-19 pandemic at the National Department of Health

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Introduction


Initially there was no evidence-based prevention and treatment for COVID-19, although this was rapidly evolving. Worldwide, the closure of borders, limited transport routes and a reduction in economic and production activity posed a significant risk to the integrity of the global medicines supply chain. In addition, an unpredictable higher demand for medicines expected to prevent and treat COVID-19 was experienced. The South African population is approximately 61 million people,3 the majority (82%) of whom are dependent on the public sector4 with a healthcare budget of R259 billion.5 A national co-ordinated response was needed to avoid stock-outs and to ensure the availability of essential medicines so that patients continued to receive life-saving medicines to prevent and treat disease. Furthermore, the National Department of Health (NDoH) had to plan for potential increases in medicine demand, in an area of which there was a paucity in evidence-based literature, ensuring that adjusted quantification plans could be used to prevent future stock-outs.

Medicines selection and the medicines supply chain

The Affordable Medicines Directorate (AMD) within the NDoH is responsible for developing systems to facilitate access to essential medicines and ongoing oversight and monitoring of access to medicines. The Directorate is also responsible for the licensing of persons and premises that deliver pharmaceutical services. Refer to Figure 1 below for the supply chain framework of the AMD.

Economies of scale, through the use of national tenders, are used to reduce medicine costs. Furthermore, equitable access and promotion of the rational use of medicines is ensured through the development and implementation of the Standard Treatment Guidelines (STGs) and Essential Medicines List (EML). The Essential Drugs Programme of the AMD oversees development and implementation of the STGs and EML through National Essential Medicines List Committee (NEMLC). The NEMLC is a non-statutory, advisory committee constituted in terms of the National Drug Policy (1996) and appointed by the Minister of Health. Its objective is to develop and review a list of essential medicines for use in the public sector, supported by Expert Review Committees.
Medicines selection during the COVID-19 pandemic

To implement effective interventions to manage the potentially increased medicine needs due to the COVID-19 pandemic, the Minister of Health appointed non-statutory advisory committees, as enabled by the National Health Act, 2003 (Act No. 61 of 2003). This included the Ministerial Advisory Committee (MAC) on COVID-19. The National Essential Medicines List (NEML) Sub-Committee on COVID-19 Therapeutics was also convened, to provide input on medicines for the treatment and prevention of COVID-19, using rapid reviews adapted from the NEMLC evidence review process with the aim to expedite decision-making for the selection of medicines for COVID-19. Existing medicines supply chain systems had to resiliently assist the already strained health care sector to mitigate the challenges and ensure medicine availability in South Africa. Refer to Figure 2 above for the COVID-19 MAC pandemic timeline.

Monitoring of medicine availability - the COVID-19 priority list

Strong, responsive leadership was needed to respond to the dynamic nature of the COVID-19 pandemic. The AMD provided this leadership in initiating the development of a priority list of medicines to prioritise forecasting needs and monitoring of availability of priority medicines and inform strategic interventions necessary to avoid medicine stock-outs. The initial list was identified from various chapters in the STGs that were expected to be important, such as respiratory diseases. This list was refined with frequent updates as treatment of COVID-19 evolved, in line with changes to the guidelines and supply chain challenges or improvements.

Medicines that were monitored closely in the supply chain included the following:

1. Medicines used in the management of COVID-19. These included medicines used for the prevention of disease and treatment of symptoms, and secondary infections and complications as recommended by the NEMLC and as stated in the STGs and EML.

Two drugs that have undergone this afore mentioned rigorous process were enoxaparin and corticosteroids.

2. Medicines essential for continuation of essential service delivery at health establishments. This included chronic medicines for which multi-month dispensing were provided, for example antihypertensives.

3. Medicines with current or potential supply chain challenges. Supply chain challenges can come from shortages in the active pharmaceutical ingredient (API), or lack of finished medicine products. Shortages could also be experienced by supply chain centres that were affected by limited operation of distribution during this pandemic. Medicines that could be used as alternatives were also included in the priority list, for example, heparin as an alternative to enoxaparin.

The National Surveillance Centre (NSC) is a web-based performance monitoring and evaluation tool that uses dashboards to represent medicine availability in health facilities, depots and medicine suppliers. From this, the medicine availability throughout the public health chain can be monitored. Data obtained from the monitoring of the priority list of medicines was presented on the NSC, giving AMD visibility into the integrity of the supply chain. The NSC was used to monitor the stock levels of these medicines to inform activities and act as an early warning system for future supply chain challenges, as well as to assist key personnel to respond quickly to address challenges throughout the supply chain.

Prior, historic order quantities were used as the baseline for consumption. COVID-19 patient modelling and various statistical methods were used to forecast potential demand for these medicines. Actual usage during the pandemic against these modelled quantities was frequently monitored, so that any adjustments to models, could be made and pharmaceutical suppliers be notified of changes to quantities needed. Data was monitored at all levels of the supply chain, including at pharmaceutical suppliers, provincial pharmaceutical depots, hospitals, community health centres and primary health care clinics in all provinces.
A guideline for monitoring of priority medicines for the pandemic was developed, together with the priority list and data fields to be reported to the NSC. Data on these medicines was monitored at all levels of the supply chain, informing demand and supply planning, and discussed at weekly COVID-19 Emergency Supply Chain meetings between the National and Provincial Departments of Health.

**Examples of medicines monitored**

1. Enoxaparin was recommended for use in hospitalised COVID-19 patients. Figure 3 shows the forecasted quantities anticipated by the demand planners that were assumed would be needed (line graph), compared to previous, actual procurement quantities for four months prior to COVID-19 (which was used as a baseline for consumption, bar graph). Of all the heparins, it was assumed that enoxaparin 40 mg would have the highest demand during the COVID-19 pandemic and as such the forecast was adjusted for this (assumptions on medicine usage by NDoH were necessary at this stage of the process as the treatment of COVID-19 was still in its infancy). There were no stock-outs noted on the NSC during the COVID-19 pandemic for this item. Increased forecasted quantities for heparin 5 000 IU and 25 000 IU were also used to ensure availability as a secondary option in the case that enoxaparin could not be procured.

![Figure 3: Forecasted and actual quantities of enoxaparin used during the COVID-19 pandemic](image)

![Figure 4: Forecasted and actual quantities of injectable corticosteroids betamethasone and dexamethasone used during the COVID-19 pandemic](image)

**References**


Intravenous corticosteroids (dexamethasone and betamethasone) were also indicated for the treatment of hospitalised COVID-19 patients. The projected patient infection rate and number of hospitalisations was used to increase the initially forecasted quantities of injectable corticosteroids in preparation for the expected increased demand during the COVID-19 pandemic. Figure 4 shows the forecasted quantities represented by the line graph, and actual procurement data (as the baseline) by the bar graph. The high availability of these agents was maintained during the pandemic. Increased forecasts of all available oral corticosteroids were also used to ensure availability as a secondary option in the case the intravenous agents were not available, as well as for their own indication in the treatment of COVID-19.

Conclusion

The effective monitoring of the COVID-19 priority list together with mitigation of risks, enabled through constant communication between the AMD and its key stakeholders, ensured the maintenance of high medicine availability during the pandemic. Transparency of medicine availability through the visibility of data on the NSC promoted accountability and enabled early warning systems to detect potential supply chain issues, allowing the priority list team time to consider and plan for alternative medicine availability. This enabled high medicine availability, in line with the requirements from the WHO.

The monitoring of medicine availability involved a successful national coordinated response through the centralisation of the medicines supply chain, together with constant communication and stakeholder management. A rapid response was initiated to strengthen AMD’s medicine supply chain to ensure availability during the pandemic, through which gaps were observed and managed. The system will continue to be strengthened and used for other emergencies that may affect the medicines supply chain in the future.

References