



Monitoring national priority programmes through a centralised National Data Command Centre: our journey and lessons learnt from South Africa

ASLM2021 Satellite Session

Sponsor

National Priority Programs (NPP) of the National Health Laboratory Service, Department of Molecular Medicine & Haematology, School of Pathology, Faculty of Health Sciences, University of the Witwatersrand.

Date and Time

17 November 2021, 8AM-9AM GMT

Summary

This 'Show & Tell' seminar provides insight into over 20 years of work in developing a national Data Command Centre (DCC) built in South Africa. We will demonstrate the importance and journey of our DCC through a series of use-cases showing the advanced analytics capabilities of the DCC supporting activities such as monitoring a national HIV program, laboratory disaster recovery planning, placement of point-of-care testing (POCT) instruments, patient-centric analytics and geospatial mapping and predictive modelling. These use-cases will illustrate how the DCC can be used to identify and plan interventions within communities, facilities, and laboratories.

Historically, laboratory data systems in South Africa were characterized by fragmentation, lack of coordination, manual data systems and a lack of interoperability. The creation of the National Health Laboratory Service (NHLS) in 2001 unified all diagnostic laboratories into a single organisation, ranging from highly sophisticated central academic laboratories to distant rural hospitals. All laboratories now use a single national Laboratory Information System (LIS) compared to the fragmented and manual data sys. To create a national repository of laboratory information, data from both decentralised LIS and the current centralised LIS feeds into the NHLS Corporate Data Warehouse (CDW). For historical data, a large data extract was used. Currently, a trickle feed mechanism ensures the replication of LIS data to the CDW in near real-time.

The uniqueness of the NHLS CDW lies in the fact that it is a national, centralised powerhouse that stores large datasets that include relevant patient demographics, facility details, diagnostic test parameters and test results. Once the CDW was established, the National Priority Programmes (NPP) of the NHLS

established the foundation for a national Data Command Centre (DCC) building on the CDW backbone to provide operational and programmatic support to the National Department of Health (NDoH) HIV and TB programmes. The foundation allows for a centralised Operations Planning Room equipped with multiple televisions, illustrating real-time programmatic key performance indicators through user-friendly dashboards. Report types will include; HIV/TB programmatic, mHealth, instrument monitoring, testing capacity, test volumes and turn-around times across the pathology value chain, all of which are drilled down to facility level.

Systems are becoming so advanced and the DCC enables us to focus on the 10% that's wrong without having to search amongst the 90% that is right. The key steps to our DCC implementation journey included: (i) Identification of data sources, (ii) integration of data sources, (iii) infrastructure set-up and (iv) data analytics and dashboard visibility. Over and above the traditional centralised laboratory data sources, the DCC provides a platform to centrally house data from POCT, patient-centric mobile digital health technologies such as rapid diagnostic test readers, and smartphone applications.

Big data and artificial intelligence (AI) are at the forefront of big data analytics. Analytics and visualisation are streamlined through the use of surveillance dashboards with AI algorithms developed to perform predictive modelling to support health research and aid in disease surveillance, such as outbreak monitoring. The centralisation of all these data sources allows for advanced statistical, spatial, and predictive analytics, all of which lead to a more real-time, targeted approach for the planning and execution of appropriate interventions at a national scale (e.g., community screening, surveillance, increased access to testing and treatment and early detection of epidemics). These reporting templates can be 'packaged' and configured for other African countries to strengthen their national disease management programmes.

Given the quadruple burden of disease in South Africa, it is important to shift the focus of the DCC going forward to non-communicable diseases (NCD). There has been substantial work done for HIV/AIDS, TB and cancers. Therefore, work is underway to mature the DCC for these NCD in line with approaches to focus on chronic diseases.

In conclusion, every environment is complex thus when the establishment of a DCC is embarked upon, the initial planning needs to include thorough end-user due diligence scoping, to ensure that you are addressing the key operational and programmatic monitoring questions. There is usually no single data point and hence interoperability is important and that the data hosting and management is supported by the relevant national data protection regulations. Other global challenges include unique patient identifiers across multiple platforms and ownership between the different data sources. However, regulated sharing of data is critical for the strengthening of global health systems.

Learning Objectives

Even if your country is still using paper-based laboratory data systems, this 'Show and Tell' seminar will demonstrate how South Africa migrated from very basic data systems to a national DCC.

This session aims to inform countries and regions about the journey and tools required to establish a national centralised data command centre to support national diagnostic operations and disease management. The delegates will not only leave with a deeper understanding of what is needed to establish a national DCC, but will they will also get to see how these reports are visualised using big data and artificial intelligence. This will be done through the illustration of use-cases that practically demonstrate how these reports are translated into actions to ensure that these national programs are sustained and continue to strengthen.

Target Audience

The target audience for this session includes all members of the laboratory medicine profession. This seminar is particularly aimed at laboratory staff based at ministries of health, national reference laboratories, regional laboratories, laboratory informatics personnel, monitoring and evaluation staff, and policy and decision-makers. Insights will also be provided into the management of national laboratory data for priority programs in particular. This session aims to work specifically on HIV and TB monitoring and evaluation at the national, provincial, or health facility levels.

Session Programme

Presenter & Affiliation	Title
Ms. Lynsey Stewart-Isherwood Department of Molecular Medicine & Haematology, School of Pathology, Faculty of Health Sciences, University of the Witwatersrand	An introduction to the National Data Command Centre (DCC): why a National DCC is valuable for the monitoring of national HIV and TB programs
Mr. Naseem Cassim Department of Molecular Medicine & Haematology, School of Pathology, Faculty of Health Sciences, University of the Witwatersrand/National Priority Programs (NPP), National Health Laboratory Service (NHLS)	The journey of the National Data Command Centre: Roadmap from where we were, where we are at and its future.
Ms. Somayya Sarang National Priority Programs (NPP), National Health Laboratory Service (NHLS)	Lessons learnt from a national HIV program
Mr. Floyd Olsen National Priority Programs (NPP), National Health Laboratory Service (NHLS)	How to practically apply the National Data Command Centre: a use-case for a national laboratory disaster recovery plan
Mr. Kumbirai Chigudu Department of Molecular Medicine & Haematology, School of Pathology, Faculty of Health Sciences, University of the Witwatersrand	Feeding patient-centric mobile apps and POCT data into the National Data Command Centre: the future of programmatic monitoring
Mr. Graeme Dor Department of Molecular Medicine & Haematology, School of Pathology, Faculty of Health Sciences, University of the Witwatersrand	Propelling the National Data Command Centre into the future: geospatial mapping and use of genotypic data for pandemic predictive modelling