NATIONAL HEALTH
LABORATORY SERVICE

ANNUAL PERFORMANCE PLAN

2022 - 2023

Table of Contents

List of abbreviations

AAR	Academic Affairs and Research
AARQA	Academic Affairs, Research, and Quality Assurance
AIDS	Acquired Immune Deficiency Syndrome
API	Application Programming Interface
APP	Annual Performance Plan
ART	Antiretroviral Therapy
ASLM	African Society of Medical Laboratories
AUDA-NEPAD	African Union Development Agency of the New Partnership for Africa's Development
BAC	Benefits Advisory Committee
BIU	Business Intelligence Unit
BLRF	Bargaining and Labour Relations Forum
BSL	Bio-Safety Level
CD4	Immune-level indicator
CDC	Centers for Disease Control and Prevention
CDW	Corporate Data Warehouse
CED	Centre for Enteric Diseases
CEO	Chief Executive Officer
CEZPD	Centre for Emerging Zoonotic and Parasitic Diseases
CHARM	Centre for Hospital Infections and Antimicrobial Resistance
CMSA	Colleges of Medicine of South Africa
CRDM	Centre for Respiratory Diseases and Meningitis
CST	Community Screening and Testing
CTB	Centre for Tuberculosis
DMP	Diagnostic Media Products
DMT2	Diabetes Mellitus Type 2
DoH	Department of Health
DRTB	Drug-resistant TB

EAP	Employee Assistance Programme
EID	Emerging Infectious Diseases
EIOS	Epidemic Intelligence from Open Sources
EOC	Emergency Operations Centre
FCL	Forensic Chemistry Laboratory
FETP	Field Epidemiology Training Programme
FPS	Forensic Pathology Services
FMPPI	Framework for Managing Programme Performance Information
GWME	Government-Wide Monitoring and Evaluation
HIV	Human Immunodeficiency Virus
HPCSA	Health Professions Council of South Africa
HPV	Human Papilloma Virus
HR	Human Resources
ICT	Information and Communication Technology
IgG	Immunoglobulin G
IMT	Incident Management Team
ISO	Organisation of International Standards
LIS	Laboratory Information System
MBDO	Medical Bureau for Occupational Diseases
MTEF	Medium-term Expenditure Framework
MTSF	Medium-term Strategic Framework
NAPHISA	National Public Health Institute of South Africa
NCD	Non-communicable Diseases
NCR	National Cancer Registry
NDP	National Development Plan
NEDLAC	National Economic Development and Labour Council
NGO	Non-governmental Organisation
NGS-SA	Network for Genomic Surveillance South Africa
NHA	National Health Act
NHI	National Health Insurance

NHLS	National Health Laboratory Service
NICD	National Institute for Communicable Diseases
NIOH	National Institute for Occupational Health
NMC	Notifiable Medical Conditions
NPA	National Prosecuting Authority
NSP	National Strategic Plan
OEHS	Occupational and Environmental Health and Safety
OHASIS	Occupational Health and Safety Information System
OHS	Occupational Health and Safety
OHSS	Occupational Health Surveillance System
PATHAUT	Pathology Disease Surveillance
PCR	Polymerase Chain Reaction
PET	Provincial Epidemiology Team
PFMA	Public Finance Management Act
PIVOTAL	Professional, Vocational, Technical and Academic Learning
PLWHIV	People Living with Human Immunodeficiency Virus
POCT	Point-of-care-testing
POPI	Protection of Personal Information
PPE	Personal protective equipment
PUI	Persons under Investigation
QA	Quality assurance
R&D	Research and Development
SADC	Southern African Developing Community
SANAS	South African National Accreditation System
SAMA	South African Medical Association
SAMRC	South African Medical Research Council
SAPS	South African Police Service
SAVP	South African Vaccine Producers
SDG	Sustainable Development Goals
SHE	Safety, Health and Environment

Stats SA	Statistics South Africa
STI	Sexually Transmitted Infections
SWOT	Strengths, Weaknesses, Opportunities and Threats
TAT	Turnaround Time
TB	Tuberculosis
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UNAIDS	Joint United Nations Programme on HIV and AIDS
WHO	World Health Organization
WRC	Water Research Commission
WSP	Workplace Skills Plan

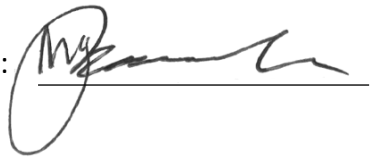
STATEMENT BY THE MINISTER OF HEALTH

The National Health Laboratory Service (NHLS) 2022/23 Annual Performance Plan (APP) is drawn from the 2020/21 - 2024/25 Strategic Plan. This APP takes into account all the relevant policies, legislation and other mandates the NHLS.

The APP accurately reflects the strategic goals and objectives which the National Health Laboratory Service will endeavour to achieve over the period 2022 - 2023.

I hereby endorse this NHLS APP developed by the Board of the NHLS under the guidance of Professor Eric Buch, Chair of the NHLS Board and Dr Karmani Chetty, NHLS Chief ExecutiveOfficer.

Dr MJ Phaahla (MP)
Minister of Health

Signature: 

STATEMENT BY THE CHAIRPERSON OF THE NHLS

The Annual Performance Plan (APP) of the National Health Laboratory Service (NHLS) is in line with the plan of the National Department of Health (NDoH), which responds to the goals identified by the Cabinet of South Africa's sixth administration in the Medium-Term Strategic Framework (MTSF) for the period 2019–2024. It provides the framework to be implemented by the NHLS in pursuit of its vision of providing a high-quality patient-centred laboratory service that is clinically efficient and cost-effective.

The NHLS provides pathology and diagnostic services to eighty percent (80%) of the South African population. It continues to play a pivotal role in providing testing for COVID-19 in the public sector. Furthermore, in collaboration with its two divisions; the National Institute for Communicable Diseases (NICD) and the National Institute for Occupational Health (NIOH), the NHLS has been instrumental in researching the SARS-CoV-2 virus, while also providing advisory services to the NDoH and other stakeholders.

Through its wide national network of laboratories located in urban and rural settings in all nine provinces of South Africa, the NHLS continues to ensure equitable access to service. In addition to fixed infrastructure, the NHLS has several mobile units that have expanded coverage and responded to healthcare concerns in the community with flexibility. Through the Medium-Term Expenditure Framework (MTEF), the NHLS will continue to play a critical role in the diagnosis of clinically relevant diseases through the implementation of point-of-care-testing (POCT) in health facilities.

The NHLS' 2022/23 APP represents the priorities and programmes that will ensure that the NHLS has a strong, sustainable, and efficient service to deliver on National Health Insurance (NHI).

It is widely recognised that good governance is the foundation of a capable state, which, in turn, is a prerequisite for a successful democracy. It is against this backdrop that the NHLS will continue to practise good governance by maintaining an unqualified audit opinion from the Auditor-General and ensuring a corrupt-free organisation.

The Forensic Chemistry Laboratory (FCL) was integrated into the NHLS in October 2021, as legislated by the NHLS Act of 2000, with four forensic chemistry laboratories servicing the entire South African population. In the year ahead, the NHLS will focus on improving efficiencies through modernisation of equipment and infrastructure.

I am confident that the 2022/23 APP supports the strategic priorities of the organisation and that it contributes to the realisation of the outcomes of the MTEF.

As the Board, we are committed to supporting the executive management team in its endeavour to enhance the provision of a high-quality patient-centred laboratory service that is clinically efficient and cost-effective.

Prof Eric Buch

Chairperson of the Board

OFFICIAL SIGN OFF

It is hereby certified that this Annual Performance Plan:

- was adopted by the management of the National Health Laboratory Service (hereunder referred to as the NHLS) under the guidance and support of the Board.
- considers all the relevant policies, legislation, and other mandates for which the NHLS is responsible; and
- accurately reflects the strategic goals and objectives for the 2022/23 financial year.

Prof Koleka Mlisana
Executive Manager:
AARQA

Dr Spoponki Kgalamono
Director: NIOH

Mr Sibongiseni Hlongwane
Chief Information Officer

Ms Violet Gabashane
Senior Manager:
Monitoring and Evaluation

Prof Adrian Puren
Director: NICD

Ms Makgopelo Mkhwanazi
Executing Manager:
Human Resources

Mrs Alida Grove
Director:
Forensic Chemistry Laboratories

OFFICIAL SIGN OFF

Mr Jonas Shai
Chief Financial Officer (Acting)

Dr Karmani Chetty
Chief Executive Officer

Prof Eric Buch
Board Chairperson

Approved by:

Dr Joe Phaahla, (MP)
Executive Authority, Minister of Health

PART A: Our mandate

Constitutional mandate

In terms of the provisions of the Constitution of the Republic of South Africa, 1996 (as amended), the NHLS is, among other things, guided by the following sections and schedules. Its role is to contribute towards the following:

- The Constitution, which places obligations on the state to realise socio-economic rights, including access to healthcare progressively.
- Section 27 of the Constitution, which states as follows with regards to healthcare:
  (1) Everyone has the right to have access to:
    (a) healthcare services, including reproductive healthcare.
  (2) The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights.
  (3) No one may be refused emergency medical treatment.

Legislative and other mandates

Public Finance Management Act (PFMA), 1999 (as amended)

- To regulate financial management in the national government and provincial governments.
- To ensure that all revenue, expenditure, assets, and liabilities of those governments are managed efficiently and effectively.
- To provide for the responsibilities of persons entrusted with financial management in those governments.
- To provide for matters connected therewith.

The National Health Laboratory Service Act, 37 of 2000

This Act requires the NHLS to provide cost-effective and efficient health laboratory services to all public sector healthcare providers, as well as any other government institution within and outside the Republic that may require such services and any private healthcare provider that requests such services. According to the Act , the NHLS must also promote health research and provide training for health science professionals,.

The National Health Act, 61 of 2003

This Act provides a framework for a structured uniform health system within the Republic, considering the obligations imposed by the Constitution and other laws on the national, provincial, and local governments concerning health services. The objects of the National Health Act (NHA) are as follows:

- Unite the various elements of the national health system according to a common goal to promote and improve the national health system in South Africa.
- Provide for a system of cooperative governance and management of health services within national guidelines, norms, and standards in which each province, municipality and health district must address questions of health policy and the delivery of quality healthcare services.
- Establish a health system based on decentralised management, principles of equity, efficiency, sound governance, internationally recognised standards of research and a spirit of enquiry and advocacy that encourages participation.
- Promote a spirit of cooperation and shared responsibility among public and private health professionals and providers, and other relevant sectors within the context of national, provincial and district health plans.
- Create the foundations of the healthcare system to be understood alongside other laws and policies that relate to health.

Applicable policies and planned policies

National Health Insurance Bill

The NHI Bill provides for the establishment of the NHI Fund as a legally defined organ of the state.

The Bill seeks to do the following:

- Establish the NHI Fund, its functions, powers, and duties, and make provision for the control of the NHI Fund by the NHI Board.
- Define beneficiaries of services covered by the NHI Fund, including population registration.
- Provide for the contracting of accredited providers of personal health care services.
- Allow the Minister to determine healthcare benefits that will be reimbursed through the NHI Fund, as well as the service coverage and cost measurement provisions.

Key features of the NHI Bill

The purpose of the NHI Bill is to establish and maintain an NHI Fund through mandatory prepayment that aims to achieve sustainable and affordable universal access to quality health care services. This will be achieved by the following:

- Serving as the single purchaser and single payer of healthcare services to ensure the equitable and fair distribution and use of health care services.
- Ensuring the sustainability of funding for health care services
- Providing for equity and efficiency in funding by pooling funds and the strategic purchase of healthcare services, medicines, health goods and health-related products from accredited and contracted healthcare service providers. This applies to all health establishments, excluding military health services and establishments.

The NHI Fund is to purchase healthcare services as determined by the Benefits Advisory Committee (BAC).

National Development Plan: Vision 2030

The National Development Plan (NDP) is a long-term vision for the country that focuses on the vital capacities required to develop the economy and society. It provides a broad strategic framework to guide crucial government decisions and actions. The plan emphasises that accelerated growth in South Africa requires the active participation of all citizens and leadership in all sectors that prioritise the country's collective interests in terms of its narrow, short-term aims and government performance that has improved significantly.

The NDP lays out nine long-term health goals for South Africa. Five of these goals are focused on enhancing population health and wellbeing, while the other four are focused on strengthening health systems. The NHLS' role is to contribute to the NDP's Vision 2030 and to match its services with it.

By 2030, South Africa should have achieved the following:

- Raised the life expectancy of South Africans to at least 70 years.
- Progressively improved tuberculosis (TB) prevention and cure.
- Reduced maternal, infant and child mortality.
- Significantly reduced the prevalence of non-communicable diseases.
- Completed health system reforms.
- Established primary healthcare teams that provide care to families and communities.

- Achieved universal health care coverage.
- Filled posts with skilled, committed, and competent individuals.

Sustainable Development Goals

The Sustainable Development Goals (SDGs) 2030, which are built on the Millennium Development Goals 2015, were adopted as the global goals by world leaders on 25 September 2015. World leaders formulated 17 SDGs to end poverty, fight inequality and tackle climate change by 2030. The following targets, to be achieved by 2030, have been adopted for Goal 3: Ensure healthy livestyles and promote wellbeing for all at all ages

1. Reduce global maternal mortality ratio to less than 70 deaths per 100 000 live births.
2. End preventable deaths of new-borns and children under five years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1 000 live births and under-five mortalities to at least as low as 25 per 1 000 live births.
3. End the epidemics of Acquired Immune Deficiency Syndrome (AIDS), TB, malaria and neglected tropical diseases, and combat hepatitis, water-borne diseases, and other communicable diseases.
4. Reduce premature mortality from non-communicable diseases by one-third through prevention and treatment and promote mental health and wellbeing.
5. Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and the harmful use of alcohol.
6. Achieve universal health coverage, including financial risk protection, access to quality essential healthcare services and access to safe, effective, quality, and affordable essential medicines and vaccines for all.
7. Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, as per the Doha Declaration on the Trade-related Aspects of Intellectual Property Rights (TRIPS) Agreement and Public Health, which affirms the right of developing countries to use, to the full, the provisions in the TRIPS Agreement regarding flexibilities to protect public health and, in particular, provide access to medicines for all.
8. Substantially increase health financing and the recruitment, development, training, and retention of the health workforce in developing countries, especially in the least developed countries and Small Island Developing States.
9. Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and the management of national and global health risks.

The vision of the NHLS is to provide a high-quality, patient-centred laboratory service that is clinically efficient and cost-effective. This will contribute significantly to Goal 3 of the SDG: Ensure healthy lives and promote wellbeing for all at all ages, as well as the vision of the South African health system: A long life for all South Africans.

Alignment with the NDoH's MTSF and the NDP Implementation Plan 2019–2024

The NHLS' plan is in line with the plan of the NDoH, which responds to the goals identified by the Cabinet of South Africa's sixth democratic administration, as embodied in the MTSF for the period 2019–2024. It aims to eliminate avoidable and preventable deaths (*survive*), promote wellness, and prevent and manage illness (*thrive*); and transform health systems, the patient's experience of care, and mitigate social factors determining ill health (*transform*), all of which are aligned with the United Nations' three broad objectives of the SDGs for health.

The NHLS' responses are structured into four outcomes and 12 outputs over the next five years, as indicated in the table below, and are aligned with the goals of the NDoH, as well as the pillars of the Presidential Health Summit Compact.

Table 1: Alignment of the NHLS' outcomes and outputs with goals of the NDoH and the pillars of the Presidential Health Summit Compact

<table>
<tr><th>Revised NDoH MTSF 2019–2024 outcomes</th><th>NHLS outcome</th><th>NHLS outputs</th><th>Presidential Health Summit Compact pillars</th></tr>
<tr><td>Universal health coverage for all South African to be achieved by 2030</td><td rowspan="4">Clinical effectiveness and efficiency

High-quality service

Cost-effective services

Good governance</td><td rowspan="4">Modernised laboratory services.

Improved total turnaround times.

Strengthened total quality management systems.

Performance-driven workforce.

Equitable service coverage

Improved stakeholder relations.

Reduced cost of pathology services to clients.</td><td rowspan="4">Pillar 4: Engage the private sector in improving the access, coverage, and quality of health services

Pillar 6: Improve the efficiency of public sector financial management systems and processes</td></tr>
<tr><td>Progressive improvement in the total life expectancy of South Africans</td></tr>
<tr><td>Total life expectancy of South Africans improved</td></tr>
<tr><td>Reduce maternal and child mortality</td></tr>
<tr><td rowspan="3">Improved educational and health outcomes and skills development for women, girls, youth, and persons with disability</td><td rowspan="3">Clinical effectiveness and efficiency</td><td rowspan="3">Appropriately trained human resources in adequate numbers.</td><td>Pillar 5: Improve the quality, safety and quantity of health services provided with a focus on primary health care</td></tr>
<tr><td>Pillar 8: Engage and empower the community to ensure adequate and appropriate community-based care</td></tr>
<tr><td>Pillar 1: Augment the Human Resources Health Operational Plan</td></tr>
</table>

Framework for Managing Programme Performance Information (2007)

The Framework for Managing Programme Performance Information (FMPPI) outlines key concepts in the design of management systems in the public sector for defining, collecting, reporting, and using performance information. The FMPPI emphasises that performance information is essential to focus the attention of the public and oversight bodies on whether public institutions are delivering value for money by comparing their performance against their budgets and service delivery plans, and to alert managers to areas where corrective measures are required.

Policy Framework for the Government-wide Monitoring and Evaluation System (2005)

The Framework for the Government-wide Monitoring and Evaluation (GWME) system identifies programme performance information as one of the data terrains underpinning it, focusing on information that is collected by government institutions while fulfilling their mandates and implementing the policies of government.

National Public Health Institute of South Africa

The establishment of the National Public Health Institute of South Africa (NAPHISA) is envisaged, and will comprise divisions dealing with the following:

- Communicable diseases
- Non-communicable diseases
- Occupational health
- Cancer surveillance
- Injury and violence prevention
- Environmental health

The establishment of NAPHISA as a single national public entity is intended to provide a high level of surveillance coordination across functions. The entity will provide evidence, expertise, and advice to the government to improve population health. It will also coordinate disease and injury surveillance, research, training, and workforce development, as well as monitor and evaluate services and interventions directed at major health problems affecting the population. NAPHISA will provide training, conduct operational research, and support interventions aimed at reducing the burden of communicable and non-communicable diseases, injuries and violence, and occupational diseases.

The NAPHISA Bill was assented to by the President on 5 August 2020. Regulations are being finalised before the Act is proclaimed. NAPHISA will have an impact on the NHLS' functions because roles and functions will be defined, and traversal functions may be shared.

Relevant court rulings

There are no court rulings that will have a significant ongoing impact on the NHLS' operations or service delivery obligations.

PART B: OUR STRATEGIC FOCUS

Situational analysis

External environment analysis

The role of pathology and laboratory service in health care

Pathology is the study of disease. It is the bridge between science and medicine. It underpins every aspect of patient care, from screening, diagnostic testing, and treatment advice to leveraging new, innovative technologies and preventing disease.

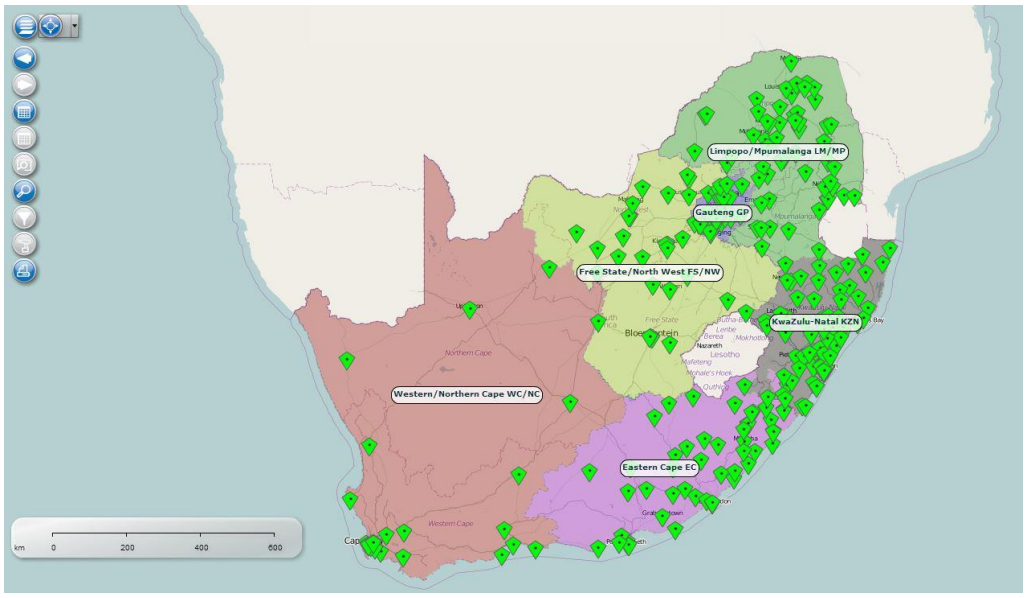
Pathology enables physicians and other healthcare professionals to make appropriate evidence-based diagnostic or therapeutic decisions for their patients. Clinical laboratory services have a direct impact on many aspects of patient care, including, but not limited to, length of hospital stay, patient safety, resource utilisation and customer satisfaction.

The laboratory service, staffed by qualified pathologists and technical laboratory staff, contributes to the healthcare value chain by means of the following:

- Improved access to laboratory testing with equitable and rational access to advanced diagnostic techniques,
- The introduction, validation, and implementation of new diagnostic tests,
- Clinical liaison and advice to clinicians on patient management, including triage testing, and
- Resource management to promote the rational and cost-effective use of laboratory services.

South Africa has a network of diagnostic laboratories that includes both the private and public sectors. Through its wide national network of 233 laboratories, which encompasses urban and rural locations in all nine provinces of South Africa, the NHLS ensures equitable access to service. In addition to fixed infrastructure, the NHLS has several mobile units that expand coverage and respond to healthcare concerns in the community with flexibility.

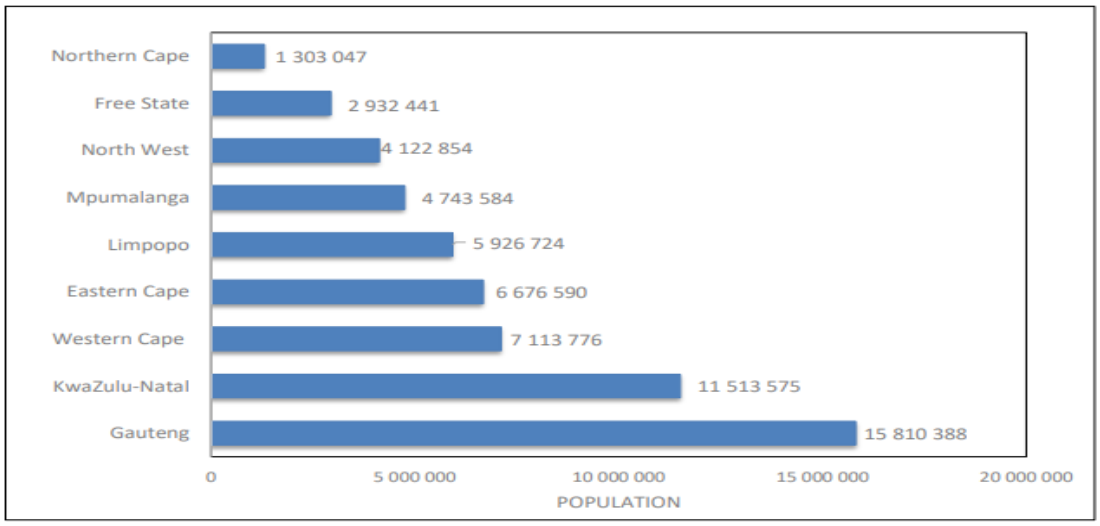
Figure 1: The NHLS' network of laboratories in all nine provinces



Population size

Statistics South Africa (Stats SA) mid-year population estimates for 2021 show that South Africa's population is still growing, with recent figures indicating that 60.14 million people will require healthcare in 2021, compared to the 59.62 million of 2020 (~0.9% increase). Gauteng still comprises the largest share of the South African population, with approximately 15.81 million people (26.3%) living in this province, followed by KwaZulu-Natal with an estimated 11.5 million people (19.1%). The Northern Cape remains the province with the smallest share of the South African population, with an estimated 1.3 million people (2.2%) living in this province.

Figure 2: The mid-year population estimates for South Africa by province, 2021



Life expectancy at birth in 2021 was estimated to be 59.3 years for males (falling from 62.5 years) and 64.6 years for females (falling from 68.5 years).

The increase in the population in South Africa occurs against the backdrop of an economy and budget that continue to decline, and rising health costs. The COVID-19 pandemic has added more pressure with the rise in infections and deaths and concomitant unemployment. Stringent financial management is critical at a time when unemployment is rife, and many societies depend on the public sector for healthcare. The NHLS must accomplish this while being financially viable.

Burden of disease

Communicable diseases

Human immunodeficiency virus infection

The NDP has called for South Africa to achieve a "generation free of HIV/AIDS", while Goal 3 of the SDGs has set the target to "end the epidemic of AIDS, tuberculosis and malaria" by 2030.

It is estimated that 8.2 million people were living with the Human Immunodeficiency Virus (HIV) in South Africa in 2021, with a 19.5% prevalence in adults (aged 15–49 years). South Africa has the largest number of people enrolled in the Antiretroviral Therapy (ART) programme in the world. The COVID-19 outbreaks raised concerns about the impact the virus will have on people living with HIV (PLWHIV) and the impact it will have on testing and treatment programmes. The lockdown measures and travel restrictions negatively impacted on the supply of medicines and access to health facilities. As a result, available data suggests a decline in the annual number of PLWHIV remaining on ART by approximately 4%. This presents challenges that are likely to hamper progress towards reaching annual targets set by the country and international organisations concerned with the eradication of HIV and AIDS.

South Africa is part of the Fast-Track 95-95-95 strategy for HIV/AIDS of the Joint United Nations Programme on HIV and AIDS (UNAIDS). This strategy calls for 95% testing, treatment, and viral suppression. This new approach requires a differentiated approach from the previously implemented 90-90-90 strategy. For the NHLS to contribute towards the achievement of the 95-95-95 strategy, it must make laboratory services more accessible by implementing POCT using mobile units.

Mycobacterium tuberculosis infection

Mycobacterium tuberculosis is one of the leading causes of mortality in South Africa. Improving case detection and retaining patients in care remain essential in reducing premature mortality and preventing the development of multidrug-resistant and extensively drug- resistant TB.

An estimated 360 000 South Africans became ill with TB in 2019. An estimated 58 000 people died from TB, of which an estimated 36 000 were HIV positive. The large number of people living with HIV in South Africa is increasing the number of people with active TB disease. The global End TB Strategy has called on the World Health Organization (WHO) member states to reduce the number of deaths caused by TB by 75% by 2025, and by 90% by 2030 compared to the 2015 baselines. This translates to a target of not more than 8 510 deaths by 2025, and not more than 3 404 by 2030 to ensure that South Africa achieves its SDG target of “ending the TB epidemic by 2030”. This will require the health system to intensify case finding and the placement of those diagnosed on treatment and ensuring that they complete their treatment.

The COVID-19 pandemic has impacted negatively on the TB programme. This requires the implementation of a TB catch-up plan. This plan seeks to expand TB screening and testing.

This catch-up plan will directly impact on the laboratory service and will require a significant programme review that is aimed at the automation, modernisation, consolidation and integration of laboratory platforms and services to ensure affordability. The integration of COVID-19, TB and HIV POCT using mobile laboratories will add value in trying to catch the missing millions.

Emerging pathogens

Severe acute respiratory syndrome-Coronavirus 2 (SARS-CoV-2) is a beta Coronavirus that was identified in a population in Wuhan, Hubei Province, China, as the cause of a severe lung disease, later named Coronavirus Disease-19. This pathogen was identified in returning tourists in South Africa in March 2020, and a State of Disaster was declared on 15 March 2020. The manifestations of the pandemic in South Africa have been significant, particularly in the healthcare sector and the NHLS.

Some of the implications included the following:

- Requirements for the rapid validation of testing (molecular and serological) with national implementation
- Extensive surveillance at local and national levels
- Flexible responses to accelerated case numbers across provinces
- Genetic typing and the monitoring of the emergence of variants of concern
- The characterisation of diseases associated with SARS-CoV-2 and vaccination
- Vaccination monitoring

The NICD commenced laboratory testing in mid-January 2020 as a WHO reference laboratory network partner. The WHO provided laboratory testing strategy recommendations for COVID-19. The NHLS developed its testing strategy following the WHO and national DoH guidelines. Laboratory testing was conducted for people meeting the case definition of persons under investigation (PUI).

Community screening and testing (CST) was implemented in April 2020 and was implemented differently in different provinces. The implementation ranged from mass screening (including asymptomatic individuals) to the screening of individuals in contact with confirmed cases and the targeted testing of cluster cases. The SARS-CoV-2 has enabled the NHLS to upscale its pandemic responsiveness to deal with emergency pathogens of international concern.

Antimicrobial resistance

Antibiotic stewardship is recognised as a key component of infection control in hospital-based settings. The development of resistant, multidrug-resistant, and extensively resistant pathogens is an area of international concern. Infection control provides surveillance of organisms in the hospital and provides advice on appropriate therapy, including when to stop therapy or change agents. The NHLS' microbiology laboratories are key partners to ensure the rational use of antimicrobial therapy.

Non-communicable diseases

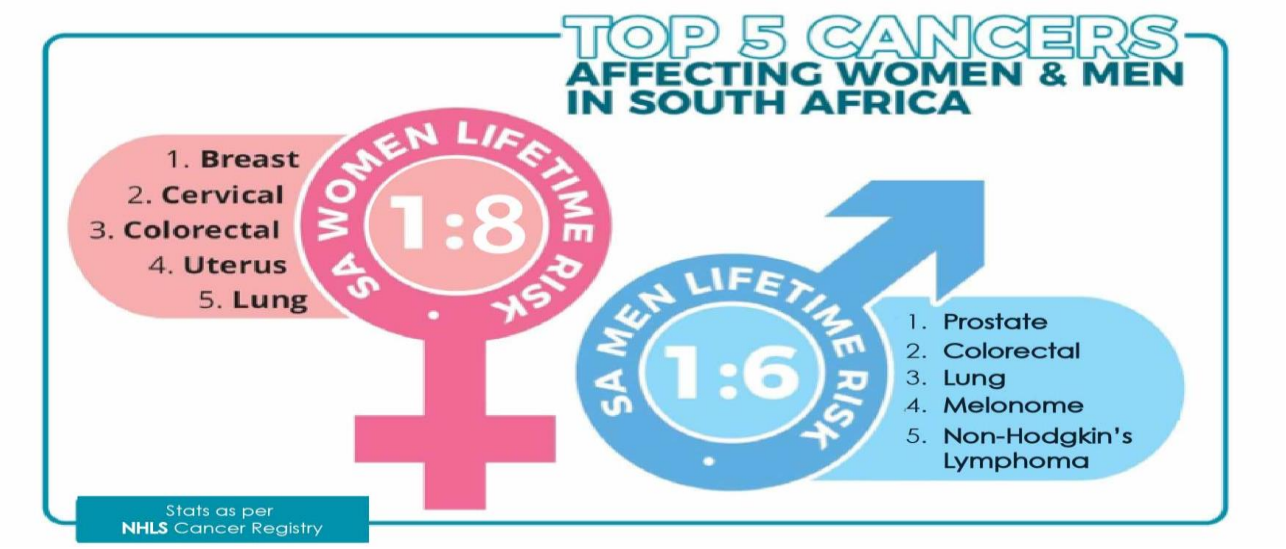
A non-communicable disease (NCD) is a medical condition or disease that is non-infectious and cannot be transmitted from person to person. NCDs may be chronic diseases for a long time with slow progression, or they may result in more rapid death, such as a sudden stroke. According to the WHO, the four main types of NCDs are cardiovascular diseases (like strokes and heart attacks), cancer, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma), and diabetes.

With advances in combatting infectious diseases in South Africa, it is predicted that non-communicable diseases will contribute more significantly to all causes of mortality than previously thought. NCDs are estimated to account for 51% of all deaths in South Africa.

Cancer

Cancer is predicted to increase by at least 30% by 2030, with annual global figures reaching an estimated 10 million cases. The NHLS reports over 80 000 newly diagnosed cases of cancer in the country each year. In addition to diagnosis, the NHLS actively participates in screening programmes and provides monitoring and prognostication services for patients receiving oncology care.

Figure 3: Top five cancers affecting women and men in South Africa



Key focus areas for the NHLS are the top ten types of cancer in patients. Cervical cancer, linked to infection with the high-risk human papilloma virus (HPV), represents an important target for screening, particularly in patients with HIV co-infection

In November 2020, the WHO released new estimates of the global burden of cervical cancer associated with HIV. They estimated that women living with HIV have a six-fold increased risk of cervical cancer compared to women without HIV. An estimated 5% of all cervical cancer cases worldwide are attributed to HIV. The WHO aims to double the efforts and work towards achieving the new WHO cervical cancer elimination targets of 90% HPV vaccination coverage, 70% screening coverage and 90% access to treatment for cervical pre-cancer and cancer, including access to palliative care by 2030. The roll-out of HPV testing by the NHLS will contribute to the achievement of the WHO's cancer elimination targets. Cancer surveillance conducted by the National Cancer Registry (NCR) at the NHLS assists in monitoring South Africa's progress towards these targets.

Other HIV-associated malignancies, including high-grade B-cell lymphoma and Kaposi sarcoma, remain important focus areas for the NHLS' Anatomical Pathology and Haematology divisions. This includes diagnosis, the monitoring of residual disease and the monitoring of therapy.

In addition to screening for pre-malignant and early malignant cervical lesions, the NHLS offers screening for prostate cancer for men and has utilised a machine learning approach to improve this programme. The NHLS also monitors patients' post-treatment utilising a range of cancer markers, including biochemical tumour markers, genetic predictors, and cytology/flow cytometric-based techniques.

Diabetes mellitus, hypertension, and cardiovascular disease

Diabetes mellitus type 2 (DMT2), hypercholesterolaemia and hypertension are non-communicable diseases that are associated with significant morbidity, specifically the development of vascular disease, end-stage kidney disease and retinal disease. Complications of DMT2 are the second most common cause of death in South Africa. The ongoing monitoring and screening of patients are important to reduce both disability and death from these conditions as secondary prevention and to monitor healthcare outcomes in affected patients. The NHLS provides the most extensive screening programmes that, among others, include the provision of HbA1c testing to monitor response to DMT2 treatment, markers of renal disease and lipid levels in patients with hypercholesterolaemia. A key strategy is to expand the provision of these surfaces through the implementation of point-of-care technology and to integrate testing into the ideal clinic system to ensure that patient follow-up proceeds smoothly. The presence of persistent infections, which may accelerate disease progression, is a significant element in the presentation of these disorders. This includes HIV, TB, SARS-CoV-2, and other chronic viral diseases.

It was predicted that, by 2030, NCDs would account for five times as many deaths as communicable diseases in low- and middle-income countries.

The NDoH has emphasised the importance of NCDs care with several national public health policies released recently to facilitate national access to diagnosis and care for cervical and breast cancers.

Emerging/re-emerging communicable disease with epidemic and pandemic potential

Emerging infectious diseases (EIDs) are defined as diseases with increased occurrence over time, including diseases caused by novel agents, or agents with emerging resistance (i.e., antimicrobial resistance). The list of emerging infections is growing and EIDs include COVID-19 and Ebola virus disease. Three-quarters of these conditions have a zoonotic origin and potential causes include global climate change, the globalisation of trade, growing resistance to insecticides and antibiotics, and habitat encroachment. Outbreaks also impact on social and economic activity. The NICD contributes to policy development in many spheres through shared knowledge and skills.

Utilising surveillance tools and forecasting or predicting an epidemic allows for the implementation of measures to prevent event-based public health surveillance, and the detection of unusual events that might signal an outbreak. Such information is non-standardised and can be obtained from multiple sources, including social media reports, community reports and media reports. Event-based surveillance is conducted by the Emergency Operations Centre (EOC) and is being expanded to include the WHO Epidemic Intelligence from Open Sources (EIOS) platform. Indicator-based public

health surveillance is a more standardised way of reporting disease and involves reports of specific diseases by healthcare providers. Only cases meeting specific case definitions are reported. Surveillance of Notifiable Medical Conditions (NMC) collects, analyses, and uses epidemiologic data to provide scientific, accurate information to detect and rapidly act against public health threats. The NICD manages the NMC surveillance system in South Africa, laboratory-based surveillance, and the monitoring of specific diseases of public health importance through the GERMS-SA programme.

The early detection of infectious diseases also contributes to the diminished impact of outbreak events. It requires astute clinical recognition and specialised laboratory investigations. When cases are recognised early, public health actions may be triggered at the early stages of an outbreak. This serves to reduce the extent of such an outbreak. The NICD offers specialised laboratory investigations for communicable diseases in South Africa, including the confirmation of the first case of COVID-19. In support of safe and secure investigations of the agents associated with these outbreaks, the NICD operates several Bio-safety Level (BSL) 3 facilities and the only positive pressure suite BSL 4 in Africa. The operation of these facilities is enabled through the Division of Biosafety and Biosecurity, which employs an engineering team that specialises in containment laboratory infrastructure. The NICD works in close collaboration with the provincial and national departments of Health to timeously report communicable disease outbreaks. The EOC can provide the coordination and management of public health events of national and regional concern using an incident management system and dedicated staff. Support for epidemiological investigations is provided to the provinces through dedicated epidemiologists in most provinces.

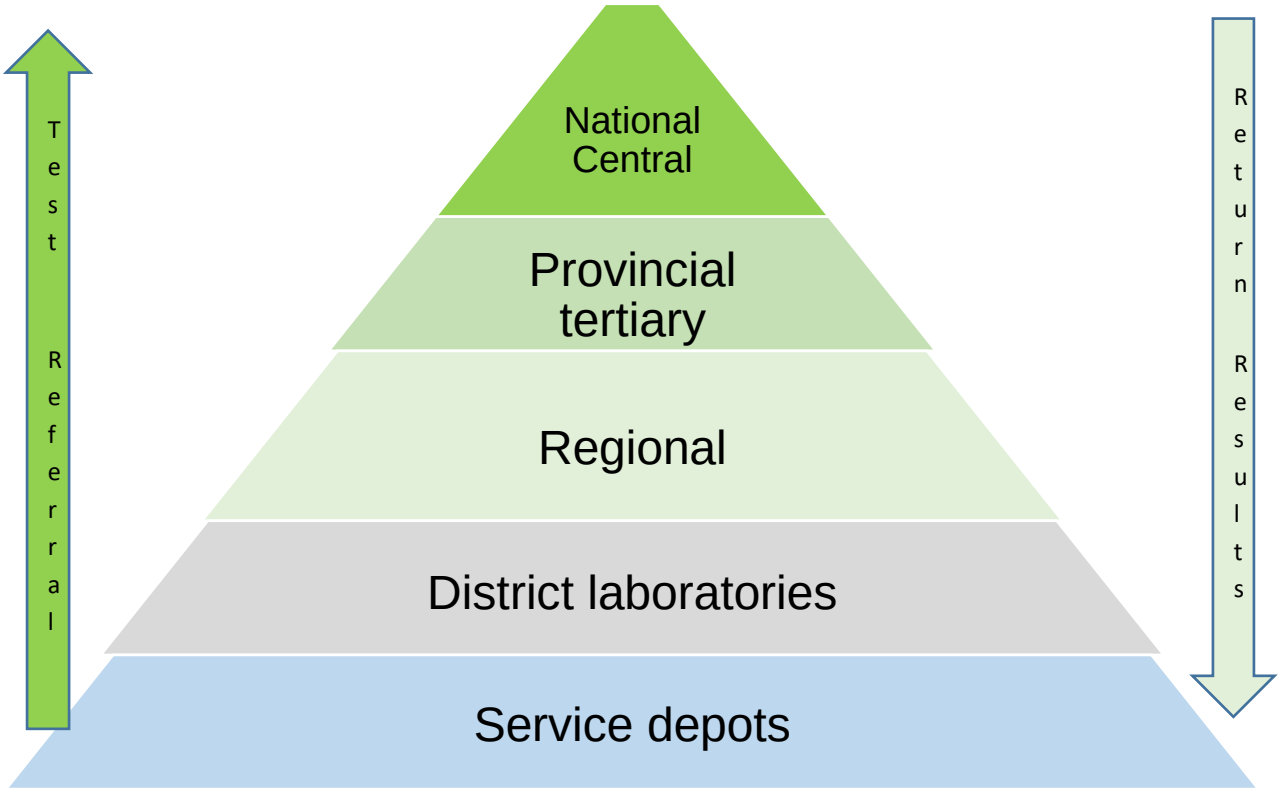
Internal environment analysis

The NHLS' operating model

The NHLS operates in six regions with a national network of 233 laboratories, including national, provincial tertiary, regional and district laboratories, and service depots.

The laboratories are predominantly based in healthcare facilities in all nine provinces, with the diagnostic offering appropriate to the level of care of that facility (a tiered model). This tiered model requires the integration of services with continuity of patient care as patients progress from primary healthcare facilities to other levels of care.

Figure 4: The tiered service delivery model

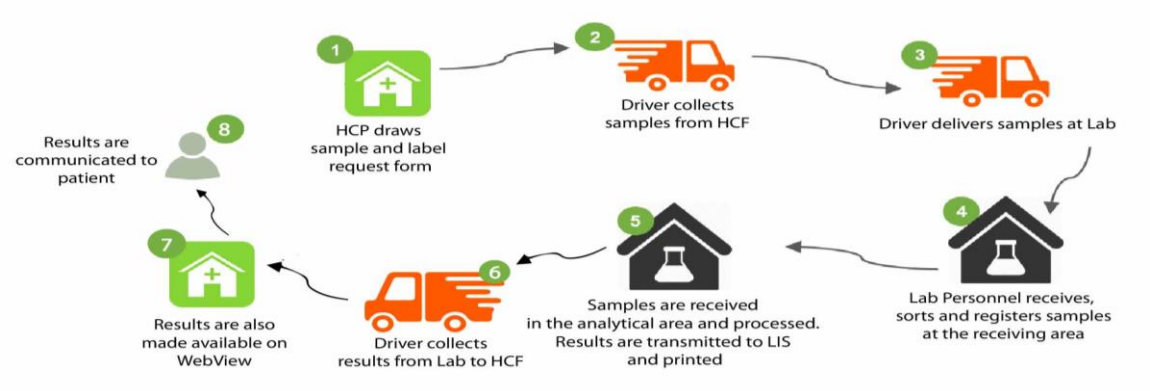


The NHLS will continue to support the hybrid service delivery model with the decentralisation of routine tests to all laboratories, and through the strengthening of POCT and the centralisation of highly specialised tests to provincial tertiary and national central laboratories.

Laboratory Service

The Laboratory Service programme contributes to clinical effectiveness and efficiency. This is done through the modernisation of laboratory services to improve turnaround times and quality. Turnaround time (TAT) of testing is a key indicator of laboratory service performance and quality of service. The measurement and monitoring of the entire laboratory value chain are critical in identifying any gaps that may lead to the delayed turnaround time of results, which impacts negatively on patient care. This includes preanalytical factors that range from the collection of specimens from the patient to laboratory registration, analytical factors, and post-analytical factors (the delivery of results). By the end of the MTSF, the NHLS will have developed and piloted a specimen tracking system that will be implemented across the service.

Figure 5: An overview of the entire laboratory process value chain (from the time the specimen is collected from the patient and registered on the Health Patient Registration System to the time the results are communicated to the patient)



The complexity of service requirements and the large number of healthcare facilities that require a pathology service highlight the need for innovation and new approaches to laboratory systems across the entire laboratory value chain. A multidisciplinary approach to service design and planning will need to be maintained. The increased demands of pathology service mean appropriate workforce development and staff retention.

The implementation of digital health technologies is a remarkable innovation that will provide opportunities to enhance health systems. These technologies transform the way health services are provided and change the way people engage with health services.

Digital pathology has shown a sufficient level of quality, efficiency, and effectiveness. It creates the possibility of future-proofing diagnostic capabilities, while allowing for more flexibility and creativity to meet targets and maintain standards. The potential of digital pathology to integrate the software interface with the laboratory information system (LIS) will allow for the interpretation of results in an all-digital environment.

An all-digital cellular pathology service is attractive for several reasons, including the following:

- It eliminates many of the time-consuming steps involved in physically transporting microscope slides to consultants for review.
- Case reviews and external expert opinions can be performed electronically and in real-time increasing access to additional diagnostic expertise, and thus precision.
- Remote consultant multidisciplinary team attendance through video conferencing is improved by the inclusion of images, resulting in the potential for greater sub-specialisation and shared working across the organisation.

Significant resources will be needed to fund a national programme. Digital pathology solutions will best be introduced in a phased manner, through a single-site pilot, followed by a national rollout.

Forensic Chemistry Laboratory Service

The forensic chemistry laboratories fall within the Forensic Pathology Services (FPS) Directorate of the NHLS and are classified as essential services according to the Labour Relations Act, Act No 66 of 1995. In June 2018, the NDoH was instructed to move FCLs to the NHLS, as legislated by the NHLS Act of 2000. There are currently four FCLs in South Africa. These are in Cape Town, Durban, Johannesburg, and Pretoria. The four laboratories service the entire South African population. Clients include the South African Police Service (SAPS), the provincial departments of Health (FPS mortuaries), the National Prosecuting Authority (NPA) and the local authorities (municipalities).

The core business of the FCLs include the following:

- The testing of biological tissues and fluids for the presence of poisons and/or drugs in instances of unnatural deaths (toxicology analysis).
- The testing of antemortem and post-mortem blood for the presence of alcohol in alleged drunken driving matters (alcohol analysis).
- Food testing in terms of the Foodstuffs Act.

The FCLs are currently experiencing challenges regarding the turnaround times of results. There were 29 225 toxicology cases as of 31 March 2021. This is mainly due to deteriorated infrastructure, old equipment, and a shortage of human resources.

The NHLS' focus, among others, will be to integrate these laboratories within the NHLS and improve its efficiencies.

Academic Affairs, Research and Quality Assurance

Academic Affairs, Research and Quality Assurance (AARQA) incorporates the Academic Affairs and Research (AAR) and the Quality Assurance (QA) divisions. The purpose of AARQA is to strengthen the quality assurance and provision of NHLS' accredited laboratory medicine mandate through training, research, and adequate laboratory service provision. AARQA contributes mainly to high-quality service outcomes. Quality can be defined as the ability of a product to satisfy the needs and expectations of the customer. The NHLS has always restricted the discussion of quality to analytical quality, focusing on imprecision and accuracy, while clinicians are interested in total quality, which encompasses rapid, reliable, and efficient service delivery at a low cost. AARQA contributes hugely to total quality management through teaching and training.

Teaching and training

AARQA oversees and collaborates with various training institutions that contribute to the development of qualified medical laboratory personnel that operate within the scientific field of pathology service. The training intake, monitoring and evaluation requirements are derived based on the aim of providing adequate and efficient laboratory service to all South Africans through sufficient laboratory medicine personnel, mainly medical technologists, medical scientists, and pathologists.

During the 2020/21 financial year, 591 trainees (103 intern medical scientists, 229 student medical technologists and 259 registrars) were on the NHLS' training platform. Training is offered in training laboratories accredited by the Health Professions Council of South Africa (HPCSA) that are linked to academic institutions. At the Colleges of Medicine of South Africa (CMSA), the pass rate in the Part I examinations of registrars who are trained to be pathologists has been improving in recent years, from 60% in 2018 to 80.7% in 2020. Similarly, the pass rate in the Part II (exit) examination increased from 40.5% in 2018 to 52.6% in 2020. Even though the pass rates have improved, the NHLS is still experiencing a challenge in attracting and retaining experienced pathologists. This poses a significant skills shortage, especially in the field of anatomical pathology. It is against this background that the NHLS is exploring digital pathology to support laboratories without pathologists.

According to the HPCSA regulations for the accreditation of laboratories as training laboratories, the training laboratory must have enough qualified medical technologists to instruct intern medical technologists and student medical technicians, as well as other practitioners who work under supervision. This demand continues to place a strain on the NHLS' capacity to train intern medical technicians and intern medical scientists. The stresses from the COVID-19 pandemic are added to the mix. Despite this, the NHLS was able to teach 55 intern medical scientists and 251 intern biomedical technologists in the 2020/21 financial year. As part of its mandate, the NHLS will continue to teach pathology experts.

Service delivery

The NHLS continues to provide adequate and efficient diagnostic pathology laboratory service to all individuals in South Africa. AARQA strives to achieve this through the implementation of the national pathologists' coverage plan, which aims to ensure access to consultative pathologist services by clinicians. This includes a strategic service delivery plan to ensure that the NHLS' laboratories are standardised and equipped with sufficient resources to provide equal service to the South African population. The key strategy for fulfilling this objective is to obtain laboratory certification through the South African National Accreditation System (SANAS), which will allow for adequate training and service provision.

In line with the NHLS' Strategic Plan, it continues to increase the number of accredited diagnostic laboratories with 15 new laboratories accredited in 2020/21. The NHLS has 91 SANAS-accredited diagnostic laboratories, as well as three ISO 9001:2015-certified support departments. By the end of the MTSF, the NHLS will have certified all eight supporting departments, and more than half of the diagnostic laboratories will have received SANAS accreditation.

Improving service delivery also involves the advancement of laboratory systems to improve the turnaround times and ensure the quality of results. AAQRA continues to implement proficiency testing schemes, health technology assessments and clinical consultative services to explore new diagnostic and disease management approaches to improve the quality of results generated by the NHLS' laboratories.

Research and innovation

AARQA serves as the custodian of the NHLS' research mandate. This mandate aims to translate research outputs into diagnostic practice and further contribute to the global scientific body of knowledge through peer-reviewed publications. AARQA oversees the research activities of the NHLS through controlled access to research-enabling laboratory databases and NHLS facilities. These services are made accessible to relevant parties such as higher institutions of learning, students, the government sector, the non-governmental sector, and the private sector, all of which contribute to the robustness of research activities in South Africa.

The NHLS' research plan is implemented and monitored by AARQA. It is primarily motivated by the country's disease burden and is aligned with the NDoH's major emphasis areas, and the improvement of health systems as outlined in the National Strategic Plan (NSP). In 2020/21, the NHLS published 620 peer-reviewed articles. During this time, COVID-19 provided an opportunity for more publishing. The research outputs help to generate evidence that is transferred into diagnostic laboratory practice, thereby improving laboratory service delivery in South Africa.

National Institute for Communicable Disease

The National Institute for Communicable Diseases is the national public health institute of South Africa, providing reference microbiology, virology, epidemiology, surveillance and public health research and training in communicable diseases. It serves as a publicly trusted source of information, both during outbreaks and as part of its routine surveillance of priority infectious diseases. The programme contributes mainly to high-quality service outcomes by providing a robust and efficient communicable disease surveillance system and outbreak response.

The NICD works in close collaboration with the national and provincial departments of Health in the planning of policies and programmes to support communicable disease control and elimination efforts and provides specialised laboratory testing. A key role is to detect, respond and report timeously during communicable disease outbreaks by providing technical support and critical laboratory diagnostic services.

Several NICD laboratories are WHO collaborating partners, providing reference diagnostic services and surveillance for communicable diseases such as influenza, poliomyelitis, TB, and measles, among others. The NICD houses BSL III laboratories and the only positive pressure suit maximum-containment BSL IV laboratory in Africa, making it a premier research, surveillance, and diagnostics institution for communicable diseases. The NICD's sequencing core facility conducts next-generation sequencing for diagnosis and outbreak support. The NICD is also equipped with a transmission electron microscopy facility, which is useful for both complicated and sophisticated diagnostic investigations and provides a resource for research. Surveillance for malaria and arbovirus vectors is a key function of the NICD, which also houses five insectaries for culturing a wide range of mosquito species that are of public health importance.

The NICD monitors disease trends using a variety of methods and data repositories. This includes the NHLS Central Data Warehouse (CDW) and the recently established Notifiable Medical Conditions mobile application that collects real-time data on communicable diseases of public health importance. This enables the collation and interpretation of up-to-date intelligence on communicable disease incidence in South Africa. This information can be used to calculate outbreak response thresholds, predict future disease trends, and inform control policies and regulatory practices.

The National Emergency Operations Centre, based at the NICD, serves as a coordination centre for responses to public health emergencies such as the listeriosis outbreak of 2017/18 and the COVID-19 outbreak in 2020/21. It aims to collate, organise, and deploy resources, both internal and external, in response to a major infectious disease incident, outbreak, or related event, which has been declared a public health emergency by the Director-General of the NDoH. The national Emergency Operations Centre was activated on 31 January 2020 by the Minister of Health in response to the emergent COVID-19 pandemic. The NICD, together with partners, developed national guidelines and training material to support the surveillance, case finding, diagnosis, management, and public health response to cases of SARS-CoV-2. The NICD's 24-hour clinicians' hotline was expanded to deal with the increased demand for COVID-19 information through the hiring of 12 community service doctors. A public hotline was also set up to address the needs of the public regarding COVID-19-related information and remains operational through the 0800 029 999 number hosted by the NHLS.

Eight of the nine provinces are supported by provincial epidemiologists. Epidemiologists are deployed to provincial health departments to help with outbreak investigations. Traning in epidemiology has been conducted for surveillance officers and communicable disease coordinators in the Northern Cape and Free State. The NICD continues to provide critical epidemiological information for the national COVID-19 response through the national incident management team (IMT). This includes the collation of daily test and case numbers and sending a daily report to the Minister of Health and the NDoH; and the issuing of several weekly reports (see www.nicd.ac.za). Reports of rates of virus transmission (R0) are also produced regularly and used in planning. COVID-19 data is now being shared directly with the NDoH and the provinces through an application programming interface (API). Up-to-date information is accessible through interactive dashboards. A publicly available dashboard is also available. The NICD continues to communicate surveillance data, guidelines, and responses to media queries on scientific information. Media coverage grew fivefold from 2 021 news items in the previous financial year to 10 962 news items in the current year. The NICD was also involved in the WHO Intra-action review for the country.

The new hospital surveillance system, DATCOV, was initiated on 1 April 2020. This online platform allows public and private-sector hospitals to submit data on patients diagnosed with COVID-19. Following a directive from the National Health Council, all 605 hospitals in the country are now reporting through DATCOV. This surveillance system, which records over 100 000 admissions, provides local real-time data on epidemic progression, including the provinces that are most affected, which populations are most at risk for severe diseases, and outcomes (in-hospital case fatality ratio).

In addition, DATCOV has been expanded to include modules for the following:

- Deaths that occur out of the hospital
- Surveillance in long-term care facilities
- A paediatric clinical registry
- Follow-up for long-term symptoms and complications of COVID-19, so-called “long COVID”

The data has yielded valuable information for understanding the risk factors associated with COVID-19 mortality and providing local data on the role of comorbidities such as NCDs, HIV and TB. DATCOV data has been used for the estimation of reproductive numbers. The NICD, in collaboration with the South African Medical Research Council (SAMRC), has initiated a COVID-19 mortality linkage project to better quantify COVID-19 mortality data.

The NICD has sequenced hundreds of SARS-CoV-2 genomes and contributes to the national molecular surveillance efforts to track the spread of known viral genotypes and monitor new evolving mutations.

The NICD is part of a broader consortium of sequencing laboratories, the Network for Genomic Surveillance South Africa (NGS-SA). The NICD has established virus neutralisation assays in preparation for assessing COVID-19 vaccine trials and has conducted post-marketing surveillance of commercial antibody tests. A new environmental surveillance programme with the Water Research Commission (WRC) is underway. This programme could act as an early warning system for COVID-19 outbreaks. Polymerase chain reaction (PCR) has been modified to detect SARS-CoV-2 in environmental samples. The number of sites for the environmental surveillance of SARS-CoV-2 has increased to 19 sites located in Gauteng, the Western Cape, Free State, KwaZulu-Natal, Eastern Cape, and Limpopo. Sampling is conducted every two weeks. SARS-CoV-2 was detected at 16 of the 19 sites. The WHO has requested that the NHLS expand the environmental detection of SARS-CoV-2 to support neighbouring countries in southern Africa.

The NICD has established partnerships and cooperative agreements with the Centers for Disease Control and Prevention (CDC), the National Institute of Allergy and Infectious Diseases, the Africa Centers for Disease Control and Prevention, the European Centre for Disease Control and Prevention, as well as the WHO and many other internationally recognised institutions. The NICD has a significant footprint and is a major global role player in the field of communicable disease surveillance and related research. The Centre for Vaccines and Immunology supported the African region for polio surveillance, notifying 16 countries and the WHO of results for immediate action. One focus for 2021 was to pass regulatory approval to host a Polio Essential Facility, one of the few globally. The Centre for Emerging Zoonotic and Parasitic Diseases (CEZPD) continued to provide national and regional capacity for the diagnosis, surveillance and research of viral, bacterial and parasitic pathogens, particularly those classified as zoonotic BSL3 and BSL4 agents, including viral haemorrhagic fevers, arthropod-borne viral infections, rabies and rabies-related infections, bacterial infectious diseases such as anthrax, botulism and plague, rickettsioses, malaria, parasitic opportunistic infections, diarrhoeal diseases in children under five, schistosomiasis and soil-transmitted helminthic diseases.

South Africa's public health needs and priorities guide the NICD's surveillance and research agenda. The Centre for Enteric Diseases (CED) followed up on 113 suspected outbreaks (including food- and water-borne diseases, typhoid fever, and viral enteric diseases). Laboratory and epidemiological support (including field investigations, where required, the testing of patient samples and molecular subtyping of isolates and samples) was provided for 18 outbreaks, including 15 foodborne disease outbreaks, two typhoid fever outbreaks and a norovirus outbreak. The Centre for Respiratory Diseases and Meningitis (CRDM) strengthened and expanded pneumonia surveillance by appointing additional staff (across existing sites) and expanding surveillance to include two rural surveillance sites (Agincourt Health Centre and Tintswalo Hospital in the Bushbuckridge district of Mpumalanga).

Additional case definitions were added for Group A and B streptococcus at sentinel sites. Regular site visits and staff training were conducted, initially with an on-site visit and then on online platforms during the COVID-19 pandemic. The Viral Watch continued to provide valuable data on influenza circulation and as a platform to detect COVID-19. Additional surveillance programmes, such as private hospitalisations and outpatient consultations, continued to provide data on influenza and other respiratory pathogen circulation. This data provided important information on COVID-19 hospitalisations. Several research projects were started to inform policy makers on SARS-CoV-2 and COVID-19. These include a viral shedding study, a household transmission study, a serosurvey and healthcare utilisation survey, and an application-based community surveillance system.

The CRDM laboratory was part of a national viral sequencing consortium. The CRDM will continue to conduct surveillance programmes for respiratory pathogens,like influenza, respiratory syncytial virus, and other respiratory pathogens that continue to be of importance in the pandemic period. In addition, SARS-CoV-2 surveillance in 2021 is vital, specifically in the vaccine introduction period. The CRDM will review and implement changes to the surveillance programmes to accommodate necessary changes to document the effect of vaccine introduction once vaccination plans are finalised.

Research projects will continue, and data will be published timeously to inform policy and support the NDoH. GERMS-SA laboratory-based enhanced surveillance on organisms of public health importance continued throughout 2011, with data collection performed through medical record review rather than interviews from June 2020. Organisms under enhanced surveillance included *Streptococcus pneumoniae*; *Haemophilus* spp., *Neisseria meningitidis*, Group A streptococcus (*Streptococcus pyogenes*), Group B streptococcus (*Streptococcus agalactiae*), *Salmonella* Typhi, *Salmonella* enterica serotype Paratyphi (A, B and C), nontyphoidal *Salmonella* spp., *Cryptococcus* spp. and rifampicin-susceptible TB. Pneumonia surveillance at sentinel hospital sites in six provinces was enhanced to include surveillance for all suspected COVID-19 cases.

In 2020, the NICD's provincial epidemiology team (PET) played a critical role in the response to the COVID-19 pandemic in the provinces. The provincial epidemiologists fulfilled various roles within their respective provincial IMTs, including data management and harmonisation, analysis and reporting, daily provincial COVID-19 situational reports, presentations at provincial meeting forums, training, technical support, and capacity building at the district level. The team worked alongside provincial and district response teams to strengthen the reporting of COVID-19 mortality, especially deaths outside healthcare facilities, with technical and financial support from the Africa CDC. Epidemiological support to the provinces about COVID-19 response continued in 2021, with the

implementation of COVID-19 community death reporting strengthening in four sentinel sites (the Nelson Mandela Bay, Mangaung, Thabo Mofutsanyana and Frances Baard districts).

The CEZPD continued to provide national and regional capacity for the diagnosis, surveillance and research of viral, bacterial and parasitic pathogens, particularly those classified as zoonotic risk Group 3, and several agents, including viral haemorrhagic fevers, arthropod-borne viral infections, rabies and rabies-related infections, bacterial infectious diseases such as anthrax, botulism and plague, rickettsioses, malaria, parasitic opportunistic infections, diarrhoeal disease in children under five, schistosomiasis and soil-transmitted helminthic diseases. The Centre also serves as the national referral laboratory for human rabies investigations in the country.

The primary roles of the National Cancer Registry are national pathology-based cancer surveillance and the implementation of population-based cancer registration. During 2021, the NCR used multi-model supervised machine learning techniques to assign malignancy status to histology reports from the NHLS' Corporate Data Warehouse and identify missing cancer records that could not be identified by routine CDW algorithms. This significantly improved the completeness of the pathology-based registry for 2015, 2016 and 2017. Reports for the pathology-based registry for 2016 and 2017 were published on the NCR's website.

Research is conducted on the genetic and environmental factors that govern the transmissibility, virulence, epidemic behaviour, and distribution of the most significant pathogens. Investigating the impact and effectiveness of interventions such as vaccines and drug treatments, including monitoring biological resistance to these interventions, is used to develop new guidelines and policies. Technology development and intervention-driven research are used to improve communicable disease surveillance, diagnostics, and control. The Centre for HIV and Sexually Transmitted Infections (STIs) supported multiple prevention trials, including vaccines and antibody-mediated protection trials, conducted in South Africa and the African region. The Centre for Tuberculosis (CTB) plays a pivotal role in the national TB programme by providing quarterly data for drug-susceptible and drug-resistant TB (DRTB) at the national and provincial levels. The Centre has also provided the national TB programme and the National TB Think Tank with the bi-weekly analysis of Xpert TB testing volumes, Xpert positive tests, positivity, and rifampicin-resistant rates, as well as same-day TB and COVID-19 tests data to support the TB COVID-19 recovery plan. This data is now provided monthly. As part of the Centre's advancing diagnostics function, several new cutting-edge diagnostic technologies were evaluated for the rapid detection of DRTB. The data generated was submitted to the WHO for review and used for the recent recommendations of these molecular assays. Assessments of next-generation sequencing technologies for the diagnostic utility and surveillance of DRTB have been initiated and are

planned to continue over the coming years. The Centre for Hospital Infections and Antimicrobial Resistance (CHARM) will lead a multi-centre pragmatic randomised-controlled Phase III trial of treatment of cryptococcal meningitis at ten sites in South Africa and Tanzania nested within the national screening programmes. The CEZPD continued its bio-surveillance programme for zoonotic pathogens in local bat and rodent populations. This work serves to inform potential zoonotic agents of concern. Confirmation of the period for the highest marburgvirus exposure risk (April to June) highlights the value of bio-surveillance and demonstrates that this virus continues endemic circulation in South Africa.

Diagnostic and surveillance capacity was improved through the development and validation of several diagnostic platforms, including the following:

- A pen-side test for the detection of nucleocapsid protein of Rift Valley Fever in viraemic livestock
- A reverse transcription recombinase assay for the rapid detection of canine-associated rabies, and three indirect enzyme-linked immunosorbent assays for the detection of serum immunoglobin G (IgG) antibodies to Ebola virus in human sera

Real-time PCR for trypanosomiasis was validated and is now available for patient sample testing. A new research project that was to begin in 2021 entailed the metagenomic analysis of sewage at selected study sites to detect enteric bacterial pathogens and antimicrobial-resistant pathogens of public health concern.

Through a variety of educational programmes in public health, the NICD offers training in unique settings such as the BSL 3 and BSL 4 laboratories. The Institute offers formal and informal training to field epidemiologists through the Field Epidemiology Training Programme (FETP), medical registrars, and field and laboratory personnel, including intern medical scientists, environmental health practitioners and postgraduate students. GERMS-SA field staff trained numerous provincial teams on nasopharyngeal specimen-taking practices and assisted in the contact tracing of the first COVID-19 cases in KwaZulu-Natal.

The staff generates new knowledge and disseminates information through numerous publications such as the communiqué and the Public Health Surveillance bulletin, as well as reports, guidelines and scientific journals.

The NICD has the following strategic objectives:

- To be the national public health institute for surveillance of communicable diseases in South Africa.

- To detect outbreaks or epidemics at an early stage to be able to respond to them timeously and effectively, or to anticipate imminent outbreaks or epidemics by investigation, research, and the analysis of data and to communicate information accordingly.
- To engage in directed and relevant research to answer questions related to national and regional public health communicable diseases problems, as well as their surveillance and management.
- To provide a reference function for communicable diseases laboratories in the public and private sectors nationally, regionally, and internationally.
- To build capacity for communicable diseases nationally and regionally.

National Institute for Occupational Health

The National Institute for Occupational Health is a division of the NHLS. It provides occupational and environmental health and safety services and support across all sectors of the economy, including the informal economy. Its mandate is to promote workers' health and safety nationally through a range of programmes, including, but not limited to, the surveillance of occupational diseases, specialised laboratories, and health hazard evaluations, applied laboratory and epidemiological research, statutory autopsy services and other clinical services, as well as teaching and training on critical occupational health and safety skills.

The NIOH established the following goals that aim to contribute to the high quality of service outcomes and provide robust and efficient occupational environmental health services in a resource-constrained environment:

- Promote safety and health in workplaces through interventions, recommendations, and capacity building
- Provide specialised safety, health, and environmental services to the NHLS
- Maintain quality management systems
- Strengthen stakeholder collaborations, especially with government entities
- Increase capacity for occupational health surveillance
- Establish revenue-generating streams for the sustainability of key occupational health programmes

Like the previous year, the COVID-19 pandemic dominated 2021, affecting workplaces across the globe. While the arrival of the pandemic crippled some of the services provided by the Institute, it also provided numerous opportunities to highlight the NIOH's significance beyond occupational health.

The NIOH played a crucial role in the training of various occupational groups across numerous sectors to equip the industry with the tools required to protect and promote workers' health and safety, including the safe return to work during the pandemic. As the demand for online COVID-19 training increased, the online training platform capacity was extended to live streaming on YouTube when Zoom reached its maximum capacity of 3 000 participants. A dedicated workplace advisory hotline, specifically for occupational health professionals, employees, and employers, had to be established and has now been expanded to address general workplace queries beyond COVID-19. To date, 82 webinars have been conducted with over 40 000 participants being trained on COVID-19 topics. Several guidelines and fact sheets have been developed and translated into local languages. These have been disseminated nationally and to neighbouring countries. All this material is accessible via the NIOH's zero-rated website.

During the past year, the NIOH played a role in some notable developments in occupational health and safety (OHS) in South Africa. Several staff members represented the NIOH at key high-level decision-making technical committees, including the National Economic Development and Labour Council (NEDLAC) and the Department of Employment and Labour, drafting, and revising occupational health legislation and guidelines. The NIOH's newsletter, *NIOH OccuZone*, continued to be used as a medium to share information on the Institute's activities. This publication, which is disseminated quarterly, details current research that is underway, specialised services and the Institute's teaching and training activities. The NIOH launched the inaugural copy of this newsletter as a medium to disseminate critical information to its stakeholders.

In addition, the NIOH has increased its digital footprint through the effective utilisation of the social media platforms Twitter and YouTube. These communication channels provided the opportunity for networking on a global scale, assisted with targeting specific stakeholders through tailored communication, and provided a diverse public relations platform to share information. New website visits increased by 57% with new visitors from other African countries and Europe.

The NIOH, being the primary provider of safety, health, and environment (SHE) services to the entire NHLS, has provided overall leadership in guiding the implementation of policies for NHLS staff members in line with national guidelines. With the increasing number of infections, there was a need to recruit more medical personnel. Two more doctors and seven occupational health nurses were hired to perform screening, contact tracing and management of COVID-19 within the NHLS. The Occupational Health and Safety Information System (OHASIS) supports surveillance and compliance with occupational and environmental health and safety (OEHS) legislation and provides information for research in the information system used by these practitioners to support

the services offered to NHLS employees. The OHASIS has been extensively adapted for the unique needs posed by the NHLS' laboratory environment.

The NIOH's specialised laboratories have managed to maintain quality management system accreditation year upon year. The Institute is the only entity in South Africa that has acquired four different quality management system accreditations, i.e., ISO 15189 (Medical Laboratories), ISO 17025 (Testing and Calibration Laboratories), ISO 17020 (Conformity Assessment for Inspection Bodies) and ISO 9001. It has also been able to provide pre-SANAS internal audits, training, and support to NHLS laboratories, including Proficiency Testing Scheme guidance to staff.

Historically, stakeholder engagement has been lacking, but in the recent past, the NIOH has managed to strengthen functional working relationships with its key stakeholders, the Department of Employment and Labour, the NDoH, organised labour, non-governmental organisations (NGOs) and professional societies. At the insistence of organised labour and the request of the NDoH, the NIOH conducted countrywide on-site audits of public and private healthcare facilities during the latter parts of 2020. This is evidence of the relationship of trust that has been built. The audit highlighted some deficiencies in various health systems. The NHLS scored well in most indicators.

The NIOH is a WHO collaborating centre and is recognised as a Centre of Excellence. It collaborates with various local and international universities, governments, and organisations, including advising the African Union Development Agency of the New Partnership for Africa's Development (AUDA-NEPAD), as well as collaborating with the International Labour Organization on matters that include research, skills development, and policy advisory support. The NIOH currently serves as the advisory body for occupational health in the region.

Research is fundamental to the NIOH's mandate to produce new knowledge to prevent ill health and injury and to promote good health. The Institute has a large and varied interdisciplinary research programme that covers many issues that are important to the improvement of workers' health and the health of communities living around workplaces. Research remains a priority for the Institute and focuses on the prevention of workplace exposure, with specific reference to hazardous biological agents. The NIOH's few researchers managed to publish 43 articles in peer-reviewed journals during the 2020/21 financial year, an increase on the previous year. However, the recent loss of senior research staff members due to retirement is posing a huge challenge in meeting targets for the coming year.

The surveillance of occupational health, morbidity, injury, and mortality is inadequate in South Africa. Contributing to improved surveillance is a long-standing, but increasingly important part of the work

of the NIOH. Surveillance for occupational diseases was prioritised as a new strategic thrust during 2011. Concerted efforts are being made to increase the publication of surveillance reports. A national occupational health surveillance system (OHSS) was established in October 2020 to cater for the submission of workplace COVID-19 infections in line with government regulations and directives legislating the collection of data on COVID-19-positive employees. The OHSS provides an overview of the COVID-19 infection spectrum in the South African workforce with the early identification of industries and occupational groups at high risk of infection to inform appropriate interventions (e.g., policy, programmatic interventions, and resources). The surveillance of all occupational diseases and injuries will be based on this system.

In addition, several other surveillance initiatives continue within the Institute. As per statutory obligation, the Pathology Disease Surveillance (PATHAUT) report was completed and is accessible on the NIOH's website. The Institute also provided COVID-19 weekly sentinel hospital admissions surveillance for healthcare workers.

All the above-mentioned new strategic areas and responsibilities represent a major challenge for the NIOH as it tries to address its priorities with limited resources. Hence, there are ongoing efforts to generate revenue by exploring various funding mechanisms available to fulfil its core mandate effectively and sustainably.

COVID-19 and the consequent changing world of work are expected to preoccupy much of the NIOH's planning, reorganisation, and work for the near future. Many technical questions about protecting employees and employers from occupational hazards and their consequences need to be answered.

The informal economy, which is already large, will probably expand rapidly, and the NIOH's programmes in this economic sector will need to be geared to respond to its growing needs.

The NIOH recognises that new issues may emerge or become more important during the next five years, and some plans may be retired as they have been achieved, so priorities may be shifted in response to changing conditions.

Administration

The effective and efficient functioning of the NHLS' laboratories is as strong as its administration. It is for this reason that the NHLS must invest in administration departments to create an enabling environment for the delivery of its core mandate.

The administration programme plays a crucial role in the delivery of the NHLS' services through the provision of a range of support services, such as organisational development, human

resources and labour relations, information technology, property management, security services, legal services, communication, and the integrated planning, monitoring and evaluation function. The NHLS depends highly on the effective management of financial resources and the procurement process as administered in the financial department. Generating sufficient revenue remains a critical focus area for the NHLS to ensure financial viability and sustainability.

The NHLS plans to obtain ISO 9001:2015 certification for its administration departments. This will strengthen and improve the quality management systems in these departments and ensure that service delivery and academic platforms within the NHLS receive consistent, good quality products and services, which, in turn, bring business benefits.

Finance

The 2020/21 financial year was characterised by activities that aimed to support the fight against the COVID-19 pandemic. During the financial year, there was a cannibalisation of cash reserves by upfront costs that were incurred to gear the NHLS up to provide diagnostic services in response to the pandemic. Even so, the NHLS generated a surplus of R53.4 million for the 2020/21 financial year, which is a decrease from R1.1 billion in the previous financial year. The revenue grew from R9.3 billion to R10.7 billion. Based on the assessments of internal and external audits, assurance is provided that the NHLS' internal controls are effective. Without qualifying the effectiveness of controls, internal and external audits have also highlighted the need to strengthen controls pertaining to procurement and contract management.

The NHLS continues to implement better procurement policies and procedures to eliminate irregular expenditure. This includes system enhancements and continuous procurement training interventions.

Most of the consumables (reagents) required by the NHLS to perform its tests can only be used in the machines manufactured by specific manufacturers. It is therefore essential that a diverse equipment fleet is used to guard against a single dominant supplier reneging on its contracted obligations and putting the NHLS at risk.

Information and Communication Technology

Information technology continues to play a strategic role in enabling the NHLS to achieve its mandate. It is therefore important that the NHLS, as a key role player in the South African healthcare ecosystem, applies information technology successfully to transform its business processes and deliver value to customers.

The NHLS' intention for the MTEF, among others, is to leverage innovation and new technology to improve efficiency. To achieve this, the NHLS must invest in information technology, digital technology, communication links and logistical services.

The NHLS has made much progress in strengthening information and communication technology (ICT). It has thus far awarded the MPLS (IT network connectivity) tender. Inadequate ICT infrastructure has been identified as one of the NHLS' weaknesses and the awarding of this tender is a huge achievement for the NHLS as the bandwidth constraints will be addressed.

In parallel to the upgrading of the bandwidth, the ICT department is in the process of rolling out more projects that will enable the NHLS to achieve its strategic outcomes.

To improve clinical effectiveness and efficiency, and strengthen total quality management systems, the NHLS will implement order entry and specimen tracking systems in the 2022/23 financial year. Furthermore, the ICT department has made a lot of progress in preparing its systems to be ready for the implementation of digital pathology in the 2022/23 financial year.

Human Resources

In line with the NHLS Act, the main purpose of the Human Resources (HR) division is to ensure that there is support for health research and training for health science education. It also needs to ensure that the business has the right resources with the relevant skills at the right time to ensure that the organisation can provide reliable pathological diagnostic services for the accurate diagnosis of the majority of South Africans who utilise public health services.

COVID-19 has had a global impact, especially within the NHLS and how its day-to-day work is carried out. Because the NHLS is such an important part of the South African health system, the organisation needed to act quickly to assist the country in managing the pandemic. This meant that there was a need to temporarily increase its personnel to provide resources to facilitate COVID-19 testing both within and outside the normal laboratory settings.

Figure 6: Headcount trend

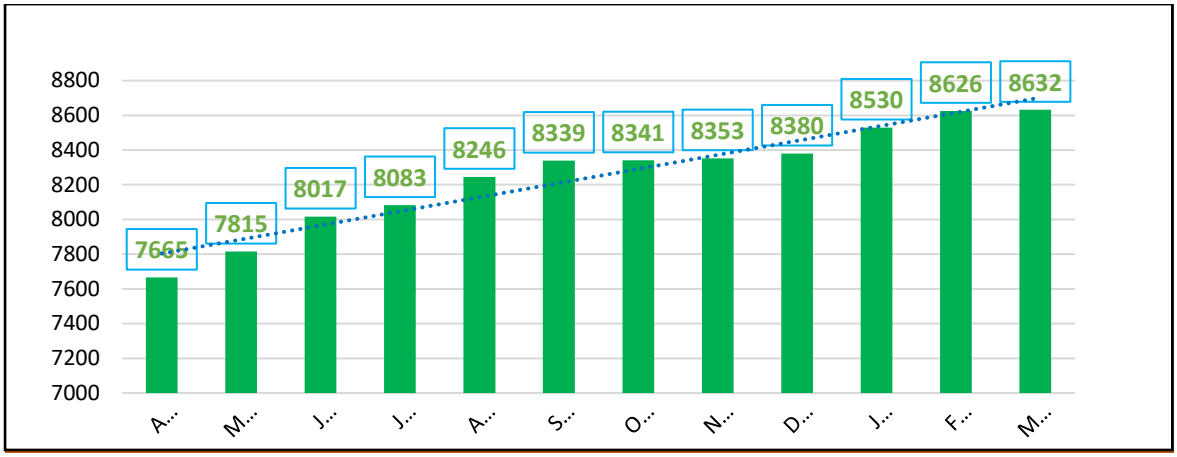


Figure 6 reflects the staff headcount from 1 April 2020 to 31 March 2021. The total staff headcount increased by 12.6% from April 2020 to March 2021.

Medical scientists, medical technologists, phlebotomy technicians, pathologists and other health professionals were recruited to help with the COVID-19 pandemic. This includes laboratory support staff such as laboratory clerks responsible for receiving and inputting data. Such categories would be nurses and laboratory drivers, noting that these employees still play a critical role in ensuring that specimens are readily packaged and labelled to be analysed accordingly. During COVID-19, nurses around the world were a critical line of defence and front-liners who safeguarded the lives of everyone affected. Among other things, they provided employees and the public at large with guidance and counselling during this darkest period. The NHLS nurses provide holistic healthcare for all NHLS employees.

Furthermore, the pandemic continues to have an impact on NHLS employees' physical and psychological wellbeing, necessitating a greater focus on employee wellness by HR, as well as more agile and sympathetic management, all of which must be balanced with the need to maintain business continuity and efficiency. Year over year, the Employee Assistance Programme (EAP) service provider's statistics reveal an increase in COVID-19-related consultations, which included grief counselling and anxiety management.

Figure 7: Employee Assistance Programme utilisation statistics per region

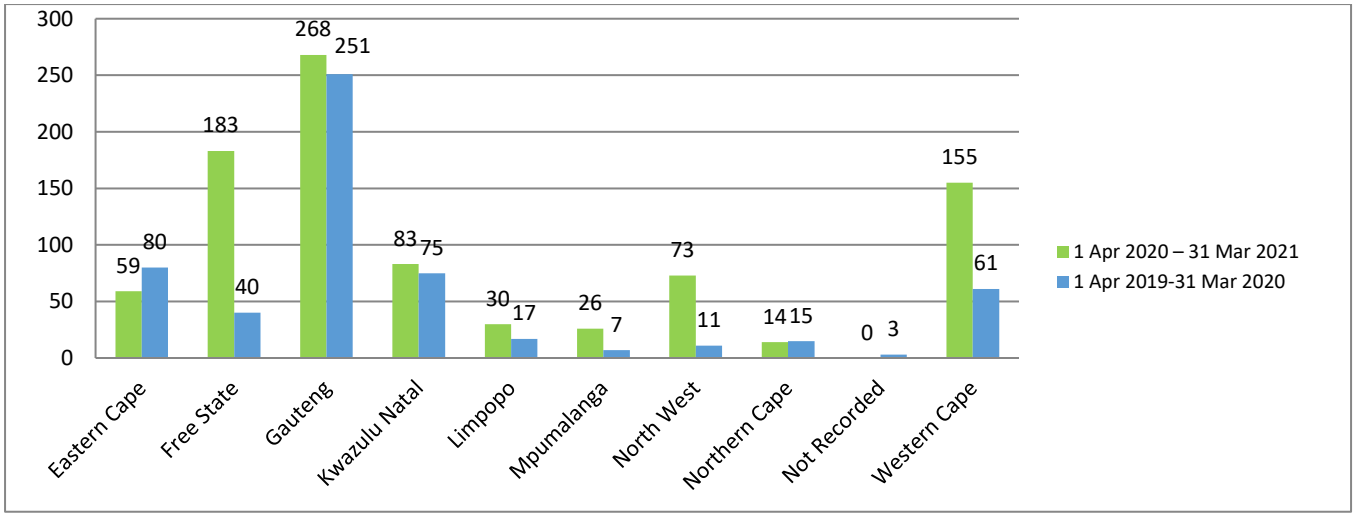


Figure 7 depicts changes in EAP service utilisation in almost all the regions, with the Free State and Western Cape showing the highest increase.

The top five problems presenting in 2020/21 compared to the previous year are COVID-19, relationships, family, mental health, and trauma.

The organisation must reassess how work is done to respond to these changes, most importantly, how flexible workspaces are enabled by systems and processes. This requires a change in people policies and a shift towards digital transformation, not only to enable remote working, but also to minimise the risk of spreading infection caused by manual processes such as hard copy documents and face-to-face contact.

One of the challenges posed by this transformation relates to training. While this forms part of the NHLS' mandate, the failure to quickly adopt technology from traditional approaches resulted in the organisation's inability to achieve its target in this area. Only 31% of the Workplace Skills Plan (WSP) was achieved in 2020/21, owing to the plan's reliance on traditional training approaches.

Table 2: Training comparison year-on-year

Training type	Training expenditure R'000 (2019/20)	Training expenditure R'000 (2020/21)	Number of employees trained (2019/20)	Number of employees trained (2020/21)
Non-PIVOTAL programmes (short courses, workshops, seminars, congresses and CPD interventions)	45 067	18 894	5 880	2 220
PIVOTAL programmes (for non-employees' higher education qualifications)	780	N/A	12	N/A
PIVOTAL programmes (for non-employees participating in learnerships, on-the-job training and workplace experience)	21 000	36 195	218	393

Table 2 compares training statistics year on year for the past two financial years, the total training expenditure in 2020/21 decreased by 58%, translating to a 62% drop in the number of employees trained.

In the future, the focus will shift to virtual and online learning, resulting in a learning culture that is agile and accessible at the employee's convenience.

While the world of work is changing, the organisation must continue to perform to achieve its targets. Performance management is again in the spotlight as an enabler to manage employees in a different work context. In 2019/20, the NHLS achieved 89% conformance on the completion of performance contracts and reviews against a target of 95%. The focus will be on exceeding the conformance target with a focus on aligning the process with career development, remuneration, and the management of poor performance.

An overarching HR strategy with a detailed implementation plan is critical in ensuring alignment with the organisation's strategy, and a structured and planned approach is necessary to create a customer-centric support function.

Diagnostic Media Products

There are currently three Diagnostic Media Products (DMP) units within the NHLS that are responsible for producing a wide range of microbiological culture media, reagents, and deionised water for use in clinical diagnostic laboratories. The media produced is supplied internally to the NHLS' laboratories, as well as externally to private laboratories and some laboratories within Africa. The DMP's product catalogue consists of 330 products, more than double the list of its competitor companies.

In 2020/21, DMP supplied 2 289 483 products to its customers. This included 1 159 240 units of plated media, 56 044 stains and reagents, and 714 559 units of bottled and tubed media. The average wastage through other factors was less than 1%, with a contamination rate of 2.4%.

DMP currently enjoys preferred supplier status with the NHLS. It provides most of the products at competitive prices and supplies highly specialised media products that are not supplied by the competitor companies. The maintenance of the ISO 9001 certification of three DMPs allows for a competitive position and supplier confidence. Due to the poor structure of the Johannesburg unit (the biggest of the two other units), DMP still has a high contamination rate pre- and post-production, resulting in increased back orders. The condition of the structure poses a safety risk for employees.

Going forward, DMP plans to restructure and re-engineer its manufacturing plant, which will centralise its processes and merge all three DMPs. The merger will enable DMP to provide several key deliverables that will add value. The Marketing Department brings in business, retains it and helps DMP to grow and achieve its financial and organisational goals. Research and Development (R&D) collaborates with medical diagnostic companies to manufacture rapid diagnostic kits for the growing POCT market. It also provides training in the form of learnership programmes for graduate students to work with the Training and R&D divisions. The WHO-Southern African Development Community (SADC)-African Society of Medical Laboratories (ASLM) Collaboration Centre manages collaboration programmes within the Centres of Excellence for Learnership and the R&D division.

Client engagement to better understand demands can help determine what capacity to invest in. The WHO, with its vast geographic reach and laboratory-related scope, is one of DMP's external clients. To have a better understanding of its laboratory needs and pinpoint the best growth opportunities, DMP should form a strategic partnership with key industry role players, including the WHO, CDC, and reference laboratories.

South African Vaccine Producers

The NHLS' subsidiary, South African Vaccine Producers (SAVP), is a national asset that offers strategic products to a global market. SAVP focuses on the development of world-renowned antivenom solutions that are considered the gold standard for treating bites from Africa's deadliest snake species.

SAVP has been developing antivenoms to treat snake and arthropod bites for more than 80 years and is a certified pharmaceutical manufacturer. The only specific treatment for envenomation remains these therapeutic animal antibodies. The manufacture of antivenom around the world is endangered by the fact that it is commercially undesirable.

In sub-Saharan Africa, SAVP is the only manufacturer of this antivenom. Antivenom production is experiencing a resurgence of interest. In an intention to unify production and quality control systems, SAVP is partnering with the WHO, which, on 9 June 2017, classified snakebite envenomation as a neglected tropical disease.

Investment in infrastructure, contemporary plasmapheresis equipment and total capacity will be required to increase SAVP's antivenom output and achieve WHO pre-qualification.

SAVP is currently facing significant difficulties with unscheduled maintenance repairs. The long delays in resolving these issues with Supply Chain Management are causing manufacturing downtime, which is affecting its ability to meet its mission of supplying appropriate quantities of strategic antivenom medicines. Furthermore, SAVP's quotation requests can take up to a year to complete, and its business unit is unable to function under these conditions.

SAVP is currently experiencing a significant back-order crisis, which is negatively impacting on its performance plan and affecting SAVP's reputation.

Governance

The Board, as the accounting authority, is responsible for ensuring that the Public Finance Management Act, Act No. 1 of 1999, is followed. According to the King IV Report on Governance for South Africa, 2016, the governing body should lead ethically and effectively,.

It therefore does the following:

- Offers leadership that results in the achievement of strategy and outcomes over time.
- Exhibits characteristics of integrity, competence, responsibility, accountability, fairness, and transparency, and ensures that these characteristics govern the ethics of the organisation in a way that supports the establishment of an ethical culture.

- Steers and sets the direction, purpose, and strategy of the organisation.
- Ensures that the reports issued by the organisation enable stakeholders to make informed assessments of the organisation's performance, and its short-, medium- and long-term prospects.

The Board continues to play its oversight role concerning good governance and has implemented a fraud prevention and response plan. The dedication of the Board to prevent fraud was marked by investigating the allegations reported through the tipoff platform swiftly and quickly. Furthermore, the Board remains committed to providing leadership by steering and setting the direction, purpose, and strategy of the organisation. It creates an enabling environment for the organisation so that it achieves its strategy and outcomes over time. The Board actively provided leadership during the COVID-19 pandemic, making it easier for the NHLS' executives to respond to the pandemic. This was evidenced by the frequent meetings that the Board held in the past financial year to discuss and take decisions related to the pandemic timeously. The NHLS maintained the unqualified audit opinion of the Auditor-General with no material findings from the audit of pre-determined objectives.

The NHLS aims to invest in the establishment of a Business Intelligence Unit to further reinforce the Board's control. The BIU will produce studies on evidence-based operational strategy, cost-cutting, market, and intellectual property appraisal. It will also be used to track whether the NHLS is on track to accomplish its strategic goals by tracking specified indicators. This will necessitate the inclusion of monitoring and evaluation personnel in this unit.

Stakeholder engagement

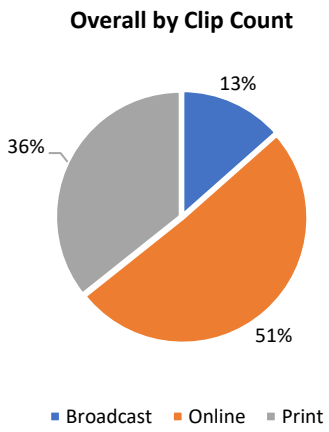
During the past financial year, the NHLS raised its public profile. The development of COVID-19 in South Africa accounted for most of this increase in its profile. The Stakeholder Engagement department was involved in a variety of initiatives to disseminate information about what the organisation does, why it does it, how it does it and for whom it does it. This was accomplished using the media.

Despite the challenges caused by the pandemic, the organisation's work was effectively communicated. As a result, the NHLS claimed a share of the voice worth R116 million, reaching over 632 million South African citizens.

Table 3: Value of media coverage

Medium	Count of headline	Sum of advertising value equivalent	Sum of reach
Broadcast	334	R12 723 389	R392 579 433
Online	1 260	R51 966 827	R218 486 351
Print	885	R51 463 341	R21 241 242
Total	**2 479**	**R116 153 557**	**R632 307 026**

Figure 8: Overall coverage by clip count



Despite negative publicity in the media, the Department focused on affirming the role of the NHLS in the country. The Department's responsibility of ensuring that all stakeholders are informed about the NHLS' activities depends on its ability to maintain an interactive internal communications environment and foster a coherent organisational culture.

SWOT analysis

The NHLS identified strengths, weaknesses, opportunities, and threats (SWOT) analysis as a powerful tool to ensure that a better understanding of the existing situation and environment provides a solid foundation for planning. The NHLS will be in a better position to plan for any potential opportunities or create strategies to prevent threats from becoming realities that need to be managed if it has a clear grasp of its strengths and weaknesses.

Table 4: Strengths, weaknesses, opportunities, and threats

Strengths	Weaknesses
• Strong academic base that allows sustainable partnerships with stakeholders through relevant research outputs. • A national pathology laboratory footprint that allows for equitable access to healthcare. • An exclusive national integrated data warehouse. • Influence in the international, national, and regional societies on laboratory medicine. • A competitive remuneration structure. • Well-established disease surveillance systems • A leader in dealing with occupational health issues in the country. • National leaders in assay validation and the development of new assays. • Competitive pricing of tests.	• Limited ownership of value chain from the collection of samples to the return of results • Lack of succession planning and development across various levels. • Inequitable distribution of critical and scarce skills. • Inadequate ICT infrastructure capacity. • Complacency due to perceived security from being a designated public sector service provider. • Inadequate supply chain management capacity • Over-reliance on suppliers due to the specialist nature of services and goods needed by the NHLS to fulfil its mandate

Opportunities	Threats
• Establish multisectoral partnerships to enhance the sharing of intellectual capacity. • Leverage the current capacity to expand research and innovation. • Make use of other sources of income to enhance revenue streams. • Expand the existing footprint in terms of the national and regional laboratory network. • Leverage on the implementation of National Health Insurance. • Strengthen integrated IT systems. • Utilise media coverage to promote the NHLS' brand and corporate image. • Perform remote oversight of laboratories by pathologists. • Investigate the automation and digitalisation of manual processes, including digital pathology.	• Private-sector competition, especially in anatomical pathology. • The opening of new medical schools: the NHLS may not have enough resources to cover the needs. • The sub-optimal functioning of the grant's office. • Insufficient throughput from the training platform. • Challenge regarding the retention of professional staff. • Operational costs exceed tariff increases. • Increased competition with the implementation of the NHI. • Data security – compliance with the Protection of Personal Information (POPI) Act. • Energy and water challenges.

Overview of the 2021/2022 budget and MTEF estimates

Materiality and significant framework

Background

Treasury Regulation Section 28.3.1 states: “For purposes of material [section 55(2) of the Public Finance Management Act (PFMA)] and significant [section 54(2) of the PFMA], the accounting authority must develop and agree on a framework of acceptable levels of materiality and significance with the relevant executive authority.

Materiality and/or significance within the NHLS is defined as a threshold or cut-off point where the information (its omission or inclusion) will alter decisions that are to be taken. The NHLS thus accepts that materiality can be both quantitative and qualitative.

The NHLS has considered the following factors:

- The nature of the NHLS’ business.
- Statutory requirements affect the NHLS.
- The inherent and control risks associated with the NHLS.

Nature of the NHLS’ business

The NHLS is the main provider of clinical support services to the national, provincial, and local departments of Health through its countrywide network of quality-assured diagnostic laboratories. The NHLS also provides surveillance support for communicable diseases, occupational health, and cancer. It thus endeavours to align its strategy with both the NDoH’s priorities and the national and regional burden of disease.

The NHLS delivers services throughout the public sector, from the primary healthcare level to tertiary or quaternary hospitals. The level of complexity and sophistication of services increases from the peripheral laboratories to the central urban laboratories (with specialised surveillance infrastructure existing at isolated sites).

Statutory requirements laid down on the NHLS

The NHLS is managed according to the provisions of the National Health Laboratory Service Amendment Act, Act No. 5 of 2019, as well as the NHLS’ Rules, gazetted in July 2007, and the Public Finance Management Act, Act No. 1 of 1999 (as amended). It is a Schedule 3A public entity governed by a Board and a Chief Executive Officer.

The control and inherent risks associated with the NHLS

In assessing the control risk of the NHLS, cognisance was given to the following, among others:

- Proper and appropriate governance structures have been established.
- An Audit and Risk Committee has been established that closely monitors the NHLS' control environment.
- The Internal Audit has been established, and some of the projects have been co-sourced with the external audit functions.
- The Audit and Risk Committee reviews and approved a three-year internal audit plan every year, which is based on annual risk assessments .
- Material risk such as irregular expenditure reported in the annual report, is being addressed, and controls are being implemented to address weaknesses or deficiencies.
- A delegation of authority is in place where awards of tenders above R10 million are approved by the NHLS' Board.
- The Accreditation Strategy for the Annual Performance Plan includes the targeted date for the accreditation of each laboratory.
- Senior Management and Bargaining and Labour Relations Forum (BLRF) engagement platforms have been established.
- Turnaround times for resolving reported IT failures or downtime are monitored.
- A conservative investment strategy is applied during the investment of funds.
- An NHLS IT strategy is being developed.
- Laboratory referral processes are reviewed and regularly updated.

Materiality level for consideration

Qualitative aspects

Materiality can be based on several financial indicators. Detailed below is an indicative table of financial indicators of the type that is widely used:

Table 5: Widely used financial indicators

Basis	Acceptable percentage range
Gross revenue	0.25–1%
Gross profit	1–2%
Net income	2.5–10%
Equity	2–5%
Total assets	**0.5–2%**

The level of materiality for 2022/23 has been set as follows:

- Assets: R7 267 893 000 x 0.5% = R36 339 465 for transactions in the Statement of Financial Position. The 2020/21 audited total assets balance was used.
- Gross revenue: R10 676 573 000 x 0.5% = R53 382 865 for classes of transactions in the Statement of Financial Performance. The 2020/21 audited revenue was used.

The utilisation of 0.5% for both the Statement of Financial Position and the Statement of Financial Performance is based on the nature, statutory requirements, controls, and inherent risk associated with the NHLS.

As far as qualitative materiality is concerned, the NHLS has adopted the following materiality levels:

- All amounts or events pertaining to criminal conduct and/or dishonest behaviour.
- All amounts or events pertaining to non-compliance with legislation.
- All unusual transactions or events that are not within the mandate of the NHLS as legislated.

Expenditure estimates

The total expenditure estimate (2022/23) comprised compensation of employees of R5.5 billion, and goods and services of R6.1 billion. Over the medium term (2022/23 to 2024/25), total revenue is estimated to increase from R11.7 billion to R12.8 billion. The NHLS has provided for a steady increase in required personnel with compensation of employees increasing from R5.5 billion to R46.1 billion over the medium term (2022/23 to 2024/25). The decrease in the transfers received will have an impact on the activities of the NICD and the NIOH.

Despite the challenges posed by the COVID-19 pandemic, the NHLS continued to enhance the provision of rapid, reliable, and efficient service delivery at a low cost. This was achieved through state-of-the-art laboratories, the right people with the right skills at the right level, effective and efficient procurement services, and cutting-edge information technology, while ensuring that it remained financially stable to sustain its operations.

Table 6: Budget 2022/23

Statement of financial perfomance	Audited	Audited	Budget	Medium Term Estimate		
R thousand	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
Revenue						
Test Revenue	8 465 159	9 778 606	9 833 542	10 692 239	11 263 555	11 824 364
Other Revenue	496 522	1 229 027	552 401	200 508	199 674	199 341
Transfers received	785 506	855 584	640 057	772 521	725 255	757 891
Total revenue	**9 747 187**	**11 863 217**	**11 026 000**	**11 665 268**	**12 188 484**	**12 781 595**
Expenses						
Compensation of employees	3 930 643	4 202 399	4 834 569	5 491 190	5 790 460	6 108 357
Goods and services	4 590 740	7 501 237	5 762 438	5 773 022	6 029 218	6 300 649
Other Expenses	151 169	105 272	318 203	334 847	349 915	367 061
Total expenses	**8 672 552**	**11 808 908**	**10 915 210**	**11 599 058**	**12 169 592**	**12 776 067**
Surplus/(Deficit)	**1 074 635**	**54 309**	**110 790**	**66 210**	**18 892**	**5 528**

PART C: Measuring our performance

Programme 1: Laboratory Service

Programme purpose

This programme represents the NHLS' core business, which is to provide cost-effective and efficient health laboratory services to all public sector healthcare providers, any other government institution within and outside South Africa that may require such services, and any private healthcare provider that requests such services, as mandated by the NHLS Act. The NHLS is expected to provide equitable, comprehensive, high-quality, timely and cost-effective pathology services that will improve patient care.

Explanation of Performance over the Medium-Term Period.

The NHLS' intention for the MTEF, among others, is to leverage innovation and new technology to improve efficiency. To achieve this, the NHLS must invest in information technology, digital technology, communication links and logistical services.

With the aim to achieve clinical efficiency and relevance, the NHLS will continue:

- surveillance to drive diagnostic implementation,
- provision of new diagnostic services including for emerging or re-emerging pathogens,
- targeted training to produce a fit-for-purpose and response workforce,
- implementation and validation of state-of-the art diagnostic testing including for surveillance e.g. Next Generation Sequencing;
- operational research to drive the placement and utilisation of laboratory services including pre-analytical, analytical, and post-analytical factors which may impact quality; and
- the harnessing of big data and bioinformatics to inform laboratory placement and test repertoire,

Outcome, outputs, performance indicators and targets

Programme 1: Sub-programme: Laboratory Service

Outcome	Output	Output indicator	Audited/actual/planned performance			Estimated performance	Medium-term targets			
			2019/20 Audited	2020/21 Audited	2021/22 Planned	2022/23	2023/24	2024/25	2025/26	2026/27
Clinical effectiveness and efficiency	Improved turnaround times	Percentage of TB GeneXpert tests performed within 40 hours	94%	95%*	92%	93%	94%	95%	95%	95%
		Percentage of CD4 tests performed within 40 hours	94%	95%*	93%	94%	95%	95%	95%	95%
		Percentage of HIV viral load tests performed within 96 hours	79%	80%	80%	82%	84%	86%	88%	90%
		Percentage of HIV PCR tests performed within 96 hours	72%	83%*	80%	81%	82%	83%	85%	85%
		Percentage of cervical smear screening performed within five weeks	86%	95%*	90%	91%	92%	93%	94%	98%
		Percentage of laboratory tests (full blood count) performed within eight hours	95%	95%*	93%	94%	95%	95%	95%	95%
		Percentage of laboratory tests (urea and electrolytes) performed within eight hours	94%	94%	93%	94%	95%	95%	95%	95%
		Percentage of SARS-CoV-2 PCR tests performed within 48 hours	New	New	New	85%	86%	87%	89%	90%

Outcome	Output	Output indicator	Audited/actual/planned performance			Estimated performance	Medium-term targets			
			2019/20 Audited	2020/21 Audited	2021/22 Planned	2022/23	2023/24	2024/25	2025/26	2026/27
Clinical effectiveness and efficiency	Equitable service coverage	Develop and implement a POCT plan	New	POCT plan developed	POCT plan developed	Implement the pilot to assess feasibility and cost benefit	20% implementation of the POCT plan based on the pilot	30% implementation of the POCT plan based on the pilot	50% implementation of the POCT plan based on the pilot	60% implementation of the POCT plan based on the pilot
		Implement digital pathology	New	0%	Develop the implementation plan	Prepare for implementation of the digital pathology	Implement the pilot	Roll out 10% of identified laboratories based on the pilot	Roll out 20% of identified laboratories based on the pilot	Roll out 30% of identified laboratories based on the pilot

*The 2020/21 audited performance is higher than the 2022/23 targets because the test volumes were lower in 2020/21 due to COVID-19. Hence, it is expected that test volumes will normalise in the next financial year; and hence, the targets have been set to be more realistic.
The turnaround time is measured from the time of registration in the laboratory until the results are authorised.

Programme performance indicators and quarterly targets for 2022/23

Output indicator		Reporting period	Annual target 2022/23	Quarterly targets			
				First	Second	Third	Fourth
6.2.2.1	Percentage of TB GeneXpert tests performed within 40 hours	**Quarterly**	93%	93%	93%	93%	93%
6.2.2.2	Percentage of CD4 tests performed within 40 hours	**Quarterly**	94%	94%	94%	94%	94%
6.2.2.3	Percentage of HIV viral load tests performed within 96 hours	**Quarterly**	82%	82%	82%	82%	82%
6.2.2.4	Percentage of HIV PCR tests performed within 96 hours	**Quarterly**	81%	81%	81%	81%	81%
6.2.2.5	Percentage of cervical smear screening performed within five weeks	**Quarterly**	91%	91%	91%	91%	91%
6.2.2.6	Percentage of laboratory tests (full blood count) performed within eight hours	**Quarterly**	94%	94%	94%	94%	94%
6.2.2.7	Percentage of laboratory tests (urea and electrolytes) performed within eight hours	**Quarterly**	94%	94%	94%	94%	94%
6.2.2.8	Percentage of SARS-CoV-2 PCR tests performed within 48 hours	**Quarterly**	85%	85%	85%	85%	85%
6.2.2.9	Develop and implement a POCT plan	**Annually**	Implement the pilot to assess feasibility and cost benefit	N/A	N/A	N/A	Implement the pilot to assess feasibility and cost benefit
6.2.2.10	Implement digital pathology	**Annually**	Prepare for implementation of the digital pathology	N/A	N/A	N/A	Prepare for implementation of the digital pathology

NB: The turnaround time is measured from the time of registration in the laboratory until the results are authorised.

Reconciling performance with budget and MTEF

Laboratory Service	**Audited**	**Audited**	**Audited**	**Budget**	**Medium-term estimate**		
R000'	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Expenses	**6 545 031**	**7 210 316**	**10 136 035**	**8 964 389**	**8 812 761**	**9 235 435**	**9 687 561**
Compensation of employees	2 973 286	3 218 694	3 316 602	3 917 587	4 154 129	4 380 530	4 621 022
Goods and services	3 571 745	3 991 622	6 819 433	5 046 802	4 658 632	4 854 905	5 066 539

NB: The budget includes the Forensic Chemistry Laboratories

Programme 2: Academic Affairs, Research and Quality Assurance

Programme purpose

The main purpose of this programme is to help the NHLS strengthen its mandate of maintaining and providing high-quality assured and accredited laboratory medicine to the academic platform. Two of the focus areas within this programme are to ensure that research is conducted to improve service delivery and quality, and to ensure national coverage by NHLS pathologists. The aim is to oversee and collaborate with various training institutions that contribute to the development of qualified and skilled people operating within the scientific field of pathology services.

- **Sub-Programme: Quality Assurance**
  The purpose of this sub-programme is to improve total quality management systems within laboratories and support structures to improve the quality of results issued by NHLS laboratories.

- **Sub-Programme: Academic Affairs**
  The purpose of this sub-programme is to support and promote the training and capacity building of all medical laboratory health professionals to ensure high-quality technical skills in pathology for the NHLS and the rest of the country. This mandate strengthens the business case for the sustained development of the NHLS through the increased output of highly trained pathologists, medical scientists, medical technologists, and medical technicians.

- **Sub-Programme: Research and Innovation**
  The purpose of this sub-programme is to create an enabling research environment to promote multidisciplinary world-class research and resultant research outputs for the NHLS to contribute to national and global scientific knowledge. The sub-programme provides support for innovative research initiatives, while promoting the exploration of innovative emerging technologies and technology transfer that will enhance the capacity of South African research and development for novel ideas.

Explanation of Performance over the Medium-Term Period.

The NHLS over the MTEF plans to obtain ISO 9001:2015 certification for its administration departments. This will strengthen and improve the quality management systems in these departments and ensure that service delivery and academic platforms within the NHLS receive consistent, good quality products and services, which, in turn, bring business benefits.

The NHLS aims to have all the National central Laboratories, Provincial Tertiary Laboratories and Regional Laboratories all SANAS accredited over the MTEF.

Outcomes, outputs, output indicators and targets

Programme 2: Academic Affairs, Research and Quality Assurance

			Audited/actual/planned performance			Estimated performance	Medium-term targets			
Outcome	**Output**	**Output indicators**	**2019/20 Audited**	**2020/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**
High-quality services	**Strengthened total quality management systems**	Percentage compliance achieved by laboratories during annual quality compliance audits	86%	100%*	92%	93%	94%	95%	95%	95%
		Percentage of laboratories achieving proficiency testing scheme performance standards of 80%	88%	99%*	90%	92%	94%	96%	98%	98%
		Number of national central laboratories that are SANAS accredited	51	51	52	53	53	53	53	53
		Number of provincial tertiary laboratories that are SANAS accredited	13	13	15	16	17	17	17	17
		Number of regional laboratories that are SANAS accredited	25	29	28	35	40	44	44	44
		Number of district laboratories that are SANAS accredited	25	35	28	40	45	50	55	60
		Number of ISO 9001-certified departments	3 departments	3 departments	4 departments	5 departments	6 departments	7 departments	8 departments	8 departments

			Audited/actual/planned performance			Estimated performance	Medium-term targets			
Outcome	**Output**	**Output indicators**	**2019/20 Audited**	**2020/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**
		Develop and implement the pathologists' national coverage plan	New	Pathologists' national coverage plan approved	20% implementation of the pathologists' national coverage plan	30% implementation of the pathologists' national coverage plan	40% implementation of the pathologists' national coverage plan	50% implementation of the pathologists' national coverage plan	50% implementation of the pathologists' national coverage plan	50% implementation of the pathologists' national coverage plan
	Cutting-edge health research	Number of articles published in peer-reviewed journals	600*	673*	640*	660*	680*	700*	720*	740*
Clinical effectiveness and efficiency	**Appropriately trained human resources in adequate numbers**	Number of pathology registrars admitted and trained in the NHLS	30	46	30	40	40	40	40	40
		Number of intern medical scientists admitted and trained in the NHLS	50	55	50	50	50	50	50	50

*The laboratory assessments were performed virtually due to COVID-19. This method of assessment is not as intense as on-site assessments. This led to high achievement in 2020/21. The targets for 2022/23 have been adjusted to be more realistic because we will resume the onsite assessments.

** The increased number of research publications was due to the increased COVID-19 related research output. The targets have been adjusted to be realistic going forward (the total number of publications is a combination of NHLS and NICD).

Programme performance indicators and quarterly targets for 2022/2023

Output indicators		Reporting period	Annual target 2022/23	Quarterly targets			
				First	Second	Third	Fourth
7.2.2.1	Percentage compliance achieved by laboratories during annual quality compliance audits	**Annually**	93%	N/A	N/A	N/A	93%
7.2.2.2	Percentage of laboratories achieving proficiency testing scheme performance standards of 80%	**Annually**	92%	N/A	N/A	N/A	92%
7.2.2.3	Number of national central laboratories that are SANAS accredited	**Annually**	53	N/A	N/A	N/A	53
7.2.2.4	Number of provincial tertiary laboratories that are SANAS accredited	**Annually**	16	N/A	N/A	N/A	16
7.2.2.5	Number of regional laboratories that are SANAS accredited	**Annually**	35	N/A	N/A	N/A	35
7.2.2.6	Number of district laboratories that are SANAS accredited	**Annually**	40	N/A	N/A	N/A	40
7.2.2.7	Number of ISO 9001-certified departments	**Annually**	5 departments	N/A	N/A	N/A	5 departments
7.2.2.8	Develop and implement the pathologists' national coverage plan	**Annually**	30% implementation of the pathologists' national coverage plan	N/A	N/A	N/A	30% implementation of the pathologists' national coverage plan
7.2.2.9	Number of articles published in peer-reviewed journals	**Annually**	660	N/A	N/A	N/A	660
7.2.2.10	Number of pathology registrars admitted and trained in the NHLS	**Annually**	40	N/A	N/A	N/A	40
7.2.2.11	Number of intern medical scientists admitted and trained in the NHLS	**Annually**	50	N/A	N/A	N/A	50

Reconciling performance with budget and MTEF

Academic Affairs, Research and Quality Assurance	**Audited**	**Audited**	**Audited**	**Budget**	**Medium-term estimate**		
R000'	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Expenses	**196 769**	**108 777**	**227 494**	**343 190**	**355 022**	**377 871**	**400 289**
Compensation of employees	71 131	40 174	132 119	111 170	118 208	124 650	131 493
Goods and services	125 638	68 603	95 375	232 020	236 814	253 221	2680796

Programme 3: Surveillance of Communicable Diseases

Programme purpose

The National Institute for Communicable Diseases is a national public health institute for South Africa providing reference microbiology, virology, epidemiology, surveillance, and public health research to support the government's response to communicable disease threats.

Explanation of Performance over the Medium-Term Period.

The NICD has the following strategic objectives:

- To be the national public health institute for surveillance of communicable diseases in South Africa.
- To detect outbreaks or epidemics at an early stage to be able to respond to them timeously and effectively, or to anticipate imminent outbreaks or epidemics by investigation, research, and the analysis of data and to communicate information accordingly.
- To engage in directed and relevant research to answer questions related to national and regional public health communicable diseases problems, as well as their surveillance and management.
- To provide a reference function for communicable diseases laboratories in the public and private sectors nationally, regionally, and internationally.
- To build capacity for communicable diseases nationally and regionally.

Programme 3: Surveillance of Communicable Diseases

			Audited/actual/planned performance			Estimated performance	Medium-term targets			
Outcome	**Output**	**Output indicator**	**2019/20 Audited**	**2020/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**
High-quality services	A robust and efficient communicable disease surveillance system and outbreak response	Percentage of identified prioritised diseases under surveillance	90%	90%	90%	90%	90%	90%	90%	90%
		Percentage of outbreaks of Category 1 notifiable medical conditions responded to within 24 hours after notification	100%	100%	100%	100%	100%	100%	100%	100%
		Percentage of NICD laboratories that are SANAS accredited	100%	100%	100%	100%	100%	100%	100%	100%
		National HIV surveillance reporting	N/A	N/A	N/A	90%	90%	90%	90%	90%
		National TB surveillance reporting	N/A	N/A	N/A	85%	85%	85%	85%	85%
		Number of articles published in peer-reviewed journals	181	200*	150	160	170	180	200	220
	Appropriately trained human resources in adequate numbers	Number of field epidemiologists qualified	6	7	7	8	8	9	10	12

*The increased number of research publications was due to the increased COVID-19 related research output. The targets have been adjusted to be realistic going forward.

Programme performance indicators and quarterly targets for 2022/2023

Output Indicator		Reporting Period	Annual target 2022/23	Quarterly targets			
				First	Second	Third	Fourth
8.2.2.1	Percentage of identified prioritised diseases under surveillance	**Quarterly**	90%	90%	90%	90%	90%
8.2.2.2	Percentage of outbreaks of Category 1 notifiable medical conditions responded to within 24 hours after notification	**Quarterly**	100%	100%	100%	100%	100%
8.2.2.3	Percentage of NICD laboratories that are SANAS accredited	**Annually**	100%	N/A	N/A	N/A	100%
8.2.2.4	National HIV surveillance reporting	**Quarterly**	90%	90%	90%	90%	90%
8.2.2.5	National TB surveillance reporting	**Quarterly**	85%	85%	85%	85%	85%
8.2.2.6	Number of articles published in peer-reviewed journals	**Annually**	170	N/A	N/A	N/A	170
8.2.2.7	Number of field epidemiologists qualified	**Annually**	8	N/A	N/A	N/A	8

Reconciling performance with budget and MTEF

Surveillance of Communicable Diseases	**Audited**	**Audited**	**Audited**	**Budget**	**Medium-term estimate**		
R000's	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Expenses	**403 836**	**420 410**	**418 225**	**443 244**	**459 886**	**483 761**	**508 700**
Compensation of employees	247 337	270 804	263 594	284 344	322 993	340 596	359 295
Goods and services	156 499	149 606	154 631	158 900	136 893	143 165	149 405

Programme 4: Occupational and Environmental Health and Safety

The environment, in this context, refers to the environment that is contaminated by workplace activities or that can be protected from contamination through workplace interventions. Safety in this context refers to the synergies between occupational health and occupational safety such as in risk assessments, ergonomic assessments, teaching and training, and the surveillance of occupational diseases and injuries.

Programme purpose

The National Institute for Occupational Health is a national public health institute that provides occupational and environmental health and safety support across all sectors of the economy to improve and promote workers' health and safety. National and provincial government departments and public entities are important clients, including the MBDO of the national DoH. The Institute achieves this by providing occupational medicine, hygiene, advisory, statutory pathology, and laboratory services, conducting research, and providing teaching and training in occupational and environmental health and safety.

Explanation of Performance over the Medium-Term Period.

The NIOH established the following goals that aim to contribute to the high quality of service outcomes and provide robust and efficient occupational environmental health services in a resource-constrained environment:

- Promote safety and health in workplaces through interventions, recommendations, and capacity building
- Provide specialised safety, health, and environmental services to the NHLS
- Maintain quality management systems
- Strengthen stakeholder collaborations, especially with government entities
- Increase capacity for occupational health surveillance
- Establish revenue-generating streams for the sustainability of key occupational health programmes

Programme 4: National Institute for Occupational Health

			Audited/actual/planned performance			Estimated performance	Medium-term targets			
Outcome	**Output**	**Output indicator**	**2019/20 Audited**	**2020/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**
High-quality services	Robust and efficient occupational and environmental health services	Percentage of occupational and environmental health laboratory tests conducted within the predefined turnaround time	93%	97%*	90%	90%	90%	90%	90%	90%
		Number of occupational, environmental health and safety assessments completed	30	15	15	15	15	15	15	15
		Number of occupational health surveillance reports produced	4	4	4	4	4	4	4	4
		Percentage of NIOH laboratories that are SANAS accredited	New	100%	100%	100%	100%	100%	100%	100%

The 2020/21 audited performance are higher than 2022/23 targets because the test volumes were lower in 2020/21 due to COVID-19. It is expected that test volumes will normalise in the next financial year; hence, the targets have been set to a more realistic.

Programme performance indicators and quarterly targets for 2022/2023

Outputs		Reporting period	Annual target 2021/2022	Quarterly targets			
				First	Second	Third	Fourth
9.2.2.1	Percentage of occupational, and environmental health laboratory tests conducted within the predefined turnaround time	**Quarterly**	90%	90%	90%	90%	90%
9.2.2.2	Number of occupational, environmental health and safety assessments completed	**Annually**	15	N/A	N/A	N/A	15
9.2.2.3	Number of occupational health surveillance reports produced	**Annually**	4	N/A	N/A	N/A	4
9.2.2.4	Percentage of NIOH laboratories that are SANAS accredited	**Annually**	100%	N/A	N/A	N/A	100%

Reconciling performance with budget and MTEF

Occupational and Environmental Health and Safety	**Audited**	**Audited**	**Audited**	**Budget**	**Medium-term estimate**		
R000'	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Expenses	**125 954**	**137 787**	**139 732**	**157 717**	**166 009**	**174 738**	**183 999**
Compensation of employees	98 188	108 067	110 650	113 470	134 216	141 530	149 300
Goods and services	27 766	29 720	29 082	44 262	31 793	33 208	34 699

Programme 5: Forensic Chemistry Laboratory Service

Programme purpose

This programme is responsible for pre-and post-mortem analyses of blood alcohol levels for drunk driving, as well as toxicology analyses of biological fluids and human organs in the event of unnatural deaths like murder and suicide, in accordance with the Criminal Procedure Act, and in accordance with the Foodstuffs Act for food and cosmetic analyses.

Explanation of Performance over the Medium-Term Period.

The NHLS will be required to integrate the Forensic Chemistry Laboratories (FCL) as a division with the NHLS. The scheduled date for the integration was 01 October 2021 with full integration by the 01 April 2022.

The core business of the FCL's include:

- the testing of biological tissues and fluids for the presence of poisons and/or drugs in instances of unnatural deaths (toxicology analysis)
- the testing of ante-mortem and post-mortem blood for the presence of alcohol in alleged drunken driving matters (alcohol analysis)
- food testing in terms of the Foodstuffs Act.

The initial analysis performed on FCL shows that there will be a need for a large capital injection as well as additional funding will be required to improve the operational performance. The capital injection is mainly required as the infrastructure is deteriorated, and the additional operational funding is required as FCL is currently underfunded. This surplus will be utilised, in part, for these improvements in operational performance and reduce the backlog of tests that accumulated over the years.

Outcomes, outputs, output indicators and strategic objectives

Programme 5: Forensic Chemistry Laboratory Service

Outcome	Output	Output indicator	Audited/actual/planned performance			Estimated performance	Medium-term targets			
			2019/20 Audited	2020/21 Audited	2021/22 Planned	2022/23	2023/24	2024/25	2025/26	2026/27
Clinical effectiveness and efficiency	Blood alcohol tests completed within a normative period of 90 days	Percentage of blood alcohol tests completed within a normative period of 90 days	New	New	New	60%	75%	80%	85%	90%
	Eliminate the historic backlog	Percentage reduction of backlogged toxicology cases	New	New	New	20%	40%	60%	80%	100%
	Maintain legislated food testing turnaround times	Percentage of perishable food samples tested within 30 days of sampling	New	New	New	50%	75%	80%	85%	90%
		Percentage of non-perishable food samples tested within 60 days of sampling.	New	New	New	50%	75%	80%	85%	90%

Programme performance indicators and quarterly targets for 2022/23

Output indicator		Reporting period	Annual target 2022/23	Quarterly targets			
				First	Second	Third	Fourth
10.2.1	Percentage of blood alcohol tests completed within a normative period of 90 days	**Quarterly**	60%	12.5%	25%	37,5%	60%
10.2.2	Percentage reduction of backlogged cases	**Quarterly**	20%	5%	10%	15%	20%
10.2.3	Percentage of perishable food samples tested within 30 days of sampling	**Quarterly**	50%	12.5%	25%	37.5%	50%
10.2.4	Percentage of non-perishable food samples tested within 60 days of sampling	**Quarterly**	50%	12.5%	25%	37.5%	50%

Programme 6: Administration

Programme purpose

The Administration programme plays a crucial role in the delivery of the NHLS' services through the provision of a range of support services, such as organisational development, HR and labour relations, information technology, property management, security services, legal services, communication, and integrated planning. The NHLS depends highly on the effective management of financial resources and the procurement process as administered by the financial department. Generating sufficient revenue remains a critical focus area for the NHLS to ensure financial viability and sustainability. There are three sub-programmes.

Financial Management

The purpose of this sub-programme is to improve the cash flow position of the NHLS.

Information and Communication Technology

The purpose of this sub-programme is to build a robust and agile ICT infrastructure and innovative digital solutions to facilitate and enable state-of-the-art laboratory services at the NHLS by 2025.

Human Resources Management

The purpose of this sub-programme is to provide effective services through efficient processes, systems, and adequate human resources.

Explanation of Performance over the Medium-Term Period.

The NHLS' intention for the MTEF, among others, is to leverage innovation and new technology to improve efficiency. To achieve this, the NHLS must invest in information technology, digital technology, communication links and logistical services.

It continues to implement better procurement policies and procedures to eliminate irregular expenditure. This includes system enhancements and continuous procurement training interventions.

In line with our revenue enhancement strategy, the NHLS aims to restructure and re-engineer DMP’s manufacturing plant and establish the research and development (R&D) section. The establishment of this section will facilitate the collaboration with medical diagnostic companies to manufacture rapid diagnostic kits for the growing POCT market and bring more business for the NHLS.

Furthermore, the NHLS aims to invest in the establishment of a Business Intelligence Unit (BIU) to further reinforce the Board's control. The BIU will produce studies on evidence-based operational strategy, cost-cutting, market, and intellectual property appraisal. It will also be used to track whether the NHLS is on track to accomplish its strategic goals by tracking specified indicators.

Programme 6: Sub-Programme: Financial Management

Output indicator			Audited/actual/planned performance			Estimated performance	Medium-term targets			
Outcome	**Output**	**Output indicator**	**2019/20 Audited**	**2020/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**
Cost-effective services	Improve the liquidity position of the NHLS	Ratio of current assets to current liabilities	2:1	3,1:1	2:1	2:1	2:1	2:1	2:1	2:1
		Cash flow coverage ratio (operating cash in-flows / total debt)	1.5:1	2,9:1	2:1	2:1	2:1	2:1	2:1	2:1
		Number of creditor days	30 days	35 days	30 days	30 days	30 days	30 days	30 days	30 days
		Number of debtors days	250 days	109 days	115 days	100 days	90 days	90 days	90 days	90 days
		Percentage turnaround time for awarding tenders that are below R10million within 180 days	80%*	69%*	90%*	75%	80%	85%	90%	90%
		Percentage turnaround time for awarding tenders that are above R10million within 180 days	New	New	New	70%	75%	80%	80%	80%
Good governance	Audit opinion of the Auditor-General	Audit opinion of the Auditor-General	Unqualified	Unqualified	Unqualified	Unqualified	Clean	Clean	Clean	Clean
	Corruption-free organisation	Percentage of allegations reported through the NHLS' tipoff platform that are investigated and completed within 180 days	New	92%	90%	90%	90%	90%	90%	90%

***Figures represent the turnaround time of all the tenders awarded within 90 days.

Sub-programme performance indicators and quarterly targets for 2022/23

Output indicator		Reporting period	Annual target 2022/23	Quarterly targets			
				First	Second	Third	Fourth
11.2.2.1	Ratio of current assets to current liabilities	**Quarterly**	2:1	2:1	2:1	2:1	2:1
11.2.2.2	Cash flow coverage ratio (operating cash in-flows / total debt)	**Quarterly**	2:1	2:1	2:1	2:1	2:1
11.2.2.3	Number of creditor days	**Quarterly**	30 days	30 days	30 days	30 days	30 days
11.2.2.4	Number of debtors days	**Quarterly**	100 days	100 days	100 days	100 days	100 days
11.2.2.5	Percentage turnaround time for awarding tenders that are below R10million within 180 days	**Quarterly**	75%	75%	75%	75%	75%
11.2.2.6	Percentage turnaround time for awarding tenders that are above R10million within 180 days	**Quarterly**	70%	70%	70%	70%	70%
11.2.2.7	Audit opinion of the Auditor-General	**Annually**	Unqualified	N/A	N/A	N/A	Unqualified
11.2.2.8	Percentage of allegations reported through the NHLS' tipoff platform that are investigated and completed within 180 days	**Annually**	90%	N/A	N/A	N/A	90%

Outcome, output, output indicators and targets

Programme 6: Sub-programme: Information and Communication Technology

			Audited/actual/planned performance			Estimated performance	Medium-term targets			
Outcome	**Output**	**Output Indicator**	**2019/20 Audited**	**20120/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**
Clinical effectiveness and efficiency	Modernised information technology systems	High-capacity bandwidth rollout (new MPLS)	New	New	New	Implement to 80% of the NHLS sites	Implement to 85% of the NHLS sites	Implement to 90% of the NHLS sites	Implement to 95% of the NHLS sites	Implement to 95% of the NHLS sites
		Distribution of CDW summary reports to provinces	New	New	New	80% of the public hospitals serviced by the NHLS receive monthly reports	85% of the public hospitals serviced by the NHLS receive monthly reports	90% of the public hospitals serviced by the NHLS receive monthly reports	95% of the public hospitals serviced by the NHLS receive monthly reports	95% of the public hospitals serviced by the NHLS receive monthly reports
		Implementation of stock management system and analytics	New	New	New	Implement to 80% of the NHLS' laboratories	Implement to 85% of the NHLS' laboratories	Implement to 90% of the NHLS' laboratories	Implement to 95% of the NHLS' laboratories	Implement to 95% of the NHLS' laboratories
		Percentage system uptime for critical systems	99%	100%	99%	99%	99%	99%	99%	99%

Sub-programme performance indicators and quarterly targets for 2022/23

Output indicator		Reporting period	Annual target 2022/23	Quarterly targets			
				First	Second	Third	Fourth
11.3.2.1	High-capacity bandwidth rollout (new MPLS)	**Quarterly**	Implement to 80% of the NHLS sites	20%	40%	60%	80%
11.3.2.2	Distribution of CDW summary reports to provinces	**Quarterly**	80% of the public hospitals serviced by the NHLS receive monthly reports	80% of the public hospitals serviced by the NHLS receive monthly reports	80% of the public hospitals serviced by the NHLS receive monthly reports	80% of the public hospitals serviced by the NHLS receive monthly reports	80% of the public hospitals serviced by the NHLS receive monthly reports
11.3.2.3	Implementation of stock management system and analytics	**Quarterly**	Implement to 80% of the NHLS' laboratories	20%	40%	60%	80%
11.3.2.4	Percentage system uptime for critical systems at laboratory level	**Quarterly**	99%	99%	99%	99%	99%

Outcomes, outputs, output indicators and targets

Programme 6: Sub-programme: Human Resources

			Audited/actual/planned performance			Estimated performance	Medium-term targets			
Outcome	**Output**	**Output indicators**	**2019/20 Audited**	**2020/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**
Clinical effectiveness and efficiency	Appropriately trained human resources in adequate numbers	Staff turnover ratio	5%	3%	5%	5%	5%	5%	5%	5%
		B-BBEE compliance	New	Not achieved	Level 5	Level 5	Level 4	Level 4	Level 4	Level 4
		Number of intern medical technologists and student medical technicians admitted and trained in the NHLS	200	251	250	250	250	250	250	250
		Percentage of employees trained as per the approved training plan (WSP)	New	New	New	70%	75%	80%	85%	90%
	Performance-driven workforce	Percentage of employees with approved and evaluated performance agreements	95%	89%	98%	98%	98%	98%	98%	98%

Sub-programme performance indicators and quarterly targets for 2022/23

Output indicator		Reporting period	Annual target 2022/23	Quarterly targets			
				First	Second	Third	Fourth
10.4.2.1	Staff turnover ratio	**Quarterly**	5%	5%	5%	5%	5%
10.4.2.2	B-BBEE compliance	**Annually**	Level 4	N/A	N/A	N/A	Level 4
10.4.2.3	Number of intern medical technologists and student medical technicians admitted and trained in the NHLS	**Annually**	250	N/A	N/A	N/A	250
10.4.2.4	Percentage of employees trained as per the approved training plan (WSP)	**Quarterly**	70%	20%	40%	60%	70%
10.4.2.5	Percentage of employees with approved and evaluated performance agreements	**Semester**	98%	N/A	98%	N/A	98%

Reconciling performance and budget and MTEF

Administration	**Audited**	**Audited**	**Audited**	**Budget**	**Medium-term estimate**		
R000	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Expenses	**717 798**	**795 262**	**887 423**	**1 006 670**	**1 805 381**	**1 897 787**	**1 995 519**
Compensation of employees	270 498	292 904	379 431	407 998	761 644	803 154	847 247
Goods and services	447 300	502 358	507 992	596 672	1 043 737	1 094 633	1 148 272

Key risks

The risks detailed below are not specific to a specific outcome. Any one of them can have an impact on the NHLS' Strategic Plan.

Table 7: NHLS' key risks

No	Risk name	Risk exposure	Risk Owner	Current business processes and mitigating action plans	Action status
1	Failure to procure timely and irregular expenditure (Procurement)	High	CFO	• Updating the contract management system. • Upskill staff. • Participate in existing contracts (transversal contracts). • Relook appropriateness of structure. • Greater application of consequence management. • Review the process to identify and minimise bottlenecks • Ongoing information sessions with end-users with regards to the different requirements of procurement.	In progress 80% complete
2	Aging infrastructure and equipment	Moderate	CFO	• Development of Infrastructure Committee Charter. • Appointment of Infrastructure committee members. • Investigate the possibility of utilising available internal resources to improve working conditions. • Development and implementation of infrastructure development and maintenance strategy. • Development of Equipment Modernisation Plan • Formal agreements with hospitals. SLAs with all provinces indicating that they are responsible to maintain infrastructure	In progress 60% complete
3	Failure to meet short-term commitments(Cash Flow)	Low	CFO	• Cash reserves build up. • Arrangements with certain key suppliers. • Careful management of cash. • Constant communication with debtors. • Following a conservative Investment Strategy during investment of funds.	Final tested, monitored and maintained
4	Insufficient budget for NHLS services allocated by DoH (Funding model	Moderate	CFO	• Continuous engagement with Department of Health and other stakeholders.	In progress 80% complete

No	Risk name	Risk exposure	Risk Owner	Current business processes and mitigating action plans	Action status
	and economic sustainability)			• Investing in innovations to establish and/or enhance revenue streams including services that are being provided by NIOH, DMP and SAVP. • Following a conservative Investment Strategy during investment of funds. • Compiling the financial projections and sustainability report.	
5	Failure to meet demand of tests	Moderate	CEO Area `Managers	• Procurement and distribution/allocation plan of PPEs for NHLS all staff. • Procurement and distribution/allocation plan of COVID-19 collection materials, consumables, extraction kits, testing kits and testing platforms. • Stock management plan and projections (short – weekly, medium - monthly and long term – 3 to 6 months) • Purchasing and implementation of Mobile Vans/Laboratories (Including fittings/accessories e.g., generator/fridge/computer/Xpert). • Recruitment of additional personnel including head-hunting (drivers/nurses-phlebotomy & occupational/techs/scientists/doctors). • Continuous engagement with Departments of Health, Academia, and another stakeholder. • Planning and Review of routes for sample transportation from collection to testing labs. • Sample and workflow management throughout total testing process (including sample tracking, turnaround time and temperature monitoring). • Validation records, maintenance plans and performance monitoring of extraction/testing kits and testing platforms. • Coding/Pricing/Billing of COVID 19 test by method for Public and Private patients. • Review and updating of laboratory send away and referral processes (Update on laboratory contingency plan). • Review and implementation of essential test list and/or turnaround times.	In progress 90% complete

No	Risk name	Risk exposure	Risk Owner	Current business processes and mitigating action plans	Action status
				• Compiling and implementation of laboratory shutdown and re-opening checklist procedures. • Monitoring of impact of COVID 19 on TB and HIV Viral load testing on shared testing platforms. • Implementation of laboratory quality assurance (Internal and External) in compliance with SANAS standards/guidelines. • Reporting and distribution channels for results to healthcare workers and Contact Tracing Teams. • COVID 19 data access to assist in reporting, troubleshooting, monitoring and process improvement. • Continuous engagements and evaluation of potential private, research and academic laboratory partners.	
6	Rising cost of employee compensation	High	Executive Manager: HR	• **For D1 and below:** Negotiation of wage in line with Treasury Medium Term Expenditure Framework (MTEF) guidelines with the Senior management at the Bargaining and Labour Relation Forum (BLRF) engagement platforms. • Conclusion of wage negotiations in line with the Board mandate. • **For D2 and above:** Alignment with Treasury guidelines and make recommendations to the Board for approval. • Implementation of Board approved wage increases within the relevant financial year.	In progress 70% complete

7	Skill shortages (Pathologists) in key disciplines to execute strategy and business objectives	High	Executive Manager: AARQA	• Implementation of the umbrella and bilateral agreement with the Universities
				• Design an enabling strategy to effectively balance NHLS mandates
				  ○ Develop and implement skills retention plan
				  ○ Develop a clear career progression path
				• Review of current performance agreements to align to NHLS mandates and effective implementation thereof - Ongoing
				• Motivate to ensure adequate grants to fund sufficient training needs of the NHLS. Enabling completion of research project towards degree requirements.
				• Establishment of Head of Department development programme – roadmap to develop identified personnel to qualify as HOD's.
					In progress 70% complete

8	Laboratories Failure to obtain SANAS Accreditation	Moderate	Executive Manager: AARQA	• There is Annual Performance Plan Accreditation Strategy listing target date for laboratories to achieve SANAS accreditation. Below is the progress against target:	In progress 95% complete

No	Risk name	Risk exposure	Risk Owner	Current business processes and mitigating action plans	Action status
				○ District Laboratories – 36 Accreditations achieved from a target of 28. ○ Regional Laboratories –30 Accreditations achieved from a target of 28. ○ Provincial Tertiary Laboratories – 13 Accreditations achieved from a target of 15. ○ National Central Laboratories – 51 Accreditations achieved from a target of 52.	
9	Failure to provide IT services during IT network downtimes and failure to generate reports and information security	High	CIO	• Increase the current broadband capacity through appointment of the new service provider for MPLS. • Improve turnaround time for resolving reported IT failure/downtime. • Complete Development of NHLS IT strategy. • Complete Capacitation of IT security resources • Complete Information security awareness to be increased. • Revision of business continuity plan. • Complete Review and update of IT policies and procedures	In progress 85% complete
10	Inability to operate during disaster (Business continuity)	Moderate	CIO Facilities Manager HOD: Risk Management and Internal Audit	• Braamfontein disaster recovery site. • Generators have been installed in the critical sites • Installation of solar power panels and invertors. • Water tanks are first filled up prior to consumption of water. • Schedule regular data back-ups. • Laboratory Contingency Plan namely laboratories referral process and laboratories essential tests list. • Schedule regular disaster recovery testing. • Implementation of Disaster Management Plan. • Implementation of Disaster Recovery Policy. • Review and updating of Business Continuity Plan.	In progress 70% complete
11	Staff infected with COVID-19	Moderate	All	• Appointment of designated COVID-19 Compliance Officers. • Screening and testing of employees. • Procurement and distribution of PPE. • Implementation of COVID-19 staff training monitoring by Health and Safety Reps • Relevant COVID-19 information is loaded on the Intranet • Individual Risk Assessment for a particular area	In progress 90% complete

No	Risk name	Risk exposure	Risk Owner	Current business processes and mitigating action plans	Action status
				• On day of testing, staff are required to go directly home pending the outcome of their results (not go anywhere elsewhere within the campus) • Implementation of NHLS COVID-19: Working arrangement for staff to promote social distancing. • Continuous communication to NHLS staff and other stakeholders. • Identification and appointment of accredited service providers to disinfect facilities when required. • Review and updating of laboratory referral processes. • Review and implementation of laboratory essential tests list. • Compiling and implementation of laboratory shutdown checklist procedures. • Regular scheduling of EXCO/OPCO meetings. • Implementation of zoom meetings to promote social distancing • Compiling and implementing Return to Work Framework NHLS Guidelines. • Continuous engagement and evaluation of potential private and academic laboratory partners. • Weekly stats from all regions (Wednesday) are sent to the Occupational Doctor who sends to the CEO on the overall infections within NHLS • Risk assessments are performed on high-risk individuals (those with chronic illnesses)	

Part D: Technical Indicator Descriptions – APP 2022-2023

Programme 1: Laboratory Services

Indicator Title: 6.2.2.1	Percentage of TB GeneXpert tests performed within 40 hours
Definition	It is a measure of the time it takes from registration on the Laboratory Information System (LIS) of the tests until the results are reviewed.
Source/collection of data	The data comes from the information which is captured on the laboratory information system and is interfaced with the NHLS Central Data Warehouse (CDW) for consolidation. A report is then generated from the CDW.
Method of calculation	Total of the number of TB GeneXpert tests performed and reviewed within 40 hours divide by the total number of TB GeneXpert tests requested in the same period, expressed in percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly

New indicator	No
Desired performance	93%
Indicator owner	Area Managers
Indicator Title: 6.2.2.2	**Percentage of CD4 tests performed within 40 hours**
Definition	It is a measure of the time it takes from registration on the Laboratory Information System (LIS) of the tests until the results are reviewed.
Source/collection of data	The data comes from the information which is captured on the laboratory information system and is interfaced with the NHLS Central Data Warehouse (CDW) for consolidation. A report is then generated from the CDW.
Method of calculation	Total number of CD4 tests performed and reviewed within 40 hours divide by the total number of CD4 tests requested in the same period, expressed in percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly

Desired performance	94%
Indicator owner	Area Managers
Indicator Title: 6.2.2.3	**Percentage of HIV Viral Load tests performed within 96 hours**
Definition	It is a measure of the time it takes from registration on the Laboratory Information System (LIS) of the tests until the results are reviewed.
Source/collection of data	The data comes from the information which is captured on the laboratory information system and is interfaced with the NHLS Central Data Warehouse (CDW) for consolidation. A report is then generated from the CDW.
Method of calculation	Total number of HIV viral load tests performed and reviewed within 96 hours divide by the total number of HIV viral load tests requested in the same period, expressed in percentage.
Calculation type	Cumulative – Year to date
Desired performance	82%
Indicator owner	Area Managers

Indicator Title: 6.2.2.4	**Percentage of HIV PCR tests performed within 96 hours**
Definition	It is a measure of the time it takes from registration on the Laboratory Information System (LIS) of the tests until the results are reviewed.
Source/collection of data	The data comes from the information which is captured on the laboratory information system and is interfaced with the NHLS Central Data Warehouse (CDW) for consolidation. A report is then generated from the CDW.
Method of calculation	Total number of HIV PCR tests performed and reviewed within 96 hours divide by total number of HIV PCR tests requested in the same period, expressed as a percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly
Desired performance	81%
Indicator owner	Area Managers
Indicator Title: 6.2.2.5	**Percentage of Cervical Smear screening performed within 5weeks**

Definition	It is a measure of the time it takes from registration on the Laboratory Information System (LIS) of the tests until the results are reviewed.
Source/collection of data	The data comes from the information which is captured on the laboratory information system and is interfaced with the NHLS Central Data Warehouse (CDW) for consolidation. A report is then generated from the CDW.
Method of calculation	Total number of cervical smears tests performed and reviewed within 5 weeks divide by total number of cervical smear tests requested in the same period, expressed in percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly
Desired performance	91%
Indicator owner	Area Managers
Indicator Title: 6.2.2.6	**Percentage of laboratory tests (Full blood count) performed within eight (8) hours**
Definition	It is a measure of the time it takes from registration on the Laboratory Information System (LIS) of the tests until the results are reviewed.

Source/collection of data	The data comes from the information which is captured on the laboratory information system and is interfaced with the NHLS Central Data Warehouse (CDW) for consolidation. A report is then generated from the CDW.
Method of calculation	Total number of full blood count tests performed and reviewed within 8 hours divide by the total number of full blood count tests requested in the same period, expressed in percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly
Desired performance	94%
Indicator owner	Area Managers
Indicator Title 6.2.2.7	**Percentage laboratory tests (Urea & Electrolytes) tests performed within 8 hours**

Definition	It is a measure of the time it takes from registration on the Laboratory Information System (LIS) of the tests until the results are reviewed.
Source/collection of data	The data comes from the information which is captured on the laboratory information system and is interfaced with the NHLS Central Data Warehouse (CDW) for consolidation. A report is then generated from the CDW.
Method of calculation	Total number of Urea & Electrolytes tests performed and reviewed within 8 hours divide by the total number of Urea & Electrolytes tests requested in the same period, expressed in percentage.
Calculation type	Cumulative-Year to date
Reporting cycle	Quarterly
New indicator	No
Desired performance	94%
Indicator owner	Area Managers

Indicator Title 6.2.2.8	Percentage of SARS-CoV-2 PCR tests performed within 48 hours
Definition	It is a measure of the time it takes from registration on the Laboratory Information System (LIS) of the tests until the results are reviewed.
Source/collection of data	The data comes from the information which is captured on the laboratory information system and is interfaced with the NHLS Central Data Warehouse (CDW) for consolidation. A report is then generated from the CDW.
Method of calculation	Total number of SARS-CoV-2 PCR tests performed and reviewed within 8 hours divide by the total number of SARS-CoV-2 PCR tests requested in the same period, expressed in percentage.
Calculation type	Cumulative-Year to date
Reporting cycle	Quarterly
New indicator	Yes
Desired performance	85%
Indicator owner	Area Managers

Indicator Title: 6.2.2.9	**Develop and implement Point of Care Testing plan**
Definition	Point of Care Test (POCT) is a test that is performed at, or near the site of patient care, with the view to effect immediate clinical decision-making and optimise patient management. The plan will be aligned with the national priorities in health.
Method of calculation	Implementation of POCT to the identified sites as outlined in the plan
Calculation type	Non-Cumulative
Reporting cycle	Annually
Desired performance	Implement the pilot to assess feasibility and cost benefit
Indicator owner	Chief Executive Officer

Indicator Title: 6.2.2.10	**Implement digital pathology**
Definition	Digital pathology (DP) incorporates the acquisition, management, sharing and interpretation of pathology information (including slides and data) in a digital environment. It also refers to artificial intelligence (AI)-based approaches for the detection, segmentation, diagnosis, and analysis of digitized images. Globally DP has been adopted for clinical work but also for education and research.
Method of calculation	Number of information sharing sessions.
Calculation type	Non-Cumulative
Reporting cycle	Annually
Desired performance	Prepare for the implementation of the digital pathology
Indicator owner	Chief Executive Officer

Programme 2: Academic Affairs, Research and Quality Assurance

Indicator Title: 7.2.2.1	**Percentage compliance achieved by laboratories during annual quality compliance audits**

Definition	This indicator measures the percentage of laboratories achieving 80% compliance using the internal quality compliance audits. The target laboratories are laboratories that are not SANAS accredited at the time audit.
Source/collection of data	Spreadsheet with percentage scores obtained by laboratories audited. Manual collection of data by Quality Assurance
Method of calculation	Total number of laboratories achieving a minimum score of 80% with the quality compliance audits divide by the total number of laboratories audited. (Audited laboratories refers to the laboratories which are not SANAS accredited only).
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	93%
Indicator owner	National Quality Assurance Manager/Executive Manager: AARQA

Indicator Title: 7.2.2.2	**Percentage of laboratories achieving proficiency testing scheme performance standards of 80%**
Definition	The indicator measures the percentage of laboratories achieving a minimum average score of 80% in all NHLS proficiency testing schemes they are enrolled in the financial year. This does not include external Performance Testing Schemes (PTS) performance.
Method of calculation	Average of the total number of laboratories scoring 80% and above, divide by the average of the total number of laboratories participating in the PTS, express as a percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	92%
Indicator owner	National Manager: Quality Assurance/Area Managers

Indicator Title: 7.2.2.3	**Number of National Central laboratories that are SANAS Accredited**
Definition	This indicator measures the number of laboratories in the National Central laboratories that are accredited by SANAS (Laboratory in this case refers to a discipline/department within the national central laboratory).
Source/collection of data	SANAS Accreditation Certificates or SANAS assessment outcome letter. The SANAS accreditation certificate is active for a four-year cycle, however SANAS assess the accredited laboratories annually and issue a letter of recommendation to indicate that the laboratory remains accredited. So, the laboratory is considered accredited as long as the accreditation certificate is still valid and the annual assessment are done to maintain the accreditation status.
Method of calculation	Count
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	53
Indicator owner	National Manager: Quality Assurance/Area Managers

Indicator Title: 7.2.2.4	**Number of Provincial Tertiary laboratories that are SANAS Accredited**
Definition	This indicator measures the number of laboratories in the Provincial Tertiary laboratories that are accredited by SANAS (Laboratory in this case refers to a multidisciplinary facility in or attached to one Provincial Tertiary Hospital)
Source/collection of data	SANAS Accreditation Certificates or SANAS assessment outcome letter. The SANAS accreditation certificate is active for a four-year cycle, however SANAS assess the accredited laboratories annually and issue a letter of recommendation to indicate that the laboratory remains accredited. So, the laboratory is considered accredited as long as the accreditation certificate is still valid, and the annual assessment are done to maintain the accreditation status.
Method of calculation	Count
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	16
Indicator owner	National Manager: Quality Assurance/Area Managers

Indicator Title: 7.2.2.5	Number of Regional laboratories that are SANAS Accredited
Definition	This indicator measures the number of regional laboratories that are accredited by SANAS Assessors during an accreditation visit per Laboratory (Laboratory in this case refers to a multidisciplinary facility in or attached to one Regional Hospital).
Source/collection of data	SANAS Accreditation Certificates or SANAS assessment outcome letter. The SANAS accreditation certificate is active for a four-year cycle, however SANAS assess the accredited laboratories annually and issue a letter of recommendation to indicate that the laboratory remains accredited. So, the laboratory is considered accredited as long as the accreditation certificate is still valid, and the annual assessment are done to maintain the accreditation status.
Method of calculation	Count
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	35
Indicator owner	National Manager: Quality Assurance/Area Managers

Indicator Title: 7.2.2.6	Number of District laboratories that are SANAS Accredited
Definition	This indicator measures the number of laboratories in the district laboratories that have are accredited by SANAS Assessors during an accreditation visit per Laboratory.
Source /data collection	SANAS Accreditation Certificates or SANAS assessment outcome letter. The SANAS accreditation certificate is active for a four-year cycle, however SANAS assess the accredited laboratories annually and issue a letter of recommendation to indicate that the laboratory remains accredited. So, the laboratory is considered accredited as long as the accreditation certificate is still valid, and the annual assessment are done to maintain the accreditation status.
Method of calculation	Count
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	40
Indicator owner	National Manager: Quality Assurance/Area Managers
Indicator Title: 7.2.2.7	**Number of ISO 9001 certified departments**

Definition	This indicator measures the number of support departments in head office that have the ISO 9001 certification.
Source/collection of data	The ISO 9001 certificates or the assessment outcome letter
Method of calculation	Count
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	5 departments
Indicator owner	National Manager: Quality Assurance/Executive Managers of the respective departments
Indicator Title: 7.2.2.8	**Develop and implement the pathologists' national coverage plan**
Definition	A plan that will ensure equitable access to quality pathology services for all persons as well as access of pathologists to all healthcare practitioners nationally
Method of calculation	N/A
Calculation type	Non-Cumulative

Reporting cycle	Annually
Desired performance	30% implementation of the pathologists' national coverage plan
Indicator owner	Executive Manager: AARQA
Indicator Title: 7.2.2.9	**Number of articles published in the peer-reviewed journals**
Definition	The indicator measures the number of peer reviewed articles published by, and in collaboration with, NHLS researchers.
Source/collection of data	NHLS Research database. The database captures all the research peer reviewed articles which were published by the NHLS staff, this includes the NICD and NIOH publications.
Method of calculation	Count

Calculation type	Cumulative-Year to date
Reporting cycle	Annually
Desired performance	660
Indicator owner	National Manager: Academic Affairs and Research
Indicator Title: 7.2.2.10	**Number of pathology registrars admitted and trained in the NHLS**
Definition	Number of registrars appointed in the NHLS to be trained.
Source/data collection	Human Resource Information System which will confirm the appointment of pathology registrars.
Method of calculation	Count
Calculation type	Cumulative-Year to date
Reporting cycle	Annually
Desired performance	40

Indicator owner	National Manager: Academic Affairs and Research
Indicator Title: 7.2.2.11	**Number of intern medical scientists admitted and trained in the NHLS**
Definition	Number of intern medical scientists appointed in the NHLS to be trained.
Source/collection of data	Human Resource Information System which will confirm the appointment of the intern medical scientists.
Method of calculation	Count
Calculation type	Cumulative-Year to date
Reporting cycle	Annually
Desired performance	50
Indicator owner	National Manager: Academic Affairs and Research

Programme 3: Surveillance of Communicable Diseases

Indicator Title: 8.2.2.1	**Percentage of identified prioritised diseases under surveillance**
Definition	This is described by the percentage of cases which were followed up at the enhanced surveillance sites for the organisms which are identified as priority as per the GERMS protocol.
Source/collection of data	The departmental enhanced site surveillance operational report (IT Database).
Method of calculation	Total number of cases followed up at the enhanced surveillance sites for the organisms identified as priority according to the GERMS protocol divide by the total number of cases that match the same case definition, expressed as a percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly
Desired performance	90%
Indicator owner	Executive Manager: NICD
Indicator Title: 8.2.2.2	**Percentage of outbreaks responded to within 24 hours after notification**

Definition	Measure of speed to which we can respond to outbreaks. All the outbreaks which are notified to NICD are documented and stored in the database.
Source/collection of data	All the organisms which are responsible for the outbreaks are documented and kept in the database. The date of notification of the outbreak is also documented and the time it took for NICD to respond is documented.
Method of calculation	Total number of notified outbreaks responded to in 24 hours divided by the total number of outbreaks notified, expressed in percentage.
Calculation type	Cumulative –Year to date
Reporting cycle	Quarterly
Desired performance	100%
Indicator owner	Executive Director: NICD
Indicator Title: 8.2.2.3	**Percentage of NICD laboratories that are SANAS accredited**
Definition	This indicator measures the percentage of laboratories that have been accredited by SANAS.
Source/collection of data	SANAS Accreditation Certificates or SANAS assessment outcome letter. The SANAS accreditation certificate is active for a four-year cycle, however SANAS assess the accredited laboratories annually and issue a letter of recommendation to indicate that the laboratory remains accredited. So, the laboratory is considered

	accredited as long as the accreditation certificate is still valid, and the annual assessment are done to maintain the accreditation status.
Method of calculation	Total number of medical laboratories accredited by SANAS divide by total number of all medical the laboratories in NICD (this excludes all the non - medical laboratories and the sequencing laboratory which does not have the ISO standard for accreditation), express in percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	100%
Indicator owner	Executive Director: NICD
Indicator Title: 8.2.2.4	**National HIV surveillance reporting**
Definition	HIV surveillance reports distributed to National and Provincial Departments of Health.
Method of calculation	Count

Calculation type	Non-Cumulative
Reporting cycle	Quarterly
Desired performance	90%
Indicator owner	Executive Director: NICD
Indicator Title: 8.2.2.5	**National TB surveillance reporting**
Source/collection of data	Weekly reports distributed to National and Provincial Departments of Health alerting all GeneXpert **Rifampicin Susceptible, GeneXpert Rifampicin Resistant, MDR and XDR TB** cases diagnosed in the NHLS in the preceding week (National and Provincial Reports are generated and stratified to district/sub-district level)
Method of calculation	Count
Calculation type	Non-Cumulative
Reporting cycle	Quarterly
Desired performance	85%

Indicator owner	Executive Director: NICD
Indicator Title: 8.2.2.6	**Number of articles published in the peer reviewed journals**
Definition	The indicator measures the number of peer reviewed articles published by, and in collaboration with, NICD researchers.
Source /data collection	NICD Data. The database captures all the research peer reviewed articles which were published by the NICD staff
Method of calculation	Count
Calculation type	Cumulative-Year to date
Reporting cycle	Annually
Desired performance	170
Indicator owner	Executive Director: NICD
Indicator Title: 8.2.2.7	**Number of field epidemiologists qualified**

Definition	Number of Field Epidemiologists qualified who were admitted at NICD for training. The candidates enrol with the relevant training facilities to complete their qualification in field epidemiology.
Source/collection of data	Copy of certified results from the training facility or a copy of the qualification from the training facility.
Method of calculation	Count
Calculation type	Cumulative – Year to date (Academic Year - January – December)
Reporting cycle	Annually
Desired performance	8
Indicator owner	Executive Director: NICD

Programme 4: Occupational and Environmental Health and Safety

Indicator Title: 9.2.2.1	**Percentage of occupational, and environmental health laboratory tests conducted within the predefined turn-around time**
Definition	It is a measure from the time specimens were received until they were completed, express as a percentage

Source/collection of data	NIOH Database and Excel spreadsheet of all the test performed and the time it took to complete the tests.
Method of calculation	Total number of occupational and environmental health laboratory tests completed within predefined turnaround time in testing laboratories only (Analytical Services, Immunology, Microbiology, Occupational Hygiene, Pathology) divide by a total number of occupational and environmental health laboratory tests received in testing laboratories only (Analytical Services, Immunology, Microbiology, Occupational Hygiene, Pathology), express as a percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly
Desired performance	90%
Indicator owner	NIOH Head of Analytical Services
Indicator Title:9.2.2.2	**Number of occupational, environmental health and safety assessments completed**
Definition	An occupational, environmental health and safety assessment is a report or letter with recommendations to address the issues reported which is not a project or substantial collaborative effort involving more than one man-week.

Source/collection of data	Records of reports or letters concerning risks in the workplace sent to clients
Method of calculation	Count
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	15
Indicator owner	Head of Occupational Hygiene
Indicator Title:9.2.2.3	**Number of occupational health surveillance reports produced**
Definition	Pathological (macroscopic and microscopic) examination of cardiorespiratory organs and submission of diagnostic report to Medical Bureau for Occupational Diseases (MBDO) per case received
Source/collection of data	Cardiorespiratory organs from current and ex-miners are sent to the NIOH from regions within South and Southern Africa.
Method of calculation	Count
Calculation type	Cumulative – Year to date

Reporting cycle	Annually
Desired performance	4
Indicator owner	NIOH Head of Pathology
Indicator Title:9.2.2.4	**Percentage of NIOH laboratories that are SANAS accredited**
Definition	This indicator measures the percentage of laboratories that have been accredited by SANAS.
Source/collection of data	SANAS Accreditation Certificates or SANAS assessment outcome letter. The SANAS accreditation certificate is active for a four-year cycle, however SANAS assess the accredited laboratories annually and issue a letter of recommendation to indicate that the laboratory remains accredited. So, the laboratory is considered accredited as long as the accreditation certificate is still valid, and the annual assessment are done to maintain the accreditation status.
Method of calculation	Total number of laboratories accredited by SANAS divide by total number of all medical the laboratories in NIOH, express in percentage.
Calculation type	Cumulative – Year to date

Reporting cycle	Annually
Desired performance	100%
Indicator owner	Executive Director: NIOH

Programme 5: Administration: Sub-Programme – Financial Management

Indicator Title: 11.2.2.1	**Ratio of current assets to current liabilities**
Definition	This is a measure of short-term liquidity.
Source/collection of data	The current assets figure and current liabilities figure are obtained from the Balance Sheet report generated by the Financial Accounting Department monthly.
Method of calculation	Current assets/current liabilities
Calculation type	Non-Cumulative
Reporting cycle	Quarterly
Desired performance	2:1

Indicator owner	Chief Financial Officer
Indicator Title: 11.2.2.2	**Cash flow coverage ratio (Operating cash in-flows / total debt)**
Definition	Current assets/current liabilities
Source/collection of data	NHLS Cash flow report and Creditors Age Analysis as at the end of the reporting period
Method of calculation	Cash and cash equivalent / Payables from exchange transactions
Calculation type	Non-cumulative
Reporting cycle	Quarterly
Desired performance	2:1
Indicator owner	Chief Financial officer
Indicator Title: 11.2.2.3	**Number of Creditor days**
Definition	The creditor days' ratio measures how quickly invoices are being paid to suppliers. The longer it takes for the NHLS to make payments for services rendered/goods received, the greater the number of creditors' days.
Source/collection of data	The creditors figure is obtained from the Excel Age Analysis report generated by the Accounts Payable Department monthly. The net creditors figure is used, and it excludes the SAVP (NHLS subsidiary).

	Purchases figures are determined through an account inquiry on Oracle and are obtained by selecting the parent expenditure accounts for production as well as support operations.
Method of calculation	(Total month-end trade creditors/ YTD Purchases annualised) x 365 days
Calculation type	Non-Cumulative
Reporting cycle	Quarterly
Desired performance	30 days
Indicator owner	Chief Financial Officer
Indicator Title: 11.2.2.4	**Number of Debtors days**
Definition	The debtor days' ratio measures how quickly cash is being collected from debtors. The longer it takes for the NHLS to collect payments for services rendered the greater the number of debtors' days.
Source/collection of data	The debtor's figure is obtained from the Excel Age Analysis report generated by the Accounts Receivable Department monthly. The net debtors' figure is used, and it excludes the SAVP (NHLS subsidiary).

	The net debtors figure relates to total debt which incorporates government debt as well as private sector debt. Revenue figures are determined through an account inquiry on Oracle and are obtained by selecting the parent revenue account (5000 range) as well as other income (Grants, Teaching income, miscellaneous sales)
Method of calculation	(Total month-end trade debtors/ YTD Test revenue & other income annualised) x 365 days
Calculation type	Non-Cumulative
Reporting cycle	Quarterly
Desired performance	100 days
Indicator owner	Chief Financial Officer

Indicator Title: 11.2.2.5	**Percentage turnaround time for awarding tenders that are below R10million within 180 days**
Definition	The tenders must be awarded within 90 days after the closing date of the advert.
Source/collection of data	The supply chain management unit to provide data on the spreadsheet.

Method of calculation	Total number of tenders that are below R10 million awarded within 180 days from closing date of the tender divide by the total number of tenders that are below R10 million advertised for the same period, express in percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly
Desired performance	75%
Indicator owner	Chief Financial Officer
Indicator Title: 11.2.2.6	**Percentage turnaround time for awarding tenders that are above R10million within 180 days**
Source/collection of data	The supply chain management unit to provide data on the spreadsheet.
Method of calculation	Total number of tenders that are above R10 million awarded within 180 days from closing date of the tender divide by the total number of tenders that are above R10 million advertised for the same period, express in percentage.

Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly
Desired performance	70%
Indicator owner	Chief Financial Officer
Indicator Title: 11.2.2.7	**Audit opinion of the Auditor general**
Definition	This means that AFS are prepared in accordance with GRAP, and our internal policies and the information is presented to the public in the required framework and timeframes
Source/collection of data	Audit opinion
Method of calculation	N/A
Calculation type	Non-Cumulative
Reporting cycle	Annually
Desired performance	Unqualified

Indicator owner	Chief Financial Officer
Indicator Title:11.2.2.8	**Percentage of allegations reported through the NHLS tipoff platform that are investigated and completed within 180 days**
Source/collection of data	A spreadsheet provided by the Internal risk management and audit department
Method of calculation	A total number of allegations reported through the NHLS tipoff platform that are investigated and completed within 180 days divide by the total number of allegations reported through the NHLS tipoff platform, express as a percentage.
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	90%
Indicator owner	Head of Internal risk management and audit.

Programme 5: Administration: Sub-Programme – Information and Communication Technology

Indicator Title:11.3.2.1	**High-capacity bandwidth rollout (new MPLS)**

Source/collection of data	MTN
Method of calculation	Number of NHLS sites with new MPLS divide by the total number of NHLS sites, express as a percentage
Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly
Desired performance	Implement to 80% of the NHLS sites
Indicator owner	Chief Information Officer
Indicator Title:11.3.2.2	**Distribution of CDW summary reports to provinces**
Source/collection of data	CDW Daily Activity Reports
Method of calculation	Total number of public hospitals serviced by the NHLS receiving the CDW summary reports divide by the total number of public hospitals serviced by the NHLS, express as a percentage
Calculation type	Non-Cumulative

Reporting cycle	Quarterly
Desired performance	80% of the hospitals receive monthly reports
Indicator owner	Chief Information Officer
Indicator Title:11.3.2.3	**Implementation of stock management system and analytics**
Source/collection of data	Oracle Stock Management and CDW Analytics Tool Usage Report
Method of calculation	Total number of NHLS laboratories as at the end of the financial year where the stock management and analytics have been installed divide by the total number of NHLS laboratories as at the end of the financial year, express as a percentage
Calculation type	Cumulative – Year to date
Reporting cycle	Quarterly
Desired performance	Implement to 80% of the NHLS' laboratories
Indicator owner	Chief Information Officer

Indicator Title:11.3.2.4	**Percentage System Uptime for Critical Systems at laboratory level**
Definition	TrakCare, Oracle EBS and CDW system availability
Source/collection of data	SLA and incident report/reports
Method of calculation	Total SLA uptime minus downtime (impacting SLA uptime) as recorded on the incident report(s) for a month for each system (Oracle EBS, TrakCare and CDW). (The numerator is a total number of days in a quarter when the systems were down and denominator is the total number of days in that quarter, express that as a percentage). You then take average of the total for each system (percentage uptime).
Calculation type	Non-Cumulative
Reporting cycle	Quarterly
Desired performance	99%
Indicator owner	Chief Information Officer

Programme 5: Sub-Programme – Human Resource

Indicator Title: 11.4.2.1	**Staff Turnover ratio**
Source/collection of data	Human Resource Information System (Oracle)
Method of calculation	Divide the number of voluntary terminations by the total number of staff at the end of the reporting period, expressed as a percentage

Calculation type	Non-Cumulative
Reporting cycle	Quarterly
Desired performance	5%
Indicator owner	Executive Manager: Human Resources
Indicator Title: 11.4.2.2	**BBBEE compliance**
Source/collection of data	A BBBEE certificate from the department of labour
Method of calculation	N/A
Calculation type	Non-cumulative
Reporting cycle	Annually
Desired performance	Level 5
Indicator owner	Executive Manager: Human Resources

Indicator Title: 11.4.2.3	Number of intern medical technologists and student medical technicians admitted and trained in the NHLS
Source/collection of data	Human Resource Information System which will confirm the appointment of pathology registrars.
Method of calculation	Count
Calculation type	Cumulative – Year to date
Reporting cycle	Annually
Desired performance	250
Indicator owner	Executive Manager: Human Resources
Indicator Title 11.4.2.4	**Percentage of employees trained as per the approved training plan (WSP)**
Source/collection of data	Spreadsheet from Human Resource
Method of calculation	Total number of employees trained in the financial year as per the WSP divide by the total number of employees registered on the WSP in the same financial year
Calculation type	Cumulative – Year to date

Reporting cycle	Quarterly
Desired performance	70%
Indicator owner	Executive Manager: Human Resources
Indicator Title: 11.4.2.5	**Percentage of employees with approved and evaluated performance agreements**
Definition	Alignment of individual, team, and organizational performance to ensure delivery of strategy and appreciation of contribution
Source/collection of data	Performance Management System – HRIS
Method of calculation	The number of employees with approved and evaluated performance agreements divide by total number of employees, expressed as a percentage
Calculation type	Non-Cumulative
Reporting cycle	Twice a year
Desired performance	98%
Indicator owner	Executive Manager: Human Resource

ANNEXURE A:

CHANGES MADE TO THE STRATEGIC PLAN AND ANNUAL PERFORMANCE PLAN 2022/2023 FINANCIAL YEAR.

According to the Revised Framework for Strategic Plans and Annual Performance Plans:

- 3.3.4. Strategic Plan (SP) should not be revised during the five-year period but may be revised during this period if there are significant changes to policy, in service delivery environment or in the planning methodology. The current SP covers the period 2020 – 2025.

The following process must be followed when revising the SP:

(a) Institutions must reflect the revisions to the SP through the re-tabling of the whole SP or the tabling of the Annexure to the APP.

- If the changes in policy, service delivery environment and planning methodology result in the revision of the vision, mission, values, and impact statement, outcomes, outcome indicators or targets, institutions must comprehensively revise the Strategic Plan which must be re-tabled in relevant legislature.

- If the changes are minimal, such as changes to the outputs, output indicators and the targets, institutions must reflect such revisions to the SP as an Annexure to the APP, which must be table in the relevant legislature.

The NHLS will make minimal changes to the few outcome and output indicators as well as targets and include the FCL as a new programme. For this reason, there is no need to re-table the SP. The changes will be reflected as an Annexure to the Annual Performance Plan (APP) and will be table together with the 2022/2023 APP.

The tables below indicate the changes made to the Strategic Plan and Annual Performance Plan.

Changes made to the Strategic Plan		
Output	Output Indicator	Reason for changes

Modernised laboratory services	Service delivery model developed	The service delivery model was developed in 2020/2021 and the implementation will be monitored at the operational level. It will therefore be removed from the APP for operationalisation.
	Specimen tracking system developed	The KPI has been removed from the 2022/2023 APP because the specimen tracking system has been developed and implemented for the national priority tests.
Reduced cost of pathology services to the clients	Develop and implement a revenue and costing strategy	The strategy was developed in 2020/2021 and the implementation will be monitored at the operational level.

Programme 1: laboratory Services

CHANGES MADE TO THE ANNUAL PERFORMANCE PLAN							
Output Indicator	**Audited Performance**	**Planned Performance**	**Estimated targets**	**Medium-term targets**			**Reasons for change**
	2020/21	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	
Percentage of TB Microscopy tests performed within 40 hours	95%	92%	-	-	-	-	The KPI has been discontinued from the APP with effect from 2022/2023 financial year because it is no longer considered as a diagnostic test.
Percentage of TB GeneXpert tests performed within 40 hours	95%	92%	93%	94%	95%	95%	No Change
Percentage of CD4 tests performed within 40 hours	95%	93%	94%	95%	95%	95%	No change
Percentage of HIV Viral Load tests performed within 96 hours	80%	80%	82%	84%	86%	90%	The target has been adjusted based on the audited performance in 2020/21.
Percentage of HIV PCR tests performed within 96 hours	83%	80%	81%	82%	83%	85%	The target has been reduced because it is unrealistic to achieve.
Percentage of cervical smear screening performed within 5weeks	95%	90%	91%	92%	93%	94%	No Change
Percentage of laboratory tests (FBC) performed within eight (8) hours	95%	93%	94%	95%	95%	95%	No change
Percentage of laboratory tests (U&E) performed within eight (8) hours	94%	93%	94%	95%	95%	95%	No change
Percentage of SARS-CoV-2 PCR tests performed within 48 hours	New	New	85%	86%	87%	89%	This will assist in effective management of the COVID-19 pandemic.

CHANGES MADE TO THE ANNUAL PERFORMANCE PLAN							
Output Indicator	**Audited Performance**	**Planned Performance**	**Estimated targets**	**Medium-term targets**			**Reasons for change**
	2020/21	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	
Develop and implement Point of Care Testing (POCT) plan	Point of Care testing plan developed	Point of Care testing plan developed	Implement the pilot to assess feasibility and cost benefit.	20% implementation of the Point of Care Testing plan based on the pilot	30% implementation of the Point of Care Testing plan based on the pilot	50% implementation of the Point of Care Testing plan based on the pilot.	The targets for 2022/2023 have been changed because it is unrealistic to start implementation these plans before piloting them. The targets in subsequent years will be adjusted depending on the outcome of the pilot.
Implement digital pathology	Roll out 100% anatomical pathology laboratories	Develop an implementation plan	Prepare for the implementation of digital pathology	Implement the pilot	Roll out 10% of identified laboratories based on the pilot	Roll out 20% of identified laboratories based on the pilot.	

Programme 2: Academic Affairs, Research and Quality Assurance

	Audited/Actual/planned performance			Estimated Performance	Medium-term targets			Reasons for change
Output Indicators	**2019/20 Audited**	**2020/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	
Percentage compliance achieved by laboratories during annual quality compliance audits	86%	100%	92%	93%	94%	95%	95%	The NHLS achieved 100% in 2020/21 because assessments were conducted virtually, which is much lighter than the actual physical assessment. We have based the 2022/2023 target based on the 92% target planned for 2021/2022 with the understanding that the assessments will be done physically.
Percentage of laboratories achieving proficiency testing scheme performance standards of 80%	99%	99%	90%	92%	94%	96%	98%	The NHLS achieved 99% in 2020/21 because assessments were conducted virtually, which is much lighter than the actual physical assessment. We have based the 2022/2023 target based on the 92% target planned for 2021/2022 with the understanding that the assessments will be done physically.
Number of National Central laboratories that are SANAS accredited	51	53	52	53	53	53	53	No change
Number of Provincial Tertiary laboratories that are SANAS accredited	13	14	15	16	17	17	17	No change
Number of Regional laboratories that are SANAS accredited	25	21	28	35	40	44	44	No change
Number of District laboratories that are SANAS Accredited	25	35	28	40	45	50	55	The NHLS has already accredited more than 30 district laboratories, hence the target is adjusted to 40 for 2022/2023.
Number of ISO 9001 certified departments	3 departments	4 departments	4 departments	5 departments	6 departments	7 departments	8 departments	No change

	Audited/Actual/planned performance			Estimated Performance	Medium-term targets			Reasons for change
Output Indicators	**2019/20 Audited**	**2020/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	
Develop and implement the pathologists' national coverage plan	New	Approved pathologists' national coverage plan	20% implementation of the pathologists' national coverage plan	30% implementation of the pathologists' national coverage plan	40% implementation of the pathologists' national coverage plan	50% implementation of the pathologists' national coverage plan	50% implementation of the pathologists' national coverage plan	No change
Number of articles published in the peer-reviewed journals	600	620	673	660	680	700	720	No change
Number of pathology registrars admitted and trained in the NHLS	30	46	30	40	40	40	40	There is a shortage of pathologists in South Africa and the NHLS as the only institute that trains them must increase the number of trainees to respond to the countries need.
Number of intern medical scientists admitted and trained in the NHLS	50	55	50	50	50	50	50	No change

Programme 3: Surveillance of communicable diseases (NICD)

	Audited/Actual/planned performance			Estimated Performance	Medium-term targets			
Output Indicator	**2019/20 Audited**	**2020/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	
National HIV Surveillance Reporting	N/A	N/A	N/A	90%	90%	90%	90%	KPIs included to enhance surveillance reporting of national priority programmes.
Nation TB Surveillance Reporting	N/A	N/A	N/A	85%	85%	85%	85%	

Programme 5: Forensic Chemistry Laboratory Service

Outcome	Output	Output Indicator	Audited/Actual/planned performance			Estimated Performance	Medium-term targets			
			2019/20 Audited	2020/21 Audited	2021/22 Planned	2022/23	2023/24	2024/25	2025/26	2026/27
Clinical Effectiveness and efficiency	Blood alcohol tests completed within normative period of 90 days	Percentage of blood alcohol tests completed within normative period of 90 days	New	New	New	60%	75%	80%	85%	90%
	Eliminate the historic backlog	Percentage reduction of backlogged cases	New	New	New	20%	40%	60%	80%	100%
	Maintain legislated food testing turn-around times	Percentage of perishable food samples tested within 30 days of sampling	New	New	New	50%	75%	80%	85%	90%
		Percentage of non-perishable food samples tested within 60 days of sampling.	New	New	New	50%	75%	80%	85%	90%

In June 2018, an instruction was given by the National Department of Health that the Forensic Chemistry Laboratories (FCLs) must be moved to the NHLS as legislated by the NHLS Act of 2000. Currently, there are four FCLs in South Africa; one each in Cape Town, Durban, Johannesburg, and Pretoria. The four laboratories service the entire South African population. Clients include the South African Police Service (SAPS), Provincial Departments of Health (Forensic Pathology Services Mortuaries), National Prosecuting Authority (NPA) and Local Authorities (municipalities). The Forensic Chemistry Laboratory Service has been moved to the NHLS effective the 1 October 2021. It has now been added as a programme in the NHLS APP.

Programme 6; Sub-Programme: Financial Management

	Audited/Actual/planned performance			Estimated performance	Medium-term targets			Reasons for change
Output indicator	**2019/20 Audited**	**20120/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	
Ratio of current assets to current liabilities	2:1	2:1	2:1	2:1	2:1	2:1	2:1	No change
Cash flow coverage ratio (Operating cash in-flows / total debt)	1.5:1	2:1	2:1	2:1	2:1	2:1	2:1	No change
Number of creditor days	30 days	30 days	30 days	30 days	30 days	30 days	30 days	No change
Number of debtors days	250 days	120 days	115 days	100 days	90 days	90 days	90 days	No change
Percentage turnaround time for awarding tenders that are below R10million within 180 days	80%	85%	90%	75%	80%	85%	90%	After proper analysis of the processes the KPI has been split to the tenders that are below R10million and tenders that are above R10million. The reason being that the tenders that are above R10million must be tabled to the Board and this process takes longer. The KPIs targets are then set to be more realistic.
Percentage turnaround time for awarding tenders that are above R10million within 180 days	New	New	New	70%	75%	80%	80%	
Audit opinion of the Auditor General	Unqualified	Unqualified	Unqualified	Unqualified	Clean	Clean	Clean	Changed the KPI from "**Clean audit opinion of the Auditor Genera**l" to "**Audit opinion of the Auditor General**"
Percentage of allegations reported through the NHLS tipoff platform that are investigated and completed within 180 days	New	90%	90%	90%	90%	90%	90%	Rephrased the KPI to Percentage of allegations reported through the NHLS tipoff platform that are investigated and **completed** with 180 days

Programme 6; Sub-Programme: Information and Communication Technology

	Audited/Actual/planned performance			Estimated Performance	Medium-term targets			Reasons for change
Output Indicator	**2019/20 Audited**	**20120/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	
High-Capacity bandwidth rollout (new MPLS)	New	New	New	Implement to 80% of the NHLS sites	Implement to 85% of the NHLS sites	Implement to 90% of the NHLS sites	Implement to 95% of the NHLS sites	The KPI has been added to replace "Develop and implement a real-time communication system with patients" KPI because this KPI was achieved in 2020/2021 and implemented to COVID-19 results.
Distribution of CDW summary reports to provinces	New	New	New	80% of the public hospitals serviced by the NHLS receive monthly reports	85% of the public hospitals serviced by the NHLS receive monthly reports	90% of the public hospitals serviced by the NHLS receive monthly reports	95% of the public hospitals serviced by the NHLS receive monthly reports	The KPI has been added to replace "Implement the interface between NHLS LIS and the HPRS" because this KPI depends entirely on the National Department of Health roll out of the HPRS to the health facilities.
Implementation of stock management system and analytics	New	New	New	Implement to 80% of the NHLS laboratories	Implement to 85% of the NHLS laboratories	Implement to 90% of the NHLS laboratories	Implement to 95% of the NHLS laboratories	The KPI has been added to replace "Develop and implement the order entry system" KPI because this KPI depend entirely on the health facilities having access to internet.
Percentage System Uptime for Critical Systems	99%	99%	99%	99%	99%	99%	99%	No change

Programme 6; Sub – Programme: Human Resources

	Audited/Actual/planned performance			Estimated performance	Medium-term targets			Reasons for change
Output indicators	**2019/20 Audited**	**2020/21 Audited**	**2021/22 Planned**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	
Staff turnover ratio	5%	5%	5%	5%	5%	5%	5%	No change
Average staff recruitment turnaround within 90 days	80%	90%	90%	-	-	-	-	KPI has been discontinued on the APP, however, will be included in the operational plan for monitoring.
BBBEE compliance	New	Level 6	Level 5	Level 5	Level 4	Level 4	Level 4	The target has been kept the same with the one for 2021/2022 because the NHLS is currently working towards establishing the baseline.
Number of intern medical technologists and student medical technicians admitted and trained in the NHLS	200	250	250	250	250	250	250	No change
Percentage of employees trained as per the approved training plan (WSP)	90%	Not measured	Not measured	70%	75%	80%	85%	This KPI has been added to strengthen the monitoring of training and development of employees.
Percentage of employees with approved and evaluated performance agreements	95%	95%	98%	98%	98%	98%	98%	The target will be maintained at 98% to make provision for employee who will be on maternity leave, suspended etc. when the performance agreements and assessments are performed.