



Southern Africa Tuberculosis and Health Systems Support Project Implementation Completion and Results Report for Zambia, 2017–2023

INTRODUCTION

Project context and development objectives

Global context

The Southern Africa Tuberculosis and Health Systems Support (SATBHSS) project was launched in 2016. Although tuberculosis (TB) is preventable and curable, it is one of the leading infectious causes of death, globally, surpassing human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS). Despite the Millennium Development Goals' success in reducing TB incidence, there were still 9.6 million new cases and 1.5 million deaths from TB in 2014¹; 99% of cases were in low-income countries². A 2015 survey conducted by *Médecins Sans Frontières* and the Stop TB Partnership in 24 countries, including Zambia, revealed significant disparities between current TB control policies and the essential best practices needed to achieve the global target of a 90% reduction in TB incidence, and a 95% reduction in TB mortality, by 2035. The results of the survey showed that many countries needed to update their policies in line with international standards. There was a need to use rapid molecular tests for the diagnosis of TB and to reduce expenses for people with TB. This, coupled with innovative approaches to active case finding, would help reach the nearly four million TB cases missed each year.

Regional context

In 2014, sub-Saharan Africa had the highest rates of TB and the poorest treatment outcomes, globally. With an estimated incidence of 281 cases per 100 000 population, sub-Saharan Africa's TB incidence surpassed the global average of 133. The rise in TB cases in southern Africa was largely propelled by the HIV epidemic, and the mining industry had historically been associated with some of the highest TB incidence rates. In 2012, the Southern African Development Community (SADC) Heads of States recognised mining activities as one of the drivers of TB and other occupational lung diseases (OLDs) in the region. Consequently, they signed the 2012 Declaration on TB in the Mining Sector, which advocates for a supportive policy environment to address and control TB, HIV, silicosis, and other OLDs. The Heads of States committed to providing appropriate legislative and regulatory authorities and public health resources to eradicate TB. A code of conduct, endorsed by the Health Ministers of the SADC, was integral to this commitment.

The SADC had adopted the Minimum Standards for the Prevention, Treatment and Management of TB to guide a regional approach to controlling the TB burden, which proved instrumental in the implementation of the SATBHSS project. The African Union also adopted the 2015 Catalytic Framework to End HIV/AIDS, TB,

and Malaria by 2030 (the World Health Organization (WHO) End TB Strategy) as a framework to guide the TB response in Africa. This was also critical in guiding the project implementation and providing strategic focus, and proved essential during the mid-term review of the project.

Zambian context

Despite significant progress through implementation of the WHO 'TB DOTS' and 'STOP TB' strategies prior to the inception of the SATBHSS project, Zambia remained one of 30 countries in the world with the highest TB burdens. HIV prevalence among TB-diagnosed patients in Zambia varied between 50% and 70%, but the burden of TB/HIV co-infections in miners was not known at the time of appraisal.

The 2013/2014 TB survey revealed that the adult prevalence of bacteriologically confirmed TB in Zambia was 638/100 000, and that the estimated prevalence of all forms of TB was 455/100 000 for all age groups. Ninety-seven percent (258 of 265) of TB cases diagnosed were not on treatment at the time of interview³. Up to 50% of patients with symptoms suggestive of TB, who were not on treatment, sought care in health facilities, but the health system failed to identify them.

Lessons learned from previous projects that informed the implementation of the SATBHSS project

The project design was informed by good practices and lessons learned from both regional and country project experiences, such as the Global Fund Tuberculosis in the Mines project, the Great Lakes Emergency Sexual and Gender Based Violence & Women's Health project, the Sahel Women's Empowerment and Demographics project, and public-private collaborations focusing on communicable disease control such as the African Programme for Onchocerciasis Control in West Africa, and the Lubombo Spatial Development Initiative, which focused on malaria control in south-east Africa.

Project development objectives

The project development objectives (PDOs) were developed to:

1. Improve coverage and quality of TB control and occupational lung disease services in targeted geographic areas of the participating countries
2. Strengthen regional capacity to manage the burden of TB and occupational diseases
3. Strengthen country-level and cross-border preparedness and response to disease outbreaks

¹ World Bank; March 2014. <https://thedocs.worldbank.org/en/doc/770861483124917730-0010022016/original/AmongSouthernAfricasMineworkersBenefitsandCostsofReducingTuberculosis.pdf>

² World Bank; May 2018. <https://documents1.worldbank.org/curated/en/763241529292640506/pdf/FINAL-20180529-Project-Appraisal-Documents-PAD-05292018.pdf>

³ Kapata N, Chanda-Kapata P, Ngosa W, Metitiri M, Klinkenberg E, Kalisvaart N, et al. The prevalence of Tuberculosis in Zambia: Results from the First National TB Prevalence Survey, 2013–2014. *PLoS One*. 2016; 11(1):e0146392. doi: 10.1371/journal.pone.

Five communities of practice were envisaged, based on consultations between the four participating countries, the World Bank, and regional entities:

1. Continuum of TB care led by Malawi
2. Laboratory and surveillance led by Mozambique
3. Research, monitoring, and evaluation led by Lesotho
4. Occupational health and safety led by Zambia
5. Project components

Components and sub-components to address the project development objectives

Component 1: Innovative prevention, detection, and treatment of TB

This component improved the demand for, and availability of, high-quality TB, TB-HIV/AIDS, and OLD services in targeted geographic areas of the four participating countries. WHO’s End TB Strategy, the Harmonised Framework for the Management of TB in the Mining Sector, the SADC Code of Conduct for the Management of TB, and national plans provided a sound framework. Sub-components were 1) enhancing case detection and treatment success, and 2) rolling out a standardised package of occupational health services and mining safety standards across the four countries.

Component 2: Regional capacity for disease surveillance and diagnostics, and management of TB and occupational lung diseases

This component supported strengthening critical areas of health systems to improve efficiency and effectiveness of TB and OLD control, and to improve health system responses to infectious disease outbreaks. During the additional financing phase, the focus was on improved functioning of cross-border committees between participating countries and other neighbouring countries,

supporting national responses to the COVID-19 pandemic through improvements in capacity and quality of laboratory and X-ray diagnoses, and capacity building of health staff for COVID-19 pandemic responses, TB management, occupational health, and mine safety and health. Sub-components were 1) improving quality and availability of human resources in the targeted areas, 2) strengthening diagnostic capacity and disease surveillance, 3) strengthening mine health regulations, and 4) supporting COVID-19 responses and integrated TB and OLD care.

Component 3: Regional learning and innovation, and project management

Component 3 funded technical support to strengthen regional capacity and promote innovation through sharing of knowledge and evidence from interventions implemented under Components 1 and 2. It also supported advocacy for policy reforms and for better accountability by mining companies on the enforcement of occupational and mine health standards. Sub-components were 1) operational research and knowledge sharing, 2) centres of excellence in TB and OLD control, 3) regional coordination, policy advocacy, and harmonisation, and 4) project management.

The theory of change on achievement of the project outcomes is summarised in Figure 1.

Implementation structure for the SATBHSS project in Zambia

The SATBHSS project initiative recognised that combating TB required a broad health systems approach, involving various stakeholders in the country and the region. Therefore, a multi-sectoral approach was adopted in Zambia. The Ministry of Health (MoH), Ministry of Finance, Ministry of Labour and Social Security (MLSS), Ministry of Mines and Minerals Development (MMMD), and the Occupational

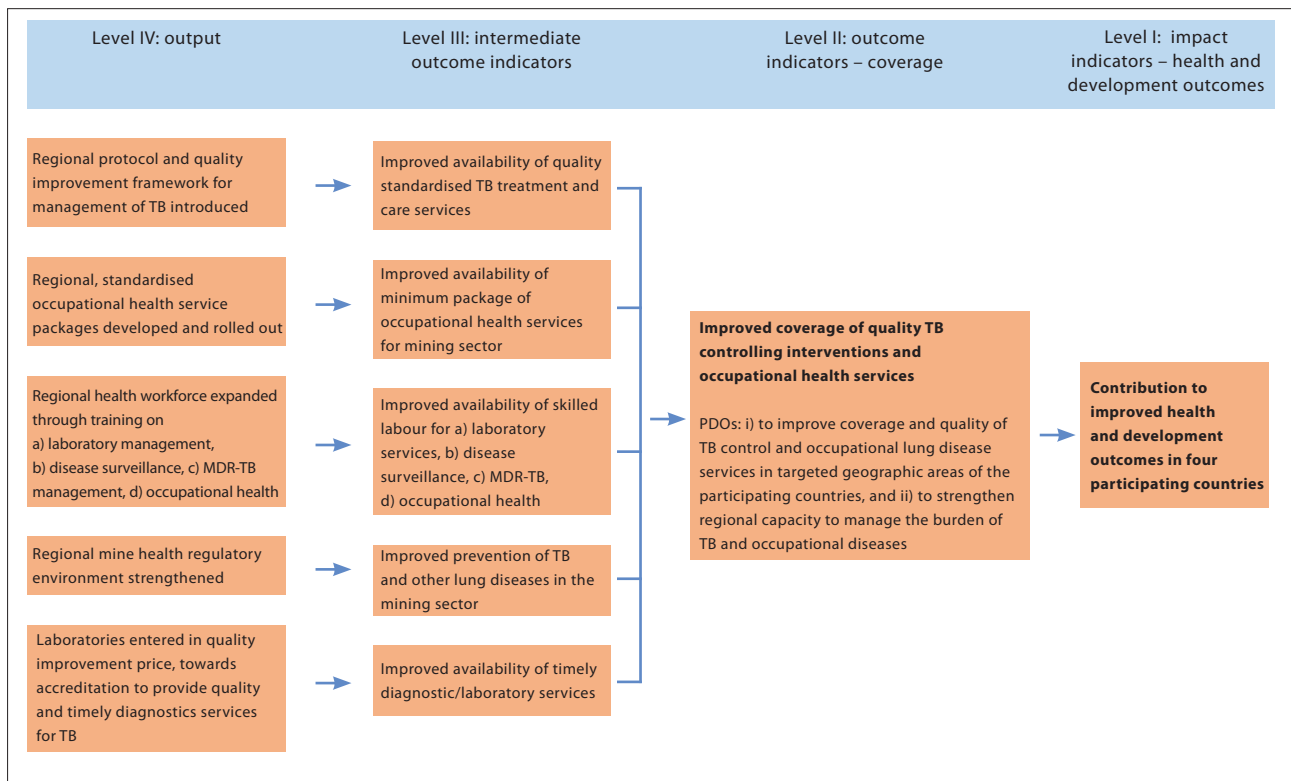


Figure 1. Southern Africa Tuberculosis and Health Systems Support project theory of change

PDO: project development objective, TB: tuberculosis, MDR-TB: multidrug-resistant tuberculosis



Health and Safety Institute (OHSI) were the leading institutions for implementation. The project was designed to work closely with other partners and organisations in the country (the Global Fund, TB in the Mining Sector (TIMS) project, Centers for Disease Control and Prevention (CDC), WHO, Centre for Infectious Disease Research in Zambia (CIDRZ), Zambia Tuberculosis and Leprosy Trust (ZATULET), Chamber of Mines, Tropical Diseases Research Centre (TDRC), University of Zambia School of Public Health, Mine Workers' Union, Ex-miners Association of Zambia, and Eradicate TB under PATH), with the aim of preventing the duplication of activities while enhancing synergism among all stakeholders involved in the fight against TB. Nineteen districts were selected, based on TB prevalence, HIV prevalence, transport corridors, and mining activities.

The East, Central and Southern Africa-Health Community (ECSA-HC) primarily served as the regional coordination organisation, while the AUDA-NEPAD coordinated efforts on policy advocacy, private sector engagement, and occupational health and safety (OHS) aspects of the regional project. Clear delineation of roles was established among the two regional entities, with the Regional Advisory Committee (RAC) providing oversight, leadership, and guidance. All were Government-led, with Permanent Secretaries from each of the ministries of health, labour, and mines in the four participating countries spearheading efforts.

OUTCOMES

Relevance and coherence of the project development objectives

The PDOs were highly relevant. The project was in line with Zambia's 7th National Development Plan upon which all national strategic plans were based, i.e. the MoH's National Strategic Plans 2017–2021 and 2022–2026, and the OHSI strategic plan that envisions a TB-free Zambia by 2030. The project played a significant role in the implementation of these strategic plans.

Training, capacity building, and deployment of specialised equipment and infrastructure development

The project provided technical assistance and capacity-building support to enhance the skills and knowledge of healthcare workers, laboratory staff, and programme managers involved in TB control in Zambia. This included training on TB diagnosis, treatment, surveillance, infection control, and programme management. The project supported the improvement of TB diagnostic and treatment facilities in Zambia by providing funding and technical assistance for the renovation, expansion, and equipping of laboratories, clinics, and healthcare facilities.

Health information systems

The project supported the development and enhancement of health information systems for TB surveillance, monitoring, and reporting, which included the implementation of electronic reporting systems, data quality improvement initiatives, and training on data management and analysis.

Monitoring and evaluation

The project assisted Zambia to strengthen its monitoring and evaluation systems for TB control, including the development of monitoring and evaluation frameworks, indicators, and data-collection tools. The project provided critical support to advance progress toward milestones and targets laid out in the WHO's End TB Strategy and the United Nations Sustainable Development Goals (SDGs).

Zambia is one of seven countries that reached the first milestone of the End TB Strategy – a 20% reduction in TB incidence from the baseline in 2015. The project also contributed to the attainment of the United Nations High-Level Meeting (UNHLM) targets; Zambia has already attained the target for TB case finding.

The project was fully in line with the Regional Integration Assistance Strategy (RIAS), the Africa Strategy, and the Country Partnership Framework (CPF) Strategies. Implementation of Pillar III of the RIAS – Coordinated Interventions to Provide Regional Public Goods – was directly supported by the project, given its aim to strengthen regional capacity to manage the burden of TB and OLDs, with cross-border dimensions. The project contributed to Focus Area II of the CPF, which sought to facilitate inclusive human capital development and strengthen national capacity to respond to disease outbreaks and broader public health emergencies. The project also contributed to the implementation of the International Health Regulations, the Global Health Security Agenda, and International Bank for Reconstruction and Development (IBRD)/International Development Association (IDA) priorities for improving disease preparedness and response.

The project came at a critical juncture in TB control efforts after the endorsement of the SDG target to end TB by 2030. In addition, it directly contributed to meeting the International Health Regulations 2005. At the sub-regional and country levels, the project directly advanced the implementation of the SADC Declaration on TB and the 2008 Maputo Declaration on Health.

Strengthening OHS services in mining areas in Zambia is crucial for the wellbeing of workers, reducing injuries and fatalities, improving productivity and efficiency, ensuring legal compliance and reputation management, safeguarding communities and the environment, and empowering workers and trade unions. It requires collaborative efforts among governments, mining companies, workers' organisations, civil society, and other stakeholders to create a culture of safety, promote responsible mining practices, and achieve sustainable development in the mining sector. The project supported the four Government institutions in Zambia, viz. the Mines Safety Department (MSD), the OHSI, the Workers' Compensation Fund Control Board (WCFCB), and the Occupational Safety and Health Services Department (OSHSD), to become the Centre of Excellence (CoE) for OHS. The CoE offers primary prevention services that include mine inspections, hazard identification, risk assessments, and implementation of an OHS management system across the mining industry. Secondary and tertiary prevention are provided by the OHSI and WCFCB authorities.

The CoE has enhanced the OHS agenda in Zambia by improving quality of, and access to, OHS services. The CoE has aligned the operations of the four institutions linked to the provision of OHS services, namely the OHSI, WCFCB, OSHSD, and MSD.

Multi-sectorial support for TB

The SATBHSS project brought together different sectors of Government and the private sector to work on a common agenda of TB control.

Efficacy of the project

Achievements of the project development objectives (results framework analysis)

The project had a clear results framework, with indicators to measure the achievement of the PDOs. All seven of the project outcome indicators (POIs) and 14 of the 17 intermediate outcome indicators (IOIs) have been either fully or partially achieved.

The project performed well on 1) TB case notification in target geographic areas, 2) TB cases identified through active case finding in target geographic areas, 3) project-supported laboratories compliant with regionally harmonised standard operating procedures (SOPs) for surveillance of multidrug-resistant tuberculosis MDR-TB, and 4) countries with multi-hazard preparedness plans. Reasons for underperformance in some areas included lack of funds to sustain the nutritional support and mining inspections, and unrealistic targets, particularly related to construction.

Monitoring and evaluation data utilisation

Monitoring and evaluation data utilisation is critical in enhancing programme effectiveness, informing decision-making, promoting accountability, and fostering learning and innovation. The monitoring and evaluation data were used to inform project management and decision-making at country and regional levels. Data were reviewed quarterly to assess performance and provide guidance on interventions.

EFFECTIVENESS OF THE PROJECT

This section describes the overall progress of the project against expected results (outcome and coverage performances), and the effectiveness of the project’s strategies.

Component 1: Innovative prevention, detection, and treatment of TB

Sub-component 1.1: Enhancing TB case detection and treatment success

This sub-component aimed to increase TB case detection and treatment success rates in line with the National TB Strategic Plan, which, together with interventions such as TB preventive treatment, would decrease TB incidence and mortality rates, ultimately helping Zambia to achieve the goal of eliminating TB by 2030. Although the project focused on 19 districts, all districts in Zambia benefited from the health system strengthening component of the project.

Enhancing TB case detection

The project aimed to detect and treat 175 749 TB patients from 2017 to 2023. By the end of the project, 198 201 patients had been detected and treated, surpassing the target by 13%. In the same period, 311 308 people with TB were diagnosed and received treatment nationwide. This translated to 64% of all national TB notifications being attributed to the project. The proportion of laboratory-confirmed TB patients among those with pulmonary TB fluctuated between 44% and 60%.

The project’s investments complemented other support from the Global Fund to fight AIDS, TB, and Malaria. The United States Government contributed significantly to an exponential increase in

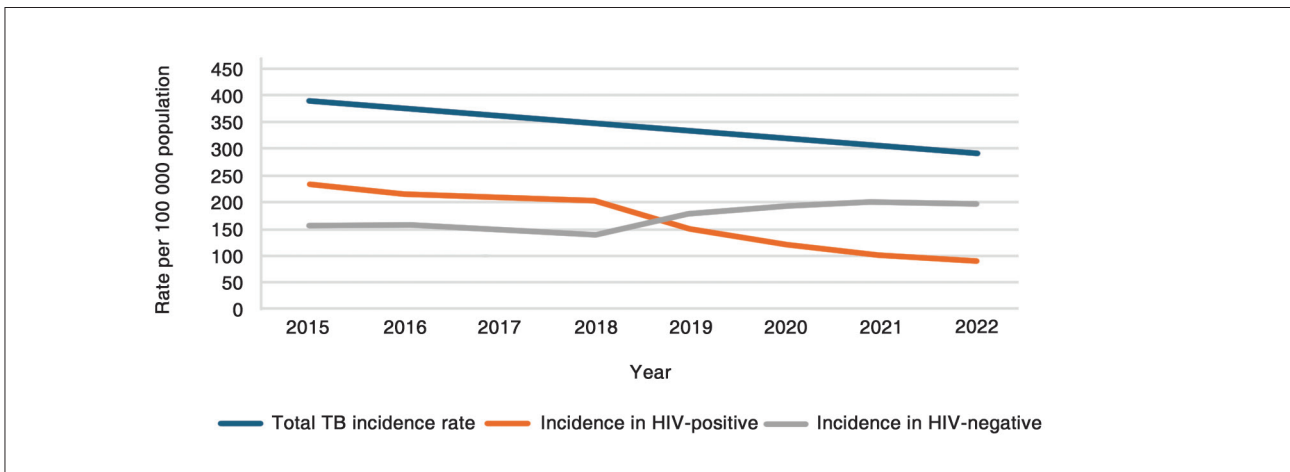


Figure 2. Trends in TB incidence rates (2015–2022)

HIV: human immunodeficiency virus, TB: tuberculosis

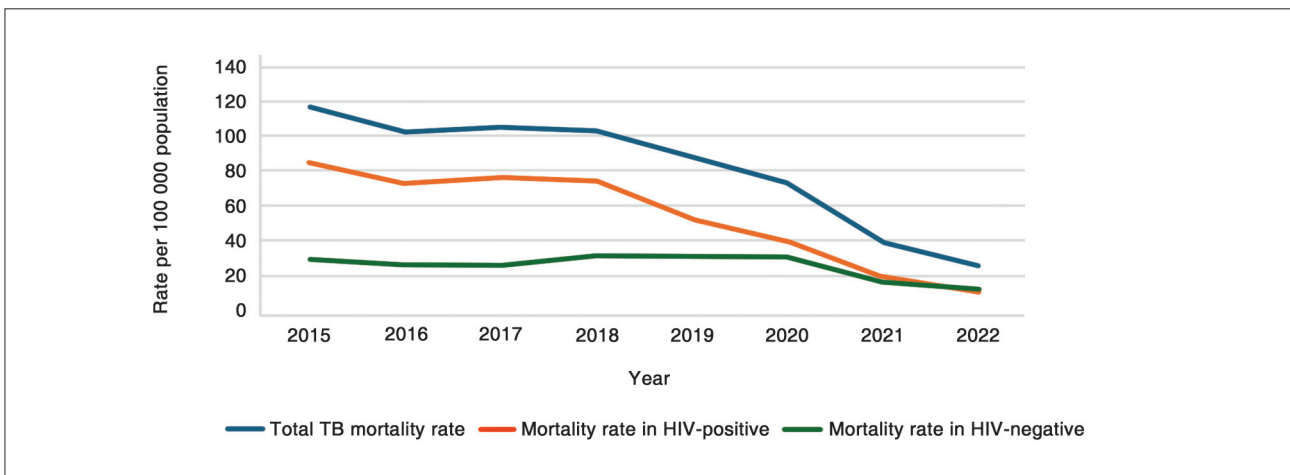


Figure 3. Trends in TB mortality rates (2015–2022)

HIV: human immunodeficiency virus, TB: tuberculosis



TB notification, despite the cholera outbreak in 2018 and the COVID-19 pandemic from 2020 to 2022. This stellar performance was made possible by investing in TB diagnostic tools, reagents and supplies, infrastructure, and innovation in systematically organising TB case-finding approaches in health facilities and the community. For example, in 2018, the project procured 48 GeneXpert machines and, in 2022, four X-ray diffractometer (XDR-TB) machines were procured. In 2020, the country faced a critical shortage of GeneXpert cartridges, which posed a threat to TB case-finding efforts. However, the project's provision of 200 000 GeneXpert cartridges ensured the continuity of TB case-detection efforts.

In 2021, the project took a significant step forward by introducing four new mobile diagnostic units to the health sector. These state-of-the-art units came equipped with digital X-ray and artificial intelligence technology. They allowed the MoH to provide X-ray services to vulnerable populations in rural areas.

Investments from the project were also directed towards implementing active case-finding innovations aimed at detecting TB patients, through an initiative dubbed "*marching towards finding 45 000 and 55 000 TB patients in 2020 and 2021, respectively*". This innovative approach involved implementing TB case finding in health facilities by ensuring that TB screening was routine and permanent, and conducted at all entry points and units systematically, complemented by community-based active case finding.

Impact attributed to the project investments

The TB incidence rate dropped from 391 cases per 100 000 in 2015 to 295 cases per 100 000 in 2022; a decrease of 26% (Figure 2). This remarkable progress enabled Zambia to achieve the 2020 End TB Strategy milestones. The country has also made significant strides in reducing the TB mortality rate, with the rate falling from 115 deaths per 100 000 population in 2015 to 27 deaths per 100 000 population in 2022; a reduction of 77% (Figure 3). This means that Zambia has already met the 2025 End TB Strategy milestone.

The WHO has recognised Zambia's remarkable achievements in reducing TB incidence and mortality rates. Zambia has been placed among the 83 nations, worldwide, that have recorded a decline in TB incidence of 20% or more from the 2015 baseline. Furthermore, Zambia has been recognised among the 47 countries that have successfully reduced TB mortality by 35% or more. These achievements are a testament to Zambia's commitment to fighting TB and improving the overall health of its citizens.

Sub-component 1.2: Rolling out a standardised package of occupational health services and mining safety standards across participating countries

The project in Zambia provided a comprehensive package of occupational health services through the OHSI, MSD, OSHSD, and health facilities, using a multi-sectoral approach. These institutions are responsible for primary, secondary, and tertiary prevention. Primary prevention services include mine inspections, hazard identification, and risk assessments. Secondary and tertiary prevention are provided by the OHSI and WCFCB authorities. The OHSI provides occupational health surveillance and impairment evaluations for workers. The WCFCB provides compensation for disabilities and diseases.

The main activities that were funded under this sub-component included:

1. Strengthening the capacity of public sector agencies responsible for mine health and safety to undertake inspections of mines, with an emphasis on determining dust levels and control measures, and compliance with mine health regulations

2. Expanding periodic screening and referral for OLDs and other diseases, in line with standards set within the sub-region and international best practices
3. Developing/strengthening care programmes for workers with OLDs

Occupational Health and Safety Institute

The project provided for an improvement of the Institute in terms of infrastructure, viz. massive upgrades of essential diagnostic equipment to replace obsolete technologies, and building capacity of human resources in OHS.

The OHSI was able to increase occupational health services in the project districts, specifically related to medical surveillance examinations of miners and ex-miners, and hazard assessments.

Activities in the project districts were aimed at ex-miners who might not have been able to visit the Occupational Health Service Centre for medical surveillance (specifically for silicosis). Consequently, an additional 1 500 ex-miners were identified, and certification for OLDs increased by 5.4% from 2018 to 2023. Support to the outreach programme included the provision of vehicles and a mobile X-ray truck, and logistics that enabled efficient delivery of the surveillance services.

There was an overall decrease in the number of disease certifications in 2018. There was a gradual decrease in the number of TB cases certified from 2017 to 2021, and a surge in pneumoconiosis cases from 2019 to 2020. Silicosis case notification increased by 283% from 2017 to 2023, and pulmonary tuberculosis (PTB) with silicosis case notification increased by 83% over the same period. Tuberculosis case notification in the mines decreased during the same period by 38%. Collaboration with the district and provincial health offices enabled the provision of TB medications.

Compliance in medical surveillance examinations increased across the mining industry. The number of joint compliance inspections increased, and awareness improved among employers, employees, and the community due to programmes carried out by the OHSI.

Diagnostic capability to detect OLDs in line with international best practice guidelines was improved, through a combination of equipment provision and enhanced competencies of OHSI staff. The provision of, and training in, spirometry, audiometry, and vision-screening equipment enabled the enhancement of medical surveillance and improved health outcomes.

The X-ray department of the OHSI was modernised with digital mobile and fixed X-ray equipment, which improved the quality of the chest X-ray images. This, in turn, reduced waiting times for miners in line for X-rays from two hours to five minutes. The adoption of the International Labour Organization (ILO) International Classification of Radiographs of Pneumoconioses improved the rate of diagnosis and certification of pneumoconiosis and other OLDs. Overall, costs for the OHSI were drastically reduced.

The provision of a GeneXpert machine and other laboratory equipment improved the diagnosis of TB according to the WHO guidelines, and physiology equipment assisted in the diagnosis and assessment of OLDs.

To improve service delivery, information and communication technology (ICT) infrastructure was improved. A new server was installed and secured, and the network improved. To improve skills in reading of chest X-rays, B-reading computers were procured for training in the ILO International Classification of Radiographs of Pneumoconioses. Scanners and computers were procured to

digitalise medical records. This improved ICT infrastructure allowed for the electronic transfer of employee certificates of fitness, further reducing costs.

The results of a client satisfaction survey about service delivery at the OHSI showed that 94% of miners and ex-miners were satisfied with the examination processes, and 97% were satisfied with the state of cleanliness.

Ministry of Labour and Social Security

The mapping of ex-miners was successfully undertaken in six provinces; 14 997 ex-miners were mapped. Only 42.4% of the ex-miners underwent routine medical examinations, mostly at government hospitals; only 5% went to private hospitals. The distributions of ex-miners and health facilities from the districts that were sampled are shown in Figure 4. Most were in the Copperbelt districts.

The MLSS developed the Communication and Advocacy Strategy on Tuberculosis and other Occupational Lung Diseases for Ex-Miners in Zambia: 2019–2023, to increase awareness of TB and other OLDs.

The procurement of occupational hygiene and environmental monitoring equipment enabled the execution of specialised services that were not possible before the SATBHSS project. Equipment included gas analysers, gravimetric dust samplers, sound level meters, a motor vehicle, portable gas detectors, multi-functional gas and dust detectors, heat stress meters, a data-logging personal noise dosimeter, anemometers, personal multi-gas detectors, personal dust sampling kits, and respirator fit testers.

Mines Safety Department

The MSD focused on the following areas: integrated inspections, dust sampling, risk assessments, and audits; stakeholder engagement workshops to promote safe mining; legislative reforms; institutional capacity building; increasing the demand for medical examinations for TB and other OLDs; and mainstreaming OSH in tertiary education curricula.

Three hundred and sixty-five mines were inspected during the project lifetime; 1 499 inspections were conducted and, on average, 94.3% mines were inspected twice or more, annually. A total of

15 305 dust samples were taken, of which 12 656 were compliant (< 1.05 mg/m³). As of 2023, the compliance level for dust was 96.3%.

Component 2: Regional capacity for disease surveillance and diagnostics, and management of TB and occupational lung diseases

Sub-component 2.1: Improving quality and availability of human resources in the target areas

Under this sub-component, the project focused on improving quality and availability of human resources for health in the target areas. The situation analysis on human resources to attend to TB and other lung disease, before the start of the project, indicated that human resources for health were below the WHO-recommended density (no. per population). This shortage hampers disease surveillance, TB control efforts, quality of healthcare, and laboratory testing services. Additionally, poorer rural areas, mining and peri-mining areas, transport corridors, and cross-border areas were particularly affected by these gaps.

The capacity building for human resources aimed at developing a skilled health workforce related to project activities, based on a regionally defined curriculum, mentoring, and knowledge sharing in three critical areas: 1) case detection and management of TB, 2) mine health regulation and occupational services, and 3) disease surveillance. The total investment was US\$15.24 million.

The target number was 4 200, but 5 989 staff were trained under the short- and long-term training programmes from 2017 to 2023 (143% of the target). Some of the short-term training programmes included training on case detection and management of TB, GeneXpert technology, fluorescent microscopy, line probe assay technology, leprosy diagnosis, biosafety cabinet servicing, second-line drug susceptibility testing, GeneXpert proficiency testing panel preparation, quality-management systems, biosafety and biosecurity, leadership, and governance. Staff at the OHSI have been supported to develop their skills through long-term courses. One doctor has completed studies in radiology (Master of Medicine in Radiology), one radiographer upgraded to degree level

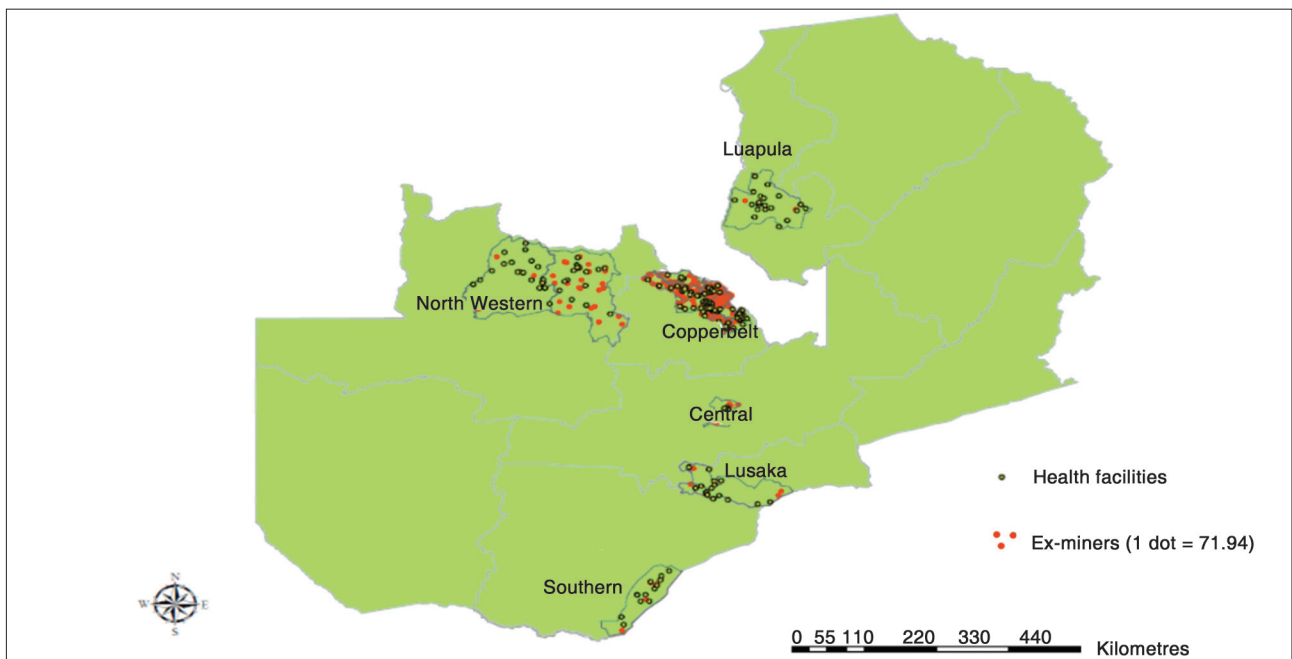


Figure 4. Distribution of health facilities and ex-miners in the mapped districts



in radiography, one occupational hygienist upgraded to a Master's in Occupational Safety and Health (OSH), one laboratory technologist upgraded to a Bachelor of Science degree in biomedical sciences, and one doctor is pursuing a Master of Medicine in Pathology. This has improved local capacity and efficiency of the CoE in serving the local and regional needs.

Laboratory staff are now able to diagnose TB on different platforms through skills gained in microscopy and GeneXpert (testing and maintenance). Staff from the three culture laboratories gained specialised skills in line probe assay (LPA) and drug susceptibility testing (DST). Other skills gained include leprosy diagnosis and biosafety cabinet servicing. The Chest Disease Laboratory (CDL) is now able to prepare its own in-country GeneXpert proficiency testing (PT) panels after three staff members were trained at the Uganda Supranational Laboratory. The CDL is now ready to apply for ISO17043 accreditation.

Sub-component 2.2: Strengthening diagnostic capacity and disease surveillance

Laboratory systems strengthening and accreditation

The regional project delivered substantial achievements through various interventions, including the procurement of new molecular diagnostics such as GeneXpert, digital X-rays with artificial intelligence-enabling features, and use of mobile diagnostic units to increase access to TB diagnosis and treatment. These public health diagnostics investments have led to increased use of WHO-recommended TB diagnostics.

The low leprosy notification and high rates of patients presenting with severe disability point to poor awareness about leprosy in the community, delay in presentation, and poor skills to diagnose leprosy among healthcare workers. Therefore, a deliberate move was made to prioritise capacity building in the diagnosis of leprosy by laboratory personnel.

Stepwise Laboratory Improvement Process Towards Accreditation (SLIPTA)

In 2017, baseline audits were conducted in 19 laboratories supported by the SATBHSS project, in all 10 provinces of Zambia. Seven have been taken up by the accreditation/certification programme under the Laboratory Services Unit of the MoH, four are undergoing mentorship in order to apply for ISO15189 accreditation, three are undergoing certification mentorship, and the three TB culture facilities achieved, and have maintained, their ISO15189 international accreditation under the SADC Accreditation Services (SADCAS).

The ECSA-HC contributed to building capacity of project countries to implement laboratory system strengthening and quality-management systems towards accreditation, through training and certification, using African Society for Laboratory Medicine (ASLM) SLIPTA-certified auditors.

Procurement of laboratory commodities/consumables and equipment

The sputum courier system was strengthened by the procurement of packaging accessories and an additional 60 motorbikes. There are now 349 motorbikes available in the districts. Fifty-two GeneXpert machines were procured under the project, bringing the total number in the country to 340, and resulting in improved access to WHO-recommended rapid diagnostic tools. The expansion of GeneXpert sites and sustained provision of cartridges have contributed to an increase in the number of bacteriologically confirmed TB cases detected, and has improved the turn-around time for results from seven days in 2016 to 24 hours since 2020. This has significantly contributed to timely commencement of quality TB treatment and care.

With the addition of GeneXpert machines came an increase in testing among presumptive TB patients, from 90 979 in 2017 to 249 873 in 2020 (Figure 5), and an increasing trend in bacteriologically confirmed cases, from 16 443 in 2017 to 18 768 in 2020.

The CDL is now able to produce its own expert proficiency testing panels and has enrolled 100 sites. This reduces the cost of procuring commercial panels for the country. The new negative air pressure ventilation system at the CDL is the first of its kind in Zambia in a public facility. The three culture laboratories have maintained their accreditation and have received awards of recognition for this.

Disease surveillance, preparedness, and response

The SATBHSS project supported the Zambia National Public Health Institute (ZNPHI) to implement a number of disease surveillance activities, in line with its mandate of maintaining national public health security as from 2018. Notable activities included the establishment of cross-border disease surveillance committees between Zambia and the Democratic Republic of the Congo, Malawi, Tanzania, Zimbabwe, and Mozambique for preparedness and response to epidemics or other events of public health concern. Some of the disease outbreaks and threats investigated were cholera, COVID-19, Ebola virus disease, polio, typhoid, anthrax, and measles. The ZNPHI was able to develop and roll out an electronic version of the Integrated Disease Surveillance and Response (e-IDSR) in six provinces.

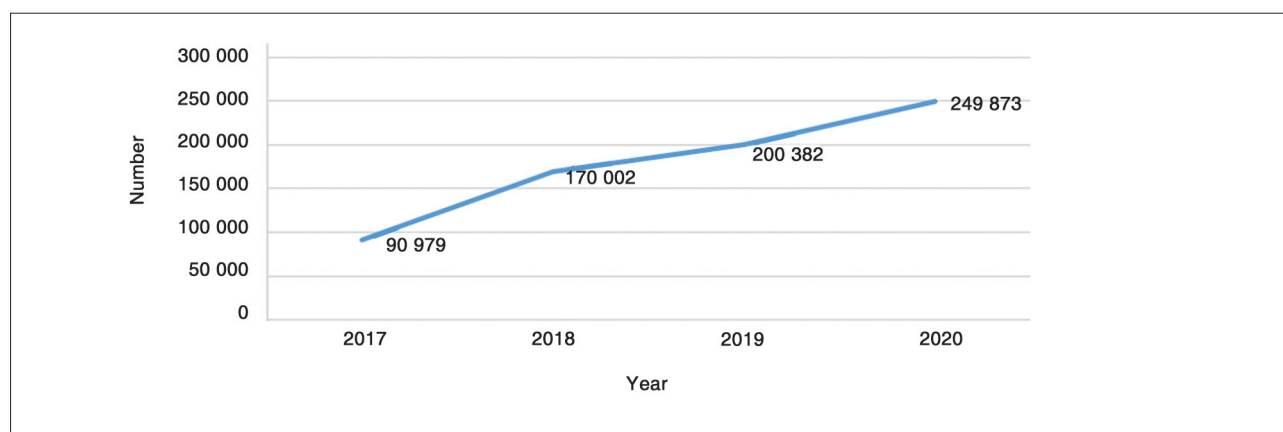


Figure 5. Number of GeneXpert tests per year



Sub-component 2.3: Strengthening mine health regulation

The MLSS Cabinet approved the Workers’ Compensation Act amendment to allow miners with TB to return to work after successful treatment, provided they are certified fit. However, this is yet to be tabled in Parliament as the new Government requested time to review the draft Act. Further, the Ministry reviewed the Factories Act to include advances in OHS equipment, incorporating issues raised in the ILO Convention on Enterprises and ILO Convention no. 155.

The National Occupational Safety and Health Policy was developed and launched on 28 April 2023. The policy covers all sectors to comprehensively address the requirements, functions, and roles of stakeholders, including public institutions, employer and worker organisations, and research institutions. It mainstreams OHS in all sectors and reinforces the promotion of decent work in the country.

It was observed that inadequate OHS management practices contributed to illnesses, accidents, and injuries at work because Zambian guidelines for dust and noise levels were not specific enough. The SATBHSS project supported the development of occupational hygiene standards on dust and noise limits. A training manual on dust control in the mines was developed, and 53 mine health and safety representatives were trained.

Under the MMMD, the MSD has been able to review the Explosives Act of 1973 and the Mining Regulations Act of 1971, both of which are outdated. The Explosives Act is due for presentation to the Minister en route to Parliament. The Mining (Environmental) Regulations and the Environmental Protection Fund Regulations are to be presented to the Minister for signing into Statutory Instruments. However, the process has been delayed because of the creation of the Minerals Regulatory Commission, which has split the Mines and Minerals Development Act into two Acts – one to be used by the Commission and the other by the Ministry. All new Acts have been drafted and the Minerals Regulatory Commission Bill has been presented in Parliament for debate and enactment. Table 1 provides an overview of the status of the various legislations.

Component 3: Regional learning, innovation, and project management

Sub-component 3.1 Operations research and knowledge sharing

From inception, the SATBHSS project allocated funds to support regionally and nationally commissioned operational research. Three regional

and nine national studies were commissioned to enhance innovation in TB and OLD control, and to inform policy and practice through innovative knowledge-sharing approaches.

Sub-component 3.2 Centres of excellence in TB and occupational lung disease control

The Centre of Excellence on Occupational Health and Safety

The SATBHSS project supported the four Government institutions in Zambia, namely, the MSD, OHSI, WCFCB, and OSHSD, to become the CoE on OHS to serve the country and the needs of the SADC region. The CoE is responsible for primary, secondary, and tertiary prevention in mining areas. It offers primary prevention services that include mine inspections, hazard identification, risk assessments, and the implementation of an OHS management system across the mining industry. Secondary and tertiary prevention are provided by the OHSI and WCFCB authorities. The OHSI covers the greater part of the mining industry and provides occupational health surveillance and impairment evaluations for workers. The WCFCB provides compensation of workers for disabilities suffered or diseases contracted during the course of employment.

Training and capacity building under the Centre of Excellence

Capacity building for OHS formed a big part of the project under the CoE, with support from the SATBHSS project, AUDA-NEPAD, and ECSA-HC. All medical officers from the OHSI were trained in the ILO International Classification of Radiographs of Pneumoconioses. The adoption of this system in the OHSI operations improved the diagnosis of pneumoconiosis among miners and ex-miners. An additional 44 doctors from mining districts in Zambia, and 93 from the region (Angola, Botswana, Democratic Republic of the Congo, Eswatini, Lesotho, Madagascar, Malawi, Mozambique, Namibia, South Africa, Tanzania, and Zimbabwe) were also trained in the recognition of OLDs using the ILO Classification system.

Training of occupational hygienists was prioritised by the CoE as the region lacked certified occupational hygienists. The Occupational Hygiene Training Association programme was used for the training of officers from the OHSI, MLSS, and MSD. Risk assessment is the foundation of any health and safety programme, and the programme provided capacity building of occupational health practitioners, mines, and labour inspectors. Thirty-three staff from the three agencies were trained from 2018 to 2023.

Table 1. Legislative reforms

Legislation	Status	Comment
Mines and Minerals Development Act	First round of stakeholder consultation complete	Change of Government meant change of policy; thus, two new Acts are in the process of enactment and this Act will be repealed and replaced
Explosives Act	Cleared by Justice Dept.	Waiting for Cabinet approval before Parliament debate and enactment
Mining (Environmental) Regulations	Cleared by Justice Dept.	Waiting for launch by the Minister
Environment Protection Fund Regulations	Cleared by Justice Dept.	Waiting for launch by the Minister
Mine Safety (Inspection and Examination) Regulations	Second draft in place after first stakeholder consultation	Draft Regulations in place, awaiting clearance by Business Regulatory Authority, then Ministry of Justice, before launch by the Minister
Workers’ Compensation Act	In progress	Awaiting Cabinet approval before tabling in Parliament
OHSI Act, OHSI Regulations	In progress	Awaiting stakeholder engagement of introduction of fees
Factories Act	In progress	Draft Bill awaiting Cabinet approval
OHS Policy	Completed	Implementation plan and policy officially launched

Short-term training was provided in spirometry, audiometry, and vision screening (12 nurses and doctors were trained). Four technicians were trained in dust analysis and four mine and labour inspectors were trained in research and manuscript writing. Health and safety committee representatives were trained in OHS concepts, with a focus on dust management. District Labour Officers were trained on compensation and OHS concepts to enhance their knowledge and skills for inspections in that area.

Impact of the Centre of Excellence

Most of the interventions planned have been implemented in a timely manner. The availability of trained human resources and the procured state-of-the-art equipment have enhanced the efficiency and effectiveness of service delivery at the CoE. The OHSI in Kitwe expanded its coverage by opening up new OHS centres in Lusaka (in 2019) and Solwezi (in 2021). The investment made by the project in equipment and infrastructure, and the opening of these new sites, have contributed to improved access and quality of OHS services in the country, targeting miners, ex-miners, and non-mining sectors (factory workers, agriculture, drivers, contractors, food handlers etc.).

The increased access, coverage and quality of OHS services has improved performance of the CoE over the years, especially in the areas of medical surveillance, OHS examinations and certification, joint inspections of mines, compensation for miners and ex-miners with work-related disabilities, and human resource capacity development. Additionally, waiting times from initial screening to examination have decreased.

Figure 6 illustrates the impact of the CoE-OHS interventions in the mining industry from 2015 to 2022, where the number of reportable and fatal accidents dropped, more steeply in 2018, due to an increase in inspections, training, and advisory interventions.

The purchased dust sampling equipment necessitated a robust exercise in dust-generating mines, to ensure that sampling was conducted and real-time data recorded and reported. This equipment helped the Inspectorate to cover mines that do not have the capacity to monitor dust levels in the workplaces, and then make informed decisions about appropriate control measures to safeguard employees. Control measures included changes in design and provision of appropriate personal protective

equipment (PPE), which were sanctioned after inspection and dust sampling exercises. For example, the Inspectorate team visited Neelkanth Lime Limited during routine inspections and dust sampling. Around 182 employees were working without respirators in dusty work environments, verified with spot dust samplers procured under the project. The Inspectorate immediately withdrew the employees from the site and directed the mine management to immediately issue them with respirators.

Efficiency in project implementation

Throughout implementation, the project ensured that financial resources were allocated and utilised effectively to achieve the project objectives in a timely and cost-efficient manner. This involved the strategic allocation of funds to ensure that budget allocations within the project components were aligned with project priorities, goals, and activities outlined in the project plan. Resources were strategically allocated to areas with the highest impact and greatest need, such as innovative prevention and detection of TB, epidemic preparedness and response, capacity building, infrastructure development, procurement of essential supplies, and implementation of key interventions.

Cost-effective procurement practices

The project implemented cost-effective procurement practices to maximise the value of project funds, which included conducting competitive bidding processes, negotiating favourable terms with suppliers, leveraging economies of scale, and avoiding unnecessary expenditures.

Transparent financial management

The project established transparent financial management systems and procedures to track budget expenditure, monitor financial performance, and ensure accountability. Accurate records of expenditures, receipts, and financial transactions were maintained, and financial reports were regularly reviewed to identify variances, discrepancies, or potential areas for improvement.

Efficient utilisation of resources

The utilisation of project resources was optimised, including human resources, equipment, and facilities, to maximise efficiency and productivity. Resources were allocated based on workloads,

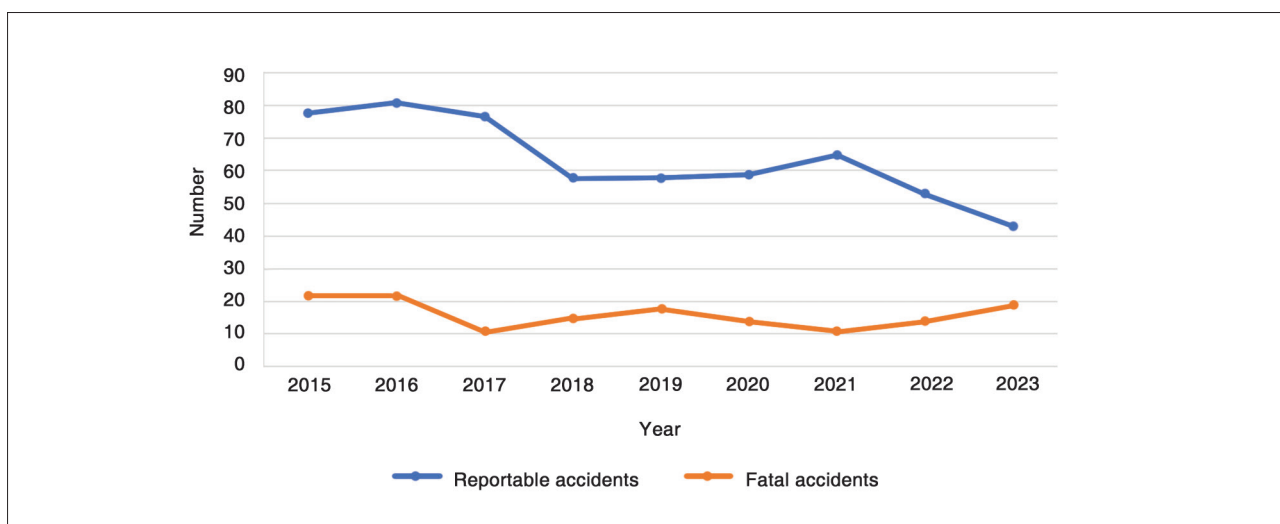


Figure 6. Trends in reportable and fatal accidents, 2015–2023



priorities, and project needs, and minimised wastage or duplication of efforts. Measures to streamline processes, eliminate bottlenecks, and improve workflow efficiency were implemented.

Timely implementation of activities

Activities were implemented according to schedules and within budgetary constraints. Delays, obstacles, or resource constraints that could have impeded progress were identified and addressed; proactive measures were taken to keep the project on track. Critical activities and resource allocation were prioritised to meet project deadlines and milestones.

Monitoring and evaluation of expenditures

Expenditures were regularly monitored and evaluated to assess efficiency and effectiveness of project implementation. This was done internally and externally during the World Bank implementation support mission, to evaluate the impact of budget allocations on project outcomes, outputs, and deliverables, and to identify lessons learned and best practices for future budget planning and management. Feedback from monitoring and evaluation activities, including implementation, was used to improve budgeting processes and enhance project efficiency over time.

The CoE-OHS procured modern digital X-rays to replace the analogue X-ray machines previously in place, which led to improved diagnosis of OLDs. The project invested in GeneXpert and digital X-rays, and mobile clinics, which assisted patients far from health facilities and laboratories.

A regional TB out-of-pocket expenditure survey was undertaken in the participating countries to understand the costs associated with TB treatment, so as to inform better TB control strategies and interventions.

Project implementation arrangements were efficient, with government ministries taking the lead in implementation cost saving. Strategic experts were recruited to build capacity in-house and transferable capabilities to the national TB programmes. The country transferred resources to districts through a performance-based framework and empowered ownership and bottom-up planning with the end user in mind. The World Bank also utilised existing country bank structures. Local technical assistance was utilised where capacity at regional or country level was available.

Despite these successes, it is worth noting that the changes in Government affected the project implementation. A number of procurement activities were either delayed or put on hold until the transition period was complete, which significantly affected the achievement of some key deliverables, especially civil works and the procurement of equipment.

FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOMES

Factors that positively affected implementation

- Strong multisectoral collaboration among the implementing agencies' technical teams
- Use of multisectoral teams in conducting mine inspections resulted in more mines reached within a short timeframe
- The integrated approach to OHS service delivery of the primary, secondary, and tertiary services, all housed in one place
- Strong political will from Ministers in the three ministries of health, mines, and labour to ensure that the project was a success
- Strong support from the respective Permanent Secretaries and senior management, as evidenced by their participation in National Technical Committee meetings

- Buy-in by various stakeholders at all levels of service delivery, from community to national levels
- Strong linkages created with mining companies, local and regional learning institutions, and organisations that promoted knowledge exchange and skills development

Key factors during preparation and design

A few factors delayed the project's effectiveness:

- The Zambia SATBHSS project delayed completing, submitting, and getting approval of the Project Appraisal Document (PAD)
- The project only became effective in March 2017, which delayed disbursement of funds
- Delayed staff recruitment for the Project Implementation Unit (PIU) resulted in delayed initiation of activity implementation
- Each implementing agency identified staff as focal points persons to be on the project; key positions, such as the accountant and internal auditor, were seconded by the MoH to support the project at no added cost to the project

Key factors during implementation

Despite the achievements of the project, there were factors during implementation that either facilitated or hampered success. These were documented based on key informant interviews. There are opportunities for future programmes to develop risk-mitigation plans. Some of key factors included:

- Delayed project effectiveness, recruitment of PIU staff, and release of funds affected start-up of activity until September 2017.
- Equipment and civil works were grossly under-budgeted. This led to extended time spent obtaining approval for budget adjustments, which subsequently caused delays in initiating procurement and service delivery.
- High staff turnover at district and facility levels affected activity implementation.
- High turnover among TB treatment supporters/volunteers was evident, due to lack of remuneration.
- Outbreak of epidemics, such as cholera and COVID-19, resulted in deviating resources from approved activities that had to be suspended.
- The COVID-19 pandemic and associated control restrictions by the Government on movement and gatherings, such as training events, affected project implementation.
- Prolonged procurement processes and approvals resulted in delayed acquisition of services and equipment.
- The suspension of the MoH's Procurement Department for nearly a year, due to administrative reasons, caused significant delays in procurement and service delivery.
- Administrative changes at the MoH delayed the approval of programmes and procurement of goods and services.
- Approval of designs of infrastructures and bills of quantities were given by other ministries, but took longer than expected; the project had no control over the mandate of other ministries, which impacted the programme schedule.
- Prolonged delays in the review and approval processes for no objection by the World Bank affected the implementation of activities, especially the infrastructure designs for key buildings needed to enhance service delivery for screening and examination, and actualisation of the CoE-OHS.
- Delayed infrastructure completion, partly due to delays in payments, delayed the installation of major dust analysis equipment and other laboratory services needed to enhance OHS programmes in the country.



- Prolonged legislative and regulatory reforms hindered the implementation of changes that could have enhanced service delivery and increased benefits for the project beneficiaries.
- The absence of legislation to regulate and/or support the operations of artisanal and small-scale miners prevented them from accessing OHS services amidst excessive dust exposure.

SUSTAINABILITY

Sustainability is essential for healthcare projects to achieve lasting improvements in health outcomes. Optimising the use of resources ensures that investments in TB control and health systems strengthening in Zambia continue to yield benefits in the long term. Maximising the impact of investments in health projects requires sustained efforts to maintain and build upon the progress achieved during the project’s implementation. The SATBHSS project had many elements of sustainability embedded during implementation. The project was mainstreamed within the existing government structures, which ensures sustainability of the project interventions through government funding. In addition, each implementing agency ensured that the milestones created through the project will be sustained.

Ministry of Health National TB Control Programme

The project contributed to the strengthening of the overall health system in Zambia to ensure that TB control efforts are integrated into broader health service delivery platforms. This involved improving infrastructure, notably the construction and renovation of health facilities, and supply of state-of-the-art equipment. The project enhanced supply chain management, human resource capacity building through short- and long-term training, and information systems to support sustainable TB diagnosis, treatment, and care services within the existing healthcare infrastructure.

Mines Safety Department

The MSD has drafted an instrument to enable statutory services rendered to be paid for by mining license holders. The legislation is in its final form and is waiting for the approval of a new law that will see the creation of the Minerals Regulatory Commission. The

objectives of the drafted statutory instruments are to provide for the sustainable administration and enforcement of safety, health, and environmental protection laws in the mining industry, and to enhance service delivery by the MMMD.

The MSD has streamlined its funding to include OHS-related inspections in the mining and mining-related sectors. It has also taken over the maintenance of vehicles procured under the project and will ensure that funding is available for consumables for equipment bought under the project. The MSD will continue to collaborate with other institutions at the CoE to ensure an integrated approach to increasing capacity of occupational hygienists in the country, and increased research on OHS, to protect workers against OLDs and TB.

Centre of Excellence on Occupational Health and Safety

The CoE-OHS was designed to be implemented primarily through existing public institutions such as the MSD, OHSI, WCFCB, and OSHSD. This implementation model created a foundation for sustainability and for the Government to maintain activities within its institutions and resource environments, after the closure of the SATBHSS project. The CoE activities are sustainable, especially since there is adequate capacity being built in OHS coupled with the procurement of state-of-the-art equipment.

The sustainability plan outlines strategies, governance, current efforts, goals, and targets for key operational initiatives, and opportunities for delivering OHS services at the COE-OHS. The aim is to chart the trajectory of self-sustenance of the CoE-OHS, by adopting and implementing value-adding initiatives that embody the four major perspectives of the balanced score card, i.e. internal processes, learning and growth, people, and finances. It further clarifies the modus operandi for quality improvement, financial adequacy, skills, and human resources.

LESSONS LEARNED AND RECOMMENDATIONS

This SATBHSS project Zambia ICR report highlights major successes in TB and OHS programming, and challenges that need to be tackled. Table 2 summarises the lessons learned and recommendations for improvement.

Table 2. Lessons learned and recommendations for TB and OHS programming

<p>Lesson 1: Healthcare workers screening programme</p> <ol style="list-style-type: none"> 1. Most of the healthcare workers that were identified as having TB were seemingly healthy, yet they had TB active disease. 2. The source of TB disease in health facilities is multiple, including undiagnosed patients in the communities, fellow healthcare workers with undiagnosed TB, and guardians. 3. Early TB case detection and routine screening are helpful strategies for reducing nosocomial transmission in areas with either low or high TB incidence. 4. Accurate and timely diagnosis of TB disease is essential to ensure correct and appropriate patient care and public health responses. 5. Most of the staff who volunteer to be screened for TB are juniors, so the number of healthcare workers diagnosed with TB is not an accurate representation. <p>Recommendations</p> <ol style="list-style-type: none"> 1. Consistency in annual screening and awareness-raising are critical elements in addressing hesitance and creating demand for TB screening services. 2. Confidentiality is critical in building trust and motivating healthcare workers to undergo screening for TB.
<p>Lesson 2: Implementation of the results-based financing programme</p> <p>The national TB programme implemented results-based financing (RBF) in 19 districts with support from the SATBHSS project. Since 2019, the initiative has been a game-changer in efforts to control and reduce the burden of TB, with the potential to minimise or even eradicate the disease. The approach relies on community-based volunteers, who are embedded in the communities where missing cases are identified. This proximity facilitates the timely detection and referral of cases to healthcare facilities for further investigation. Regarding RBF, a key consideration is whether to build a new system from scratch or leverage existing systems, as each option has cost implications. This was evident in the in the SATBHSS project; due to inadequate planning, its community RBF efforts were prematurely suspended.</p>



<p>Lesson 3: Availability of qualified personnel</p> <p>The project proved that operations that had qualified managers and support staff implemented primary, secondary, and tertiary interventions more effectively than those that did not have these staff. Operations that had well-structured safety, health, and environment sections handled OSH matters robustly. Effective monitoring of workplace dust requires trained and qualified personnel, who can assess the conditions at each workstation and provide feedback on the effectiveness of intervention measures.</p> <p>Recommendations It is important for the industry to have personnel with diverse qualifications if OSH matters are to be adequately addressed.</p>
<p>Lessons 4: Training needs</p> <p>Review of training needs of employees and the Inspectorate was key in accelerating the enforcement and implementation of primary, secondary, and tertiary interventions for better OSH environments.</p> <p>Recommendations Training needs of employees should be periodically reviewed to accelerate the enforcement and implementation of primary, secondary, and tertiary OHS interventions.</p>
<p>Lesson 5: Knowledge sharing</p> <p>Knowledge sharing among project partners accelerated the implementation of project goals, and provided a platform for reviews of implementation strategies to better manage the mining and mining-related sectors.</p> <p>Recommendations Improve knowledge sharing among project partners to accelerate the implementation and attainment of project goals</p>
<p>Lesson 6: Stakeholder engagement and management</p> <p>The success of the project was mainly centred on the good reception of the concept by all stakeholders, especially the mining sector. Well-crafted stakeholder engagement and management led to significant industry investments, aimed at either reducing dust emissions in the workplace or containing dust to minimise exposure. These measures improved compliance levels in the sector.</p>
<p>Lesson 7: Medical surveillance</p> <p>Access to medical surveillance at initial and every other stage is key for all operations. Availability of such services across the country helps to determine the effectiveness of the intervention measures by the Inspectorate team. During the project life, mobile screening services and the establishment of two screening centres in Lusaka and Solwezi by the OHSI were milestones, used to track the success of intervention measures undertaken during the project.</p>
<p>Lesson 8: Occupational health and safety support</p> <p>Occupational health and safety support provided through infrastructure, training, and equipment procurement was transformative to the regional SATBHSS project. This support led to the establishment of OHS clinics, specifically targeting mining companies and communities.</p> <p>Recommendations</p> <ol style="list-style-type: none"> 1. Zambia's OHSI, as a CoE, needs to be sustained to continue as a critical resource in the broader southern Africa region, and beyond. 2. There is an urgent need to adopt and finalise the pending OHS legislations to increase the benefits of mine safety, compensation, and other OHS policies. 3. The OHSI, through its sustainability plan, should develop its market-shaping strategy for OHS services in the region, and income-generating activities. 4. Investment in a robust data system and collection procedures, including digital health systems (transition from a manual system), is necessary for OHS in mining areas.
<p>Lesson 9: Training and capacity building</p> <p>Training and capacity building were central to the SATBHSS project's success, with 5 989 personnel trained in Zambia through short- and long-term training programmes supported by the project. This initiative has contributed to establishing a competent and sustainable workforce for managing TB and OHS. The combination of training and mentorship proved effective in ensuring that learning took place and was cascaded to lower levels, as demonstrated in the laboratory accreditation SLIPTA process.</p> <p>Recommendations</p> <ol style="list-style-type: none"> 1. Future training and capacity-building project components should be periodically evaluated. 2. There should be a shift to competence-based training curricula at regional and country levels, linked to quality improvement; gaps should be identified and targeted with refresher trainings. 3. The use of e-learning platforms or hybrid practical approaches such as Extension for Community Health Outcomes (ECHO) should be used to deliver training; costly physical training platforms should be avoided.
<p>Lesson 10: Collaboration</p> <p>Multi-sectorial collaboration between the ministries of health, mining, and labour, and external partners, was instrumental in accelerating project components and outcomes.</p>
<p>Lesson 11: Research</p> <p>Operational research complemented and informed evidence-based interventions for TB and OHS. Twelve studies have been completed in Zambia; findings were disseminated in national and international forums. These studies have expanded the knowledge base for practitioners and will be key in enhancing better decision-making for both ongoing and future initiatives. The research studies were aligned to country TB and OHS research priorities, to some extent. Some contributed to policy changes.</p> <p>Recommendations</p> <ol style="list-style-type: none"> 1. These research findings should be disseminated to lower levels and utilised for funding applications. An example is the TB out-of-pocket expenditure studies in countries that had recommendations for reducing financial burdens on TB patients, by using health insurance and social protection measures; however, limited work has been undertaken in countries to drive this. 2. Consideration should be given to conducting more action/implementation research that is strongly linked to local TB operational challenges, with the objective of finding local solutions. 3. The link between researchers and policymakers should be strengthened.
<p>Lesson 12: Digital innovations</p> <p>Zambia invested in digital health innovations, including TEST and a virtual TB situation room. These represent innovative approaches for utilising data science and connectivity to enhance visibility and decision-making in TB management. The ECSA-HC also played a supportive role in training countries on utilising data for action.</p> <p>Recommendations A clear pathway should be developed for scaling up of the digital health innovations launched in the country, and integrating these innovations with national health information systems for greater buy-in by Governments and sustainability.</p>

CoE: Centre of Excellence, ECSA-HC: East, Central and Southern Africa-Health Community, OHS: occupational health and safety, OHSI: Occupational Health and Safety Institute, OSH: occupational safety and health, RBF: results-based financing, SLIPTA: Stepwise Laboratory Quality Improvement Process Towards Accreditation, TB: tuberculosis



CONCLUSION

The SATBHSS project timely supported innovative and progressive interventions over the seven years of implementation in Zambia. A number of achievements have been registered, challenges documented, and lessons learned from the implementation of the three project components, as described in this report. Consequently, the WHO has recognised Zambia's remarkable achievements in reducing TB incidence and mortality rates. Zambia has been placed among 83 nations, worldwide, that have recorded a decline in TB incidence of 20% or more from the 2015 baseline. Furthermore, Zambia has been recognised among 47 countries that have successfully reduced TB mortality by 35% or more. These achievements are a testament to Zambia's commitment to fighting TB and improving the overall health of its citizens.

The project has immensely supported Zambia on cross-border preparedness, the COVID-19 pandemic, and future disease outbreak responses, by the creation of a stronger, resilient health system. A number of public health assets were procured during the project, including state-of-the-art equipment. Laboratories were renovated and DR-TB wards were built. Additional benefits include improved laboratory and healthcare infrastructure, enhanced quality, and transformative support for OHS practices. This is demonstrated through a multi-disease approach, effective targeting of mining and related communities, and the introduction of innovations and CoEs. Furthermore, operational research studies are building evidence for future interventions.

Additional information about some of the issues presented in this report can be found at: <https://practhealth.co.ke/wp-content/uploads/2024/05/Abridged-ECSA-HC-SATBHSS-ICR-Report.pdf>