

## **SPEAKING NOTES FOR DIRECTOR-GENERAL**

### **DUST AND INFECTION FREE LUNGS: HARNESSING ARTIFICIAL INTELLIGENCE FOR TB AND SILICOSIS**

**DATE: 20 - 22 JUNE 2024**

**VENUE: RADISSON BLU, SANDTON**

---

Programme Director,  
World Health Organisation and International Atomic Energy Agency representatives who will be presenting virtually,  
The Deputy Executive Director of the Stop TB Partnership, Dr Suvanand Sahu and representatives of the Stop TB Partnership,  
The Senior Fund Portfolio Manager of The Global Fund to Fight AIDs, TB and malaria - Dr John Ocheru,  
Mr Gaurang Tanna from the Bill and Melinda Gates Foundation,  
The Chairperson of the Southern Africa Miners Association, Mr Jabu Xaba and other representatives from SAMA,  
Dr Thuthula Balfour from the Minerals Council and health executives from the mining companies,  
Dr Charles Sandy from NEPAD,  
The CEO of the Tshiamiso Trust, Dr Munyadziwa Kwindu and senior managers,  
The representatives of the different vendor companies providing Computer Aided Detection solutions and portable X-ray units,  
Academics and researchers from China, India, Canada, South Africa and Mozambique including the National Institute for Occupational Health and the TB Think Tank.  
Officials from South African Health Products Regulatory Authority  
Officials from Ministries of Health in Mozambique and South Africa and from the provincial departments of Health  
Ladies and gentlemen

**Good morning!**

And a warm welcome to all delegates during the cold month of June to Sandton – the economic heart of our country! Our transition to democracy has spanned 30 years and we applaud our political leadership in their vision and implementation of a government of national unity following on the peaceful elections in May. On 16 June, we celebrated Youth Day which remembers the sacrifice of the youth of South Africa in 1976 during what is known as the Soweto uprising.

The Soweto uprising was a series of demonstrations and protests led by black school children in South Africa during apartheid that began on the morning of 16 June 1976. Students from various schools began to protest in the streets of the Soweto township - not far from Sandton - in response to the introduction of Afrikaans, considered by many blacks as the 'language of the oppressor', as the medium of instruction in black schools. It is estimated that 20,000 students took part in the protests. They were met with fierce police brutality, and many were shot and killed. The number of pupils killed in the uprising is unknown, but some sources estimate as many as 700 fatalities. The uprising was a key moment in the fight against apartheid as it sparked renewed opposition against apartheid in South Africa both domestically and internationally. In remembrance of these events, 16 June is a public holiday in South Africa, named *The Youth Day*. Internationally, 16 June is known as ***The Day of the African Child***, in recognition of the role played by those young people in the struggle against Apartheid!

Programme Director

The theme of this conference is ***Dust and infection free lungs: harnessing artificial intelligence for TB and silicosis***. The Industrial Revolution was the transition from creating goods by hand to using machines. Its start and end dates are widely debated, but the period generally spanned from about 1760 to 1840. Indeed, computer aided detection tools using artificial intelligence are part of the fourth industrial revolution and are based on four paradigms in computational intelligence namely – Fuzzy Logic theory, Artificial Neural Networks, Evolutionary Computation and Swarm Intelligence. As a health professional, I will leave it to the esteemed delegates at this conference who are well versed with such technologies and are using them in the Computer Aided Detection development process to answer any questions!

This conference in collaboration with the StopTB Partnership and The Southern Africa Miners Association comes at an opportune time to help us gain awareness of the CAD diagnostic tools to assist us towards the End TB Goal by 2035. Chest radiography is an essential tool for screening and evaluating diseases of the chest and for over a century it has played an important role in TB diagnosis, clinical care and follow-up. The accurate interpretation of the Chest X-ray, however, depends on the availability of skilled medical doctors or specialist radiologists. CAD for TB is a disrupter and used ethically and in support of good clinical practice will assist us with enhanced diagnostic support and defining appropriate algorithms for further sputum diagnostics and treatment of TB in the general adult population and use by the Medical Bureau for Occupational Diseases in compensation claims management and mining companies to assess workers undergoing their annual medical examinations.

I note that the World Health Organisation issued a recommendation that CAD solutions may be used in place of human readers for TB screening and triage in individuals aged 15 years and above after the WHO undertook a comprehensive review of the artificial intelligence-based CAD software for Chest X-Rays in 2021. This conference presents a timely opportunity to discuss expanding the use of CAD technology to detect silicosis given the substantial mining sector in South Africa and exposures of miners and other workers to silica dust. Our experience with CAD in TB screening has demonstrated its potential to revolutionize disease detection, and we are eager to bring this technology to bear on silicosis. I am assured by colleagues from the StopTB Partnership, the MBOD and our esteemed academic colleagues that CAD for silicosis is still in its developmental phase and the deliberations at this conference will assist with the scientific approach for the use of CAD for silicosis in working populations.

The conference will also have inputs on the use of portable and ultra-portable X-ray units which in combination with the Computer-Aided Detection software could significantly increase the diagnostic capabilities especially in outreach services and to reach the missing populations in TB. These portable units have not been used in South Africa and discussions across the StopTB Partnership, the MBOD and SAHPRA have begun and will ensure the provision of the necessary documentation and field implementation results for regulatory approval and incorporation into the TB plan.

While the CAD software and portable hardware units are a game changer, implementation challenges remain. Further operational research is needed in the use of CAD and portable units in field settings and sub-populations. Infrastructure needs such as connectivity may be a problem and electricity supply can be overcome using battery packs and solar units. Updates and new CAD versions are provided that may be incompatible with existing computer operating systems and generally the CAD software is standalone and not incorporated into electronic health records.

The CAD-based Chest X-rays have proven accurate for TB detection in adults, and it is hoped that this conference will provide an overview of the evidence for TB detection and the research, development and field implementation of CAD for silicosis as well as consider the clinical, ethical and regulatory aspects related to its deployment.

I thank you and wish you well with your deliberations over the next few days!