

**Remarks by Minister Ebrahim Patel at the National Covid-19 Conference and Webinar, held on 31 July 2020.**

Ministers Blade Nzimande our host today and our innovation champion  
Minister Zweli Mkhize, who leads our national medical efforts  
Cabinet Ministers present today.  
Director General of the WHO, Dr Tedros Gebreyesus  
African Union Commissioner, Sarah Anyang Agbor  
Distinguished scientists and participants  
Fellow South Africans

Today, there is no doubt about the devastating effect of the Covid-19 on human life and the economy.

A globalised, integrated world brings benefits, but also vulnerabilities – consider just the sheer speed with which the virus has spread and the more than 650 000 lives already lost. Every life lost is a tragedy, for the family and the community.

Yesterday the world's largest economy, the United States, reported a 33% fall in economic output. This is unprecedented; the greatest quarterly decline in US records. The Bank of England has said the UK is likely to have the deepest recession in 300 years. China is expected to have the lowest growth since the death of Mao Zedong. Across the world, the impact of the virus is harsh.

South Africa and the African continent are not being spared, with deep impacts on growth, jobs and funds for development.

But in the challenging moment, what we can draw on to fight this virus is human solidarity and scientific innovation.

And so honoured guests and fellow South Africans, I want to report on progress with an initiative that draws on the best of South African solidarity and innovation.

One of the most serious effects of Covid is the attack on the respiratory system, with problems that patients have with breathing that can cause loss of life.

Medical ventilators are used to supply oxygen to the lungs of severely ill patients.

Under normal circumstances, hospitals have a basic and adequate supply of ventilators, ranging from ambu-bags resuscitators, to nasal cannulas, to CPAPs and finally to invasive ventilating machines. They buy these from suppliers elsewhere in the world based on normal need.

In March, when the virus reached our shores, we had no local manufacturing capacity for ventilators and yet the health-care demand for ventilators surged.

But today as we speak, South African-designed and manufactured ventilators are rolling off the production line. Over the next month, we expect many thousands of non-invasive ventilators to be delivered to hospitals and medical facilities across the country, brought together through South African ingenuity and by South African hands.

I want to briefly tell the story of this innovation.

In April this year, hospitals reported that they were unable to source ventilators on global markets.

Minister Nzimande and I then decided to initiate the National Ventilator Project.

We appointed one of our top agencies, the South African Radio Astronomy Organisation (SARAO) to serve as project managers given their world-class systems integration and systems engineering capabilities.

These same scientists and engineers had delivered some of the technologies for the Square Kilometer Array project in the Northern Cape; the world's largest radio telescope project with the power to peer deep into the cosmos and to shed light on the mysteries of the universe.

Based on clinical experience in Covid-19 epicentres like China, Italy, the UK and the US, senior critical-care physicians advised us that we should focus on the production of non-invasive Continuous Positive Airway Pressure devices – what are called CPAPs – because they had the greatest potential impact on saving lives.

And so we put out a national call: to our manufacturing sector; to research agencies; to universities and science councils, with the aim of rapidly facilitating the local development and manufacture of thousands of non-invasive ventilators.

The response we received was phenomenal. Nearly 100 individual proposals were received.

These were thoroughly evaluated by the engineers and scientists at SARAO, to ensure compliance with international standards for ventilators, usability in our hospitals and medical facilities, and to fully leverage South African manufacturing expertise.

We needed a machine that could be used as easily in a private hospital in Sandton as in a field hospital in the Eastern Cape.

Prototypes of the most promising proposals were then built. They were in turn tested first in the laboratory and then in one of our largest public hospitals.

The designers took the machines through approval by the medical products regulator.

Funding was mobilised quickly from the Solidarity Fund, which was established early in the crisis by the President as a platform for South African citizens and businesses to donate towards addressing the challenges of the crisis.

Ms Gloria Serobe, Chairperson of the Solidarity Fund and her excellent team are present on this virtual call.

Each machine consists of about 30 separately manufactured components. These have been produced in the past few weeks. Today, the first batch of completed ventilators are coming off the assembly line, part of an initial order of 10 000 units which have been engineered by the Council for Scientific and Industrial Research. A second manufacturer is also producing a further few thousand. Twenty thousand units in all will be produced.

Final assembly of this device is taking place at the Akacia Medical facility just outside of Cape Town, and from there it will be distributed to hospitals across the country.

But this is just final step in a supply chain that brings together components made by eight different supplier companies across the country, from Centurion in Gauteng, to the Dube Tradeport in Kwazulu-Natal and Buffalo City in Eastern Cape, to Central University of Technology in Manguang in Free State and the University of Cape Town.

Incidentally Mr President, the Buffalo City component firm Ikusasa Green, was initially incubated through the competition supplier fund that we put as a condition of the Walmart/Massmart merger and which stepped up to produce a hosing component for the CPAP.

May I take a moment to show a few photos of the device and how they will be used:



Picture 1: This is a Medical technician holding the entire device, showing the blending unit and patient mask. The device supplies a pressurised mixture of ambient air and industrial oxygen to the patient through a mask or hood.



Picture 2: This is a close up of the blending device. The pressurized gas helps the patient by supplying a higher level of oxygen and by keeping the airway and lung pressure elevated above the surrounding air pressure throughout the breathing cycle, ensuring the patient's lung is operating effectively.



Picture 3: The medical operator can adjust the inspired oxygen proportion ( $FiO_2$ ) of the gas supplied to the patient and can adjust the elevated pressure to the required level.



Picture 4: The achieved pressure can be monitored by the medical operator. Infection control is critical to prevent the spread of the virus in the health care facility. For this reason the management of exhaled air and proper sealing of the mask/hood is important.



Picture 5: The final assembly and packaging of the CSIR device is taking place at the Akacia Medical production facility outside of Cape Town.

I want to conclude with the observation that the shortage of testing kits and ventilators and medical grade masks and other PPEs have underlined the importance of Africa developing a strong innovation and manufacturing capability, of building more resilient economies.

The ventilator project shows what is possible. Disease and poverty are the challenge – science and solidarity are the weapons to fight this.

Within the space of four months our country has gone from having no capacity to produce CPAP ventilators, to now having the first units coming off the production line.

As we build our production capacity, we will support our neighbours across the African continent with these ventilators. South African manufacturers have produced sanitisers, masks and other critical medical goods to neighbouring countries.

The National Ventilator Project is one example of solidarity and science, of what we can achieve when we work together toward common objectives.

Other strong initiatives had been the production of millions of litres of locally-made hand sanitisers and surface disinfectants; and the doubling of local production of medical grade masks from 6m a month to 13m a month.

We now need to bring that same spirit to the wider task of economic reconstruction and use our technologies, our know-how, our expertise and our social solidarity to rebuild the economy.

May I conclude with an appreciation to Dr Blade Nzimande for this timely Webinar, Dr Rob Adam and his SARAQ team!