COVID-19

Lockdown Time capsule of South Africa, April 2020

South Africa had one of the strictest Covid lockdowns in the world starting on the 26th of March and lasting for 35 days. With five weeks of quarantine where only essential services were open, all educational institutions, places of worship and workplaces were shut down and people had to shelter in place. Walking on the streets was even prohibited except to buy food. The country was slowly moved through varying restrictions over the next 5 months as the health risks decreased as the virus was slowed down effectively. The articles in this timecapsule represent the analysis from scholars at The University of Johannesburg of the 5 week lockdown period and appeared on various open access platforms. They are collected here as a small historical archive of that time.

CORONAVIRUS:
The answers lie in the numbers

By Rendani Mbuvha and Tshilidzi Marwala | Archive

This article first appeared in the Daily Maverick on 1 April 2020
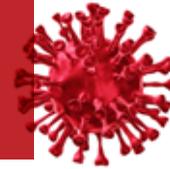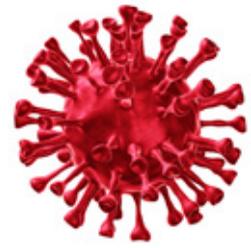
The Black Death is the plague that infected people in Europe and Asia in the mid-1300s. It killed more than 20 million European people in five years, which was more than a third of Europe's population then. It is estimated that between 75 and 200 million people died in Eurasia. It took Europe 200 years to recover its population size.

Many, including the king of France, blamed the heavens, but that was irrelevant because the bacteria was transmitted through rats and fleas. Some, in cities such as Barcelona, Strasbourg and in Flanders, accused and massacred the Jewish people "for poisoning the wells", but it turned out that the relatively low mortality in that community was due to the Jewish religion's promotion of cleanliness. The culture of cleanliness was not widespread in Europe at the time. The absence of science in any society is dangerous, and it can lead to superstition and murder. The Spanish influenza of 1918 infected 500 million people in the world and killed between 50 and 100 million. These are scary numbers.

Today we have another pandemic – the coronavirus (Covid-19). The novel coronavirus first manifested in the city of Wuhan in China in December 2019. The disease has subsequently spread around the world, leading to the World Health Organisation (WHO) declaring it a pandemic on 11 March. In South Africa, by Sunday 29 March, it was reported that the coronavirus had infected 1,280 and killed two people. The growth trajectory of this virus is less than exponential, which means it is significantly slower than the regular 'flu. What is emerging is that modern pandemics are killing fewer people than previous ones. However, it is still too early to tell" how this pandemic will evolve and what havoc it will heave in society.

States around the world have embarked on numerous strict measures to lock down their countries to "flatten" the curve of Covid-19 cases. Governments around are now scrambling to ready their healthcare for surges in systems capacity as the pandemic reaches its peak. However, for governments to plan appropriately, they have to answer some of the following questions: how much of the population will be affected? How many will require hospitalisation? When will the country hit the peak infection level? Is the current lockdown effective?

The Susceptible-Infectious-Recovered Model

Answers to these questions lie in projections of each country's infection trajectory. There are various techniques that epidemiologists, actuaries and data scientists use to generate such predictions. One well established epidemiological model for the projection of infectious diseases is the Susceptible-Infectious-Recovered (SIR) model. The SIR models the transition of individuals between three stages of a condition: 1) being susceptible to the condition, 2)

having the condition and being infectious to others 3), and having recovered and built immunity for the disease. In its simplest form, it uses two variables, and these are the basic reproductive number and the infectious period. The infectious number is the number of individuals that a person on average may infect, whereas the infectious period is the time frame in which an individual is contagious.

The SIR model utilises a branch of mathematics called differential equations to simulate transitions of individuals between various stages of a disease over time. Differential equations is a type of mathematics that falls under the field called Calculus. Sir Isaac Newton and Gottfried Leibnitz independently invented calculus. Ironically the seeds for the invention of Calculus were germinated when Newton left Cambridge University in 1665 to escape the plague (not too dissimilar to the coronavirus) that was affecting the town.

Specifically, the differential equations in the SIR model govern the rate at which susceptible individuals become infected, how the infected transmit the virus to the susceptibles and finally the rate at which the infected recover. The SIR model is a very influential method, in epidemiology, and in the last two months alone there have been over 20 articles (without peer review) published by researchers in online repositories using the SIR to forecast Covid-19 related infection trajectories.

Many projections reported in the media are actually based on outputs of SIR modelling reports such as the now popular Oxford Study suggesting that 60% of the UK population will be or have been infected by Covid-19.

We have similarly calibrated the SIR model on the current South African data with similar findings to the Oxford study, assuming no state intervention. Considering recent state interventions, our SIR model infection estimates could be lower than 20% at its peak.

Proceed with Caution

As models are mere simplified abstractions of reality, the SIR model does have its pitfalls. First, the SIR model assumes random mixing of individuals – this fundamentally starts to deviate from reality as more

and more countries adopt lockdown and gathering restrictions. One aspect that is proving difficult to model is how the socioeconomic differentials will impact the already nonlinear epidemiological models. Furthermore, how does one tune the model, especially to account for townships where community sharing facilities is widespread? The model also requires the distinction between infected individuals and "confirmed infected cases".

Thus a percentage of infections like the currently popular 60% includes a large number of latent cases who will not even know that they have been infected by the disease and will exhibit either no or mild symptoms. This distinction becomes critical in healthcare resource planning as the infected population estimates, which includes the latent cases, tend to overestimate the expected healthcare utilisation. In Wuhan, it was found that the actual confirmed cases were only 0.5% of the prediction of the SIR model. Evidence such as this from Wuhan assists greatly in contextualising results that might seem alarming such as the popular 60% estimate. In reality, only around 2% will translate to the utilisation of healthcare facilities – at least based on what we have seen from SIR models around the world.

While there are numerous estimates for the Covid-19 infection trajectory, it is crucial to discern the foundational assumptions of the models used clearly. Importantly, caution must be exercised given the limited data available to establish clear trends of the pandemic and the many dynamics at play from state interventions. Now that President Cyril Ramaphosa has declared a national lockdown, to defeat the coronavirus let us stay in our homes during this time and follow basic hygiene as recommended by the Ministry of Health.

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Marwala is a professor and the Vice-Chancellor of the University of Johannesburg. He deputises President Cyril Ramaphosa on the South African Presidential Commission on the Fourth Industrial Revolution.

Covid-19:

A multipronged approach to protect ourselves and others.

By Sehaam Khan and Saurabh Sinha | Archive

*This article first appeared in the Daily Maverick on 6 April 2020 as
"Covid-19: Droplets and Aerosol transmission: How do we protect others and ourselves?"

The rapid increase in the spread and transmission rate of the virus SARS-CoV-2 (Covid-19), has led to a frenzied upsurge in general and social media coverage. This, in turn, has led to many conflicting reports related to the spread and transmission of Covid-19 within various environments.

Hourly, we are bombarded with newspaper articles and social media stories, which relay "factual" information from "reliable" sources. The public is confused! While we are cautioned to only rely on information provided by the Centre for Disease Control and Prevention (CDC) and the World Health Organisation (WHO), there have also been many reputable research papers that have recently been published, related to the transmission and spread of the virus.

Furthermore, infectious disease experts working on the frontline of Covid-19 control have released videos and reports. Peer-reviewed journal articles and expert information from infectious disease specialists are thus important resources, which must be considered in our quest to learn as much as we can about this virus currently ravaging our globe. Let us thus attempt to simplify and collate the recent information related to the transmission and longevity of Covid-19.

To date, Covid-19 is known to spread by short-range respiratory droplets and is hypothesised to spread by longer-range aerosol transmission. When we consider the nature of aerosols versus droplets, we must understand that size and behaviour matter. The virus particle size is approximately 50 to 200 nanometres (nm) in diameter. To put this into perspective, one nm is one-billionth of a metre. The human eye (regular vision), without any assistance (magnifying glasses or microscopes etc.), can see objects of approximately 20 micrometres (μm) in size.

Nanometre-sized objects, like the coronavirus, are thus a thousand times smaller. Droplets are normally larger than 20 micrometres (μm) in diameter and are usually produced when coughing or sneezing. They are heavy enough to succumb to gravity and usually travel no more than one to two metres. When an infected person releases these droplets, each droplet may contain many virus particles. To complicate matters, droplets may travel further distances depending on wind conditions. Airflow thus influences the travel distance of droplets.

However, irrespective of the distance, when these droplets fall onto various surfaces, inanimate objects that now "carry" the infectious virus particles, are called fomites. The infection is then indirectly spread when an uninfected person touches these fomites and proceeds to touch their face (mucous membranes of the eyes, nose and mouth).

We therefore must stress the importance of handwashing and hand hygiene. However, we do not advocate irresponsible wearing of gloves. Just before the nationwide lockdown commenced, I (Sehaam Khan) was at the airport travelling from Johannesburg to Cape Town. Almost every person I encountered, whether airport staff or traveller, was wearing a pair of latex gloves. Now, I have been in the laboratory environment long enough to recognise a pair of gloves that have been worn for an extended period – the glove sticks to your skin because your hands are perspiring. This to me indicated that people were not regularly changing their gloves.

I watched in awe and horror as one young woman put her gloved hand to her mouth to blow a kiss at a colleague. In her mind, I am sure, the gloves were offering a form of protection. I am willing to bet that wearing those gloves may even have been considered as a replacement for hand washing. IT DOES NOT. You need to change your gloves numerous times a day. In fact, it should be noted that almost every time you touch an object, you need to dispose of the worn gloves. This is similar to what one observes when visiting a doctor! For many, this is not possible. Soap, water and proper hand hygiene works.

Direct infection (person to person) may also occur by droplet infection, if we stand within range (one to two metres), from the respiratory tract of an infected individual (cough or sneeze), to the mucous membranes of the uninfected person. Moreover, aerosol particles, which are normally smaller than 10 µm in diameter, can travel for many metres (greater than two meters) in the air before they fall to the ground or onto a surface, and may be inhaled.

As a countermeasure, many Asian countries have strongly advocated for the wearing of facemasks. In contrast, the WHO has indicated that wearing a facemask is not advisable. We encourage wearing a facemask when in public spaces for the following

reasons: a) even with proper and frequent hand hygiene, unless you are washing your hands after touching every single object, there may be a time when you (an uninfected person) could come into contact with a fomite and inadvertently touch your face; b) by wearing a facemask, direct infection can also be curtailed; c) comparing the transmissibility rate of the USA and some European countries (e.g. Italy) to South Korea, Japan and Taiwan, it is evident that wearing a mask in public areas (together with many other factors) has positively contributed to controlling the virus spread; d) a facemask decreases the spread of the virus by an infected person; and e) if it is in fact true that non-symptomatic infected people may transmit the virus, it is definitely advantageous to encourage the public to wear facemasks, to curtail spread and infection.

Recently, the Czech Republic took the radical step of mandating the wearing of nose and mouth coverings in public spaces. In contrast, the US Surgeon General and WHO have stated that wearing a mask is not effective in preventing the public from being infected, yet state that they require these masks for their health professionals.

Ultimately, we are of the opinion that a protective measure like a surgical facemask, in conjunction with social distancing and good hand hygiene, will lower the virus infection rate. We do, however, support the sentiment that should there be a shortage of facemasks, health professionals should take priority.
The University of Johannesburg plays an important role in the Fourth Industrial Revolution (4IR). In my (Saurabh Sinha) contact with our campus clinics, we have directly faced the shortage of masks. One of our Chinese partner institutions, Shandong University, has donated 2,000 facemasks for campus clinics and security staff. Supported by an open-source design, we have 3D-printed face shields. In a university environment, one can occasionally find overhead projector transparencies and these have been used for the shield cover. A number of innovations have come about as a result of Covid-19. Like many other measures, post the control of a pandemic, our hope is that innovative thinking will remain and also assist with economic rebound.

We further understand that health professionals are trained in wearing professional protective equipment

like facemasks, thus the likelihood of them constantly fiddling with their masks, and in so doing touching their faces, is substantially lower. Can we thus not teach the public proper "facemask etiquette", in the same way that we have educated the public on how to wash their hands correctly?

There is a lot to still learn about Covid-19. One peer-reviewed article talks about the spread of Covid-19 at patient lavatories and change-rooms in hospitals. This is due to contamination in change-rooms and through fomites in lavatories. Shared spaces, like lavatories are, however, common given the socioeconomic conditions of informal settlements in South Africa. Focusing on healthcare professionals, a recent peer-reviewed study conducted in Wuhan Province, China, investigated for the presence of Covid-19 within various areas in two hospitals, during the outbreak.

The authors divided the sampling locations into patient areas (where the Covid-19 patients had a physical presence), and medical staff areas (workplaces in the two hospitals exclusively accessed by the medical staff who had direct contact with the patients). Their results showed that the Covid-19 concentrations were high inside the patient mobile bathroom (aerosol; one hospital), excessively high in the rooms where protective apparel of healthcare professionals were removed (aerosol; seven locations – one hospital) and high on the floor of the intensive care units (deposits; two locations – one hospital).

Researchers in Singapore, who also detected high levels of the virus in bathrooms, confirmed this study. In both studies, rigorous sanitation processes (when implemented) and the surface sanitation of protective apparel drastically reduced the virus numbers to undetectable levels.

We think it is evident that in order to slow down the virus transmission rate, a multipronged approach is required. It is also evident that we must be willing to constantly consider new information, and if necessary, adjust our recommendations based on evidence and global successes, that use best practice. Humility to listen and be adaptable is now more important than ever. Cover your nose and mouth, wash your hands regularly, practice physical distancing, implement rigorous sanitation processes in hospitals (where infected numbers may be higher), or shared lavatory spaces, and surface sanitise personal protective clothing.

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Pandemic underscores gross inequalities in South Africa, and the need to fix them

By Lauren Graham | Archive

This article first appeared in The Conversation Africa on 5 April 2020

Now more than ever, South Africans are painfully aware of the inequalities that continue to play out in the country. In people's pre-Covid-19 lives, the realities of living in a country that is among the most unequal in the world were easily overlooked. The pandemic shines a very bright light on this reality. It asks us to fundamentally address them – not just at this time of the pandemic, but as a social justice imperative.

As messaging about preventing the coronavirus ramped up, the consequences of inequalities in the provision of basic service provision in the country have become clear. These disparities between rich and poor are reflected across a range of interventions that have been put in place to manage the pandemic and its social and economic consequences. These include access to water, housing circumstances, as well as people's very high dependence on social grants and the informal sector for income.

Five areas where inequality is starkest

Living circumstances: The preventive measures have highlighted inequalities in living circumstances. Take the case of hand washing. The 1.1 to 1.4 million people who live in informal settlements in South Africa don't have access to water in their homes or in their yards. An estimated 19% of the nearly 19 million people living in rural areas lack access to reliable supply of clean water; 33% do not have basic sanitation. This makes regular hand washing difficult. And social distancing or quarantining is near impossible when water access and ablutions are communal, and where settlements are overcrowded.

Livelihoods: For many people at the upper end of the wage spectrum, working remotely has been relatively easy, with limited impact on their ability to earn a living. Such workers are in the formal labour market. They are protected by both a legal and social contract as well as a safety net of unemployment benefits.

Small business owners will be under significant pressure in the coming weeks and months. But they will be partially cushioned by the business support measures announced by the government. In contrast, the most vulnerable workers will struggle without support at this time. Casual workers (like many domestic workers), those who are self-employed (such as Uber drivers), and those working in the informal
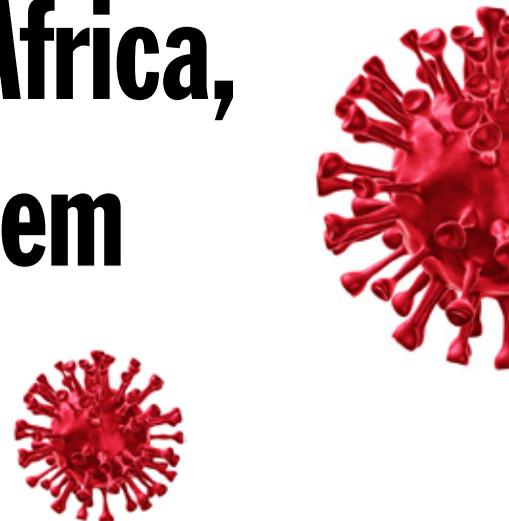
economy are not protected by legal contracts.

In general these workers, who make up over 20% of South Africa's workforce, cannot access unemployment benefits. They will be under enormous pressure financially, potentially unable to feed themselves and their families.

President Cyril Ramaphosa has made it clear that the government is aware of these challenges and will move to ensure support. But it remains to be seen what that entails.

Education: Inequalities in education were also immediately evident when school were closed. While private schools and many suburban public schools were able to switch to technology-supported learning relatively easily, most public schools were not. The directive by the Department of Basic Education was to ensure that learning continued by providing workbooks and worksheets online. But, many parents will be facing the very real struggle of supporting their families in a locked down economy. This, and other problems, including limited access to technology and data, means that many parents will struggle to supervise their children's learning.

Equally concerning is how this will affect education outcomes in the longer term. Analysis already shows how learning backlogs in the early years, forged in an unequal education system, are compounded over time. Further backlogs under the current situation are likely to have long-term effects.

Access to the internet: Manuel Castells, a sociologist concerned with the internet age and inequality, notes in his book The Internet Galaxy:

The fundamental digital divide is not measured by the number of connections to the Internet, but by the consequences of both connection and lack of connection. At universities and other higher education institutions, wealthier students have been able to switch to online learning quickly, while poorer students battle with high data costs.

Inequalities in access to data further entrench existing inequalities in education and livelihoods during the Covid-19 crisis.

Food security: The effects of panic buying on the food security of people with limited income has received attention. But a less well-known impact of the measures is that over 9 million children will not receive a daily, nutritious meal while schools remain closed.

The National School Nutrition Programme potentially has positive effects on reducing stunting and obesity. In the face of prolonged school closures, these children face increased food insecurity, with potential long-term consequences for their health.

There have been heartwarming responses from the public to ensure that food packs are provided to children. But it is simply not possible to reach the over 9 million children who depend on this meal.

What can be done?

The measures announced by President Ramaphosa to mitigate the problem reflect an understanding of how existing inequalities will affect especially the most vulnerable people, and a willingness to address the problem.

Social protection measures that can quickly provide a safety net are crucial at this time. But, the current social protection system provides a safety net only to those outside of the labour market – children, older people, and people with disabilities. Unemployment benefits accrue to those in formal employment who contribute to the Unemployment Insurance Fund. This leaves the vast majority of working-age adults without a safety net at this time.

While there have been relatively quick changes to existing mechanisms to provide support to small, medium and micro enterprises there are, as yet, no measures to protect informal and casual workers and ensure cash injections into vulnerable households.
The country needs to devise a social contract to better address the vulnerabilities that low-wage, casual and informal workers face daily.

The country must also move towards having low-cost, reliable internet access that can open up opportunities for learning and work for its most vulnerable citizens. Basic services – such as clean water, electricity and sanitation – must also be of a quality that not only

promotes people's right to dignity, but also help protect people from the effects of such a pandemic as Covid-19.

This pandemic highlights how crucial it is to fundamentally address the inequalities that exist in South African society. If a social justice imperative does not push us to do so, perhaps the realisation of mutual connections, borne of a pandemic that knows no class or race lines, will.

Prof. Lauren Graham is an Associate Professor and the Director of the Centre for Social Development in Africa. She has a Doctorate in Sociology from UJ. Her research interests are in the application and testing of social and development theories in practice with a focus on youth transitions to adulthood and specifically to the labour market. She is an NRF Y-rated scholar and a previous Newton Advanced Fellow.

Prof. Suzy Graham speaks on Covid-19 and its impact on international relations, trade and travel

By Stephan Lehman | Archive

This article first appeared in the Bedfordview and Edenvale News on April 5 2020

With the Covid-19 pandemic sweeping across the globe, the Bedfordview and Edenvale News spoke with Prof. Suzy Graham, Associate Professor and Head of Politics and International Relations at the University of Johannesburg (UJ).

Graham spoke about the South African government's reaction and the impact the virus will have on international relations, trade and travel.

She said the measures taken by the South African government were appropriate to try and reduce the spread of the virus: "I think the government took action when the virus started to spread already in the country."

Graham said in hindsight, measures such as the closure of borders and returning citizens to South Africa, could have already been put in place when the virus broke out in the northern hemisphere.

However, if this had been done, she said the economy and other aspects of society would have been impacted earlier too.

While comparing SA's response to Covid-19 to that of other countries, Graham believes the South African government responded fairly quickly to the pandemic as cases rose in the country: "In my opinion, our government instituted measures earlier in the crisis than other governments did in their countries."

Graham said although the measures put in place will have an impact on the economy, tourism, education and other sectors, the health of citizens must take precedence.

Speaking on the international community, Graham said many countries are still cooperating instead of seeking total isolation: "There is regional protection and individual country protection. Countries recognise how globally connected the world is; there are so many intricate networks and multiple layers of interaction. Countries are taking advice from the World Health Organisation (WHO), among other scientific advice."

One example of countries cooperating is the European Union (EU). Graham said the EU is acting to protect all EU citizens.

Despite the cooperation, leaders of countries needed to implement measures like the closure of borders as the number of cases increased: "This 'enemy' is not another country, it [the virus] is attacking any humans regardless of culture, race, creed, class, station in life."

Graham believes if states do isolate themselves completely, they would have to reassess their global supply chains and production industries.

With regards to international trade, Graham described the impact as significant and added that the international community has not seen the full impact on trade yet.

Graham said although she could not predict if the virus would bring a change in the economic superpowers of the world, she highlighted that global events like world wars can dramatically shift economic positions worldwide.

"This is different though as WHO has indicated that this virus could reach every country in the world and therefore all states are likely to suffer losses of many kinds."

On the topic of travel and the ease of migration in regions such as the EU, Graham said new regulations may be put in place to better control travel. However, in the same breath, Graham said things may just return to the way they were before the crisis: "As this is linked to health, new health regulations might be enforced."

In Graham's opinion, the ease of travel in areas like Europe contributed to the spread of the virus: "Despite this, the rapidity of spread and impact on communities of the novel coronavirus could not have been anticipated in my view."

Dr. Suzanne Graham is Associate Professor of International Relations at the Department of Politics and International Relations at UJ and HOD of the Department (2018-2020).

Covid-19, cellphone location tracking and SA's contradictory security response
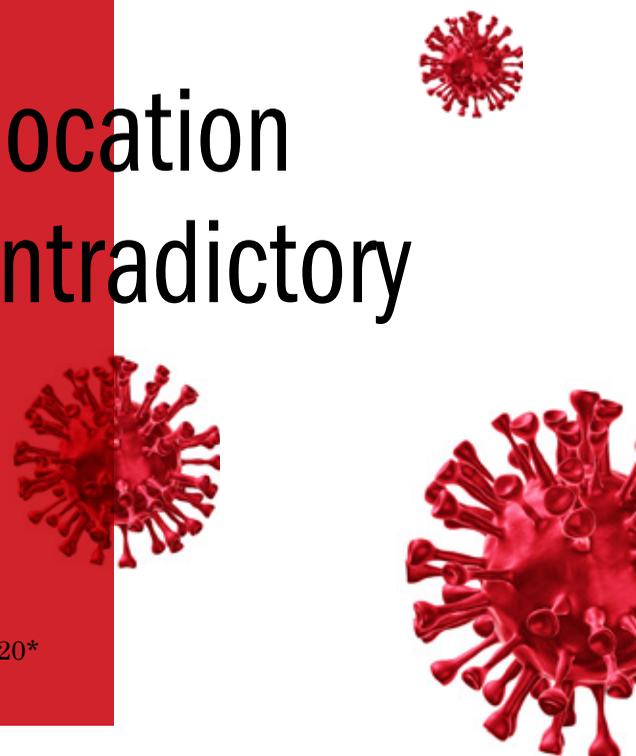
By Jane Duncan | Archive

This article first appeared in the Daily Maverick on 6 April 2020

Ever since the lockdown began in South Africa, I have been tracking the government's evolving positions on using cellphone tracking in the fight against Covid-19. It hasn't been easy obtaining information about exactly what their intentions are.

Initially, it seemed as if the government was intending to use aggregate location data to map trends in the spread of the virus. The Minister of Communications announced this intention at a security cluster briefing on 25 March. In it, she said that the cellphone industry has agreed to provide data analytics to track how many people are affected in a particular area.

However, her statement didn't provide much clarity on exactly what they would be providing. Since then, the government has elaborated on their intentions, notably through revised regulations published by the Ministry of Cooperative Governance on 2 April.

So how has the government's position on cellphone tracking evolved, what do the regulations say, how do government's plans measure up to international best and worst practices, and what do these

intentions tell us about how democratic or autocratic government's response is to the pandemic?

The spectrum of uses for location data in the fight against Covid-19

There is a spectrum of uses for location data in the fight against the virus, ranging from non-intrusive to highly intrusive.

The least non-intrusive is to use aggregated and anonymised location data to model population density in the spread of the Covid-19 virus. For instance, Belgium is tracking the mobility of peoples' movements at a broader level to see if confinement measures are working or not. This data can then be fed into government decisions about whether to relax or tighten measures.

There is always the danger of this data being de-anonymised and people being re-identified. But these dangers recede when densely populated areas are being surveilled, which is most likely where the data will be of most use, and mitigation measures are used.

On the more intrusive end of the scale, governments can obtain location data to track the movements of people infected with Covid-19, to establish who they have been in proximity to, and to isolate those people. People who violate lockdowns can also be traced and people graded according to the public health risks they pose. South Korea, China, and Israel have been using location data in such ways.

Location data can speed up the hugely laborious task of contact-tracing by interviewing Covid-19 carriers in countries that are failing to flatten the curve. People who have been in contact with someone diagnosed with the virus can be informed immediately, without having to wait for contact tracers to get to them.

In these cases, location data can literally save lives. It even be used as an alternative to an economically-damaging lockdown, as economic activities among uninfected individuals could continue.

However, there are unanswered questions about the effectiveness of location data for these more granular uses. According to the digital rights group, the Electronic Frontier Foundation, location data may not be sufficiently precise to allow people who have been in close proximity to a Covid-19 carrier to be identified with accuracy.

A more democratic option to involuntary contact tracing involves self-monitoring tracking apps that encourage cellphone users to provide to health authorities their location information and information about symptoms voluntarily. They offer an attempt to strike a balance between public health concerns, on the one hand, and privacy on the other.

This option will be difficult to implement in South Africa, though, where large numbers of South Africans still lack access to data, some don't even carry cellphones and, of those who do, many carry feature phones. Furthermore, these apps are only effective if large numbers of people use them. Zero-rating the apps could be one solution.

South Africa's evolving position on location data

Government's evolving position on this is clear from the changes between an initial set of directions issued on 26 March and new regulations issued on 2 April.

On 26 March, the Department of Telecommunications and Postal Services released a direction in terms of the Disaster Management Act, covering communications and media-related issues.

Under the heading "individual track and trace", the cellphone operators, and in fact "the digital sector in general", are required to provide location-based services "to support government departments to assist and combat the spread of Covid-19".

The regulation provided important clues to the government's intentions, in that they appeared to extend beyond obtaining aggregate information and into using location data to track those infected with Covid-19 to see who they had been in the vicinity of.

This intention was confirmed to my colleague, researcher and information rights activist, Murray Hunter, by the Department of Communications. Yet, at that stage, there was no indication of them intending to apply for warrants to obtain this information.

When approached for comment, the largest cellphone operator in South Africa, Vodacom, told me this:

> "Current laws in South Africa serve to protect customer information and do not allow us to share any customer information without a court order or without the consent of the customer. In the event that Vodacom is served with a Section 205 subpoena from the court, Vodacom will then be obliged to act accordingly and will abide by applicable South African laws. Having said that, our understanding of the data information request outlined recently by minister Stella Ndabeni-Abrahams is for high-level aggregated data on how people are moving, to help curb the spread of Covid-19. This does not include personal information or information that identifies a specific individual."

This statement suggested that Vodacom and the government were not of one mind about how location data would be used. I was unable to obtain a comment from the second biggest cellphone operator, MTN.

Revised Covid-19 regulations and the new route

Then, on 2 April, the government released revised

regulations, with much more elaborate procedures for location tracking. In important respects, they even exceed the privacy protections for metadata provided in Rica and the Criminal Procedures Act.

According to the regulations, the Department of Health will maintain a Covid-19 database of those infected or reasonably suspected of being infected. The department can direct the cellphone companies to provide location data for the database about the Covid-19 carriers or people who have been in close proximity to them.

Furthermore, the department can only request data between 5 March (when the pandemic really picked up) and when the state of disaster finally lapses, and they can only use the data strictly for the purpose of countering the virus. They and others are not allowed to intercept any other communication content.

The regulations envisage the appointment of a special Covid-19 judge, appointed by the Minister of Justice. The Department of Health, on a weekly basis, needs to provide the judge with a list of people whose details were obtained through the regulation, and these people need to be informed six weeks after the state of disaster has lapsed that their details were intercepted.

The Covid-19 judge can also make recommendations to the relevant Cabinet members regarding the amendment or enforcement of the regulations in order to safeguard privacy, while not compromising the fight against the virus.

There are positives and negatives to these regulations. One huge positive is that these regulations recognise the principle of user notification.

In its constitutional challenge to Rica, the amaBhungane Centre for Investigative Journalism has argued that Rica is incorrect in not allowing people whose communications have been intercepted to be notified after investigations have reached a non-sensitive stage. This secrecy prevents interception subjects from contesting abusive government interceptions.

The regulations also incorporate basic data protection principles, such as purpose specification and time limit principles. They require that within six weeks after the

lapsing of the state of disaster, all information in the Covid-19 database should be de-identified, and retained and used for research purposes. The designated judge can give directions if s/he isn't satisfied about these new storage arrangements.

However, I am less convinced about the role of the special judge, as the regulations do not envisage judicial authorisation.

If the judge has any reservations about decisions taken, then s/he only has the powers to recommend remedial action, not review the decisions. This part of the regulations should be reconsidered, as it turns the judge into a rubber stamp for the executive.

Rica does contain similar emergency procedures where the authorities can notify the judge after the fact if they have intercepted communications when life and limb is threatened. While not the subject of the constitutional challenge, that procedure is unsatisfactory, too, as it doesn't spell out what happens if the judge disagrees with the authorities' decisions.

This loophole has seen the intelligence agencies using emergency powers thousands of times, simply because it is easier to use than the conventional procedure involving prior judicial authorisation.

Now, it could be argued that locating people infected and affected by Covid-19 requires urgency, but courts deal with urgent matters all the time. Nothing stops the judge, or a panel of judges, from dealing with applications and making decisions on an urgent basis.

The reporting requirements in the regulations mitigate the potential for abuse, but the absolute baseline for individual cellphone tracking is that the authorities must apply for a warrant, which a judge must issue.

Securocratic or democratic? Untangling the government response

When it comes to government's intentions to use cellphone tracking in the fight against Covid-19, the bottom line is it could be worse. The government has clearly made an effort to come up with a much less autocratic system than countries like China, Israel and South Korea. The fact that the regulations are driven by public health officials and not the police or the spy

agencies is a significant strength.

But, it's impossible not to contrast this (largely) positive development with the conduct of some police and military officers on the streets. Already, violent military and police actions have become a blight on the lockdown, with police officers under investigation for the deaths of three civilians.

Police Minister Bheki Cele's threatening tone in announcing lockdown measures is a stark reminder that the militarised conditions that gave rise to the 2012 Marikana massacre remain deeply embedded in the police.

In other countries, the lockdowns have revealed already-existing problems in policing, and South Africa is no exception to that general rule. However, the government has had a large window of opportunity in the wake of the massacre to deal with these problems, and it hasn't. Yet, it has moved with much more speed on the Jacob Zuma-era abuses in the State Security Agency, give or take a speed bump here and there.

Why this contradictory picture? Most likely, because largely policing abuses don't touch the political elite. They touch the working class: the families crowded into one-roomed houses, shack dwellers, refugees.

The elites, on the other hand, are touched by unaccountable state spying. As is public knowledge, politicians in the highest levels of the state have been targets. Clearly, the amaBhungane challenge to Rica has been a wake-up call for them, to the point where they are even willing to concede the very accountability measures they opposed in the case, such as user notification.

State violence erodes trust in the state's ability to protect people during this crisis, and is likely to inflame an already tough situation at the worst possible moment. The last thing the government needs to deal with is spontaneous protests of angry people raging against state violence and unbearable conditions.

Unless the government is consistent in its commitment to rein in the securocrats during "normal" times – and not just cherry-pick those powers that affect politicians directly – then we are likely to see uneven, classist and selectively violent responses continuing in times of crisis.

Jane Duncan is a professor and Head of Department of Journalism, Film and Television. She is author of 'Stopping the Spies: Constructing and Resisting the Surveillance State in South Africa' (Wits University Press, 2018).

Staring down the securocrats

By Jane Duncan | Archive

In a rare encouragement for public oversight, South Africa has indicated to use location data responsibly in the fight against Covid-19.

In light of South Africa's history and its weak metadata controls, concerns were strong that the government's intention to use location data in the fight against Covid-19 would lean authoritarian. Yet, the fairly comprehensive regulations added to the Disaster Management Act on April 2 have been seen as a welcome change and glimmer of hope. Arguably, this is due to the pressure civil society had put on the country's surveillance regime before the crisis.

(Tweet: @DuncanJane (@go2uj): South Africa has issued surprisingly strong regulations for the use of location data against #Covid19, incl. purpose specification, user notification & a sunset clause. This speaks to the unrecognised power of public oversight.)

Last month, the South African government announced its intention to follow other governments around the world and use mobile phone location data in the fight against the Covid-19 pandemic.

At the time of writing, South Africa had recorded 1462 cases of Covid-19 and 5 deaths: thankfully, below what the government had projected for this stage of the pandemic. Yet, the country is the most affected by the pandemic in Africa. There is the real possibility that infections may rise massively if the virus sets into the country's densely-populated low-income or no-income areas.

Instead of wasting crucial time by fumbling its response, the government moved quickly and decisively to counter the pandemic. South Africa has been in a police- and military-enforced lockdown for a week, and faces at least another two weeks before the lockdown is lifted.

It is in these conditions that South Africa announced its intention to use location data: a move that has triggered privacy concerns. However, significantly, the government has declared a national state of disaster, rather than a national state of emergency. So, rights such as privacy have not been suspended.

How does the government intend to use location data, and what do these intentions tell us about

how autocratic or democratic its response is to the pandemic? This question matters because emergency powers have a nasty tendency of sticking around long after the emergency that necessitated them has passed. In the case of South Africa, in the wake of the September 11, 2001, attacks and as part of its contribution to the 'War on Terror', Parliament passed a basket of anti-terror laws, including the Regulation of Interception of Communication and Provision of Communication-Related Information Act (RICA), that has remained largely unrevised in spite of the overbroad powers it gave to the country's security services.

South Africa has a terrible history of a securocracy, in which members of the military and the police helped to govern the country and invoked emergency powers to crush mass opposition to apartheid. More recently, the country has emerged from a decade where the security and intelligence apparatuses of the state were misused to benefit a corrupt political elite. If South Africa is to put this history behind it once and for all, then the government needs to ensure that any emergency measures lapse after the pandemic has abated. Thus, the declaration of the State of Disaster must lapse as soon as possible after the pandemic subsides, as the declaration of a lockdown allows the security services to wield extraordinary powers such as prohibiting gatherings.

Intelligence uses and abuses of metadata

There is a spectrum of uses for location data in the fight against the virus, ranging from non-intrusive to highly-intrusive. The least intrusive way is to use aggregated and anonymised location data to model population density in the spread of the Covid-19 virus. Governments intent on more intrusive measures can obtain location data to track the movements of people infected with Covid-19, to establish who they have been in proximity to, and to isolate those people. People who violate lockdowns can also be traced and graded according to the public health risks they pose. South Korea, China, and Israel have been using location data in such ways.

Even before the pandemic began, South Africa had a cavalier approach towards using metadata in intelligence operations, with the number of requests into the thousands. A new research report by information rights researcher and activist Murray Hunter shows how useful metadata (and especially location data) is to the police for investigating and solving crimes, but how they also prefer to use the least transparent route for obtaining it.

There are two main routes that state intelligence agencies can use to access metadata: a more stringent procedure set down in RICA and the Criminal Procedures Act.

RICA is used mainly by the Crime Intelligence Division of the South African Police Service. The State Security Agency (the civilian intelligence agency), the Defence Intelligence Division of the South African Defence Force, and the Financial Intelligence Centre are less frequent users.

While RICA is used mainly for accessing communication content, the state agencies can also use it to access metadata in real-time. Both, however, require authorisation by a special judge. The applicants must show that there are reasonable grounds to believe that a serious crime has been, is being, or will probably be committed. RICA requires that the cell phone companies store metadata for between three to five years. The Act also sets out procedures for the intelligence agencies to access archived metadata, but these are less stringent than for content or real-time metadata. However, the intelligence agencies prefer to use the Criminal Procedures Act, which merely requires that a judge needs to be satisfied that the metadata is relevant to a case. Its usage is not restricted to serious crimes. Furthermore, even a magistrate can issue a subpoena in terms of the Act; it does not have to be a High Court judge.

While RICA is slightly stronger than the Criminal Procedures Act on controls and oversight, neither Act provides sufficient protections for metadata. These weaknesses are premised on the outdated view that communication metadata is less privacy-sensitive than communication content.

Currently, the South African Constitutional Court is considering whether RICA is even constitutional. An investigative journalism organisation, the amaBhungane Centre for Investigative Journalism, challenged the constitutionality of RICA on several grounds, including privacy. The case followed a

revelation that amaBhungane's managing partner, Sam Sole, was spied on by the state, presumably to uncover his sources in a state institution. The Constitutional Court heard the case in February and judgement is reserved.

Some of the key problems that amaBhungane is challenging are the lack of post-surveillance user notification, the lack of independence of the special judge, the lack of procedures for the processing of personal information, and the fact that the State Security Agency's bulk signals intelligence agency, the National Communications Centre, has no founding statute and is, therefore, in its entirety a rogue entity.

While the amicus curiae applicants in the case raised the lack of controls over metadata usage, the issue was not central to the case and is unlikely to be ruled on. So in other words, South Africa announced its intention to use location data in the fight against Covid-19 in a context where metadata oversight and controls were already weak. Therefore, it was widely expected (and understandably so) that the government's plans would lean towards the authoritarian end of the spectrum.

South Africa's approach to using location data

The government's evolving position on this is clear from the changes between an initial set of directions issued on 26 March and new regulations issued on 2 April. On 26 March, the Department of Telecommunications and Postal Services released a direction in terms of the Disaster Management Act, covering communications and media-related issues. Under the heading 'individual track and trace', the cell phone operators, and in fact 'the digital sector in general', are required to provide location-based services 'to support government departments to assist and combat the spread of Covid-19'. The regulation provided important clues to the government's intentions, in that they appeared to extend beyond obtaining aggregate information and into using location data to track those infected with Covid-19, to see who they had been in the vicinity of. This was in spite of the fact that according to South Africa's largest mobile operator, Vodacom, their understanding was that the government was only after aggregate data.

Then, on 2 April, the government released revised

regulations, with much more elaborate procedures for location tracking. In important respects, they even exceed the privacy protections for metadata provided in RICA and the Criminal Procedures Act. According to the regulations, the Department of Health will maintain a Covid-19 database of those infected or reasonably suspected of being infected. The Department can direct the cellphone companies to provide location data for the database about the Covid-19 carriers or people who have been in close proximity to them. Furthermore, the Department can only request data between 5 March (when the pandemic really picked up) and when the state of disaster finally lapses through a declaration by the Minister of Cooperative Governance and Traditional Affairs, and they can only use the data strictly for the purpose of countering the virus. They, and anyone else for that matter, are not allowed to use these procedures to intercept any other communication content, allaying fears that the state of disaster would be used to spy on what people are saying.

The regulations envisage the appointment of a special Covid-19 judge, appointed by the Minister of Justice. The Department of Health, on a weekly basis, needs to provide the judge with a list of people whose details were obtained, and these people need to be informed six weeks after the state of disaster has lapsed that their location data was obtained. The Covid-19 judge can also make recommendations to the relevant cabinet members regarding the amendment or enforcement of the regulations in order to safeguard privacy, while not compromising the fight against the virus.

The regulations also incorporate basic data protection principles, such as purpose specification and time limit principles. They require that within six weeks after the lapsing of the state of disaster, all information in the Covid-19 database should be de-identified, retained and used for research purposes. The designated judge can give directions if s/he isn't satisfied about these new storage arrangements.

Most surprisingly, the regulations recognise the principle of user notification: surprisingly because the government had opposed user notification in the amaBhungane case. In its constitutional challenge to RICA, amaBhungane argued that RICA is incorrect in not allowing people whose communications have

been intercepted to be notified after investigations have reached a non-sensitive stage. This secrecy prevents interception subjects from contesting abusive government interceptions.

One disappointing aspect of the regulations is that they do not envisage judicial authorisation. If the judge has any reservations about decisions taken, then s/he only has the powers to recommend remedial action, not review the decisions. This part of the regulations should be reconsidered, as it turns the judge into a rubber stamp for the executive. RICA does contain similar emergency procedures where the authorities can notify the judge after the fact if they have intercepted communications when life and limb is threatened. While not the subject of the constitutional challenge, that procedure is unsatisfactory, too, as it doesn't spell out what happens if the judge disagrees with the authorities' decisions. The intelligence agencies have used this emergency power thousands of times, simply because it was easier than the conventional procedure involving prior judicial authorisation.

The reporting requirements in the regulations mitigate the potential for abuse, but the absolute baseline for individual cell phone tracking should be that the authorities must apply for a warrant, which a judge must issue.

Making the securocrats blink

People around the world are scared of the pandemic and the uncertainty it has created. These are times when people are least likely to resist the removal of democratic rights and freedoms. After all, what is the point of having rights when the most important right of all, namely life, is at risk. Autocrats could quickly take advantage of the fact that protests have been shut down and popular counter-power is weak.

The South African government's enforcement of the lockdown has been highly uneven, and has revealed existing cracks in policing. Members of the public have laid scores of complaints against the police and military for violent enforcement of the lockdown, including three deaths, allegedly as a result of police action. The situation is precarious and may lead to reactive protests: the very thing the country can do without at the moment. Therefore, it is of the utmost importance that the lockdown be enforced using the least intrusive and coercive means possible. It is commendable that the government moved with great speed on clarifying their intentions with location tracking, put their powers in writing, limited their scope (although there is room for improvement), and subjected themselves to a sunset clause restricting the Department of Health to use these powers until the State of Disaster has lapsed or has been terminated through a gazetted official notice.

The fact that the regulations are driven by public health officials and not the police or the spy agencies is a significant strength. They imply that the government has actually conceded deficiencies in its metadata interception practices. It is doubtful that they would have done so had the amaBhungane case not happened. This case demonstrates the power of one of the most unrecognised forms of intelligence oversight, namely public oversight. But, at least it is clear now that it is possible to stare down the securocrats and make them blink.

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From weapons to ventilators:
time for Denel to do some socially useful work

By Jane Duncan | Archive

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Earlier this month, South Africa's parastatal arms manufacturer, Denel, announced that it would begin to manufacture ventilators in partnership with other entities, to assist in the fight against Covid-19. Countries are battling with major shortages of medical equipment, and South Africa has the additional challenge of a declining Rand.

So it stands to reason that domestic manufacturing capacity should be put to use in the fight. The parastatal has also floated the idea of turning Casspirs into ambulances and producing sanitisers.

Crises have a remarkable way of focussing the collective mind on what really matters. Denel should have branched out into socially useful work a long time ago. Markets for conventional arms are shrinking around the world, leading to more arms manufacturers focussing on the same market: the Middle East.

Denel has set its sights on marketing its wares to corrupt and repressive Gulf states as its target market, with Saudi Arabia at the helm. It should not be allowed to continue with its plans, as it will be feeding the disastrous instability in the region and beyond.

As its finances flounder and job losses loom, it has become clear that Denel has reached its sell-by date. But what happens to Denel beyond the manufacture of war toys? Its current turnaround strategy is underwhelming.

Major arms manufacturers such as the US and the UK are also facing shrinking markets for conventional arms. Yet, they continue to cling obstinately to old growth paths of militarism, financialisation and automation. They have even been willing to resort to military action if their global supremacy is threatened, irrespective of how unsustainable these measures are.

Many countries have severe shortages of the kinds of scientists and engineers involved in defence manufacturing, South Africa included. Companies in the thrall of the 'Fourth Industrial Revolution' are automating more productive functions, leading to the massive destruction of jobs. At the same time, the globe is experiencing an unprecedented ecological crisis.

Yet, economic production remains doggedly skewed towards market demands rather than broader social needs. If there is one positive thing to come out of

the Covid-19 pandemic, it is that countries are being forced to rethink what forms of production are really needed to sustain life.

Denel's ideas are not new. In fact, for many decades, the anti-war and trade union movements have called for the transformation of arms manufacturing into socially responsible, useful and necessary work.

One of the most inspiring legacies of the labour movement was a plan developed by a group of workers in the UK company Lucas Aerospace, who were facing imminent retrenchment in the 1970s. The company produced technical products for the civilian market, as well as weapons for the defence industry.

As highly skilled scientists and engineers, they used this threat to their livelihoods to reimagine their work and their contributions to society more generally. The workers lamented what they referred to as the 'dehumanisation of science and technology', not necessarily because of the misbehaviour of scientists and technologists, but because society misused their skills.

The Lucas workers also expressed concern about the de-skilling of their jobs, as the increasingly popular principles of scientific management atomised them into separate production units, overseen by managers who left little room for discretion, much less creative problem-solving. As more workers felt completely oppressed by their working environment, they lost interest and disengaged from the world of work.

They also recognised that the shift from human intelligence to machine intelligence was exacerbating the problem. They argued that society has the capacity, and in fact the duty, to shape the trajectory of technological innovation, and governments should not allow people to be lulled into believing that these innovations occurred autonomously of society.

According to the workers:

There is something seriously wrong about a society which can produce a level of technology to design and build [the] Concorde, but cannot provide enough simple urban heating systems to protect the old age pensioners who are dying each year from hypothermia. ...[Further] it is clear that there is

now deep rooted cynicism amongst wide sections of the public about the idea, carefully nurtured by the media, that advanced science and technology will solve all our material problems.

So, the workers began a shopfloor-led discussion to transform their work from military/industrial production into socially useful work. However, they recognised the dangers of planning for their shop floor only, as the hostile environment would most likely impinge on them and scupper their plans. So, they felt it necessary to link their plans to a wider industrial strategy that promoted economic diversification of areas dependent on arms manufacturers.

The workers were decades ahead of their time, and perhaps even foresaw the current ecological crisis, by arguing for the need for a just transition from arms manufacturing into socially useful work, especially renewable energy. In other words, they argued for the need to move from destructive to constructive work.

The Lucas workers assessed their existing product range and workplace skills and drafted an alternative corporate plan, dubbed the Lucas Plan. They did so by collecting ideas from the shopfloor, and came up with 150 alternative products.

These products included scaling back on military submarine production and focussing on producing submersible vehicles for marine agriculture, and braking systems linked to velocity sensing devices to address the inadequacies in braking systems in widespread use in public transportation.

In the medical sector, they proposed producing kidney dialysis machines. In the energy sector, they intended to make heat pumps and wind turbines. They even grappled with alternative energy storage solutions, recognising that batteries of the time placed limits on any ambitions to transition to green energy. They proposed using lessons learnt in building batteries for defence ground support to offer hybrid alternatives to conventional battery production, which could be used in combined rail/ road vehicles.

Although the Lucas plan was never implemented, it has continued to inspire activists to this day. The UK-based Campaign against the Arms Trade (CAAT) has used the plan as a touchstone to develop detailed

proposals for shifting defence manufacturing to green products.

According to CAAT, it is entirely feasible to shift employment in large scale arms manufacturing to the renewable energy sector, and would go some way to freeing up scarce skills in the science, technology, maths and engineering fields.

Focussing specifically on offshore wind energy, they have argued that the UK government could contribute to global security by demilitarising its foreign policy and promoting sustainable, low carbon and planet-saving energy sources.

These proposals could well have application beyond the UK, including in southern Africa, where South Africa dominates the local defence industry.

Denel is beset with financial problems. While some problems relate to the parastatal becoming embroiled in state capture, some are more deep-rooted and include unprofitable sales and loss-making contracts, and rising costs coupled with declining revenues.

Their turnaround strategy for the strategy includes plans to strengthen corporate governance, reduce internal costs, unbundle non-core functions and focus on core functions. It also intends to explore diversification into related areas, find new markets for its niche products, and possibly take on a private equity partner.

However, the parastatal's reported diversification plans appear to be limited to security, cyber-technology and advanced software solutions, and providing more services to the police, suggesting that it was also considering the markets for dual-use technologies.

Many conventional arms manufacturers are, in fact, moving into dual-use production, including spyware, as it allows them to sell not only to defence departments, but to police and intelligence agencies also. This is something that South Africa does not want to do, as it will contribute to a globally destabilising cyber-arms race, and existing export controls remain inadequate.

Weapons-grade spyware can be (and has been) abused to target dissidents and others who are considered politically inconvenient. So serious is the problem that the UN Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression, David Kaye, called for an immediate moratorium on the global sale and transfer of the tools of the private surveillance industry until rigorous human rights safeguards are put in place.

As the parastatal dispenses with what it has identified as non-core parts of the business, job losses remain a looming threat, particularly in aerostructures manufacturing. All of these factors mean that the parastatal is ripe for conversion to a company that provides socially useful goods.

It is necessary and important or an arms manufacturer to repurpose itself to produce socially useful goods during a national crisis. But this commitment to thinking outside the bomb mustn't be abandoned once the crisis subsides.

Jane Duncan is a professor and Head of Department of Journalism, Film and Television. She is author of 'Stopping the Spies: Constructing and Resisting the Surveillance State in South Africa' (Wits University Press, 2018).