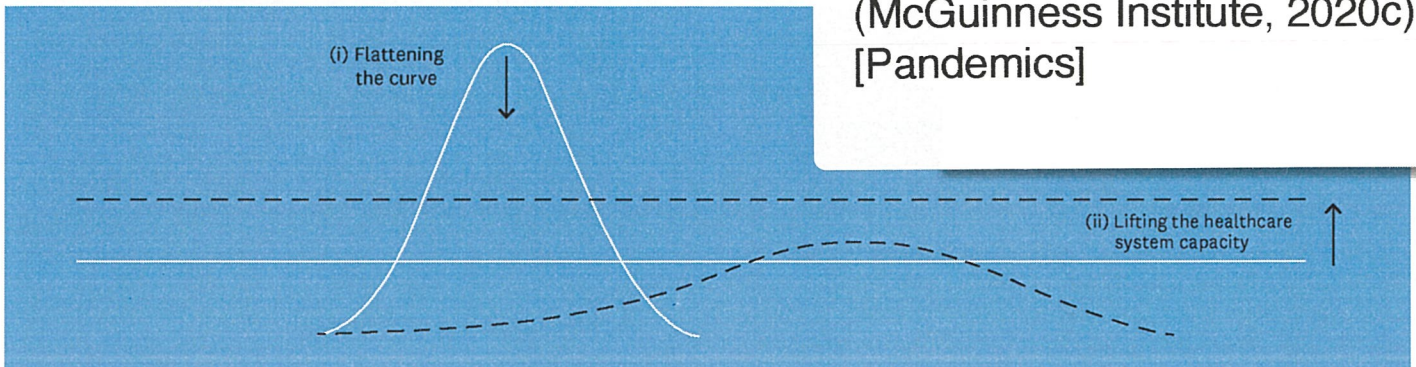


The Long Normal: Preparing the National Reserve Supply (NRS) for pandemic cycles

Think Piece 33: April 2020

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[Pandemics]



Two strategies for managing COVID-19.

Wendy McGuinness

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Pandemics are not uncommon. The COVID-19 pandemic is the fifth global pandemic in just over a century (previous pandemics began in 1918, 1957, 1968 and 2009). When looking back over time, pandemics can be seen as part of the normal cycle of events, what the Institute calls 'The Long Normal'. In this context, taking the time to reflect on New Zealand's performance to date may not only reduce further healthcare shocks during this pandemic but also help the country prepare for the next.

Why complacency must be avoided

The four pandemics in the last century (mentioned above) were all types of influenza. They all come from one family of viruses: technically known as A(H1N1), A(H5N2), A(H3N2) and A(H1N1) respectively. In contrast, COVID-19 is a disease generated by a human coronavirus. Importantly, human coronaviruses have only been around since the 1960s; before that time coronaviruses were only found in animals.¹

What is concerning is that two smaller human coronavirus outbreaks have occurred over the last 17 years: the 2003 Severe Acute Respiratory Syndrome (SARS) (technically called SARS-CoV) and the 2012 Middle East Respiratory Syndrome (MERS) (technically called MERS-CoV).

The COVID-19 pandemic is therefore the third significant human coronavirus outbreak in just under two decades. To date, a vaccine has not been developed for any type of human coronaviruses 'despite the fact that the 2002 SARS and 2012 MERS outbreaks, both caused by viral cousins of the new coronavirus, were warning shots that claimed about 1,600 lives'.²

The fatality rate is also an important consideration. The World Health Organization (WHO) believes the SARS mortality rate was in the vicinity of 15% of confirmed cases, while MERS was about 34% of confirmed cases.^{3,4} In comparison, WHO believes COVID-19 mortality rates sit between 3-4% of confirmed cases.⁵ Given the increased number of human coronavirus outbreaks in the last 17 years, it is particularly important to build New Zealand's system now in preparation for another, more deadly, pandemic in the next few years.

What this means for New Zealand

The COVID-19 pandemic presents an opportunity to learn the lessons now for what might lie ahead. Vaccines take time, in which case the onus falls on the Government to minimise the impact of a pandemic. This means practices must be transparent and able to be scrutinised by all; every failure must be identified and every success understood.

This think piece looks at what can be learnt so far: what information is transparent (and what remains hidden and unable to be scrutinised) and what public policy solutions might be useful in the future. There is a particular focus on the national reserve supply (NRS) and resourcing of personal protective equipment (PPE) to frontline health workers.

Flattening the curve and lifting the healthcare system's capacity

New Zealand's first case of COVID-19 was confirmed on 28 February 2020 – almost a full month after most of Europe and the United States. New Zealand has been able to learn from the experiences from other countries, and has therefore been able to quickly implement a full lockdown. For more on the COVID-19 country curves see the graphs at the end of this think piece.

New Zealand's response to the COVID-19 pandemic has been to 'flatten the curve' by eliminating the coronavirus in New Zealand. The country was placed in a month-long lockdown from 26 March 2020. A second strategy, see Figure 1 above, is to 'lift the healthcare system's capacity' to deal with pandemics, particularly in regard to the storage and distribution of the NRS. How the system is meant to respond to a pandemic is set out in a collection of Ministry of Health (MoH) documents (see Appendix 1 for a table of MoH's pandemic planning documents).

One of the most important documents in the collection is the 2013 *National Health Emergency Plan: National Reserve Supplies Management and Usage Policies*. This sets out New Zealand's pandemic stock and how it is to be distributed during an epidemic, pandemic or other emergency. Its aim is to provide 'continued access to essential supplies during large or prolonged emergencies that generate unusual demands on normal health service stocks or supply chains'. The key phrase in this is 'continued access', as there have been numerous reports in the media and concerns raised that this has not been the case; implying that somewhere there has been a breakdown either in stocks held or logistics in getting product from MoH and DHBS to frontline health workers.

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The Ministry manages and/or controls a number of national reserve supplies. Some of these are held in MoH and DHB stores, (and others in bulk stores off DHB sites).⁶ For example, the plan states that masks are held by both the MoH and DHBs, whereas all other PPE is to be held by DHBs. DHBs are required to account 'to the Ministry for all national reserve supply receipt and usage'.⁷

Since mid-January, as a global COVID-19 pandemic became increasingly likely, the Institute has been trying to ascertain New Zealand's medical ventilator and NRS stock levels. The Institute wrote to the Minister for Health on 2 March asking about ventilator numbers in New Zealand and ICU capacity. The Institute also sent an open letter to New Zealand's 20 DHBs on 27 March, requesting stock levels of gowns, masks, goggles, gloves, disinfectant (e.g. bleach), hand sanitiser, oxygen tanks, CT scanners and medical ventilators.

This information has not been forthcoming: responses to date (9 April 2020) have simply acknowledged receipt of the request or cited s 18 (f) of the Official Information Act 1982 (which enables a request to be refused on the basis 'that the information requested cannot be made available without substantial collation or research').

Due to the lack of publicly available information and poor communication, the Institute's view is that many DHBs either did not keep this stock or, if they did, they did not establish a separate NRS inventory. There may be several reasons for this: perhaps the DHBs failed to understand their role and responsibilities and/or the MoH failed to remind each DHB of their role and responsibilities and/or MoH failed to regularly review stock levels held by each DHB. Regardless, this has left officials and others (e.g. doctors, private hospitals, and philanthropists) racing to try and access PPE and additional supplies from overseas and/or to manufacture products here, without the public having any detailed understanding of the actual stock New Zealand holds.

Proposed solution: A comprehensive stocktake of New Zealand's NRS

Basic accounting requires 1) an opening balance, 2) add inputs (purchases and production) and 3) remove outputs (sales and usage) to generate a closing balance. A running total is critical and should be used as a model to tighten governance over the NRS.

1) Opening Balance

In response to OIA requests, the Institute expected to receive a detailed stocktake of items as at early March. Given the pandemic unfolding globally, the Institute had thought a detailed and comprehensive stocktake of items (such as the number and sizes of P2 masks, the number of surgical mask, the number of face shields, the types, sizes and number of pairs of gloves, the number of test kits etc.), who held those items and where those items were located, was already in the hands of officials. Instead the Institute was referred to an outdated composition of stock items held by MoH (which excludes DHB-held stock), found on their website, dated 28 January 2020.

As of 9 April 2020, there is still no up to date comprehensive list in the public arena of stock held by the MoH or the DHBs and statements in the media are confusing. For example, the MoH website states the MoH held a total of 13.5m masks on 28 January 2020 (which is different from the 18m of masks mentioned by the Prime Minister and Minister of Health in late March).⁸ The Institute is not aware of any additional supplies of masks that have arrived from overseas between 28 January and 28 March, nor do we think New Zealand production could account for such a discrepancy, particularly given a large number of masks have already been distributed to DHBs. It is difficult to be confident that the figure of 18m masks can be correct.

In a state of emergency this is a serious gap in real time data, and brings with it several risks:

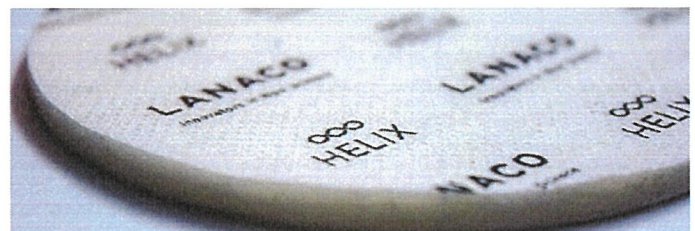
- The government fails to purchase the right stock (undersupply) which puts patients and healthcare workers at unnecessary risk.
- The government purchases the wrong stock (oversupply) and wastes public money.
- Private individuals and organisations purchase stock that is not required (leaving them out of pocket, or in search of an international buyer). Philanthropists, healthcare workers and business people, aware that New Zealand may have a stock issue but unsure of the magnitude, have worked hard to access and improve New Zealand's supplies.
- The government fails to distribute the stock fairly and appropriately given they have poor information over what stock is held (inventory), where stock is held (location) and what is required (usage per week) by frontline health workers and others needing PPE. The rate of usage is particularly important given most PPE is disposable.

2) Add Inputs

Making sense of inputs can be challenging. For example, there were media reports of purchases of PPE indicated that 41 million masks were arriving over the next six weeks from overseas but very little detail on the specific types or sizes of the masks purchased (despite the fact that the type [e.g. P2] and the size of masks matter).⁹ It was also reported in the international press that supply chains are weak and in some cases broken (e.g. global medical ventilator and P2 masks supply issues).¹⁰ This problem could be mitigated if New Zealand supply chains were strengthened.

Examples of localised PPE production includes two New Zealand-based companies that have the capacity to supply P2 masks. The first is Auckland-based Lanaco. It manufactures a P2-equivalent mask (see the filter in Figure 1 below).

Figure 1: Lanaco's Helix™ Filter.



The filters are made using New Zealand merino wool, which means the company is not reliant on overseas supplies. Although awaiting the final approval, the filters have already been independently lab tested in the USA to be above the necessary 95% filtration.¹¹

The second is Whanganui-based QSi. It is likely to be the company the MoH's 2017 New Zealand Influenza Pandemic Plan refers to as having the necessary capability and stockpile of raw material 'to further reduce the country's vulnerability to the disruption of overseas supply lines'.¹² The Prime Minister said on 5 April that 400,000 N95s were being 'produced locally each week at a factory in Whanganui'.¹³ This does not indicate how many weeks this level of output is achievable. For example, if the stockpile of raw material, referred to in the plan, is nonwoven polypropylene (that is used to sew P2 mask), this is now in short supply globally.¹⁴

3) Remove Outputs

MoH currently distribute to DHBs, which are responsible for 'ensuring appropriate and economical use of national reserve supplies in all clinical settings in their districts'.¹⁵ It is critically important to understand the demand for stock (e.g. usage per day). The actual figures are difficult to track, which creates unnecessary concern, confusion and anxiety for healthcare workers and their families.

Recommendations

Lessons can already be learnt from the challenges New Zealand has faced to date. The Institute has collated some recommendations to help make New Zealand's systems more robust for future pandemics. Some of these ideas might also be useful to think about implementing now to reduce further healthcare shocks during the COVID-19 pandemic.

1. **Reconsider the titles and reduce the number of plans and plan-related documents the MoH have in place.**
For example, removing the term 'influenza' from the *2017 New Zealand Influenza Pandemic Plan*. The Institute found five plans dated (2004 to 2017) and four plan-related documents (dated 2006 to 2008). See Appendix 1.
2. **Require all NRS stock (including PPE stock) to be held by MoH (rather than across DHBs).**
Stock will need to be regularly turned over (sold back to DHBs) to ensure it does not expire (a First-in First-out [FIFO] basis). Alternatively stock could still be purchased by DHBs but held and stored at a MoH warehouse to ensure the country has clarity over what pandemic stock it holds. MoH can then distribute the stock during an epidemic or pandemic. This would enable the MoH to develop and distribute an 'NRS all-in-one cluster kit' to help control clusters. This kit could be customised and urgently delivered to each cluster area and contain, for example, bleach, gloves, buckets, mops, antibacterial wipes and hazmat suits so areas could be decontaminated quickly and thoroughly. This could even include a special decontamination unit to be established. Note: The Institute has just learnt a central NRS may be actioned from 14 April.¹⁶
3. **Set minimum stock levels.**
This should be for all key PPE and other healthcare items that make up the NRS as a matter of good practice.
4. **Put in place a 'New Zealand made and manufactured' supply chain for P2 masks (or equivalent) and/or medical ventilators as part of the national pandemic plan.**
This will ensure New Zealand is capable of being fully independent of the international supply chain. It might also be appropriate for such entities to be listed in Schedule 1 of the Civil Defence Emergency Management Act 2002.

5. **Increase New Zealand's stock of publicly-owned medical ventilators.**
Influenza viruses and human coronaviruses tend to affect the respiratory system, so medical ventilators (including a wide range of types) are extremely useful. USA research models, based on population size, indicate New Zealand should have 1000 ventilators available in the case of a moderate pandemic (the Institute considers the COVID-19 pandemic to be a moderate pandemic) and about 11,000 for a severe pandemic. The MoH would need to purchase another 220 medical ventilators to reach 1000.¹⁷
6. **Conduct regular reviews of the composition of the NRS, and additional reviews whenever a new and significant virus emerges globally.**
When a new virus is identified as having the potential to cause a significant global health event such as a pandemic, the MoH should then review its unique characteristics and determine New Zealand's specific healthcare equipment requirements. These requirements should be defined in terms of what is needed to cure patients and protect healthcare workers. In the case of COVID-19, this process would ideally have begun in mid-January with the goal of creating a COVID-19 inventory list that would in turn trigger overseas purchases, New Zealand manufacturing and logistic planning.
7. **Require a monthly audit (ideally by the OAG) of the composition of the NRS as a matter of public accountability during an epidemic or pandemic.**
Both the detailed composition (including stock inputs and outputs over the month) and an assurance statement should be placed on the MoH website as a matter of good practice. It is impossible to know what needs be bought, rationed or manufactured without knowing what New Zealand already has.

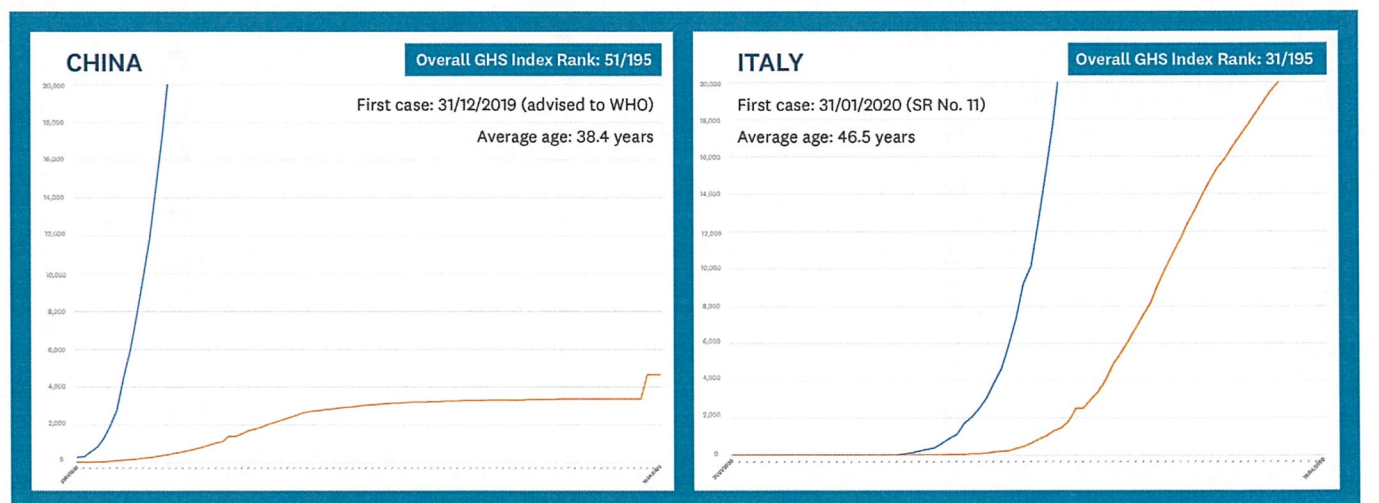
The McGuinness Institute's contribution: SupplyNZ

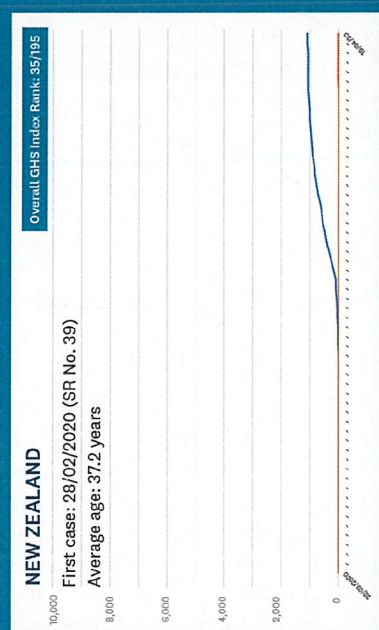
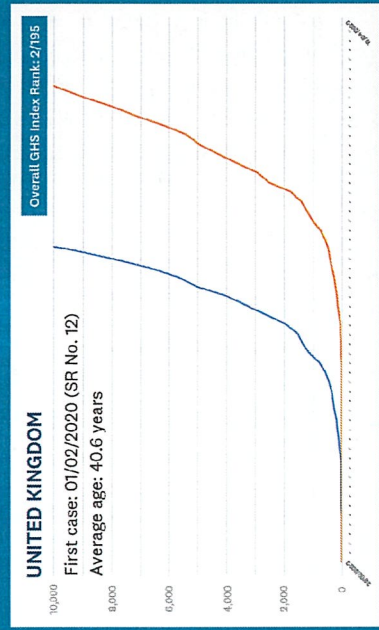
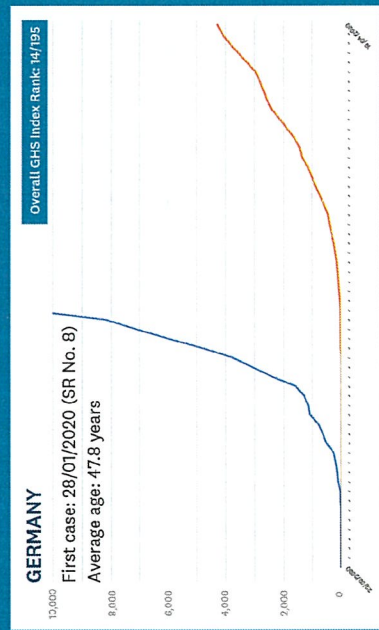
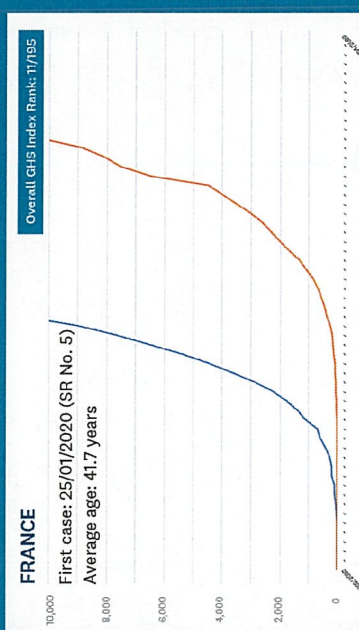
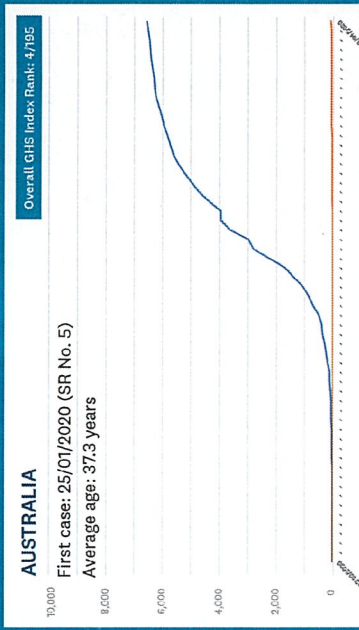
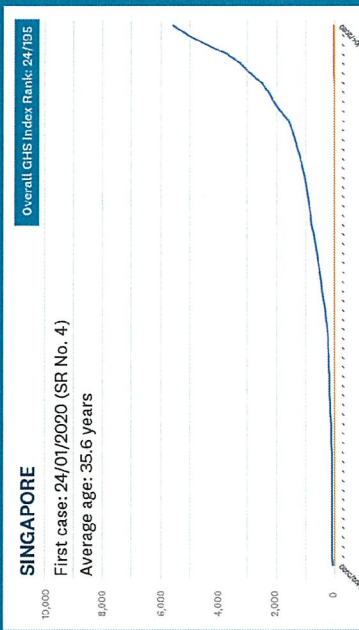
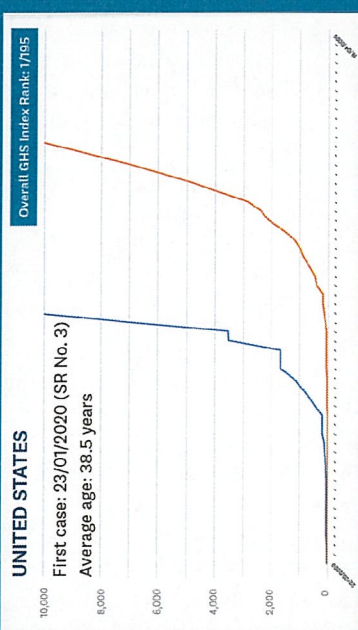
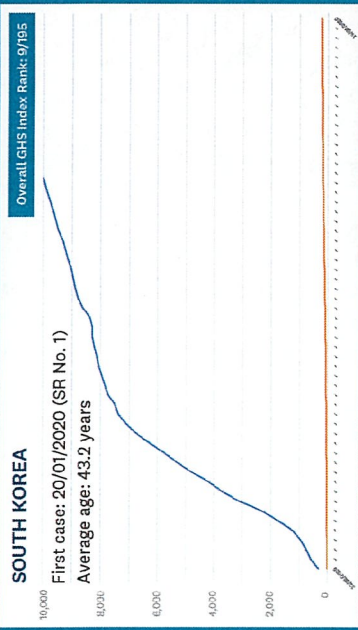
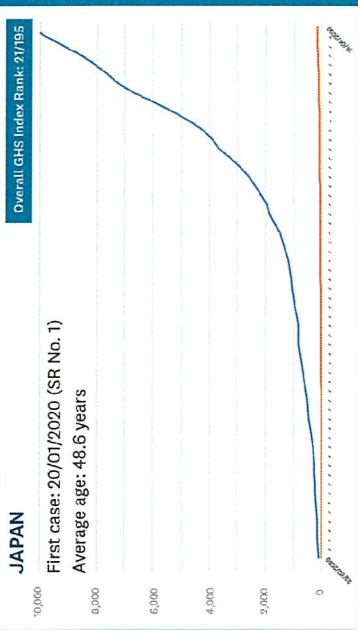
At the Institute we study low probability high magnitude events. For this reason we are working on what we call Plan Z. We feel it is important to build New Zealand's connections and capabilities now in case supply chains and/or the virus mutates and/or another virus emerges. Learn more at supplynz.org

References for this think piece can be found on the McGuinness Institute website at www.mcguinnessinstitute.org/think-pieces.

Figure 2: Country graphs: Mapping the COVID-19 curves

Adapted from World Health Organization Situation Reports between 21 January and 19 April 2020.





Global Health Security (GHS) Index: The GHS Index ranks 195 countries in terms of level of preparedness, at present New Zealand sits at 35/195 and is classified as 'more prepared' but not 'most prepared'. The GHS Index is a project of the Nuclear Threat Initiative and the John Hopkins Center for Health Security. It was developed in collaboration with The Economist Intelligence Unit (EIU) with the intention to assess and benchmark measurable changes in national health security and improve international capability.



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