



Australian Government
Department of Defence

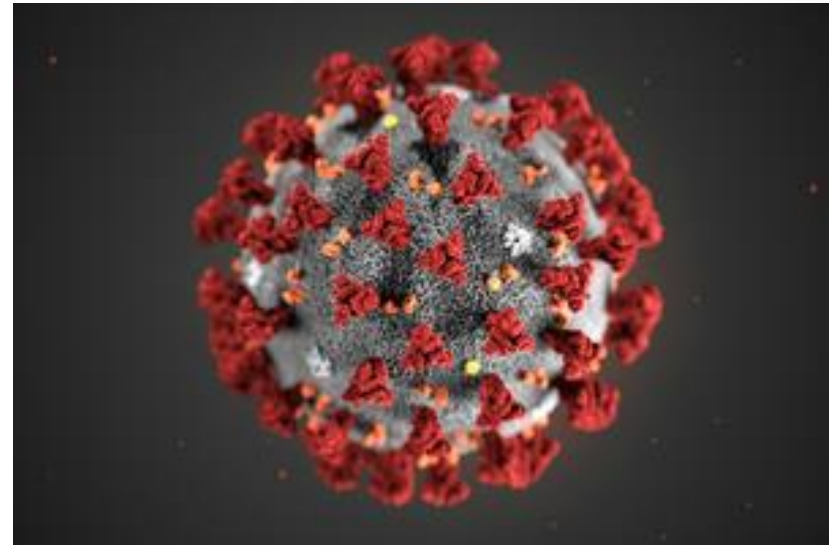
Resources Management in Pandemics

Virtual ASEAN Military Medicine Conference

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RN, MBA



- Resources Management
- Brief overview of Pandemics
- Covid-19 Pandemic
- Resources Challenges in Pandemics
 - Financial
 - Health
 - Equipment
 - Human Resources
 - Military
- Post Pandemic



Resource Management – What is it?

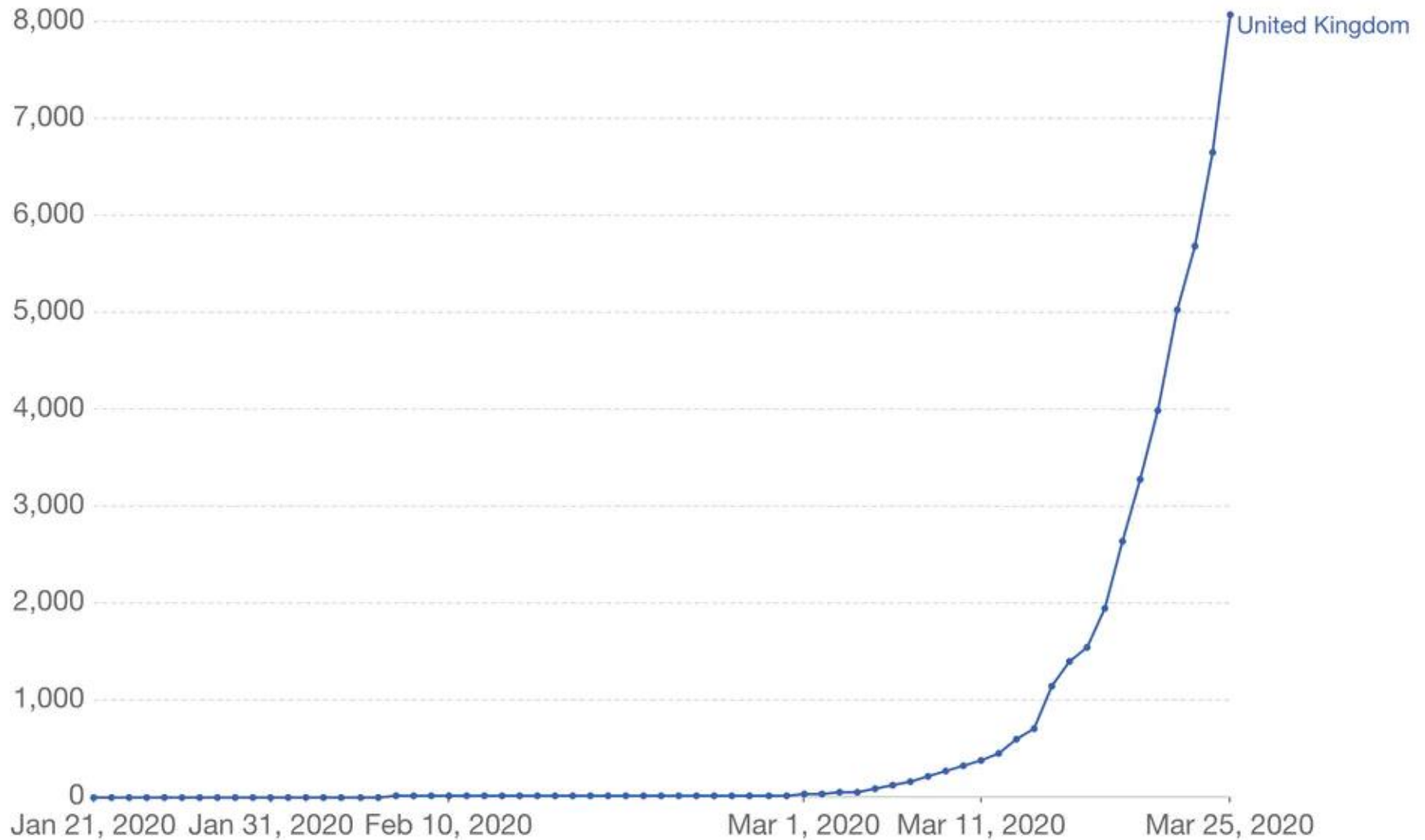
- The practice of:
 - Planning, scheduling and allocating people, money, time and technology to a program or project, or
 - The process of allocating resources to achieve the greatest organisational value, or
 - The right resources being available at the right time for the right work.
- All whilst realising that there will be other demands on the 'business' or BAU operations.
- So in answering the question of resource management in pandemics, I will examine what has happened during COVID-19





Total confirmed COVID-19 cases

The number of confirmed cases is lower than the number of total cases. The main reason for this is limited testing.



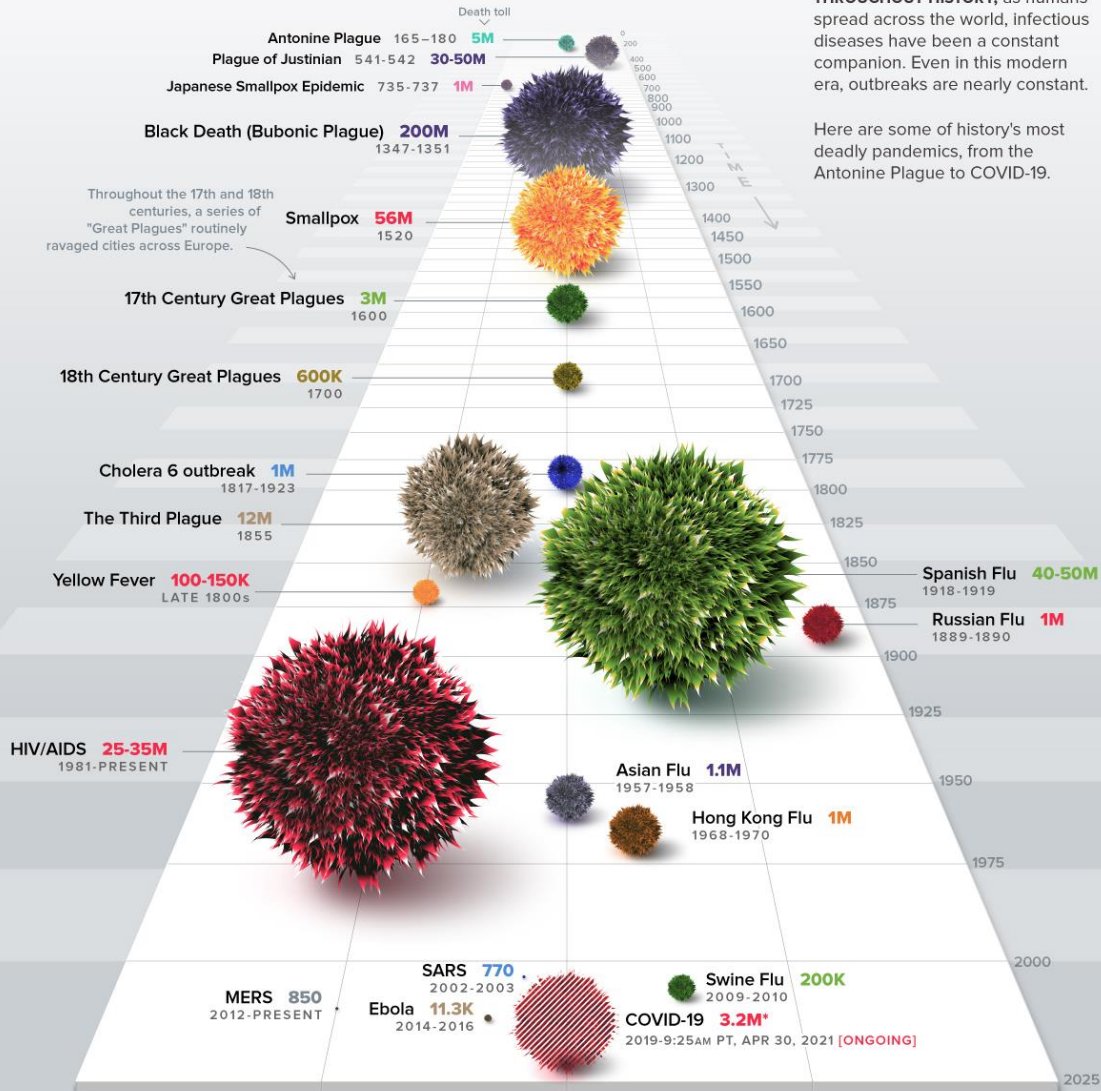
Source: European CDC – Latest Situation Update Worldwide

OurWorldInData.org/coronavirus • CC BY

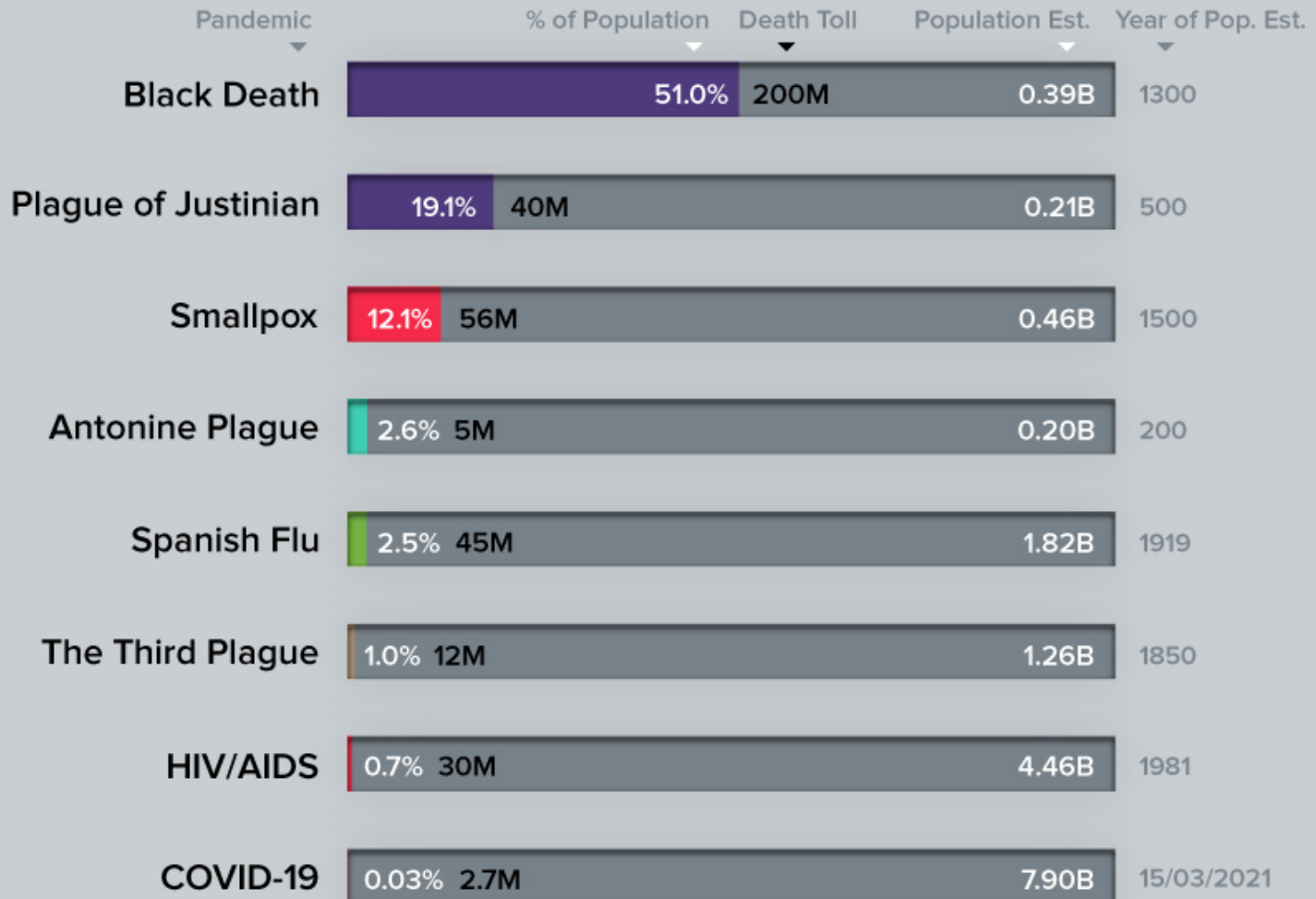
Note: The large increase in the number of cases globally and in China on Feb 13 is the result of a change in reporting methodology.

HISTORY OF PANDEMICS

PAN-DEM-IC (of a disease) prevalent over a whole country or the world.



[DEATH TOLL AS A PERCENT OF THE POPULATION]



Case fatality rates: COVID-19 vs. US Seasonal Flu

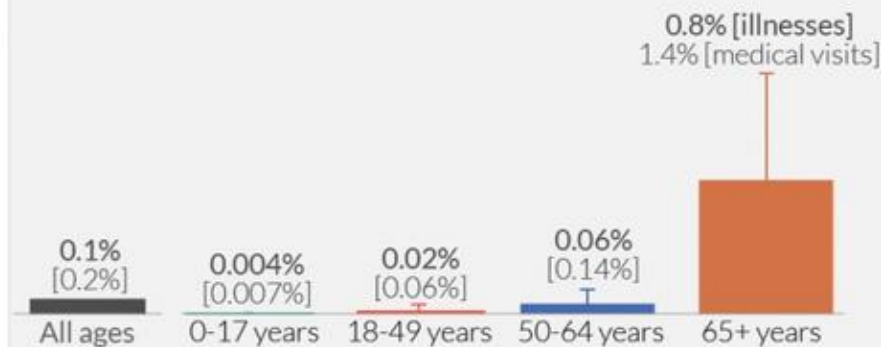
Our World
in Data

Case fatality rate (CFR) is specific to a location and time. It is calculated by dividing the total number of deaths from a disease by the number of confirmed cases.

Seasonal Flu

Case fatality rates for the influenza season 2018-19 in the USA.

Symptomatic cases are calculated based on models which aim to account for underreporting – figures based on medical visits are therefore also shown in square brackets, which may be a closer comparison to COVID-19 case fatality rates.



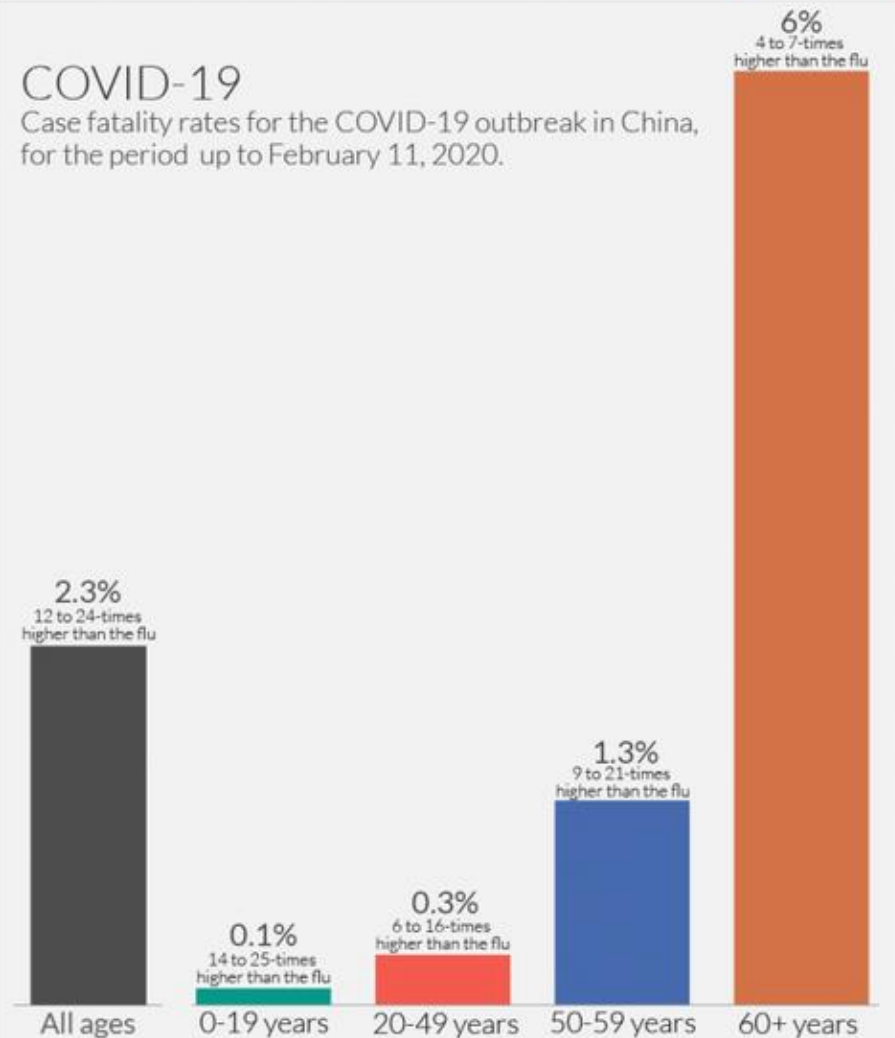
Data: Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. Vital surveillances: the epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19)—China, 2020. China CDC Weekly.
US Influenza data is sourced from the US Centers for Disease Control and Prevention (CDC).

OurWorldinData.org – Research and data to make progress against the world's largest problems.

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COVID-19

Case fatality rates for the COVID-19 outbreak in China, for the period up to February 11, 2020.









WHO Coronavirus (COVID-19) Dashboard

Latest

Yesterday

Search by Region/C

Situation by Region, Country, Territory & Area

Name	Cases - cumulative total ⇅	Cases - newly reported in last 24 hours	Deaths - cumulative total	Deaths - newly reported in last 24 hours
Global	165,158,285	620,434	3,425,017	12,786
Americas	65,573,768 <div></div>	205,351	1,604,776	5,207
Europe	53,983,008 <div></div>	67,773	1,131,679	1,801
South-East Asia	29,543,024 <div></div>	284,362	363,515	4,725
Eastern Mediterranean	9,805,376 <div></div>	34,349	196,940	609
Africa	3,432,495 <div></div>	8,065	85,667	128
Western Pacific	2,819,852 <div></div>	20,534	42,427	316
 United States of America	32,706,250 <div></div>	29,296	582,346	629
 India	26,031,991 <div></div>	259,551	291,331	4,209
 Brazil	15,812,055 <div></div>	79,219	441,691	2,641
 France	5,820,918 <div></div>	0	107,403	0
 Turkey	5,160,423 <div></div>	9,385	45,626	207
 Russian Federation	4,983,845 <div></div>	8,937	117,739	378



Resources Challenges in Pandemics

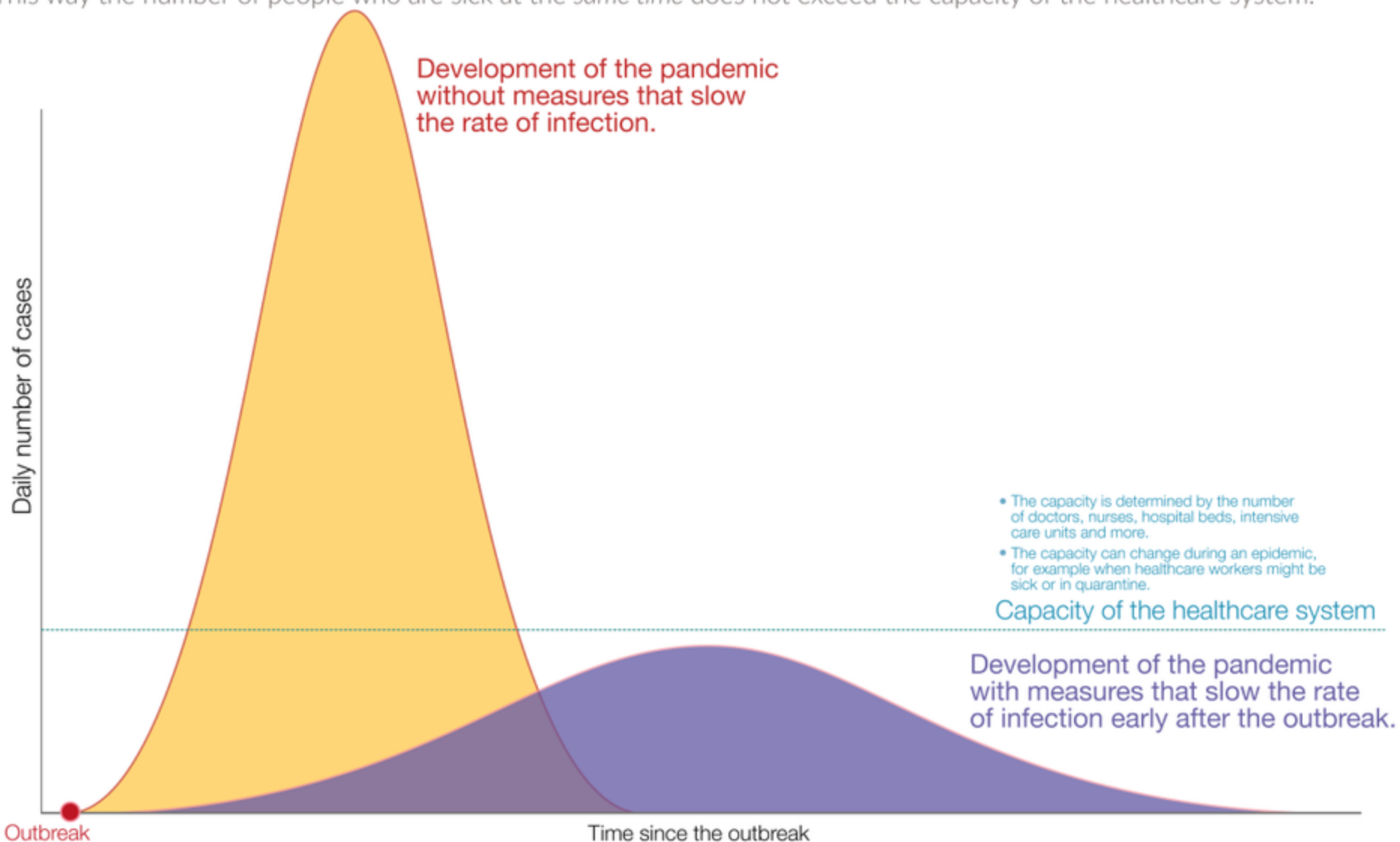
- Resources are limited
- Financial
 - smaller countries have less ability to pull resources into a crisis
 - Even larger countries have pressures on budget
 - financial support for workers/businesses?
- Health
 - facilities often operating at or close to capacity
 - Shortage of healthcare capability e.g. ICU capacity
- Equipment
 - Traditional supply lines not able to deliver equipment quickly enough
 - Many countries trying to get the same stock at the same time (PPE, ventilators)
 - Innovative thinking required to provide resources where gaps exist (face shield, hand rub, ventilators etc)
- Personnel
 - Limited resource
 - Limited number of people skilled in certain areas
 - public health in pandemics, ICU nursing etc

- How do you project the number and timing of cases in a pandemic?
 - No one model
 - (Systemic review Sep 20 - 690 articles)
 - Uncertainty about disease's spread over time
 - Models being developed still
 - Makes resource planning difficult
 - Models based on assumptions of how pandemic occurs over time
 - All slightly different parameters but all allow some ability to quantify resource requirements over time
 - The best fit will probably only be known retrospectively
- To manage resources, it is easier to try and manage a large number of cases over a longer period of time, than the same number of cases over a much shorter period of time

In the outbreak of an epidemic *early* counter measures are important

Their intention is to 'flatten the curve': to lower the rate of infection to spread out the epidemic.

This way the number of people who are sick at the *same time* does not exceed the capacity of the healthcare system.



Based on the Centers for Disease Control and Prevention
[OurWorldinData.org](https://www.ourworldindata.org) – Research and data to make progress against the world's largest problems.

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Financial cost

- NHS Nightingale Hospital at Bristol cost £26m to set up and operate to provide 300 additional ICU beds and 1,000 people in total
- Established in 3 weeks in April 2020
- Used instead to assess and treat more than 7,000 non-Covid patients
- Closed in March 2021
- “insurance policy”
- Seven Nightingale hospitals in total
- £220m set up cost



Working with Local Communities

- Partnerships with local communities and minority groups are important to ensure pandemic preparedness, response, recovery and evaluation
- Socially at risk
 - Elderly
 - Migrants
 - NESB
 - Disabled/Unwell
 - Disadvantaged
- In Singapore, migrant workers living in overcrowded dormitories constituted almost 95% of close to 58 000 confirmed cases¹.
- Dealing with sceptics
- Another problem COVID-19 is that there is typically an asymptomatic period at the start of the disease. During this time, people can harbour the virus and infect others without showing symptoms themselves.
- That means we need to add another class of people to the model. These are people who, once infected, are capable of passing on the disease while displaying no symptoms - the so-called “carrier” class.
- People can become complacent with mask wearing

¹ <https://www.moh.gov.sg/docs/librariesprovider5/2019-ncov/situation-report---24-jun-2020fdc9841fccc4bdbbe3b116c9e2f6d13.pdf>



- Telehealth
 - Chronic disease and other health conditions
 - At risk populations
 - No physical examination
 - Not many places set up for telehealth previously
- Additional spaces needed for isolation and quarantine in the advent of community outbreak especially where housing is already crowded
- Need for targeted health promotion material
- Epidemiological tracking of cases
- Testing strategies
 - Waste water
- Waste management
 - Plastics
 - Infectious waste



Additional challenges for Public Health

- Travellers wanting to get home
- People who travel overseas to visit relatives/work then struggle to get home
- Emotive when people get sick in another country and then want to travel home
- Families get separated
- Pressure on governments to fund flights to get citizens home whilst maintaining control of virus



Local Communities

- Collaboration and coordination of public health in human, animal and environmental sectors
- Pandemic has given people less job opportunities in cities
- People seeking less crowded living conditions are moving to more rural locations with less infrastructure and services
- In many countries, families are moving back from lost city jobs to farming and fishing to try and earn money
- Activities such as illegal fishing and logging increased during the pandemic and detected less, further impacting the environment
- Bodies like the Asian Development Bank have developed a green recovery approach for the Indo-Pacific addressing key issues from the pandemic that pose health and security risks
 - Curbing illegal wildlife trade
 - Habitat degradation



Civilian Industry driving innovation to meet demand

- Ventilators
 - Invasive
 - Non-invasive
- Hand Gel
- Face Shields
- Re-examining protection for Healthcare workers from Aerosol Generating Procedures (AGPs)
- New Standards (ISO)



Tracking Information during a Pandemic

- Information typically comes from multiple sources and is changing rapidly
- The inability to effectively track and assess information makes it difficult to provide effective decision making and clear and concise reporting
- Technology has a big role to play to assist in building situational awareness through centralising and recording event intelligence
- Multiple layers of government and individual reporting systems may hinder the ability to clearly see the true impact of the pandemic in any one area, compare and contrast strategies and plan for future resource allocation
- Many governments rely on digital means to monitor the spread of the pandemic such as QR codes for venues or personal apps on smartphones to monitor infected persons and trace their contacts.



Please check in before entering our premises

We're helping keep our community safe with contactless check-in



It's easy to check in

- 1 Download the Service NSW app
- 2 In the app, select 'COVID Safe Check-in'
- 3 Follow the prompts
- 4 Show a staff member that you've signed in.

We respect your privacy

When you scan the QR code, the only personal information sent to Service NSW is your Customer ID, the location of the business you are visiting, time and the date of your visit. The business will not see or collect this information and if you wish to opt out of contact tracing, we will delete this information for 28 days unless required for contact tracing related to a COVID-19 hotspot. Please refer to the collection notice in the app for more information.

This QR code is for Wolke Road Motel, located at 528 Wolke Road, WILLOW CHA, NSW 2256.



- COVID-19 has required a high frequency of communication across most stakeholder groups
- Prior to COVID-19, many organisations lacked online collaboration tools, video conferencing or VPN capacity to facilitate working from home prior to the pandemic
- Increased investment in bandwidth expansion, network equipment, and software that leverages cloud services has been required
- The pandemic has brought the world to a situation where those not connected to the internet are facing total exclusion
- With strict social and physical distancing measures in place, new routines require accessing the internet for most services
- In developing countries, the condition is more serious if connectivity is not assured
- Access or no-access to ICTs may reinforce societal inequalities. With substantial use of technology in accessing basic requirements like health and education, it is imperative to understand the impact of the digital divide on social equality



Technology Resources

- Traditional industries hard hit by the pandemic.
- Governments needing to ensure economic stability, employment and ability to meet resource demands of the pandemic
- Use and investment in emerging technologies during the pandemic include big data analytics, internet of things (IoT), Artificial Intelligence (AI), Virtual Reality (VR) and Augmented Reality (AR) amongst others.
- All beneficial for knowing the environmental situation, early detection, diagnosis of disease, analysis of data and mitigating risk etc
- AI and machine learning allow for mapping and tracking COVID cases in real-time
- 3D Printing used for the production of medical equipment



- Telehealth, the COVID-19 pandemic has seen this rapidly expand in many countries, but:
 - no or low reimbursement is a major challenge impacting longer-term investment;
 - perceived barriers for patients included lack of access to technology and internet/broadband, and low digital literacy;
 - 58% of physician respondents were not able to access their telehealth technology directly from their EHR¹

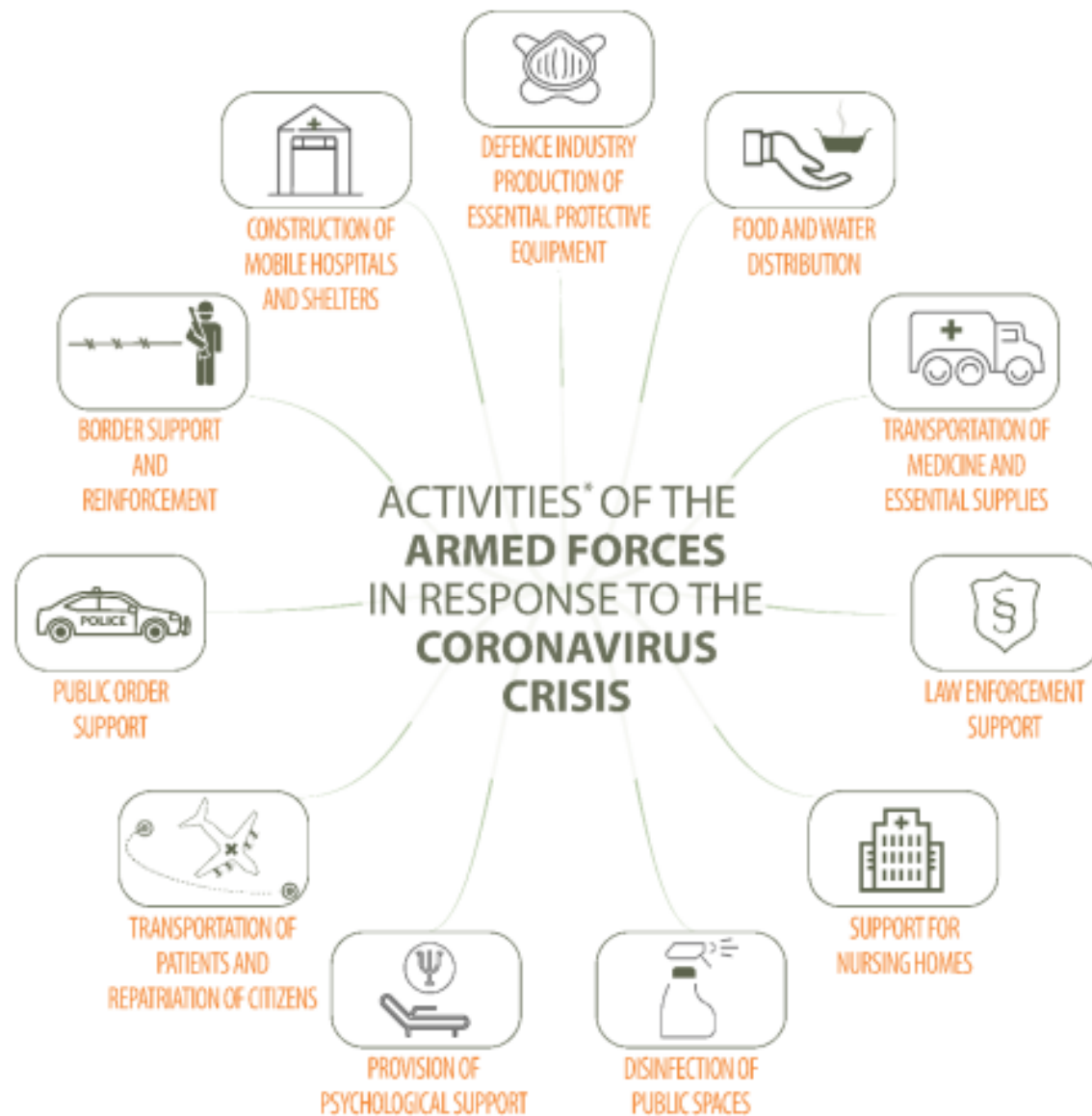


- ¹<https://healthcommunity.nature.com/posts/post-pandemic-implications-for-the-future-of-telehealth>

Human Resources

- Hospital scheduling changes
- Cancel elective surgery
 - Flow on effects – patients and staff
 - How long?
- Personnel available for redeployment
- Personnel requiring various levels of orientation and upskilling to work in different clinical areas
- Support of staff travelling to and from work
- Support of needing to self-isolate from families
- Working from home? – who can and who can't
- Greater use of virtual meetings





* These represent non-exhaustive examples of European armed forces' support to civilian authorities

Military Resources to support human resources in hospitals

- Deployment of military medical staff to existing facilities
 - Augmentation
 - Replacement
- Deployment of staff to new facilities
- Provision of specialist medical skills (Reservists)
- Patient transport
- Help with mask fit testing
- Medical Logisticians
- Pathology



Military specialist support

- Unique ability to transport *multiple* patients
 - Relieve hospital congestion
 - Repatriate national citizens
 - Transport infected individuals
 - Transport multiple critical care patients
 - From remote locations to larger centres
- Set up temporary hospitals, patient recovery centres, vaccination centres, ambulatory care centres
- Set up temporary mortuaries
- “As USAF learned to operate during the pandemic, it got real-world experience with the kind of skills that might need to be used in a war involving chemical or biological weapons”¹

¹<https://www.military.com/daily-news/2021/04/22/how-covid-19-prepared-military-future-biological-warfare.html>



Military Resources to support existing hospitals supply management

- Deployment of Medical logistic planners
- Distribution of medical supplies
- Equipment maintenance
- Stores Management
- Disinfection of hospitals and other spaces
- UK MOD: e-portal to allow customers to order and receive PPE within 2 days



Military support to police and security

- Small security teams
- Curbing Movement
 - Hotel Quarantine
 - Public Order
- Border Control



Military resource support across international borders

- Working with NATO Partners – workshop held by Multinational Medical Coordination Centre – shared experience including humanitarian response
- NATO Communication Hub – try to combat spread of harmful, false and misleading narratives
- International aid
 - Personnel
 - Equipment
 - PPE
 - Medical equipment such as ventilators
 - Oxygen
 - Vaccinations and other medicines
 - Blood
 - Food



NATO Communications and Information Agency
Agence OTAN d'information et de communication



Ongoing Military Operations

- Reduction or cancellation in domestic and international military exercises
- Reduction in military training
- Reduction in ability to conduct face-to-face and close contact training
- Decreased ability to move personnel around the country or overseas
- Needing to manage hotel quarantine (flight crews)



Resource Management

- Understand which resources are in short supply and focus on them
- Agree on a common approach to prioritising work across shared resources
- Embrace different ways of working across the organisation and resources
- Realise resource management is an ongoing process
- Manage work and resource uses a blend of granularities
- Apply assignment types that align to your needs
- Account for time for BAU tasks
- Avoid or limit multi-tasking
- Keep your most valuable assets and resources happy and productive
- Manage resource assignments
- Report time
- Defining a Crisis Management Team allows to pre-emptively plan for both BAU and the crisis (pandemic) event

Post Pandemic Review - Financial Resource Implications

- Budgets will likely come under renewed pressure to pay for COVID-19
- Particularly hospital and defence budgets
- Resultant strain in defence capabilities
- Some (Thailand and South Korea) have already reduced Defence budgets
- “The collective answer should be to engage in more collaborative capability planning and development as this approach is more cost-effective than national solo efforts.” (EDA)
- Enhanced defence cooperation
- “The same goes for defence research where national ministries of defence will face considerable problems to receive the same funding than in the past to finance their individual national programmes.” (EDA)

Politics Federal Hospitals in crisis

‘Nothing’ in the budget for public hospitals under pressure



By Rachel Curt
May 16, 2021 – 7:30pm

Save Share A A 21 View all comments

Medical experts say Australia's public hospitals got nothing in the federal budget, despite state health ministers urging the federal government to increase funding for the overrun system.

Ministers from both sides of the political divide have also called on the Commonwealth to fix assessment delays for aged care and the National Disability Insurance Scheme that regularly leave the elderly and people with disabilities stuck in hospitals for too long.



‘We need to be realistic: defence budgets will come under pressure from COVID-19’

26 May 2020 | News

New head of the European Defence Agency, Jiri Sedivy, took up the post in the midst of crisis. In a Q&A with Science|Business, he says the pandemic makes cooperation in defence research even more important

Science | Business Reporting



Jiri Sedivy. Photo: European Defence Agency.

Science | Business: How has the pandemic changed life at the European Defence Agency?

Jiri Sedivy: The crisis has some practical implications, of course, as we had to put precautionary measures in place, including teleworking, to protect staff, stakeholders and partners. The agency's output, however, has not really been impacted thanks to adjustments in the workflow and the extensive use of written procedures and video teleconference calls. Overall, the practical repercussions on our work are limited. As for strategic planning, the crisis

Post Pandemic Review – Financial Resources

- Many finance leaders are turning to zero-based budgeting, where anticipated expenses have to be justified and approved for each new budget period
- “Organizations are putting new frameworks in place to prevent what they just went through from ever happening again”
- Organisations are using data to understand how they operate and to gain visibility and control to ensure expenditures are valid and directly support your planned objectives
- It’s impossible to manage what you can’t define or see – something organisations discovered all too quickly when the pandemic began¹



Post Pandemic Review - Public Health Resources

- In Europe, more than a decade of austerity measures were seen as having substantially weakened the health systems
- In many Asian countries, major epidemics such as SARS in 2003 and MERS in 2015, drove them to invest in building more robust healthcare and public health infrastructure that better equipped them to handle the outbreak
- In many Asian countries, the population was used to wearing face masks
- Each country should have an effective find, test, trace, isolate, and support system in place
- Preliminary data suggests identifying and isolating mild and asymptomatic cases can significantly reduce health-care burden, and overall fatality
- Measures to reduce infection likely to be needed for some time
- Need for control but allowing controlled movement of people



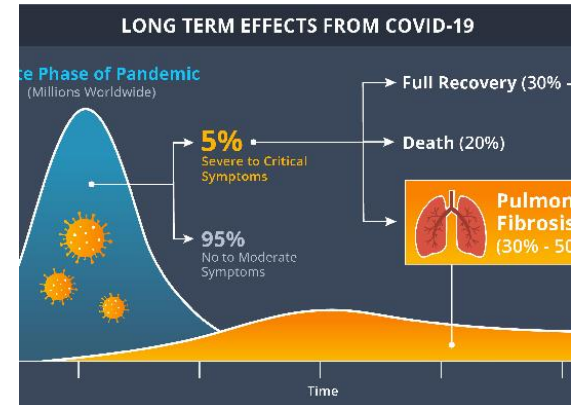
Post Pandemic Review – Public Health Resources

- Removing COVID-19 restrictions is not about returning to the prepandemic normal but about gradually and cautiously transitioning to a new normal, while being ready to reimpose measures if, and when, necessary
- Countries have differed in terms of the speed, scale, and intensity at which they have implemented similar interventions
- Differences can be observed between Asia and Europe in particular
- Many Asian countries and Australia promptly did extensive testing, tracing, and isolating of all cases from the start of the outbreak
- These processes were delayed in most of Europe
- Confirmed cases are mostly isolated at institutions in Asia rather than at home, such as in Europe¹.

- ¹: Dickens BL Koo JR Wilder-Smith A Cook AR, Institutional, not home-based, isolation could contain the COVID-19 outbreak. Lancet. 2020; 395: 1541-1542

Post Pandemic Review – Public Health Implications

- A growing burden of so-called long COVID which is becoming apparent in people who have survived COVID-19 but continue to have symptoms for longer than expected
- As more countries start to reopen their borders, screening tools and quarantine measures become essential to identify potential cases and prevent further transmission in the community
- Vaccines necessary for community protection
 - ‘race’ to produce effective vaccine
 - Some countries trying to hold vaccines for their own use and potentially denying others



Post Pandemic Review – IT and Cyber

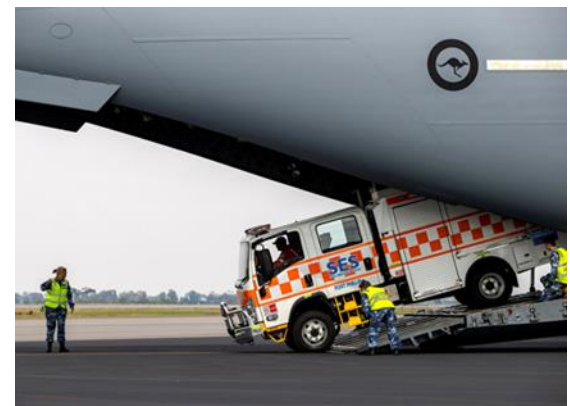
- Look at where the investments have been - in the right or wrong place
- In areas like cyber-defence need to do more not less
- Mobile devices, virtual meetings, AI, electronic record keeping, people working from home
- Since 10 March 2020, the Australian Cyber Security Centre has:
 - received more than 95 cybercrime reports about Australians losing money or personal information to COVID-19 themed scams and online frauds,
 - responded to 20 cyber security incidents affecting COVID-19 response services and/or major national suppliers in the current climate, and
 - disrupted over 150 malicious COVID-19 themed websites, with assistance from Australia's major telecommunications providers, as well as Google and Microsoft



Post Pandemic Review – Military Resources

- Changed the focus from terrorism with an emphasis on defence and security to the pandemic relying largely on civilian departments with support from Defence
- COVID-19 has highlighted the enormous disruptive potential of biological substances
- It has also highlighted the urgent need to do considerably more in order to improve prevention and defence capabilities in the CBRND domain
- For example, the COVID crisis highlighted to USAF AMC the importance of tracking the readiness of its medical crew force, and to keep vital medical equipment maintained and ready for when an emergency erupts.
 - “Once the Ebola crisis passed, AMC put its isolation chambers in storage and “weren't really looking after it the way we should have”
- Public perception of Defence may change post pandemic as not only responsible for overseas operations but an essential resource for the government (and the country) to lean on in times of crisis
 - Australia has a history of this in recent natural disasters, and
 - rescuing its citizens from overseas trouble spots

1. <https://www.military.com/daily-news/2021/04/22/how-covid-19-prepared-military-future-biological-warfare.html>



- Resource Management in Pandemics is complex and evolving
- Joint military civilian-military mix will be required
- Public Health most likely lead agency
- Flexible surge capability is the first step to manage imbalance between needs and resources and requires dedicated team
- Need to have robust public emergency plan that includes pandemics
- Need to identify national, regional and local capacities
- Need to regularly exercise all aspects of the plan
- Need to work locally, regionally, nationally and internationally to manage a Pandemic
- Need to support less able nations
- Defence is a key contributor in many areas
- Pandemics are an ongoing part of our human existence and we need to plan for them in order to manage and control them

