Covid-19 Pandemic
International Health Care Perspectives & Lessons
What Next?

SECTIONS VIRTUAL COLLOQUIUM 2020

Moderator: Adrian Baskir
Section Chair

May 12th 2020

IAAHS Health

Our Speakers

Nicola Oliver

Medical Intelligence

UK/France

Ed Pudlowski

MorningStar Actuarial Consulting

USA

Alex Leung

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Chinese Taipei

Barry Childs

Insight Actuaries & Consultants

South Africa

Joanne Buckle

Milliman

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IAA AAI ACTUAIRES

SECTIONS VIRTUAL COLLOQUIUM 2020

IAA AAI IAAHS Health

The IAA Health Section

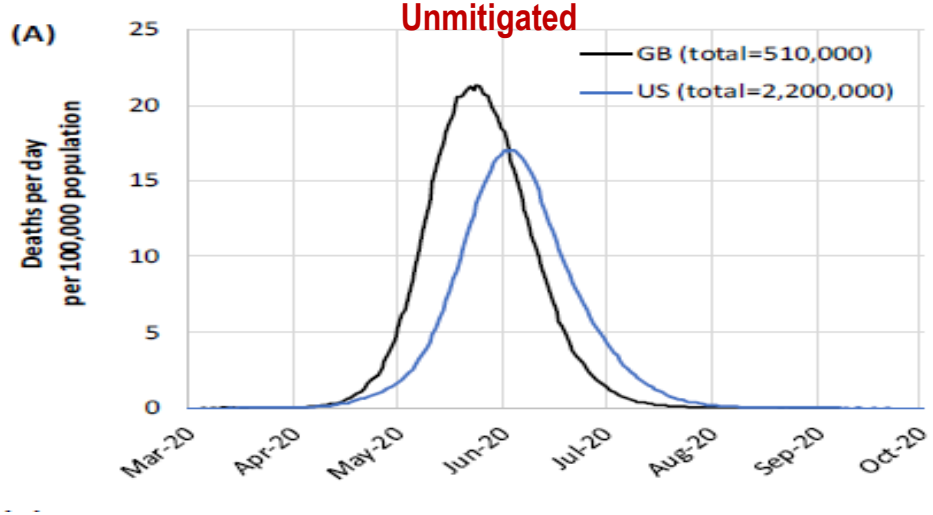
"The IAAHS Promotes and facilitates international exchange of views, advice, research and practical information among actuaries involved in public and private health issues."

- *Major activities*:
  - Regular Webcasts
  - Conferences / Colloquia / ICA
  - Collaboration … with other Sections … and with other IAA Members via the Health Committee
  - Project Teams (previously called Topic Teams)

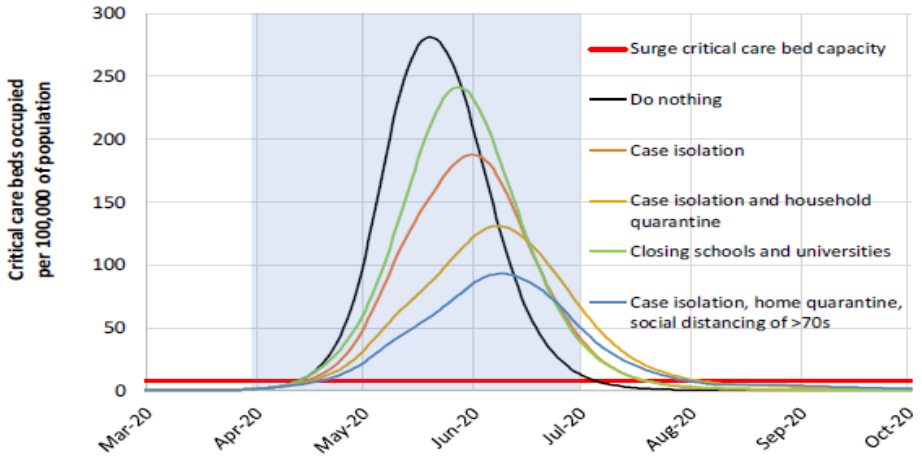
- *Objectives:*
  - Benefit members
  - Expand Section membership
  - Increase Section visibility

Flattening the Curve – Impact of NPI's

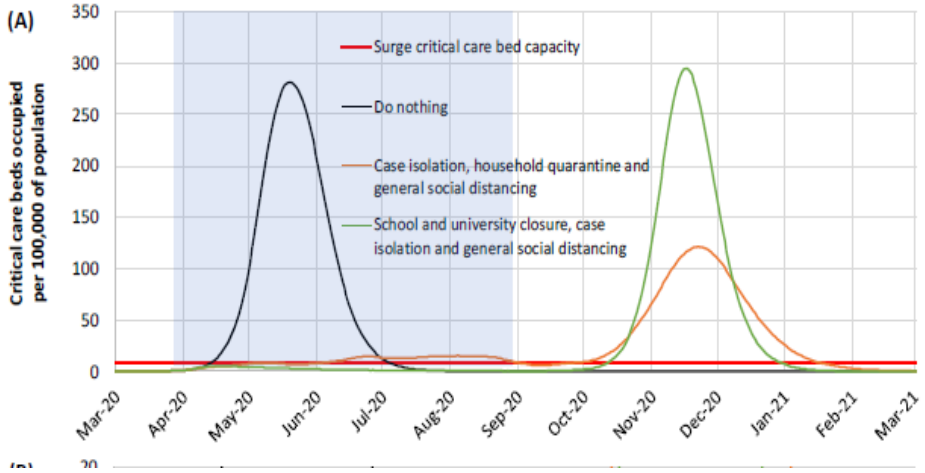
Unmitigated



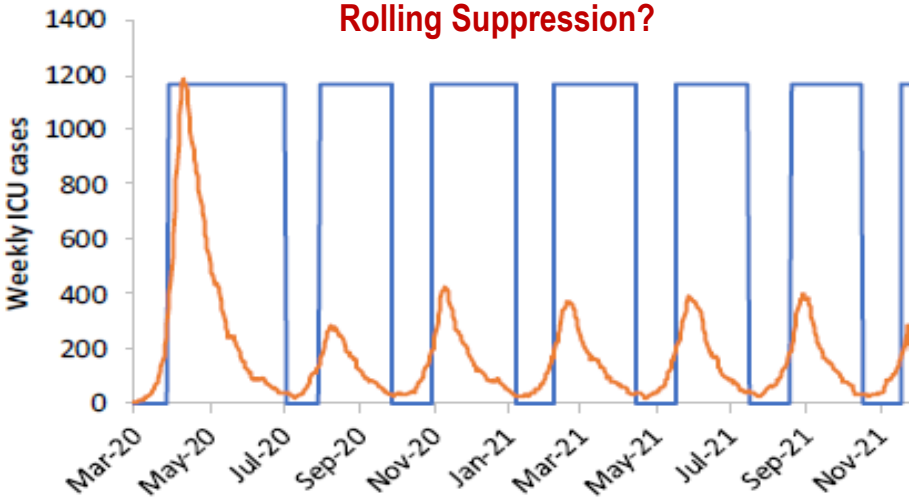
Mitigation Strategies



Second Wave?

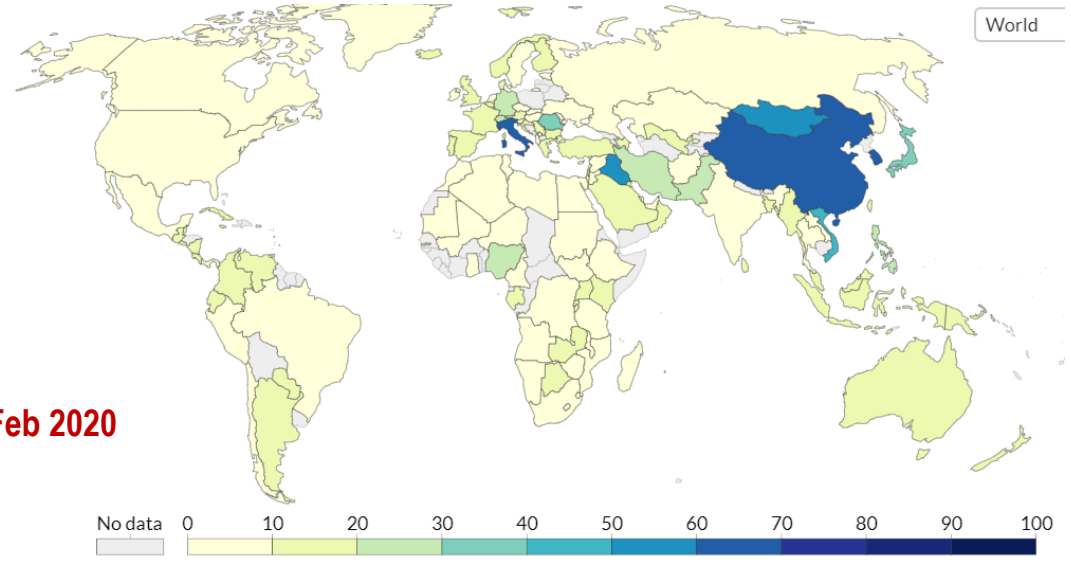


Rolling Suppression?

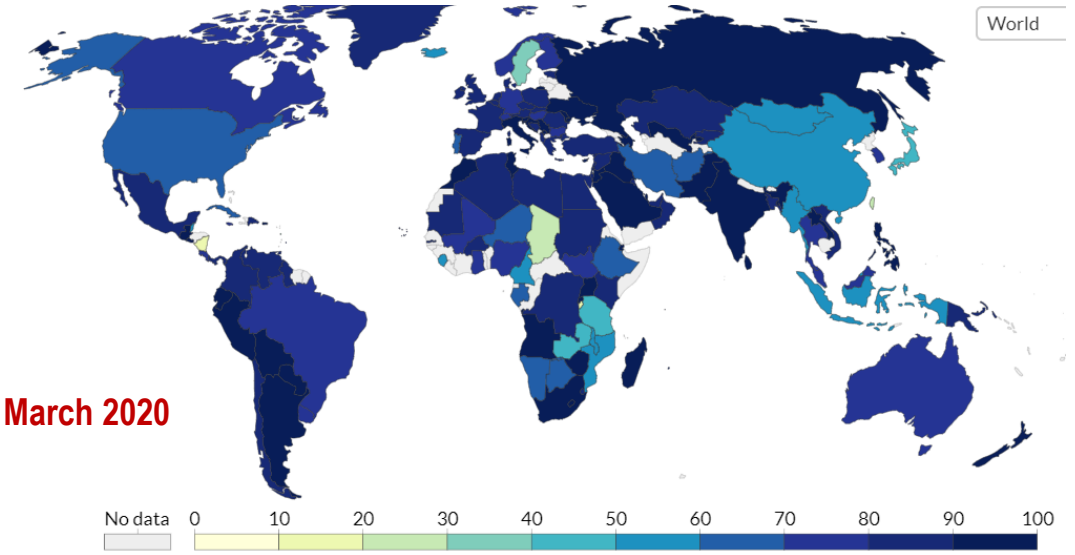


Source: Imperial College Covid-19 Response Group Report No.9 (published on 16 March)

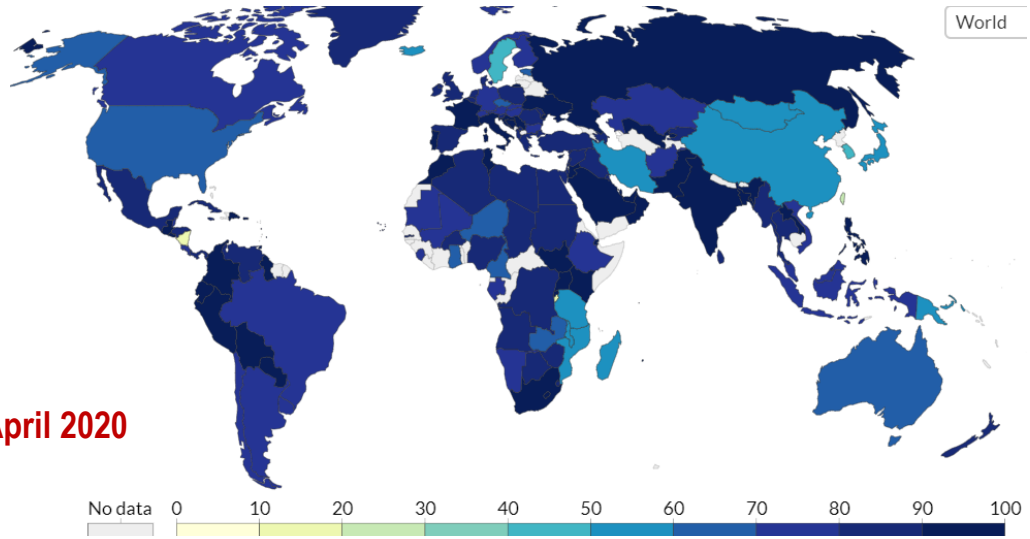
Government Response Stringency Index



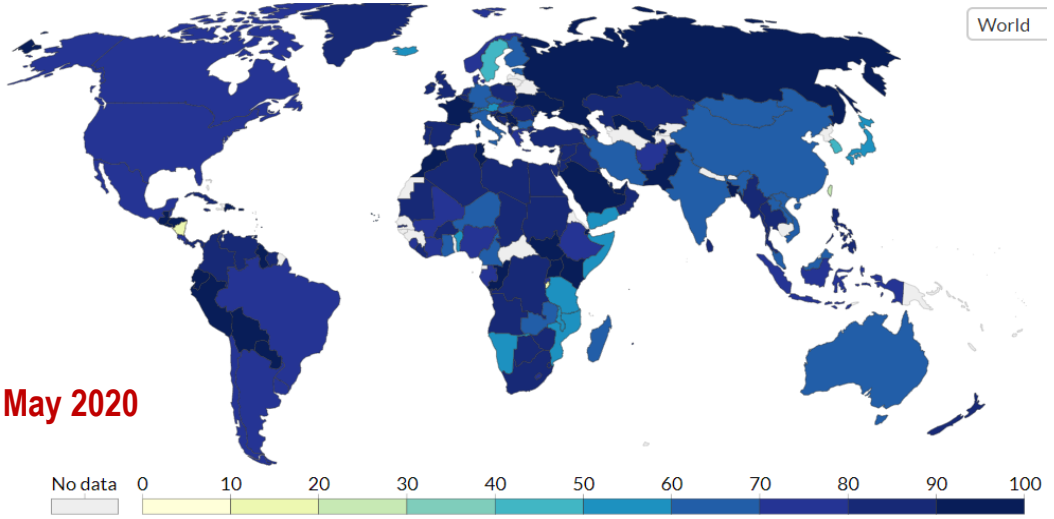
28 Feb 2020



31 March 2020



30 April 2020

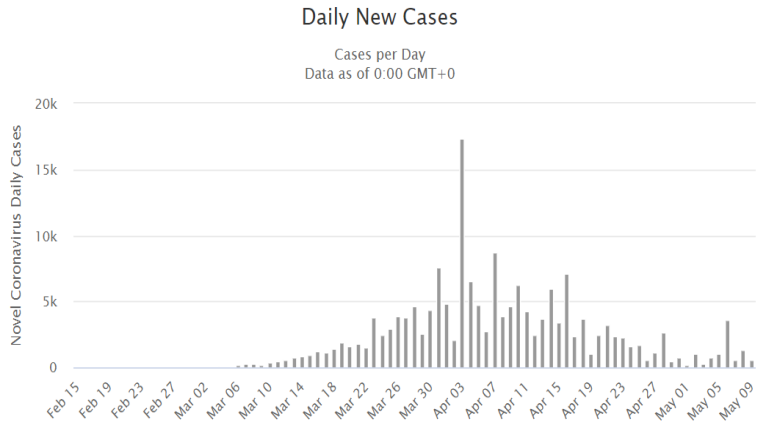


10 May 2020

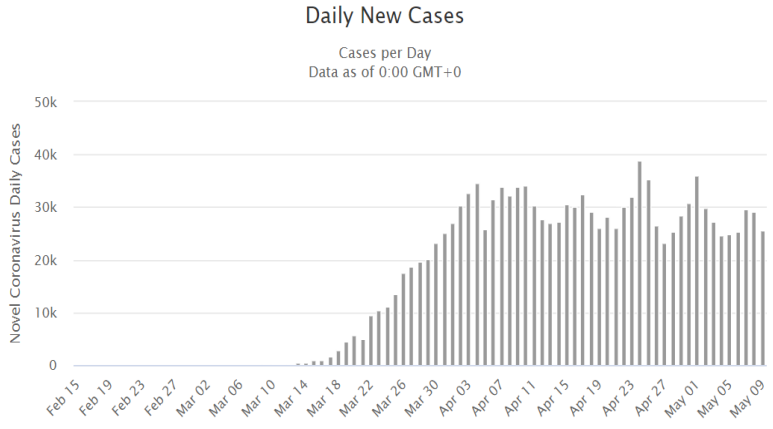
Source: Hale, Webster, Petherick, Phillips, and Kira (2020). Oxford COVID-19 Government Response Tracker – Last Updated 8th May.
OurWorldInData.org/coronavirus • CC BY

Around the World – Our 5 Speakers

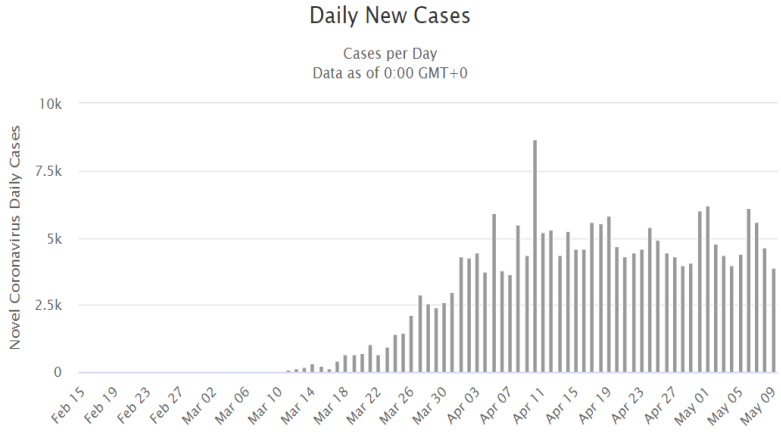
Daily New Cases in France **Cases = 177k**



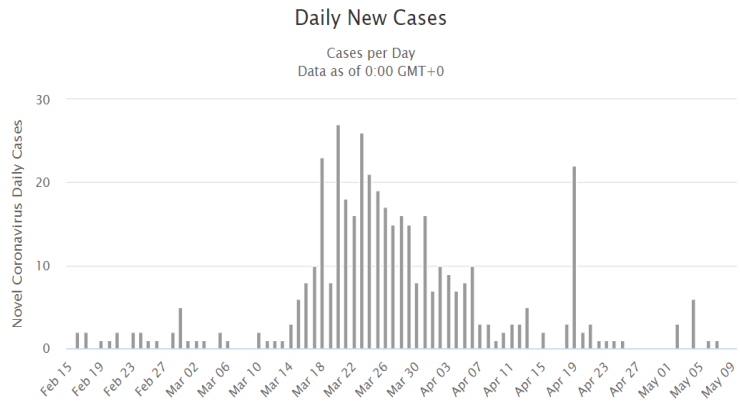
Daily New Cases in the United States **Cases = 1,357k**



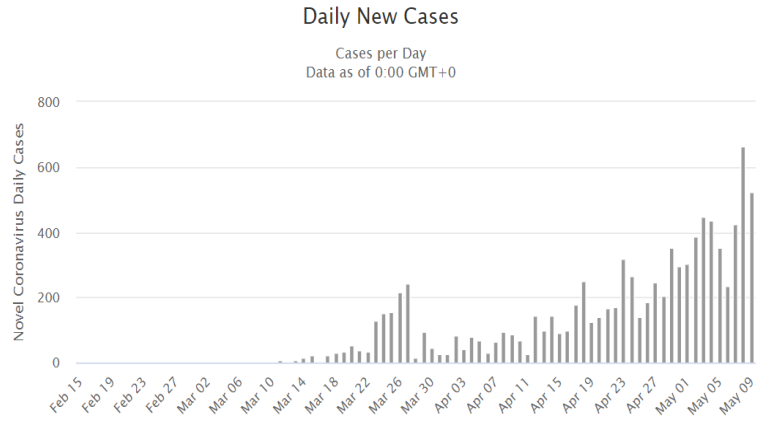
Daily New Cases in the United Kingdom **Cases = 219k**



Daily New Cases in Taiwan **Cases = 440**



Daily New Cases in South Africa **Cases = 10k**



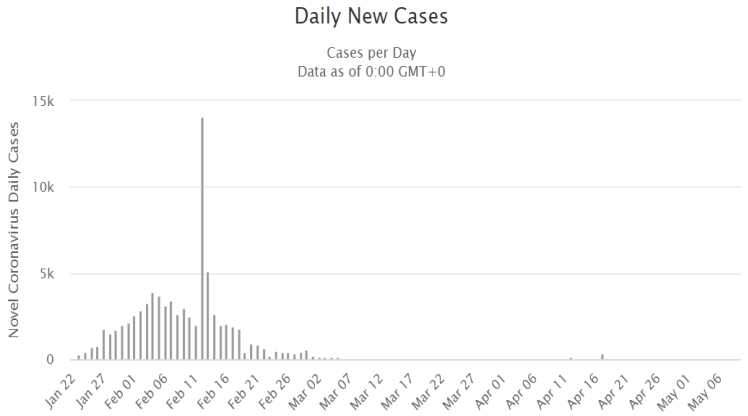
- Cases vs Deaths
- REPORTED with inconsistent metric
- Timing of intervention
- When introducing easing of NPI's
- Nature of economy
- Its all about the Rx

Source: worldometers.info data as at Sunday 10 May 2020

Around the World – Other Countries of Interest

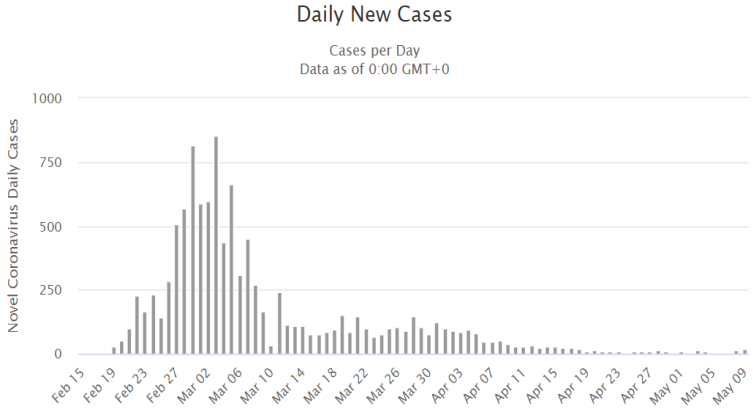
Daily New Cases in China

Cases = 83k



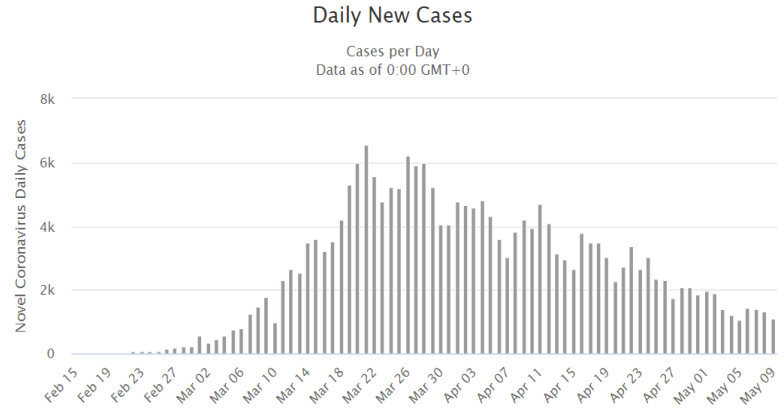
Daily New Cases in South Korea

Cases = 11k



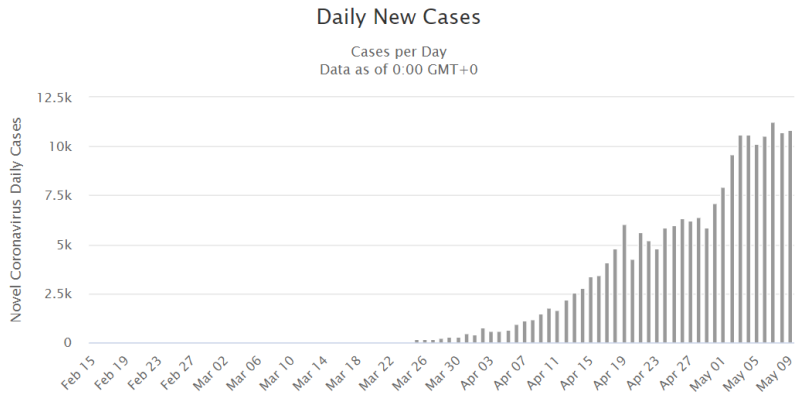
Daily New Cases in Italy

Cases = 219k



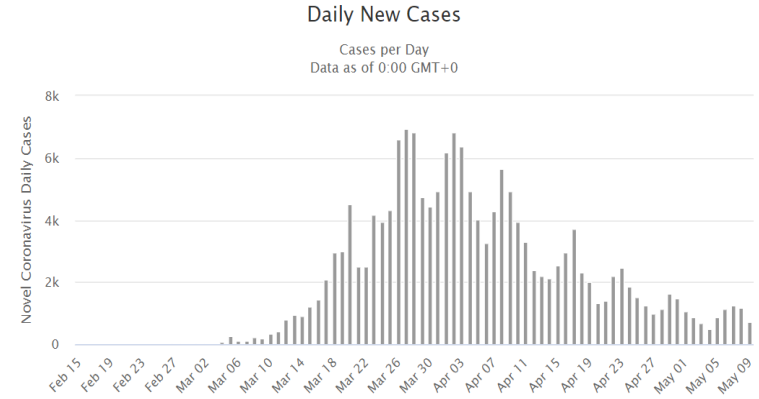
Daily New Cases in Russia

Cases = 210k



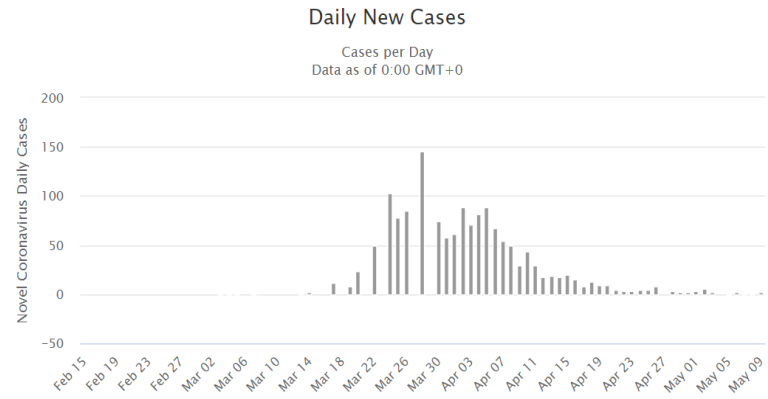
Daily New Cases in Germany

Cases = 172k



Daily New Cases in New Zealand

Cases = 1.5k



Source: worldometers.info data as at Sunday 10 May 2020

Our Speakers

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UK

COVID-19
Myths Dispelled

Nicola Oliver
Medical Intelligence

May 11th – May 15th 2020

About the speaker

Nicola Oliver

- Co-founder of Medical Intelligence. Director of Life & Health
- Mortality and longevity expert supporting clients with underwriting, annuity pricing and product development and internal model calibration
- Previously a registered nurse with intensive care and public health experience

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Medical Intelligence

- Provider of insights into key drivers behind changes in life expectancy, now and in the future
- Established in 2007

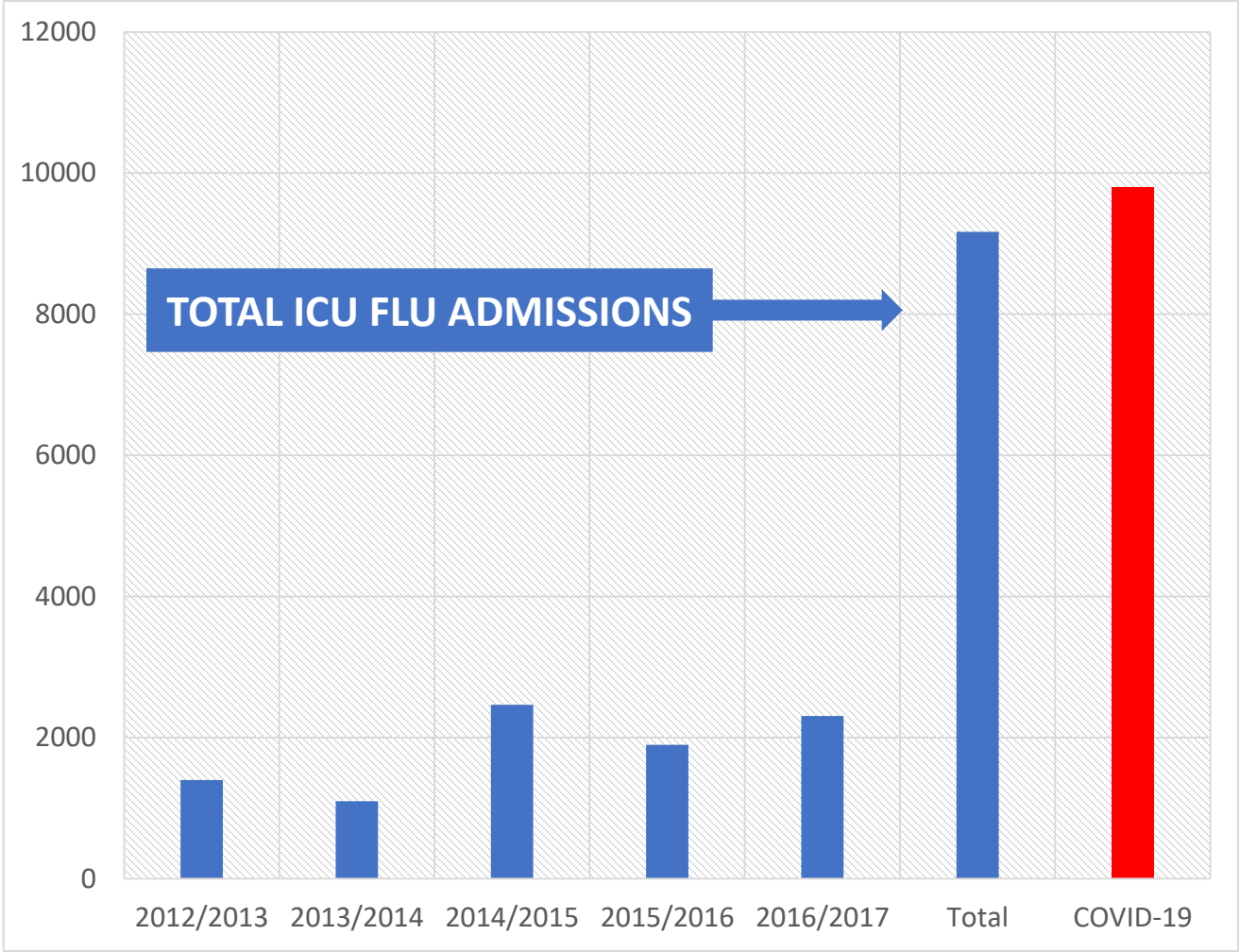
“It’s just the flu”

Pathophysiology

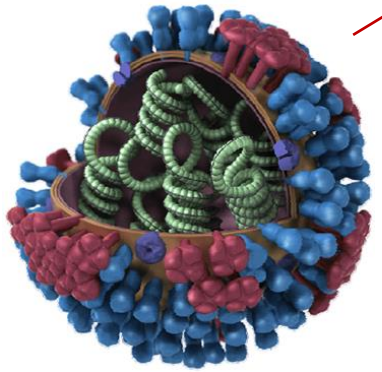
Demographic characteristics

Known vs. Unknown

Management



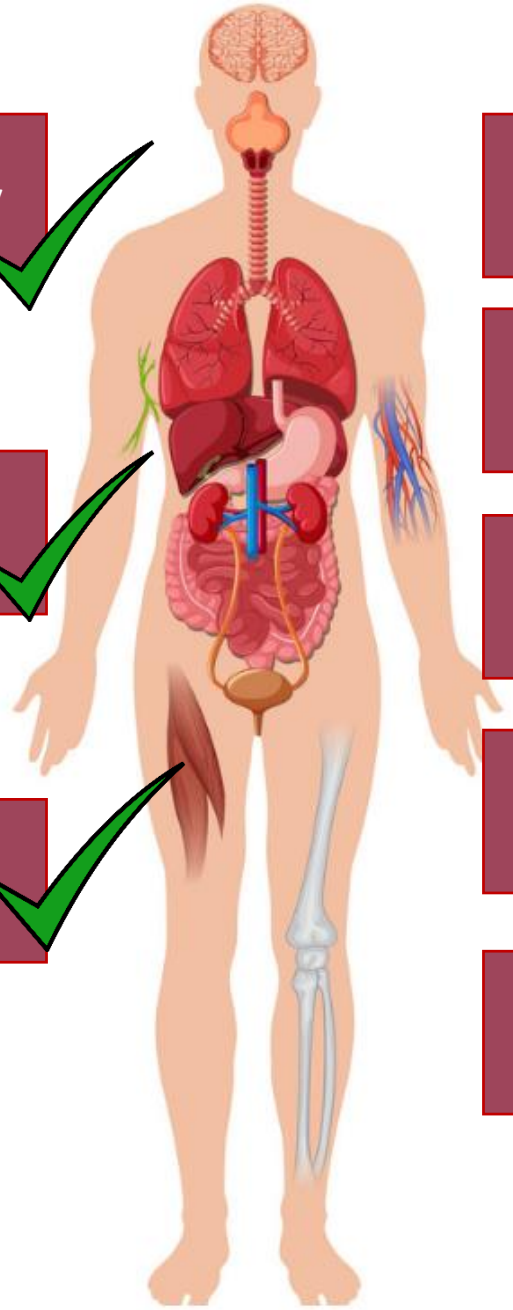
Numbers admitted to ICU by flu season, and in total, France, vs. ICU admissions with COVID-19



Enters cells via the respiratory tract

Also causes GI symptoms

Myalgia & arthralgia common



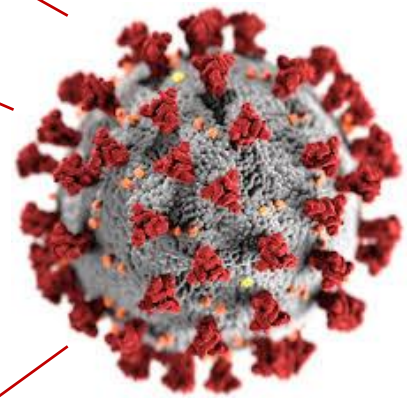
Key enzyme is ACE2

Implications for cardiovascular system

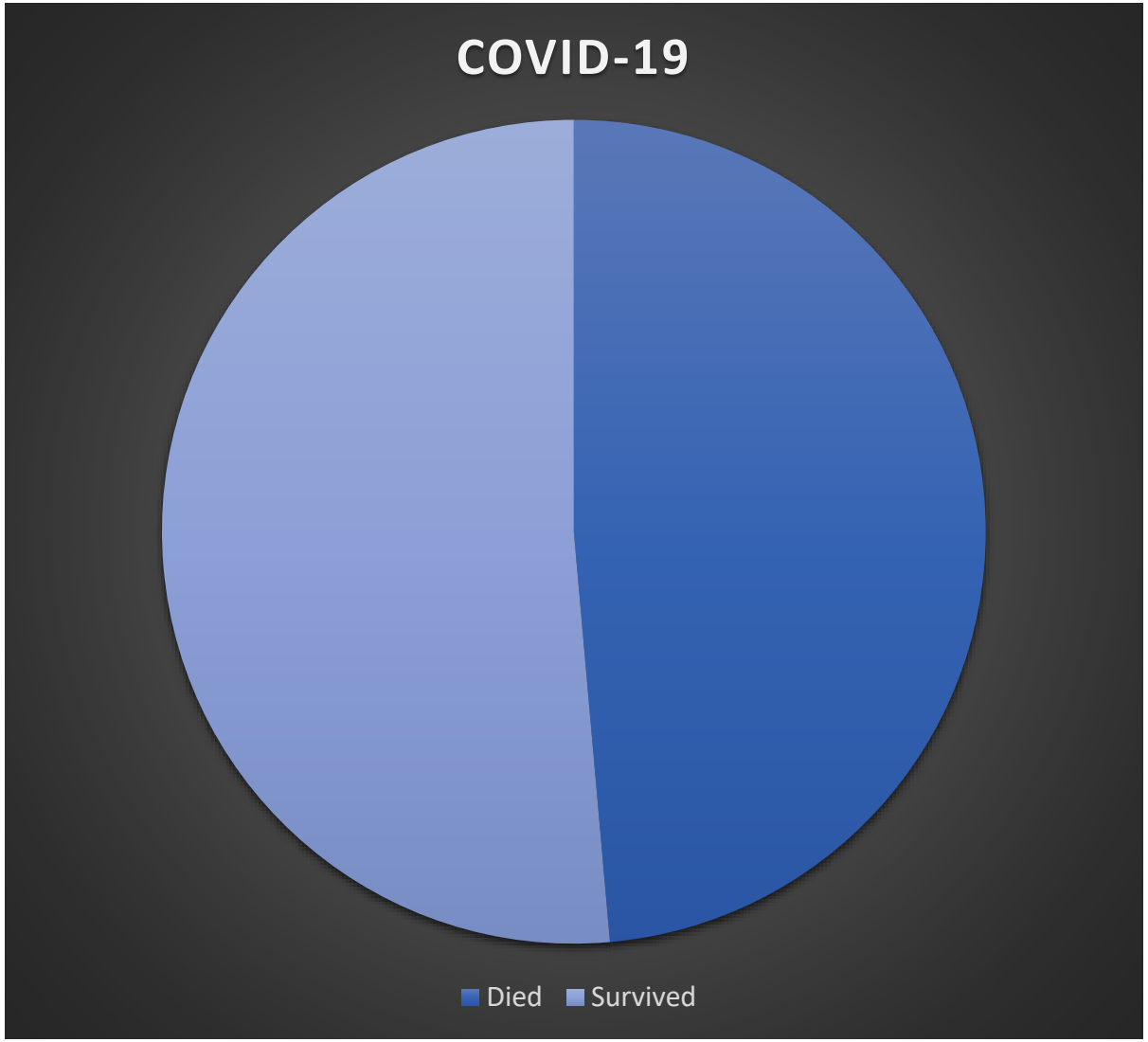
Renal system also vulnerable

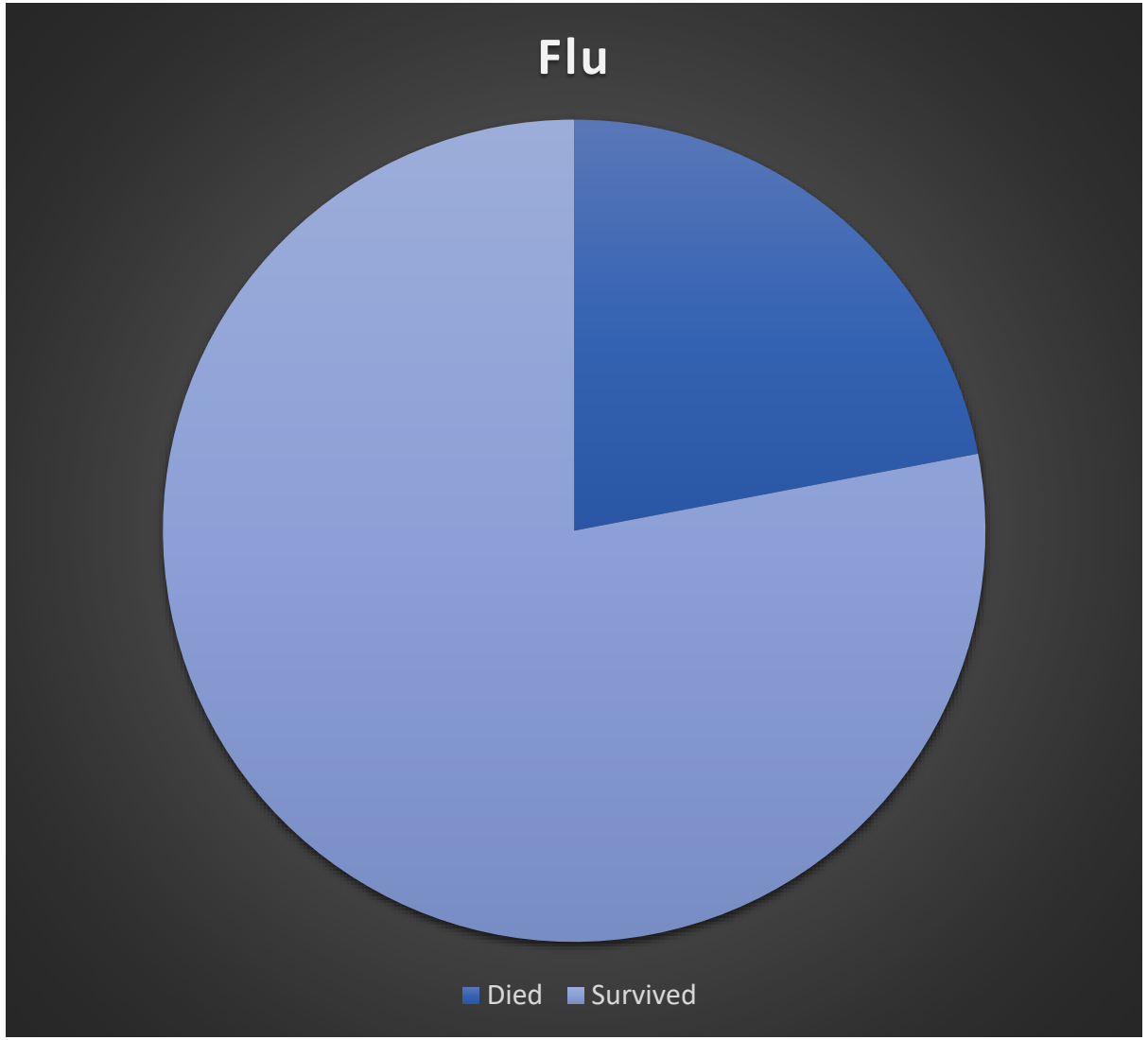
Clotting cascade is disrupted

Immune system mounts a brisk over-reaction



Demographics. The critically ill





SWINE INFLUENZA

I. Experimental Transmission and Pathology

By RICHARD E. SHOPE, M.D.

(From the Department of Animal Pathology of The Rockefeller Institute for Medical Research, Princeton, N. J.)

Plates 32 to 34

(Received for publication, May 6, 1931)

Swine influenza ("hog flu") was first recognized as a clinical entity in the fall of 1918. Because of the prevalence at the same time of human influenza and a marked resemblance in the symptoms of the two diseases Koen became convinced that they were the same. He therefore gave the name of "flu" to the new malady of hogs (1).

The cardinal features of swine influenza are amply presented in the veterinary literature (1–6).

Swine influenza is essentially a disease of autumn and early winter and reaches epizootic proportions each year. The onset is sudden and the incidence in an affected herd is practically 100 per cent. Fever, anorexia, prostration of an extreme type, cough, and a peculiar abdominal type of respiration are salient features of the disease. The animals cry out when handled, which has been interpreted as evidence of muscular tenderness. The period of illness is short, varying from 2 to 6 days, and in uncomplicated cases the recovery is almost as sudden as the onset. The mortality is stated to range from 1 to 4 per cent. Fatal cases exhibit an extremely edematous type of bronchopneumonia.

During the autumn of 1928 and of 1929 two epizootics were observed by the writer in eastern Iowa.[1] That in 1928 was very severe,

[1] For material and advice about the disease we are grateful to the following veterinarians of eastern Iowa: Drs. Fred J. Crow, J. S. Potter, and E. O. Thomas of Iowa City; A. H. Legenhausen, G. B. Munger, and J. W. Griffith of Cedar Rapids; H. J. Fry of Kalona, G. Lames of Dysart, J. B. Bryant of Mt. Vernon, R. Schuchert of Keystone, J. C. Glenn of Norway, and R. E. Elson of Vinton; also to Mr. N. W. Brooks of Cedar Rapids.

We are indebted to the State University of Iowa Medical School, and especially to Dr. O. H. Plant of the Department of Pharmacology and Dr. G. H. Hansmann of the Department of Pathology, for laboratory facilities during the autumns of 1928 and 1929.

The Journal of Experimental Medicine vol. 54, 1931

The NEW ENGLAND JOURNAL of MEDICINE

BRIEF REPORT

A Novel Coronavirus from Patients with Pneumonia in China, 2019

Na Zhu, Ph.D., Dingyu Zhang, M.D., Wenling Wang, Ph.D., Xingwang Li, M.D., Bo Yang, M.S., Jingdong Song, Ph.D., Xiang Zhao, Ph.D., Baoying Huang, Ph.D., Weifeng Shi, Ph.D., Roujian Lu, M.D., Peihua Niu, Ph.D., Faxian Zhan, Ph.D., Xuejun Ma, Ph.D., Dayan Wang, Ph.D., Wenbo Xu, M.D., Guizhen Wu, M.D., George F. Gao, D.Phil., and Wenjie Tan, M.D., Ph.D., for the China Novel Coronavirus Investigating and Research Team

SUMMARY

In December 2019, a cluster of patients with pneumonia of unknown cause was linked to a seafood wholesale market in Wuhan, China. A previously unknown betacoronavirus was discovered through the use of unbiased sequencing in samples from patients with pneumonia. Human airway epithelial cells were used to isolate a novel coronavirus, named 2019-nCoV, which formed a clade within the subgenus sarbecovirus, Orthocoronavirinae subfamily. Different from both MERS-CoV and SARS-CoV, 2019-nCoV is the seventh member of the family of coronaviruses that infect humans. Enhanced surveillance and further investigation are ongoing. (Funded by the National Key Research and Development Program of China and the National Major Project for Control and Prevention of Infectious Disease in China.)

From the NHC Key Laboratory of Biosafety, National Institute for Viral Disease Control and Prevention, Chinese Center for Disease Control and Prevention (N.Z., W.W., J.S., X.Z., B.H., R.L., P.N., X.M., D.W., W.X., G.W., G.F.G., W.T.), and the Department of Infectious Diseases, Beijing Ditan Hospital, Capital Medical University (X.L.) — both in Beijing; Wuhan Jinyintan Hospital (D.Z.), the Division for Viral Disease Detection, Hubei Provincial Center for Disease Control and Prevention (B.Y., F.Z.), and the Center for Biosafety Mega-Science, Chinese Academy of Sciences (W.T.) — all in Wuhan; and the Shandong First Medical University and Shandong Academy of Medical Sciences, Jinan, China (W.S.). Address reprint requests to Dr. Tan at the NHC Key Laboratory of Biosafety, National Institute for Viral Disease Control and Prevention, China CDC, 155 Changbai Road, Changping District, Beijing 102206, China; or at tanwj@ivdc.chinacdc.cn, Dr. Gao at the National Institute for Viral Disease Control and Prevention, China CDC, Beijing 102206, China, or at gaof@im.ac.cn, or Dr. Wu at the NHC Key Laboratory of Biosafety, National Institute for Viral Disease Control and Prevention, China CDC, Beijing 102206, China, or at wugz@ivdc.chinacdc.cn.

Drs. Zhu, Zhang, W. Wang, Li, and Yang contributed equally to this article.

This article was published on January 24, 2020, and updated on January 29, 2020, at NEJM.org.

N Engl J Med 2020;382:727-33.

EMERGING AND REEMERGING PATHOGENS ARE GLOBAL CHALLENGES FOR public health.[1] Coronaviruses are enveloped RNA viruses that are distributed broadly among humans, other mammals, and birds and that cause respiratory, enteric, hepatic, and neurologic diseases.[2,3] Six coronavirus species are known to cause human disease.[4] Four viruses — 229E, OC43, NL63, and HKU1 — are prevalent and typically cause common cold symptoms in immunocompetent individuals.[4] The two other strains — severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV) — are zoonotic in origin and have been linked to sometimes fatal illness.[5] SARS-CoV was the causal agent of the severe acute respiratory syndrome outbreaks in 2002 and 2003 in Guangdong Province, China.[6-8] MERS-CoV was the pathogen responsible for severe respiratory disease outbreaks in 2012 in the Middle East.[9] Given the high prevalence and wide distribution of coronaviruses, the large genetic diversity and frequent recombination of their genomes, and increasing human–animal interface activities, novel coronaviruses are likely to emerge periodically in humans owing to frequent cross-species infections and occasional spillover events.[5,10]

In late December 2019, several local health facilities reported clusters of patients with pneumonia of unknown cause that were epidemiologically linked to a

This article was published on January 24, 2020, and updated on January 29, 2020, at NEJM.org.

"History suggests that the battle against SARS-CoV-2 and related coronaviruses is still in its infancy. Once this new Coronavirus outbreak has been overcome, we may come to discover we have fought only one battle not the entire war."

Thank you for your attention

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https://www.actuarialcolloquium2020.com/

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South Africa

Joanne Buckle

Milliman

UK

Covid-19 Pandemic
South African experience

Barry Childs

Joint CEO, Insight Actuaries & Consultants

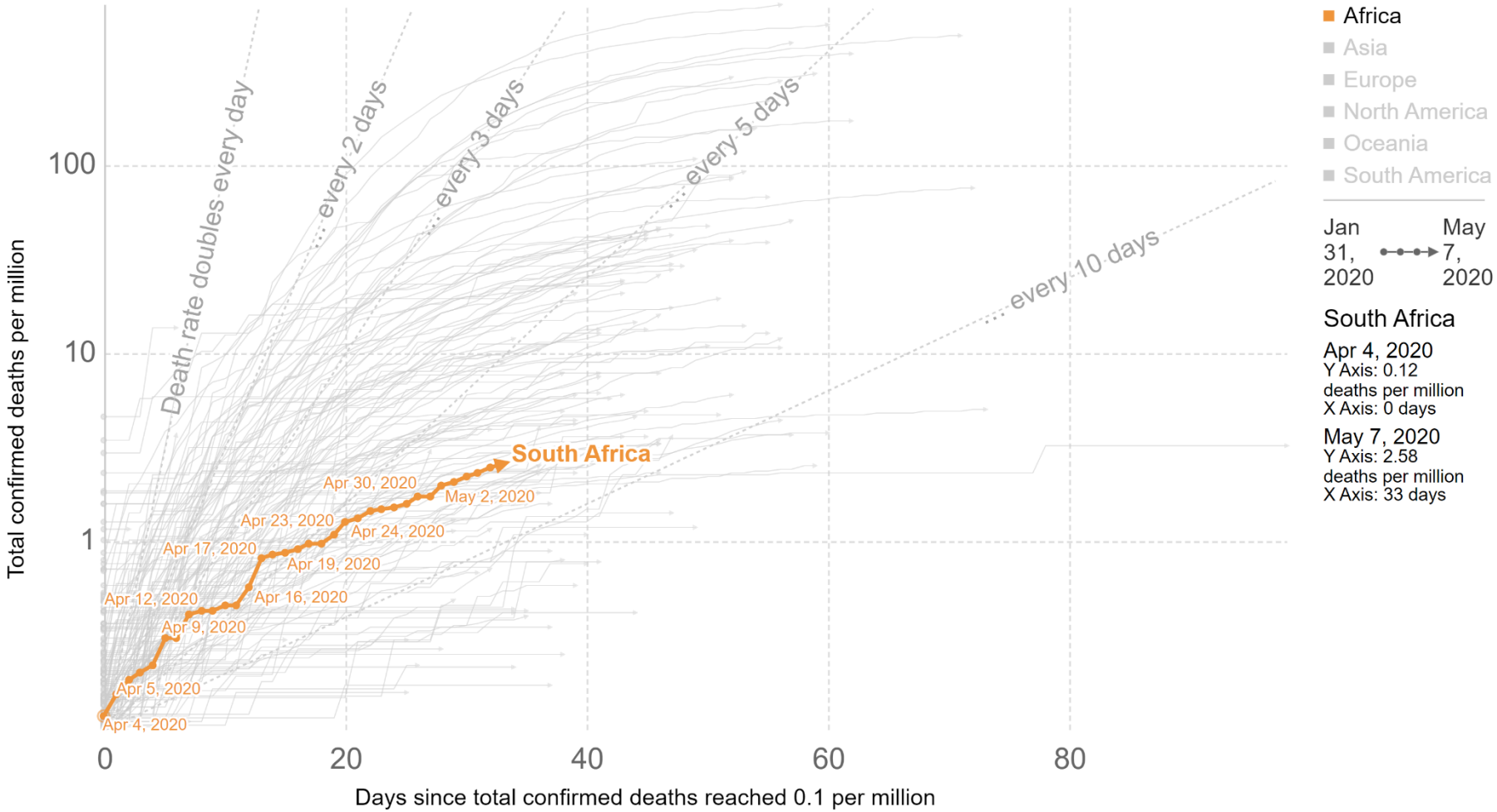
Chair ASSA healthcare committee

May 12th 2020

Total confirmed COVID-19 deaths per million: how rapidly are they increasing?

Our World in Data

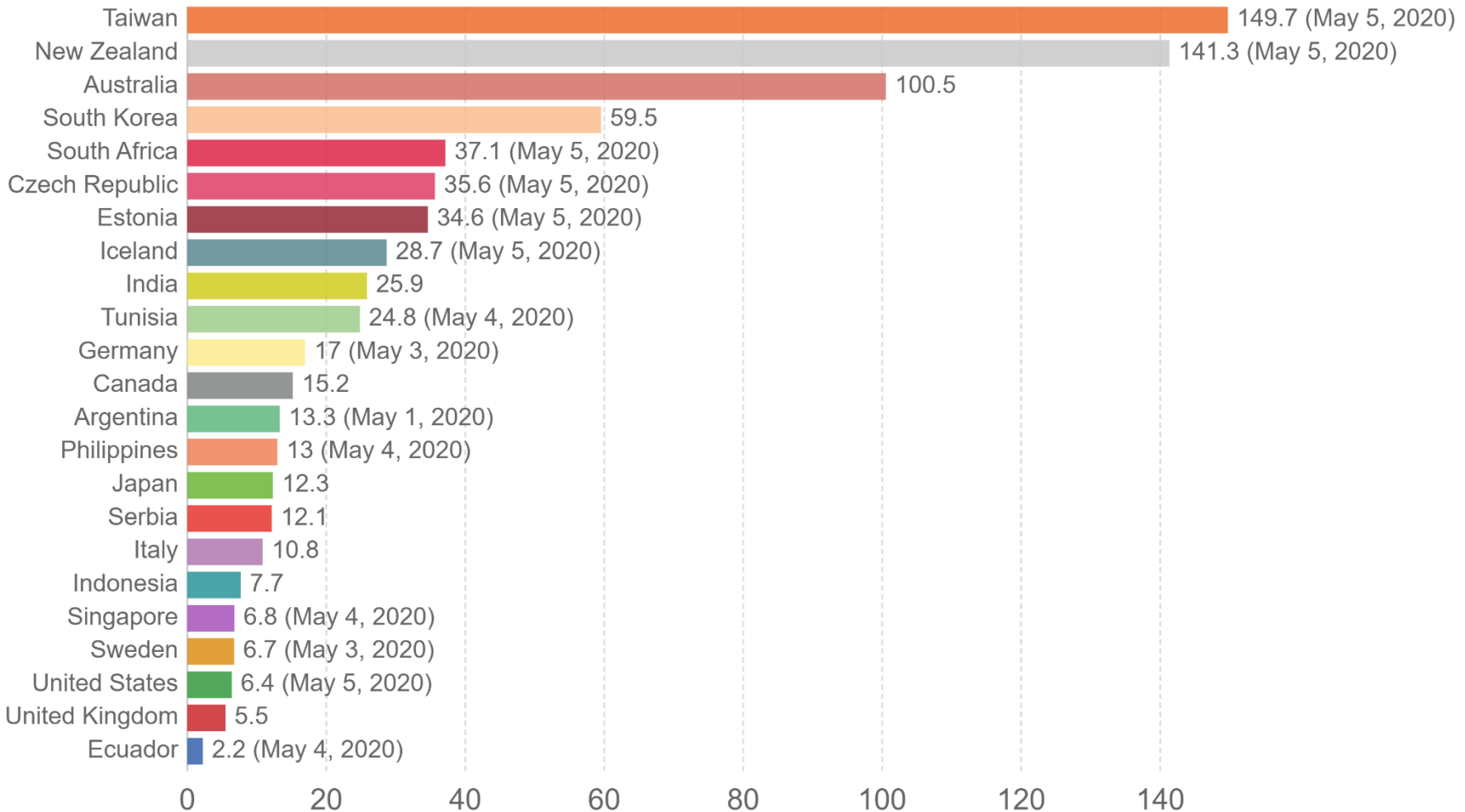
Shown are the total confirmed deaths per million people. Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.



Source: European CDC – Situation Update Worldwide – Last updated 7th May, 11:15 (London time)

OurWorldInData.org/coronavirus • CC BY

Number of COVID-19 tests per confirmed case, May 6, 2020



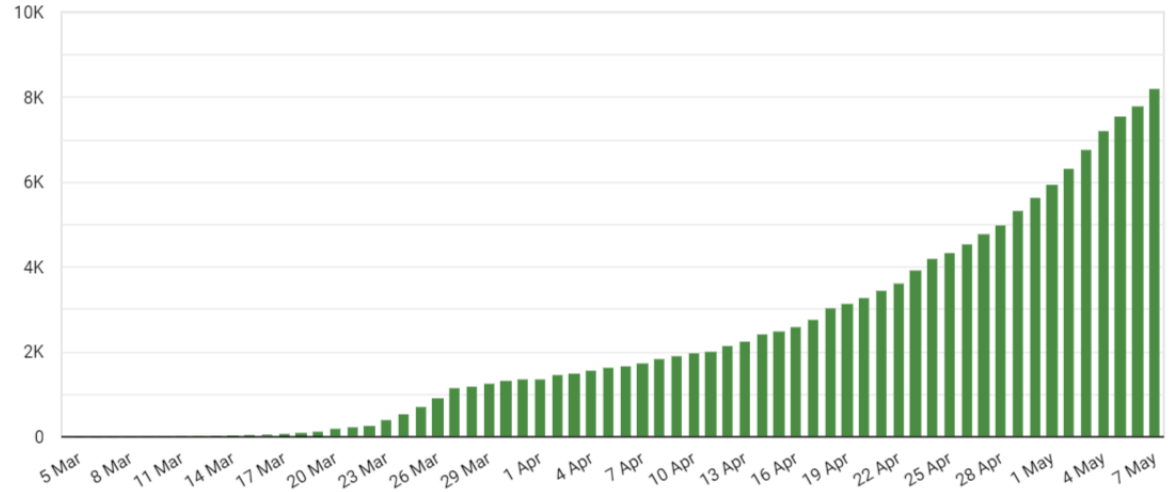
Source: Tests: official data collated by Our World in Data. Confirmed cases: European CDC – Situation Update Worldwide
Note: For testing figures, there are substantial differences across countries in terms of the units, whether or not all labs are included, the extent to which negative and pending tests are included and other aspects. Details for each country can be found at the linked page.

South Africa's story so far

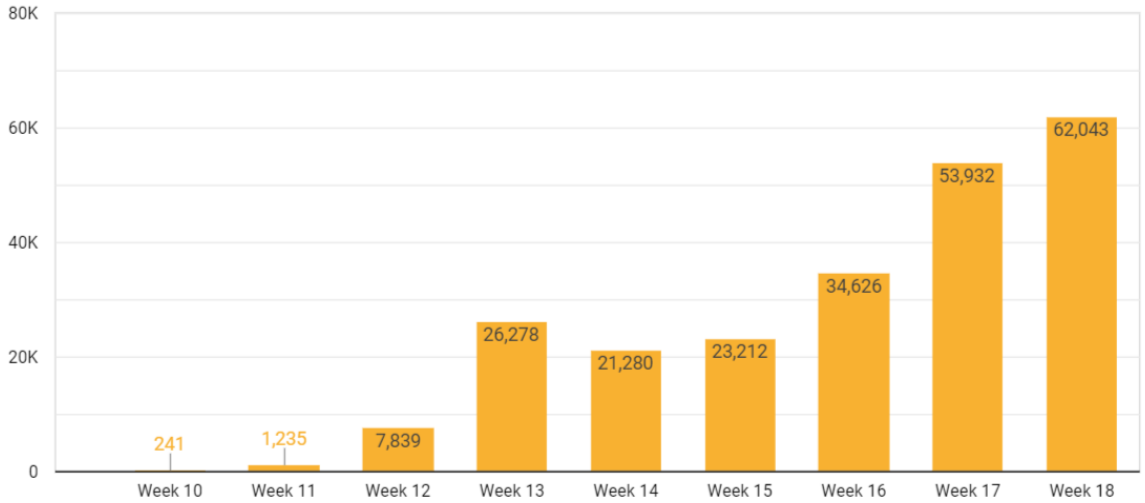
Cumulative Cases	Daily change	Cumulative Fatalities	Mortality Rate	Total Recoveries
8,232	+424	161	1.96%	3,153
Active Cases	**Relative to Population**		**Relative to Population**	**Total Tests**
4,918	0.0140%		0.000274%	292,153

Gauteng	Western Cape	KwaZulu Natal	Free State	Eastern Cape	Limpopo	Mpumalanga	North West	Northern Cape
1,804	3,994	1,204	134	929	41	59	40	27
Daily Increase								
84	234	15	4	80	1	2	3	1

Cumulative Confirmed Cases

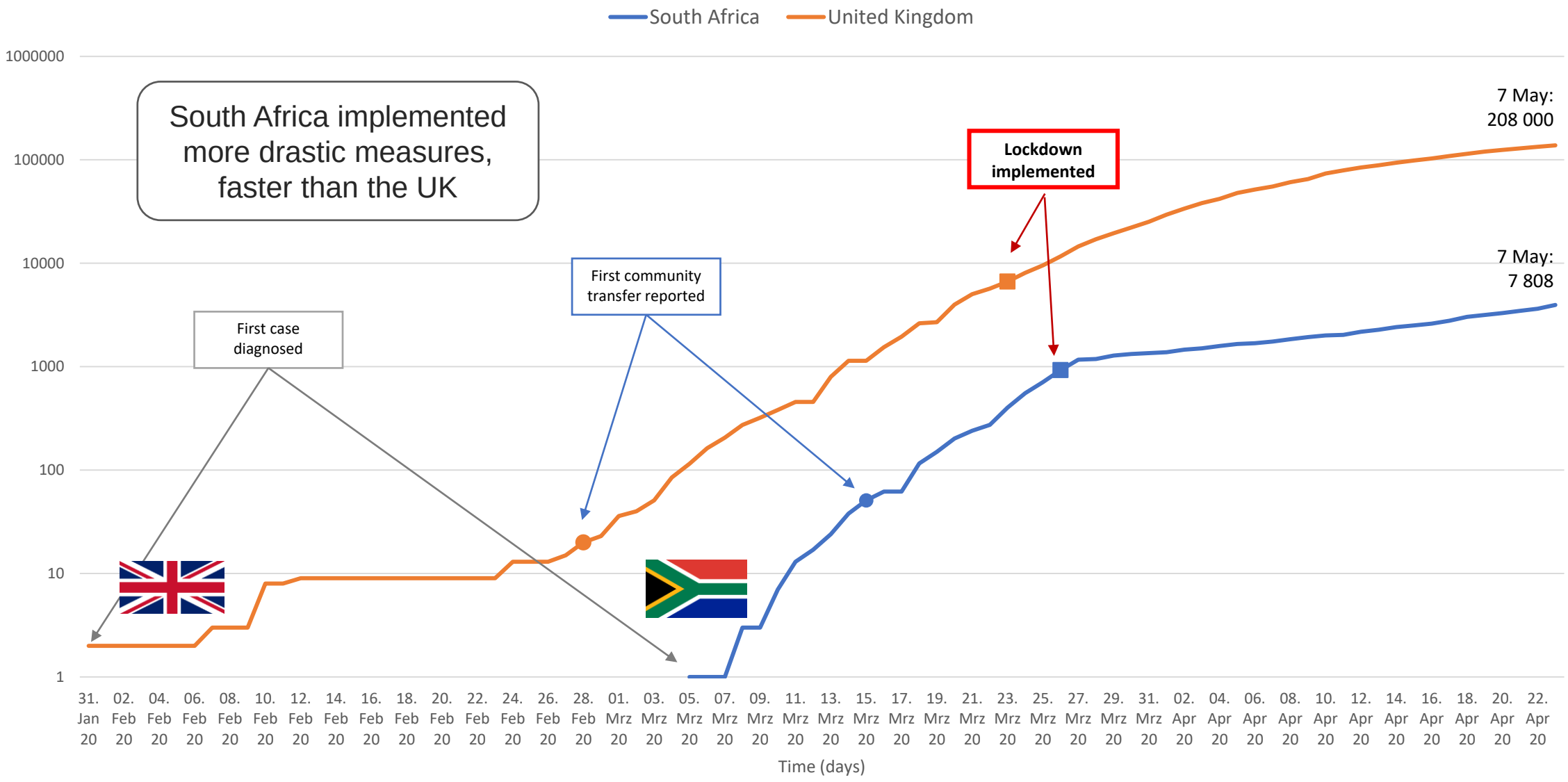


Total Conducted Tests per week



Implemented suppression strategies earlier than many other countries. Reset growth trajectory of disease. Big debates about trade-offs of economic effects on health and direct effects of virus. Expanding testing capabilities. Five Levels of risk based lockdown. Concerns about community transmission in highly dense areas, and levels of comorbidity, offset by relatively younger age profile of the population.

WITS UNIVERSITY · NRF National Research Foundation · iThemba LABS Laboratory for Accelerator Based Sciences


South Africa
United Kingdom
South Africa implemented more drastic measures, faster than the UK
First case diagnosed
First community transfer reported
Lockdown implemented
7 May: 208 000
7 May: 7 808
1000000
100000
10000
1000
100
10
1
31. Jan 20
02. Feb 20
04. Feb 20
06. Feb 20
08. Feb 20
10. Feb 20
12. Feb 20
14. Feb 20
16. Feb 20
18. Feb 20
20. Feb 20
22. Feb 20
24. Feb 20
26. Feb 20
28. Feb 20
01. Mrz 20
03. Mrz 20
05. Mrz 20
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19. Mrz 20
21. Mrz 20
23. Mrz 20
25. Mrz 20
27. Mrz 20
29. Mrz 20
31. Mrz 20
02. Apr 20
04. Apr 20
06. Apr 20
08. Apr 20
10. Apr 20
12. Apr 20
14. Apr 20
16. Apr 20
18. Apr 20
20. Apr 20
22. Apr 20
Time (days)

Challenges

Too much (often conflicting) information

Pace of information change

Missing pieces

Unknowns

Treatments

Vaccine

Immunity

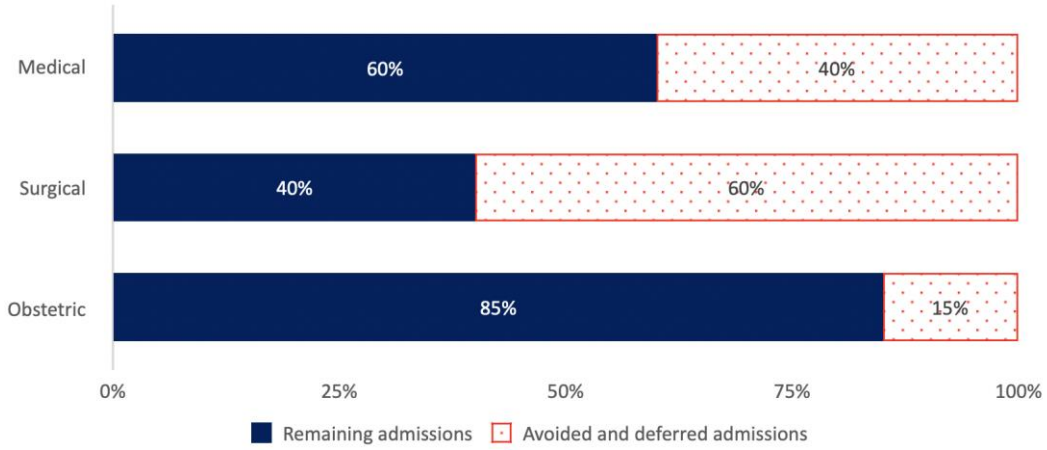
Interventions

Long term morbidity

True IFR

Missing deaths

Health system effects



The more than 50% decline in the hospital admission rate will save medical schemes more than R1 billion a week for so long as the trend is sustained. Over a five-week lockdown period savings will exceed R5.0 billion. The effect is disproportionate on different parts of the system.

Rush to scaleup PPE, ventilators, medicines, hospital beds.

Healthcare workers are a key risk in the system in terms of exposure, not also their treatment of patients.

Economic effects

NATIONAL

Sars projects annual revenue loss of more than R280bn

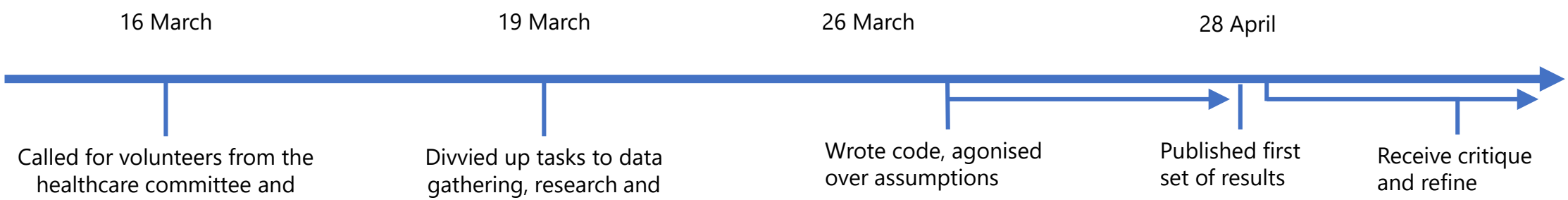
The significant decline in tax revenue compared to is due to the lockdown and its adverse effects on economic activity

05 MAY 2020 - 13:30 *by* LINDA ENSOR
UPDATED 05 MAY 2020 - 14:41

Business Day

Early forecasts suggest significant economic disruption from the current lockdown, which is costing the economy an estimated R13 billion per day. Preliminary projections by the South African Reserve Bank indicate that South Africa could lose 370,000 jobs in 2020. Projections by private banking analysts (based on the initial 21-day lockdown) suggest a GDP contraction of 7% during 2020, leading to a fiscal deficit of 12% of GDP (forecast at 6.8% in the 2020 budget) and a debt-to-GDP ratio in excess of 81% in 2021. This means that the country's already limited public finances will be further constrained.

https://theconversation.com/south-africa-needs-to-end-the-lockdown-heres-a-blueprint-for-its-replacement-136080

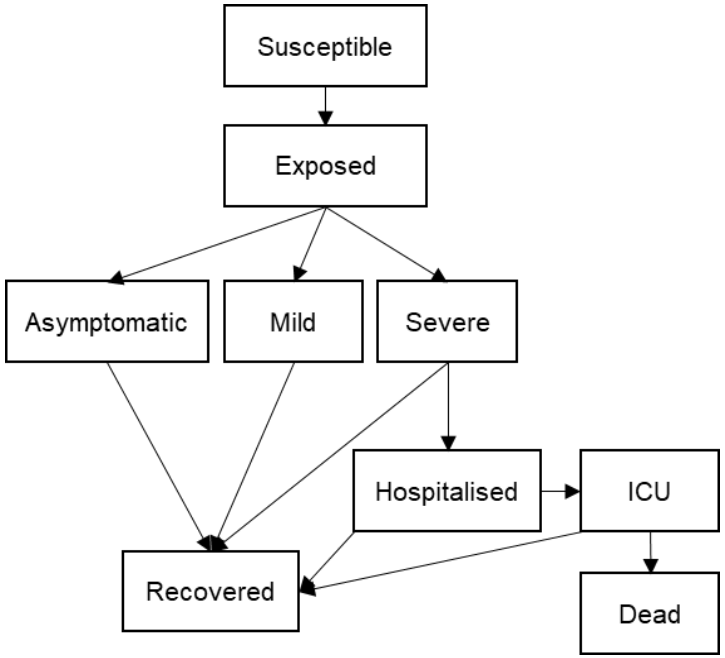


Approach is to produce a model for use by broader profession that is sound in its basis and provides guidance in its application.

Special thanks to:

Percept	NMG
Clinix	3One
Alexander Forbes	Discovery
Medscheme	Insight

ASSA Covid19 Model structure



Base parameters

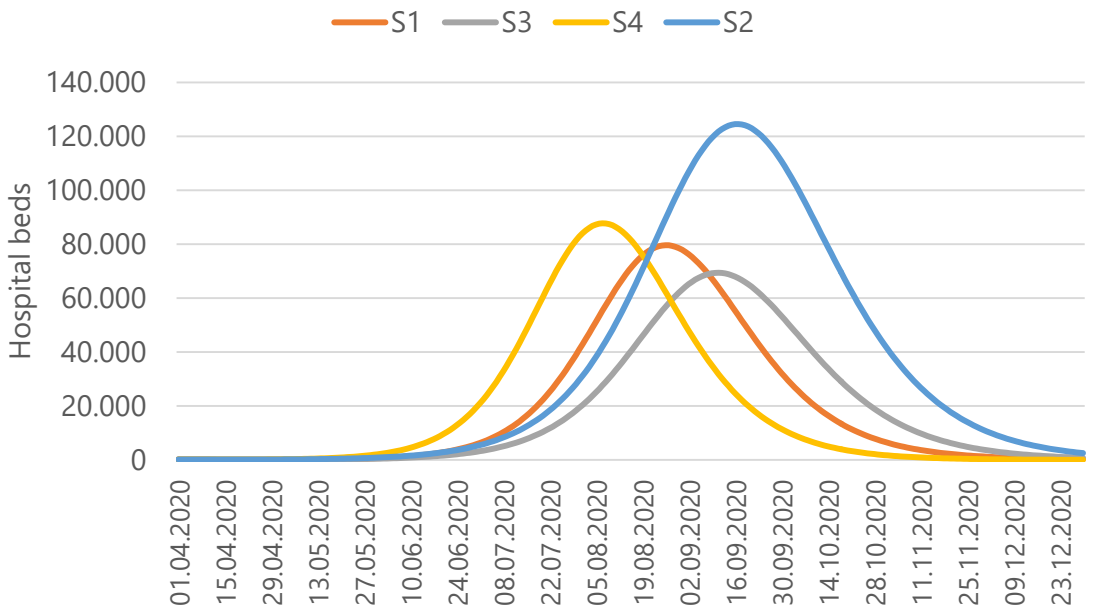
- *R0 = 3*
- *Proportion of asymptomatic cases = 75%*
- *Relative Infectiousness of asymptomatic cases (to symptomatic cases) – 50%*
- *30% of mild cases detected, all severe and critical cases detected**
- *Lockdown effect = 60% x R0*
- *NPIs after lockdown = 75% x R0*
- *Infectiousness pre isolation: Asymptomatic 10 days, Mild 7 days, Severe 2.3 days,*
- *Severe isolated in hospital for 3.7 days*
- *Hospital stay: 10 days if not critical, 6 critical days if critical plus 10 days in ICU if recover or 6 if die*
- *Proportion of admissions ending in ICU =21.3%.*

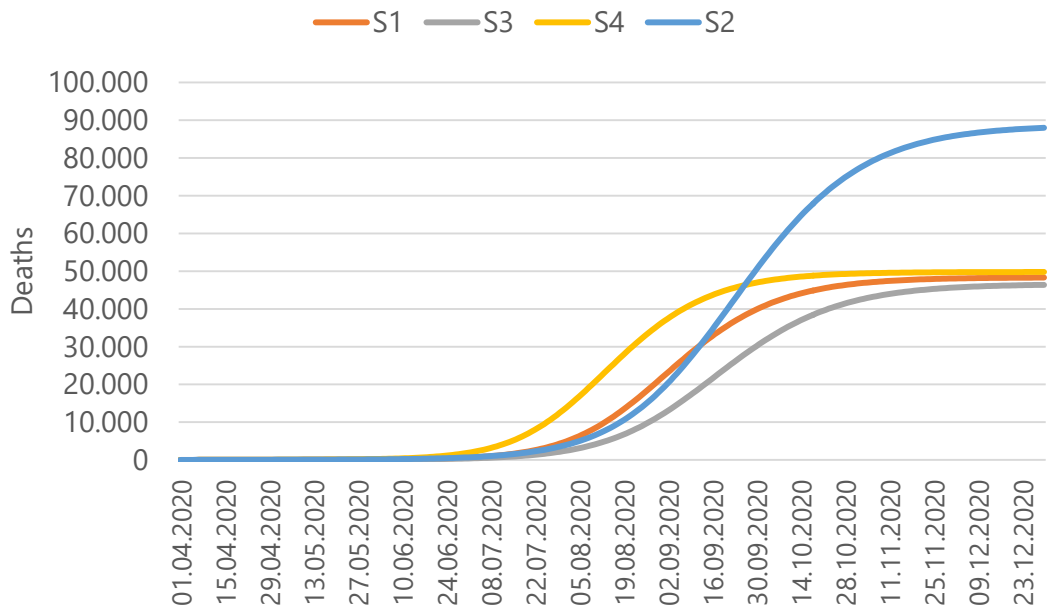
Scenario 2 (else equal to base)
- *R0 = 2.6*
- *Asymptomatic proportion = 50%*

Scenario 3 (else equal to base)
- *Lockdown effect = 50% x R0*
- *NPIs after lockdown effect = 70% x R0*

Scenario 4 (else equal to base)
- *Lockdown effect = 70% x R0*
- *NPIs after lockdown effect = 80% x R0*

First set of scenarios



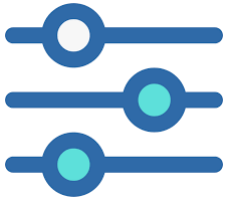


Planned next steps

Critique

covid19@actuarialsociety.org.za

Online version for users, including code. Technical write up.



More scenarios and testing of key parameters

Mortality
Asymptomatic
Treatment paths
Cycles
NPI effects

Refine model to allow for:

Comorbidities
Density
Regions
Movement

Thank you

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Milliman

UK

An Overview of the US Health Care System

Program	Population Covered	National Health Expenditure (2018 in Billions)
Medicaid / CHIP	Low Income	$615.9
Medicare	Age 65 & Over / Disabled	$750.2
Private Health Insurance:		$1,243.1
State/Federal Marketplace	• Individuals • Employed by small employers	
Employment-based	Employed by Large Employers	

https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical

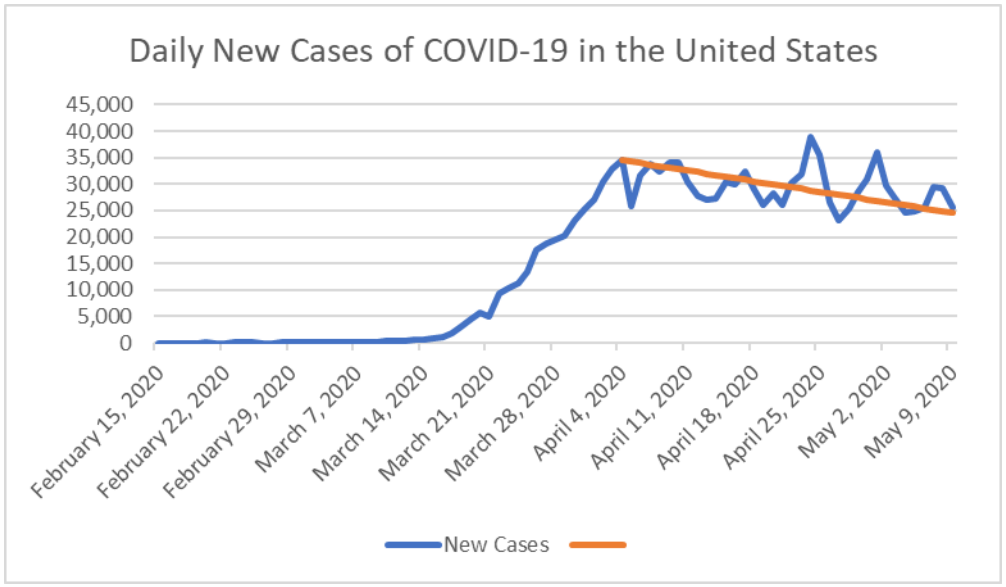
U.S. Legislative Actions

Act	Allowance
Coronavirus Preparedness & Response Supplemental Act	$8 Billion
Families First Coronavirus Act	$192 Billion
Coronavirus Aid, Relief, and Economic Security (CARES) Act	$2.7 Trillion
Paycheck Protection Program and Health Care Enhancement Act	$733 Billion
	$3.6 Trillion

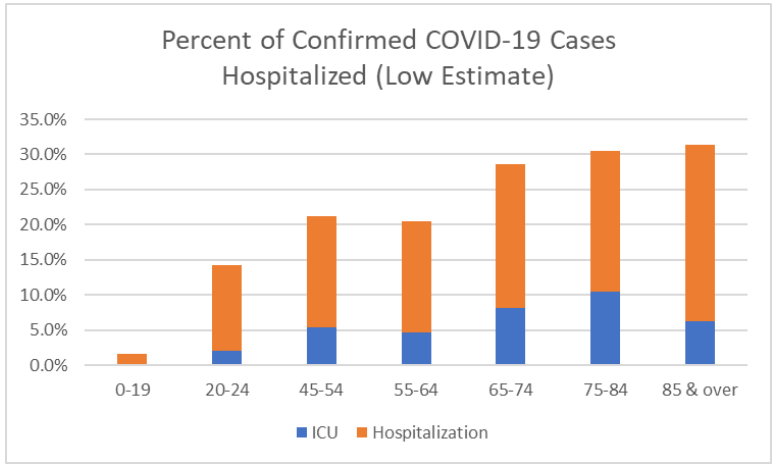
National Emergency declared March 13, 2020

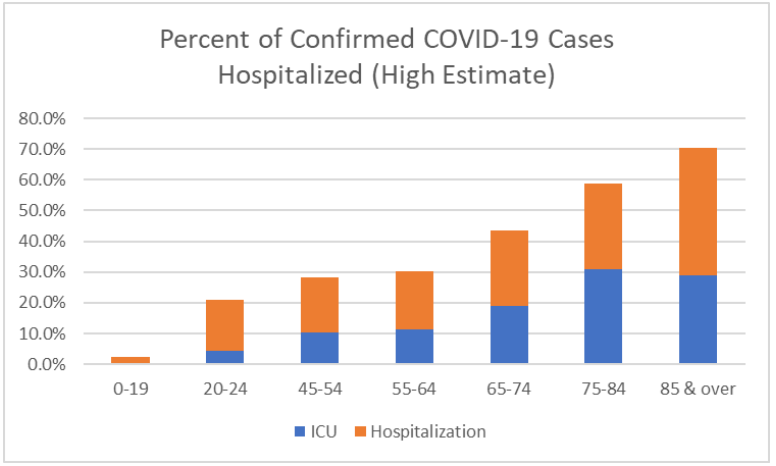
Region	Total Cases	Cases per Million	Deaths per Million
USA	1,349,605	4,077	242
Spain	264,663	5,661	569
Italy	218,268	3,610	503
UK	215,260	3,171	465
Russia	209,688	1,437	13
France	176,658	2,706	403
Worldwide	4,132,605	530	36

Source: https://www.worldometers.info/coronavirus/ as of May 9, 2020



Source: https://www.worldometers.info/coronavirus/country/us/ as of May 9, 2020





Source: US Center for Disease Control and Prevention

Actuarial Modeling: COVID-19 Decision Tree

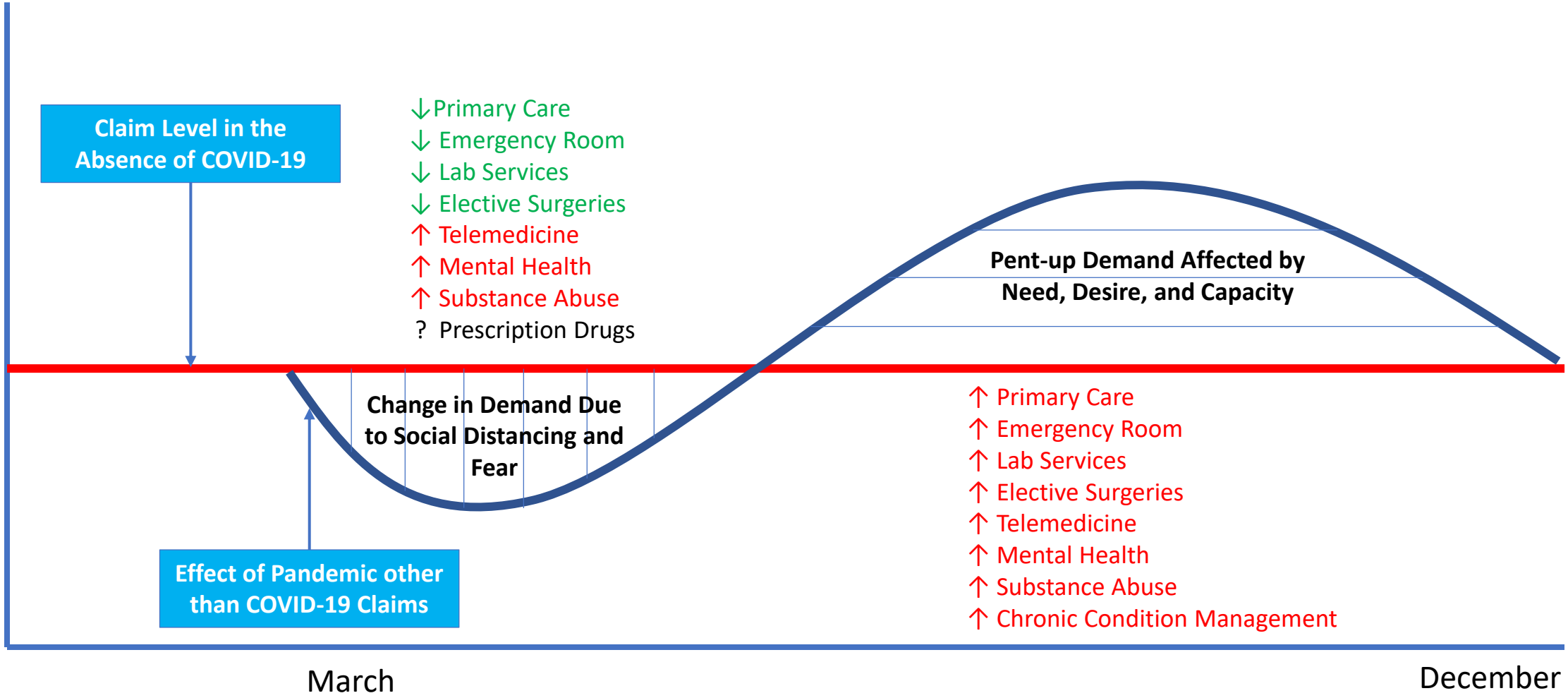
http://clipart-library.com/clipart/1518155.htm

- Infected
  - COVID-19 Test
  - No
  - Yes
    - Asymptomatic
    - Symptomatic
      - Mild
      - Severe
        - Intensive Care Unit Admission
        - Sepsis[2]
        - ARDS[2]
        - ARDS with Sepsis[2]
      - Emergency / Urgent Care[1]
      - Physician Office Visit[1]
      - Tele-medicine Consult[1]
      - Non-ICU Hospital Admission

[1] With likely diagnostic testing and possible OTC drug prescription

[2] Likely requiring post-discharge care

Actuarial Modeling: Social Distancing



Actuarial Modeling: Other Considerations

- Demographic information about the population modeled:
  - Age distribution
  - Family-size
  - Geographical distribution (COVID-19 hot spots)
  - Co-morbid conditions
- Benefit plan design
- Local jurisdiction social distancing policies
- Legislative / Regulatory Actions
- Second Wave

2018 Cost Projection Modeling[1]

	Net Decrease in Cost Scenario	Moderate Cost Increase Scenario	20% Confirmed Infection Rate Scenario
Confirmed Cases per 1,000	10	100	200
Annual Reduction in Non-Elective, Non-Urgent Healthcare Services due to Social Distancing	20%	10%	10%
Change over Pre-COVID Projections for COVID-19 Testing and Treatment Only	1.3%	13.0%	22.5%
Change over Pre-COVID Projections due to Social Distancing Only	-5.1%	-2.5%	-2.5%
Total Change over Pre-COVID Projections	-3.8%	10.5%	20.0%

[1] MorningStar Actuarial Consulting COVID-19 Projection Model. Calendar year 2020 projection. Note that there are over 50 assumptions utilized in the model and only two are shown here and varied for simplicity to demonstrate a range of possible results currently promoted by numerous organizations. A thorough review of all assumptions and their interrelationship are required for valid projection purposes. These results should not be interpreted as applicable to any plan as factors including plan demographics and benefit design are integral component of any valid projection.

Thank you for your attention

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UK

Covid 19 for European Medical Insurers

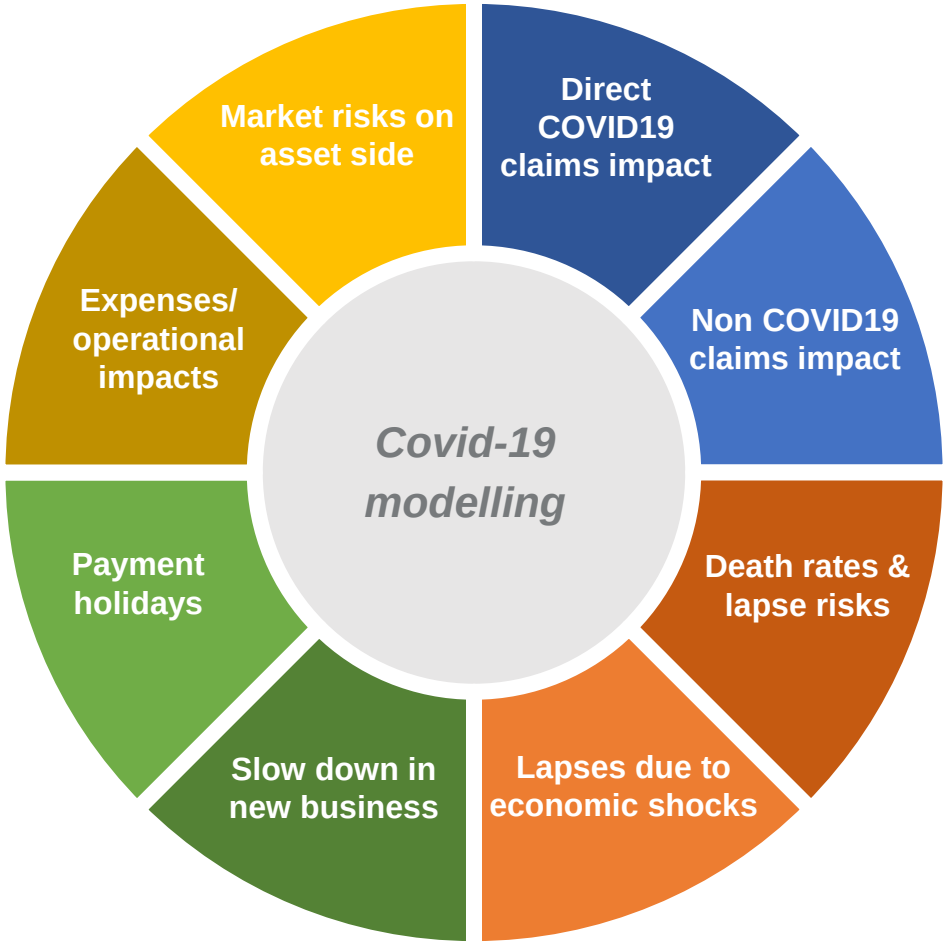
Issues and Considerations for 2020 and Beyond

Joanne Buckle,
Milliman

May 11th – May 15th 2020

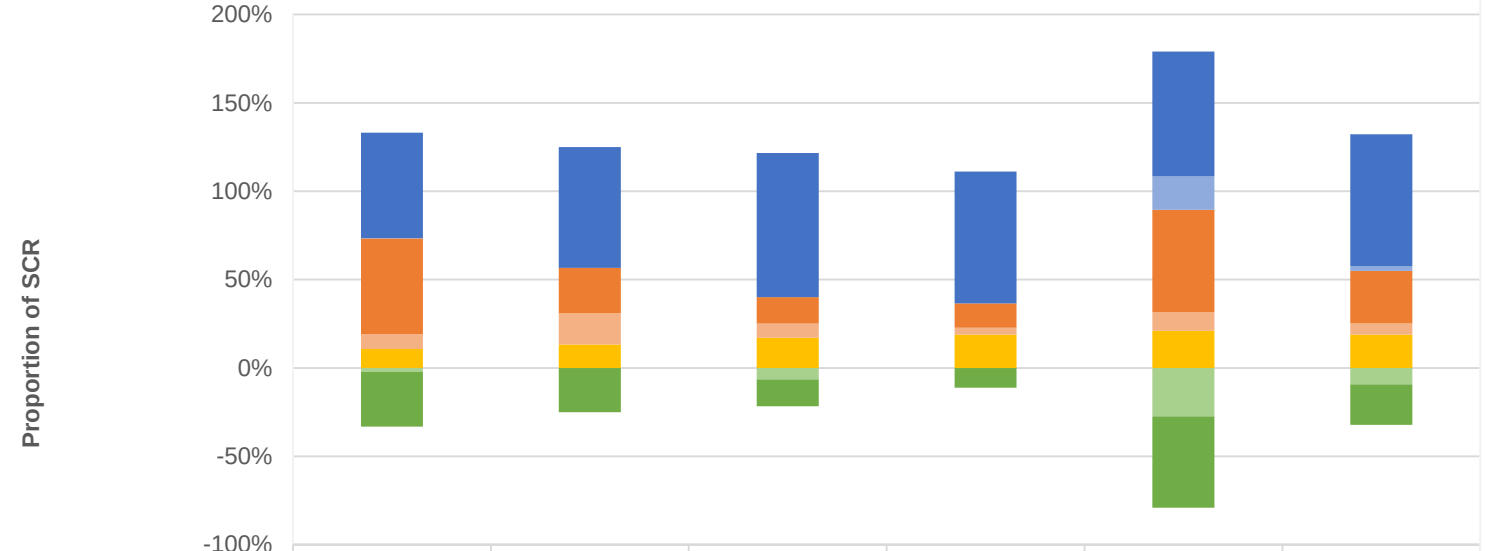
Covid 19 impact framework for risk

These are some common themes we see across Europe for medical insurers



What do published SFCR's reveal about COVID-19?

Analysis of 2018 SFCRs revealed that underwriting risk, followed by market risks are most significant in the SCR calculation



	France	IPMI	Ireland	Netherlands	Spain	United Kingdom
Health underwriting risk	60%	68%	82%	75%	71%	75%
Non Life underwriting risk	0%	0%	0%	0%	19%	3%
Market risk	54%	26%	15%	14%	58%	30%
Counterparty default risk	8%	18%	8%	4%	11%	6%
Operational risk	11%	13%	17%	19%	21%	19%
Intangible asset risk	0%	0%	0%	0%	0%	0%
Diversification	-31%	-25%	-15%	-11%	-52%	-23%
Loss absorbing - Deferred taxes	-2%	0%	-6%	0%	-27%	-9%

- Proportion of SCR compromised of underwriting risk is usually 60% to 80%.
- Next most significant is market risks, which ranges from 15% to 60% (undiversified). High proportion of assets in government and corporate bonds, cash. Relatively low use of equities, which limits market risk.
- Counterparty risks are also significant in countries with high levels of reinsurance.
- Operational risks are generally 10% to 20% of the SCR.
- In general, medical insurers had very high coverage ratios and therefore COVID-19 should not have a significant impact on solvency in the short term, although some insurers will have suffered reductions in coverage ratios due to financial market impacts. Some listed multiline insurers have suspended dividend distributions.
- Pandemic risks, if mentioned at all in 2018 SFCRs, are relatively insignificant in capital terms and those markets with potentially large exposure (eg Netherlands) have additional protection through the RES.

1. Milliman Analysis of Insurers' Solvency and Financial Condition Reports: European Health Insurers (published Feb 2020)

What do the 2019 SFCRs published so far say about COVID?

Generally qualitative considerations only, but there are some common themes

Market risks

- Some impact on asset side, but relatively limited in most cases
- Capital markets are a key concern in Germany with ageing reserves held as compulsory health insurance is a long term contract (not annually renewable)
- Generally no liquidity issues.

Underwriting risk

- Still being considered in most cases, but warning of significant additional uncertainty in 2020 results
- In general no additional impacts on 2019 results/no additional reserves been put aside explicitly
- Commentary on significant efforts on identifying and modelling emerging impacts and planning for a wide range of outcomes

Operational risks

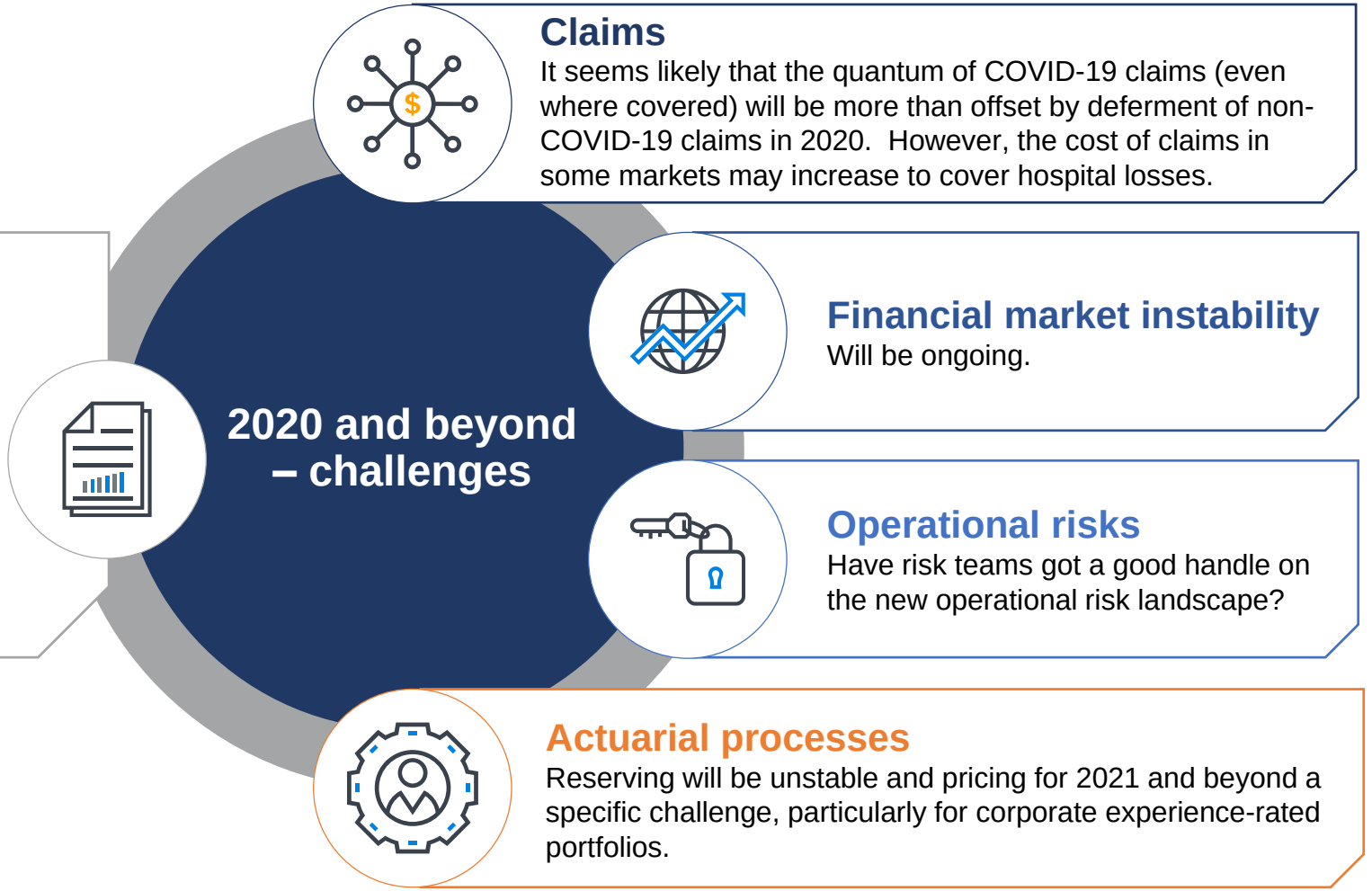
- Insurers have demonstrated considerable resilience and have implemented business continuity plans smoothly and effectively.
- Several have reduced call centre capacity, but responding to emails and instant messages
- Few significant issues
- Planning for increased staff sickness
- Some issues with overseas outsourced vendors, eg for claims processing

Customer focus

- Strong focus on customer outcomes and treating customers fairly
- Some acknowledgement of reduced access to private health care facilities

What else do we know?

From talking with clients and looking at press releases, there are a number of concerns for 2020/2021/2022



What are European insurers doing to mitigate the risks?

And seize opportunities!

Evolving proposition design

- Promoting existing GP helplines and EAP.
- Paying for remote specialist consultations.
- Waiving pandemic exclusions where they exist and adding enhanced COVID-19 benefits.
- Vaccines and anti-body tests as a value-add?

Opportunities for operational re-design

- Many have been pleasantly surprised by Work From Home productivity and effectiveness.
- Few see a return to pre-COVID-19 operating models.

Risk scenario development/ORSA development

- Starting to identify new ORSA scenarios which capture the new world/operating models.
- Increased focus on cyber risk and IT security incidents.

New distribution channels

- Re-design and renewed focus on digital-first distribution channels to try and stem decline in New Business volumes.

Rebate schemes

To help stave off request for payment holidays and mitigate lapses, some major insurers in the UK and Ireland have announced rebate or premium reduction schemes

Bupa UK

"*But we want to reassure our customers that we will do the right thing for them, and that any exceptional financial benefit ultimately arising from COVID-19 will be passed back to our health insurance customers. This will be by rebate or other appropriate means.*" **BUPA UK press release 3rd April 2020**

AXA-PPP

"*In the short term, we expect to pay lower claims as private hospitals focus on helping the NHS during the pandemic. When the crisis is over we expect to pay higher claims due to a catch up in treatment. Once normality resumes, if the value of our health insurance claims in 2020 and 2021 combined falls because of the current crisis, we'll pass back to you, our customers, the difference compared with 2019".* **AXA Website 8th April 2020**

Premium rebates

A way to keep customers on board?

VHI

In response to the Covid-19 emergency, the private hospital network has entered into a temporary agreement with the public health system so there is one single health system to meet the healthcare needs of everyone during this crisis. We understand that this hospital agreement changes the nature of some of the services that can be provided to you right now and as a result, a fall in claims costs is likely.

In recognition of this change, all Vhi private health insurance customers will see an average premium waiver of 50%. The exact waiver amount will vary depending on your plan(s), and will range between 45% - 60%. We are writing to every customer to let you know exactly what this means for you. The waiver is proposed for three months, effective from mid May 2020, however, if there is an extension or curtailment to the partnership agreement between the HSE and the Private Hospital Association (PHA), this waiver will be adjusted. " **VHI press release 16th April 2020**

Thank you for your attention

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UK

Alex Leung

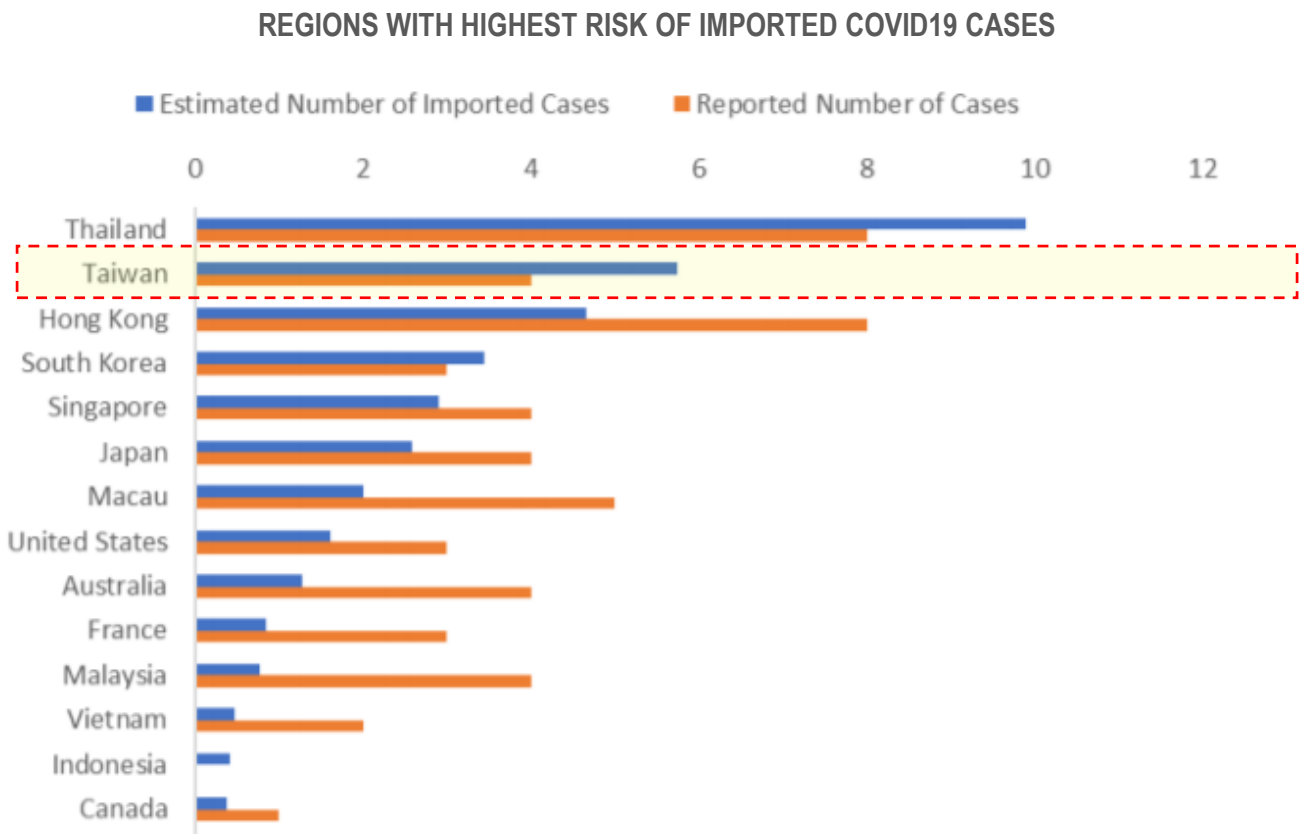
OneDegree

Chinese Taipei

Background on Taiwan

- Known for its National Health Insurance system that covers 99% of its population
- 81 miles off the coast of mainland China
- Population size of 23 million, of which 404,000 work in mainland China
- In 2019, 2.7 million visitors from mainland China traveled to Taiwan

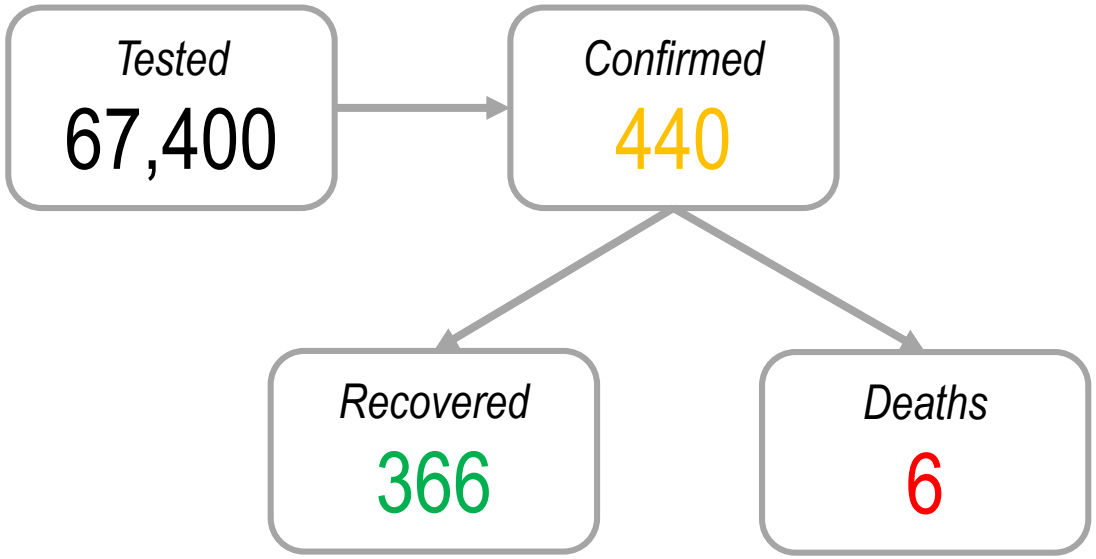
Taiwan was originally identified as a potential high-risk region



https://systems.jhu.edu/wp-content/uploads/2020/01/Gardner-JHU_nCoV-Modeling-Report_Jan-26.pdf

A study conducted by Johns Hopkins University in January 2020 indicated that Taiwan could have had the second highest confirmed cases after mainland China

Life as normal and latest Covid-19 statistics in Taiwan



Taiwan CDC as of May 11 2020

Taiwan has 440 cases, of which over 85% were imported,
and 6 deaths with a mortality rate of 0.25 per million people

Effective management of Covid-19 via contact tracing

3 BASIC STEPS OF CONTACT TRACING

Identification

- Once someone is confirmed as infected with a virus, contacts are identified by asking about the person's activities and the activities and roles of the people around them since onset of illness.
- Contacts can be anyone who has been in contact with an infected person: family members, work colleagues, friends, or health care providers

Notification

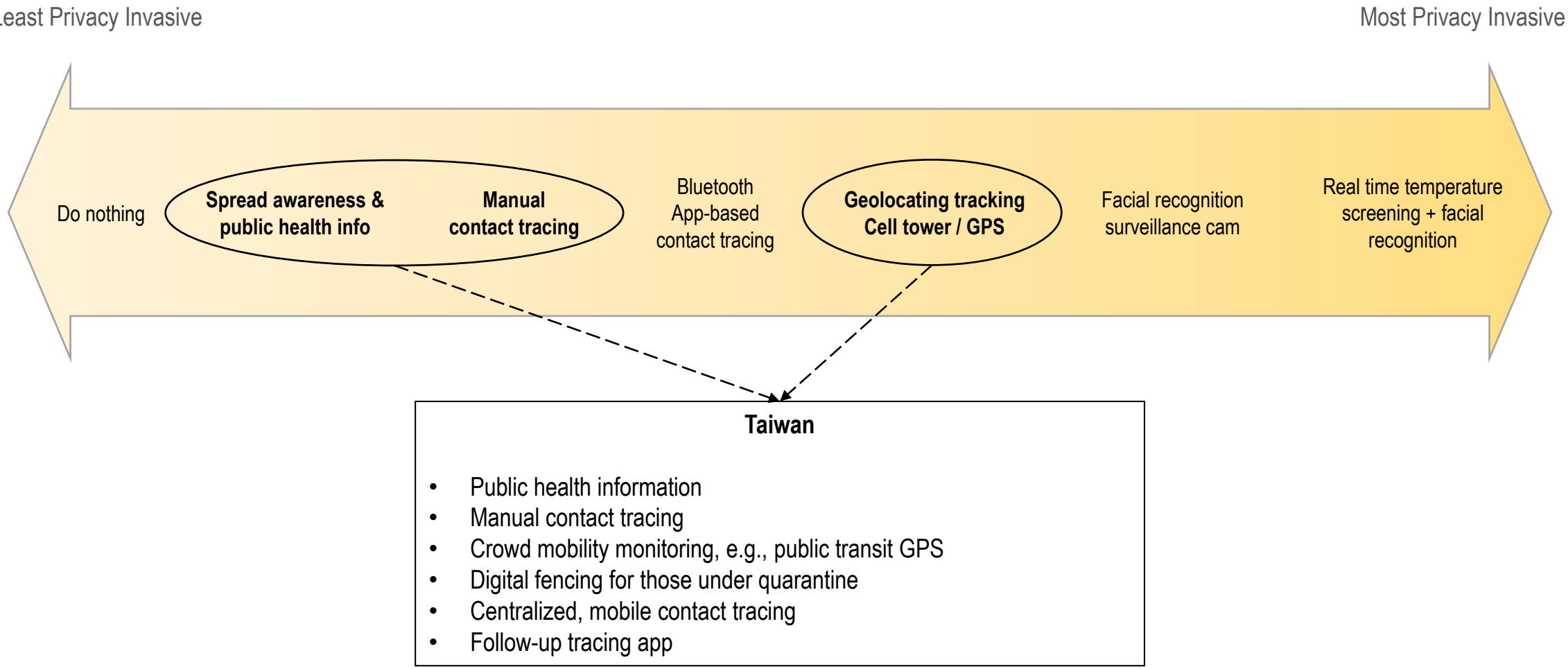
- All persons considered to have contact with the infected person should be listed as contacts.
- Efforts should be made to identify every listed contact and to inform them of their contact status, what it means, the actions that will follow, and the importance of receiving early care if they develop symptoms.
- Contacts should also be provided with information about prevention of the disease. In some cases, quarantine or isolation is required for high risk contacts, either at home, or in hospital.

Follow-up

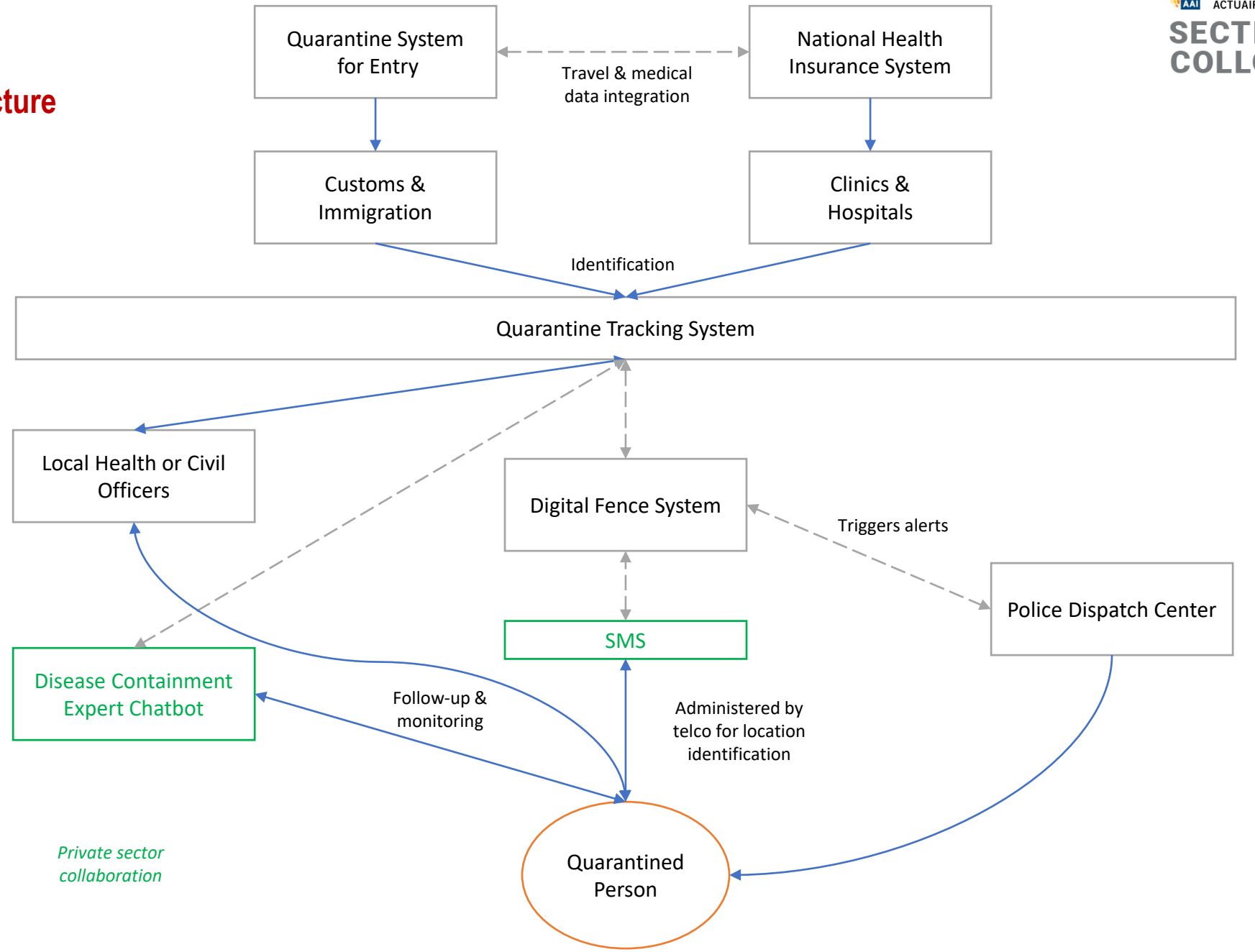
- Regular follow-up should be conducted with all contacts to monitor for symptoms and test for signs of infection.

Source: World Health Organization

Technology for contact tracing



Taiwan's contact tracing infrastructure



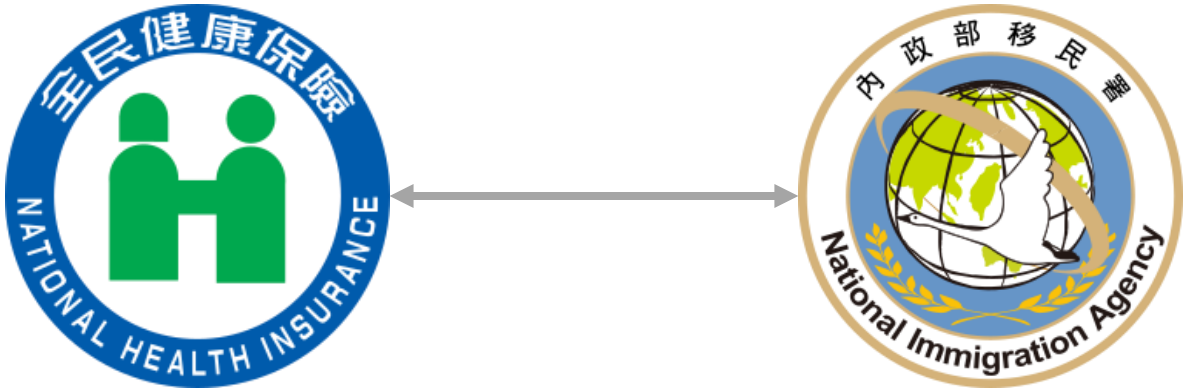
Taiwan: Identification

In-bound travelers health declaration & screening

Travelers can complete the health declaration form by scanning a QR code that leads to an online form, either prior to departure from or upon arrival at a Taiwan airport, with real-time custom clearance & quarantine result

Taiwan: Identification

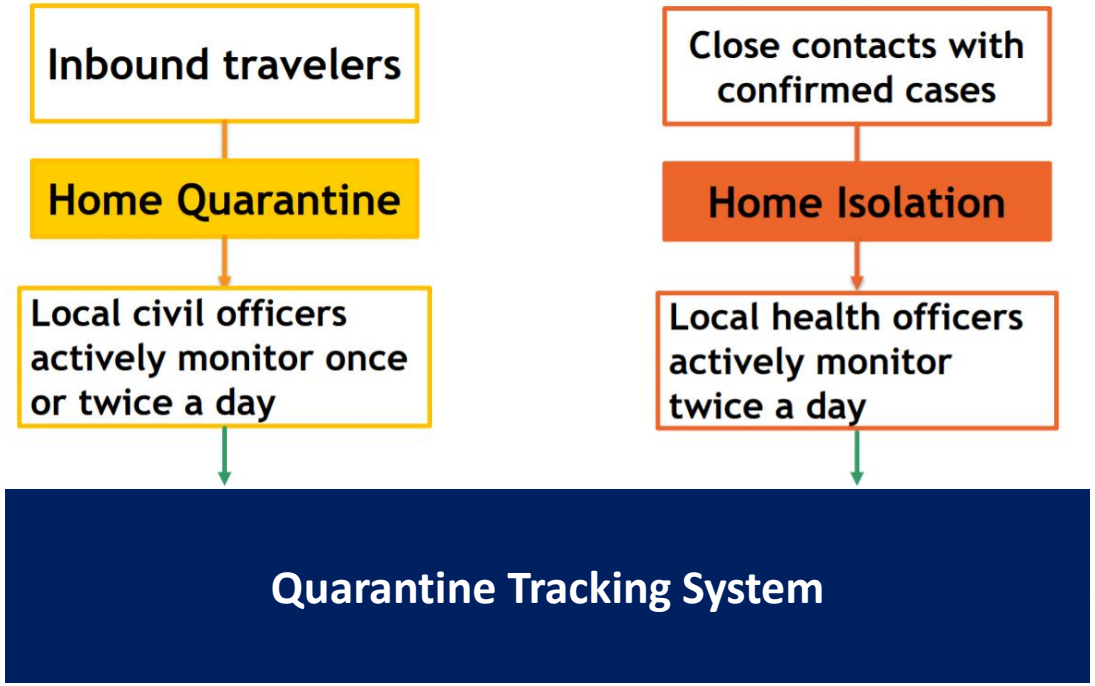
Big data & analytics on National Health Insurance infrastructure

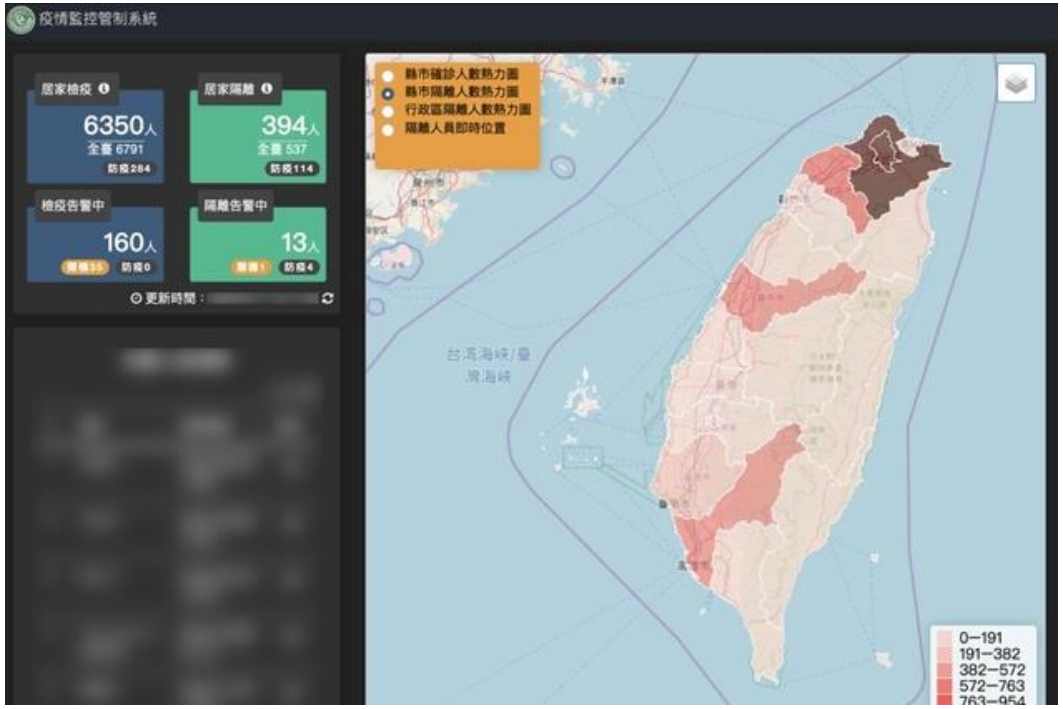


- The National Health Insurance Administration, in collaboration with the National Immigration Agency, launched the measure by integrating patients' most recent 30-day travel history into the NHI database
- That allowed effective identification by generating real-time alerts to clinicians during a clinical visit based on travel history and clinical symptoms
- All hospitals, clinics, and pharmacies in Taiwan would have access to patients' travel histories
- Also, Taiwan enhanced case identification by proactively seeking out patients with severe respiratory symptoms (based on medical records from the NHI database) who had tested negative for influenza and retested them for Covid-19; 1 was found of 113 cases

Taiwan: Notification

Home quarantine & isolation





- The quarantine tracking system is used to coordinate care and support to quarantined or isolated persons
- Those under quarantine or isolation receive a daily subsidy for 14 days to compensate for their time
- Every quarantined person is provided a mobile phone for follow-up and actively monitoring once or twice a day

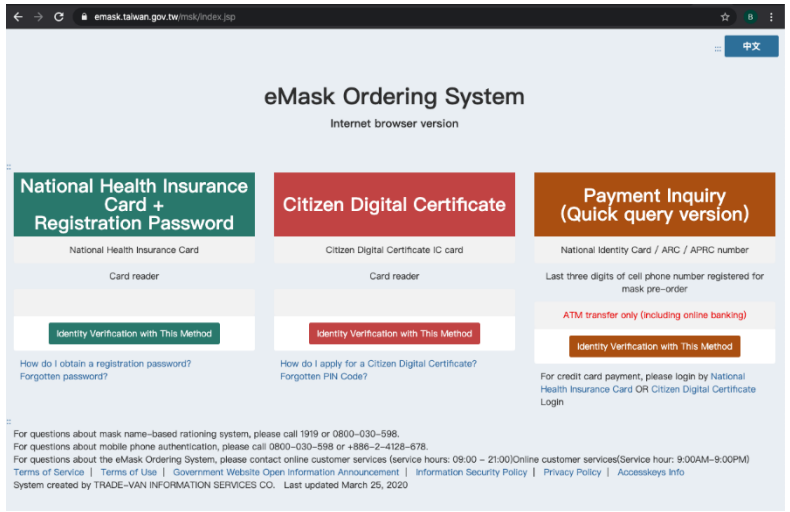
Taiwan: Follow-up

Monitoring & digital fencing

- When the number of people required to be in quarantine has increased to around 40,000 as of 26 March, the manual monitoring technique via calls by local civil or health officer quickly got out of hand and became a burden
- A chatbot was launched to report daily health status and request for medical consultation and health care services
- Also, with the mobile phone that was provided, the SIM card becomes a tracking device and would alert those leaving the range of quarantine
- If someone is found outside of the quarantine area, e.g., home or hotel, the person could get fined up to $1 million TWD (around $33,000 USD)

Other notable challenges & technology solutions in Taiwan

Uneven demand of masks. Community developed map of face mask availability at pharmacies



Limited face mask supply. Effective rationing face mask supply via an authenticated online ordering system

Fight misinformation with public health information chatbot on popular messaging app LINE

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