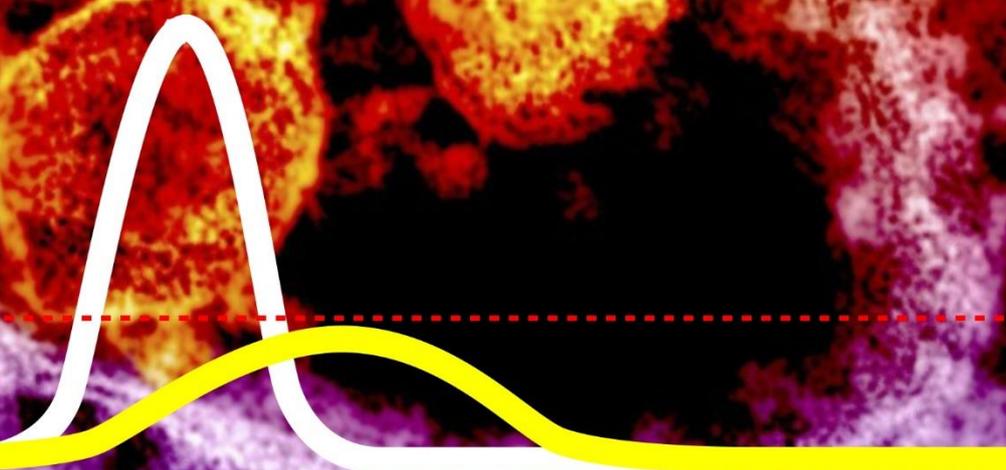


**SEVERE ACUTE RESPIRATORY SYNDROME
CORONAVIRUS 2 (SARS-COV-2)**

COVID-19

**FLATTENING
THE CURVE**

A white bell-shaped curve and a yellow flattened curve are shown on a red dashed horizontal line. The white curve is tall and narrow, while the yellow curve is shorter and wider, illustrating the concept of 'flattening the curve'.

BY TIM PRICE

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Background¹

The outbreak of Covid-19, a coronavirus-caused illness that originated in Wuhan, China, and has since spread to most of the world, is one of the most serious respiratory virus since the 1918 H1N1 influenza pandemic. It has spread far wider than Ebola did in 2014, and the World Health Organization has designated it a pandemic.

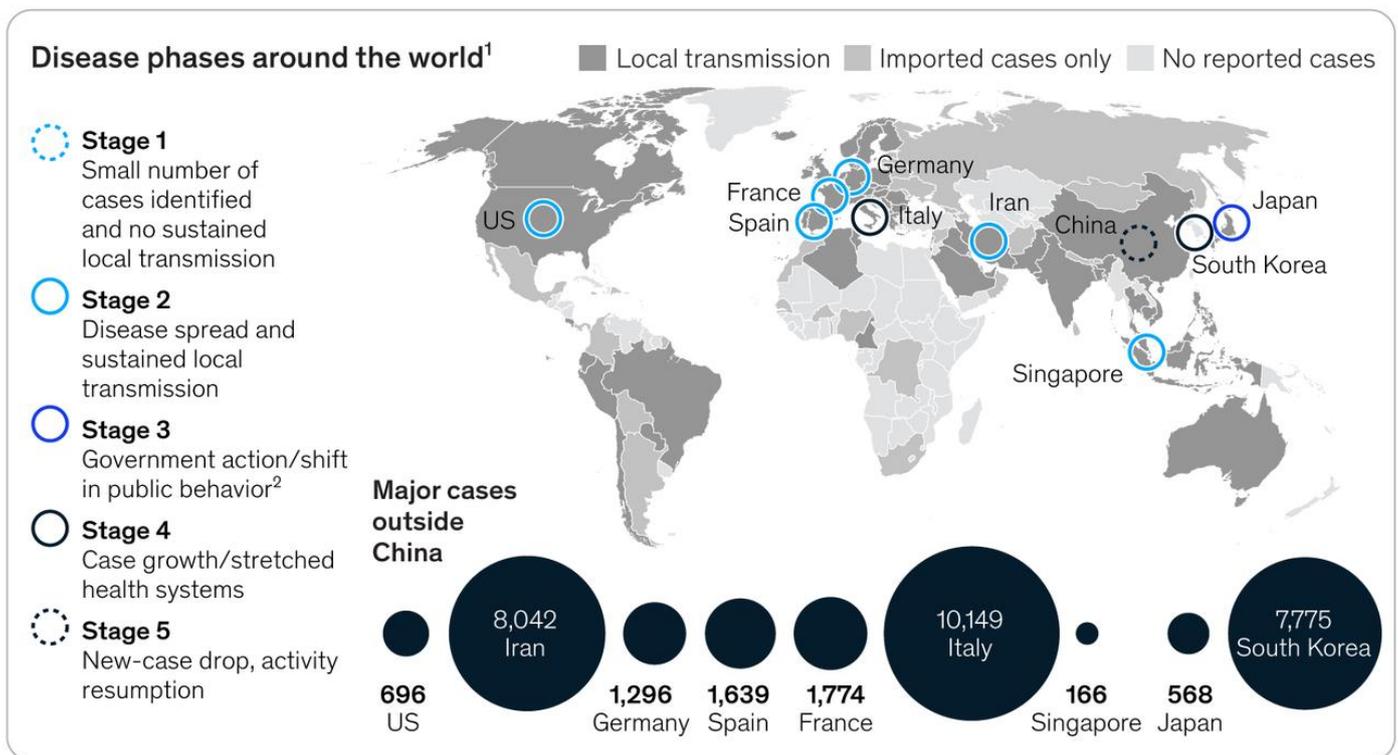
In less than 10 weeks, since China reported the existence of the new virus to the World Health Organization, this virus, now known as SARS-CoV-2, causing COVID-19 disease, spread quickly in the city of Wuhan and throughout China. The country has experienced a deep humanitarian challenge, with more than 80,000 cases and more than 3,000 deaths.

COVID-19 progressed quickly beyond China's borders. Four other major transmission complexes are now established across the world: East Asia (especially South Korea, with more than 7,000 cases, as well as Singapore and Japan), the Middle East (centred in Iran, with more than 6,500 cases), Europe (especially the Lombardy region in northern Italy, with more than 7,300 cases, but with widespread transmission across the continent), and the United States, with more than 200 cases.

Each of these transmission complexes has sprung up in a region where millions of people travel every day for social and economic reasons, making it difficult to prevent the spread of the disease. In addition to these major complexes, many other countries have been affected.

The graphic below offers a snapshot of the progress of the disease on 11 Mar 2020:

Critical indicators of the impact of COVID-19 (March 11, 2020)



Please note: This diagram is used for illustrative purposes to demonstrate the principle stages of the disease and the relative situation at the time¹.

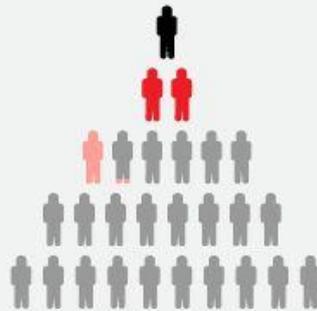
For up to date information: Please use a real-time dashboard, such as the Coronavirus COVID-19 Global Cases by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU) at:

<https://coronavirus.jhu.edu/map.html>.

¹ Source: McKinsey and Company.

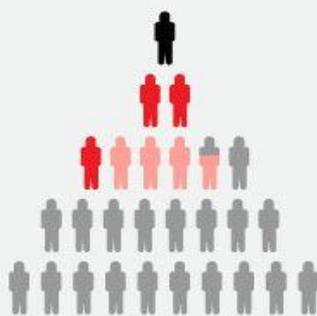
How contagious is a disease?

Scientists use "R naught," or R_0 , to estimate how many other people one sick person is likely to infect

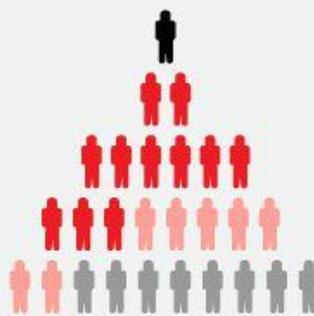


Covid-19
2-3.11

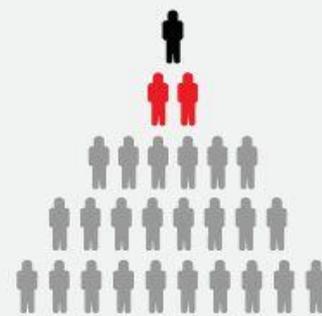
*This estimate is preliminary and likely to change



Zika
3-6.6

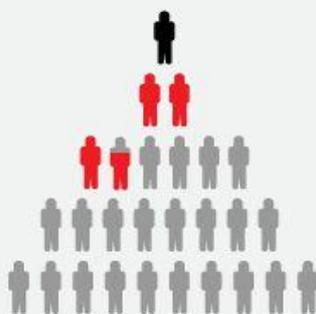


Measles
11-18

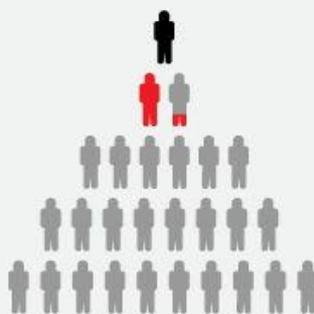


Ebola
2

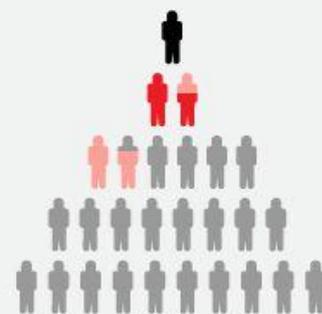
*An early estimate based on the Colombia outbreak in 2015



HIV
3.6-3.7



Seasonal flu
1.3



Norovirus
1.6-3.7

*An estimate based on Réunion Island in 2006

SOURCES: Travel Medicine, PLOS One, JAMA Pediatrics, MDPI, NCBI, New England Journal of Medicine, "The Spread and Control of Norovirus Outbreaks Among Hospitals in a Region"

Vox

Unaddressed, COVID-19 can spread rapidly – yet public health measures can help minimize spread

	Diamond Princess cruise ship	Migration post-Lunar New Year	
Overview	<p>~3,700 Number of crew members and guests on board of Diamond Princess cruise ship</p> <p>1 Feb Individual who had been a passenger tested positive for COVID-19 six days after leaving</p> <p>4 Feb 10 individuals who had been on board tested positive for COVID-19; Japan's Ministry of Health places the entire ship under a 14-day quarantine</p>	<p>25 Jan China marked the Lunar New Year while concerns grow about the coronavirus</p> <p>~3bn Original number of trips expected to occur during the Lunar New Year</p>	<p>Highly transmittable, especially in confined spaces</p> <p>Few or no symptoms in many confirmed cases</p> <p>Comprehensive public health measures effective in reducing case count growth post-Lunar New Year, minimizing viral spread despite high passenger volumes</p>
Response	<ul style="list-style-type: none"> Japanese public servants tested passengers; those who tested positive were transported to health facilities Those who had symptoms stayed on board until cleared Some repatriated passengers who were placed under additional quarantine tested positive 	<ul style="list-style-type: none"> Extension of the Lunar New Year holiday 14-day self-quarantine of everyone travelling from affected areas Rapid expansion of hospital facilities Closure of tourist sites, cancelled public events Travel restrictions imposed 	
Impact	<p>~700 Reported number of confirmed COVID-19 cases</p> <p>~50% Percentage of confirmed cases where no symptoms were evident</p> <p>7 Confirmed number of deaths due to COVID-19</p>	<p>754 Number of incremental cases February 1, China ex-Hubei</p> <p>376 Number of incremental cases February 11, China ex-Hubei</p>	

Source: WHO, Statista, Press search

McKinsey & Company 7

Economic Impact

All sectors are impacted, with several seeing severe consequences

Preliminary views based on base case – Subject to change as the COVID-19 outbreak evolves

Estimated degree of impact, in terms of duration	Tourism and hospitality	Aviation / airlines	Oil and gas	Automotive	Consumer products	Consumer electronics, semi-conductors
Estimated global restart (Global slowdown scenario)	Longest					
	Q4	Late Q3 / early Q4	Q3	Late Q2 / Q3	Q2	Q2
	<p>Severe ripple effects (e.g., closures in Paris, tourism down 50% in Vietnam, despite lack of local transmission)</p> <p>Delayed recovery until winter season, when disease might surge again</p> <p>Potential of more localized impact, containing negative demand hit</p>	<p>Sustained headwinds, with global travel acutely impacted; summer season missed – forward bookings for Mar-April down significantly; reports of over 40% in certain airlines</p> <p>Pace of recovery faster for domestic travel (~2 quarters); slower pace of recovery for long-haul and/or international travel (up to ~3-4 quarters)</p>	<p>Oil price decline driven by both longer-term demand impact and short-term supply overhang</p> <p>Rebound expected with resumption of consumer demand, but long-term impact likely if situation persists and depresses prices beyond a year</p>	<p>Existing vulnerabilities (e.g., trade tensions, declining sales) amplified by acute decline in Chinese demand, continued supply chain and production disruption (in China, rest of Asia, now EU)</p> <p>Headwinds to persist into Q3 given tight inventories (<6 weeks), supply chain complexity (therefore, minimal ability to shift)</p>	<p>Overall moderate decline in private consumption and exports of services</p> <p>Demand for certain product segments (e.g., food, produce) resilient; significant online growth (though hampered by labor shortage)</p> <p>Potential of localized impact, containing negative demand hit</p>	<p>Market structure shifts accelerated (e.g., strategic moves to diversify supply chain)</p> <p>Downstream impact due to supply chain challenges in China, rest of Asia (esp. South Korea), causing delays in 5G, product development</p> <p>Pace of recovery to differ by sub-sector (e.g., semiconductor likely faster)</p>

Source: IHS Market, McKinsey Global Institute Analysis; Subject matter experts; Press reports

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Note: The time projections (Year Quarters) in this infographic do not match the predictions in the [Imperial College paper](#) used as the particular model for this game, but it is included in order to show the relative impact on different parts of the economy.

Strategies²

Assumptions. It is assumed that infections will occur in three main areas: In the home, in schools or at work, or randomly in the community (shopping, attending public events, places of worship, etc). Based on per-capita contacts in these areas, about one third of transmissions take place in the home, one third in schools or at work, and one third in the community.

Two fundamental strategies are possible:

Mitigation. Mitigation focuses on slowing but not necessarily stopping epidemic spread – reducing peak healthcare demand while protecting those most at risk of severe disease from infection.

Optimal mitigation policies (combining home isolation of suspect cases, home quarantine of those living in the same household as suspect cases, and social distancing of the elderly and others at most risk of severe disease) might reduce peak healthcare demand by 2/3 and deaths by half. However, the resulting mitigated epidemic would still likely result in hundreds of thousands of deaths and health systems (most notably intensive care units) being overwhelmed many times over.

In this scenario, population immunity builds up through the course of the epidemic, leading to an eventual rapid decline in case numbers and transmission dropping to low levels.

Suppression. Suppression aims to reverse epidemic growth, reducing case numbers to low levels and maintaining that situation indefinitely.

Suppression is the preferred policy option for countries able to achieve it. In the case of the UK and US context, suppression will minimally require a combination of social distancing of the entire population, home isolation of cases and household quarantine of their family members. This may need to be supplemented by school and university closures, though it should be recognised that such closures may have negative impacts on health systems due to increased absenteeism.

The major challenge of suppression is that this type of intensive intervention package – or something equivalently effective at reducing transmission – will need to be maintained until a vaccine becomes available (potentially 18 months or more) – given that it is predicted that transmission will quickly rebound if interventions are relaxed.

It is clear that intermittent social distancing – triggered by trends in disease surveillance – may allow interventions to be relaxed temporarily in relatively short time windows, but measures will need to be reintroduced as case numbers rebound.

Finally, while experience in China and now South Korea show that suppression is possible in the short term, it remains to be seen whether it is possible long-term, and whether the social and economic costs of the interventions adopted thus far can be reduced.

Severity estimates for the purpose of the game:

Age-group (years)	% symptomatic cases requiring hospitalisation	% hospitalised cases requiring critical care	Infection Fatality Ratio
0 to 9	0.1%	5.0%	0.002%
10 to 19	0.3%	5.0%	0.006%
20 to 29	1.2%	5.0%	0.03%
30 to 39	3.2%	5.0%	0.08%
40 to 49	4.9%	6.3%	0.15%
50 to 59	10.2%	12.2%	0.60%
60 to 69	16.6%	27.4%	2.2%
70 to 79	24.3%	43.2%	5.1%
80+	27.3%	70.9%	9.3%

² Source: [Imperial College](#).

Three scenarios for how COVID-19 could evolve

Potential scenarios as of March 9, 2020

	Quick recovery	Global slowdown	Global pandemic and recession
What you have to believe	<ul style="list-style-type: none"> • Public health response similarly effective as with China • Virus is seasonal • Fatality ratio similar to that of the flu (or an existing therapy proves effective) • Socioeconomic reaction is localized • Strong public reaction, initial drop in demand, but peak comes quickly • Working populations change some daily habits but resume ec. activity 	<ul style="list-style-type: none"> • Less effective public-health response than China • Virus is seasonal • Fatality ratio is higher than or near that of the flu, dependent on public health response • Impact largely localized in Europe and US; some spread in other transmission complexes in Africa, India, with more generalized reactions • Greater shift in daily behaviors 	<ul style="list-style-type: none"> • Less effective public-health response than China • Virus is not seasonal so transmissibility does not decline with northern hemisphere spring; case resurgence observed in China • Fatality ratio is higher than that of the flu, because of disease characteristics or insufficient health system response • Continued case growth count through Q2 and Q3 • Reaction is generalized
How the scenario could evolve	<ul style="list-style-type: none"> • China recovery is largely complete, inc. Hubei by early Q2 • Relatively fast rebound after initial acute drop in consumer demand • US, Europe economic slowdown until the end of Q1 • Varied impact in other economies (Middle East, rest of Asia, Africa, LatAm) – slowdown in Middle East until Q2; some disruption in Africa, LatAm 	<ul style="list-style-type: none"> • China recovery is largely complete, incl. Hubei by early Q2 • US, Europe sees economic slowdown until mid-Q2; other regions see varied impact (rest of Asia, Middle East more impacted; LatAm, Africa more insulated) • Certain sectors (e.g., aviation, hospitality) deeply hit – missing the summer season • Other sectors (e.g., CPG) experience acute initial drop, recover at end-Q2 	<ul style="list-style-type: none"> • China recovery increases transmission and potential resurgence in cases; complete by Q4 2020 • US, Europe see generalized reaction • Global recession – economic slowdown across all regions • Consumer confidence does not recover until end Q3 or beyond

What's in a Name?³

Naming viruses is a surprisingly tricky process because if the wrong one sticks; it could cause a diplomatic crisis.

In April 2009 a new flu virus was on the rampage, and the Israel was expected to announce its first case any minute. But as he addressed the media from a local hospital, it soon became clear that Israel's deputy health minister wasn't just there to reassure the public. "We will call it Mexican flu," he said, defiantly. "We won't call it swine flu."

Though the virus is now called H1N1, swine flu acquired its popular epithet almost as soon as it emerged. After all, the virus looked suspiciously like one known to infect pigs, and patient zero lived in a village next to an industrial farm that held 50,000 of the animals at any given time. Of course, in Israel the name "swine flu" was deeply offensive to the country's Jewish and Muslim citizens, many of whom shun pork on religious grounds. The suggestion of "Mexican flu" followed a tradition of naming viruses after the places they were discovered or emerged from.

This of course has racist undertones and deep political consequences. In the case of swine flu, the Mexican ambassador to Israel hit back with an official complaint, saying that naming the virus after his country was deeply offensive. Naturally, no one wants their country associated with a deadly disease, but in the end, never one to pander to external opinion, Israel agreed that the original name was fine – swine flu would not be rebranded.

Health officials have faced a similar political tightrope recently, as the coronavirus first identified in the city of Wuhan, China, continues to be a source of growing concern. Mere weeks after it was first discovered and started spreading, it had already amassed an impressive array of sobriquets, such as "Wuhan flu", "Wuhan coronavirus", "coronavirus", "2019-nCoV", and the rather long-winded "Wuhan seafood market pneumonia virus".

On 11 February, the World Health Organisation (WHO) called a press conference to announce the official name for the *disease* caused by the new coronavirus – Covid-19, but before it was even over, the International Committee on Taxonomy of Viruses released a paper proposing a name for the *virus* itself: Severe Acute Respiratory Syndrome Coronavirus Two, or Sars-CoV-2 for short. This reflects research that suggests it is a close relative of the Sars virus. A spokesperson for the WHO said that they won't be using this virus name, in case the word "Sars" causes extra panic.

Some Representatives in the USA have been accused of deliberately stoking xenophobia and racial hatred by using the inaccurate "Wuhan virus" or even the "Chinese Virus" names for partisan political purposes⁴. There are, after all, already 17 or so "Wuhan" viruses in existence, which range from cricket viruses to mosquito viruses, and most are harmless to people. Any name that links these to a human outbreak may complicate matters and make them harder to research.

During the 2009 swine flu outbreak, pig farmers protested that the term had led to huge losses in their industry as the public mistakenly believed that pork might be infectious. In fact, though it was a pig virus, it is thought to have been transmitted to people via a different animal. The pigs themselves were not the problem. Nevertheless, Egypt ordered a cull of every single pig herd in the country, with some even buried alive. It was a naming worst case scenario: the words "swine flu" had sparked a fearful killing frenzy.

Similarly, when an outbreak is named after a geographical area, it's often the wrong one. Back in 1918, as World War One drew to a close, a formidable new flu virus was emerging. "Spanish flu" affected almost every corner of the world, from the frozen wastelands of the Arctic to the South Pacific Islands. Just a handful of obscure settlements and asylums emerged unscathed. (Read more about why the flu of 1918 was so deadly.)

Many countries suppressed the news, out of concern that it might affect public morale at a crucial moment in a long war, but not Spain. As the first cases popped up, the nation's newspapers dutifully reported what was going on. There's overwhelming evidence that it didn't start there, but as one of the first countries to admit having cases, Spain acquired the dubious honour of sharing its name.

Regardless what we call a virus, giving it a name will not prevent its spread. Perhaps it would be better to put petty squabbles aside, and focus on that instead.

³ Source: BBC

⁴ <https://www.theatlantic.com/ideas/archive/2020/03/stop-trying-make-wuhan-virus-happen/607786/> (edited)

Rule #1 – Do No Harm

When designing this game, we were mindful of [Professor Rex Brynen's](#) comments on the [PAXsims blog](#):



"As we collectively grapple with the unfolding global crisis, however, I thought it prudent to also highlight some the risks of serious pandemic gaming. As I will argue below, while serious games have a great deal of utility, they can also be counterproductive. We thus all have a moral responsibility to make sure (as they say in the humanitarian aid community) that we DO NO HARM with our work.

First of all, there's the modelling problem. We have to be very humble in assessing our ability to examine some issues when so little is known about key dynamics. Related to this is the "garbage in, garbage out" problem. Our data is often weak. The excellent epidemiological projections published by the [Imperial College COVID-19 Response Team](#) have been very useful in spurring states to action, but in the interests of avoiding confirmation bias we also need to recognize that some epidemiologists are [raising concerns](#) about the adequacy of the data used in such models. We need to make the robustness of our game assumptions clear to clients and partners. Be humble, avoid hubris, make assumptions and models explicit, caveat findings, and don't over-sell.

Second, playing games with subject matter experts (SMEs) can pull them away from doing other, more important things. I've done a lot of work on interagency coordination, where there is a similar problem: coordination meetings are great, but when you add up the time that goes into them, they can actually weaken capacity if you aren't careful. Of course, you can run games with non-SME's, but then the GIGO problem is exacerbated.

Any gaming generally needs to be client-driven. Do the end-users of the game actually find it worthwhile? What questions do they want answered? This isn't a universal rule—it may be that gaming alerts them to something that they hadn't considered. But do keep in mind the demands on their time, institutional resources, and analytical capacity.

We also have to recognize that the much-maligned BOGSAT ("bunch of guys/gals sitting around a table") is sometimes preferable to a game, when the former is run well. For a game to be worth designing and running it has to be demonstrably superior to other methods, and worth the time and effort put into it. There is a reason, after all, why the CIA's Tradecraft Primer: [Structured Analytic Techniques for Improving Intelligence Analysis](#) warns that gaming techniques "usually require substantial commitments of analyst time and corporate resources."

We need to debrief and analyze games carefully. The [DIRE STRAITS experiment](#) at Connections UK (2017) highlighted that the analytical conclusions from games are often far from self-evident, and that different people can walk away from the same game with very different conclusions.

Messaging for these games matter. The public is on edge. Some are dangerously complacent. Some are on the verge of panic. One wrong word, and suddenly there's no toilet paper in the shops. If you don't consider communication issues, reports from a game could feed either a "don't worry it's not that bad" view or a "my god we're all going to die" response in the media and general public.

We also have to beware of clients with agendas, of course [[insert everything Professor Stephen Downes-Martin has ever written here.](#)]

We need to be careful of both uncritical game evangelism and rent seeking—that is the "it would be cool to a game/games solve everything" over-enthusiasm, or "here's a pot of money, let's apply for it."

In short, in a time of international crisis, we need to do this well if we do it. In my view it generally needs to respond to an identified need by those currently dealing with the crisis—or, if it doesn't, there needs to be a good reason for that. They're busy folks at the moment, after all."

Game Disease Model and Assumptions⁵

The time represented by a game turn is "about a month" assumed to be a reasonable approximation of the time taken to develop an intervention, get approval, enact it, and see the general results of that intervention. If nobody takes any Mitigation or Suppression actions, it is assumed that peak mortality will occur in **Month 3**, with a total of about **510,000** UK deaths overall. Example proposed actions **taken over a 3-month period** are:

- **Closure of schools and universities.** Closure of all schools, 25% of universities remain open. Household contact rates for student families increase by 50% during closure. Contacts in the community increase by 25% during closure.
Result will be a 14% drop in demand for ICU beds and a 2% reduction in total deaths.
- **Case isolation in the home.** Symptomatic cases stay at home for 7 days, reducing non-household contacts by 75% for this period. Household contacts remain unchanged. Assume 70% of household comply with the policy.
Result will be a 33% drop in demand for ICU beds and a 17% reduction in total deaths.
- **Voluntary home quarantine.** Following identification of a symptomatic case in the household, all household members remain at home for 14 days. Household contact rates double during this quarantine period, contacts in the community reduce. It is assumed that this is a more comprehensive version of **Case Isolation** and will be enacted alongside it.
Result will be a 53% drop in demand for ICU beds and a 31% reduction in total deaths.
- **Social distancing of entire population.** All households reduce contact outside household, school or workplace by 75%. School contact rates unchanged, workplace contact rates reduced by 25%. Household contact rates assumed to increase by 25%. It is assumed that this is linked to other measures as follows:
 - **Case Isolation & Social Distancing:** *Result will be a 53% drop in demand for ICU beds and a 20% reduction in total deaths.*
 - **Case Isolation, Voluntary home quarantine & Social Distancing:** *Result will be a 33% drop in demand for ICU beds and a 13% reduction in total deaths.*
- **Social distancing of only those over 70 years of age.** Reduce contacts by 50% in workplaces, increase household contacts by 25% and reduce other contacts by 75%. Assume 75% compliance with policy. This measure would be extended for a month longer than other measures for this vulnerable age group. It is assumed that this is linked to other measures as follows:
 - **Case Isolation, Voluntary home quarantine & Social distancing for over 70s:** *Result will be a 67% drop in demand for ICU beds and a 49% reduction in total deaths.*
 - **School Closures, Case Isolation, Voluntary home quarantine & Social distancing for over 70s:** *Result will be a 69% drop in demand for ICU beds and a 29% reduction in total deaths.*

Actions that are extended over longer periods are assumed to have similar beneficial effect *if there is compliance with the policies*. So, extending the most effective measure, **Case Isolation, Voluntary home quarantine & Social distancing for over 70s**, for 6 months will result in an **89% drop in demand for ICU beds and a 72% reduction in total deaths**. Please note that this fundamentally assumes that there will be compliance with the policy and that the underlying assumptions don't change (e.g. There is no increasing economic imperative to ensure people continue to work in a part of the population, resulting in changes to the contact rates assumed above).

Adaptive Strategies. This is where there is an assumption that compliance may drop over an extended period, and that the impact is so grave, that short term "relaxation" of measures are taken, in cycles, by monitoring the increase in infections and reduction of available ICU beds.

Additional Measures. The purpose of wargaming is to come up with imaginative additional measures that were not initially considered, but be aware that some measures, such as mobilising the Armed Forces for anything other than focussed interventions, such as to secure essential services, are unlikely to have any large scale benefit given their small size in relation to the total population. It may, however, materially have an impact on transmission in that specific area, and the political messaging effect may well be disproportionate.

⁵ Source: [Imperial College](#) and Game Designer

Panic or Don't Panic?⁶

The current coronavirus disease, Covid-19, has been called a once-in-a-century pandemic. But it may also be a once-in-a-century evidence fiasco.

At a time when everyone needs better information, from disease modelers and governments to people quarantined or just social distancing, we lack reliable evidence on how many people have been infected with SARS-CoV-2 or who continue to become infected. Better information is needed to guide decisions and actions of monumental significance and to monitor their impact. Draconian countermeasures have been adopted in many countries. If the pandemic dissipates — either on its own or because of these measures — short-term extreme social distancing and lockdowns may be bearable. How long, though, should measures like these be continued if the pandemic churns across the globe unabated? How can policymakers tell if they are doing more harm than good?

Vaccines or affordable treatments take many months (or even years) to develop and test properly. Given such timelines, the social, political and economic consequences of long-term lockdowns are entirely unknown.

Given the limited testing to date, some deaths and probably the vast majority of infections due to SARS-CoV-2 are being missed. We don't know if we are failing to capture infections by a factor of three or 300. Three months after the outbreak emerged, most countries lack the ability to test a large number of people and no countries have reliable data on the prevalence of the virus in a representative random sample of the general population.

This creates tremendous uncertainty about the risk of dying from Covid-19. Reported case fatality rates, like the official 3.4% rate from the World Health Organization, cause horror — and are meaningless. Patients who have been tested for SARS-CoV-2 are disproportionately those with severe symptoms and bad outcomes. As most health systems have limited testing capacity, selection bias may worsen in the near future.

The one situation where an entire, closed population was tested was the Diamond Princess cruise ship and its quarantine passengers. The case fatality rate there was 1.0%, but this was a largely elderly population, in which the death rate from Covid-19 is much higher. It is possible that some of the passengers who were infected on the ship might die later, and that tourists may have different frequencies of chronic diseases than the general population (people with respiratory problems often "take a cruise for the sea air"). Adding these extra sources of uncertainty, reasonable estimates for the case fatality ratio in the general U.S. population vary from 0.05% to the WHO 3.4%.

That huge range markedly affects how severe the pandemic is and what should be done. A population-wide case fatality rate of 0.05% is lower than seasonal influenza. If that is the true rate, locking down the world with potentially tremendous social and financial consequences may be totally irrational.

Could the Covid-19 case fatality rate be that low? No, some say, pointing to the high rate in elderly people. However, even some so-called mild or common-cold-type coronaviruses that have been known for decades can have case fatality rates as high as 8% when they infect elderly people in nursing homes. In fact, such "mild" coronaviruses infect tens of millions of people every year, and account for 3% to 11% of those hospitalized in the U.S.

Although successful surveillance systems have long existed for influenza, the disease is confirmed by a laboratory in only a tiny minority of cases. In the U.S., for example, so far this season 1,073,976 specimens have been tested and 222,552 (20.7%) have tested positive for influenza. In the same period, the estimated number of influenza-like illnesses is between 36,000,000 and 51,000,000, with an estimated 22,000 to 55,000 flu deaths.

In an autopsy series that tested for respiratory viruses in specimens from 57 elderly persons who died during the 2016 to 2017 influenza season, influenza viruses were detected in 18% of the specimens, while any kind of respiratory virus was found in 47%. In some people who die from viral respiratory pathogens, more than one virus is found upon autopsy and bacteria are often superimposed. A positive test for coronavirus does not mean necessarily that this virus is always primarily responsible for a patient's demise.

Of course, overreaction is safer than complacency — but when this happens again, as it inevitably will, the reaction to the new outbreak may be downplayed to a dangerous, and fatal, degree...

⁶ Source: statnews.com (edited)

The Matrix Game Construction Kit

The ultimate matrix game design kit

In a "matrix game" there are few pre-set rules limiting what players can do. Instead, each is free to undertake any plausible action during their turn. The chances of success or failure, as well as the effects of the action, are largely determined through structured argument and discussion. This process allows for imaginative game dynamics that are lively and open-ended, and yet also grounded in reality.



Matrix games are particularly well-suited for complex conflicts and issues involving multiple actors and stakeholders, varying interests and agendas, and a broad range of (diplomatic/political, military, social, and economic) dimensions. The game system crowdsources ideas and insight from participants, thereby fostering greater analytical insight.

First developed by Chris Engle, matrix games have been played by hobbyists for years. They have also been used as serious games for training at the US Army War College, National Defense University, the Central Intelligence Agency, and elsewhere; for defence planning, capability assessment, and acquisitions in Australia, Canada, the UK, and US; for security planning for the Vancouver Olympics; as a research and analytical support tool at the UK Foreign Office; and as an educational method in various universities. They are particularly well-suited for multi-sided conflicts or other issues that involve a broad range of capabilities and interaction.

MaGCK contains everything that is required to play two different matrix games, or to design your own matrix games addressing almost any aspect of modern conflict:

- A core set of matrix game rules.
- Player briefings and supplementary rules for ISIS CRISIS, a matrix game that explores the rise and decline of the so-called "Islamic State" insurgency in Iraq. Two scenarios are included: "The Caliphate Reborn?" (set in September 2014) and "Road to Mosul" (starting January 2016).
- Player briefings, map tiles, and supplementary rules for A RECKONING OF VULTURES, a game that explores coup plotting and political skullduggery in a fictional dictatorship.
- 255 large blank game tokens in eight colours, together with over 700 stickers depicting various unit types, other assets, capabilities, and effects. The stickers are used to customize the game tokens, offering enormous flexibility for matrix game designers.
- 80 smaller discs in the same colours as above, which can be used to indicate damage, supplies and resources, political influence, or other characteristics.
- 10 two-sided tracking mats, with various scales (+/-3, 1-3, 1-10, days, months, and so forth)
- Assorted dice.

In addition, purchasers of MaGCK gain access to templates so they can print additional stickers using readily-available sticker sheets and any laser printer—thus making it possible to produce an unlimited number of games and scenarios. See: <https://www.thegamecrafter.com/games/magck-matrix-game-construction-kit>

[The kit is being offered at cost](#), with expedited shipping, at the moment for organizations working on pandemic response matrix games for serious (policy-development or educational) reasons.

Abbreviated Matrix Game Rules

How to Play a Matrix Game

In a Matrix Game, actions are resolved by a structured sequence of logical "arguments". Each player takes turns to make an argument, with successful arguments advancing the game, and the player's position. There are a number of ways you can do this, depending on the size of the game and the purpose (each has their own strengths and weaknesses), but the one recommended for this game is:

The "Pros and Cons" System

In this system, each argument is broken down into:

- The active Player's states: Something That Happens and a Number of Reasons Why it Might Happen (Pros).
- The other Player's state: A Number of Reasons Why it Might NOT Happen (if they can think of any) (Cons).

The game needs a Facilitator to adjudicate on the arguments, but if you have a limited number of players, you can take it in turns to be the Facilitator – this works out much better than you might imagine and helps reinforce the idea that your role in the game might be in conflict with others, but you are all working together to generate a credible narrative.

The advantage of this system is that you formalise the Pros and Cons of an argument and the role of the Facilitator becomes that of ensuring that the Pros and Cons carry equal weight - perhaps making compelling reasons worth two Pros and two or three weaker reasons against only worth one Con. You need to ensure you don't end up with a laundry list of trivial reasons, or the player re-stating a reason already accepted in a slightly different way in a desperate attempt to gain points.

One very useful benefit of the "Pros and Cons" system is that it provides reasons for failure should the dice roll not succeed. You can also more easily run the game with very knowledgeable players.

Notes about arguments

The important thing to remember in a Matrix game is that arguments can be made about anything that is relevant to the scenario. You can argue about your own troops or about the enemy, the existence of people, places, things or events, the weather, plague, disease or public opinion. The actions and consequences of arguments are reflected in the placement of the generic counters on a map (examples are enclosed below), forming narrative

markers for the game; or by writing the results on a whiteboard or flipchart so the players can keep track of what is going on.

Some things can seem a little odd to new players – "how can he argue about my troops?" – It is true, he can't give them orders, but he could argue that their morale and motivation are low because they haven't been paid in months. The only criteria for judgement is the likelihood of the event taking place. With a bit of imagination, common sense and rational thinking, it is possible to present persuasive arguments as to what should happen in any scenario - from traditional military campaigns to the strange world of defence procurement.

A common error in Matrix games is for a player to argue about another player being influenced by something or them agreeing to a course of action. The player is present and can simply be asked – so that a little time between turns to allow the players to negotiate with each other (in secret if necessary) makes for a better game. It might be that a player wants to argue that all parties come to negotiations – in which case let them state their case, then ask the other players if they want to come along. If they agree then the argument is an automatic success. Arguments are for measurable actions – if the players want to negotiate with each other, they can do that in between turns.

Sometimes players get carried away with their arguments and try to do several different things. This isn't allowed in a Matrix game – you only get to do one action a turn because part of the insight comes from deciding what the highest priority is. The action itself could be large (like a general mobilisation of the Militia), but it must be a single action, so mobilising the Militia and providing the Police with heavy weapons would be two separate actions – which one do you want to do first?

If two arguments are in direct opposition ("This happens" - "No it doesn't") they represent a Logical Inconsistency since they cannot both be true. The earlier argument has already happened, so it is impossible for it not to have happened. The later player may argue that the event is reversed, but this tends to make for a poor narrative in the game and should be discouraged.

Reasonable Assumptions and Established Facts

It is important that the Facilitator understands the difference between "reasonable assumptions" in the game, such as the proposition that well trained and equipped Special Forces soldiers are going to be much more effective in combat than untrained protestors;

and "established facts" which are facts that have been specifically mentioned in the game briefings or have become established during play as the result of successful arguments.

The former can be deployed as supporting reasons (Pros and Cons), but the latter need to have been argued successfully in order for them to be included. Many inexperienced players will make vast all-encompassing arguments full of assumptions that are not reasonable. For example: It is not a reasonable assumption that an unarmed Protestor counter could fight off trained Police. It is reasonable to assume that the Police are trained, armed, equipped and quite capable of dealing with a group of protestors (after all, that is their job). It would be necessary to argue for large number of Protestors, argue that they had weapons of some sort or argue that they were especially devoted or fanatical about their cause, for them to have a reasonable chance of beating the Police.

Of course, you might argue that your Protesters undergo special training, get access to firearms, or are simply fired up with enthusiasm by the powerful and impassioned speech from their leader, so they get a bonus. In this case, you should mark the counter with a +1 or something similar (depending on the strength of the argument) to show their improved status.

Game Length and Turn Length

The game should last a minimum of 6 turns as it is essential that sufficient turns are allowed to develop the narrative and force the players to have to live with the consequences of their actions from earlier in the game. Each turn represents a deliberately vague period defined by the game Facilitator and the arguments are the "headline events" that took place in the period.

End of Turn "Consequence Management"

At the end of each game turn (a cycle of player arguments) the Facilitator should go over those successful and failed arguments that have generate new "established facts" in the game. They should also review situations that are on-going, such as the generation of refugees from fighting or the arrival of new recruits to a popular cause. If these have not been countered during the turn by a successful argument, the Facilitator should make them continue until someone does make an argument to stop them.

It might also be that some of the arguments, when considered as a whole, will have additional or even unintended consequences that are reasonable to expect to arise. It is therefore worth taking time to consider the consequences of the players' arguments

beyond their immediate results. Invite the players to consider the events of the turn, suggest possible consequences and then agree on the most likely that should be taken forward to the next turn.

In some games, it is worthwhile having an individual (if you have one to spare) who is particularly experienced about the sort of subject that the Matrix Game is focussed on, make "the law of unintended consequences" arguments at the end of a turn. This can help to formalise the process and provide good examples to widen the players' understanding of the consequences of their actions.

Inter-Turn Negotiations

As we have already said, the actual "arguments" of the Matrix Game are about actions that take place in the course of the game. In most cases, the actors represented by the players may well want to engage in face to face negotiation with each other in an effort to strike a deal. Players attempting to make Arguments saying that they want to "influence the Prime Minister" are essentially pointless if the Prime Minister is represented by another player. If they want to strike a deal, then they had better head off to a quiet corner of the room and try a little influence in real life. Of course, if a player wants to make an argument about a position or group not represented by another player, they are welcome to do so in the normal way.

In analytical games, it is important to record the essential elements of these discussions. What was suggested? Was agreement reached and why? If no agreement was reached what were the private and public reasons why the negotiations were unsuccessful? Analysis of these "off-table" negotiations and the reasons the players felt why they were successful or failures can provide important insights.

Secret arguments

There will be some cases where you want to hide from the other players the thing you want to argue about. It could be that you have booby trapped a piece of equipment you think your opponent will use, or that you have swapped the vital blueprints for a set of fake ones in case the safe is broken into. In this case, you simply write down your argument on a piece of paper and present it to the Facilitator announcing to the other players that you are making a secret argument. The Facilitator will make a judgment and you will roll the dice normally, but the other players have no idea what it is about.

You should be careful, however, that the players don't make too many secret arguments. This can ruin the

game's atmosphere and reduce the focus, so that the game drags on unnecessarily. They also depend on the judgement of the Facilitator as to their success of failure, rather than being decided on a consensual basis from the participants. They must only be permitted when they refer to quite specific things or events. An argument about gathering information from a spy, in most games, will be quite a generic argument and should be argued openly. Similarly Arguing about the placement of an IED to catch forces moving down a route should be made openly as the results will take effect the same turn. It is only really for secret things you need to establish several turns in advance.

Measures of Success

In many arguments success or failure may not be a simple "Yes" or "No" proposition. There might well be a sliding scale of success or failure in terms of numbers or the quality of the outcome, which is usually represented by the score on the dice. If you

More information

There has been quite a lot of discussion about Matrix games, including links to example games on the "PAXsims" Blog that are worth reading: <https://paxsims.wordpress.com/?s=Matrix+Game>

Professor Rex Brynen was also interviewed by the GrogHeads "GrogCast" Podcast, a copy of what he said about Matrix Games is here: <http://grogheads.com/?podcast=grogcast-season-2-episode-12> with the discussion about Matrix Games starting at the 31-minute mark.

Full rules here: <https://www.thegamecrafter.com/games/pdf-only-magck-matrix-game-construction-kit-user-guide>

Additional Covid-19 serious game resources: <https://paxsims.wordpress.com/2020/03/16/covid-19-serious-gaming-resources/>

Specific pandemic game icons: <https://paxsims.wordpress.com/2020/03/16/pandemic-response-game-icons/>

Game Turn Length:

The time represented by a game turn is "about a month" assumed to be a reasonable approximation of the time taken to develop an intervention, get approval, enact it, and see the general results of that intervention. The game is intended to last about 6 game turns, but could continue longer, and should end with a round of arguments about the longer-term consequences of the virus.

Starting Conditions

The game is assumed to start at the end of Stage 2 (disease spread and sustained local transmission) and the start of Stage 3 (Government action and change in public behaviour).

Actors in the Game and Order of Play:

- UK Government
- The Population
- The World Health Organisation
- The USA
- Mishaps and Markets

needed a 7+ to succeed and rolled a double-six (12), this can indicate an especially notable success. Conversely, a roll of a double-one, it could represent a disastrous failure.

Conduct of the Game:

The players should be formed into teams around the Actors in the game. They should be provided with the introductory background (above) and their Actor brief; and provided with a short period in which to study the brief. They should then write down a few (3 or 4) short, pithy, objectives they would wish to achieve in the game in accordance with their briefs. One of these should be a longer-term objective, with a reach of at least 10 years in order to ensure that the players address something other than short-term goals and reactions to other player's actions in the game. Play should then commence in the normal way. The final turn should be followed by a discussion of the objectives, and comparison made with the Actor's achievements during the game.

The UK Government⁷

Hundreds of scientists have written to the government urging immediate “more restrictive measures” be brought in to enforce social distancing, following announcement of their action plan. The 245 UK people supporting the open letter include scientists from a wide range of departments, while it is also backed by 29 international signatories.

The letter said: “We are deeply preoccupied by the timeline of the proposed plan, which aims at delaying social distancing measures even further. The current data about the number of infections in the UK is in line with the growth curves already observed in other countries, including Italy, Spain, France, and Germany. The same data suggests that the number of infected will be in the order of dozens of thousands within a few days. Under unconstrained growth, this outbreak will affect millions of people in the next few weeks. This will most probably put the NHS at serious risk of not being able to cope with the flow of patients needing intensive care, as the number of ICU beds in the UK is not larger than that available in other neighbouring countries with a similar population.”

Grant Shapps, the UK transport secretary, has rejected criticism the government is being too slow to introduce measures limiting the spread of coronavirus, saying ministers are rigorously following scientific advice rather than “doing things that just sound good”. Speaking on a broadcast round, Shapps indicated that further restrictions could be announced following a meeting of the government’s Cobra emergency committee, perhaps connected to large gatherings. Furthermore, following a wave of flight cancellations by airlines including easyJet, Shapps said the government would examine “lots of different options” to help the sector.

Ministers have come under pressure over a perception that other countries, particularly elsewhere in Europe, are taking more stringent measures to combat the virus, and about a perceived lack of openness. News that older Britons could be told to self-isolate for months, for example, first emerged via an off-the-record briefing to ITV.

The Government has changed tack following the publication of the Imperial College Covid-19 modelling study which predicts that attempts to slow, or mitigate - rather than actively halt, or suppress - the novel coronavirus could overwhelm the number of intensive care hospital beds and lead to about 250,000 deaths in the UK and more than a million in the United States during the course of the current pandemic.

The study, which has not been published in a peer-reviewed journal, was released by London's Imperial College COVID-19 Response Team, which says it is advising the UK government on its response strategy. The study says it used modelling that has informed the approach of the British government in recent weeks; on Monday, the government abruptly called on vulnerable and elderly Britons to isolate themselves for 12 weeks, and introduced a variety of social distancing and quarantine recommendations that days earlier seemed distant prospects.

It is essential therefore to reassure the public, and take steps to lessen the huge economic impact to the country (at a time where Brexit has created massive uncertainty in its own right).



⁷ Source: The Guardian, CNN Health, Imperial College.

The UK Population

The UK government's cautious coronavirus strategy provokes a public backlash. The UK government is facing growing calls from the public and scientific community to take more drastic measures to combat the new coronavirus, as the rest of Europe and the U.S. shuts down much of public life to prevent the virus spreading further. Many members of the British public are venting their frustration at Boris Johnson and his government's apparently cautious approach when it comes to containing, and now delaying, the spread of the virus...

Health advice confusion as virus sweeps across Europe

Steel quits over report into era of child abuse

Hotel lockdowns in Tyrol and Spain, while schools in UK send pupils home

By Sophie Borland, Mario Ledwith, Amelia Clarke and Ben Spencer

Staff and pupils at 18 schools were sent home yesterday amid fears they have picked up coronavirus on ski trips to Italy.

The British step was taken as the health crisis deepened in southern Europe. Austria, Switzerland, southern Spain and Croatia confirmed their first cases and French authorities were reported to have sent 10 affected tourists to northern Italy while those returning from the region are being told to self-isolate for 14 days.

An UK official said earlier they were consulting on closing schools and cancelling holidays to prevent a global pandemic.

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VIRUS PANIC HITS SCHOOLS

Happy to be home Harry? Prince is back in Britain

++ Pupils and staff sent home all over UK ++ Contagion strikes across Europe ++ Britons warned: Avoid north Italy

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UK warns against mass panic as race to halt outbreak intensifies

Samaritans ditch new CEO after complaints

Alarm as flood defences breached in Shropshire

Residents and business owners in Shropshire were forced to flee their properties yesterday as the River Severn rose to near record levels and overwhelmed flood defences.

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BORIS: MANY FAMILIES WILL LOSE LOVED ONES

Worst public health crisis in a generation

Up to 10,000 in Britain are infected

Call to mobilise millions to help each other

By Sophie Borland, Mario Ledwith, Amelia Clarke and Ben Spencer

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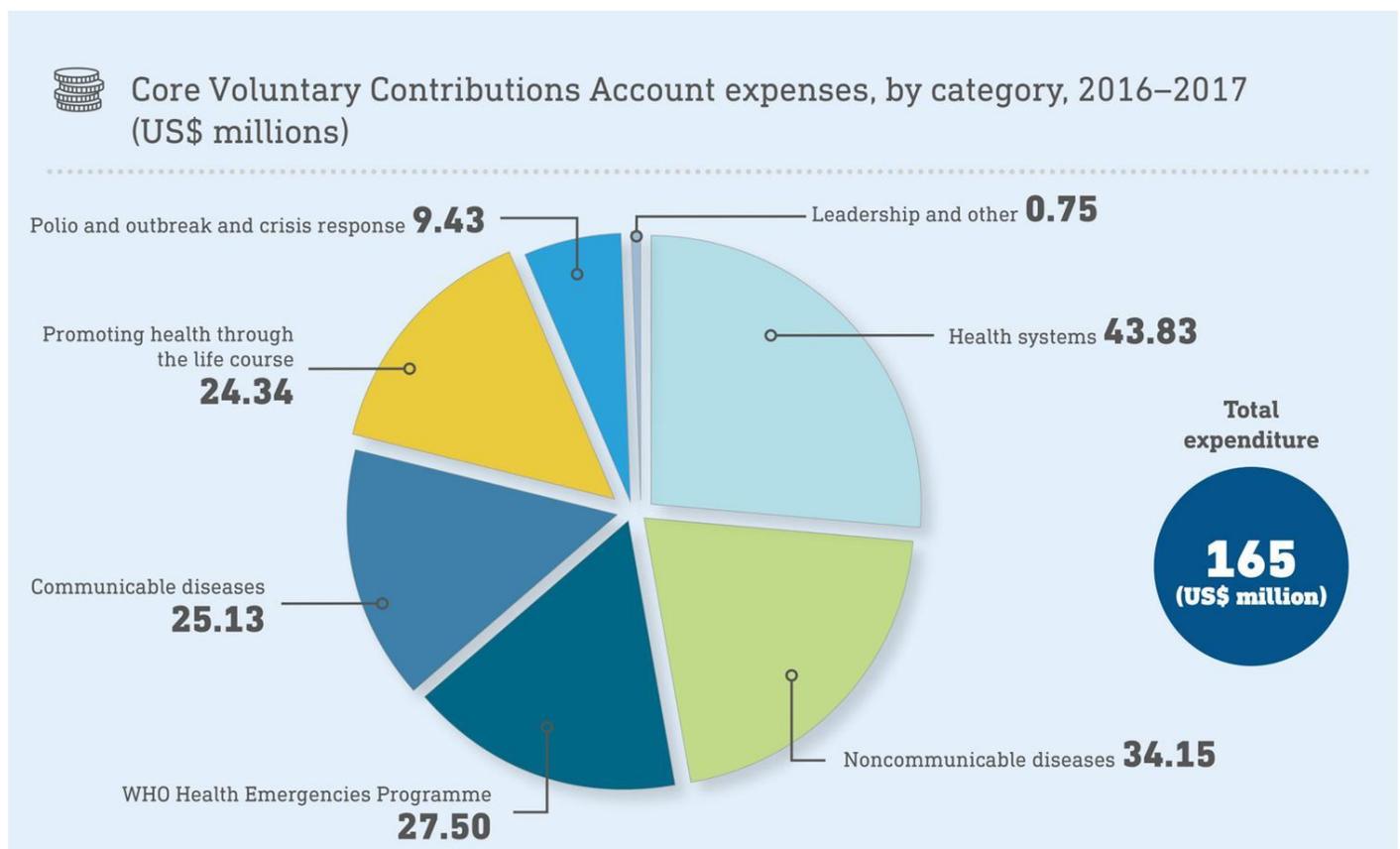
Something must be done – and done urgently!

The World Health Organisation⁸

The World Health Organization (WHO) is a specialised agency of the United Nations concerned with global public health. It was established on 7 April 1948. The WHO is headquartered in Geneva, and is a member of the United Nations Development Group. The WHO Constitution establishes the agency's main objective as ensuring "the attainment by all peoples of the highest possible level of health." It was signed by 61 countries—all 51 U.N. member states and 10 others and came into effect at the meeting of the World Health Assembly on 24 July 1948.

The WHO's primary activities are promoting universal healthcare, monitoring public health risks, coordinating responses to health emergencies, and promoting human health and wellbeing. It has played a leading role in several public health achievements, most notably the near-eradication of polio, the eradication of smallpox, and the development of a vaccine for Ebola.

The WHO's priorities include communicable diseases, particularly HIV/AIDS, Ebola, malaria and tuberculosis; the mitigation of the effects of non-communicable diseases, development, and aging; nutrition, food security and healthy eating; occupational health; substance abuse; and promoting reporting, publications, and networking.



The World Health Organization's Director-General noted that some countries can do more to contain the COVID-19 outbreak. He called for urgent action to ramp up efforts to identify, isolate and contact trace people with the disease. **Countries should test every suspected case of COVID-19.**

If people test positive, they should be isolated and the people they have been in close contact with up to 2 days before they developed symptoms should be sought out, and those people should be tested too if they show symptoms of COVID-19. WHO also advises that all confirmed cases, even mild cases, should be isolated in health facilities, to prevent transmission and provide adequate care. But they recognize that many countries have already exceeded their capacity to care for mild cases in dedicated health facilities. In that situation, countries should prioritize older patients and those with underlying conditions.

The WHO also embarked on real-time training with Online Open Courses for COVID-19 provide learning resources for health professionals, decision-makers and the public. More than 320 000 learners have already enrolled.

⁸ Source: Wikipedia and WHO.

The USA⁹

The coronavirus pandemic is in its early days. But the scale and force of the economic and medical crisis that has hit the United States is hugely significant. However, many Americans are convinced that, even in this crisis, their society is more capable than others. Much has been made about the terrifying and reckless behaviour of the authorities in China, who initially threatened doctors who talked about the new virus, forcing them into silence. This story has been told repeatedly—and correctly—as an illustration of what’s wrong with the Chinese system.

The United States also had an early warning of the virus—but it, too, suppressed that information. In late January, just as instances of COVID-19, began to appear in the United States, an infectious-disease specialist in Seattle, Helen Y. Chu, realized that she had a way to monitor its presence. She had been collecting nasal swabs from people in and around Seattle as part of a flu study, and proposed checking them for the new virus. State and federal officials rejected that idea, citing privacy concerns and throwing up bureaucratic obstacles related to lab licenses.

Chu was not threatened by the government, but she was just as effectively silenced by a complacent rule-bound bureaucracy—and by officials at the Food and Drug Administration and the Centers for Disease Control and Prevention who may have felt political pressure not to take this disease as seriously as they should.

Some now believe that this pandemic represents an existential threat to the Trump Administration and the chances of a Second Term.

We know that COVID-19 diagnostic tests are in scarce supply in the US. South Korea, which has had exactly the same amount of time as the U.S. to prepare, is capable of administering 10,000 tests every day. The United States, with a population more than six times larger, had only tested about 10,000 people in total so far.

And why not? There could be many reasons, but one element of the situation cannot be denied: The president himself did not want the disease talked of too widely, did not want knowledge of it to spread, and, above all, did not want the numbers of those infected to appear too high.

The United States, long accustomed to thinking of itself as the best, most efficient, and most technologically advanced society in the world, is about to be proved an unclothed emperor. When human life is in peril, the US are not as good as Singapore, South Korea, or Germany. Global pandemics, cyberwarfare, information warfare—these are threats that require highly motivated, deeply educated bureaucrats; a health-care system that covers the entire population; public schools that train students to think both deeply and flexibly; and much more.

American dysfunction is also the result of the bifurcated health-care system, which is both the best in the world and the worst in the world, and is simply not geared up for any kind of collective national response. The present crisis is the result of decades of underinvestment in civil service, of undervaluing bureaucracy in public health and other areas, and, above all, of underrating the value of long-term planning.

In line with the declared policy of "America First", a range of measures are being looked into. However, one of the options may have backfired. German ministers have reacted angrily following reports that President Trump offered a German medical company "large sums of money" for exclusive rights to a Covid-19 vaccine. *Welt am Sonntag* newspaper reported Trump offered \$1bn to the biopharmaceutical company CureVac to secure the vaccine "only for the United States". The report prompted fury in Berlin, but has been denied by the company (despite the German government and the company's main investor saying it was true).

This is, of course, fake news being exploited by increasingly hysterical Democrats. It is therefore essential that firm and decisive action is taken as quickly as possible to reassure the Stock Markets, silence the critics, allow calm to return, and ensure that the triumphant procession to a successful re-election later in the year and a Second Term of office, continues as planned.

⁹ Source: The Atlantic (edited)

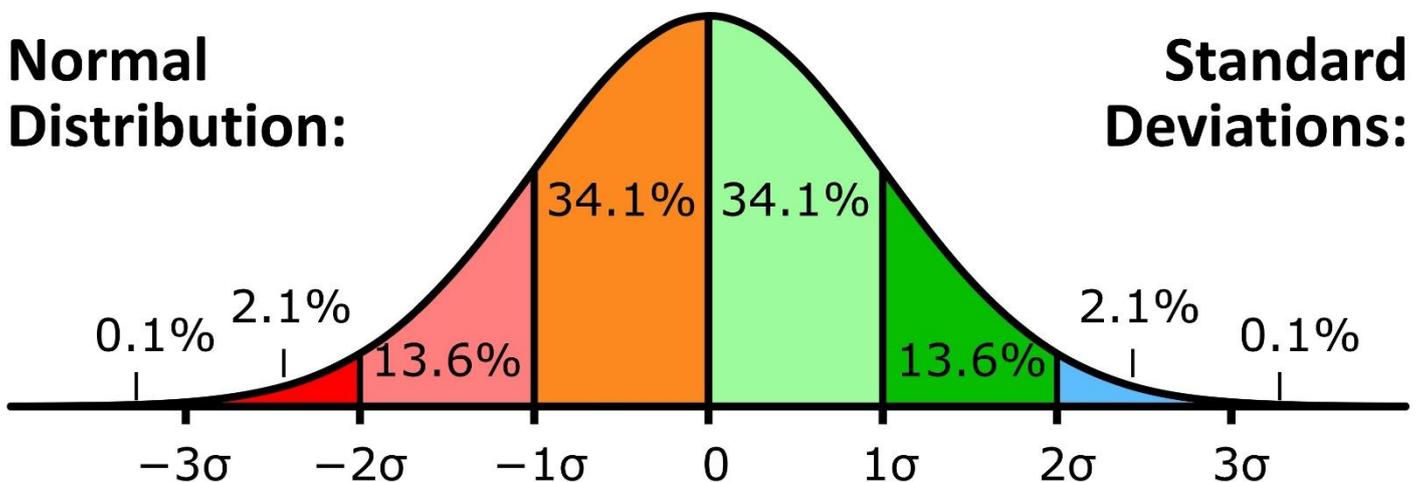
Mishaps and Markets

Note to Players: Your role in representing this Actor in the Corvid-19 pandemic is to act as the "Devil's Advocate" in order to stress-test the other Actors' options and responses, so that insights can be gained into this unfolding tragedy. It is your job to try to kill as many people as possible (innocent and guilty alike), crash the international Stock Markets, expose the worse, most cowardly and selfish behaviour of your fellow man, and destroy the economic foundations upon which ordinary people depend.

It is clearly understood that your role is not easy or pleasant, and is open to misinterpretation by others who fail to understand the purpose and utility of serious games – but, be quite clear - if you fail to do this, the game will turn into a banal procession of reassuring tropes, and genuine insights *that could have saved lives* will be missed.

The Virus.

- The effects of the virus will cross the entire globe eventually, however, different countries with different connectivity, cultures and social connections will be affected over different timescales and to different extents.
- The virus itself has the possibility of weakening the immune system, or permanently reducing patients' ability to fight off other respiratory infections. Other infections such as seasonal flu, in conjunction with an exposure to Corvid-19, may turn out to be no more deadly than normal later in the year.
- It is possible that the virus could mutate, either in combination with other viral diseases or as a reaction to anti-viral pharmaceuticals rushed into production with insufficient clinical testing.
- The predictions of transmission rates and lethality are all conjecture, based on small samples and wholly inadequate testing – they are simply the best guesses of the community at the time. You can argue that they are incorrect, but the scale of the error is proportional to the scale of the difference from the estimate (so a small change is easy to achieve, an order of magnitude difference is more difficult, and two orders of magnitude is very difficult indeed). As a rough guide, these will be based on standard deviations from a normal distribution:



The Market.

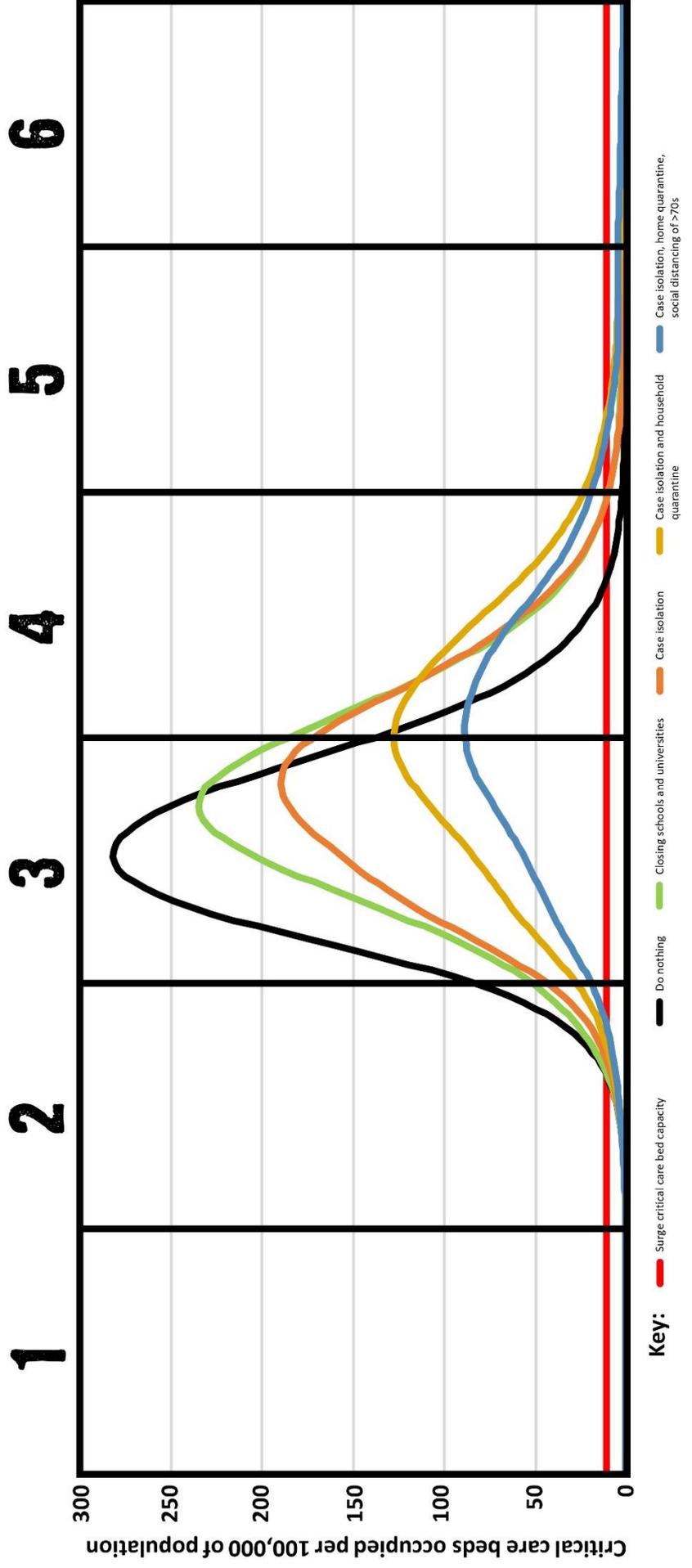
- There have been widespread reports of supply shortages of pharmaceuticals and manufactured goods due to factory disruption in China, with many areas seeing panic buying and consequent shortages of food and other essential grocery items. The technology industry, in particular, has been warning about delays to shipments of electronic goods.
- The spectre of food riots is never far away. Certain sectors of society are much hit harder by the effects of quarantines and self-isolation, reducing their income, costing their jobs, and panic buying causes shortages.
- On the other hand, there have been huge decreases in pollution in industrial areas, but only time will tell if the reaction to the crisis is a return to cheaper, more polluting fossil fuels in an effort to make up lost ground, or a realisation that alternative fuels are essential in the longer term.

Game Timeline Chart:

COVID-19 - FLATTENING THE CURVE

TIMELINE (MONTHS):

Total Deaths at a point are assumed to be : (Current plot height-10) x 664



Key: Surge critical care bed capacity (red line), Do nothing (black line), Closing schools and universities (green line), Case isolation (orange line), Case isolation and household quarantine (yellow line), Case isolation, home quarantine, social distancing of >70s (blue line).

Source: <https://www.imperial.ac.uk/media/imperial-college/medicine/sph/ide/gida-fellowships/Imperial-College-COVID19-NPI-modelling-16-03-2020.pdf>

How to Use the Game Timeline Chart

The Game Timeline Chart is the "map" for the game.

Print the map as large as you can, preferably A0 or A1 so that all participants can see it clearly. Laminate the map so you can write on it with marker pens – water soluble pens are best as they don't rub off so easily with a careless elbow. WB SL brand drywipe markers are second best, with generic whiteboard markers a very poor third. If you can get different colours to match the intervention action curves, all the better.

The counters on the following pages should be printed into A4 labels, then stuck to 5mm foamboard and cut out. Alternatively use plain paper and self-adhesive vinyl floor tiles (these are difficult to cut out, but won't blow away in the wind or get brushed aside by an errant necktie...).

In addition, make some blanks and have some Post-It notes in various sizes and shapes handy.

The counters are used to provide a visual marker to represent actions taken by the Actors, so an increase in critical care beds created by deploying military Field Hospitals to increase the capacity of normal hospitals could be represented by an Army symbol, a Medical symbol or Building symbol and a Smiley face. The counter can mean anything appropriate and are just to help as visual reminders. You can also simply write on the chart with the marker in the relevant month.

Political capital acquired by successful actions can simply be represented by a Smiley face, given to an Actor. Similarly, political cock-ups and embarrassments represented by a Sad face. Smiley faces can, of course, be traded in for dice roll modifiers when adjudicating an argument, representing political favours and capital being traden in for support. Sad faces can be exploited by opposing Actors in their own arguments.

Success or failure in the game will be represented by modifications to the Imperial College¹⁰ modelling shown as curves on the chart. The curves can be flattened, increased, moved to the right or left, or changed to multiple smaller peaks by the use of hybrid adaptive measures.

Important Note: This game and the use of the [Imperial College paper](#) represents a single model ([other models](#) are available) against which the game is played. A fundamental part of the purpose of the game is to stress test the model and its assumptions.



¹⁰ Source: [Imperial College](#).

Example Counters: