

Brenwynne Grigg

From: Bill Leighty [REDACTED]
Sent: Wednesday, May 6, 2020 12:42 PM
To: Managers Office; Mila Cosgrove; Brenwynne Grigg; Economic Stabilization
Subject: COVID: Relax hunker? What's next ?
Attachments: COVID-19-BreathingTransmission-NAS-10Apr20.pdf; COVID-GCC-May6-20.pdf; COVID-LockdownWorked-Next-17Apr20.pdf

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Juneau Friends, 6 May 20 PM

General advice from aviation:

- There are old pilots and bold pilots, but no old bold pilots.
- Most accidents happen to pilots with about 100 hours.
- WW2 training: You're flying along, fat , dumb, and happy -- that's when you get shot down.

Please see attached. Juneau has been smart, disciplined, and lucky. Thank you, CBJ management and citizens. As the USA, Juneau, and AK begin the dangerous experiment of "opening", emerging from extreme distancing, and as Juneau contemplates its economic future, please heed the attached:

- If virus particles can be emitted in "aerosol" clouds by normal respiration by an infected person, home-made fabric masks may be of some value in intercepting some of those potentially-deadly particles within, and from outside, the mask. But they are probably not adequate to protect us from all virus propagation.
- As we think beyond COVID, trusting that a vaccine and / or drugs plus testing and behavioral discipline will allow us to control it, remember that we also need attention to the bigger, but slower, challenge of "climate change" caused by anthropogenic greenhouse gas (GHG) emissions. Consider Shell's scenario for "A Climate-neutral EU by 2050", composed before the COVID disaster. How will Juneau do its part for "A Climate-neutral Juneau and USA by 2050" ? https://www.shell.com/energy-and-innovation/the-energy-future/scenarios/scenario-sketches/new-sketch-a-climate-neutral-eu/_jcr_content/par/relatedtopics.stream/1587034457359/dad7b112d536241e759584da50430cfade845d39/scenario-sketch-a-climate-neutral-eu-by-2050.pdf

Juneau's COVID luck may change. We need only one infected, probably asymptomatic person to come to town and jump quarantine to begin an infection propagation chain we may not be able to contain.

How shall we respond, when the next COVID case appears in Juneau ? Have we a plan for that ? Require all citizens in gathering places and inside retail stores to wear high-quality masks at all times, while allowing those exercising remotely to go mask-free ?

Now, many people in public places and retail stores in Juneau do not wear masks of any kind. What shall we do about that ?

At the moment, that may not matter, if Juneau is really COVID-SARS-2-free. Are we dangerously fat, dumb, and happy ?

It's visitor season. How will we enforce 14-day quarantine for everyone arriving from outside Juneau ? Will that eliminate all visitation, perhaps for this entire season ?

Beware the lure of "opening the country" when we haven't in place the testing, tracing, and tracking capability that has been demonstrated necessary elsewhere in the world.

We are not yet New Zealand. Our national leadership has not earned our trust, nor yet seems earnestly engaged in preparing and enforcing the discipline for "opening", for preventing tens of thousands more deaths.

Therefore, that leadership must originate in Juneau.

Thank you for your consideration. Best wishes in your important work.

Bill Leighty

Director, The Leighty Foundation (TLF)

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www.leightyfoundation.org/earth.php

1000 contacts have been included already; a first result from that subset should be available around 15 April, Mitjà says. Similar studies are underway in Minnesota, Washington, and New York.

Experience with HIV has shown that PrEP and PEP can work to reduce infections. But before large-scale studies in HIV began, scientists had an “amazing amount of data” from a monkey model and epidemiology studies suggesting the strategies would work, says Steven Deeks, an HIV researcher at the University of California, San Francisco (UCSF). “I’m not sure any of that applies to what’s happening now.”

Potential side effects of chloroquine and hydroxychloroquine, including heart arrhythmia, are another concern. “The risks that might be acceptable in someone with disease may be much less acceptable when you are treating someone who doesn’t have it,” says Annie Luetkemeyer, an infectious disease physician at UCSF. “And you’re very unlikely to be monitoring them in the same way.”

Some countries aren’t waiting for the new trials. India, for instance, has already recommended hydroxychloroquine for health care workers caring for suspected or confirmed COVID-19 cases as well as patients’ household contacts. Many scientists say such measures are premature. “The idea that it is better than nothing is not true,” White says. “It could be worse than nothing.”

That’s not just because of the potential side effects. People who think they are protected may also become less cautious and run a greater risk of infection. And broad use of the drugs will make them harder to obtain for other conditions. In addition to curing malaria, chloroquine and hydroxychloroquine are mainstays for patients with lupus and rheumatoid arthritis, Luetkemeyer says. “We better be really sure that these drugs are working before we start impacting that drug supply.”

Even if chloroquine works, it is unlikely to confer 100% protection and a low level of protection may not make the risk of side effects worthwhile. “If you were a health care worker and I said, ‘Here’s a medicine which you have to take every day and it reduces your risk of getting COVID-19 by 20%, would you take it?’” White asks. Below that, people probably wouldn’t bother, he says.

White hopes for a quick answer, but he is still navigating the “myriad rules, regulations, and sequential hurdles that govern the conduct of clinical trials.” No one is acting with ill intent, he adds, but he thinks the emergency warrants faster action. “Is it really ethical to take 3 weeks to review an application for a medicine that has been available for 70 years?” ■

COVID-19

NAS letter suggests ‘normal breathing’ can expel coronavirus

But some experts are skeptical that small respiratory particles transmit infectious virus

By **Robert F. Service**

On 31 March, University of California, San Diego, atmospheric chemist Kimberly Prather set off an online debate by saying people should stop surfing during the coronavirus outbreak. Her reasoning: Viruses can travel long distances if carried by wind. “I ignited a bomb,” Prather says, as commenters pushed back, pointing to official assurances that the novel coronavirus is transmitted only short distances in respiratory droplets from a sneeze or cough.

The surfing controversy just adds to the fog surrounding how the novel coronavirus is transmitted. When people cough and sneeze, the droplets they expel fall to the ground within 1 or 2 meters. The fallen droplets deposit virus on surfaces, where people can pick it up and infect themselves by touching their faces. But if the coronavirus can be suspended in an ultrafine mist of particles smaller than 5 micrometers known as aerosols people could potentially spread infection when they exhale. And aerosol particles are so light that they can float like dust for hours in air.

The National Academy of Sciences (NAS) weighed in last week, suggesting it’s likely the novel coronavirus can spread this way. A 1 April letter to Kelvin Droegemeier, head of the White House Office of Science and Technology Policy, noted that current studies are inconclusive. But, it added, “The results of available studies are consistent with aerosolization of virus from normal breathing.”

The debate was kicked off by a finding published 17 March in *The New England Journal of Medicine* that the new coronavirus, SARS-CoV-2, can float in mechanically generated aerosols for up to 3 hours and remain infectious. People readily shed such particles, and an analysis published 26 March in *JAMA* reported that a single sneeze can propel them up to 8 meters. “From the physics it’s very clear the emissions go beyond [2 meters],” says the pa-

per’s author, Lydia Bourouiba, a physicist at the Massachusetts Institute of Technology.

The NAS letter also pointed to a preprint posted on medRxiv on 26 March by Joshua Santarpia and colleagues at the University of Nebraska Medical Center that found widespread evidence of viral RNA in rooms of patients being treated for COVID-19. Viral RNA turned up on hard-to-reach surfaces and in air samples more than 2 meters from the patients. Another preprint posted 10 March on bioRxiv found the coronavirus can be resuspended in the air when health care workers remove their personal protective equipment, clean the floors, and move through infected areas. Considering all the data, “The presence of viral RNA in air droplets and aerosols indicates the possibility of viral transmissions via these routes,” the NAS letter concluded.

“This added airborne pathway helps explain why [the virus] is spreading so fast,” Prather says.

To others, the question is far from settled. A 27 March scientific brief from the World Health Organization states that aerosol transmission “may be possible in specific circumstances and settings that generate aerosols,” such as when severely ill patients are intubated. However, the brief adds, an analysis of more than 75,000 coronavirus cases in China revealed no cases of airborne transmission. As for studies such as Santarpia’s, it notes that detection of viral RNA doesn’t necessarily mean infectious virus persists.

Meanwhile, some researchers are considering another possible transmission route: feces. According to the Centers for Disease Control and Prevention, no cases of fecal transmission have been documented even though the novel coronavirus has been detected in the feces of some patients. CDC says the risk “is expected to be low based on data from previous outbreaks of related coronaviruses, such as severe acute respiratory syndrome and Middle East respiratory syndrome.” ■

With reporting by Jocelyn Kaiser.

8
meters

The distance a single sneeze can propel aerosol particles

NAS letter suggests 'normal breathing' can expel coronavirus

Robert F. Service

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A COVID-19 recovery for climate

In response to the coronavirus disease 2019 (COVID-19) pandemic, countries are launching economic recovery programs to mitigate unemployment and stabilize core industries. Although it is understandably difficult to contemplate other hazards in the midst of this outbreak, it is important to remember that we face another major crisis that threatens human prosperity: climate change. Leveraging COVID-19 recovery programs to simultaneously advance the climate agenda presents a strategic opportunity to transition toward a more sustainable post-COVID-19 world.

The climate and COVID-19 crises are global and unprecedented in their level of disruption, and require coordinated responses by policy-makers, businesses, and broader society. But they are also different. The pandemic directly threatens individuals and health systems, whereas climate change undermines broader natural and human systems. COVID-19 requires responses within days and weeks, whereas reactions to the climate crisis appear less acute. Nevertheless, science suggests that climate impacts will worsen the longer we wait. So, we are faced with overlapping crises that require immediate societal mobilization.

Yet, as nations marshal massive resources to mitigate the economic and social impacts of COVID-19, they may be missing the chance to address climate change. Indeed, earlier experiences show that policy responses to major calamities, such as the 2008 global financial crisis and the Millennium drought in Australia, tend to focus on stabilizing incumbent industries, technologies, and practices rather than seizing the opportunity for sustainable transformation.

At this early stage of the pandemic, we are witnessing how worldwide lockdowns have decreased air pollution and greenhouse gas emissions because of reduced transportation, electricity generation, and industrial production. This shows how intertwined modern economic life and fossil fuels have become, and suggests consideration of climate implications in economic recovery plans.

However, there is variation in political responses to COVID-19. The United States has rolled back certain environmental regulations and appears poised to direct stimulus funds toward reinvigorating the fossil fuel industry. The German Council of Economic Experts submit-

ted a 110-page report on the coronavirus crisis without mentioning climate change or sustainability. By contrast, 17 European climate and environment ministers called on the European Commission to make the Green Deal central to the recovery following the pandemic.

Where, then, should we begin to focus in building back jobs and the economy while also transitioning toward a more sustainable future? One strategy would be to use recovery funds to stimulate innovation for the low-carbon energy transition. This might involve promoting new infrastructure, business models, and industrial capacity in renewable energy technology, energy storage, electric vehicles, and charging stations through tax credits and other measures. An example would be supporting the diffusion

of electric delivery vehicles, given the rise in e-commerce. But transitioning entire sectors is a long-term endeavor that requires continuous adaptation and attention to context. There may also be opportunities to build on social changes catalyzed by COVID-19 such as remote working, video conferencing, e-commerce, and reduced air travel. Science must explore how such changes can be made durable and contribute to low-carbon pathways.

A complementary strategy is to harness disruption to accelerate the decline of carbon-intensive industries, technologies, and practices. COVID-19 has temporarily destabilized businesses, economic activity, and consumption. This can be leveraged to accelerate the phase-out of coal-fired power, which is already part of the climate action plans of several countries, including Canada, the United King-

dom, Finland, and Germany. Destabilization has also affected the oil and gas industry, with the price of U.S. oil futures turning negative for the first time in history and global demand for oil estimated to reach a 25-year low. These circumstances can be harnessed to transition away from fossil fuels toward clean alternatives. To drive this change, it is important not to bail out fossil fuel companies and industries. Support must instead flow to affected workers and communities in the form of temporary relief, retraining, and retirement benefits.

COVID-19 recovery programs can lay the foundation for a more sustainable and prosperous future. Nations should not squander this opportunity.

—Daniel Rosenbloom and Jochen Markard

“...COVID-19 recovery... presents a strategic opportunity to transition toward a more sustainable... world.”

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Science

A COVID-19 recovery for climate

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A priest in Innsbruck, Austria, views photographs of his absent congregation. Austria eased social distancing on 14 April.

IN DEPTH

COVID-19

The lockdowns worked—but what comes next?

Easing the rules while keeping the virus at bay will be a process of trial and error

By Kai Kupferschmidt

The world is holding its breath.

After the novel coronavirus made its way around the world, one country after another adopted harsh measures to stop SARS-CoV-2 from spreading and overwhelming hospitals. They have hit the pause button on their economies and their citizens' lives, stopping sports events, religious services, and other social gatherings. School closures in 188 countries affect more than 1.5 billion students. Borders are closed and businesses shuttered. While some countries are still seeing daily case numbers increase, others first in Asia but increasingly in Europe have managed to bend the curve, slowing transmission of COVID-19.

But what is the exit strategy? "We've managed to get to the life raft," says epidemiologist Marc Lipsitch of the Harvard T.H. Chan School of Public Health (HSPH). "But I'm really unclear how we will get to the shore."

As they seek a path forward, governments around the world must triangulate the health of their citizens, the freedoms of their population, and economic constraints. Could schools be reopened? Restaurants? Bars? Can people go back to their offices? "How to relax the lockdown is not something around which there is a scientific consensus," says Caroline Buckee, an epidemiologist at HSPH. Most researchers agree that reopening society will be a long haul, marked by trial and

error. "It's going to have to be something that we're going to have to take baby steps with," says Megan Coffee, an infectious disease researcher at New York University.

The number to watch in the next phase may no longer be the actual number of cases per day, but what epidemiologists call the effective reproduction number, or R , which denotes how many people the average infected person infects in turn. If R is above 1, the outbreak grows; below 1 it shrinks. The goal of the current lockdowns is to push R well below 1. Once the pandemic is tamed, countries can try to loosen restrictions while keeping R hovering around 1, when each infected person on average infects one other person, keeping the number of new cases steady.

To regulate R , "Governments will have to realize that there are basically three control knobs on the dashboard," says Gabriel Leung, a modeler at the University of Hong Kong: isolating patients and tracing their contacts, border restrictions, and social distancing.

TURNING THE KNOBS

Singapore, Hong Kong, and South Korea have all managed to keep their epidemics in check through aggressive use of the first control. They identify and isolate cases early and trace and quarantine their contacts, while often imposing only light restrictions on the rest of society. But this strategy depends

on massively scaling up testing, which has been hampered by a scarcity of reagents and other materials everywhere. Contact tracing is also labor-intensive. Massachusetts is hiring 500 contact tracers, but a recent report by researchers at Johns Hopkins University estimated the United States as a whole needs to train about 100,000 people.

Mobile phone apps could help by automatically identifying or alerting people who recently had contact with an infected person. But Western countries have yet to implement these systems. Google and Apple have teamed up to incorporate a contact tracing app in their operating systems. Germany, France, and other countries are developing apps based on a protocol called Pan-European Privacy Preserving Proximity Tracing. It relies on short-range Bluetooth signals to gauge the proximity between two devices without logging their exact locations, which helps sidestep some privacy concerns.

But short of making these technologies compulsory, as China has done, how can a country ensure that enough people download an app for it to provide reliable information and influence the spread of disease? And what exactly counts as a contact? "If I live in a big apartment block, am I going to be getting dozens of notifications a day?" asks epidemiologist Nicholas Davies of the London School of Hygiene & Tropical Medicine (LSHTM).

Science's
COVID 19
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Davies adds that widespread use of the apps will further drive up the demand for testing.

As to the second control knob, border restrictions, most countries have already banned entry to almost all noncitizens. Quarantining returning citizens, as New Zealand and Australia began to do in the past few weeks, further minimizes the risk of new introductions of the virus. Such measures are likely to remain in place for a while; the more a country reduces transmission domestically, the greater the risk that any new outbreaks will originate with travelers. And foreign visitors are generally harder to trace than citizens and more likely to stay at hotels and visit potential transmission hot spots, says Alessandro Vespignani, a disease modeler at Northeastern University. "As soon as you reopen to travelers, that could be something that the contact tracing system is not able to cope with," he says.

The third dashboard dial, social distancing, is the backbone of the current strategy, which has slowed the spread of the virus. But it also comes at the greatest economic and social cost, and many countries hope the constraints can be relaxed as case isolation and contact tracing help keep the virus in check. In Europe, Austria took the lead by opening small shops on 14 April. Other stores and malls are scheduled to follow on 1 May, and restaurants maybe a few weeks later. A 13 April report from the German National Academy of Sciences argued for slowly reopening schools, starting with the youngest children, while staggering break times and making masks mandatory. But French President Emmanuel Macron has said France's lockdown will remain in place until 11 May.

Choosing a prudent path is difficult, Buckee says, in part because no controlled experiments have compared the effectiveness of different social distancing measures. "Because we don't have really strong evidence," she says, "it's quite hard to make evidence-based policy decisions about how to go back." But Lipsitch says that as authorities around the world choose different paths forward, comparisons could be revealing. "I think there's going to be a lot of experimentation, not on purpose, but because of politics and local situations," he says. "Hopefully the world will learn from that."

Finding out how any particular measure affects R is not straightforward, because infections that occur today can take weeks to show up in disease reports. In 2004, mathematician Jacco Wallinga of the Dutch National

Institute for Public Health and the Environment and colleagues published a statistical method to estimate R in real time, which is now used around the world. Researchers are also incorporating data on mobility patterns and people's behavior to make the estimates more accurate. Having real-time estimates of R is important, says Adam Kucharski, a modeler at LSHTM: "If governments put a measure in or lift it, they can get a sense of what the immediate implications are, rather than having to wait," he says.

There's one other, unknown factor that will determine how safe it is to loosen the reins: immunity. Every single person who becomes infected and develops immunity makes it harder for the virus to spread. "If we get 30% or 40% of the population immune, that really starts to change that whole picture, it helps us a lot," because it would

bring R down by the same percentage, says Michael Osterholm, director of the Center for Infectious Disease Research and Policy at the University of Minnesota, Twin Cities.

Immunity will inevitably build up as more people become infected, but some researchers argue for ramping up immunity more quickly, by letting the virus spread in younger people, who are less susceptible to severe illness, while "cocooning" more at-risk patients, such as the elderly. The United Kingdom floated this "herd immunity" idea in February but backed away from it, as did the Netherlands. Some scientists say other countries should consider it once the strain that the first wave of cases has put on their health care systems eases. "Is it better to have a controlled burn in younger populations right now than it is to prevent it? I think that's a very important conversation to have," Osterholm says.

Skeptics doubt that vulnerable populations could really be protected. In many countries, multiple generations live under one roof, and young people work at nursing homes. Nor are scientists certain that COVID-19 produces robust, long-lasting immunity. Several studies seek to address these questions.

EXIT STRATEGY

For now, the most likely scenario is one of easing social distancing measures when it's possible, then clamping down again when infections climb back up, a "suppress and lift" strategy that both Singapore and Hong Kong are pursuing. Whether that approach can strike the right balance between keeping the virus at bay and easing discontent and economic damage remains to be seen.

Even Singapore and Hong Kong have had to toughen some social distancing measures in recent weeks after a surge of cases, Lipsitch notes; Singapore's social distancing regime is no longer very different from that in New York City or London. And both cities' strategies are much harder to implement across a big country like the United States. "We have to have every single town and city and county be as good as Singapore for this to work," he says.

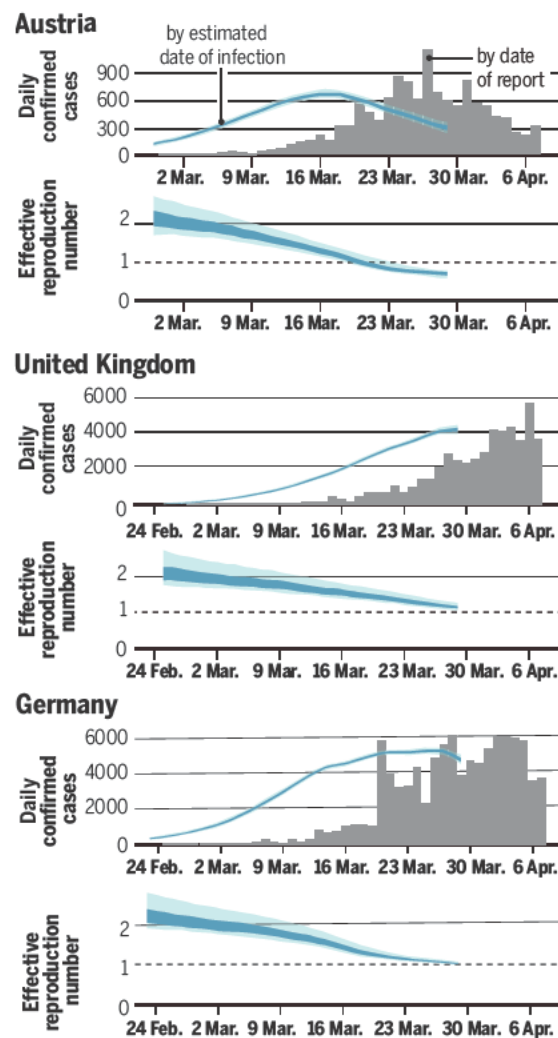
Ultimately, says Jeremy Farrar, head of the Wellcome Trust, a path out of the dilemma now facing the world will come from research. It might take the form of an effective treatment for severely ill patients, or a drug that can prevent infections in health care workers, or ultimately a vaccine. "Science is the exit strategy," Farrar says. ■

With reporting by Kelly Servick.

The number to watch

Lockdowns lower the number of new cases as well as R, the effective reproduction number. If R drops below 1, the epidemic shrinks.

● 50% confidence interval ● 90% confidence interval



Science

The lockdowns worked—but what comes next?

Kai Kupferschmidt

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