



**EMERGENCY
RESILIENCE
PROGRAM**

**KFAS COVID-19
weekly brief
5th of July 2020**



Introduction

As the COVID-19 continues to impact the wealth and welfare of our society, much remains to be understood about the pandemic and its impact. Hence, the importance of using scientific research, facts and data for a better understanding of the nature of the pandemic, as well as its associated public health issues, to drive policy making in addressing challenges related to healthcare and wellbeing of the population. This newsletter is intended to provide a weekly overview on the latest information on health-related topics surrounding the COVID-19 pandemic, covering five main themes: infection control and prevention, diagnosis and testing, treatment and therapy, training for healthcare professionals and exit strategies. Each edition of the newsletter will cover a specific sub-theme under the five main themes, providing up to date information on available resources, research, data and studies, along with policy recommendations and implications, based on scientific evidence and facts, for decision makers to utilize in developing policies and measures to address the challenges associated with COVID-19 within the healthcare sector.

News Highlights

(up to July 7th, 2020)

- How 'Superspreading' Events Drive Most COVID-19 Spread [Scientific American](#)
- Study suggests 80% of COVID-19 cases in the US went undetected in March [CNN](#)
- Human challenge trials with live coronavirus aren't the answer to a COVID-19 vaccine [STAT](#)
- The Pandemic's Mental Toll: More Ripple Than Tsunami [NY Times](#)
- Sanofi, a straggler in the COVID-19 vaccine race, accelerates its plans [STAT](#)
- A surge in cases shows the coronavirus won't go away soon [CNN](#)
- Coronavirus research updates: A striking share of infected people never show classic symptoms [Nature](#)
- Coronavirus: German outbreak sparks fresh local lockdowns [BBC](#)
- Americans Face New Virus Limbo as Some Reopenings Are Halted [NY Times](#)
- Oxford COVID-19 vaccine trials start in South Africa and Brazil [Clinical Trials Arena](#)
- The Risks of Rushing a COVID-19 Vaccine [Scientific American](#)
- Women Leaders Unite To Push For Testing To Exit COVID-19 [Forbes](#)
- France's COVID-19 tracing app fails to engage, chalking up roughly 1.5 million users [France 24](#)
- Coronavirus: Newborn Mexican triplets test positive in 'unprecedented' case [BBC](#)

Key Takeaways

Infection Control and Prevention:

The world's estimated 164 million migrant laborers are particularly vulnerable to the COVID-19 pandemic. Their risk of infection is compounded by factors like overcrowded living quarters, and working conditions. Across the Middle East, migrant workers account for high proportions of COVID-19 infections. In Kuwait, official figures suggest the majority of cases were among this population. The majority of this population live in tightly packed labour camps, or dormitories often in unsanitary conditions, some without access to running water. These conditions provide the perfect conditions for the spread of COVID-19. To deter future spread and to protect the migrant and local population, business and the government must take drastic steps to improve housing for migrant workers. This article will summarize key principles in improving migrant worker accommodation and look at the practical steps taken by Singapore to rectify the housing situation for its migrant worker constituents.

A summary of the main guideline required to improve housing facilities for migrant workers to meet public health standards is presented. This may be used as a "cheatsheet" for businesses, government and regulators to implement the necessary changes in housing facilities for migrant workers. These changes are essential in our fight to contain the COVID-19 pandemic and in to help protect society from future disease outbreaks.

Diagnosis and Testing:

The combined use of testing, contact tracing, and isolation is essential for effective containment of the coronavirus, SARS-CoV-2. A new modeling study published in The Lancet Infectious Diseases journal suggests one measure alone is not sufficient to ensure infection control, estimating a 64% reduction in transmission with manual tracing and isolation efforts, when used in combination. Limitations in testing, inefficient tracing efforts, and barriers to effective data collection have the potential to hinder tracing efforts, but another study has found that contact tracing does not need to be perfected to obtain results.

Treatment and Therapies:

A randomized, controlled clinical trial in the United Kingdom has found an inexpensive and commonly used steroid can save the lives of people seriously ill with COVID-19. The drug, called dexamethasone, is the first shown to reduce deaths from the coronavirus, which has killed more than 470,000 people globally. In the trial, it cut deaths by about one-third in patients who were on ventilators because of coronavirus infection.

The Oxford RECOVERY Trial is the best example: Low-to-moderate dose of dexamethasone cut the risk of death of COVID-19 patients on ventilators from 40% to 28%, saving one life for every eight patients treated without any prominent side effects. However, it is not helpful to those that can breathe properly.

Exit Strategies:

Many countries are facing peaks of new infections. Several states in the United States, for example, have seen a drastic reduction in the number of cases, but others, have continued to observe increases in infections, including some setting records for the number of cases in a single day. Furthermore, the number of infections amongst the younger generation has also increased, as restrictions have been lifted. The following piece describes the current state in relation to the resurgence in the number of cases, as well as reasons why the increase in cases amongst the younger generation could put the vulnerable at risk. In addition, an interesting study out of Harvard University shows the potential impact of COVID-19 through the post pandemic period.

Infection Control and Prevention



MIGRANT WORKERS' ACCOMMODATION AND COVID-19 PANDEMIC: INFECTION CONTROL

Background:

The COVID-19 pandemic is shining a spotlight on the unsanitary, overcrowded conditions many migrant workers live in around the world. Migrant workers are usually low-paid laborers and are often accommodated in dormitory-style housing facilities. Typically, they are provided small rooms that are shared between 6-12 people that sleep in bunk beds. Workers tend to share communal bathrooms and kitchens, which are often unsanitary, inadequate, and sometimes even lacking electricity and proper running water.

The spread of COVID-19 has highlighted the severity of the situation and the need to urgently rectify it. Following infection control, hygiene guidelines and adhering to social distancing measures are all but impossible in these circumstances. In light of the COVID-19 pandemic, many countries have taken active steps to change the living situation of migrant workers.

Health and Housing

The quality of workers' living environment has a major effect on their physical and psychological well-being. The provision of decent housing is an important sign that businesses respect and value their employees and is shown to enhance productivity. Many businesses report that new workers settle into their roles much faster when they live in decent and dignified accommodation. Conversely, poor housing conditions can lead to workers becoming demotivated and unwell, with obvious implications for their ability to perform their work effectively.

World Health Organization

"Poor housing conditions and uses may provide weak defenses against death, disease, and injury or even increase vulnerability to them. Adequate and appropriate housing conditions, on the other hand, not only protect people against health hazards but also help to promote robust physical health, economic productivity, psychological well-being and social vigor."

-WHO

The Singapore Experience¹

Singapore was a COVID-19 success story until the outbreak spread in its migrant worker population. After reporting single-digit daily caseloads in February, the island nation of 5.6 million had the highest number of reported COVID-19 infections in Southeast Asia by the end of April, almost all migrant workers. As of April 28, 2020, migrant worker dormitories were home to 85% of Singapore's 14,951 cases. Times-April 2020

The Singapore government has taken initiatives in changing the living conditions of migrant workers as they are recovering from COVID-19 and resuming work. Lessons were learnt from the current COVID-19 pandemic and are the main driver for drastic change.

The Inter-agency Taskforce of Singapore is currently working with dormitory operators and employers on the housing arrangements for migrant workers.

Here is a summary of their current initiative:

-Short-Term Arrangements:

Workers have been housed temporarily in sites such as army camps, sports halls, and private apartments slated for redevelopment.

-Medium-Term Arrangements: 2020-2021

To reduce the current density in the dormitories, the Singapore government plans to build additional dormitories with higher standards over the coming months and years. By the end of 2020 additional housing will be constructed for 60,000 employees through:

New Quick Build Dormitories: temporary structures that can be constructed quickly with low density. These dormitories will last for around two or three years and can house approximately 25,000 people.

Unused state properties: former schools and vacant factories will be temporarily fitted to house approximately 25,000 people.

The Government is in discussion with contractors on building additional Construction Temporary Quarters to house their workers near the worksite and cut down on the need for transportation.

EBRD/IFC Guidelines

In 2009 the European Bank for Reconstruction and Development (EBRD) and the International Finance Corporation (IFC) published detailed guidelines for worker accommodation on projects they had funded. The guidance is viewed as a key source of best practice for employers around the world.

Dhaka Principles for Migration with Dignity

Principle 8: Living conditions are safe and decent

Migrant workers should enjoy safe and hygienic living conditions, and safe transport between the workplace and their accommodation. Migrant workers should not be denied freedom of movement or confined to their living quarters.

United Nations

"States must make every possible effort, within their available resources, to realize the right to adequate housing and to take steps in that direction without delay." -UN

¹ <https://www.gov.sg/article/improved-standards-of-new-dormitories-for-migrant-workers>

Long-Term Arrangements: 2020-2022

Plans are underway for new purpose-built dormitories (PBDs) to house up to 100,000 workers. These buildings will replace the temporary accommodations described above. It is anticipated that the new building program will take several years to complete. The goal will be to have 11 new PBDs ready over the next one to two years. The new PBD will include minimarts, barber services, and indoor recreation facilities. Blocks will be well spaced out to ensure good ventilation. Workers living in these dormitories will have ready access to medical care and support. With the additional housing capacity, the Government will be able to decant workers from the temporary housing projects and undertake major upgrading of these dormitories to ensure that new standards are met.

Standards	Current	Improved
Living space per resident	≥ 4.5sqm per resident, including shared facilities	≥ 6sqm per resident, not including shared facilities
Occupancy per room	No maximum beds per room. In practice, 12-16 beds per room. Mostly double decker beds	≥ 10 beds per room. Use of single deck bed only, with 1m spacing between beds
Toilets	≥ 1 set of toilet, bathroom, sink and urinal: 15 beds	≥ 1 set of toilet, bathroom and sink to 5 beds
Sick bay and isolation facility	≥ 1 sick bay bed per 1,000 bed spaces Additional isolation spaces (to be stood up if needed) at 19 beds per 1,000 bed spaces	≥ 15 sick bay beds per 1,000 bed spaces Additional isolation spaces (to be stood up if needed) at 10 beds per 1,000 bed spaces

<https://www.mom.gov.sg/newsroom/press-releases/2020/0601-joint-mnd-mom-media-release-on-new-dormitories-with-improved-standards-for-migrant-workers>

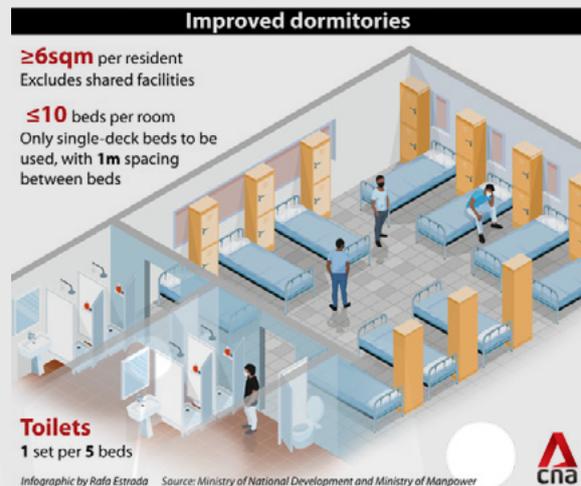
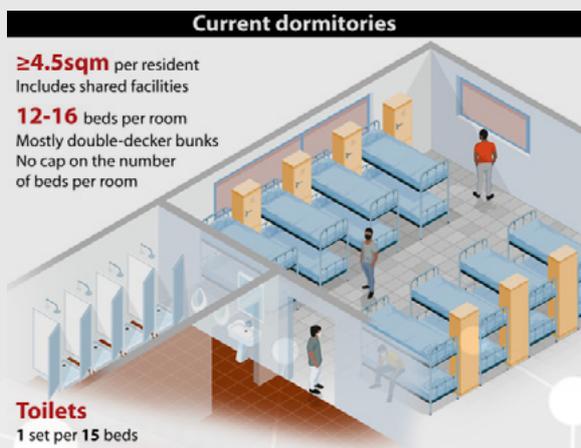


Figure 1

New Standards and Dorm Operating Model:

New standards and specifications were developed for the new dormitories. It includes guidelines for design, facilities, management and regulation of the dormitories. The guidelines factor in social interaction and disease response needs. The new model is designed to ensure that the dormitories are more resilient to public health risks, including pandemics.

What Can Kuwait do Moving Forward During the COVID-19 Pandemic?

Kuwait has taken active steps to ensure the health and well-being of migrant workers during the COVID-19 pandemic. The Government provided free healthcare for COVID-19 patients and is working to help secure basic needs for the migrant worker community. To capitalize on the progress that has been achieved, the Government and the private sector should work on the following:

1. The governments and private companies should work together to identify overcrowded and unsanitary labour accommodations.
2. Concerned migrant workers should temporarily relocate to facilities where they can practice social distancing, maintain the necessary hygiene standards like regular hand washing and other measures required to protect against infection.
3. Companies should implement health and safety recommendations in accommodation and workplaces. The Government should ensure that companies enforce these measures.
4. The Government should ensure that migrant workers have equal access to testing for COVID-19 and those with symptoms are provided with facilities to self-isolate and access health care.
5. The Government should coordinate with relevant embassies so that all migrant workers have enough food and water and adequate sanitation.

MIGRANT WORKERS' ACCOMMODATION AND COVID-19 PANDEMIC: A SUMMARY OF INFECTION CONTROL GUIDELINES

What Should Businesses and Governments do to Improve Housing for Migrant Workers to combat COVID-19?

1. Define and outline the definition of “Decent and Adequate Housing.”
2. Offer workers assistance in finding housing in the local market, or where this is not feasible, offer employer accommodation.
3. Limit the number of workers to a room, ensure sufficient, proper and well- maintained water, sanitation and cooking facilities.
4. Ensure sleeping quarters are air-conditioned and well-ventilated.
5. Ensure that workers have access to leisure activities.
6. Ensure that adequate and decent housing does not cost the worker more than a reasonable proportion of income.

Definition of Workers' Housing by The International Labour Organization (ILO):

ILO Recommendation No. 115 concerning Workers' Housing gives guidance for employers directly providing accommodation for their employees. Below is a summary of the main principles:

- 1. It is “generally not desirable that employers should provide housing for their workers directly.” Employers are encouraged to help their workers obtain housing through autonomous private agencies, public housing, or cooperatives.**
- 2. The housing and related community facilities should be of durable construction, taking into account local conditions.**
- 3. Employers should ensure that workers are not affected by air pollution, surface run-off or sewage or other wastes due to the location of the workers' housing.**

4. Housing should ensure “structural safety and reasonable levels of decency, hygiene and comfort.” The undertaking should ensure the following:

In workers sleeping rooms: Floor area should not be less than:

- 7.5 square meters in rooms accommodating two persons.
- 11.5 square meters in rooms accommodating three persons.
- 14.5 square meters in rooms accommodating four persons.
- If a room accommodates more than four persons, the floor area should be at least 3.6 square meters per person.
- Rooms should indicate the permitted number of occupants.

Separate bed for each worker.

Adequate headroom, providing full and free movement, of not less than 203cm.

The minimum inside dimensions of a sleeping space should be at least 198cm by 80cm.

Beds should not be arranged in tiers of more than two.

Bedding materials should be reasonably comfortable.

Bedding and bed-frame materials should be designed to deter vermin.

Separate accommodation of the sexes.

Adequate natural light during the daytime and adequate artificial light.

A reading lamp for each bed.

Adequate ventilation to ensure sufficient movement of air in all conditions of weather and climate.

Heating where appropriate.

Adequate supply of safe potable water.

Adequate sanitary facilities.

Adequate drainage.

Adequate furniture for each worker to secure his or her belongings, such as a ventilated clothes locker, which can be locked by the occupant to ensure privacy.

Common dining rooms, canteens or mess rooms, located away from the sleeping areas.

Appropriately situated and furnished laundry facilities.

Reasonable access to telephone or other modes of communications, with any charges for the use of these services being reasonable in amount.

Rest and recreation rooms and health facilities, where not otherwise available in the community.

5. Sanitary Facilities:

A minimum of one toilet, one washbasin and one tub or shower for every six persons.

Sanitary facilities provided should meet minimum standards of health and hygiene.

Hot and cold fresh running water.

Sanitary facilities should have ventilation to the open air, independently of any other part of the accommodation.

Soap and hygienic paper should be adequately stocked.

6. The accommodations should be kept free of rats, mice, insects and vermin.

7. Separate facilities should be provided for sick workers to prevent the spread of transmissible diseases among the occupants.

8. Fire safety measures should be taken, including installing and maintaining fire equipment.

9. Provisions should be made for workers' physical safety and well-being, and protection of their belongings.

10. Premises should be inspected frequently to ensure that the accommodation is clean, decently habitable and maintained in a good state of repair. The results of each such inspection should be recorded and be available for review.

Conclusion:

As the world steps up the fight to prevent the spread of the pandemic, it is essential to ensure that our migrant workers are not unduly disadvantaged. The implementation of migrant workers' human rights and international labour standards is even more critical than ever to deter disease, ensure public health and maintaining the essential services in the country. Protecting migrant workers protects economic productivity and growth.

Important Resources for Governments and Businesses to Improve Housing for Migrant Workers:

1. International Labour Organization: Workers' Housing Recommendation, 1961 (No. 115).

ILO: Workers' Housing Recommendations

2. Migration with Dignity: A Guide to Implementing the Dhaka Principles

https://www.ihrb.org/uploads/member-uploads/IHRB%2C_Migration_with_Dignity_-_Implementing_the_Dhaka_Principles.pdf

3. World Health Organization: WHO HOUSING AND HEALTH GUIDELINES

WHO housing and health guidelines

4. Protecting migrant workers during the COVID-19 pandemic: Recommendations for policymakers and constituents

Recommendation for Policymakers and constituents

5. ILO Standards and COVID-19 (coronavirus):

https://www.ilo.org/global/standards/WCMS_739937/lang--en/index.htm

Diagnosis and Testing

We All Talk About Testing, but What About the Other T?

The importance of tracing in controlling transmission

Contact tracing has successfully suppressed the spread of infection to manageable levels in several countries as well as in the past

Without a vaccine or effective treatment available for the novel coronavirus SARS-CoV-2, countries around the world adopted contact tracing strategies that identify those exposed to the virus before they infect others. Efforts have typically led to mixed results.¹ South Korea and Germany are among the countries with rigorous, innovative test and trace techniques, leading to successful suppression of infection spread². Germany employed contact tracing by phone, with approximately 400 call centers around the country, German Chancellor Angela Merkel aims to have one tracer per 4000 individuals. Positive results were observed with new cases dropping from a peak of 6,000 a day to about 600 in a population of 83 million. With a current average of 6.9 cases per million citizens, the government has reopened most businesses, while continuing to promote social distancing. Recruits for call centers include social workers, but also librarians, gardeners, students, and soldiers. Guidelines include a state-mandated home quarantine for those in contact with a confirmed case, if they have been within two meters for more than 15 minutes³. South Korea, alternatively, engaged digital solutions such as accessing credit card history and location data from mobile devices to ensure all potential contacts are identified⁴. The country used its test and trace system to curb several infection clusters, and is tackling a recent outbreak by mandating customers “log in” when visiting restaurants, churches, or gyms using a QR code system.⁵ In the past, contact tracing has been successfully utilized to control diseases like Ebola, tuberculosis, and HIV⁶.

1 Joseph, Andrew. “Contact Tracing May Help Avoid Another Lockdown. Can It Work in the U.S.?” STAT, Stat News, 29 May 2020, www.statnews.com/2020/05/29/contact-tracing-can-it-help-avoid-more-lockdowns/.

2 Zastrow, Mark. “How South Korea Prevented a Coronavirus Disaster-and Why the Battle Isn’t Over.” National Geographic, 28 May 2020, www.nationalgeographic.com/science/2020/05/how-south-korea-prevented-coronavirus-disaster-why-battle-is-not-over/.

3 Schmitz, Rob. “How Germany Staffed Up Contact Tracing Teams To Contain Its Coronavirus Outbreak.” NPR, NPR, 22 June 2020, www.npr.org/sections/health-shots/2020/06/22/880803278/how-germany-staffed-up-contact-tracing-teams-to-contain-its-coronavirus-outbreak.

4 Zastrow, Mark. “How South Korea Prevented a Coronavirus Disaster-and Why the Battle Isn’t Over.” National Geographic, 28 May 2020, www.nationalgeographic.com/science/2020/05/how-south-korea-prevented-coronavirus-disaster-why-battle-is-not-over/.

5 Kim, Daewoung, and Mah, Soohyun. “South Korea Mandates QR Codes to Log Customers after Nightclub Coronavirus Outbreak.” Reuters, Thomson Reuters, 2 June 2020, www.reuters.com/article/us-health-coronavirus-southkorea-qr-code/south-korea-mandates-qr-codes-to-log-customers-after-nightclub-coronavirus-outbreak-idUSKBN23907E.

6 Joseph, Andrew. “Contact Tracing May Help Avoid Another Lockdown. Can It Work in the U.S.?” STAT, Stat News, 29 May 2020, www.statnews.com/2020/05/29/contact-tracing-can-it-help-avoid-more-lockdowns/.

A new modeling study estimates contact tracing and isolation can be used to lower the reproductive value (R_0) of the virus to less than one

New modeling research published in *The Lancet* found that using contact tracing along with self-isolation and other mitigation efforts “could enable ongoing control of the COVID-19 epidemic.” The study marks the first time social contact data is used to quantify and compare the effect of control measures on limiting the spread of SARS-CoV-2. The study also found that efficient strategies will likely include testing and tracing in addition to moderate levels of social distancing, such as working from home and limiting social gatherings when possible. The social distancing measures would reduce the number of people that need to be traced in case of contact with an infected individual. By assessing the movements of about 40,000 individuals, the study predicts a reproductive value (R_0) of less than 1 is needed to keep new cases in decline.⁷ A reproductive value indicates the number of people likely to be infected by a single positive case. For example, an R_0 of 2 would mean, on average, an infected person would lead to two subsequent new cases.⁸ The study estimates self-isolation of symptomatic cases alone would lower the transmission rate by 29% within the household and 35% outside the household. A combination of self-isolation and contact tracing could lower transmission by 47% for app-based tracing methods only, and 64% (R_0 0.94) in the case of manual tracing in addition to app-based tracing methods. However, it is worth noting that the study assumes rigorous testing with positive cases identified on an average of 2.6 days and that 90% of those contacted will obey a mandated self-quarantine. Although the level of testing and tracing required is resource and manpower intensive, the alternative, relying on mass testing alone, would yield an R_0 of 2.5. In another model, self-isolation of symptomatic cases with no other control measures would lower the R_0 value to 1.8. The authors further estimate that by limiting daily contact with people outside of work, school, and home to four people, an R_0 of 0.87 can be achieved using manual tracing of acquaintances only, as well as app-based tracing, resulting in the most significant reduction in transmission. These results, though significant, would likely depend on a large number of cases being tested and traced rapidly⁹.

Despite potential limitations, imperfect contact tracing efforts are still effective in controlling new cases

COVID-19 is suggested to be most infectious approximately two days before symptoms start and in the first week of illness. Thus rapid identification and isolation of infected individuals is crucial to keeping the strain on contact tracers and healthcare workers, relatively low. The speed of testing, result

7 Kucharski, Adam J, et al. “Effectiveness of Isolation, Testing, Contact Tracing, and Physical Distancing on Reducing Transmission of SARS-CoV-2 in Different Settings: a Mathematical Modelling Study.” *The Lancet Infectious Diseases*, 16 June 2020, doi:10.1016/s1473-3099(20)30457-6.

8 Aronson, Jeffery, et al. ““When Will It Be over?”: An Introduction to Viral Reproduction Numbers, R_0 and R_e .” *CEBM, The Centre for Evidence-Based Medicine*, 14 Apr. 2020, www.cebm.net/covid-19/when-will-it-be-over-an-introduction-to-viral-reproduction-numbers-r0-and-re/.

9 Kucharski, Adam J, et al. “Effectiveness of Isolation, Testing, Contact Tracing, and Physical Distancing on Reducing Transmission of SARS-CoV-2 in Different Settings: a Mathematical Modelling Study.” *The Lancet Infectious Diseases*, 16 June 2020, doi:10.1016/s1473-3099(20)30457-6.

delivery, and tracing system could potentially limit the system's effectiveness. Another factor to consider is manpower capacity; contact tracing is time consuming and requires training. Countries like the United Kingdom have struggled with their contact tracing efforts with news outlets reporting a lack of training and low salary for tracers as well as problems with test reporting, hindering the system's success¹⁰. Despite potential barriers to successful implementation, a study from the Center for Inference and Dynamics of Infectious Diseases asserts contact tracing does not have to be perfect to help keep the virus under control. A positive effect is still observed if some contacts are missed and some individuals do not follow stay-at-home recommendations. If only half of symptomatic cases are identified through testing, with 40% of contacts successfully traced, the study predicts the "reduction in transmission would allow the reopening of economic activities while attaining a manageable impact on the healthcare system."^{11,12} As research continues to confirm the importance of contact tracing in conjunction with testing, isolation, and physical distancing techniques, ongoing development of a test and trace system will be essential in preventing the need for another economic shutdown.¹³

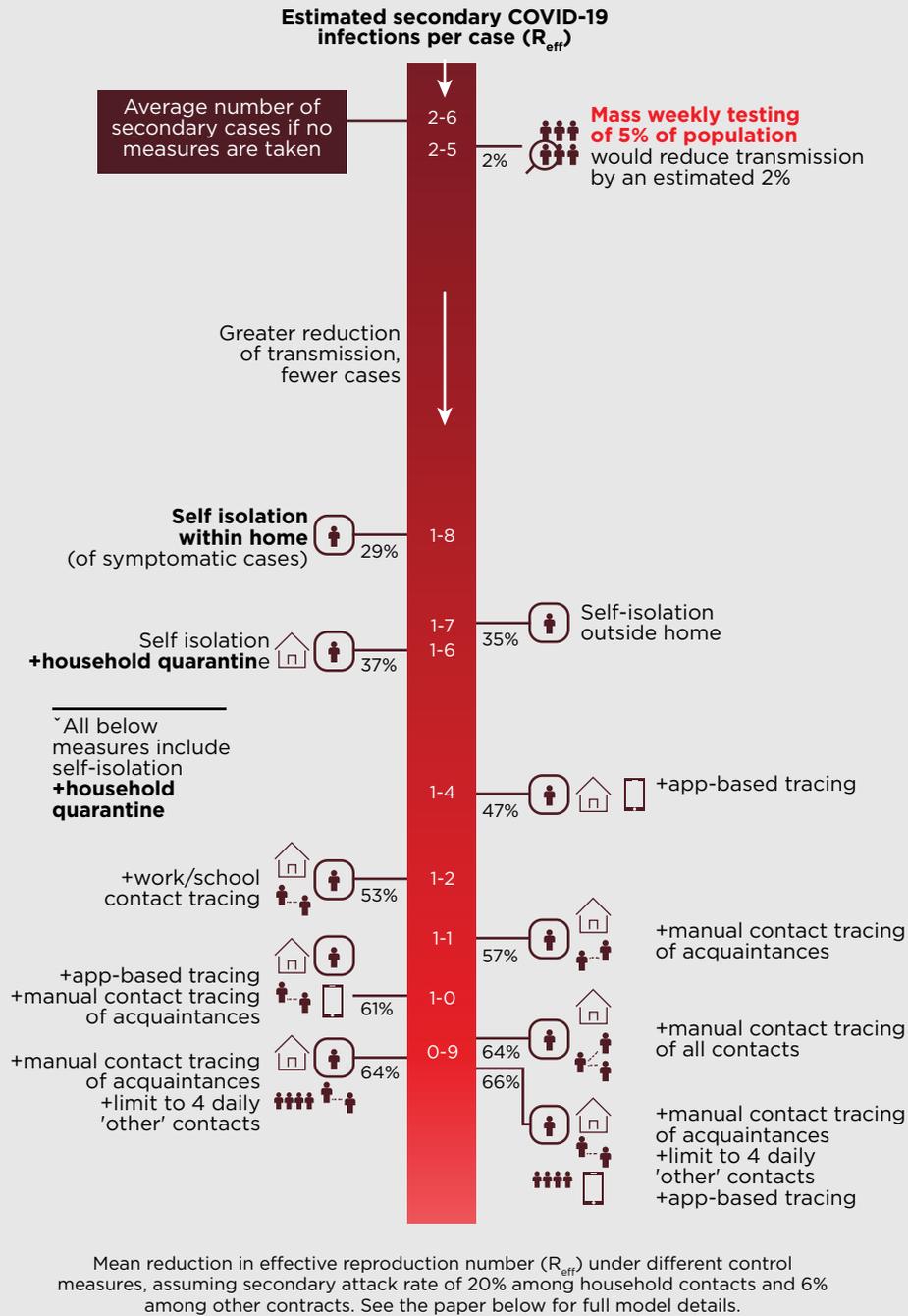
10 Mueller, Benjamin, and Jane Bradley. "England's 'World Beating' System to Track the Virus Is Anything But." The New York Times, The New York Times, 17 June 2020, www.nytimes.com/2020/06/17/world/europe/uk-contact-tracing-coronavirus.html.

11 Joseph, Andrew. "Contact Tracing May Help Avoid Another Lockdown. Can It Work in the U.S.?" STAT, Stat News, 29 May 2020, www.statnews.com/2020/05/29/contact-tracing-can-it-help-avoid-more-lockdowns/.

12 Aleta, Alberto, et al. "Modeling the Impact of Social Distancing, Testing, Contact Tracing and Household Quarantine on Second-Wave Scenarios of the COVID-19 Epidemic." Center for Inference and Dynamics of Infectious Diseases, 18 May 2020, doi:10.1101/2020.05.06.20092841.

13 Joseph, Andrew. "Contact Tracing May Help Avoid Another Lockdown. Can It Work in the U.S.?" STAT, Stat News, 29 May 2020, www.statnews.com/2020/05/29/contact-tracing-can-it-help-avoid-more-lockdowns/.

How effective is isolation, testing, and tracing on reducing transmission?



THE LANCET
Infectious Diseases

Kucharski AJ, Kelpac P, Conlan AJK, et al.
Effectiveness of isolation, testing, contact tracing, and physical distancing reduction transmission of SARS-CoV-2 in different settings: a mathematical modeling study.
The Lancet Infectious Diseases 2020

Figure 2. In the absence of a vaccine or highly effective treatments for COVID-19, combining isolation and intensive contact tracing with physical distancing measures--such as limits on daily social or workplace contacts--might be the most effective and efficient way to achieve and maintain epidemic control, according to new modelling research published in *The Lancet Infectious Diseases* journal¹⁴.

Credit: *The Lancet Infectious Diseases*

14 Kucharski, Adam J, et al. "Effectiveness of Isolation, Testing, Contact Tracing, and Physical Distancing on Reducing Transmission of SARS-CoV-2 in Different Settings: a Mathematical Modelling Study." *The Lancet Infectious Diseases*, 16 June 2020, doi:10.1016/s1473-3099(20)30457-6.

Treatment and Therapy

Treatments in Development: Dexamethasone

It's in the headlines. A cheap and widely available drug saves lives from severe COVID-19. The RECOVERY Trial launched in March¹ by Oxford University in the UK included 2104 patients on dexamethasone and 4321 that were not. This is one of the largest clinical trials to date.

Preliminary results showed that the drug lowered the death risk² from 40% to 28% for patients on ventilators, and from 25% to 20% for those requiring supplemental oxygen over 28 days. There were no substantial side effects. And it did not help mild COVID-19 cases without any breathing issues.

Treatment guidelines from several countries as well as the World Health Organization (WHO) cautioned against treating people with coronavirus with steroids, and some investigators were concerned about anecdotal reports of widespread steroid treatment. The drugs suppress the immune system, which could provide some relief for patients whose lungs are ravaged by an overactive immune response that sometimes manifests in severe cases of COVID-19. But such patients may still need a fully functioning immune system to fend off the virus itself.

Putting it into context, dexamethasone could save one life when applied to eight patients on ventilators and 25 patients needing oxygen therapy. So, the NNT (Number Needed to Treat) value of dexamethasone in rescuing ventilator-related death is eight, which is impressive by clinical standards.

How Does Dexamethasone Work?

Dexamethasone is a synthetic glucocorticoid (i.e., a class of corticosteroid) given orally or intravenously to treat diseases such as arthritis, allergies, asthma, and some forms of cancers. It mimics the action of cortisol that the body naturally produces to quell inflammation.

As dexamethasone is long-acting and has systemic effects, it is about 25 times more potent³ than other synthetic corticosteroids. Glucocorticoids are also stronger than nonsteroidal anti-inflammatory drugs (NSAIDs) like

1 https://www.nature.com/articles/d41586-020-01824-5?utm_source=Nature+Briefing&utm_campaign=0a4a70f642-briefing-dy-20200616&utm_medium=email&utm_term=0_c9dfd39373-0a4a70f642-44499541

2 <https://www.bbc.com>

3 <https://pubmed.ncbi.nlm.nih.gov/9713398/>

ibuprofen or aspirin. Glucocorticoids stop two phases of inflammation; vasodilation and immune cells migration. In contrast, NSAIDs only inhibit the vascular stage. Hence, dexamethasone is both anti-inflammatory and immunosuppressive.

On the biochemical level, glucocorticoids easily diffuse through the host cell membranes and bind to the glucocorticoid receptor in the cell cytoplasm. This receptor binding triggers a cascade of reactions that end up suppressing⁴ pro-inflammatory cytokines IL-1, IL-2, IL-6, IL-8, TNF, and IFN-gamma. Importantly, five of these are linked to COVID-19 severity. Moreover, one of the primary culprits of COVID-19 cytokine storm is the over-activation of macrophages, which is also inhibited by glucocorticoids. A 2019 cell culture study has also shown that dexamethasone rescued⁵ human alveolar (air sacs) cells from destruction by pro-inflammation cytokines.

Potential Side Effects

High and long-term doses would cause side effects. “Chronic use is associated with a sobering list of adverse effects, but a few days, or even a week, of steroid therapy [including dexamethasone] is generally free of significant side effects,” a 2013 review stated⁶. The Oxford study used a low-to-moderate dose for 10 days, which is justified considering that uncontrolled and excessive inflammation fuels the critical stage of COVID-19.

In cases where dexamethasone did cause side effects, the common ones⁷ are increased appetite, aggression, agitation, mood changes, blurred vision, dizziness, headache, tingling in arms and legs and irregular heartbeats among others. As corticosteroids have systems-wide effects, its potential side effects are broad-spectrum too. People with chronic diseases, such as diabetes, dyslipidaemia, heart diseases, hypertension, peptic ulcer disease and osteoporosis, are more prone to develop side effects from corticosteroids.

Immunosuppression Concerns vs Clinical Benefits

As mentioned above dexamethasone is anti-inflammatory and immunosuppressive at the same time. There are concerns¹ of the latter weakening immune responses to the COVID-19 virus. “Corticosteroids have been avoided in most cases of pneumonia due to concerns that their immunosuppressive effects may actually worsen the underlying infection.”¹

4 <https://www.ncbi.nlm.nih.gov/books/NBK531462/>

5 <https://intensivecare.biomedcentral.com/articles/10.1186/s40560-019-0365-5>

6 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3601727/>

7 [https://medlineplus.gov/druginfo/meds/a682792.html#:~:text=It%20relieves%20inflammation%20\(swelling%2C%20heat,treat%20certain%20types%20of%20cancer.](https://medlineplus.gov/druginfo/meds/a682792.html#:~:text=It%20relieves%20inflammation%20(swelling%2C%20heat,treat%20certain%20types%20of%20cancer.)

According to a 2020 review⁸ in The Lancet, glucocorticoids did not work well against previous coronaviruses.

But sometimes clinical practice suggests otherwise. Corticosteroids are useful in specific types of pneumonia, especially the *Pneumocystis jirovecii* fungal pneumonia. A 2018 analysis⁹ of six clinical trials calculated that low-dosing of corticosteroids (including glucocorticoids like dexamethasone) shortened hospitalization periods for community-acquired pneumonia compared to placebo. A 2014 review¹⁰ of meta-analyses and clinical trials concluded that there is evidence supporting low-dose glucocorticoids (including dexamethasone) in lowering the severity of acute respiratory distress syndrome (ARDS; a typical outcome of severe COVID-19).

8 [https://www.thelancet.com/journals/lanrhe/article/PIIS2665-9913\(20\)30120-X/fulltext](https://www.thelancet.com/journals/lanrhe/article/PIIS2665-9913(20)30120-X/fulltext)

9 <https://academic.oup.com/cid/article/66/3/346/4110206>

10 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4297198/#:~:text=High%20dose%20and%20short%20course%20treatment%20with%20steroids%20does%20not,treatment%20with%20steroids%20for%20ARDS.>

Exit Strategies

Don't Throw Caution to the Wind

"More than six months into the pandemic, this is not the time for any country to take its foot off the pedal"

WHO Director General Tedros Adhanom Ghebreyesus (June 8th, 2020)¹

Just as countries around the world have started to reopen their economies, by reducing or removing the restrictions and interventions put in place to mitigate the impact of COVID-19, resurgences are being observed globally. South Korean officials reported new COVID-19 infections early this week, bringing the national caseload to 12,421 infections, with 280 deaths. While the majority of cases were in Seoul, there were also a number of infections found in other more rural areas, such as Daejeon². Most of the cases were attributed to super-spreader events, such as the re-opening of local nightspots. Among the 618 cases detected in the first half of June, one could not be traced, presenting an issue for health authorities, as tracing, along with testing, were key initial measures that led to the country's success in mitigating the impact of the pandemic.³

Beijing recently had a spike in the number of COVID-19 infections, linked to a food wholesale market, where 106 people were infected, leading to the lockdown of 29 communities⁴. A similar pattern was observed in Japan where, where in Tokyo, 48 new infections were confirmed, the largest increase in the number of cases since early May. In Tokyo, a similar pattern was observed to that of South Korea, where 20 of the 48 infected were related to the reopening of businesses, that could be considered super-spreader events. Officials are considering reinstating restrictions, if the number of infections are greater than 50/day, if more than 50% of the cases are not traceable, or if there is a doubling of cases from the previous week.⁴

Similar resurgences have been seen elsewhere. In Russia⁵, the number of cases continues to rise, with 8,246 new cases within a day, making it third in the world in relation to the number of infections. In India, the number of daily infections has surpassed 11,000 new cases for three days in a row.⁵ Egypt, which has the highest death rate in the Arab world, continues to see a resurgence in the daily numbers of infections; however, the government is also resisting a full lockdown and plans to reopen airports for tourism to

1 <https://news.un.org/en/story/2020/06/1065892>

2 <https://www.usnews.com/news/world/articles/2020-06-20/the-latest-pakistan-reports-153-deaths-highest-daily-toll>

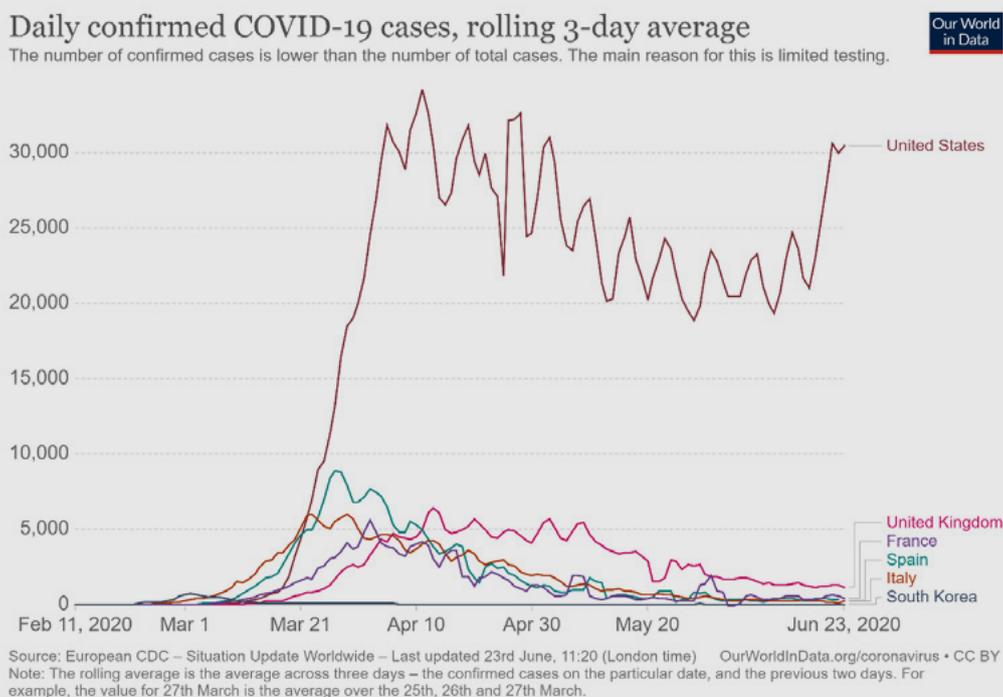
3 <https://www.todayonline.com/singapore/cautionary-tales-4-countries-hit-resurgence-covid-19-cases-after-reopening-economies>

4 <https://www.japantimes.co.jp/news/2020/06/16/world/rise-coronavirus-infections-need-vigilance-world-reopens/#.XvBxtGgzZaQ>

5 <https://www.nbcwashington.com/news/coronavirus/coronavirus-updates-chinas-new-outbreak-under-scores-continued-threat/2333523/>

destinations where the incidence of infections is lower⁶. Iran, one of the first countries impacted by high COVID-19 infection rates, recently experienced a dramatic increase in the number of cases, reaching 3,574 infections.³ South Africa announced nearly 5,000 new cases for a new daily record, with more than half of these cases in the city of Cape Town. A fifth of these cases are in Johannesburg and Pretoria, the capital. Nevertheless, the President of South Africa, continues to further loosen the strict lockdown restrictions, with the reopening of restaurants, salons, and casinos⁷.

Unfortunately, several states in the US are also dealing with resurgences. As new cases plummeted in cities, such as New York City, Boston, and Chicago, other cities saw dramatic increases in the number of cases. More than 1,100 new infections were reported on June 19th and 20th, in Harris County, Houston, by far the two highest daily totals there⁸. In Arizona, a new daily case record was reached, with 3,246 infected⁹. A similar pattern was observed in South Carolina, where the Department of Health and Environmental Control reported more than 1,150 new confirmed cases, and more than 16% of the people tested, were positive for the virus, compared to that number being 9% two weeks earlier.⁶ Oklahoma surpassed 10,000 confirmed cases, setting a record number of 450 cases on June 18th.⁶ In Florida, there is a 10.3% rate increase in people testing positive for the virus, the highest daily level since at least mid-April, reporting a total of 69,069 cumulative cases earlier in June, with a seven-day total of 8,886, the highest observed since the pandemic began.¹⁰



6 <https://www.reuters.com/article/us-health-coronavirus-egypt/egypt-confirms-highest-daily-rise-of-new-covid-19-cases-and-deaths-idUSKBN23KOSZ>

7 <https://www.startribune.com/the-latest-pakistan-reports-153-deaths-highest-daily-toll/571384312/>

8 https://www.texastribune.org/2020/06/16/texas-coronavirus-spike-young-adults/?campaign_id=154&emc=edit_cb_20200622&instance_id=19621&nl=coronavirus-briefing®i_id=126366072&segment_id=31581&te=1&user_id=08039f5ae8478538c86a808c44d717ef

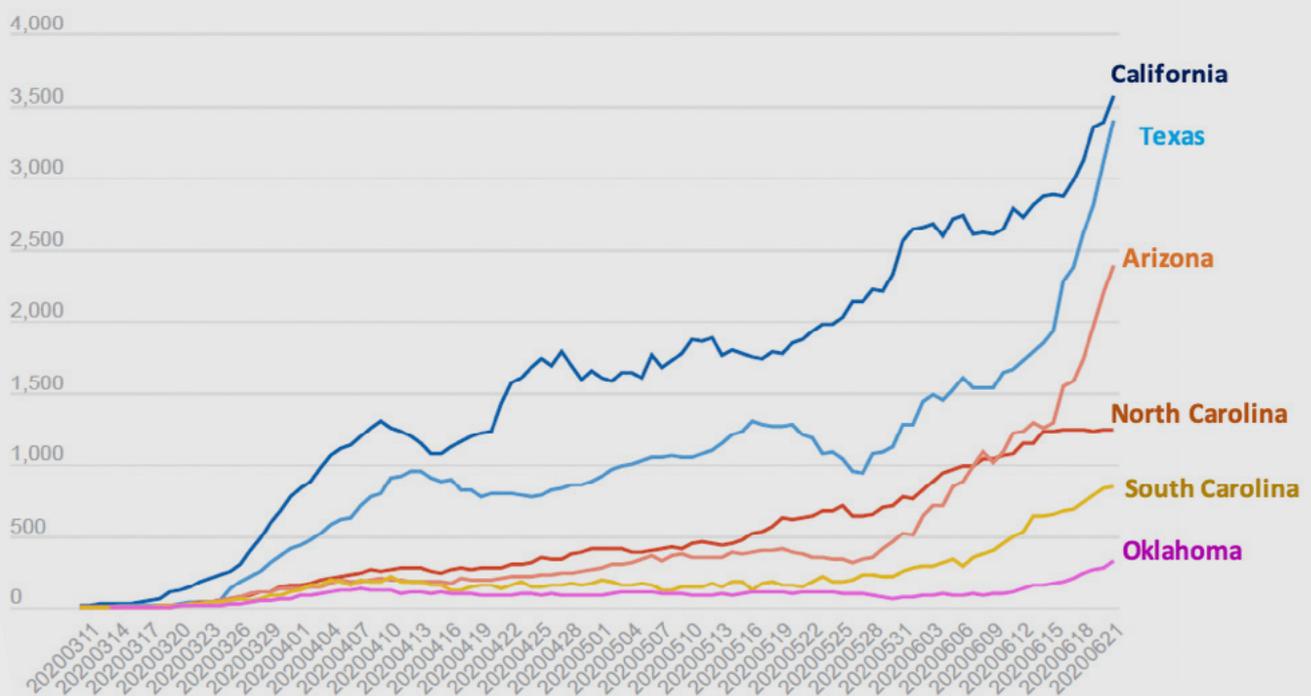
9 <https://thehill.com/policy/healthcare/503588-arizona-texas-florida-again-report-record-high-covid-19-cases>

10 <https://www.bloomberg.com/news/articles/2020-06-11/dissecting-florida-s-covid-19-resurgence-in-four-charts>; <https://www.bloomberg.com/news/articles/2020-06-23/virus-surges-across-u-s-throwing-reopenings-into-disarray>

Is This Resurgence Considered the Second Wave?

The Director of the South Korean Centers for Disease Control and Prevention, Jung Eun-kyeong, warned that the country could be headed into another huge surge of COVID-19 infections, potentially in its most populous region¹¹. She noted that healthcare workers are struggling to track transmissions, which are spreading fast and unpredictably, as a result of enhanced mobility and less social distancing. The government, in mid-April, allowed the reopening of entertainment and sports venues, as well as schools. These measures, along with the ease of social distancing and attrition of citizen vigilance, seem to have reduced the impact of the testing, tracing and isolation approach that had been effective in keeping the number of infections and fatalities down in the country.¹⁰

In an op-ed published in the Wall Street Journal earlier this month, the Vice President of the United States reaffirmed to the American people that “There isn’t a Coronavirus ‘second wave,’” and that the country was doing much better than the media was suggesting¹². However, that same day, Dr. Anthony Fauci, the Director of the National Institute of Allergy and Infectious Diseases (NIAID), noted that “We are still in the first wave”¹³. As more scientists start to look at the numbers, most would echo Dr. Fauci’s



States in which the first wave of COVID-19 has not ended. Adopted from Kaiser Health News (Reference 12). Source: <https://covidtracking.com/data/us-daily>

11 <https://time.com/5851818/resurgence-coronavirus-south-korea-second-wave-covid19/>

12 <https://www.wsj.com/articles/there-isnt-a-coronavirus-second-wave-11592327890>

13 <https://www.wsj.com/articles/fauci-warns-of-coronavirus-resurgence-if-states-dont-adhere-to-safety-guidelines-11592338771?mod=searchresults&page=1&pos=2%2527>

sentiments, as the number of new daily infections have only declined by roughly a third between early March and early June. A wave on the other hand would show a peak followed by a substantial reduction, which most states did not observe.¹³

In some states, such as New York and Massachusetts, the most recent reduction in the number of cases is indicative that they may be over the first wave, whereas other states are still considered to be in the first wave¹⁴. It is important to note that, similarly to South Korea and perhaps other countries around the world, the nonpharmaceutical interventions of lockdowns and social distancing, have been important in overcoming the first wave. The peaks have been shown to depend on human behavior and policymaking. If the data and science are not leading social behavior, then the number of peaks will continue to rise, as opposed to one continuous wave.¹³

Higher Infection Rates Among Younger Age Groups

In the US, there is a higher number of cases among the younger generation. In Texas, those under 30 are testing positive at a higher rate since the onset of the pandemic in the state.⁷ The same trend was observed in Florida, where most cases are within the 25-34 age group according to the Florida Department of Health. In South Carolina, health officials are also observing an increase in viral infections amongst younger people: roughly 18% of all the cases reported are within the 21-30 age group, and 7% among teenagers.⁶

There are several speculations as to why the numbers are increasing amongst the younger age groups. For one, their behavior varies in comparison to the elderly, who tend to be more vigilant in keeping up with the recommended guidelines of social distancing, wearing masks, and avoiding large gatherings¹⁵. The increase in infections could be attributed to their carelessness, but evidence has shown that, to date, when infected, most in that age group are able to fight off the virus; hence an increase in their confidence to mitigate the severe consequences of the pandemic. This leads to reduced caution and compliance with the recommended measures in place.

Data has shown that the elderly are at a higher risk of severe infections and complications due to the pandemic, especially those with co-morbidities; what is troubling about the higher number of infections amongst the youth, is their ability to put vulnerable populations at

¹⁴ <https://khn.org/news/fact-check-is-a-second-wave-of-coronavirus-coming/>

¹⁵ <https://abcnews.go.com/Health/cases-rise-pence-warns-young-people-increasingly-catching/story?id=71383601>

risk. In a recent study published in *The Lancet*, Jing et al. performed a retrospective cohort study to assess household transmission, as it was suspected to have caused the increase in infections in China following the stringent lockdown measure¹⁶s. Understanding the transmissibility within households as well as understanding the implications for a secondary attack¹⁷ rate of SARS-CoV-2 were assessed with contact tracing data among household and non-household close contacts in Guangzhou, using a statistical transmission model. The study considered two types of household/close contacts:

- Family members or close relatives, regardless of residential address
- People living at the same address regardless of relationship

The study considered data between Jan. 7, 2020, and Feb. 18, 2020, and traced 195 unrelated close contact groups (215 primary cases, 134 secondary or tertiary cases, and 1964 uninfected close contacts).¹⁶ What they were able to observe was a greater infectivity during the incubation period, a mean period of 5 days, rather than the symptomatic period (although it is important to note that there was not a statistical significance observed). The estimated secondary attack rate among household contacts was 12.4% when household contacts were defined on the basis of close relatives and 17.1% when household contacts were defined on residential address.¹⁶ The study also showed a correlation between the secondary attack rate, based on age, where the oldest age group (>60 years) had a higher risk of infection than the youngest age group (<20 years) or adults between the 20 and 59 years old.

Predictions about Transmission in the Post-Pandemic Era

In April, Stephen Kissler and his colleagues at Harvard T.H. Chan School of Public Health, built a model of multiyear interactions between existing coronaviruses, HCoV-OC43 and HCoV-HKU1 in the US, to project the potential epidemic dynamics and pressures on critical care capacity of COVID-19 in the US for the next five years¹⁸. By using existing data, their assessments considered viral, environmental and immunological factors, and involved comparing data from other coronaviruses to project various scenarios, providing a glimpse into what the post-pandemic phase could look like in the next few years. Their findings, although based on modeling, may outline some key points for policymakers to consider during the post-pandemic phase:

- In all of their models, the virus was able to spread at any time of year.

¹⁶ Jing et al. Household secondary attack rate of COVID-19 and associated determinants in Guangzhou, China: a retrospective cohort study; *Lancet Infect Dis* 2020; Published Online June 17th, 2020.

¹⁷ Adopted from Reference 13: "Defined as the probability that an infected individual will transmit the disease to a susceptible individual [e.g., household or close contacts]"

¹⁸ Kissler SM, Tedijanto C, Goldstein E, Grad YH, Lipsitch M. Projecting the transmission dynamics of SARS-CoV-2 through the postpandemic period. *Science*. 2020;368(6493):860-868. doi:10.1126/science.abb5793

- If immunity to the virus is not permanent, it is likely that the virus will become part of the circulation of other viruses, possibly on an annual, biennial, or sporadic basis for the next five years. Depending on the length of immunity, annual or biennial outbreaks will occur with short or long-term immunity respectively.
- Long-term immunity consistently led to the elimination of the virus and the overall incidence of infection. If there is 70% cross immunity, such that immunity to COVID-19 would lead to immunity against the other betacoronaviruses, it is possible that they would all disappear.
- Should the immunity from COVID-19 last only a few years, with mild cross immunity from the other betacoronaviruses, transmission of COVID-19 would be reduced, potentially for up to three years, before another resurgence is observed in 2024.
- Current non-pharmaceutical interventions are impactful and should be continued with other measures such as seroprevalence, as well as the continued pursuit of potential treatments and/or a vaccine. Longitudinal serological studies are required to understand the extent and duration of immunity and would provide a better insight into the possible scenarios for a resurgence to occur.

Policy Implications and Recommendations

The biggest risk, at this point in time, is reducing non-pharmaceutical interventions that have been shown to mitigate the impact, and reduce the dire consequences, of the deadly virus on the healthcare system. While policymakers continue to drive measures that factor in economic aspects and reduce restrictions, it is essential that policies are put in place to enforce safe social behavior, such as social distancing and the wearing of masks. In addition, there is an immediate need to understand the extent and duration of immunity through seroprevalence studies for potential resurgence of the virus, in the short and long term.