



**EMERGENCY
RESILIENCE
PROGRAM**

**KFAS COVID-19
weekly brief
28 June 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 June 17, 2020)

- Coronavirus: Dexamethasone proves first life-saving drug [BBC](#)
- Human trials expected to start next month for COVID-19 treatment derived from cows' blood [CNN](#)
- NIH researchers identify key genomic features that could differentiate SARS-CoV-2 from other coronaviruses that cause less severe disease [NIH](#)
- Rising COVID-19 cases and hospitalizations underscore the long road ahead [STAT](#)
- Fauci Warns That the Coronavirus Pandemic Is Far From Over [NY Times](#)
- WHO Clarifies Comments on Asymptomatic Transmission of SARS-CoV-2 [Medscape](#)
- NIH launches analytics platform to harness nationwide COVID-19 patient data to speed treatments [NIH](#)
- HIV and TB increase death risk from COVID-19, study finds—but not by much [Science](#)
- Florida, Arizona and Texas report record number of daily COVID-19 cases this week [CNN](#)
- Beijing reimposes lockdown measures after new COVID-19 outbreak [The Guardian](#)
- To fight COVID-19, open access to scientific publishing [STAT](#)
- How deadly is the coronavirus? Scientists are close to an answer [Nature](#)
- 'We've got to be able to move more quickly.' The pandemic reality of COVID-19 clinical trials [Science](#)

Key Takeaways

Executive Summaries

Infection Control and Prevention:

Businesses and employers can prevent and slow the spread of COVID-19 within the workplace. Employers must first determine the occupational risk related to his/her business. A thorough infection control protocol may then be implemented. The infection control measures should include: administrative controls, engineering controls and personal protective equipment when necessary. This section will cover the main areas of infection control measures required for a business to safely re-open.

Diagnosis and Testing:

As of June 4th, the Food and Drug Administration (FDA) has granted emergency-use approval to 15 antibody-based tests, two of which have been reportedly approved for use in the United Kingdom. The tests are currently available for public health and research use and are already employed for screening in high prevalence areas like New York, Italy, Germany, China, and the United Kingdom. Despite this progress, a number of limitations remain important to consider. This report reviews the questions surrounding antibody based testing, and the current guidelines for their utilization.

Treatment and Therapies:

Favipiravir is an antiviral drug that works by preventing the virus from replicating in cells. It is marketed under the brand name Avigan, and was developed in 2014 by Fujifilm Toyama Chemical, a unit of Fujifilm Holdings. Favipiravir was able to shorten the recovery time from 11 to four days for mild and regular cases. The Wuhan trial, showed that the drug shortened fever duration from an average of 4.2 to 2.5 days. Studies are showing that Favipiravir has been effective, without any obvious side-effects, in helping coronavirus patients recover. However, it should not be given to pregnant women due to its negative effects on animal embryos. One expert in the U.S. also signaled caution, stressing that coronaviruses constitute a very different family of viruses than the orthomyxovirus family, which includes influenza viruses.

Favipiravir will be made available to 43 countries for clinical studies on its effectiveness against COVID-19.

Training of Healthcare Professionals:

Businesses should be required to provide all workers with job-specific education and training on preventing transmission of COVID-19, including initial and routine/refresher training. This section will provide a brief overview on the main areas of training for employers and their employees. It will also provide useful resources for employers to use as they plan for their training programs.

Exit Strategies:

One major impact of the COVID-19 pandemic has been the need for healthcare reforms in countries, addressing the gaps and challenges that emerged as a result of the pandemic or those existing prior to the public health crisis. This section highlights some of the potential healthcare reform measures and policies being considered in the United States, China, the Arab World and England. While most of these reforms will vary among countries, there are overlapping reforms that need to be considered, such as healthcare equity, and the use of innovation and technology to reimagine healthcare systems, including the inclusion of telemedicine platforms.

Infection Control and Prevention

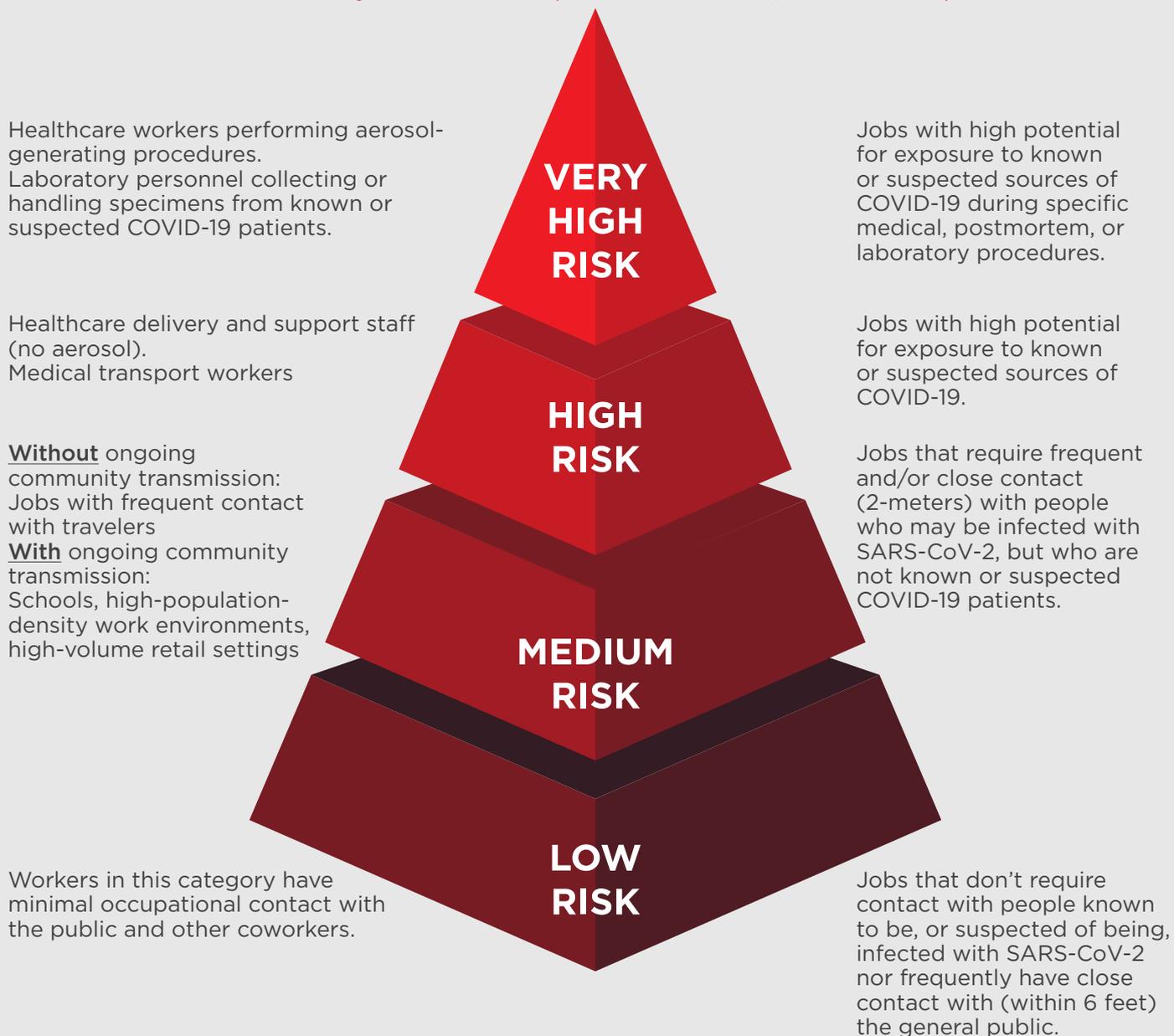
Infection Control Guidance for Businesses and Employers During the COVID-19 Pandemic

Businesses and employers can prevent and slow the spread of COVID-19 within the workplace. Employers should respond in a way that takes into account the level of disease transmission in their communities and revise their business response plans as needed. Worker risk of occupational exposure to SARS-CoV-2 should also be considered when planning to reopen businesses. To help employers determine appropriate precautions, the US Department of Labor, Occupational Safety and Health Administration (OSHA), has divided job tasks into four risk exposure levels: very high, high, medium, and low risk. The level of risk depends, in part, on:

- Industry type
- Need for contact within 2-meters of people known to be, or suspected of being, infected with SARS-CoV-2
- Requirement for repeated or extended contact with people known to be, or suspected of being, infected with SARS-CoV-2.

Figure 1: Occupational Risk Pyramid.

Most workers in Kuwait will likely fall in the low exposure risk (caution) or medium exposure risk levels.



Administrative

Practices involving management and communication
Cleaning and disinfection
Training staff

- Monitor Kuwait Ministry of Health communications about COVID-19.
- Conducting daily health checks before entering the facility, (ask about symptom and temperature screening using a temporal thermometer).
- Actively encourage sick workers to report symptoms and stay home.
- Consider policies that support flexible sick leave and alternative work schedules.

- Employees should not return to work until the criteria to discontinue home isolation are met in accordance with the Kuwait Ministry of Health guidelines. (See Figure 2 for a summary of CDC guidelines)
- Communicate to partners, suppliers, other contractors on new policies and practices.
- Encourage social distancing and the use of cloth face coverings (if appropriate) in the workplace.
- Minimizing contact among workers, clients, and customers by replacing face-to-face meetings with virtual communications and telework if feasible.
- Cancel group events.
- Discontinuing nonessential travel to locations with ongoing COVID-19 outbreaks.
- Close or limit the use of shared spaces.
- Ask customers who are ill to stay home.
- Schedule stocking during off-peak hours.
- Promote frequent and thorough hand washing.

Cleaning and Disinfection

- Clean and disinfect frequently touched surfaces (e.g., counters, shelving, displays).
- Provide employees with disposable disinfectant wipes, cleaner, or sprays that are effective against SARS-CoV-2. Also, provide workers, customers, and worksite visitors with a place to wash their hands. If soap and running water are not immediately available, provide alcohol-based hand rubs containing at least 60% alcohol.
- Provide tissues, no-touch trash cans, and disposable towels for workers to clean their work surfaces.

Training

Provide employees with training on:

- Policies to reduce the spread of COVID-19
- General hygiene
- Symptoms, what to do if sick
- Cleaning and disinfection
- Cloth face covers
- Social distancing
- Use of personal protective equipment when needed



Engineering

Solutions and controls involving facilities and equipment

- Safe work practices
- Stress management
- Assess job hazards for the feasibility of engineering controls.
- Installing high-efficiency air filters.
- Increasing ventilation rates in the work environment.
- Ensuring ventilation and water systems operate correctly.
- Alter workspaces to maintain social distancing. Examples include:
 - Installing physical barriers, such as clear plastic sneeze guards.
 - Installing a drive-through window for customer service.
 - Move electronic payment reader away from the cashier.
 - Use verbal announcements, and visual cues to promote social distancing.
 - Remove and rearrange furniture to ensure a 2-meter distance between people.
 - Provide remote shopping alternatives (e.g., delivery, pick-up).



Personal Protective Equipment (PPE)

While engineering and administrative controls are considered more effective in minimizing exposure to SARS-CoV-2, Personal Protective Equipment (PPE) may also be needed to prevent specific exposures. While the correct use of PPE can help prevent some exposures, it should not replace other preventative measures such as:

- Conducting a workplace hazard assessment.

- Determining what PPE is needed for workers’ specific job duties based on hazards and other (administrative, engineering) controls present.
- Select and provide appropriate PPE to the workers at no cost.
- Take steps to limit the spread of respiratory secretions of a person who may have COVID-19 by providing a facemask. If feasible and tolerable, provide a face mask, and ask the person to wear it. A face mask (surgical mask, procedure mask) on a patient or other sick person should not be confused with PPE for a worker. The facemask on patients act to contain potentially infectious respiratory secretions at the source. This concept is also termed “source control.”

Figure 2: Return to work guidelines for sick employees based on the US-CDC guidance for the discontinuation of isolation for persons with COVID-19 not in healthcare settings.

For Persons With COVID-19 Under Isolation		For Persons Who have NOT had COVID-19 Symptoms but Tested Positive and are Under Isolation	
<p>Symptom-based strategy</p> <ul style="list-style-type: none"> - At least three days (72 hours) have passed since recovery defined as resolution of fever without the use of fever-reducing medications and improvement in respiratory symptoms (e.g., cough, shortness of breath) <p>AND</p> <ul style="list-style-type: none"> - At least ten days have passed since symptoms first appeared 	<p>Test-based strategy</p> <ul style="list-style-type: none"> - Resolution of fever without the use of fever-reducing medications <p>AND</p> <ul style="list-style-type: none"> -Improvement in respiratory symptoms (e.g., cough, shortness of breath) <p>AND</p> <ul style="list-style-type: none"> - Negative results of an FDA Emergency Use Authorized COVID-19 molecular assay for detection of SARS-CoV-2 RNA from at least two consecutive respiratory specimens collected ≥24 hours apart (total of two negative specimens) 	<p>Time-based strategy</p> <ul style="list-style-type: none"> - At least ten days have passed since the date of their first positive COVID-19 diagnostic test, assuming they have not subsequently developed symptoms since their positive test. - If they develop symptoms, then the symptom-based or test-based strategy should be used. 	<p>Test-based strategy</p> <p>Negative results of an FDA Emergency Use Authorized COVID-19 molecular assay for detection of SARS-CoV-2 RNA from at least two consecutive respiratory specimens collected ≥24 hours apart (total of two negative specimens)</p>
			

Resources for businesses and employers on infection control:

1. CDC Resuming Business Toolkit:

<https://www.cdc.gov/coronavirus/2019-ncov/downloads/community/Resuming-Business-Toolkit.pdf>

2. CDC General Business Frequently Asked Questions:

<https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html>

3. OSHA Guidance on Preparing Workplaces for COVID-19:

<https://www.osha.gov/Publications/OSHA3990.pdf>

Diagnosis and Testing

Antibody Tests: Do We Know Enough?

Despite test developments and approvals, questions remain about the efficacy and suggested use of antibody tests.

Antibody tests are useful in identifying past infections and current infections, by detecting antibodies produced by the body in response to the SARS-CoV-2 virus. Because we are measuring an immune response to the virus, results typically improve relative to increasing time from infection. Antibody tests do not inform if individuals need to isolate and do not differentiate between current and past infections. Although the tests are being promoted as a method to guide the lifting of lockdown restrictions, questions remain about their accuracy, whether antibodies can actually confer immunity, and if the reported accuracies of these tests are attainable in areas of varying prevalence.

Reported false negative risk from Abbott's rapid antibody test highlights the urgent need for test validation

When pharmaceutical company Abbott gained FDA emergency approval for their rapid antibody test 'ID NOW' they reported at least a 94.7% sensitivity (ability to identify true positives) and 100% specificity (ability to identify true negatives)¹. Since then research has emerged disputing the self-reported accuracy of the ID NOW system, with one study reporting the test missing 30-48% of infections caught by PCR based tests in a study of 100 patients². The New York University research team leading the study deemed the test's performance "unacceptable", since it could potentially lead to patients believing they are infection free when they can still spread the virus to others³. Despite Abbott rejecting the study, the FDA issued an alert to the public on May 14th, suggesting the very grave possibility of false negative results and announcing their investigation⁴. A study led by Cleveland Clinic similarly reported a false negative rate of 15% for samples stored in transport media, yet the tests are already in use at thousands of

1 "ABBOTT RELEASES INTERIM CLINICAL STUDY DATA ON ID NOW COVID-19 RAPID TEST SHOWING STRONG AGREEMENT TO LAB-BASED MOLECULAR PCR TESTS." Abbott, Abbott Media, 21 May 2020, [abbott.mediaroom.com/2020-05-21-Abbott-Releases-Interim-Clinical-Study-Data-on-ID-NOW-COVID-19-Rapid-Test-Showing-Strong-Agreement-to-Lab-Based-Molecular-PCR-Tests](https://www.abbott.com/2020-05-21-Abbott-Releases-Interim-Clinical-Study-Data-on-ID-NOW-COVID-19-Rapid-Test-Showing-Strong-Agreement-to-Lab-Based-Molecular-PCR-Tests).

2 Performance of Abbott ID NOW COVID-19 rapid nucleic acid amplification test in nasopharyngeal swabs transported in viral media and dry nasal swabs, in a New York City academic institution Atreyee Basu, Tatyana Zinger, Kenneth Inghima, Kar-mun Woo, Onome Atie, Lauren Yurasits, Benjamin See, Maria E. Agüero-Rosenfeld *bioRxiv* 2020.05.11.089896; doi: <https://doi.org/10.1101/2020.05.11.089896>

3 Satyanarayana, Megha. "COVID-19 Antibody Tests Are Raising as Many Questions as They Answer." *Chemical & Engineering News*, American Chemical Society, 3 June 2020, cen.acs.org/analytical-chemistry/diagnostics/COVID-19-antibody-tests-are-raising-as-many-questions-as-they-answer/98/i22.

4 Commissioner, Office of the. "Coronavirus (COVID-19) Update: FDA Informs Public About Possible Accuracy Concerns with Abbott ID NOW Point-of-Care Test." U.S. Food and Drug Administration, FDA, 14 May 2020, www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-informs-public-about-possible-accuracy-concerns-abbott-id-now-point.

locations across the United States, including the White House⁵. Similarly, numerous other serology tests marketed in the United States are failing to deliver comparable, accurate information⁶. The FDA has launched its own independent evaluations of approved antibody tests and has released results for 4 test distributors thus far⁷. Despite the discouraging results, no 2 tests are alike, and tests from pharmaceutical giant, Roche, as well as from researchers at Mt. Sinai have thus far been praised and well reviewed in terms of their ability to distinguish nearly all true positives and negatives in areas of high prevalence⁸.

Antibody tests cannot be used to guarantee immunity from COVID-19 yet, but can be used to identify populations with higher rates of herd immunity

According to the World Health Organization (WHO), as of April 24th, no study successfully confirmed that the presence of SARS-CoV-2 antibodies in a patient indicates immunity. The WHO also cautions that tests require further validation before they can reliably be used by businesses to regulate those allowed to return to work⁹. Additionally, the Center for Disease Control and Prevention (CDC) advises that antibody based tests cannot identify conferred immunity yet. However, the CDC did advise using antibody tests to identify what proportion of a population has previously been infected, indicating certain areas or populations that might have higher rates of herd immunity. Guidelines include using antibody tests to select for those qualified to donate blood for convalescent plasma treatments and suggest 1-3 weeks from symptom onset for optimal results¹⁰.

Antibody test accuracy decreases significantly in areas of low prevalence (<5%)

In order to understand the importance of prevalence levels in relation to accurate test results, we must first understand what factors allow a test a high positive predictive value (PPV). A PPV simply means the positive results can be trusted as true positive. Positive predictive value can be determined using a formula that factors in sensitivity, specificity, and prevalence. Thus, as the level of prevalence goes down, so too does the PPV of a given antibody test. To gain perspective, a test with 98% specificity and sensitivity would only have a 72% positive predictive value in a population with an

5 Osorio, Carlos, and Associated Press. "FDA Probes Accuracy Issue with Abbott's Rapid Coronavirus Test." Los Angeles Times, Los Angeles Times, 15 May 2020, www.latimes.com/science/story/2020-05-15/fda-probes-accuracy-issue-with-abbotts-rapid-coronavirus-test.

6 John Hopkins. "Developing a National Strategy for Serology (Antibody Testing) in the United States." Johns Hopkins Center for Health Security, Bloomberg School of Public Health, 22 Apr. 2020, www.centerforhealthsecurity.org/our-work/publications/developing-a-national-strategy-for-serology-antibody-testing-in-the-US.

7 FDA2. "Independent Evaluations of COVID-19 Serological Tests." OpenFDA, 2020, open.fda.gov/apis/device/covid19serology/.

8 Collins, Francis. "Discussing the Need for Reliable Antibody Testing for COVID-19." National Institutes of Health Director's Blog, U.S. Department of Health and Human Services, 2 June 2020, directorsblog.nih.gov/2020/06/04/discussing-the-need-for-reliable-antibody-testing-for-covid-19/.

9 Newsroom, WHO. "'Immunity Passports' in the Context of COVID-19." World Health Organization, World Health Organization, 24 Apr. 2020, www.who.int/news-room/commentaries/detail/immunity-passports-in-the-context-of-covid-19.

10 CDC. "Interim Guidelines for COVID-19 Antibody Testing." Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 23 May 2020, www.cdc.gov/coronavirus/2019-ncov/lab/resources/antibody-tests-guidelines.html.

infection rate of 5%. However, at a prevalence of 15% the PPV would increase to 90%. This clearly illustrates that antibodies are more reliable in areas with higher prevalence and can be more confidently employed for screening. False positives could give individuals a false sense of immunity and may affect decisions about social distancing and using protective precautions, contributing to the potential spread of the virus.

$$PPV = \frac{\text{Sensitivity} \times \text{Prevalence}}{\text{Sensitivity} \times \text{Prevalence} + (1 - \text{Specificity}) \times (1 - \text{Prevalence})}$$

Figure 1. Positive Predictive Value (PPV) formula highlighting the importance of prevalence.¹¹

Specificity	Sensitivity	Prevalence				
		1%	3%	5%	10%	15%
98%	98%	33%	60%	72%	84%	90%
98%	99%	33%	60%	72%	85%	90%
98%	100%	34%	61%	74%	85%	90%
99%	98%	50%	75%	84%	92%	95%
99%	99%	50%	75%	84%	92%	95%
99%	100%	50%	76%	84%	92%	95%
100%	98%	100%	100%	100%	100%	100%
100%	99%	100%	100%	100%	100%	100%
100%	100%	100%	100%	100%	100%	100%

Figure 2. PPV differences based on prevalence, sensitivity, and specificity of antibody tests¹².

Antibody tests remain vital for mass surveillance

Antibody tests are still useful and important and should continue to be developed. They are key in identifying asymptomatic infections, tracking prevalence over time, and for contact tracing¹³. The Johns Hopkins Center for Health Security recommends making “validated, accurate tests” available for community surveillance, and if proven as a test for immunity, to essential workers, prioritizing healthcare workers and any workers that come into contact with vulnerable populations, and finally for personal use¹⁴. We might not know if a positive antibody test proves immunity, but some argue that imperfect tests are often used in healthcare in cases where the pros outweigh the cons. As countries lift restrictions and return to work, one journal article suggests a policy requiring antibody tests to suggest potential immunity before returning to work may be better than no policy at all¹⁵.

11 Gagan Mathur, MD, MBA, Sweta Mathur, BDS, MPH, PhD, Antibody Testing for COVID-19: Can It Be Used as a Screening Tool in Areas With Low Prevalence?, American Journal of Clinical Pathology, Volume 154, Issue 1, July 2020, Pages 1-3, <https://doi.org/10.1093/ajcp/aqaa082>

12 Gagan Mathur, MD, MBA, Sweta Mathur, BDS, MPH, PhD, Antibody Testing for COVID-19: Can It Be Used as a Screening Tool in Areas With Low Prevalence?, American Journal of Clinical Pathology, Volume 154, Issue 1, July 2020, Pages 1-3, <https://doi.org/10.1093/ajcp/aqaa082>

13 Gagan Mathur, MD, MBA, Sweta Mathur, BDS, MPH, PhD, Antibody Testing for COVID-19: Can It Be Used as a Screening Tool in Areas With Low Prevalence?, American Journal of Clinical Pathology, Volume 154, Issue 1, July 2020, Pages 1-3, <https://doi.org/10.1093/ajcp/aqaa082>

14 Johns Hopkins. “Developing a National Strategy for Serology (Antibody Testing) in the United States.” Johns Hopkins Center for Health Security, Bloomberg School of Public Health, 22 Apr. 2020, www.centerforhealthsecurity.org/our-work/publications/developing-a-national-strategy-for-serology-antibody-testing-in-the-us.

15 Weinstein, Milton C., et al. “Waiting for Certainty on Covid-19 Antibody Tests — At What Cost?” New England Journal of Medicine, 5 June 2020, [doi:10.1056/nejmp2017739](https://doi.org/10.1056/nejmp2017739).

Treatment and Therapy

Treatments in development: Favipiravir (Avigan)

Developed by Fujifilm Toyama Chemical and manufactured by Zhejiang Hisun Pharmaceutical, the antiviral drug Favipiravir used to treat influenza viruses seems to be effective at treating the novel coronavirus that causes COVID-19. In April, the drug reportedly received approval as an experimental treatment for COVID-19 infections, Pharmaceutical Technology¹ reported.

The drug is specifically made to treat RNA viruses like SARS-CoV-2; these are viruses whose main genetic material is RNA, rather than DNA. The drug stops some viruses from replicating by disabling the RNA polymerase enzyme, which builds RNA. Without that enzyme intact, the virus can't duplicate its genetic material efficiently once inside a host cell according to an article describing the drug that was published in 2017 in the journal Proceedings of the Japan Academy, Ser. B, Physical and Biological Sciences.

"It has a high degree of safety and is clearly effective in treatment," said China National Centre for Biotechnology Development Director Zhang Xinmin on March 17, The Guardian reported.

In April the Japanese government said it will triple the country's stockpile to include doses for 2 million people. Fujifilm Toyama Chemical is working to increase its monthly production by July to 100,000 treatment courses, defined as doses for a 14-day period, and 300,000 courses by September².

Studies

Fujifilm began a phase 2 clinical trial in Massachusetts in April. The trial called for approximately 50 patients and is taking place in collaboration with Brigham and Women's Hospital, Massachusetts General Hospital and the University of Massachusetts Medical School.

Health centres in China and Japan have been studying Favipiravir as a COVID-19 treatment for months. It also has been tested in Italy, and a trial is set to begin in India. In one clinical trial in China, patients taking the drug tested negative for coronavirus after a median of four days, less than half the 11 days it took for patients in a control group, the China National Centre for Biotechnology Development said in March³. It also found that 8.2% of Favipiravir patients needed respiratory aid compared to 17.1% of the patients in the control group. Centre director Zhang Xinmin called the drug "very safe and clearly effective" and without obvious side effects, Nikkei news reported³.

1 <https://www.pharmaceutical-technology.com/news/fujifilm-favipiravir-covid-19/>

2 <https://www.biopharmadive.com/news/coronavirus-fujifilm-avigan-flu-boost-production/576198/>

3 www.ncbi.nlm.nih.gov/pmc/articles/PMC7102570/

Japanese researchers began administering Favipiravir to COVID-19 patients around the end of February. Fujifilm itself began a phase 3 clinical trial in Japan in March with approximately 100 patients, targeting those with mild and moderate symptoms. But it's not the only effort. More than 2,000 people in Japan were treated with Favipiravir as part of clinical trials as of April 26, according to the Ministry of Health, Labour and Welfare. An official at Fujita Health University Hospital in Aichi Prefecture, where a trial is under way, said staff would finish analysing test data by the end of August⁴.

The antiviral drug, also showed positive outcomes in clinical trials involving 340 individuals in Wuhan and Shenzhen. In the Wuhan trial, the drug also seemed to shorten the duration of a patient's fever from an average of 4.2 days to 2.5 days, according to Pharmaceutical Technology. In that same trial, lung conditions (using X-rays) improved in 91% of patients administered with Favipiravir, compared with just 62% who weren't taking the antiviral drug.³

However, the drug seems less effective in patients with severe symptoms. "We've given Avigan to 70 to 80 people, but it doesn't seem to work that well when the virus has already multiplied," a source from the Japanese Health Ministry told the Mainichi Shimbun newspaper, according to The Guardian.

Doctors are using the same drug in Japan to treat coronavirus patients with mild to moderate symptoms, The Guardian reported. In addition, results from these trials have not been published in a peer-reviewed scientific journal and seem to be just preliminary findings.

To date, there is no approved or known drug to treat SARS-CoV-2.

Is it approved?

Japan approved Favipiravir in 2014, but not for seasonal flu. It was given the OK for novel or re-emerging influenza viruses when other antiviral drugs don't work, and the government has to approve each case. There were no such cases in the past six years, but Favipiravir was studied in a Japanese trial for ixodid tick-borne infectious disease and serious fever with thrombocytopenia syndrome. The government of Guinea also approved the drug as a standard treatment for patients with Ebola Virus Disease following a clinical trial in the West African country.⁴

Avigan (Favipiravir) antiviral dosage

The dosage of Avigan to treat COVID-19 patients is currently in various clinical studies. In a phase 2 study in Boston, Massachusetts, Avigan tablets are being evaluated: on the first day, once for 1600 mg, twice a day; from the 2nd day to the 10th day, once for 600 mg, twice a day; maximum of 10 days for oral administration of the drug⁴.

⁴ <https://www.cnn.com/2020/05/04/fujifilm-flu-drug-favipiravir-sent-to-43-nations-for-covid-19-trials.html>

However, reports indicate Avigan cannot be administered to expecting mothers or those who may become pregnant.

Sources of concern

There have been concerns about Favipiravir, however, due to reports of potential foetal deaths and deformities, as well as transmission via semen. In a review article¹ published earlier this year in the journal *Pharmacology & Therapeutics*, Japanese researchers concluded that “Favipiravir is expected to be an important therapeutic agent for severe influenza, the next pandemic influenza strain, and other severe RNA virus infections for which standard treatments are not available.” While noting an apparent lack of drug resistance with Favipiravir, the authors said it should not be given to pregnant women due to its negative effects on animal embryos. One expert in the U.S.⁵ also signalled caution, stressing that coronaviruses constitute a very different family of viruses than the orthomyxovirus family, which includes influenza viruses.

“While they both encode an RNA-dependent RNA polymerase, coronaviruses have a proofreading enzyme that can remove nucleoside analog drugs that can induce mutations and block replication in influenza, so these drugs may not work well in coronaviruses,” says Rachel Roper, associate professor of microbiology and immunology at East Carolina University. “We can try it in clinical trials, but we must remember if there is no control group for comparison, there is no data. Anecdotes do not make data, only well-designed and controlled studies can provide real data on drug efficacy.” Still, doctors in the U.S. and Japan are hoping their studies will help patients until people can be inoculated.

Japan offers Avigan for free

Japan’s government has considered providing the influenza drug Avigan for free to countries treating coronavirus patients, Chief Cabinet Secretary Yoshihide Suga stated.

According to the *Japan Times* on April 4, 2020, 30 countries have made requests through diplomatic channels to Japan for the procurement of Avigan. Japan’s government is accordingly coordinating to provide the necessary amounts for free to the requesting countries, according to chief cabinet Secretary Yoshihide Suga⁴.

Japan is expected to ship the drug to 43 countries for clinical studies on its effectiveness against COVID-19. The shipment is being sent through the United Nations Office for Project Services, and each country will receive enough to treat between 20 and 100 people, Japan Foreign Minister Toshimitsu Motegi said⁴.

⁵ www.ncbi.nlm.nih.gov/28769016/

Training of Healthcare Professionals

Training Employees to Re-open Businesses During the COVID-19 Pandemic

Businesses and employers are required to take steps to provide a safe operating environment for employees and consumers. Employers will have to train their employees on safety procedures and be sure to update their training regularly. Training must go beyond providing written or verbal instruction. Hands-on training before going back to work is essential for the safety of employees and potential customers. Training material should be easy to understand and available in the appropriate language and literacy level for all workers.

Who should receive training?

All employees, including managers and owners, should receive training. Employees who deal directly with consumers may need additional training. Training must be completed before re-opening a business and must be renewed regularly.

What should employees train for?

Employees should be trained on required hygiene and measures to prevent and slow the spread of COVID-19 within the workplace. Training on necessary prevention measures should be required to re-open all business.

Areas of training:

1. Employee hygiene:

- Thorough hand washing techniques.
- Where workers, consumers, and worksite visitors can wash their hands.
- If soap and running water are not immediately available, train on where and how to use alcohol-based hand rubs containing at least 60% alcohol.

2. Policy on workers who are feeling sick:

- What symptoms to monitor?
- What is the policy of the institution for sick leave?
- When can an employee come back to work?

3. Rules on respiratory etiquette:

- How to cover coughs and sneezes.
- Ensuring customers and the public have tissues and trash receptacles.
- The use of cloth face covers for source control.

4. Policies on flexible worksites:

- Telecommuting
- Flexible work hours (e.g., staggered shifts)

5. Social distancing among employees and between employees and customers to comply with Ministry of Health guidelines:

- Map out your physical spaces then determine and mark-off how pre-COVID-19 congregating areas will be reconfigured to allow for a 2-meter distance between people.

6. Restrictions on using other workers' phones, desks, offices, or other work tools and equipment, whenever possible. Develop a plan regarding communal phones.

7. Procedures for maintaining regular cleaning and disinfection practices:

- Routine cleaning and disinfection protocol for all surfaces, equipment, and other elements of the work environment.
- The selection of proven disinfection products and ensuring the adherence to manufacturers' instructions for their use.

8. The use of personal protective equipment (PPE) when needed:

- Who needs PPE?
- When to use PPE?
- Proper use of face masks (donning and doffing)
- Proper usage and discarding of gloves. (donning and doffing)
- Disposable gloves cannot be cleaned and re-used. Cleaning latex gloves with alcohol-based sanitizer can cause micro aberrations and deem the gloves unfit for infection control.
- How to maintain, store, and replace PPE.

Where can employers go for more resources?

1. CDC:

[Interim Guidance for Businesses and Employers Responding to Coronavirus Disease 2019 \(COVID-19\), May 2020](#) (available in multiple languages)

[Communications Posters & Other Resources](#)

2. Back to Work Safely™: The website features expert, industry-specific guidance for both businesses and consumers to safely re-open and re-engage as they emerge from the COVID-19 quarantines.

<https://www.backtoworksafely.org>

3. U.S. Food & Drug Administration (FDA)

[Downloadable Poster of Best Practices](#)

Exit Strategies

COVID-19 Driving Healthcare Reform

One of the major consequences of the COVID-19 pandemic was the spotlight it shed on the dysfunctions, challenges and issues facing healthcare systems across the globe. While some issues are shared across healthcare systems across the globe, others tend to be unique to the nature and structure of each country. As countries start to implement their exit strategies, governments and policymakers alike are reconsidering healthcare reform and policies addressing long-standing and COVID-19 related challenges, whether they be technical or political. Simply returning to pre-pandemic healthcare platforms will not suffice in most countries. The obstacles that arose as a result of the pandemic need to be vigorously assessed to identify policies for reform, including revisiting the concept of health equity and enhancing healthcare delivery by strengthening collaboration between the government and other sectors of society. The following paragraphs discuss some of the potential reform measures needed within the specific countries and regions.

United States (US)^{1,2}:

As the US reflects on the implication of the pandemic on their healthcare system, the issues and challenges that need to be addressed are at the forefront. At the core of these issues is how Americans perceive and conceive medicine and healthcare, and how to make healthcare affordable and accessible.^{1,2}

Most Americans receive insurance through their employer, but the pandemic led to high unemployment rates, leaving many Americans without health insurance.^{1,2} Even those with health insurance, more often than not, worry about the costs related to receiving care. Prior to the onset of COVID-19, more than half of Americans with employer-sponsored health insurance had avoided or postponed treatment because of related costs. A recent poll found that 68% of adults noted that the costs associated with getting treatment for COVID-19 would be very or somewhat important to their decision to seek care. This, at a time of a public health crisis, would only lead to prolonged transmission, increased morbidity and mortality, and worsening economic impact.^{1,2}

A recent survey of prominent health policy experts, gave insight on what healthcare reform in the US might look like moving forward, outlining nine ways in which the coronavirus pandemic is likely to change the healthcare

1 King JS. Covid-19 and the Need for Health Care Reform [published online ahead of print, 2020 Apr 17]. N Engl J Med.

2 Fuchs VR. Health Care Policy After the COVID-19 Pandemic. JAMA. Published online June 12, 2020. doi:10.1001/jama.2020.10777

system, and the types of policies that will be needed for reform³.

1. Acceleration of telemedicine (more on Telemedicine in the inset):

The inevitable telemedicine revolution as a result of COVID-19, has been pushed forward by a decade, if not more. Telemedicine has shown to be safer, quicker and easier, as well as, in a time of a public health crisis, to provide an added dimension of protection for both patients and healthcare workers.

2. Moving away from traditional employer-based health insurance⁴:

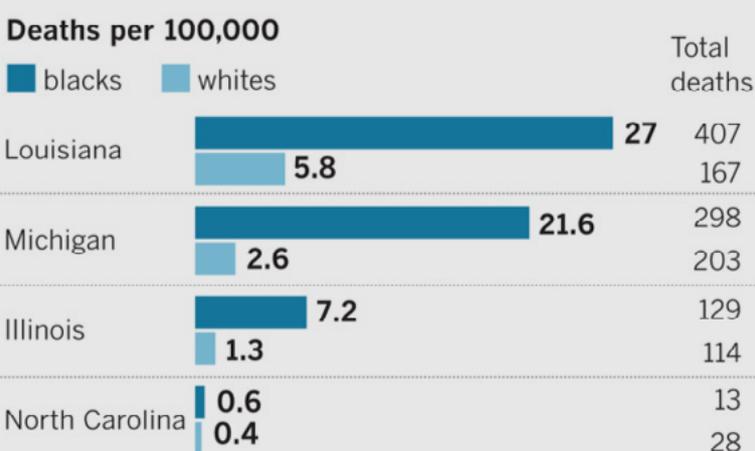
When dealing with a struggling economy, employers will look to reduce costs, comprising the healthcare benefits of their employees. In addition, high unemployment rates have made traditional models of employer-based health insurance less relevant than ever. This has reignited the debate on adopting a universal healthcare system, which has become not only a technical issue, but, more recently, a politically partisan issue.

3. Replacing nursing homes and assisted living facilities with home health aides:

In most States, over one-third of the deaths resulting from COVID-19 were in nursing homes and long-term care facilities. This raises the question as to whether the society's most vulnerable and high risk should be housed in such close proximity. Some alternative approaches can be considered, including increased home health aides, house calls, and in-person medical services catered to the elderly.

Coronavirus deaths and race

COVID-19 is disproportionately killing black Americans, according to data released by several states.



Death totals as of Tuesday afternoon.

State governments, U.S. Census Bureau

Lorena Elebee / Los Angeles Times

³ <https://www.statnews.com/2020/05/19/9-ways-covid-19-forever-upend-health-care/>

⁴ A.P. Galvani et al., The imperative for universal healthcare to curtail the COVID-19 outbreak in the USA, *EClinicalMedicine* (2020)

4. *Racial disparities:* The alarming fact that in the US, African American communities have a higher number of COVID-19 fatalities demands an end to the health disparities and the social determinants of health. These staggeringly disproportionate rates are too immediate to ignore, and require robust policy solutions.

5. *Drug affordability:* For years, the pharmaceutical industry has had the reputation of profiteering from the healthcare system. COVID-19 however, provided a new perspective into the role of these companies. The pressure to develop treatments and vaccines at warp speed provided an opportunity for pharmaceutical companies to showcase their vast research and development capabilities, as well as their impact in addressing a global pandemic. Furthermore, the lingering issue related to the prices of drugs could also be addressed, where the government can leverage the present situation to finally exercise negotiating power and make drugs more affordable, especially at a time where unemployment is high.

6. *Drug manufacturing*⁵: The pandemic could lead to the revitalization of the drug manufacturing industry in the US, relying on more production at home.

7. *A new era of health care preparedness:* COVID-19 has prompted the US to consider its disaster readiness workforce and infrastructure needed to deal with a pandemic. For example, testing and tracing capabilities have fallen short, leading to increased infections. There needs to be proposals to revamp emergency preparedness plans, especially in relation to healthcare workers during a public health emergency. Tapping into the network of retired doctors, practitioners working in different fields and medical students will address gaps and shortages in workforce.

8. *Allowing non-physicians, like nurses, nurse practitioners, and physician assistants to play a bigger role in care:* A pandemic, like COVID-19, places an immense toll on emergency rooms and intensive care units, highlighting the importance of nurses, nurse practitioners, and physician assistants in providing the support needed. This concept predates COVID-19 and has existed to support rural hospitals that were struggling. The use of non-physicians would help lower costs by relying more on these types of practitioners, present on their payrolls.

9. *Who makes money in health care, and how they make it:* The dynamic of payment structures could change, shifting from the traditional model of paying for healthcare services on a fee-for-service basis, to a lump sum for caring for an entire group of patients, or compensation for keeping a patient healthy and avoiding an unnecessary readmission, leading to reduced costs.

⁵ <https://www.npr.org/sections/health-shots/2020/04/24/843379899/pandemic-underscores-u-s-dependence-on-overseas-factories-for-medicines>

China ⁶:

Several initiatives were incorporated by China's healthcare system, which led to the successful containment of the epidemic. Nevertheless, in mitigating and dealing with the impact of COVID-19, several issues arose. These included inadequate capacity of resources at times, leading to shortages in budgets and medical supplies. Although testing and tracing measures were in place, there was inadequate capacity for disease surveillance and detection in the early stages of the epidemic, mainly due to capacity issues, inflexible administration mechanisms and even insufficient infrastructure at community levels.

What changes need to be made? For one, as noted by Gu Xuefei, a research professor at the Health Development Research Center in the National Health Commission of China, more effective coordination and governance mechanisms, connecting efforts between the three systems of public health, medical services and healthcare security. In addition, reforms should be made towards disease prevention, as well as improving patient care during emergencies. There should also be efforts to⁶:

- Improve the medical insurance and assistance system for catastrophic diseases.
- Strengthening capacity building and professionalism, as well as independence of disease control agencies.
- Strengthening the monitoring and early detection capacity of the disease control system, and enabling data sharing among disease control agencies and medical institutions to enhance detection, tracing and care during a public health crisis.
- Increase the capacity of laboratories of disease control agencies and enable regional resource sharing.
- Enhance the capabilities of medical care providers, including hospitals and resources needed, to deal with infectious diseases. This includes establishing a pre-hospital emergency system, as well as improving public health literacy.
- Establish an integrated health care system to enable hospitals to use medical insurance and public health funds for more efficient use, and a harmonization of approaches between medical service providers and healthcare security system.
- Improve the health insurance and assistance system for epidemics, ensuring that hospitals provide treatment before charging fees. Considerations should also be given for exemptions from medical fees for specific groups of individuals.

⁶ <https://news.cgtn.com/news/2020-05-29/What-should-China-s-health-care-reform-focus-on-after-COVID-19--QRhV0tehBC/index.html>

Arab World⁷:

In the Arab world, the healthcare provisions provided by the State were challenged, leading to increased dependency on non-state actors, notably the private sector, in delivering healthcare during the COVID-19 pandemic. Thus considerations for reform, moving forward, need to include new models of collaboration between state and non-state actors that would accelerate progress towards Universal Health Coverage (UHC).

The collaboration and integration between state and non-state actors that unfolded during the pandemic, revealed the challenges that exist, providing insight on what and how the future roles of state and non-state actors should be. The response and engagement of state actors with the private sector in dealing with the pandemic varied. In countries, like the United Arab Emirates and Bahrain, the private sector was relied on in dealing with COVID-19 infections⁸. In other countries, systematic and comprehensive engagement with non-state actors did not exist, which presented challenges. As noted by the WHO, effective mitigation, control and prevention of a pandemic requires a highly coordinated and integrated effort between state and non-state actors⁹. In some countries, the state issued policies to engage with non-state actors, as was the case in Lebanon, but there was limited coordination between these two entities¹⁰. Non-state actors can provide a myriad of services to support governmental efforts, such as awareness, advocacy and providing social care and support.

What are the lessons learned moving forward? For an area of the world dealing with strained healthcare systems due to armed conflict and displaced populations, pandemics further deepen fragilities and vulnerabilities.¹¹ Moving forward, the lessons learned from the COVID-19 pandemic present potential policy measures that can amplify and strengthen healthcare systems in the Arab World, by re-envisioning the role of state and non-state actors. This involves the following considerations:

- ***The State as a coordinator and regulator of health systems:*** Governments should continue to take the leadership role in coordinating efforts for healthcare services between state and non-state actors. They should also leverage the capabilities of non-state actors to help meet the national health demands, especially in relation to providing universal healthcare

7 <https://www.arab-reform.net/publication/after-the-pandemic-reimagining-the-role-of-state-and-non-state-actors-in-rebuilding-national-health-systems-in-the-arab-world/>

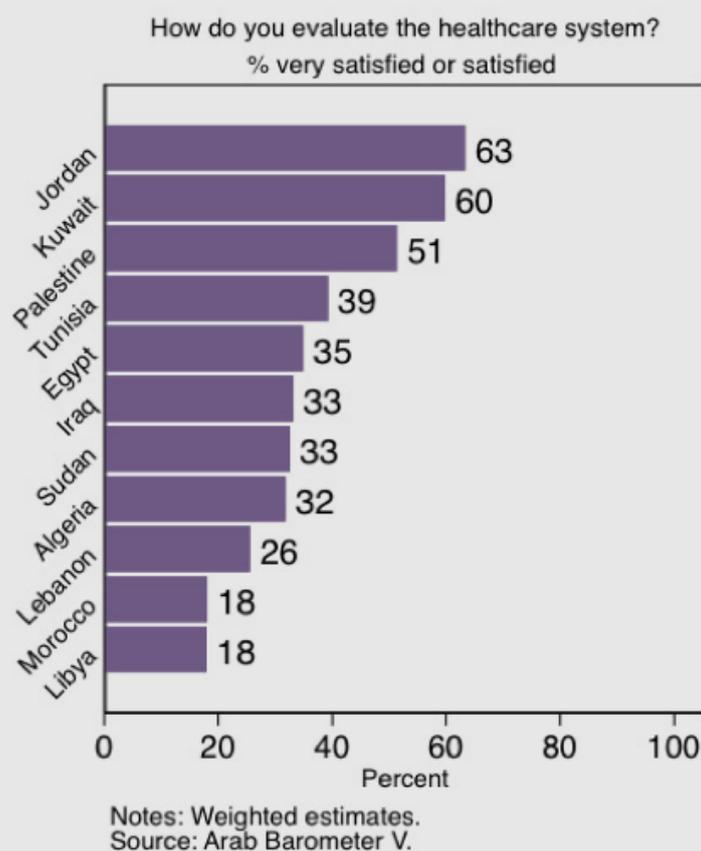
8 <https://www.khaleejtimes.com/coronavirus-outbreak/coronavirus-crisis-thumbay-group-aligns-with-uae-governments-precautionary-policies>

9 World Health Organization (WHO). (2020). An action plan to engage the private sector in the response to COVID-19. Consultation draft of Interim Guidance 30 March 2020.

10 El-Jardali F, Fadlallah R, Abou Samra C, Hilal N, Daher N, BouKarroum L, Ataya N. K2P Rapid Response: Informing Lebanon's Response to the COVID-19 Pandemic, Knowledge to Policy (K2P) Center. Beirut, Lebanon, March 2020.

11 <https://medium.com/@UNDPArabStates/grappling-with-a-crisis-like-no-other-the-fragility-of-arab-countries-in-the-face-of-covid-19-a174b1017824>

coverage. One important area of collaboration is data sharing and transparency. Efforts to mitigate the COVID-19 pandemic shed light on the importance of real time data, and the use of centralized platforms to share the data. This would require that governments strengthen regulations, foster accountability and build mutual trust. Some states have moved towards stronger regulations, in Bahrain for instance, the government has been shifting away from health services delivery to that of planning and regulation¹².



• ***Towards evidence-informed public health policymaking:*** Globally, COVID-19 highlighted the importance of leading with science and data for decision making and setting policies. In several countries, where the expertise was available, governments did not always leverage these resources when dealing with the pandemic. Moving forward, there needs to be an integration of science, evidence and data within the state's policymaking processes to ensure that governments are prepared to respond and deal with a crisis. This will involve organizational arrangements that foster the integration between experts and policymakers, including committees within ministries, independent non-governmental organizations, etc. More research and analysis is needed to effectively embed health policy and systems into public health policymaking settings of Arab countries¹³.

12 Economic and Social Commission for Western Asia (ESCWA). (May 17 2013). Provision of basic healthcare services by non-state actors in Arab countries: Benefits and risks.

13 Koon AD, Rao KD, Tran NT et al. (2013) Embedding health policy and systems research into decision-making processes in low- and

• **Multisectoral action for driving innovation and technology:** COVID-19 highlighted the importance of technology and innovation in finding solutions, especially in relation to the use of big data and artificial intelligence. There is disparity and variation in the availability and access to technological tools and resources across the Arab World, whereby populations with limited accessibility are prone to health risks¹⁴. It is essential that moving forward, there are collaborative efforts between the private and public sectors to accelerate and drive innovative solutions to address public health challenges and ensure equal access to technology across all demographics of the population.

• **Towards recognizing health as a basic human right:** The pandemic exposed several inequalities and inequities globally, and the Arab world was no exception. Throughout the region, there is a significant proportion of the population living in low- or middle-income countries or have a high number of refugees or migrant workers, leading to severe disparities in healthcare access and affordability. Governments need to reconsider how to address these inequalities and encourage collaborative efforts with non-governmental organization and the private sector, to deliver universal access to healthcare for all people living in these countries.

England¹⁵:

Policy response in England presented challenges in dealing with the COVID-19 pandemic. After a slow start, the scale and reach of policy adjustment resulted in a complex combination of changes within the healthcare system and amongst society. Due to the National Health System (NHS) having fewer doctors, nurses, hospital beds, and other resources than other countries, the response involved widespread changes, such as postponing all non-urgent elective operations and shifting to telemedicine. However, the government's support for social care was inadequate and not timely, including the resources for testing and protecting frontline workers and healthcare staff.

However, COVID-19 only amplified an already existing and long-standing crisis in the social care system. There are issues with inadequate government investments and widespread staff shortages. Moving forward, it is important that the social care system is protected and it is the responsibility of the government to provide the support needed to address the gaps. Furthermore, science and evidence must drive policy making, especially in a crisis, where balancing the economy and public health is challenging. Finally, the number of deaths based on social and economic disparities, emphasizes the need to commit to reforming healthcare policy

middle-income countries. Health Res Policy Sys 11, 30 (2013).

14 http://arabcenterdc.org/policy_analyses/the-coronavirus-pandemic-and-the-arab-world-impact-politics-and-mitigation/

15 Alderwick Hugh, Dunn Phoebe, Dixon Jennifer. England's health policy response to covid-19 BMJ 2020; 369 :m1937

to ensure health equity. Enhanced social protections and action to address structural inequalities must be at the forefront of reform.

Policy implications and recommendations:

1. As a part of their exit strategies, countries need to reimagine and reform their healthcare systems, addressing issues that have resulted due to the onset of the pandemic, or long standing issues that have been challenging healthcare delivery.
2. The pandemic has highlighted the importance of health equity, including affordability and accessibility, for all demographics and policies should support reform to address inequalities.
3. An integrative and collaborative platform between the government, and other sectors, should be at the forefront of the considerations, allowing for a more effective way to drive healthcare reform.
4. Considerations should be given for telemedicine and its ability to deliver healthcare services remotely, through the use of innovative technologies and artificial intelligence.

Telehealth Beyond COVID^{16,17}

The COVID-19 pandemic has placed telemedicine in the spotlight and accelerated its implementation. With the telemedicine market set to be valued at \$175.5 billion by 2026, there is more buy in from consumers after the pandemic. A recent survey by Sage Growth Partner (SGP) and Black Book Market Research found that 59% of their respondents reported they are more likely to use telehealth services now than previously, and 33% would even leave their current physician for a provider who offered telehealth access.¹⁷ If telemedicine was starting to grow pre-COVID-19, it now has the momentum needed for implementation as part of the “new” normal. Here are some reasons why:

- **Readiness to adopt technology:** Many patients and healthcare professionals alike are embracing telehealth technology, moving beyond just primary care, and into specialties, such as dermatology and mental health. The Federal Communications Commission (FCC) has established a \$200 million COVID-19 Telehealth Program to treat patients using telemedicine platforms, making the technology more available and accessible to patients.¹⁷
- **Lower regulatory barriers:** Regulatory changes introduced as a result of the COVID-19 pandemic, reduced barriers that previously existed to encourage both providers and patients to opt for telehealth over in-person visits, to ensure patient and medical staff safety. In addition, waivers were provided to physicians permitting them to treat new and current patients through telemedicine platforms. Another important regulatory barrier that was loosened during the COVID-19 pandemic was the HIPAA privacy standards for telehealth platforms allowing the use of standard video conferencing apps, which provided the flexibility needed to treat patients. There was also some ease in the prescription of drugs and equipment needed for a patient, such as a crutch or brace through telehealth forums.

¹⁶ <https://www.ft.com/content/31c927c6-684a-11ea-a6ac-9122541af204>

¹⁷ <https://www.forbes.com/sites/joeharpaz/2020/05/04/5-reasons-why-telehealth-here-to-stay-covid19/#4bee0c1253fb>

• **Improved financial impact and reimbursements:** In the US, Medicare and, in many cases, Medicaid and others, are reimbursing at the same rates for both virtual and in-office visits, incentivizing doctors to use these virtual platforms for healthcare delivery. Some commercial payers also applied the same policy, allowing for practices to stay open and provide ongoing care, as well as incentivizing the adoption of these technologies.

• **Video telehealth is great but it could (and will) be even better:** The combination of medicine and technology will only lead to newer technologies and innovations that will drive endless possibilities in expanding the capabilities of telemedicine. For example, TytoCare just received \$50 million to invest in its telehealth-connected stethoscope, infrared thermometer and otoscope, among others that will help extend the quality of care provided and allow telehealth to rival in-person visits¹⁸.

• **Looking towards the future of telehealth:** Increased adoption will lead to the groundwork needed to ensure that telemedicine becomes part of the norm for healthcare delivery moving forward. While there are uncertainties in what the new normal will look like, it is certain that telemedicine will be an integral part of future healthcare systems and will continue to evolve and develop to further enhance healthcare.

¹⁸ <https://venturebeat.com/2020/04/07/tyto-care-raises-50-million-to-grow-its-telehealth-examination-platform-globally/>