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America's Inadequate Public Health Response to the COVID-19 Pandemic

ABSTRACT

This report is a critical analysis of America's inadequate response to the novel coronavirus infection that has been epidemic since March 2020. We analyze the health data, explain the public health concepts, report key scientific findings and offer recommendations on testing, contact tracing, prevention and treatment

COVID-19 HEALTH TEAM; DONALD MOORE

Donald E. Moore, M.D., M.P.H.
Monica Sweeney, M.D., M.P.H.
Robert Smith, M.D., M.P.H.
Myriam Ochart, CSSBB, CQA,
CMQ/OE

STUDENTS:

Downstate

Kaitlyn Daly
Christine Zogaib
Josaphat Michel

NYIT:

Zamiur Rahman

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I. Executive summary

COVID-19, the worst pandemic in the past hundred years will directly and indirectly kill more than 300,000 Americans. It will temporarily and permanently disable tens of millions and cause severe financial hardship for most people. The inadequate public health response of the United States governments and public health agencies has exposed inherent weaknesses in our public health and healthcare delivery systems. These weaknesses have resulted in:

1. failure to protect health care workers and the population by not providing adequate personal protective equipment (PPE);
2. failure to prevent unnecessary COVID-19 infection due to an uncoordinated, poorly managed testing strategy;
3. failure to implement effective primary and secondary preventive public health strategies due to political polarization; and
4. failure to lead by modeling behavior as previously done by the presidents during the flue pandemic of 2009, and earlier for HIV

Despite the availability of adequate public health data, expert scientific guidance and WHO recommendations, the United States federal government, state governments and municipalities have failed to effectively inform and direct the American population towards behavior that would prevent COVID-19 infections and thereby limit the spread of infection and death.

Epidemiology

America has among the highest [infection rate](#) (186 COVID-19 cases per 100,000 population) and [mortality rate](#) (5.64 deaths per 100,000 population) in the developed world. This infection rate is six times greater than the world average and the death rate is five times greater. These are poor outcomes for one of the richest countries in the world.

These poor health outcomes result from the very wide [income gap in America](#) and well documented [health disparities based on race](#).

Testing

Testing for COVID-19 in America has been plagued with difficulty from the beginning. We started widespread testing early March, much later than the rest of the developed world, because we refused to use the [available test](#) recommended by the [World Health Organization](#) (WHO) in January. In addition, [the test developed by our CDC was initially defective](#). This resulted in impaired disease surveillance and delayed secondary prevention particularly in the [acceleration phase](#) of the pandemic. This is evidenced by the steep peaked epidemic curves experienced by New York and other northeastern states. Our Team has identified and reported that there was no rationalized strategy to distribute and perform the tests where they were most needed. When testing was eventually available, we observed the following:

1. testing has not been effectively linked to clinical care;
2. many tests have been done in non-traditional medical settings and pop-up sites managed by outside providers with little or no connection to the local community;
3. pop-up sites, such as tents, churches, and community centers are not the ideal hygienic settings for specimen collection; and
4. delays in testing results have made most testing useless for diagnosis, treatment and contact tracing.

Testing strategies have often been [politicized](#). Our group identified and reported previously one instance where [federal dollars earmarked for testing was directed to an outside non-governmental entity \(Northwell\)](#) not usually connected to the people they were testing. The community physicians and health centers in that community were ignored. We also observed that some elected officials favored less testing in order to underrepresent the number cases while others favored more random excessive testing in order to decrease the [positivity rate](#), thereby demonstrating their purportedly successful public health program.

Our group recommends a medically directed strategic testing program based on disease prevalence and surveillance data.

Contact tracing

Our governments have not effectively used contact tracing in this epidemic so far, according to articles in the [New York Times](#), [The Atlantic](#) and [National Geographic](#). We failed initially due to:

1. our flawed testing strategy and
2. we did not have a prepared corps of contact tracers in the [pre-pandemic phase](#).

The role of contact tracing for COVID-19 in the United States today should be to prevent second waves in areas that are post peak and to prevent initial waves in areas that are pre-pandemic. When our disease surveillance system demonstrates a surge of COVID-19 cases, contact tracing should begin within hours, careful field investigation should follow, and effective quarantine should be mandated.

The challenges for effective contract tracing will be to secure adequate continuous funding, get faster test turnaround time and overcome public distrust.

Treatment

The treatment for symptomatic COVID-19 infection is supportive medical care. This might include oxygen therapy, nutritional support and rest. Infected people should be isolated with respiratory and contact precautions for their caregivers. There is no FDA approved drug or vaccine treatment indicated for COVID-19 infection. However, some drugs, treatments and tests have been issued emergency use authorization ([EUA](#)) by the US [FDA](#).

Prevention

Prevention strategies include wearing the appropriate mask, effective handwashing, physical distancing, disinfection of frequent contact surfaces and limits to the size of public gatherings.

Gaps in clinical care

Observations in this and other pandemics have revealed [excess deaths](#) that may result from medical treatment gaps. Gaps in care directly or indirectly caused by COVID-19 include pressure ulcers and limited attention to potentially life-threatening diseases such as congestive heart failure (CHF), end stage renal disease (ESRD), diabetes mellitus (DM), serious mental illness (SMI), injuries and childbirth complications. This report will focus specifically on pressure ulcers.

Conclusion

We opine that the public health decisions made by our elected officials and the actions executed by our public health officials and medical decision makers were inadequate to contain the COVID-19 pandemic in Brooklyn, New York and the United States. We base this on a critical analysis of the process of the public health response and the health outcomes of the population. Suppression of new cases of COVID-19 and prevention of epidemic disease and death in the future will require both structural and process changes to our public health and medical care delivery systems. We must move to a universal [single payer](#) health insurance which will [improve access](#) for all Americans and [reduce disparities](#) in healthcare delivery.

II. Project Initiation

At the request of [Congress Member Yvette Clarke, 9th Congressional District](#), we assembled a team of health professional thought leaders with interest in correcting the health disparities in Central and South Brooklyn. Four student mentees subsequently join the team.

Purpose

The purpose was to promote quality healthcare for the residents of the Brooklyn and the United States during and after the COVID -19 Pandemic and to build the groundwork to address longstanding and systemic health inequities in Black and Brown communities

Project Need

It is expected that more than [70 million Americans](#) will contract COVID-19 and over [300,000 will die](#). Many Americans will die and suffer not of COVID-19 but because of it. Because the health delivery system was repurposed to respond to the epidemic many Americans have had limited access to chronic disease maintenance, emergency services and desperately needed treatments for life-threatening and life ending endemic diseases. These circumstances were worse for Black and Brown Americans because of the many disparities they endure.

Objectives

1. To assist government in the development of a health plan that better distributes community and federal health resources to the areas of greatest need.
2. To support our local hospitals, community health clinics and medical practices in securing testing and maintaining the capacity to effectively treat COVID-19 and other diseases
3. To facilitate the use and movement of human resources to areas of greatest need.

4. To identify primary care networks and practices that can and will manage patient with COVID-19 and similar future health emergencies.

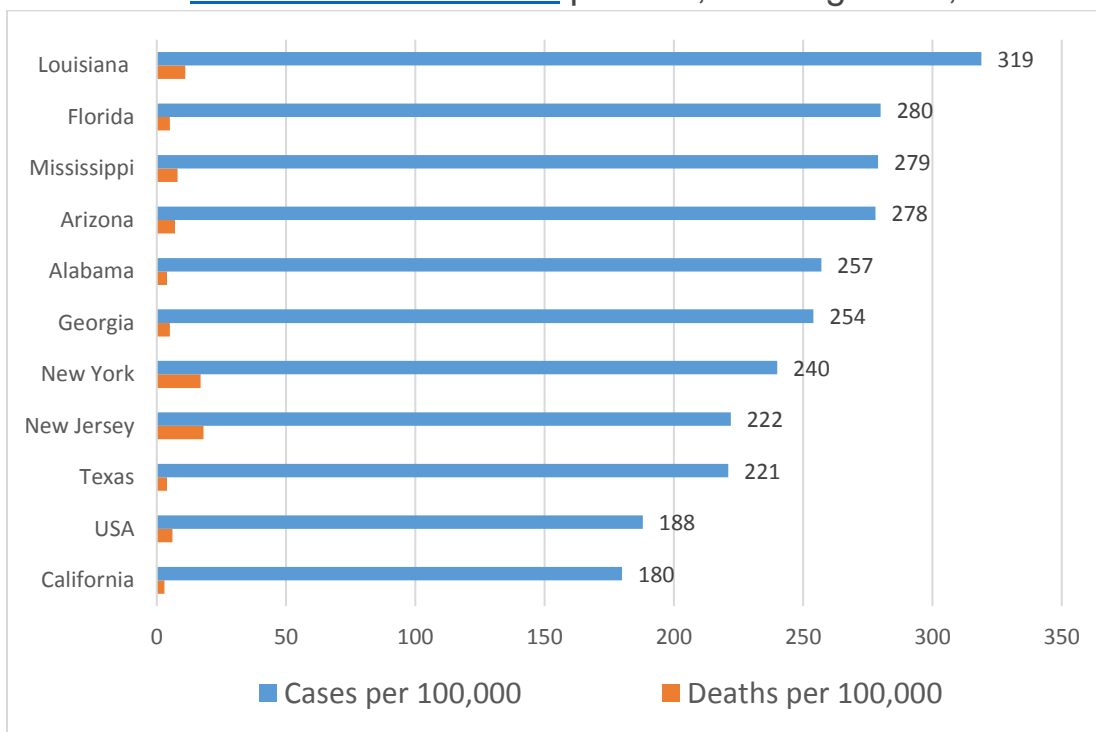
III. Overview of the pandemic in the US

Current state of the pandemic

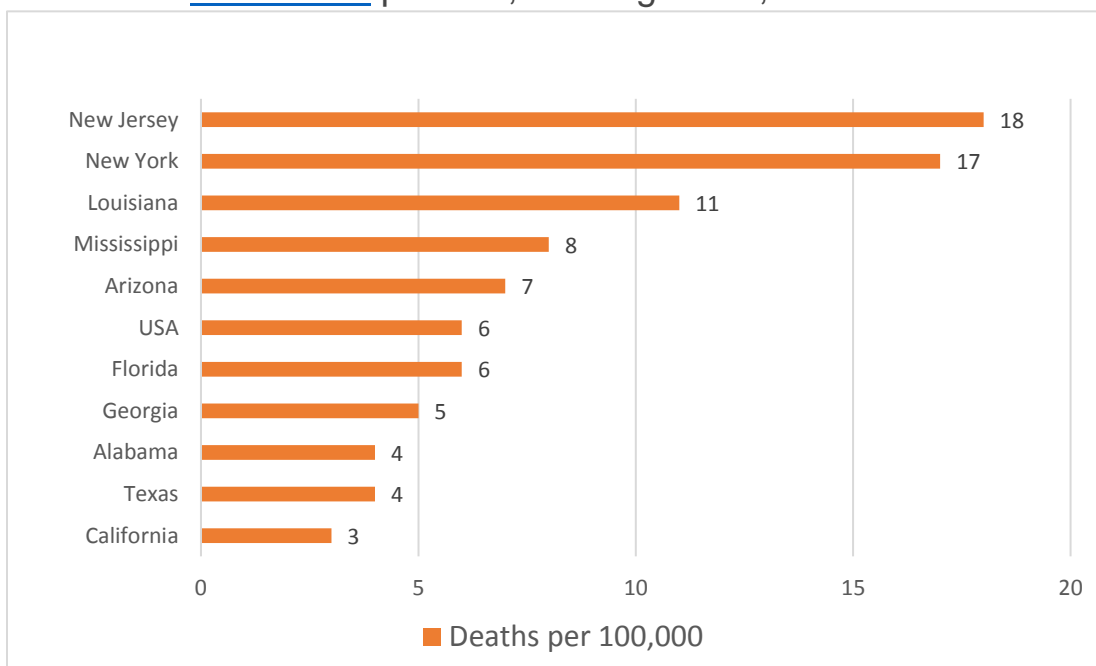
We are eight months into the worldwide COVID-19 pandemic with more than 25 million cases and almost 1,000,000 deaths. The United States appears to be peaking at five months with 6 million cases and almost 200,000 deaths. Regions and cities are at different points on their epidemic curve. New York City and other northeastern cities are at the end of the first epidemic wave. Miami and the large southeastern cities are early post-peak. Los Angeles and the state of California is also post-peak. Florida reported over 15,000 cases on July 12, the most for a single day for any state in the United States. California has had the largest number of cases of any state in the country due to its larger population. Southern states like Louisiana and Florida have the largest case rates per population and northeastern states like New Jersey and New York have the highest death rates per population.

Understanding where one's country, region, state and city is on the epidemic curve is critical to determining the strategy for testing, contact tracing, lockdowns, universal masking and other public health interventions. There is no doubt that testing and contact tracing linked to public health protocols and clinical treatment is the best strategy to reduce suffering and death in a pandemic such as COVID-19.

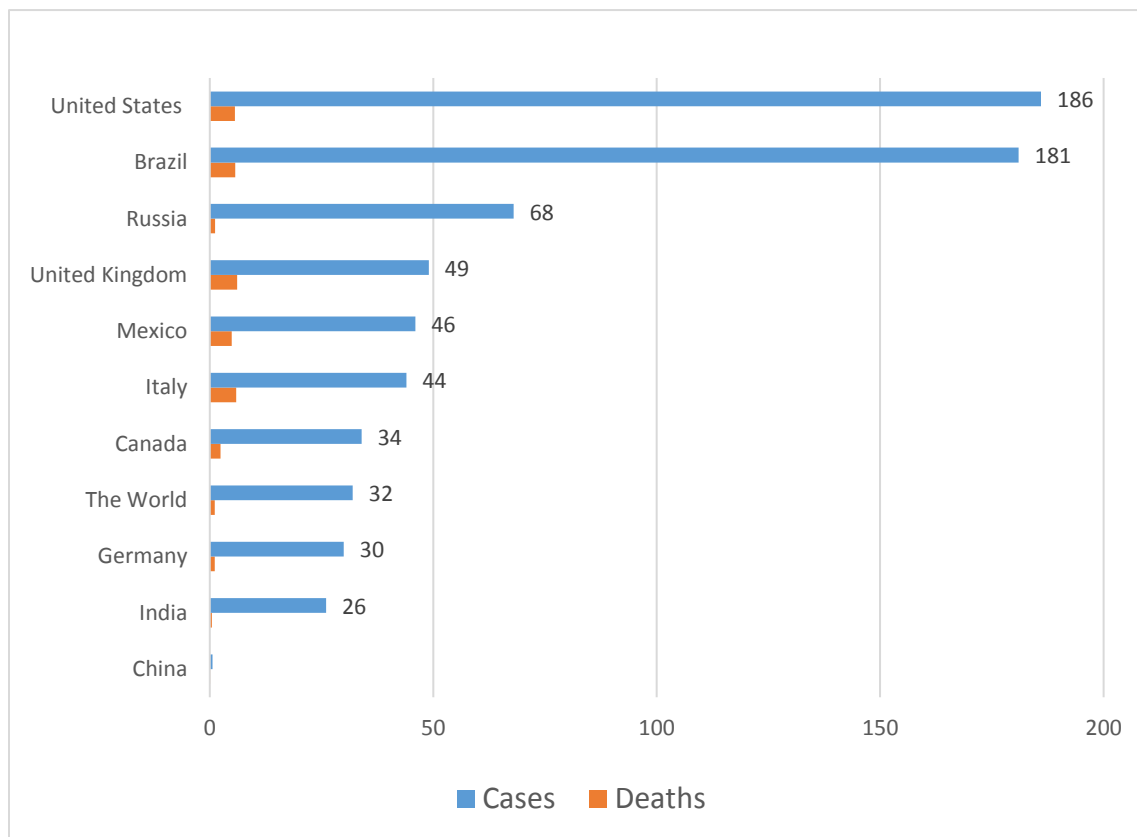
COVID-19 [US Cases and Deaths](#) per 100,000 August 30, 2020



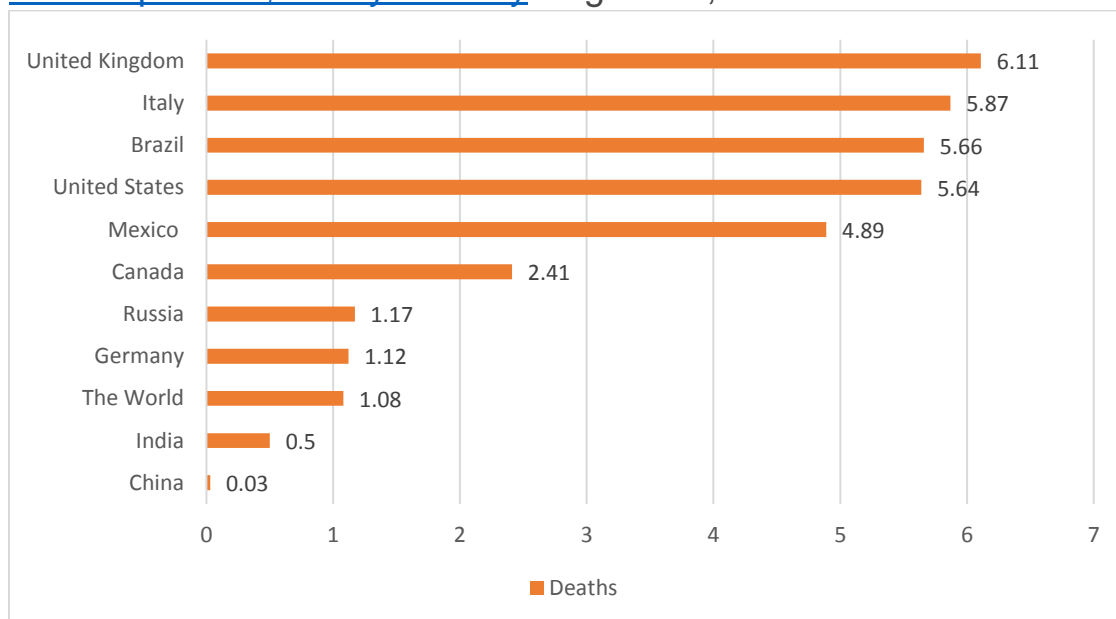
COVID-19 [US Deaths](#) per 100,000 August 30, 2020



Cases and Deaths per 100,000 by Country August 30, 2020



Deaths per 100,000 by Country August 30, 2020



Governments Response

[The World Health Organization](#) (WHO) makes recommendations to member states, creates protocols and provides guidelines for public health and medical management of endemic and epidemic diseases. They provide passive, active and sentinel surveillance for the countries of the world.

When China identified the outbreak of novel coronavirus causing SARS in Wuhan in late December 2019, the [WHO was informed](#). The WHO informed the governments of the World by January 4th and a month later a [Public Health Emergency of International Concern \(PHEIC\) was declared](#). Some governments acted swiftly with testing, contact tracing, isolation and quarantine resulting in containment of the epidemic. When there was evidence of widespread community transmission these proactive governments went on lockdowns.

In the United States, very little public health planning and intervention occurred in the pre-pandemic and pre-peak phases. This resulted in a rapid surge of cases in the Northeastern United States in March. The [health facilities were overwhelmed](#), resulting in [overcrowding of emergency facilities](#) and [shortages of equipment and PPE](#). We believe that these conditions lead to excess COVID-19 deaths resulting in a [higher than necessary mortality rates](#).

Statements indicating that New York State has overcome the virus through its public health efforts are exaggerated. New York's low rate of new cases, hospitalizations and deaths is due to its position on the epidemic curve. All states and cities affected by COVID-19 will go through a bell-shaped epidemic curve. Some curves will be more peaked or flatter than the average based on their adherence to public health measures. However, the outcome measures are likely to be quite similar in the long run. The only way to significantly change the death rate in this novel infectious disease is to prevent the disease by limiting community spread. This is done through primary and secondary prevention. Primary prevention is best accomplished with an educated population and secondary prevention is best accomplished through strategic targeted testing followed by effective contact tracing, isolation and quarantine. Some countries have

accomplished this, not the United States. The high incidence of COVID-19 initially in the northeastern states and subsequently in the southeastern states attest to this. The high death rates in the northeast resulted from a failure of both primary and secondary prevention.

We believe that there is still time to change the course of this pandemic in America. Some parts of the country are still in the acceleration, pre-peak phase of the pandemic and should be locked down. For those parts of the country not yet affected, there is still time for primary and secondary prevention. There is also time to prevent second and third waves in areas that are at the end of their post-peak phase.

IV. Epidemiology

The pandemic phases and waves

The COVID-19 pandemic is meandering through the United States causing rising national infection rates, deaths and financial hardship. It hit New York in April like a tsunami, peaking around April 7 and is now flooding Florida, Louisiana, Mississippi, Georgia, Alabama, Arizona and Texas. It is likely that it will take up to 12 months from now for the pandemic to trickle into the small towns and hamlets across the country. This means that it is still not too late for us to develop a national strategy.

As long as COVID-19 is prevalent anywhere in the country, significant epidemic surges are likely to occur, either in large population areas that have not had their first epidemic surge or in areas previously affected and therefore will be experiencing a second or even third wave. [Second and third waves can be prevented](#) by heightened disease surveillance, strategic testing, meaningful contact tracing, secondary prevention, isolation and quarantine.

The first wave can be prevented or controlled in previously unaffected parts of the country by primary prevention: public health messaging, masking, physical distancing, limits on public gatherings, travel restrictions and environmental reengineering.

COVID-19 prevalence

Based on [antibody testing](#) data, the infection rate of COVID-19 in the United States is about 10 times the number of people who test positive so far. This would mean that more than 70 million Americans have been affected by COVID-19, more than 1 in 5 people. Despite these high numbers, this is not enough for full herd immunity, so this means that most Americans are still susceptible to this disease. It is estimated that between 200,000 and 300,000 Americans will die and as many as 70 million will contract the disease resulting in significant short term and long-term disability. Many Americans will suffer financial hardship and the economic consequences to the country will be devastating.

Fortunately, the [duration of illness](#) for COVID-19 is relatively short, usually 14 days and the [period of infectivity](#) may even be shorter (10 days). Therefore, the public health focus should be on new cases ([incidence](#)) and medical care should focus on active cases (symptomatic disease, infectivity and mortality).

National and local strategic public health and medical plans

The national strategic plan should focus on predicting where the epidemic will surge next. Testing and contact tracing resources should be directed to those areas. Areas such as Florida, Texas, Louisiana and California that are experiencing the full force of the flood should be on lockdown, have universal masking and be prioritized to have resources such as ventilators and PPE. As we recommended during the New York surge, pop-up testing and treatment sites should be avoided, and the community health infrastructure should be bolstered to accommodate the surges.

In the post-peak phase of the epidemic, surveillance is crucial. When there is an outbreak in a community, strategic, timely testing should identify the index cases and contact tracing should immediately identify those exposed. Total facility testing has been shown to be effective. Quarantine and isolation should be mandated and immediately put in effect to prevent

further disease transmission. Public health officials and workers should manage those exposed who are placed on quarantine and medical professionals should monitor, and treat if necessary, those infected who are on isolation. This requires an intact, well-resourced and well-managed public health force and healthcare delivery system.

States and large cities should develop [epidemic intelligence services](#) similar to the one that exists at the [national level](#) in the Center for Disease Control ([CDC](#)). These highly trained, well-resourced agencies can be used to rapidly descend on local areas where there is an outbreak of disease. The objective would be to quickly identify the source or sources and bring larger community resources to mitigate the community spread of disease.

V. Testing

What are the relevant tests?

The two most common [COVID-19 testing](#) performed in the United States currently are the [nucleic acid \(RNA\) PCR diagnostic test](#) and [SARS-CoV-2 IgG Immunoassay antibody test](#). The diagnostic test is usually done from nasal or nasopharyngeal swab, sputum or more invasive lung specimens. This test is quite sophisticated and takes a longer time to perform compared to other infection diagnostic tests. It requires special reagents and viral transport media of which there is a worldwide shortage. Many community labs are not equipped to perform this test. These are some of the reasons why testing in the United States has been saddled with inappropriately long turnaround times. The antibody test is simpler, and the technology is less complex.

[SARS-CoV-2 antigen testing](#) will be the next expansion of our testing armamentarium. This technology will bring the benefits of point of care (POC) testing with more rapid results. We should be careful, however, not to move too quickly before these tests have been scientifically validated or we may err in a similar fashion as we did with the [rapid antibody test](#) which generally provided a higher rate of inaccurate results.

How does each test guide our decision making?

Clinical decision making can be significantly affected by the RT-PCR diagnostic test and eventually the antigen test, as this test will determine if the individual has active disease and it is likely contagious. Therefore, decisions for isolation and elective invasive procedures are made based on these test results. Contact tracing should generally follow positive RT-PCR diagnostic test.

On the other hand, the antibody test, usually a qualitative IgG immunoassay, serves more as a public health tool to determine disease prevalence and for surveillance. It also can be used to determine the susceptibility of an individual or a community to COVID-19 disease. Hopefully, a quantitative antibody test will be available soon as this will serve to be a better predictor of ongoing immunity.

Medically Directed Strategic Targeted Testing

Currently in the United States, testing is quite disconnected from treatment. The [average time from testing to results](#) for routine COVID-19 diagnostic testing is from five days to over one week. With a week delay in return of the test results, testing plays very little role in treatment decision. In early April when the pandemic was [peaking in New York](#), clinical decisions were made without the benefit of definitive COVID-19 test results because testing was either not available or the results took too long to come back. Now four months later, we are still in the same boat.

[America tests more people than most other countries](#), both on a total volume basis and a per capita basis yet our outcomes in controlling the pandemic is among the worst worldwide. Reasons for this include the fact that our testing is not rationalized, it is not connected to treatment and it is competitive. New York performs more tests per capita than any other state, although New York is at the end of its post-peak phase. In July, new cases, deaths and test positivity rate were all at the lowest since late March when the pandemic of COVID-19 surged. Other than for public health and research, there was no need to continue testing New Yorkers randomly at such a high rate. This strategy wastes resources, diverts testing resources

and delays testing results from the areas of the country which need it most, i.e. Florida, Louisiana, Texas and California. New York should do more targeted testing such as testing travelers in quarantine, healthcare workers, hospitalized and pre-surgical patients and pre-natal women. Results should be available within hours and no more than 2 days to allow for meaningful contact tracing, secondary prevention and clinical care.

Unnecessary testing

Focusing solely on [test positivity rate](#) can be misleading. One reason why New York's positivity rate is so low at 1% is that many people who are low risk for COVID-19 or been tested randomly. We already know that the new cases and the prevalence of COVID-19 in New York City and State is low, and this confirms that we are post-peak, about to become post pandemic. Testing low risk people randomly at high rates adds nothing to the public health knowledge at this late phase but it slows down testing results. Also, positivity rates can vary significantly by community, income status, race and other demographic factors. Therefore, targeted testing based on medical need, disease risk and public health is the appropriate strategy.

Managing outbreaks

When random routine testing or active disease surveillance signals an outbreak in a community, repeated excessive random testing adds nothing to the knowledge of the source are sources of the infection. In fact, further random testing only serves to decrease the positivity rate and may create a false sense that the disease is declining. Areas signaling an outbreak should be locked down and thoroughly investigated by public health field experts. Total facility testing along with testing contact should be undertaken immediately. Isolation of confirmed cases should be mandated, and treatment offered to the symptomatic cases. Effective quarantine (cordon sanitaire) of the area and the contacts should be implemented. This strategy has been shown to be effective in other countries ([Beijing outbreak in June 2020](#)) and with previous epidemics.

If a case is identified in an institution such as a school, hospital or nursing home, immediate total facility testing should be performed and if initial testing results demonstrate significant transmission, the institution should be closed until the disease is controlled. Studies have shown that these institutions are often accelerators for community spread of infectious disease during epidemics.

Best practices to connect testing and contact tracing to clinical care

Testing should be performed in hospital emergency rooms, hospital clinics, walk-in clinics, community health centers and doctors' offices. All these sites are generally linked to opportunities for meaningful contact tracing and early treatment. COVID-19 positive people who are infectious should be isolated and their contacts quarantined. We reiterate, that for this to be done effectively routine test results must be available within 2 days and even earlier when possible.

As with most diseases, testing requires interpretation by a knowledgeable expert, usually a physician. Some clinical cases may even require consultation with a specialized expert. The medical profession and most enlightened societies recognize this, so it is unclear why in the worst pandemic in over 100 years we have deviated from our usual paradigm of diagnosis and treatment. Municipalities, countries and the international community have established institutions, public health networks and healthcare delivery systems to manage diseases. These include the WHO, CDC, state and city health department. Again, it is therefore unfortunate that these structures have been bypassed, minimized and overruled by the controlling political forces. [Politicizing disease](#) during a pandemic increases morbidity and mortality.

VI. Contact Tracing

Effective contact tracing has been demonstrated in many Asian countries including South Korea and China. The Journal of the American Medical Association published a brief report of the public health response to the [Beijing coronavirus outbreak](#) in June 2020. After 56 days of no community

transmission, the [surveillance system](#) identified a man in his 50s with COVID-19 symptoms. An outbreak alert was triggered the same day and the market where the investigators believed he had contracted the disease was shut down the next day after two other people tested positive. The entire market, recent visitors, close contacts of cases, and the surrounding community was sought after for a diagnostic RT-PCR testing. 335 cases were confirmed by diagnostic testing and 368 people were isolated and treated. The people in Beijing were able to contain the epidemic within one month using the following [public health protocols](#):

1. Cases were required to be reported within 2 hours of diagnosis and investigated within 24 hours of reporting.
2. Only 1 case was required to trigger an alert.
3. Response plans dictated
 - a. immediate personnel deployment,
 - b. aggressive case finding and contact tracing
 - c. isolation of cases and asymptomatic persons
 - d. quarantine of close contacts,
 - e. movement restrictions, and
 - f. thorough environmental testing.

This study offers a glimpse of how effective contact tracing can be and it “underscores the effectiveness of sensitive surveillance, immediate investigation, and rapid response in combination with public health interventions in containing an [outbreak of SARS-CoV-2](#).”

New York failed initially in contact tracing by [politicizing the testing and contact testing process](#). This is evidenced by the fact that in the middle of the pandemic, [contact tracing was transferred from the public health department](#), an agency with a long history and knowledge of this process to [NYC H+H](#) a quasi-governmental health provider organization, not generally involved in contact tracing

What should be the standards for a 5-day incubation period, highly infectious respiratory disease?

New York City Health and Hospitals [Test and Trace Corps](#) manages testing and contact tracing for coronavirus in New York City at 150 sites. They [reported on May 8](#) that they were testing about 20,000 people daily with a goal of 50,000 by August. It appears that for the most part the testing has been done randomly with maybe some targeting to travelers arriving from states currently being hit hard by coronavirus. Currently there is no policy that those who test negative can come off quarantine before the end of 14 days. The city states that their turnaround time for a PCR test is 3 to 5 days which is half the national average time. This is still an extraordinarily long time for a disease where [one infected individual](#) in a sleep over summer camp can infect nearly half of vulnerable population of almost 600 people within less than five days.

VII. Treatment

There is [no FDA approved drug treatment or vaccine for COVID-19](#) in the United States. Medical care is primarily supportive. [Remdesivir](#), an antiviral drug and [COVID-19 convalescent plasma](#) has received emergency use authorization (EUA) by the US FDA. The [NIH treatment guideline panel](#) recommends remdesivir and dexamethasone (corticosteroid) in specific clinical situations. The guidelines neither recommends nor opposes the use of COVID-19 convalescent plasma or SARS-CoV-2 immunoglobulins.

Vaccine development

Timeline for vaccine development

Vaccine development for COVID-19 has been occurring with an unprecedented accelerated and truncated timeline. The [New York Times reported on September 4th that over 90 vaccine candidates](#) were in the pre-clinical phase and 37 were in clinical trials with humans. [Margaret Harris](#), spokesperson for the World Health Organization (WHO) said in a press conference that she did not expect [widespread vaccination](#) of the COVID-19 until the middle of 2021. In early September, officials from the

CDC alerted public health agencies across the country to prepare for the possible distributions of two COVID-19 vaccines in October 2020.

Given the usual challenges of clinical trials, our fractionated health delivery and payment systems, and issues of manufacturing and control, the WHO timeline for widespread COVID-19 vaccine seems more realistic than what has been announced by the [US government and public health officials](#).

How will we determine if a vaccine is safe and will work?

The US FDA and WHO have set the minimum [clinical efficacy for COVID-19 vaccine](#) at 50%, like that of influenza. Clinical efficacy endpoints include 1. reduction in severity of disease, and 2. non-acquisition of disease. Vaccine efficacy in generating immunological surrogate endpoints such as neutralizing antibodies and binding to spike protein have been demonstrated in phase 1 and 2 clinical trials. However, these surrogate endpoints have not been shown to be equivalent to the clinical endpoints of non-acquisition of disease or reduction of severity of disease. Experts agree that 15,000 to 20,000 people must receive the vaccine to adequately assess safety and it is not clear that any vaccine trial has accomplish this yet. [Vaccine-associated enhanced respiratory disease](#) remains a concern particularly at this stage when large numbers of humans have not yet been tested with the vaccines.

Vaccine science, manufacturing and controls

Currently there are [six major platforms](#) for the development of COVID-19 vaccines. They include

- live attenuated viral vaccines,
- recombinant viral vectored vaccines,
- inactivated viral vaccines,
- protein subunit vaccines,
- virus like particles and
- nucleic acid-based vaccines.

No vaccine has ever been approved using a nucleic acid-based platform, but these appear to be the leading candidates for a COVID-19 at this time.

Large scale manufacturing for some vaccines have already begun in India and other countries. This pre-approval manufacturing strategy has been supported by the wealthier countries of the world and the WHO. The United States has implemented [Operation Warp Speed](#) and the WHO has a COVID-19 diagnostic, therapeutic and vaccine accelerator program ([ACT](#)). We can only hope that the vaccine programs will roll out much better than the manufacturing and distribution of personal protection equipment in the earlier part of the pandemic.

Vaccine distribution

There is a global discussion over who should be at the front of the line when approved vaccines are available for widespread immunization. The founding of the COVID-19 Vaccines Global Access ([COVAX](#)) Facility by Gavi, the Coalition for Epidemic Preparedness Innovations (CEPI) and the WHO is an attempt to gather and equitably share COVID-19 vaccine resources worldwide. These collaborations also seek to unite higher- and lower-income countries for the coordinated, rapid, transparent and equitable access to COVID-19 vaccines. However, given the fact that the US and the European Union have already invested tens of billions of dollars in pre-orders of COVID-19 vaccine it is very likely that initial supplies of the vaccine will be limited to the richer developed countries.

Will a vaccine end the COVID-19 pandemic?

Herd immunity occurs as each animal in the herd becomes immune from a disease either by natural infection or from some other intervention such as a vaccine. The herd also becomes stronger as weaker animals die from the disease. Epidemic curves are shaped by these principles. These curves can be modified by public health interventions such as containment, mitigation and suppression. Even without any intervention an epidemic will end. Herd immunity does not occur at a specific percentage of collective immunity. Instead, it occurs gradually based on the gradual reduction of susceptible hosts and change in the virulence of the infecting organism (regression to the mean).

For this COVID-19 pandemic, it is unlikely that the vaccine will come in time to have a significant impact. Most of the major countries of the world,

particularly their large cities have already or are experiencing their peak of the COVID-19 pandemic. As we have seen in China, Western Europe and the United States the epidemic curve for COVID-19 lasts between three and six months. By mid-2021 most major cities throughout the world would have already experienced the COVID-19 pandemic. The urgency for a vaccine will have abated by then and the more usual vaccine issues such as community distrust, disparate access and limited vaccine efficacy will be the major issues.

Treatment and preventive protocols

1. Isolation

All individuals diagnosed with COVID-19 should be isolated until clear of active infection. If isolation cannot be carried out effectively at home (multiple individuals living together with inadequate number of bathrooms and bedrooms) then isolation in a separately designated facility should be ordered by a qualified health professional. People in contact with people in isolation should observe respiratory and contact precautions.

2. Quarantine

Persons under investigation for COVID-19 should be quarantined from all individuals presumed to be free of active COVID-19 disease. If quarantine cannot be carried out effectively at home (multiple individuals living together with inadequate number of bathrooms and bedrooms) then quarantine in a separately designated facility should be recommended by a qualified health professional.

3. Isolation and quarantine facilities

Hotels, hostels and other rooming facilities not adequately utilized can voluntarily become certified as quarantine or isolation facilities. Should it become medically necessary, some facilities should be designated as isolation and quarantine facilities by the appropriate state and federal authorities. The facilities and their workers can be paid by the government and will operate with the assistance of health and medical personnel.

4. Telehealth

Healthcare services that can be delivered remotely should be to reduce contact. The mode of delivery should be determined by medical personnel based on capabilities of the patient and the matter requiring review.

VIII. Prevention

Masking

Masking is a public health issue, not a political one. It is more than a fashion statement. Universal masking in hospitals is associated with lower transmission of COVID-19 between patients and health care workers (HCW) and among HCW. We therefore recommend universal masking in hospitals when respiratory pandemics and epidemics exist such as COVID-19 and influenza. Masks should also be worn constantly on public transportation and at terminals. We also recommend universal masking in restaurant and catering kitchens at all times. During the pandemic, wait staff should always wear effective masks and diners should wear masks, whether indoors or outdoors, when they are not eating or drinking. Schools and other complex gatherings where a variety of activities are occurring will require specific individualized guidelines.

Masks and facial covering should be rated and categorized for consumer and healthcare/ public health use based on WHO, CDC and OSHA standards.

Handwashing

Handwashing is a well-established, highly effective and relatively low-cost public health and medical procedure. Handwashing for 20 seconds kills germs, including coronavirus. Soap and water break down dirt and grime and, in most cases, decontaminates germs such as bacteria, fungi and viruses. Alcohols, particularly isopropyl alcohol greater than 70%, can also accomplish this.

Physical distancing (social distancing)

Unlike higher forms of life, germs do not usually perform locomotion. Germs move around by contact, spraying or aerosolization. Physical distancing mitigates the efficacy of these processes.

Disinfection of surfaces

Surfaces can be [disinfected from SARS-CoV-2 with bleach or alcohol](#). The alcohol is usually isopropyl alcohol and should be greater than 60%. A commonly used bleach is sodium hypochlorite (NaClO), a chlorine-based bleach usually in a 3% to 6% water solution. Other bleaches include hydrogen peroxide (H₂O₂) at 3% and sulfur dioxide. Bleaches are generally diluted for safety when used to disinfect household or institutional surfaces. Sunlight also acts effectively as a bleach.

The CDC and the Environmental Protection Agency ([EPA](#)) recommend gloves and adequate ventilation when bleaches are used. They also recommend reading commercial labels for appropriate use, including contact time necessary for disinfection. Mixing these products should be avoided.

It should be common knowledge that bleaches, or disinfecting alcohols should not be ingested or brought in contact with the eyes or other sensitive body surfaces.

IX. Clinical care gaps

We identified in our previous report that pandemics in general and COVID-19 has created gaps in medical care resulting in significant morbidity and mortality. Gaps in care directly or indirectly caused by COVID-19 include pressure ulcers and limited attention to potentially life-threatening diseases such as CHF, ESRD, DM, SMI and childbirth complications. One such clinical condition is pressure ulcers. One clinician on our team has identified a series of three patients where pressure ulcers directly resulted from inadequate care caused by isolation and lockdown procedures.

Case 1

The first case is a 76-year-old nursing home resident who was admitted to the hospital for mental state change due to COVID-19. This patient was post-stroke with quadriparesis and required total assistance with feeding, toileting and bed positioning. Within one week of hospitalization she became malnourished from inadequate oral intake and developed a sacral pressure ulcer likely from inadequate repositioning and bodily waste removal. Placement of a feeding tube was delayed for more than two weeks due to unavailable elective procedures (peg placement). The pressure ulcer which had progressed to stage 4 with osteomyelitis and sepsis finally improved with a peg placement and discharge home where the one to one feeding and toileting care was provided by family.

Case 2

The second is a 72-year-old quadriplegic gentleman with cervical myelopathy admitted to the hospital due to respiratory symptoms associated with COVID-19. He was discharged from the hospital after two weeks with a new stage 2 sacral ulcer. The wound healed after two weeks at home under the care of his wife.

Case 3

The third case is a 92-year-old lady with dementia and diabetes who was being managed at home with tube feeding under the direction of a home care agency. The clinical findings observed on the house call performed on the day of the patient's death was consistent with overwhelming sepsis from a stage 4 pressure ulcer that had tunneled in multiple directions towards the left hip and the rectum. The patient's daughter, who is the primary caregiver, indicated that the nurse practitioner who had been coming regularly to manage the wound had stopped coming three weeks before after the lockdown had started. The daughter was instructed by phone by the home care agency to continue current treatment. It was quite apparent that the condition of the wound had changed but not diagnosed and simple remedies such as antibiotics or debridement were never considered.

X. Conclusion

The public health decisions made by our elected officials and the actions executed by our public health agencies and medical decision makers were inadequate to contain the COVID-19 pandemic in Brooklyn, New York and the United States. We base this on a critical analysis of the process of the public health response and the health outcomes of the population. In the United States of America, the infection rate of COVID-19 is six times greater than the world average and the death rate is five times greater. If you lived in China, your chance of being infected with COVID-19 would be 300 times less than in the United States and your chance of dying would be more than 200 times less. These are poor health outcomes for the richest country in the world.

In 1910, [a critical analysis of American medical education](#) resulted in the closure of almost half of the medical schools. In the ensuing century innovation and discovery thrived in America. Racism, poverty, industrial pollution and infectious diseases were beaten back.

The [1918 influenza pandemic](#) triggered a feverish effort and interest in scientific inquiry by scientists in America and around the world. This led to the discovery DNA, 20 years ago by Canadian American researcher, [Oswald Avery](#) at the Rockefeller Hospital. This discovery launched the field of molecular biology and immunology, arguably, the basis of 20th century medical advancement.

Now, in the dawn of the 21st-century, failure to adequately manage the social determinants of health threaten our survival. COVID-19, like the 1918 influenza pandemic, can serve as a wakeup call and a call to action. We will continue to suffer and die at rates higher than the rest of the world if we do not provide universal, good quality healthcare for all the people. If we continue to segregate our population with unequal opportunity, we will fail in the battles with these existential threats.

For now, we must cover our faces and clean our spaces. We must keep our hands clean. We must stop lying to ourselves and each other. We must unite and focus on defeating COVID-19. When the pandemic blows over,

we must stay united and resolve to fix racism, fix poverty and fix the environment.

XI. About the Authors

[Donald E. Moore, M.D., M.P.H.](#)

Clinical Assistant Professor, Weill Medical College of Cornell University and SUNY Downstate Medical School. Dondoc007@aol.com (718) 622-2042

[Monica Sweeney, M.D., M.P.H.](#)

M. Monica Sweeney, MD, MPH, FACP is professor emeritus in the Department of Health Policy and Management in the School of Public Health at SUNY Downstate Medical Center.

M.monica.sweeney@gmail.com

Robert Smith, M.D., M.P.H.

Public Health Consultant. Luke.423@hotmail.com

[Myriam Ochart](#), CSSBB, CQA, CMQ/OE

Six Sigma Black Belt Project Manager. Myriam.Ochart@amadeus.com