Executive Summaries

Diagnosis and Testing:
Since the onset of the Covid-19 global pandemic much of what was initially believed about the virus has changed. In the beginning, knowledge was based on previous disease outbreaks, however as research emerged it became clear that this novel virus behaved in unpredictable ways. This article examines what new information has emerged and what we’ve learned about Covid-19 in the past seven months. Topics include mask wearing, surface transmission, airborne transmission, asymptomatic and presymptomatic spread, and testing methods.

Treatment and Therapies:
The World Health Organization’s (WHO) guidance at this point lists only which groups of people should have priority access to vaccines. The US National Academies of Sciences, Engineering, and Medicine (NASEM) guidance goes a step further by ranking priority groups in order of who should get a vaccine first.

After health-care workers, medically vulnerable groups should be among the first to receive a vaccine, according to the NASEM draft plan. These include older people living in crowded settings, and individuals with multiple existing conditions, such as serious heart disease or diabetes, that put them at risk for more-serious COVID-19 infection. The plan prioritizes workers in essential industries, such as public transit, because their jobs place them in contact with many people. Similarly, people who live in certain crowded settings -homeless shelters and prisons, for example -are called out as deserving early access.

In the United States, the NASEM committee is due to issue a final plan in October. Ultimately, the CDC will consider these recommendations among others while developing its own vaccine-allocation plan for the country, expected later this year. That will be the guidance that public-health departments, doctors and pharmacies should follow when handing out vaccines, assuming that one has been proven safe and people are willing to take it. Experts encourage health departments around the world to take in account the different historic scale and unique epidemiology of the coronavirus pandemic in each country.

Exit Strategies:
It is very clear that the mitigation of the COVID-19 pandemic has been accompanied by the infodemic, where there is an overabundance of mis and disinformation that is being spread throughout the society, impacting how people find trustworthy sources of information, as well as their trust and confidence. It is important that the infodemic is addressed on a global scale, with organizations, such as the World Health Organization, taking measures and developing initiatives that fight the spread of misinformation. However, efforts should also be taken nationally, including creating innovative strategies to combat mis and disinformation.
News Highlights
(up to 08/10/2020)

- Calm down about political ‘mischief’ around COVID-19 vaccines, scientists say Science
- The messaging has to be based on trust’: American Lung Association seeks to dispel COVID-19 misinformation USA Today
- Coronavirus: How to tell which countries are coping best with Covid BBC
- COVID-19: Nitric oxide shows promise as antiviral treatment Medical News Today
- What to Know About Vitamin D and COVID-19 Healthline
- Saying human trials aren’t enough, researchers call for comparison of COVID-19 vaccines in monkeys Science
- Coronavirus: Specialist 'long Covid' clinics to be set up in England BBC News
- COVID-19 disrupting mental health services in most countries, WHO survey WHO
- Could The Live Flu Vaccine Help You Fight Off COVID-19? NPR
- Ironic Twist: In Spring Trump Halted Research Key To COVID-19 Drug He's Now Taken NPR
- UK’s COVID testing system hit by Roche supply chain glitch REUTERS
- Global partnership to make available 120 million affordable, quality COVID-19 rapid tests for low- and middle-income countries WHO
- Fourth large-scale COVID-19 vaccine trial begins in the United States NIH
- An Experimental Drug Protects Covid-19 Patients, Eli Lilly Claims NY Times
- Boost for global response to COVID-19 as economies worldwide formally sign up to COVAX facility WHO
- Substance use disorders linked to COVID-19 susceptibility NIH
- Covid-19 vaccinations could start in November or December, Fauci says CNN
- UN chief: COVID-19 vaccine must be affordable and available to all UN News
- Hidden immune weakness found in 14% of gravely ill COVID-19 patients Science
- Under 10 Percent of Americans Have Covid-19 Antibodies, Study Finds NY Times
- Vaccine Chaos Is Looming The Atlantic
- Coronavirus: Europe experiencing ‘pandemic fatigue’ BBC News
- No, the Coronavirus Is Not Like the Flu NY Times
- Coronavirus: New global test will give results ‘in minutes’ BBC News
COVID-19: WHAT HAVE WE LEARNED SO FAR?

It's been nearly seven months since the World Health Organization (WHO) first declared Covid-19 a pandemic disease on March 11, 2020, and since then the novel coronavirus SARS-CoV-2 has had calamitous effects on human health, society, and our global economy.1 With more than a million deaths and 35 million cases in 188 countries as of October 7th, 2020 Covid-19 changed life as we knew it as it swept across the globe.

As researchers rushed to uncover facts about the virus, new and conflicting information was constantly released, creating confusion for the public and policymakers alike. In the beginning knowledge was based on previous disease outbreaks, however as research emerged it was clear this novel virus behaved in unpredictable ways. Additionally, since we are psychologically more likely to hang on to information we are given first despite conflicting information that might follow, we often make a common judgment error known as anchoring bias. Now, as restrictions continue to lift and businesses reopen it seems imperative that we pause and examine what new information has emerged and what we've learned about Covid-19 in the past seven months.3

1. Masks really do work.

At the start of the pandemic the WHO held off on mandating masks, news articles proclaiming the limited ability of masks flooded the internet, as did calls to save protective equipment for health care workers and those in need. At first the consensus was that surgical masks were useless or might lure people into a false sense of security4. On March 30th, WHO officials recommended against healthy individuals wearing masks and the US surgeon general urged people to stop buying them, claiming there were “limits to how a mask can protect you”.5 Months later the WHO have changed their recommendation, and we now know that any mask whether it be N95, surgical, or cloth is better than no mask.6 What’s more is that we actually have research to support which masks might be most effective. A recent study from Duke University published in the journal Science Advances ranked 14 common types of masks in order of effectiveness. The study found N95 masks without valves to be the most effective at blocking the wearer’s respiratory droplets and surgical masks to come in second place. Interestingly enough, a couple 2-layer polypropylene and cotton masks to be more effective than a valved N95 mask and bandanas, knitted masks, and neck fleeces to be the least effective.7

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At the start of the pandemic, while public health specialists advised us against masks they suggested washing our hands frequently, disinfecting surfaces, and avoiding face-touching were the best methods to prevent infection. While that is good advice in general, more recent literature has confirmed that surfaces are not the main mode of transmission for Covid-19. The initial studies were done in lab settings and might not have reflected real-life conditions. A recent study published in The Lancet examined surface transmission in such conditions and found the viral particles on surfaces inviable, suggesting “environmental contamination leading to transmission is unlikely in real-life conditions.”

**Figure 1.** The results from the Duke University study display the effectiveness of 14 different masks displayed in figure 2.


**Figure 1.** Types of masks tested. The numbers correspond with the x-axis of figure 1.

**The takeaway:** Literature supports that masks are majorly effective if universally worn with valve-less N95 masks ranking the most effective, surgical masks ranking second, and bandanas and neck fleeces ranking last. 2-layer cotton masks were also found to be more effective than initially thought. Universal masking policies are important to any national strategy.

**2. Surfaces are not the main mode of transmission**

The takeaway: It’s still a good idea to wipe down heavy traffic surfaces such as doorknobs, counter tops, and light switches. You should still avoid touching your eyes, nose or mouth without washing your hands first, but there is most likely only a low-risk associated with surface transmission. Mask wearing and social distancing are more important methods to infection prevention.

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Initially public health experts declared large droplets expelled from coughs and sneezes were the main mode of Covid-19 transmission. The belief was that these droplets were heavy and fell to the ground rather than staying in the air. With the exception of certain medical procedures that seemed to cause the virus to exist in the air, or be aerosolized, it seemed the virus spread exclusively from close contact with an infected individual. Now, months later, most scientists seem to agree the data suggests otherwise. On October 5th, 2020 the CDC released updated guidance confirming that Covid-19 spreads through various sized droplets. Large ones that fall out of the air within seconds and smaller droplets and particles that can remain suspended in the air for minutes to hours and travel far from the source if pushed by a fan or air currents. The CDC goes on to confirm what dozens of scientists have been suggesting, the virus can spread through the air in areas with poor ventilation or a fan that circulates the air around a room rather than pushes the air outside. They state that airborne transmission has been observed on several well-documented occasions, over long distances and times.

According to the CDC documented cases of airborne transmission tend to occur:

A. In the presence of an infected individual for more than 30 minutes in an enclosed space
B. In an enclosed space shortly after the infected individual had left
C. In an indoor space where individuals have been singing, shouting, or exercising
D. In an indoor space with poor ventilation or air handling that might cause a build-up of small droplets and particles in the air over time.

This confirms what countless studies are suggesting with the most recent studies finding infected individuals to exhale millions of viral RNA particles per hour in the early stages of the disease, and documenting superspreading events in some nursing homes to poor ventilation.

**The takeaway:** Airborne transmission happens in enclosed indoor spaces, especially over long periods of time or if singing, shouting, or high-intensity exercising. Policies should be revised to reflect new airborne transmission facts. Recommendations include restricting indoor gatherings differently than those that take place outdoors. For example: outdoor dining poses a relatively lower risk than the risk associated with indoor dining, even at a reduced capacity, when airborne transmission is considered. Similarly, outdoor group classes are considered lower risk than indoor high-intensity group exercise classes. Regulations regarding ventilation could also be reviewed to ensure indoor settings provide adequate ventilation where the air-flow moves out of the room rather than circulating inside. By limiting interaction indoors, avoiding air recirculation, and improving ventilation, inhalation risk can be reduced.

As restrictions were lifted and businesses opened up many implemented temperature checks for customers, a method previously used effectively for the previous SARS-1 outbreak several years ago. While temperature checks might be effective in stopping symptomatic individuals, Covid-19 is unique in that many of those infected with the virus show no symptoms at all despite being infectious. A summary released by the CDC regarding the latest data “shows about two-thirds of the Covid-19 transmissions in the United States come from people not showing symptoms” in previous issues we’ve discussed alternatives to fever checks that take into account asymptomatic and pre-symptomatic individuals such as smell tests, since significantly more asymptomatic individuals experience a loss of smell versus a fever, and coronavirus sniffing dogs. The significant asymptomatic spread also underscores the importance of social distancing and universal mask wearing for effective infection control.

The takeaway: Recent studies suggest pre-symptomatic and asymptomatic individuals are as contagious as those who are symptomatic only emphasizes the importance of social distancing and mask wearing regardless of symptoms. A clear national mask wearing policy and campaign might prove beneficial in curbing pre-symptomatic or asymptomatic spread. Mask wearing could even contribute to milder cases of infection according to one recent study.

5. Nasal Swabs might not be necessary

By now many of us are familiar with the standard PCR test using a nasal swab, but recent studies have begun to show that saliva tests might be just as effective. In June, Japan announced they would start saliva-based testing for individuals with symptoms for more than 9 days. In April, a preprint study from Yale University suggested saliva tests might be more sensitive than a test from a nasal swab, and on September 25th, a breakthrough study was published in Japan declaring saliva samples as effective and sensitive as nasal swabs. In one of the largest studies comparing saliva-based tests to nasal swabs, about 2000 asymptomatic individuals were tested the saliva tests were found to have a sensitivity of 92% and a specificity of 99.96% while the nasopharyngeal swab tests had a sensitivity of 86% and a specificity of 99.93%. While the two sample forms were comparably effective, saliva tests have “significant logistical advantages” in comparison with the nasal swabs. The swabs, which are costly and often in short supply, put healthcare workers at risk during sample collection while saliva samples can be reliably self-administered, in cost-effective spit cups and without the need for expensive transport media. Couple that with the early release study from the CDC published in September entitled ‘Saliva Alternative to Upper Respiratory Swabs for SARS-CoV-2 Diagnosis’ reconfirming the papers from Japan and it seems like saliva samples might be in our future as a less painful more efficient testing method. The shift from nasopharyngeal swabs to spit samples highlights perhaps the most important lesson we have learned so far: what we know about this virus is going to keep changing.

The takeaway: Self-administered saliva samples have been shown to be as sensitive and specific as nasopharyngeal swabs with significant logistical advantages by numerous studies. A shift in testing policy to allow saliva samples for PCR-based tests might be cost efficient and beneficial for policy makers and healthcare workers alike. Further investigation into saliva based tests as well as other recent developments in testing could result in more effective and cost-effective national testing strategies.
As the pandemic continues to put millions at risk daily, including health-care workers, older people and those with pre-existing diseases, who should get vaccinated first?

On September 14, a strategic advisory group at the World Health Organization (WHO) agreed with the preliminary guidance for global vaccine allocation, identifying groups that should be prioritized. These recommendations join a draft plan from a panel assembled by the US National Academies of Sciences, Engineering, and Medicine (NASEM), released at the beginning of September 2020.

Experts praise both plans for addressing the historic scale and unique epidemiology of the coronavirus pandemic. And they commend the NASEM for including in their guidance minority racial and ethnic groups - which COVID-19 has hit hard - by addressing the socio-economic factors that put them at risk.

The WHO plan, on the other hand, is still at an early stage and will need more detail before its recommendations can become actionable.

A TIERED APPROACH by NASEM
NASEM has proposed a five-phase plan to fairly allocate a coronavirus vaccine to US residents.

Phase 1 Health-care workers and first responders (5%)

Phase 2 People with underlying conditions that put them at high risk of severe COVID-19 disease or death, and older adults in densely populated settings (10%)

Phase 3 Essential service workers at high risk of exposure, teachers and school staff, people in homeless shelters and prisons, older adults who have not already been treated and people with underlying conditions that put them at moderate risk (30–35%)

Phase 4 Young adults, children and essential service workers at increased risk of exposure (40–45%)

Phase 5 All remaining residents (5–15%)

Note: Phases 1 and 2 might occur in tandem. Per cent is the percentage of the US population to receive a vaccine. Source: NASEM

Many nations already have general vaccine-allocation plans, but they are tailored for an influenza pandemic rather than the new coronavirus. They typically prioritize children and pregnant women; the COVID-19 plans do not, however, because most vaccine trials currently do not include pregnant women, and the coronavirus seems to be less deadly to children than influenza is. The NASEM guidance, in fact, recommends giving children COVID-19 vaccines during one of the final phases of its allocation plan.

Unlike the NASEM guidance, the WHO plan notes that government leaders should have early access but cautions that people prioritized in this way should be “narrowly interpreted to include a very small number of individuals who identified as important to push themselves to the front of the line”.

1http://www.nature.com//
Access for disadvantaged groups is addressed in both plans. Looking to past failures, the WHO guidance urges richer countries to ensure that poorer countries receive vaccines in the earliest days of allocation. During the 2009 H1N1 flu pandemic, “by the time the world had figured out how to get vaccines to low- and middle-income countries, the pandemic was over”.

But the WHO proposal does not yet suggest how nations might resolve the tension between allocating vaccines in a country versus allocating them among countries, says Angus Dawson, a bioethicist at the University of Sydney in Australia, who published a review of national pandemic allocation ethics earlier this year. In other words, should harder-hit nations receive a bigger allocation of an early vaccine before other nations have a chance to dose their high-priority groups?

The NASEM was asked to develop its allocation plan by both the US Centres for Disease Control and Prevention (CDC), which will set the US government’s COVID-19 vaccination plan, and the US National Institutes of Health (NIH), which is coordinating vaccine and treatment trials. The panel determined that high risk groups including racial and ethnic groups are vulnerable for socio-economic reasons tied to systemic racism, for example, they have high-risk jobs and live in high-risk areas, and therefore addressed the request through this lens, without singling out the groups because of their racial or ethnic identities.

The NASEM panel therefore proposes a lengthy list of essential workers who should get priority access to a vaccine, including grocery-store workers, transit workers and postal workers. People from hard-hit ethnic and racial groups are overrepresented in these jobs.

The WHO’s strategic advisory group will continue to update its guidance, first to assign rankings to its priority groups, and then to include real data from vaccine trials, such as how effective a given vaccine is in older people. Although the guidance is available to all WHO member nations, none is compelled to implement it.

This Values Framework offers guidance globally on the allocation of COVID-19 vaccines between countries, and to offer guidance nationally on the prioritization of groups for vaccination within countries while supply is limited. The Framework is intended to be helpful to policy makers and expert advisors at the global, regional and national level as they make allocation and prioritization decisions about COVID-19 vaccines. This document has been endorsed by the Strategic Advisory Group of Experts on Immunization (SAGE).

The Values to Priority Groups table can be a useful resource for countries as they decide on priority groups for COVID-19 vaccination. The document explicitly connects priority groups with specific value principles and objectives. Given country-specific nuances in epidemiology, demographics, and vaccine delivery systems, these priority groups will need to be further interpreted at a national level. This process should be led by national health experts in wide consultation with stakeholders. Country-level decision making will

1 https://www.nature.com
require data collected, or at least collated, at the country level. The Values to Priority Groups section can help countries identify where more local data are needed and where investment now might be required to ensure vaccine delivery platforms that can effectively reach prioritized groups. Of note, two principles that do not directly implicate priority groups have important implications for national prioritization processes. The equal respect principle requires that careful attention be given to the question of who should be eligible for inclusion in national immunization programs, so that no one is left out of consideration for unjustifiable reasons. The equal respect principle also requires that everyone who satisfies the criteria and reasoning supporting the prioritization of a certain group be included within that group. The legitimacy principle provides guidance on how the process of prioritization should proceed, with safeguards to ensure trust, and to help protect against corruption and self-dealing. Also of note, the groups identified under the national equity principle may need to be further refined at the global level. Countries must ensure that vaccine access is equitable based on gender, race, socio-economic status, ability to pay, location and other factors that often contribute to inequities within population.

### Principle

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<th>Groups and Other Considerations</th>
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| Human Wellbeing | Reduce deaths and disease burden from the COVID-19 pandemic. | Populations with significantly elevated risk of severe disease or death:  
- Older adults defined by age-based risk - may vary by country/region, specific cut off to be decided at the country level by national health experts/NITAGs based on differential mortality by age.  
- Older adults in high risk living situations (examples: long term care facility, those unable to physically distance)  
- Groups with comorbidities or health states (e.g. pregnancy/lactation) determined to be at significantly higher risk of severe disease or death (list to be developed later)  
- Sociodemographic groups at disproportionately higher risk of severe disease or death  
- Populations with significantly elevated risk of being infected:  
  - Health workers at high or very high risk, as defined by interim guidance forthcoming from WHO and International labour organisation ILO.  
  - Employment categories unable to physically distance.  
  - Social groups unable to physically distance (examples: geographically remote clustered populations, detention facilities, dormitories, military personnel living in tight quarters, refugee camps).  
  - Groups living in dense urban neighbourhoods.  
  - Groups living in multigenerational households.  
- Age groups at high risk of transmitting SARS-CoV-2  
  - Non age-based population groups with significantly elevated risk of infection and transmission.  
  - School-aged children to minimize disruption of education and socioemotional development.  
  - Groups targeted as part of an emergency outbreak response using emergency vaccine reserves.  
  - Workers in non-essential but economically critical sectors, particularly in occupations that do not permit remote work or physical distancing while working. |
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| Human Wellbeing    | **Protect the continuing functioning of essential services, including health service.** | ▪ Health workers.  
▪ Essential workers outside health sector (examples: police officers and frontline emergency responders, municipal services, teachers, childcare providers, agriculture and food workers, transportation workers).  
▪ Government leaders and administrative and technical personnel critically needed for indispensable functions of the state (this group should be narrowly interpreted to include a very small number of individuals).  
▪ Personnel needed for vaccines, therapeutics, diagnostics production. |
|                    | **Treat the interests of all individuals and groups with equal consideration as allocation and priority-setting decisions are being taken and implemented.** | The equal respect principle requires that careful attention be given to the question of who should be eligible for inclusion in national immunization programs, so that no one is left out of consideration for unjustifiable reasons. The equal respect principle also requires that everyone who satisfies the criteria and reasoning supporting the prioritization of a certain group be included within that group. |
|                    | **Offer a meaningful opportunity to be vaccinated to all individuals and groups who qualify under prioritization criteria** |                                                                                                                                                                                                                                    |
| Human Wellbeing    | **Ensure that vaccine allocation takes into account the special epidemic risks and needs of all countries; particularly low-and middle-income countries.** | Priority groups that are identified through this values framework process inform allocation decisions at the global level, with special attention to the needs of low-and middle-income countries. |
|                    | **Ensure that all countries commit to meeting the needs of people living in countries that cannot secure vaccine for their populations on their own, particularly low-and middle-income countries.** | Countries with sufficient financial resources should refrain from undermining vaccine access to low and middle-income counties by contributing to market conditions that substantially disadvantage countries with less economic power. Financially able countries should participate and support approaches to ensure access to COVID-19 vaccine for resource constrained populations, including multi-lateral (e.g. COVAX Facility), bilateral procurement mechanisms, and/or other means of support. |
### Principle | Objective | Groups and Other Considerations
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National Equity | Ensure that vaccine prioritization within countries takes into account the vulnerabilities, risks and needs of groups who, because of underlying societal, geographic or biomedical factors, are at risk of experiencing greater burdens from the COVID-19 pandemic. | - People living in poverty, especially extreme poverty.  
- Homeless people and those living in informal settlements or urban slums.  
- Disadvantaged or persecuted ethnic, racial, gender, and religious groups, and sexual minorities and people living with disabilities.  
- Low-income migrant workers, refugees, internally displaced persons, asylum seekers, populations in conflict setting or those affected by humanitarian emergencies, vulnerable migrants in irregular situations, nomadic populations.  
- Hard to reach population group.

Reciprocity | Protect those who bear significant additional risks and burdens of COVID-19 to safeguard the welfare of others, including health and other essential workers. | - Health workers at high or very high risk, as defined by interim guidance forthcoming from WHO and ILO.  
- Health workers at low or moderate risk, as defined by interim guidance forthcoming from WHO and ILO.  
- Essential workers outside the health sector (see above) who are at high or very high risk of infection  
- Essential workers outside the health sector (see above) who are at low or moderate elevated risk of infection  
- COVID-19 vaccine clinical trial participants who did not receive an effective vaccine (examples: placebo recipients, recipient of vaccine products that did not show efficacy).

Legitimacy | Engage all countries in a transparent consultation process for determining what scientific, public health, and values criteria should be used to make decisions about vaccine allocation between countries. | The legitimacy principle provides guidance on how the process of prioritization should proceed, with safeguards to ensure trust, and to help protect against corruption and self-dealing.

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Table. Translation of values to (unranked) priority groups for COVID-19 vaccination.  
On September 23rd, 2020, a joint statement was issued by the WHO, UN, UNICEF, UNDP, UNESCO, UNAIDS, ITU, UN Global Pulse, and IFRC on the infodemic, which has been regarded to be a great challenge in dealing with the COVID-19 pandemic.\(^1\) As the WHO Director General, Tedros Adhanom Ghebreyesus, stated at the 2020 Munich Security Conference “We’re not just fighting a pandemic; we’re fighting an infodemic”.\(^2\) The statement by the WHO DG emphasizes the dichotomy associated with information during the fight against pandemic. The use of technology and social media was necessary to ensure that information is provided to keep people safe, informed, and connected. However, at the same time, these platforms for disseminating information were also enabling an infodemic that was jeopardizing measures to control the pandemic.

An infodemic is when there is an overabundance of misinformation through several platforms, either online or offline, that undermines the public health efforts to address an emergency situation, as a way to advance an alternative agenda of individuals or groups.\(^1\) The dissemination of wrong information with or without the intention to mislead, is considered disinformation or misinformation respectively. Both lead to increased noncompliance to public health measures, loss of lives, and stigmatization, which endanger a country's ability to address and mitigate a public health crisis. Misinformation leads to the lack of appropriate trust and confidence for public health interventions, which are essential during a pandemic, such as testing, tracing, and vaccinations. Furthermore, disinformation can lead to a polarization and politicization of science, increasing the risk of conflict and threatening democracy, human rights, and social cohesion.\(^1\)

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2. "The COVID-19 infodemic", The Lancet Infectious Diseases; EDITORIAL| VOLUME 20, ISSUE 8, P875, AUGUST 01, 2020
The sharing of scientific data and medical information during the pandemic for the benefit of enhancing public health measures in addressing the complications associated with the pandemic, before it has been thoroughly vetted through a peer-review process (i.e. preprints), can be challenging and particularly dangerous at times.\(^2\) The reason for this is that during the pandemic, the anticipation of new science and data is heightened; thus decisions makers are presented with data that might vary within a very short timeframe. This can have implications in policymaking and national messaging measures.\(^2\) Furthermore, because policymaking is not solely dependent on evidence or data, taking into account other considerations, such as political interests, often leads to false reassurances. For example, as more scientific data and evidence is gathered on the pandemic, government messaging may not always be consistent and may in some cases, may lead to reversals in previous recommendations and messages made to the public.\(^2\)

In certain countries, mixed messaging and miscommunication have been issues that have, in some cases, led to politicization of science and the undermining of advice and expertise of scientists, researchers and infectious disease experts.\(^2\) For example, the issue of masks and their role in protecting against transmission, has continued to be a political issue in the United States, simply because of the misleading reactions of President Trump. In other countries, such as New Zealand, clear communication, empathy, and alignment of science from the leadership, allowed for a more unified strategy to combating the pandemic, leading to better management and eradication of the virus amongst the population. However, mass media also play an integral part of this process. Favoring quick wins in reporting, rather than carefully conveying the science, also adds to the mixed messaging, increasing public mistrust, adding more fuel to misinformation.\(^2\)

When asked the question as to who benefits from misinformation, Claire Wardle, co-founder, and director of FirstDraft, the world’s foremost nonprofit focused on research and practice to address mis and disinformation,\(^3\) identified three main aspects: financial gain, political gain, and experimental manipulation. An example of this is the anti-vaccination industry, where it has been shown the wellness and nutritional supplement companies are major supporters, and directly profit from, anti-vaccination campaigns.\(^4\)

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\(^2\) “The COVID-19 infodemic”, The Lancet Infectious Diseases; EDITORIAL| VOLUME 20, ISSUE 8, P875, AUGUST 01, 2020

\(^3\) https://cyber.harvard.edu/people/dr-claire-wardle

\(^4\) https://www.counterhate.co.uk/anti-vaxx-industry

\(^5\) https://firstdraftnews.org/latest/fake-news-complicated/
It took a series of measles outbreaks in the developed world in 2019, the so-called Peshawar incidence, for these Big Tech giants to address and acknowledge the role of their services in fostering the anti-vaxx movement. However, even then, their response has been limited; for example, Facebook noted that it would downrank or hide anti-vax content, while Twitter and YouTube would label it, but none of these platforms had any intention on removing the content, despite the scientific validity that vaccines are safe. The implication of an anti-vaxx movement for one vaccine can quickly be transposed to all vaccines, leading to mindsets and perspectives that are difficult to reverse, especially in the midst of a pandemic, where a vaccine could be the game changer in eradication the virus.

Thus, there is increased scrutiny in manuscripts published in scientific and medical journals, and the increased interest comes from not only the scientific community, but also include emotionally and informationally charged individuals, such as journalists, decision makers, and members of the general public. The editorials, as well as scientific manuscripts, that are published are conflated with content leading to the reporting of misinformation, which the journals themselves need to take more proactive measures to address the implications of an infodemic.

Seven Types of Mis and Disinformation. Source: FirstDraft

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1. https://www.counterhate.co.uk/anti-vaxx-industry
It is important that immediate and coordinated actions are taken to ensure that the global, political, corporate, and scientific community maintain the integrity and credibility of information as a means to empower the public and regain their trust. In order to combat the global infodemic of mis- and disinformation, at the World Health Assembly in May 2020, WHO Member States passed Resolution WHA73.1, which recognizes the criticality in providing reliable COVID-19 content, ensure that measures are taken to counter mis- and disinformation and leverage digital technologies to foster the response to the pandemic. The resolution also asks international organizations to address the infodemic by taking measures to prevent digital or cyber activities that can harm and undermine public health data, information and responses that are made to keep the public safe.

The UN system and civil society organizations are also calling on Member states to develop and implement actions to manage the infodemic by ensuring that science and evidence are at the foundation for information presented to the public. These action plans should emphasize the timely dissemination of information to communities and combatting the inaccuracy of information, while respecting the freedom of expression. As a part of the plans, the UN urges Member States to listen to their communities, to gather their ideas on how best to approach this, as well as empower their communities to mitigate the spread of mis- and disinformation, as well as develop solutions towards that end. Finally, the ability to put a dent in the infodemic will rely on other stakeholders to play their part as well, including researchers and technologists, to find tools that can address the impact of the infodemic, as well as leaders and influencers, to collaborate with their local and global communities to prevent the spread of mis- and disinformation.

### Initiatives Combatting Infodemic

- **Verified**: is an initiative of the United Nations, in collaboration with Purpose, which provides content that focuses on life-saving information, fact-based advice and stories. The goal is for everyday people to use the resources of Verified to spread reliable information about COVID-19, as a means to counter misinformation. The content is produced based on the latest information and guidance from credible organizations, such as the United Nations, the World Health Organization and other UN agencies. They also work with First Draft.

- **WHO’s Infodemic Management**: The WHO Information Network for Epidemics (EPI-WIN) aims to provide everyone access to timely and accurate advice and information from trusted sources on the COVID-19 public health emergency. In early April, WHO involved the public for an event focused on crowdsourcing ideas on an infodemic management framework. The goal was to ensure that all perspectives were gathered, and that everyone understands their role in addressing the infodemic response. Ideas were gathered from experts and 1,375 webinar participants, and over 500 ideas were also submitted. In June 2020, the WHO held the 1st WHO Infodemiology Conference, to discuss the formation of a trans-disciplinary science for infodemic management and evidence-based infodemic management interventions.

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3. [https://www.who.int/teams/risk-communication/infodemic-management](https://www.who.int/teams/risk-communication/infodemic-management)
Policy Implications and Recommendations

The infodemic is a serious challenge that needs to be addressed by each country and the global community, as it can have severe consequences in the fight against the pandemic. This will involve policymakers working with various members of the society to develop vigorous and innovative strategies to combat mis and disinformation at all levels: from a member of the general public to public figures and politicians. Strategies should include how information is used and provided via the media, especially social media, and the responsibility of all members of a community in the spread of information. There has to be some accountability embedded for spreading conspiracy theories and inaccurate information.