

C **VID-19**

Pandemic Report

Global Collaboration Project

The Team

Arakelyan Lusvard

Bezjian Alex

Cidelnikova Arina

Galstyan Nare

Patin Ophelie

Petrosyan Sateny

Xutao Tang

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Introduction

This initiative, driven by the young generation and called “The Young For Health”, aimed to bring together a group of about 5 to 12 young people, experience working together, collaborating globally, and together producing value. This is considered a global project because we gathered a group of 7 members across 4 countries. This included Armenia, France, Russia, and Taiwan.

Since the beginning of the Coronavirus pandemic, news outlets and websites have been giving different information regarding the virus’s origins and the numbers of infected people. There was also a lot of disagreement concerning how it first spread. Our initiative was to research the different aspects and its origins, its effect, and its evolution in similar cases in the future. That being said, it was necessary to give an accurate representation of how the virus affected our way of life. We created a report that will be offered for publishing online to News and health organizations and share with the world.

I thank all the team members who really did a great job in creating this report.

Origin

It has been quite some time, one year and about two months, since the world had to face the COVID 19 virus that became a part of everyday life for most people. **Since then the latest recording (as of publishing this paper) of total worldwide cases of infections is 115,841,898, total deaths being 2,573,274, and total recovered being 91,528,636.** Even though we practically have known about the virus for over a year now, scientists are still working to find out the origins of the virus. The more accurate information we get about the virus the faster will be the process of finding the best vaccine. Hence, many organizations spend enormous amounts of money to finally gather all the information needed to understand where COVID 19 comes from.

Since a large investigation is going on in China by the World Health Organization we can go through the information we already have about the virus. “The coronavirus that causes COVID-19 - known as SARS-CoV-2 - was first identified in the central Chinese city of Wuhan in January 2020, and most scientists believe it is still most likely that it originated in China. Peter Ben Embarek, WHO expert on food safety and zoonotic diseases, said Wuhan offered "the first solid clues" about the transmission of COVID-19 and any investigation would start there. Though some studies have suggested COVID-19 was present in Italy or Spain earlier in 2019, and that it might have been responsible for a spike in pneumonia cases in France, few researchers believe it could have entered Wuhan from Europe. Its closest relative in nature is the RaTG13 virus, which was discovered in horseshoe bats in southwest China's Yunnan province. The 96.2% genetic match between the two makes it highly likely that COVID-19 also originated in the bat colonies of China's southwest border regions”.

<https://www.usnews.com/news/world/articles/2021-01-18/factbox-the-origins-of-covid-19>

The first cases were identified in Huanan Market so currently, a team of World Health Organization scientists is working there to find out the origins of the virus. Experts say the

Huanan market still plays a role in tracing the origins of the virus since the first cluster of cases was identified there. The WHO-led probe in Wuhan has been plagued by delays, concern over access, and bickering between China and the United States, which accused China of hiding the extent of the initial outbreak and criticized the terms of the visit, under which Chinese experts conducted the first phase of research. The origins of the virus have become highly politicized, and some Chinese diplomats and state media have thrown support behind theories that the virus potentially originated in another country.

The WHO team visited the now disinfected and shuttered Huanan seafood market, where a cluster of pneumonia-like cases was first detected in late 2019 and which is long thought to have been a potential origin of the outbreak. Peter Ben Embarek, the leader of the WHO team and a food safety specialist, told CNN that "even if the place had been to some extent disinfected, all the shops are there -- and the equipment is there. It gives you a good idea of the state of the market in terms of maintenance, infrastructure, hygiene, and flow of goods and people." The team was able to talk to locals and workers, said Ben Embarek, adding that it was too early in their investigations to draw conclusions. Another WHO team member, Professor Thea Fisher, told CNN she'd been surprised by the "usefulness" of seeing a market that had been deserted for the past year. "We had some very good public health people with us who had actually been undertaking some of the environmental samplings at the market ... explaining to us exactly where they take the samples from the ventilation system. "Daszak, who specializes in zoonoses -- diseases that can be transmitted from animals to humans -- said the market visit was "to me a critical point in the trip. "We got to see the place where every infected person that was confirmed from that market had a stall, you got a feel for how new it was, what the infrastructure is like," he said. "Would it have been a messy place, a busy crowded place? So that was extremely useful." All the WHO team have cautioned that any findings from the current investigation are likely to take a

considerable amount of time, and spoken of a need to "manage expectations," even as the eyes of the world are upon them”.

<https://edition.cnn.com/2021/02/03/asia/wuhan-coronavirus-who-bat-lab-intl-hnk/index.html>

But again many theories suggest the virus did not start from Huanan Market. Many of the earliest reported cases had no connection with the market. “On Dec. 10, 2019, 41 Wuhan residents were hospitalized with what turned out to be COVID-19, but 13 of them had no link to Huanan. A team of Chinese researchers said there were two types of SARS-CoV-2 circulating in Wuhan, only one of which was associated with the market. Scientists also said the virus was unusually "pre-adapted" for rapid human transmission, making it unlikely that the first human contact was made at the seafood market”.

<https://www.usnews.com/news/world/articles/2021-01-18/factbox-the-origins-of-covid-19>

Another theory suggests that the virus was released accidentally from a virology lab in Wuhan, China. “Though there is no credible supporting evidence, some researchers still do not rule out the possibility that the virus was released accidentally by a specialist lab at the Wuhan Institute of Virology. There is no indication that SARS-Cov-2 contains any synthetic insertions, but some researchers say it could have been subject to a process known as "gain of function", where the lab forces the virus to become more infectious by exposing it to human receptor cells. Some experts say the WHO investigators need to be granted access to all the research conducted in the lab to see whether there are any closer matches than the RaTG13 virus. But there is another explanation why the coronavirus has proven to be so lethal. If SARS-CoV-2 had been circulating in humans throughout southwest China for months before it was finally identified in Wuhan, natural selection itself could have trained it to bind more effectively to those receptor cells. Fully optimized after months of human exposure, it made an explosive breakthrough at the Huanan market, where conditions were ideal for rapid viral transmission - though it was also very likely spreading elsewhere”.

<https://www.usnews.com/news/world/articles/2021-01-18/factbox-the-origins-of-covid-19>

Even if we have more or less information already the investigators state that this process is complex and the research may continue for years. Dominic Dwyer, a microbiologist, and infectious diseases expert, said the team in Wuhan had received the access it requested from Chinese authorities as it tries to understand the early days of the novel coronavirus outbreak first identified in Wuhan. “Everybody knows how it really exploded out of Huanan market in Wuhan, but the key is what was happening around that time and before,” Dwyer said. The origin of the coronavirus has become highly politicized following accusations that China was not transparent in its early handling of the outbreak. Beijing has pushed the idea that the virus could have originated elsewhere. More work needed to be done investigating how the virus could have been transmitted by animals, including bats, as well as into antibodies to coronavirus in people who did not show symptoms of the disease. The short term was “reviewing what we know now and bringing all that data together and there are going to be a series of longer-term projects, and this could take some years,” Dwyer said”.

<https://www.reuters.com/article/health-coronavirus-who-dwyer/understanding-covid-19-origins-will-take-years-says-who-team-member-idUSL4N2KB1Z4>

These investigations and the results may take years but even if they do it is critically important for the world to understand where the virus came from to be able to fix the consequences.

How Does it Spread

COVID-19 is a respiratory virus that can be spread from an infected person by coughing or sneezing: when the virus enters the person's body through the mouth, nose, and eyes, it begins to multiply. The awkward thing here is that the infected people can become a source of transmission while being clueless because of the absence of the symptoms. The close contact between people is one of the most common ways that coronavirus transmits “(within about 6 feet, or 2 arm lengths)” Center for Disease Control and Prevention, Frequently Asked Questions, <https://www.cdc.gov/coronavirus/2019-ncov/faq.html>, for example, when someone talks, sings, shouts, coughs or sneezes. That’s why keeping distance is important to protect yourself.

Another way of spreading the virus is airborne transmission via liquid particles by speaking, sneezing, coughing, etc. Provided by the World Health Organization “Aerosol transmission can occur in specific settings, particularly in indoor, crowded and inadequately ventilated spaces, where infected person(s) spend long periods of time with others, such as restaurants, choir practices, fitness classes, nightclubs, offices and/or places of worship. More studies are underway to better understand the conditions in which aerosol transmission is occurring outside of medical facilities where specific medical procedures, called aerosol-generating procedures, are conducted.” World Health Organization, Coronavirus Disease (COVID-19): How is it transmitted, <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19-how-is-it-transmitted>

The particles can linger in the air for minutes to hours, but the amount of infectiousness decreases when time passes and the respiratory droplets travel further from the person with coronavirus. Droplets have different sizes: larger droplets fall out of the air, and

smaller ones spread apart in the air. In this case, keeping indoor spaces well ventilated is key for self-protection.

The virus can be transmitted from infected surfaces. A sick person leaves bacteria when he/she coughs on surfaces or touches objects, such as chairs, doorknobs, and tables. After this, these microbes stay there and you can get the virus by touching your face with dirty hands after touching those areas. That's why it's mandatory to disinfect the surface before touching it and wash or sanitize hands.

How Social distancing and masks protect

“Social distancing is important to prevent the spread of Coronavirus. It is also called “physical distancing,” which means keeping a safe space between yourself and other people who are not from your household. Humans need to stay at least 6 feet (about 2 arms length) away from those people to practice social or physical distancing. Social distancing is important for all of us, but those who are at higher risk of serious complications caused by COVID-19 should be especially cautious about social distancing. People who are at high risk of complications include: Older adults. People who have serious chronic medical conditions like heart disease, diabetes, and lung disease.” Center for Disease Control and Prevention, Social Distancing,

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html>

Keeping social distance during different activities is essential to slow down the speed of Coronavirus. Getting fresh air and taking walks are important for our organism, but keep in mind to stay apart from non-family members. One of the main activities people do is using public transportation. While waiting at a station or being on the transport virus can be spread. Here people need to choose seats carefully, such as the back seat in a taxi to be safe. However, try to avoid using public transportation and replace it with walking or bicycling.

Many of the schools and universities nowadays have postponed their regular face-to-face classes and moved to remote ones to make it safer for students. Some stores have special hours for elders and markings to coordinate distance between one another. Go to stores only when it is essential and keep 6 feet distance from others. Try to reduce direct contact with other people by going to stores when there are a few people, or using delivery services. Most of the restaurants and bars are closed due to COVID-19 and serve only the most essential events with limited participants. Older people are at high risk of getting the disease, so it is better to keep communicating with friends and relatives via social media by calling, texting, or doing a video call. In spite of taking part in gatherings outside the house, you can find many online formats of concerts and displays as a lot of museums have uploaded their exhibits. Remember that each government's guidelines are different, so besides the above-mentioned tips always follow the local guidance.

Even practicing social distancing there is a need to wear masks. It helps to cut down the speed of virus transmission by reducing the droplets coming out from the infected person, and if the healthy one also wears a mask fewer droplets will get through, hence wearing masks protects the wearer too. "Coronavirus primarily spreads when someone breathes in droplets containing viruses that are produced when an infected person coughs or sneezes. People who are infected but do not have symptoms, or have not yet developed symptoms, can also infect others. That's where masks come in." Harvard Health Publishing, Preventing the spread of the coronavirus,

<https://www.health.harvard.edu/diseases-and-conditions/preventing-the-spread-of-the-coronavirus>

There are a bunch of types of masks to choose from. According to CDC, "Some masks work better than others to help stop the spread of COVID-19 outside of healthcare settings.

Medical masks and N-95 respirators should not be used because they should be conserved for healthcare personnel.

Recommended masks are:

Non-medical disposable masks

Masks that fit properly (snugly around the nose and chin with no large gaps around the sides of the face)

Masks made with breathable fabric (such as cotton)

Masks made with tightly woven fabric (i.e., fabrics that do not let light pass through when held up to a light source)

Masks with two or three layers

Masks with inner filter pockets” Center for Disease Control and Prevention, Your Guide to Masks,

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html>

Non-medical disposable masks are for single use and should be thrown away after first use, surgical masks are for healthcare workers and not to shortage its supply is better not to use them. Homemade masks can be used as well; they can be washed and reused if sewn correctly.

Here is a tutorial of how to make your own masks from CDC.

Those should be cleaned often with a washing machine or by hand, then dry them by dryer or put under sunlight.

There are also alternative types of masks such as clear masks or cloth masks with a clear plastic panel, those are used when interacting with people who have some disabilities, are deaf, and when they need to see the exact shape of the mouth for example while learning to spell something.

You need to know how to wear and remove masks properly. Clean your hands before putting on the mask and after removing them, make sure it covers your nose, mouth and chin, and do not touch the mask while wearing it. When taking off a mask be really careful “ untie the strings behind your head or stretch the ear loops, handle only by the earlaps or ties, fold the outside corners together, and wash hands immediately after removing.” Center for Disease Control and Prevention, Your Guide to Masks,

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html>

People who are really young, or have breathing or upper limbs movement disabilities:

“Children younger than 2 years old

Anyone who has trouble breathing

Anyone who is unconscious, incapacitated or otherwise unable to remove the mask without assistance

Wearing masks may be difficult for some people with sensory, cognitive, or behavioral issues. If they are unable to wear a mask properly or cannot tolerate a mask, they should not wear one, and adaptations and alternatives should be considered” Center for Disease Control and Prevention, Consideration for Wearing Masks,

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover-guidance.html>

To protect yourself you need to keep social distance from others, wear masks, sanitize and wash your hands frequently every time you get in touch with people outside the household. Always keep your eyes on local guidelines to have the latest applicable information.

Symptoms and Causes

Symptoms:

In the first half of 2020, experts recommended paying attention to the symptoms of ARVI, bronchitis or pneumonia: increased body temperature, cough, shortness of breath, muscle pain and fatigue. Currently, the human respiratory tract is severely affected. These symptoms were similar to those noted by the World Health Organization (“2019-nCoV: Another crowned Killer”). Now, on the website of the Ministry of Health of Russian Federation, this list is supplemented with nausea, vomiting and diarrhea (“Coronavirus-symptoms, signs, general information...”).

A rash is one of the most common but not officially recognized, symptoms. The most common variant of skin rashes – are spots of different diameters of red color. They do not itch, but the affected skin feels warm or even hot to the touch. Another variation is “Pink” rashes. They are flaky and can cause discomfort due to itching (“Symptoms of coronavirus”). Many citizens also note the loss of tastes and smells; however, officially the Ministry of Health does not consider them, perhaps because loss of smell or anosmia can be caused not only by COVID-19, but also by other upper respiratory tract infections: colds, sinusitis, and bronchitis.

Causes:

At first, the researchers thought that the virus was spread only through meat that was sold at the market in Wuhan, but unfortunately, this hope was not fulfilled. Today, the main officially recognized ways of infection are: the Airborne pathway (through coughing and sneezing) and the Contact pathway (through touching). The Contact path involves interacting

with the infected person's belongings, subway handrails, door handles, and other surfaces.

The relevant recommendations for preventing infection are:

The use of protective masks and gloves, avoiding visiting crowded places, frequent hand washing, etc. (“Coronavirus-symptoms, signs, general information...”)

Many people were afraid that the virus could be transmitted in parcels, however,

Rospotrebnadzor (The Federal Service for the Oversight of Consumer Protection and

Welfare) explained: “The virus persists on surfaces in a viable state for no more than 3 days.

Packages that come to us, for example, from China, travel for at least 2 weeks. Therefore, it is impossible to be infected through them. » (“COVID in the package.”)

Features in Russia:

The virus spread unevenly in Russia: the huge area and unequal population density led to the fact that remote regions remained completely healthy for a long time. For example, the first case in the Altai Republic (2.38 people per km²) was registered only in April 2020, while about 3 million cases were registered worldwide (“Coronavirus infection detected in the last region of Russia”).

Lockdowns

“Since China locked down the city of Wuhan on January 23rd, over a third of the world’s population has at one time or another been shut away at home” The Economist reported on May 23rd 2020 (see appendix, fig.1a; 1b; 1c: Lockdown policies’ evolution over time). However, two other methods before imposing any lockdown have been used around the world to avoid a large scale infection. First of all public authorities might influence the population's behaviour through clear communication (face-mask wearing, social distancing) and, in return, trust and obedience from citizens. Then, authorities might introduce a testing-tracing-isolating chain. Lockdown, or stay at home requirement, is also the last way to slow the progression of covid-19. This containment policy has been realised in different ways, from very strict rules to more easy-going measures. Clear communication and the testing-tracing-isolating chain have been progressively set up to enforce lockdowns’ benefits. Thus, lockdown should not be considered as a solely policy to fight with pandemic. It is admittedly a way to save time and lives while scientists are hardly working to find a therapy. The lockdown policy should be balanced with economical issues, democracy and social equality. Lockdown from its settlement to its release, continuously deals with various factors: number of infection, social acceptance, economic resources, public-health capacity and health-system capacity

Hence, this section aims at analysing this balance, starting from a historical perspective of this plurisecular measure and how it has been adjusted to covid-19 over the world. This statement would lead to understand to which extent some measures have been working better than others. Definitely, lockdowns have been reshaping our way of life, that is why a third part would clarify the social consequences on workers, imposed to work remotely. The last analysis of this section focuses on the lockdown’s lifting policy and in which way Governments and citizens can achieve it. There are different variations of

lockdowns in different countries around the world to help stop the spread of covid-19.

Lockdowns have been used for centuries to fight epidemics to balance the lack of scientific knowledge and treatments

Admittedly, lockdowns were used in the late 14th century. However, Thucydides, in History of the Peloponnesian war, has given evidence of the first known epidemics around 430 B.C. Introduction of quarantine and lockdowns coincides with the Renaissance period and first global trade. Main maritime platforms such as Ragusa (Dubrovnik) and Venice set up quarantine in order to fight plague. Thus, European wealthy cities imposed quarantine to any ship coming from abroad. Mostly, a forty day quarantine was a standard, based on common religious belief (the Christ spent forty days in the desert for instance). But the length of isolation depended later on each city, from 20 up to 100 days. Lockdown measures have been developed to fight the severe plague outbreak of 1630. John Henderson, in Florence Under Siege, Surviving Plague in an Early Modern City, underlines that some methods, such as contact tracing, travel ban or communication with neighboring territories to stop the infection chain, were already in force in the 17th century.

Lockdown's policy has been reshaped in the 21st century according to scientific progress. As Anne-Marie Moulin, CNRS Research Director, underlines, lockdowns are now based on new principles. First, lockdown decisions arise from a rational science, which has capabilities to elaborate tools to follow and finally to eradicate the virus. Thus, solely lockdown could not eradicate the virus as the World Health Organisation (WHO) warns on its website (Q&A, 15th of October 2020). It should be considered as a way for Governments "to buy time". Public authorities should take this extratime "to build their capacities to detect, isolate, test and care for all cases; trace and quarantine all contacts; engage, empower and enable populations to drive the societal response." Second, lockdown deals with democratic and individual rights and freedom. Around the world, citizens have various participation in

lockdown policy shaping. They are fully involved by giving their data, asked in order to adapt to local situations, or, on the opposite, they stand on the sidelines. Hence, public strategies to enforce lockdowns are different, mixing preventing, tracing and sanctioning policies.

Lockdown has been avoided in some countries thanks to their experience, their resilient health system and their clear political communication, but for others lockdown measure has appeared as a necessity and has been realised in a more or less strict manner. Some countries did not rely on lockdowns because of their experience of serious and widespread diseases. South Korea and Vietnam experienced the 2002-04 SARS and the 2015 MERS (Middle East Respiratory Syndrome) outbreaks. They have been able to implement a clear communication and an efficient tracking and testing system to contain the virus spread. In that respect, WHO reported on its interactive map about 10 deaths per 1 million population on the 9th of December in South Korea, while France reported about 860 deaths per 1 million population. Other governments adopted the “herd immunity” strategy and banned lockdowns. Thus, Sweden has adopted moderate restrictions and physical distancing, relying mostly on individual self responsiveness.

Besides those few countries, lockdowns have been widely spread over the world. However, talking about “lockdowns” raises several acceptances, depending on the one hand on science: health system resilience, medical knowledge and capacity to struggle with epidemics. After China closed Hubei province, some countries enforced strict lockdowns to help stop the spread of the pandemic. European countries, The U.S.A, and Italy started lockdowns from March 11th. Thus the majority of OECD countries have adopted strict rules and restrained mobility (see appendix, fig. 2 and 3). From an international perspective, rules have been similar to flat the curve. People have been allowed to go outside with a proven document for few necessary reasons: to work (if allowed despite the remote system); to buy

food and for critical reasons. Café, restaurants, theme parks, bookstores, libraries, universities, schools, cultural infrastructures (theatres, cinemas, museums) have been closed. To make sure people respect this stay-at-home order, some Governments doubled the strict lockdown rules with fines or even jail. Borders have been closed for many countries, even within the Schengen area. By contrast, only half of North American states have restrained cross-borders exchanges at the beginning of the pandemic.

Albeit, this international perspective calls for some nuances. Some countries have elaborated stricter policing than others to achieve a collective discipline, like China or France (see appendix, fig.3). Denmark, Norway and the Netherlands have chosen a mix of strict measures (e.g. France) and individual responsibility (e.g. Sweden) with high restrictions and low mobility losses. They “closed schools, banned high-risk activities and legislated distancing measures, but allowed most businesses to continue operations and put limited restrictions on individual movement, conditional on distancing rules being observed” (Pareliussen, J. and D.Glocker (2020) “Lockdown policies and people in the age of COVID-19: Lessons from the OECD Policy Tracker”). As a consequence, the results of lockdowns have been quite similar. Governments activated similar levers (mobility restrictions, closing crowded places, etc) but speed, intensity, and scale of lockdown’s implementation have differed in each country. The efficiency of lockdown measures could be analyzed through these factors.

Lockdown’s effectiveness fits with a (temporary, targeted, and timely) approach plus a combination of other medical and political tools

The benefits of the lockdown policy depend more on its temporary, targeted, and timely settlement than its stringency. Analyses from OECD (see appendix, fig. 4) give

evidence that stringency over lockdowns should not be considered as the most effective way to fight virus propagation. Admittedly, a high stringency allowed France, Italy or Spain for example, to reach an obvious peak of death per million inhabitants. Then the trend over these countries decreased fast. Yet, countries with easier containment measures like Denmark or the Netherlands also managed to bend the curve to the same level as countries with strict lockdowns, even though the peak of deaths is less obvious, meaning the drop of deaths was slower.

Lockdown's effectiveness to fight the pandemic should be better considered in the capacity of Governments to implement a quick answer. The earlier countries imposed some restrictions and did the best job at stopping the spread of the virus. As *The Economist* reported (4th of July, 2020), “Germany, Austria, and Switzerland all imposed national or regional lockdowns before they recorded 60 deaths. By contrast, Britain already had 300 deaths by March 23rd, when its Government ordered people to stay at home. This slow response allowed the virus to reach the entire country: 90% of Britons live in a region that has at least 25 confirmed deaths per 100 000 residents. (...) Sweden, which did not impose a lockdown at all, has suffered a similarly widespread epidemic.” Hungary and Poland have implemented their containment measures at the moment they recorded the first cases, learning from their neighbors, and as a consequence have contained the virus most effectively. Hence, *The Economist* found that “restriction on a region with fewer than 100 cases knocks 50% off its chance of reaching 25 deaths per 100 000 people in the next fortnight” (4th of July).

As a consequence, lockdown policies have been an effective way to geographically contain the virus. An early and localized settlement is the most effective policy, having a low economic, social, and medical cost. However, in order to prevent a large-scale spread of the virus, some measures have been implemented on a national scale. Thus, stay-at-home order

and teleworking are common measures set up in many countries, but they have social and economical consequences.

Lockdown raises social and economical inequalities as it reshapes our way of life and our social relations

Living conditions under lockdowns are unequal

Migrants, rough sleepers, and prisoners have endured a high inequality facing the pandemic and the lockdown restrictions according to Marie-Apoline Barbara from Tresor-Eco (Analysis service of the French Ministry of Finance and Economics) (paper published on the 7th of August 2020). Lockdowns have not created new inequalities but mostly highlighted old ones: “the lockdown amplified the consequences of many inequalities between ordinary dwellings, starting with differences in size.”

Developed countries imposed companies to work remotely to foster lockdown’s benefits but this system asks workers’ productivity in the long run

In order to enforce lockdowns, Governments have fostered companies to develop remote working systems. For instance, in France in 2017 only 3% of the working population have been used to work remotely once per week and 60% of them are managers. In France, as well as in Europe, the tertiary sector has managed to turn its activities into a teleworking system (see appendix, fig.4). Thus, Education, Finance, Public administration sectors have been operated remotely for more than 50%. Between 25% (Acemo Covid May 2020) and 44% (EpiCOV) of French employees have been working remotely in spring 2020. However, teleworking implementation has been quite complex during the first lockdown in spring 2020, mostly because many people experienced remote software for the first time, they lack a

specific working room or miss face-to-face quick communication. Moreover, parents have been dealing with teleworking and children's care as soon as schools shut down. Hence, teleworking has been developed but a too fast settlement led to some difficulties.

Consequences on productivity are still controversial. Empirical studies demonstrated various effects of teleworking on productivity in normal times. Some found it null, despite others finding some gains, starting from 5% up to 30%. However, the very specific context of covid-19 led to a productivity loss of 63% (Masayuki Morikawa (2020), "COVID-19, teleworking, and productivity"). Hence, the Tresor Eco n°270 concludes that part-time teleworking may improve productivity by combining positive factors of teleworking and at the workplace.

The strategies for lifting lockdowns have been realized through different approaches at the end of the "first wave" in summer 2020 with different results. Easing lockdowns are challenging for Governments. Lockdown is a temporary measure that cannot be extended in the long run because of its economical and social issues. This restriction gives "time for countries to reduce the incidence of disease and put in place robust, yet sustainable, measures to prevent and control transmission" according to the Lancet Journal (Han, Emeline, et al. « Lessons learned from easing COVID-19 restrictions: an analysis of countries and regions in the Asia Pacific and Europe ». The Lancet Journal, 7th of November 2020). Decisions to ease lockdowns are a combination of social, economical, and medical data. According to the national priority, Governments trigger different levers. According to the Lancet analysis, "whichever combination is chosen, Governments should be explicit about their goals and transparent in their decision making, and the measures taken should be parts of a clear overall strategy; however, this is not always the case". Hence, Lifting lockdown does not mean returning to the pre-pandemic normal life, "but about gradually and cautiously transitioning to a new normal, while being ready to reimpose measures if, and when, necessary".

The Lancet analysis reported two different methods used to end the first lockdown in spring 2020. Epidemiological thresholds led some countries (like Japan or Germany) to ease restrictions. At a certain level of R (reproduction number), these countries have been launching automatic restriction measures from easy to stringent lockdown. These restrictions have been implemented in localized outbreaks to preserve the whole country from a strict lockdown. Others, such as Singapore or Spain, based their decisions on a political calendar, but the risk estimation was unclear. Therefore, a strong and efficient monitoring system of the virus spread is required to achieve a lockdown lift and to control new contaminations. Governments should also give a clear plan of lockdown's lifting and explaining which criteria are taken into account.

A second lesson emerged from this analysis: communities should be highly involved in protecting themselves and others. "Authorities should ensure that they fully understand the reality of the situation faced by the people affected by their decisions, drawing on principles of co-production of policy. Advice should also be consistent and credible". Clear communication from Governments empowers citizens to behave safely. Advice consists of mask-wearing, social distancing, hand washing, tracing, testing, and isolating.

The achievement of lockdown's release is fundamentally based on an efficient tracing-testing-isolating system, even for asymptomatic persons. Confirmed cases have been caring in hospitals or other specific institutions in Asian countries. This organization has been more efficient than the stay-at-home requirement imposed by European countries. Finally, the Lancet Journal underlines the necessity of a strong investment in health care system capacity (facilities, labor force, furniture).

What Age Groups are Affected

Coronaviruses are a large family of viruses that cause illnesses ranging from the common cold to more severe diseases. These viruses are zoonotic, which means that they are transmitted between animals and people. COVID-19 was first noticed in Wuhan, a city in China. Because the virus was highly contagious, it was rapidly spread and continuously evolved in the human population. People all over the world have been affected by coronavirus disease which was the reason that WHO (World Health organization) decided to characterize it as a pandemic. COVID-19 has become the fifth documented pandemic. It follows the 1918 Spanish flu, 1957 Asian flu, 1968 Hong Kong flu, and 2009 Pandemic flu, which caused an estimated 50 million, 1.5 million, 1 million, and 300,000 human deaths, respectively.

COVID-19 spreads between people, basically when an infected person is in close contact with another person. The virus can spread from an infected person's mouth or nose in droplets when they cough, sneeze, speak, sing or breathe heavily. Other people get the virus when it gets into their mouth, nose, or eyes, which mainly happens when people are in close contact with the infected person. The virus can also spread after infected people sneeze, cough on, or touch objects, such as tables, doorknobs, and handrails. So after touching these contaminated surfaces, then touching their eyes, noses, or mouths without having cleaned their hands first, they can be affected very easily. Common signs of infection can be symptoms like fever, cough, shortness of breath, and breathing difficulties. In more serious cases, an infection might cause pneumonia, kidney failure, and even death.

“People of all ages can get COVID-19. However, evidence shows us that there are two groups of people under the higher risk of getting COVID-19 disease: older people (over 60 years old); and people with medical conditions such as cardiovascular disease, asthma,

diabetes, chronic respiratory disease, and cancer. The risk of this serious disease slowly increases with people who are over 40 years old.”

To limit the risks of getting COVID-19 WHO suggests following these precautions:

Follow local guidance. Check to see what national, regional, and local authorities are advising so you have the most relevant information for where you are.

Stay at least 1 meter away from others, even if they don't appear to be sick.

Wear a mask, especially when you can't physically distance.

Avoid crowded places and events, poorly ventilated indoor locations, and prolonged contact with others.

Open windows when indoors to increase the amount of outdoor air.

Avoid touching surfaces, especially in public settings, because someone with COVID-19 could have touched them before. Clean surfaces regularly with standard disinfectants.

Frequently clean your hands with soap and water, or an alcohol-based hand rub. If possible carry an alcohol-based rub with you and use it often.

Cover your coughs and sneezes with a bent elbow or tissue, throwing used tissues into a closed bin right away. Then wash your hands or use an alcohol-based hand rub”

Regardless of age, there are precautions all of us should take: frequent, thorough handwashing, avoiding nonessential travel and large groups of people, and disinfecting frequently touched objects. One of the most crucial steps those over 60 can take, though, is to avoid visiting with grandchildren and other young people. Although children, especially those without underlying conditions, seem to be less affected by COVID-19 than other groups, they are still likely to be carriers of the disease. While their symptoms might look like the flu or common cold, there is every possibility that they could have COVID-19 and spread

it to those around them. Even before people show symptoms, they can still be contagious, so everyone needs to limit their contact with others to avoid spreading the virus to others without knowing it.

Impact on Animals

The affected wildlife

Since early COVID-19 cases were related to the seafood market in southern China and the virus most likely originated in bats, the study also found that pangolins may be intermediate hosts for virus transmission from bats to humans. In any case, the COVID-19 outbreak has something to do with wild animals. Before SARS, wild animals had become the culprit of this terrible virus spread to humans, the habit of Chinese folk eating so much of the wildlife, left behind potential dangers for the spread of the virus. In order to prevent a similar tragedy again, There has been a ban to strengthen wildlife management in China, a total ban on the consumption of China's general wildlife "has an important ecological, scientific, and social value of terrestrial wildlife and other terrestrial wildlife, including artificial breeding, artificial breeding of terrestrial wild animals. There is a total ban on the hunting, trading, and transportation of land wildlife that naturally grows and breeds in the wild environment for food.

On September 30, China forestry and grassland bureau issued an "about specification notice fast classification management scope of wildlife, which made it clear that for the bamboo rat, civet and porcupine 45 kinds of wild animals, to actively guide the farmers to stop farming activities before the end of December 2020, so, farmed animals go from here? The National Forestry and Grassland Administration has put forward four methods of disposal, including scientific release to nature, conversion for non-edible and legal purposes, and handing over to the shelter and rescue organizations. However, if wild animals cannot be disposed of by the above three measures, they should be disposed of harmlessly promptly.

Abandoned pets

Abundant evidence indicates that a pet can also be infected with a novel COVID19. On 4 March 2020, AFCD announced that a dog tested positive for COVID-19. This was the

first dog in the world to be diagnosed with COVID-19. Perhaps it was due to fear of Virus from COVID-19 or financial burden that a large number of pets were abandoned during the epidemic. We have seen similar news in many of the countries affected by the outbreak, including the United States and the United Kingdom. Despite WHO's clarification that no clear data is showing that novel COVID19 can transmit from pet to human, pets are relentlessly abandoned.

In the early days of the epidemic, people were trapped in their homes. They adopted pets as a temporary relief from the loneliness and isolation at home. When they returned to work, they discarded the pets that had accompanied them through difficult times, US media reported. Meanwhile, homeless animal shelters are having a tough time due to Food shortages. The lockdown during the outbreak made food purchasing for animals a major problem.

Another issue is lack of lack of space. Shelters are overcrowded with stray animals and don't have the manpower or resources to care for them. There is also much financial hardship. Pet shelters have been cut off from their financial resources and are facing financial hardship.

A singer back at the top

When the novel COVID19 silenced the city, the song of the bird was restored to its former glory. The white-crowned sparrow is a very tenacious bird that can survive the hustle and bustle of the city. But increasing urban noise pollution is forcing male sparrows to make louder calls to be heard by rivals and mates, but the loud calls are definitely worse. A 20-year study of white-crowned sparrows in And around San Francisco compared their songs to those of 1970 and found that the lowest frequencies of their songs rose to avoid being drowned out by the noise of cars. In birds, the songs are less effective at intimidating rivals and attracting females. They also speed up the aging process and disrupt the birds' metabolism. However,

that changed during the epidemic, as people were trapped in their homes and the city became less noisy. The researchers found that the number of vehicles on San Francisco's Golden Gate Bridge has dropped to 1954 levels, and noise levels have dropped by 50 percent. In this way, sparrows are finally no longer Shouting at the top of their lungs, and their average singing voice is 30% lower than before the epidemic, back to 1970s levels.

Impact on Businesses

The arrival of the epidemic has had a great impact on many aspects of China, people's consumption level, product sales level, and so on. Mobile payment, big data, artificial intelligence, cloud computing... The rapid iteration of science and technology has inadvertently changed people's lifestyle, not only in the fields of smart city, travel, communication, etc., but also in the most traditional consumption fields, whose behaviors are changing rapidly, and the outbreak of the epidemic this year has further accelerated the changes.

1. Life of ordinary residents: vegetable market

Guangzhou Meat and Vegetable Market Association recently revealed to the media that there are more than 620 vegetable markets in Guangzhou, and about 5 of them will disappear every year. However, the emergence of e-commerce supermarkets and community supermarkets this year has made the vegetable market a place where citizens used to shop almost every day, and the role of the food market has inadvertently changed. From Guangzhou Daily all-media reporter Cheng Yi lun, mighty (1) The habit of buying vegetables is changing quietly.

The outbreak earlier this year has led more and more people to stay at home as much as possible, developing a habit of buying food online or nearby at community stores. In Guangzhou university town Beigun markets, vegetable market's owner qing aunt told reporters that this year's business down obviously, "the most main is affected by the outbreak, the students of our university here for half a year back to school for class, the teacher didn't come back, originally Beigun village many tenants also retreat hire, customers reduce is a big problem, and the villagers because epidemic began to select online shopping fresh. The change in distribution channels is one thing. People's eating habits seem to be changing,

too."The owner of a food company told reporters "We make frozen noodle soup, roast beef rolls and other foods that have exploded in both offline and online channels, with sales nearly fivefold; And to the local epidemic is basically under control, the sales data did not fall. The outbreak has had a great impact on Chinese people's eating habits and consumption patterns, and people can also eat good food at home"

Guangzhou daily

2.The impact of manufacturing (industry)

It is important to reflect on what profound impact this public health security incident will have on China's manufacturing industry. What changes will be made in China's manufacturing industry? On February 4, 2020, 13 days after Wuhan was closed. The COVID-19 epidemic continues to grow, but the provinces have stepped up for confirmed, probable and close contacts of tracing and isolation, through to the community closed management, can effectively avoid more people infected, lay the foundation to the success of the whole fight disease, and clinical trials of new drugs, treatment for improvements, believe that the cure for patients will play a role. So what profound impact will this sudden public health security incident have on China's manufacturing industry? What changes will be made in China's manufacturing industry?

1. Manufacturing enterprises will pay more attention to HSE (health, safety, and environment) management

Early in the outbreak, employees of a listed company in Wuhan, China, became infected. If cross-infection is caused by close contact between employees in the enterprise, it may become a disaster for the enterprise. Therefore, this outbreak will promote the majority

of manufacturing enterprises, greatly strengthen the health, safety, and environmental management of employees, and strengthen the disaster early warning mechanism.

Chinese manufacturers will promote smart manufacturing more pragmatically

The outbreak coincides with the traditional Chinese Spring Festival, and the direct impact of the epidemic on China's manufacturing industry is that a large number of workers cannot return to work on schedule. This makes life harder for manufacturing companies, especially small and medium-sized ones, that are eager to get started. Therefore, in the long run, the person in charge of manufacturing enterprises is bound to pay more attention to intelligent manufacturing, flexible production, and employ more highly skilled and multi-skilled workers, to better cope with the fluctuation of the labor force.

On the other hand, in the process of the outbreak, the surgical masks, protective clothing, goggles, and protective products, are not created fast enough to keep up with demand, also will promote production-related medical supplies. Medical equipment manufacturing enterprises pay more attention to promote the application of flexible automatic production lines, intelligent factory buildings, and less dependence on humans. At the same time, efforts should also be made to improve the logistics supply chain intelligence, enhance the supply chain's ability to resist risks. Many enterprises will also rethink the "zero inventory". Enterprises must maintain some inventory of key raw materials and components.

Chinese manufacturers will be more active in embracing digital transformation.

As the first day of work after the Spring Festival, many companies chose to let employees work online yesterday. Several of China's leading Internet companies have had

problems with their online collaboration platforms, as the explosion of services has been difficult to respond to. This also reflects the realistic demand of enterprises for digital technology. It can be predicted that manufacturing enterprises will put forward urgent requirements for remote collaborative task management, project management, workflow management, and other software.

The deep application of digital technology can help enterprises to improve the collaboration efficiency of employees, improve the transparency of production and operation, help enterprises to deal with the fluctuation of market demand more efficiently, shorten the launch cycle of new products, and even innovate the business model, to shift from selling products to selling services. The most fundamental value of digital transformation is that it can help leaders at all levels of manufacturing enterprises to truly gain insight into the data and see the right trends from the data. It is certain that after the epidemic, manufacturing enterprises will pay more attention to the practical application of BI, big data analysis, AI, and other technologies, and put forward urgent demands on data analysts.

The life science industry will usher in huge development opportunities

For a long time, Chinese pharmaceutical companies have been dominated by generic drugs with insufficient innovation capacity. There are few original drugs like art, which was analyzed in detail in a study published by Mc. Kinsey a few years ago comparing the innovation ability of Chinese and American manufacturing industries. As a result of the outbreak, China is bound to pay more attention to developing drugs and reagents to detect, suppress and treat the virus, and the public's use of products such as flu vaccines will also be greatly increased. Therefore, more and more pharmaceutical enterprises will strengthen the r&d and manufacturing of innovative drugs and medical devices.

In 2019, China's per capita GDP exceeded \$10,000. In the process of China's rapid urbanization, with the improvement of people's living standards, there will be a higher demand for health management and health care, which will drive the development of related industries. The COVID-19 outbreak will significantly accelerate the development of China's life science industry.

In a word, the COVID-19 epidemic will not only exert a profound influence on the life and production service industries in China but also exert a great influence on the development trend of the manufacturing industry. Therefore, it is worth thinking deeply about the manufacturing practitioners. Li said that the country needs to collect all kinds of macro data to predict some emergencies (for example, Google predicted the 2009 influenza epidemic). Enterprises also need to have the ability to analyze social macro data in order to respond to emergencies in advance.

From Digital Enterprises, by Dr. Pei Huang

Indifference of People

For more than a year now COVID-19 pandemic has been having a tremendous impact on our lives no matter where we live or who we are. Some have to stay at home, learn online and some are forced to go outside to keep their jobs even though it may affect their lives horribly. The pandemic has created many problems in different spheres such as in the economy, healthcare system, food system, and work world. Nowadays we are at a place when it is impossible to imagine our daily lives without having to deal with face masks, hand sanitizers, and different kinds of protocols depending on where you live. Sadly, COVID-19 has not only been the reason for restrictions but the pandemic has led to dramatic losses of human lives.

After living side by side with the pandemic it would seem that people would have been adapted to the situation and learned how to take care of themselves. But as the cases of COVID 19 go up, we can note the indifference in people increases accordingly. According to the World Health Organization, there are 88,120,981 confirmed cases of COVID-19 in the world, and 1,914,387 deaths (Data last updated: 2021/1/10/). World health organization. <https://covid19.who.int/> Almost every country in the world is forced to deal with the virus since people are not taking the virus as seriously as before, however, It is natural that people start developing coping mechanisms while facing unexpected tragedies. In a series of studies in 2014 conducted in Sweden, Paul Slovic a professor of psychology at the University of Oregon conducted and his colleagues illustrated that, “We do not only become numb to the significance of increasing numbers but our compassion can actually fade or collapse overall as numbers increase.” To prove this point the researchers firstly showed a picture of a poor child and asked if the participants wanted to donate. Then they did the same process this time showing a picture of two poor children. Naturally, we may think that people who have donated more for more children, but apparently, people donated less when they saw

the picture of two children. The researchers explain this by the fact that ‘an individual is the easiest unit for humans to understand and empathize with. “If you see one child, you can focus on the child,” he says. “You can think about who they are and how they are like your own child. You can concentrate more deeply on one person than two. [With two] your attention starts to lessen and so do your feelings. And our feelings are what drive our behavior’.

<https://www.bbc.com/future/article/20200630-what-makes-people-stop-caring>

Continuing the research Paul Slovic and his colleagues referred to the 1994 Rwandan genocide, “When 800,000 people were killed in 100 days and millions were displaced, asked a group of volunteers to imagine they were a representative from a neighboring country in charge of a refugee camp. They had to decide whether or not to help 4,500 refugees with access to clean water. Half were told the camp was sheltering 250,000 people, while the rest were told it had 11,000 refugees. “People were much more willing to protect 4,500 people out of 11,000 than out of 250,000 because they are responding to the proportion, not the actual number,” says Slovic. “In the first scenario, it doesn’t seem worth it. But if you can cut the number of people who are suffering nearly in half, it feels like a big deal, even though it’s the same number of people.”

<https://www.bbc.com/future/article/20200630-what-makes-people-stop-caring>

This research may be one of the explanations for the fact that people are way more indifferent about the pandemic now than they were months ago when COVID-19 was just starting its journey. Why do people not care anymore? According to a report completed on December 13th, Toronto Mayor John Tory states that he is “astounded” because of the level of indifference people show while the cases of COVID-19 are increasing in the city. The Mayor thinks that there is a lack of concern among people in the city which is bothersome. While speaking with the journalists he said “I am astounded at the fact that we have had 16

deaths in the past two days. If we had those 16 deaths from fires, or 16 deaths from criminal activity, or 16 deaths from auto collisions with pedestrians, people would be out of their minds saying what is going on here and asking us what we're doing about it," Tory told CP24 on December 13th, 2020. Tory 'astounded' at the indifference of some to COVID-19 lockdown.

<https://www.cp24.com/news/tory-astounded-at-indifference-of-some-to-covid-19-lockdown-1.5229305>

Even though this seems like a natural response, the indifference by some people and the misinformation on the media are fueling the increase of the cases of the pandemic. Despite the difficulties from the very beginning people have been told to do a couple of simple things to protect themselves and others. They were told to wash their hands regularly, wear fabric or medical masks if they have symptoms they should stay at home, and avoid large crowds. This is mostly everything that people were asked to do to stop spreading the disease. Even after hearing about these simple steps, there are still many people who are indifferent about the virus. Every day we may see people on the streets who are rejecting the advice mentioned above especially at a time when we can see this kind of behavior is causing further problems such as occupied hospitals with no more medical beds to offer people who are in critical condition. Alan Levine, President and Chief Executive Officer of Mountain States Health Alliance, talked about the indifference of people and stated that one of the reasons is misinformation. "There are people by bedsides holding the hands of people who are dying, many of whom did not even believe us when we told them they had COVID" said Alan Levine. He also said that this indifference of people is 'devastating to health care workers who risk their health and lives every day. 'Health officials will continue to encourage people to follow those guidelines, he said. "We cannot make them do it, but we can certainly share the consequences," Misinformation, indifference fuels local COVID 19

strike. https://heraldcourier.com/news/misinformation-indifference-fuels-local-covid-19-spike/article_c6f22564-1cb4-58a2-bb0b-398db5d481d8.html Levine said. He also added that they appreciate people and organizations that have shown support for health care workers. This illustrates the fact that people who are indifferent about the virus not only hurt themselves but they hurt people they love and mostly they become a problem for the health care workers.

One of the reasons why some young people do not care is that they think the virus is not going to affect them. National Institute of Allergy and Infectious Diseases Director Anthony Fauci referred to this mindset on CNN's "State of the Union". Fauci said "You are not immune or safe from getting seriously ill" when he was asked the question if younger Americans should be concerned about the virus. "Even though when you look at the total numbers, it is overwhelmingly weighted toward the elderly and those with underlying conditions. The virus is not a mathematical formula. There are going to be young people who are going to wind up getting seriously ill". "Also, Fauci said it is critical for young people to understand that they can be a carrier for the virus and spread it without showing symptoms or feeling ill themselves. "Even though you do not get seriously ill, you could bring it to a person who would bring it to a person that would bring it to your grandfather or your elderly relative," he said. "That is why everybody's got to take it seriously, even the young."

Misinformation, indifference fuels the local COVID 19 strike.

https://heraldcourier.com/news/misinformation-indifference-fuels-local-covid-19-spike/article_c6f22564-1cb4-58a2-bb0b-398db5d481d8.html

It is clear that the virus is growing but no matter that fact many people are not taking the virus seriously. The reasons for people choosing to be indifferent about this global problem are different but in this report, I tried to discuss some of the possible reasons that could have led people to be indifferent. The pandemic has made life very hard for so many

people but if we want to be done with this sooner or later everyone should realize that we all are responsible for our health and for others.

Mutations

Viruses mutate by replicating when they infect the organism. Various types of COVID-19 mutations took place during this time. The SARS-CoV-2 with a D614G substitution in the gene encoding the spike protein emerged at the beginning of 2020. The first version was detected in Wuhan and was widely spread in China and then became globally dominant. “A mutation - called D614G - was found in Europe in February and that became the globally dominant form of the coronavirus. Another mutation, A222V, then spread across Europe and was linked back to people holidaying in Spain over the summer. The new strain, B117, has caused concern because it is quickly becoming the dominant variant in south-east England. It has certain mutations that affect the spike protein, which is the key the virus uses to attack our body's cells. The variant is also causing concern because it seems to be much more transmissible - although no evidence suggests it could cause a more serious illness.” The Scotsman, How does a virus mutate? What causes a mutation and how long it takes as new Covid strain continues to spread,

<https://www.scotsman.com/health/coronavirus/how-does-virus-mutate-what-causes-mutation-and-how-long-it-takes-new-covid-strain-continues-spread-3076550?amp>

Circulating in humans it developed a kind of mutation called a deletion that might have slowed its spread. Mutations do not have much impact on properties, although coronavirus mutates slower than other viruses, its mutations can help to increase the spread. Most of the time when a virus mutates, the resulting variants are weakened, But the coronavirus's mutation and spread are uncontrolled, which means we can not be sure its mutated versions will not evolve into a more efficient version. In the 3/4 of 2020, there was another “Cluster 5” variant by Danish authorities, which has a combination of mutations not previously observed. In December a variant in the United Kingdom as SARS-CoV-2 VOC 202012/01 appeared. “This variant contains 23 nucleotide substitutions and is not

phylogenetically related to the SARS-CoV-2 virus circulating in the United Kingdom at the time the variant was detected. How and where SARS-CoV-2 VOC 202012/01 originated is unclear. SARS-CoV-2 VOC 202012/01 initially appeared in South East England but within a few weeks began to replace other virus lineages in this geographic area and London. As of 26 December 2020, SARS-CoV-2 VOC 202012/01 has been identified from routine sampling and genomic testing conducted across the United Kingdom.

Over five months starting on Sept. 1, the California strain, which is sometimes referred to as 20C/L452R, rose from complete obscurity to account for more than 50% of all coronavirus samples that were subjected to genetic analysis in the state. Compared with strains that were most prominent here in early fall, the new strain seems to have an enhanced ability to spread. The variant is 19% to 24% more transmissible. But in some circumstances, its advantage was much greater: In one nursing home outbreak, B.1.427/B.1.429 spread at a rate that was six times higher than that of its predecessors. An analysis of viral samples from around the state showed that compared with people infected with other strains of SARS-CoV-2, those who were infected with the California strain had viral loads in the nasopharynx that were twice as high.

Another variant was detected in Brazil. This variant, identified as P.1, which has the N501Y and E484K mutations, was detected in 13 out of 31 positive PCR test samples collected in Manaus between Dec. 15-23. It was absent in genome surveillance samples seen between March and November, underscoring how quickly it has appeared and reproduced. Genomic data from COVID-19 tests in Manaus indicated 42% of the confirmed cases were infected by the new variant, which has mutations similar to the British and South African variants. Unfortunately, this variant has hit the U.S. as Maryland recently announced its first Brazil variant Covid case.

Preliminary epidemiologic, modeling, phylogenetic, and clinical findings suggest that SARS-CoV-2 VOC 202012/01 has increased transmissibility. However, preliminary analyses also indicate that there is no change in disease severity (as measured by the length of hospitalization and 28-day case fatality), or occurrence of reinfection between variant cases compared to other SARS-CoV-2 viruses circulating in the United Kingdom. Another of the mutations in the VOC 202012/01 variant, the deletion at position 69/70del was found to affect the performance of some diagnostic PCR assays with an S gene target. Most PCR assays in use worldwide will use multiple targets and therefore the impact of the variant on diagnostics is not anticipated to be significant. Laboratory evaluation has demonstrated no significant impact on the performance of antigen-based lateral flow devices. As of 30 December, VOC-202012/01 variant has been reported in 31 other countries/territories/areas in five of the six WHO regions.”

The South African variant, like the new UK variant, contains a mutation known as N501Y which is believed to make the virus more contagious. The South African variant also contains other mutations including E484K and K417N. While the vaccine had 95.6% efficacy against the original coronavirus and 85.6% against the UK variant, it had an efficacy of only 60% against the South Africa variant. The South African variant, 501Y.V2, cannot be distinguished from other variants in this way – instead, it is spotted by genetic sequencing. The South African variant has been found in more than 30 other countries, including Austria, Belgium, Kenya, the United Arab Emirates, and Japan.

Medical Cures/Vaccines

After the rapid spread of COVID-19, the people started using different medical and non-medical cures to fight against the virus and protect themselves. Some of these cures are offered by doctors while others are widely used due to people's beliefs. Everyone's immune system is different, that's why treatments suggested by hospitals are distinctly related to the stages of illness. Vitamin D supplements are believed to protect against COVID-19.

According to Harvard "Vitamin D may protect against COVID-19 in two ways. First, it may help boost our bodies' natural defense against viruses and bacteria. Second, it may help prevent an exaggerated inflammatory response, which has been shown to contribute to severe illness in some people with COVID-19." Harvard Health Publishing, Treatments for COVID-19, <https://www.health.harvard.edu/diseases-and-conditions/treatments-for-covid-19>

One of the remedies used against coronavirus is antibodies. The FDA authorized two monoclonal antibodies to treat non-hospitalized adults and children over age 12. Monoclonal antibodies are man-made proteins that act like human antibodies in the immune system.

"These treatments are not authorized for hospitalized COVID-19 patients or those receiving oxygen therapy. They have not been shown to benefit these patients and could lead to worse outcomes in these patients." Harvard Health Publishing, treatments for COVID-19, <https://www.health.harvard.edu/diseases-and-conditions/treatments-for-covid-19>

Another way to artificially develop the immune system is convalescent plasma therapy. This uses blood from people who've recovered from an illness to help others recover. Blood donated by people who've recovered from COVID-19 has antibodies to the virus that causes it. The donated blood is processed to remove blood cells, leaving behind liquid (plasma) and antibodies. These can be given to people with COVID-19 to boost their ability to fight the virus.

There is also confusion for dexamethasone whether it is effective for coronavirus or not. “Dexamethasone and other corticosteroids (prednisone, methylprednisolone) are potent anti-inflammatory drugs. They are readily available and inexpensive. If you start too soon you blunt the body's natural defense system, and that could allow the virus to thrive. What might make the most biological sense is to give dexamethasone when laboratory studies suggest an immune system in overdrive after the amount of virus in the body has started to decrease.” Harvard Health Publishing, treatments for COVID-19, <https://www.health.harvard.edu/diseases-and-conditions/treatments-for-covid-19>

Even though this is effective for COVID-19, it has very strong treatment and may have adverse effects, so do not use it if you are not critically ill.

According to the WHO, certain potential practices have emerged that may or may not help against coronavirus:

- Vitamin C, which can help to improve your immune system, but there is no evidence it can be useful for this virus.
- Drinking alcohol can not protect you from COVID-19 and is harmful to your health.
- Hot or cold weather does not kill the virus.
- Eating garlic does not prevent coronavirus.

'Herd immunity', also known as 'population immunity', is the indirect protection from an infectious disease that happens when a population is immune either through vaccination or immunity developed through a previous infection. WHO supports achieving 'herd immunity' through vaccination, not by allowing a disease to spread through any segment of the population, as this would result in unnecessary cases and deaths.” World Health Organization,

Coronavirus disease(COVID-19): Herd immunity, lockdowns, and COVID-19,

<https://www.who.int/news-room/q-a-detail/herd-immunity-lockdowns-and-covid-19>

Herd immunity can be reached when enough people get the virus and have antibodies to fight against it. But achieving herd immunity is not easy, because the medical cures used nowadays are not providing lifelong antibodies, and vaccines are just developed which still need to be tested and researched to realize the time of their efficiency. Vaccines may protect you from being ill but still be infected with COVID-19. It reduces the amount of virus in the organism so the speed of its spreading, but there is no evidence that people who get vaccines will not spread the virus to others. Even though it is not a common practice, people who already had the virus may get infected again, that is why they also need to get the vaccine.

Various health centers and hospitals gathered to find out vaccines that will cure the new coronavirus. There are a few officially endorsed vaccines available now.

FDA granted a few vaccines for emergency use authorization (EUA) mRNA COVID-19 vaccine developed by Moderna, another one developed by Pfizer and BioNTech, and Sputnik V developed by the Gamaleya Research Institute of Epidemiology and Microbiology .

“mRNA, or messenger RNA is genetic material that contains instructions for making proteins. mRNA vaccines for COVID-19 contain synthetic mRNA. Inside the body, the mRNA enters human cells and instructs them to produce the "spike" protein found on the surface of SARS-CoV-2, the virus that causes COVID-19. The body recognizes the spike protein as an invader and starts producing antibodies against it. Soon after, the cell breaks down the mRNA into harmless pieces. If the antibodies later encounter the actual virus, they are ready to recognize and destroy it before it causes illness. In briefing documents submitted to the FDA, the Moderna vaccine showed an overall efficacy of 94.1% in preventing COVID-19. The Moderna vaccine contains synthetic messenger RNA (mRNA), the genetic material that enters human cells and instructs them to produce the spike protein found on the

surface of the SARS-CoV-2 virus. The body recognizes the spike protein as an invader and produces antibodies against it. Soon after, the cell breaks down the mRNA into harmless pieces. If the antibodies later encounter the actual virus, they are ready to recognize and destroy it before it causes illness.

Unlike the Pfizer vaccine, which requires ultracold storage, the Moderna vaccine can be stored at normal freezer temperatures. This may allow for wider distribution to pharmacies and other facilities that are not equipped for ultracold storage.” Harvard Health Publishing, Preventing the spread of the coronavirus,

<https://www.health.harvard.edu/diseases-and-conditions/preventing-the-spread-of-the-coronavirus>

Sputnik V differs from the Moderna and Pfizer vaccines due to the fact that it uses double stranded DNA instead of single stranded RNA. Sputnik V is engineered to invade cells instead of replicating them. Once a person is injected with Sputnik V the adenoviruses bump into cells and latch onto proteins on their surface. The cell puts the virus in a bubble and pulls it inside. Once inside, the adenovirus escapes from the bubble and travels to the nucleus. The adenovirus pushes its DNA into the nucleus. The gene for the coronavirus spike protein can be read by the cell and copied into mRNA. Once the mRNA leaves the nucleus, spike proteins start assembling. The vaccinated cells break the proteins into fragments and the protein fragments are then recognized by the immune system. The cell then sends warning signals to activate immune cells nearby, causing the immune system to react more strongly to the spike proteins. After a vaccinated cell dies, an antigen-presenting cell, a type of immune cell takes the remains. When T cells detect the fragments, they bring in other immune cells to fight the infection. B cells, may bump into the coronavirus spikes on the surface of vaccinated cells or free-floating spike protein fragments. If the B cells are activated by T cells, they will bring out antibodies that target the spike protein. The antibodies then latch

onto the coronavirus spikes and block the spikes from attaching to other cells preventing infection. The antigen-presenting cells can also activate T cells that seek out and destroy any coronavirus-infected cells that have the spike protein on their surfaces. “Some researchers worry that our immune systems could respond to an adenovirus vaccine by making antibodies against it, which would render a second dose ineffective. To avoid this, the Russian researchers used one type of adenovirus, Ad26, for the first dose, and another, Ad5, for the second.” Sputnik V can be refrigerated and does not require very low storage temperatures. Sputnik V has an efficacy rate of 91.4%

<https://www.nytimes.com/interactive/2021/health/gamaleya-covid-19-vaccine.html>

Who should not get vaccinated

If you have had a severe allergic reaction (anaphylaxis) or an immediate allergic reaction—even if it was not severe—to any ingredient in an mRNA COVID-19 vaccine, you should not get an mRNA COVID-19 vaccine. If you have had a severe allergic reaction (anaphylaxis) or an immediate allergic reaction—even if it was not severe—after getting the first dose of the vaccine, you should not get another dose of an mRNA COVID-19 vaccine. An immediate allergic reaction means a reaction within 4 hours of getting vaccinated, including symptoms such as hives, swelling, or wheezing (respiratory distress). This includes allergic reactions to polyethylene glycol (PEG) and polysorbate. Polysorbate is not an ingredient in either mRNA COVID-19 vaccine but is closely related to PEG, which is in the vaccines. People who are allergic to PEG or polysorbate should not get an mRNA COVID-19 vaccine.

Side effects of the vaccines

- Sore arm or pain and redness at the injection site
- Swollen lymph nodes in the underarm on the same side as the injection site

- Chills or fever
- Fatigue, body aches or feeling run down
- Headache
- Nausea, vomiting or diarrhea in the first 72 hours

These effects should go away within one to two days (swollen lymph nodes might last up to 10 days)

<https://yalehealth.yale.edu/yale-covid-19-vaccine-program/covid-19-vaccine-side-effects>

Only about 25 percent of people ages 50 to 64 and 4 percent of those ages 65 to 74 who received the Moderna or Pfizer-BioNTech vaccine between Dec. 14 and Jan. 13 experienced side effects, according to CDC data. Meanwhile, 65 percent of those under 50 reported a reaction. The clinical trial data from the Johnson & Johnson vaccine showed a similar effect. This is a result of immune system degradation due to aging. It is also important to note that the side effects of the second dose of the Moderna and Pfizer vaccines will be a little more severe. About 40% to 50% of people experience some of the symptoms.

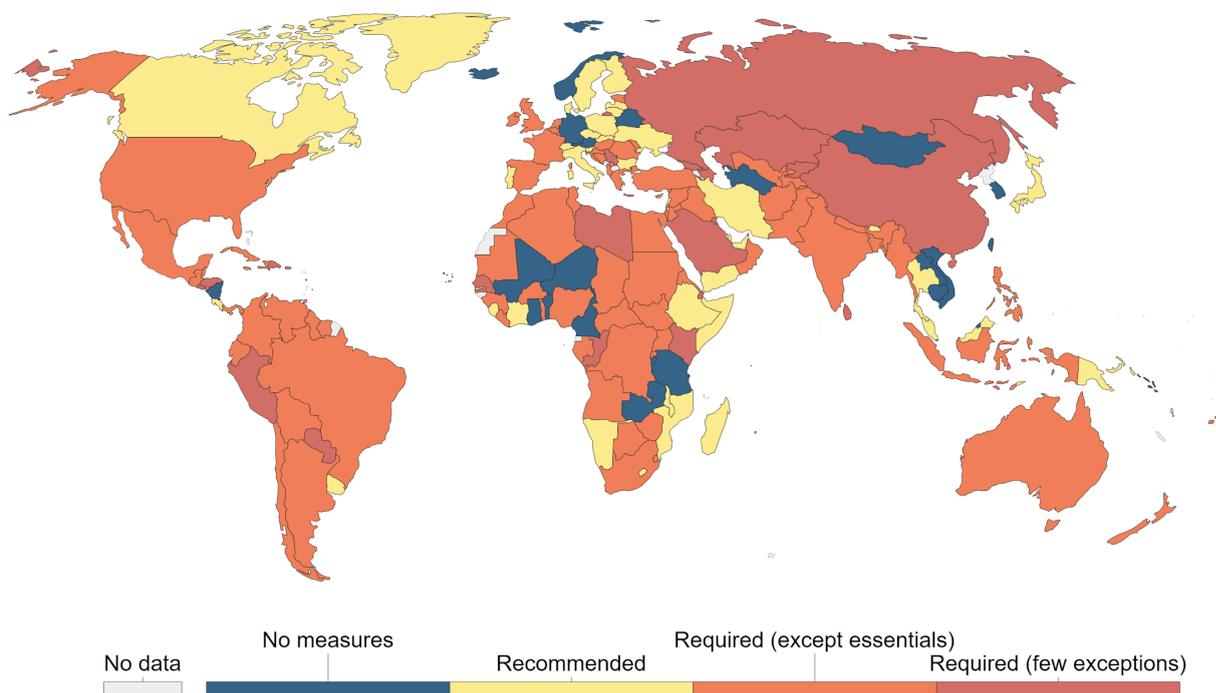
Ways to reduce the effects

- Acetaminophen
- Ibuprofen
- Pain relievers (may blunt the immune response to the vaccine)

Appendix

Figure 1a. Lockdown policies’ evolution over time: in May 2020 the majority of the countries adopted restrictions. Source: Roser, Max, et al. « Coronavirus Pandemic (COVID-19) - Statistics and Research ». *Our World in Data*

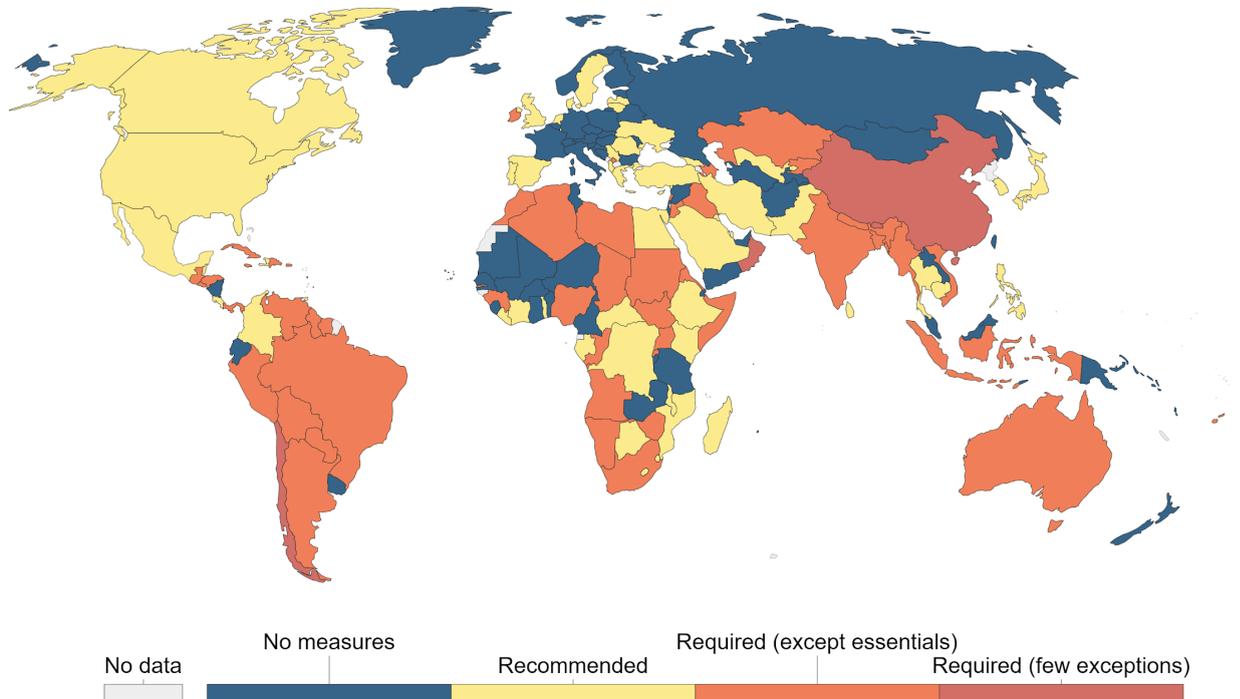
Stay-at-home requirements during the COVID-19 pandemic, May 10, 2020



Source: Hale, Webster, Petherick, Phillips, and Kira (2020). Oxford COVID-19 Government Response Tracker – Last updated 8 December, 07:23 (London time)
 Note: There may be sub-national or regional differences in restrictions. The policy categories shown may not apply at all sub-national levels. A country is coded as having these restrictions if at least some sub-national regions have implemented them.
 OurWorldInData.org/coronavirus • CC BY

Figure 1b. In September 2020 Governments relaxed lockdown measures.

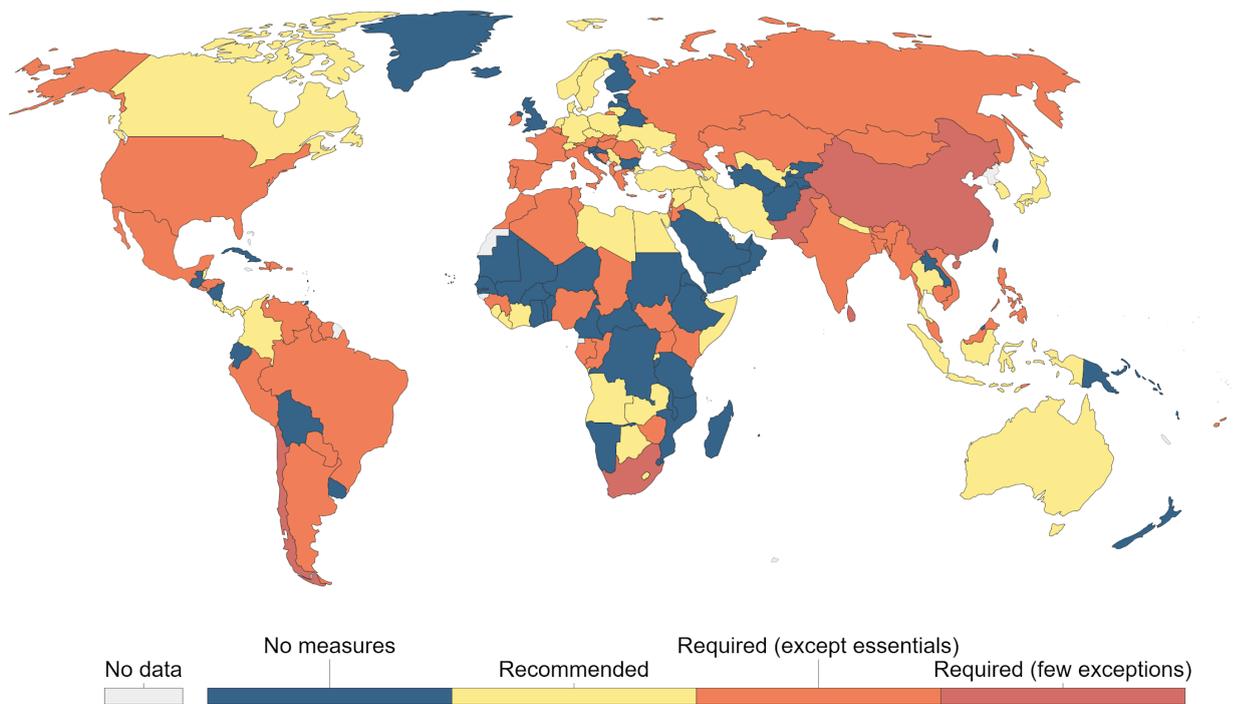
Stay-at-home requirements during the COVID-19 pandemic, Sep 15, 2020



Source: Hale, Webster, Petherick, Phillips, and Kira (2020). Oxford COVID-19 Government Response Tracker – Last updated 8 December, 07:23 (London time)
 Note: There may be sub-national or regional differences in restrictions. The policy categories shown may not apply at all sub-national levels. A country is coded as having these restrictions if at least some sub-national regions have implemented them.
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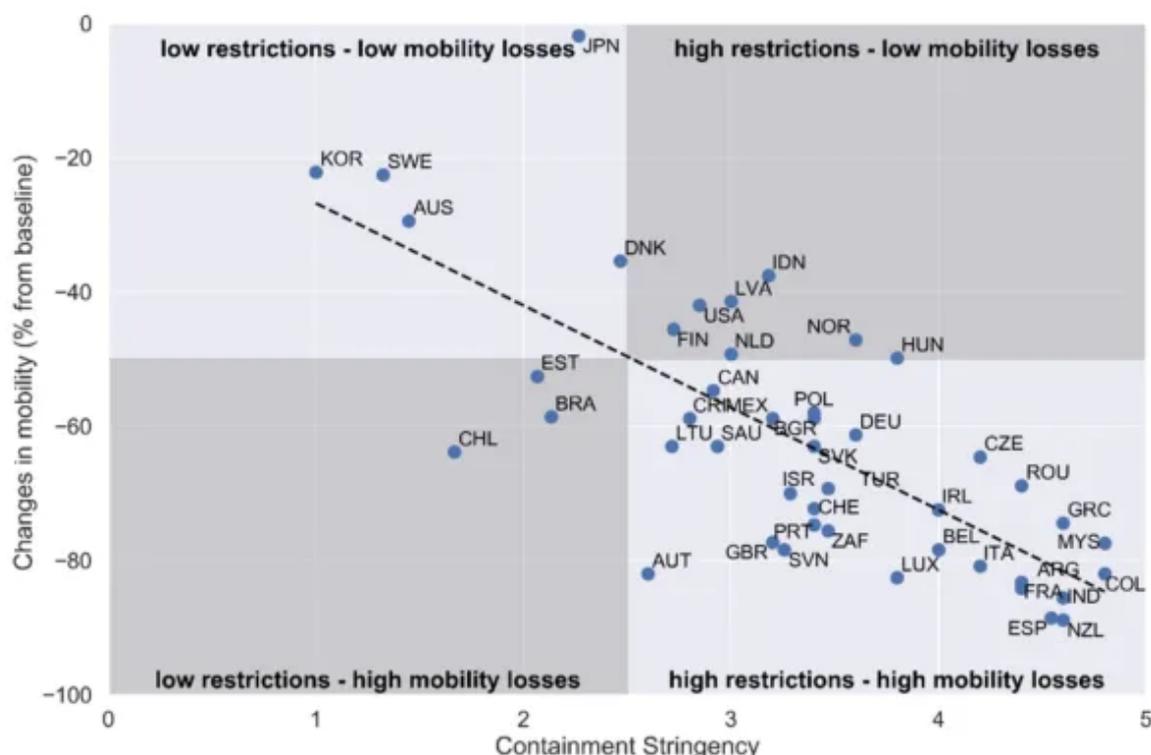
Figure 1c. Current situation in the beginning of winter. Governments imposed lockdowns again, but in an easier way compared with May 2020.

Stay-at-home requirements during the COVID-19 pandemic, Dec 8, 2020



Source: Hale, Webster, Petherick, Phillips, and Kira (2020). Oxford COVID-19 Government Response Tracker – Last updated 8 December, 07:23 (London time)
 Note: There may be sub-national or regional differences in restrictions. The policy categories shown may not apply at all sub-national levels. A country is coded as having these restrictions if at least some sub-national regions have implemented them.
 OurWorldInData.org/coronavirus • CC BY

Figure 2. Personal visits to retail and recreation facilities decreased as restrictions to movement increased. Source: Pareliussen, Jon, et Daniela Glocker. « Lockdown policies and people in the age of COVID-19 : Lessons from the OECD Policy Tracker ».



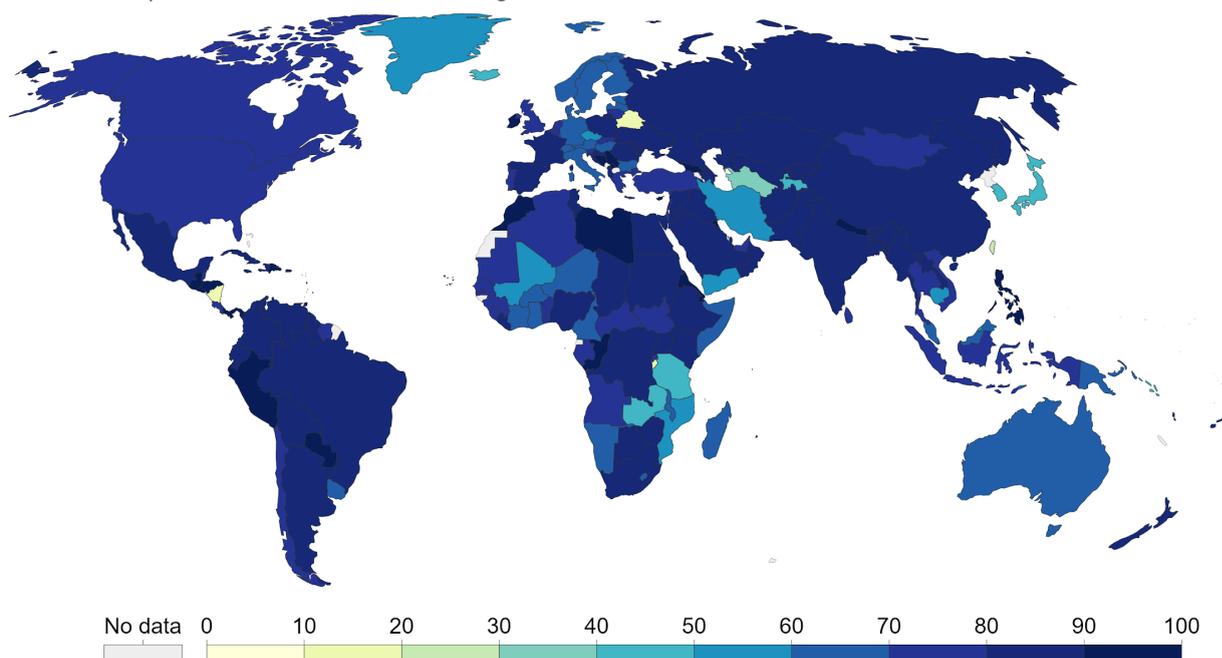
Note: Mobility trends for places like restaurants, cafes, shopping centres, theme parks, museums, libraries, and movie theatres. Mobility change is a comparison relative to a baseline day before the pandemic outbreak. Baseline days represent a normal value for that day of the week, given as median value over the five-week period from January 3rd to February 6th 2020. Average values from day 21 to day 27 after confirmed cases surpassed 1 per million of population. Source: Google Covid-19 Community Mobility Reports, OECD COVID-19 Policy Tracker.

Figure 3a. High stringency over lockdown’s policies around the world in spring 2020.

Source: Hale, et al. « COVID-19 : Government Response Stringency Index ». *Our World in Data*, 2020

COVID-19: Government Response Stringency Index, May 10, 2020

This is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown as the response level of the strictest sub-region.



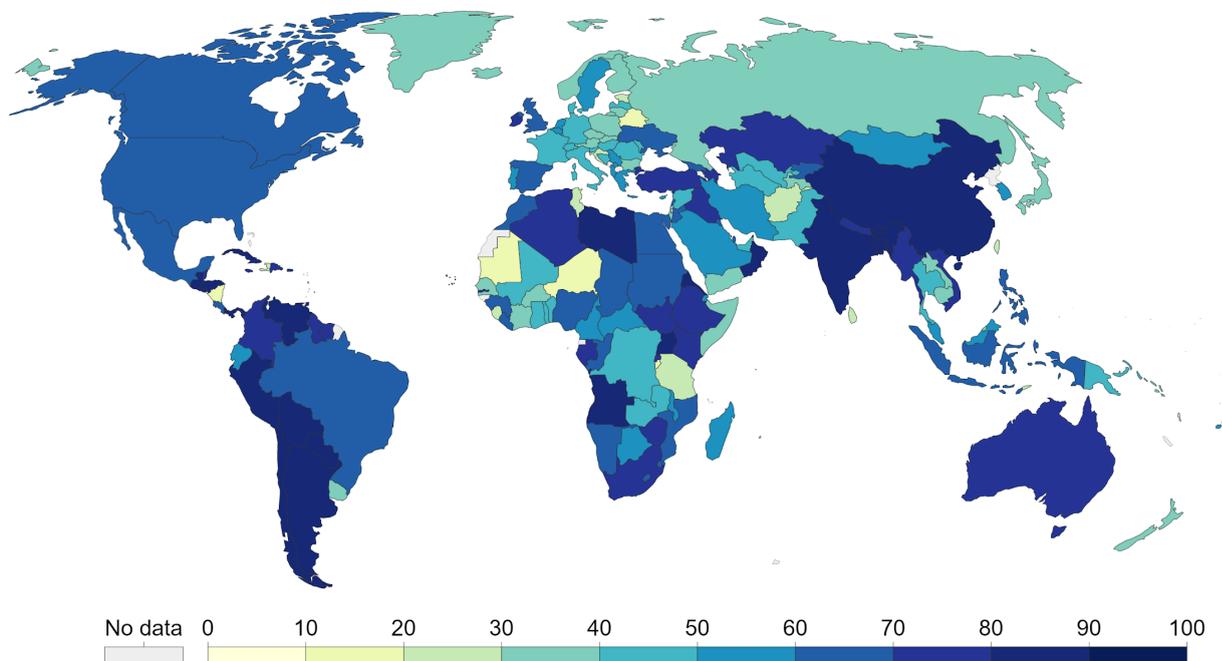
Source: Hale, Webster, Petherick, Phillips, and Kira (2020). Oxford COVID-19 Government Response Tracker – Last updated 14 December, 16:26 (London time)
 Note: This index simply records the number and strictness of government policies, and should not be interpreted as ‘scoring’ the appropriateness or effectiveness of a country’s response.
 OurWorldInData.org/coronavirus • CC BY

Figure 3b. Lockdown’s relaxing policies in late summer 2020

COVID-19: Government Response Stringency Index, Sep 15, 2020



This is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown as the response level of the strictest sub-region.



Source: Hale, Webster, Petherick, Phillips, and Kira (2020). Oxford COVID-19 Government Response Tracker – Last updated 14 December, 16:26 (London time)

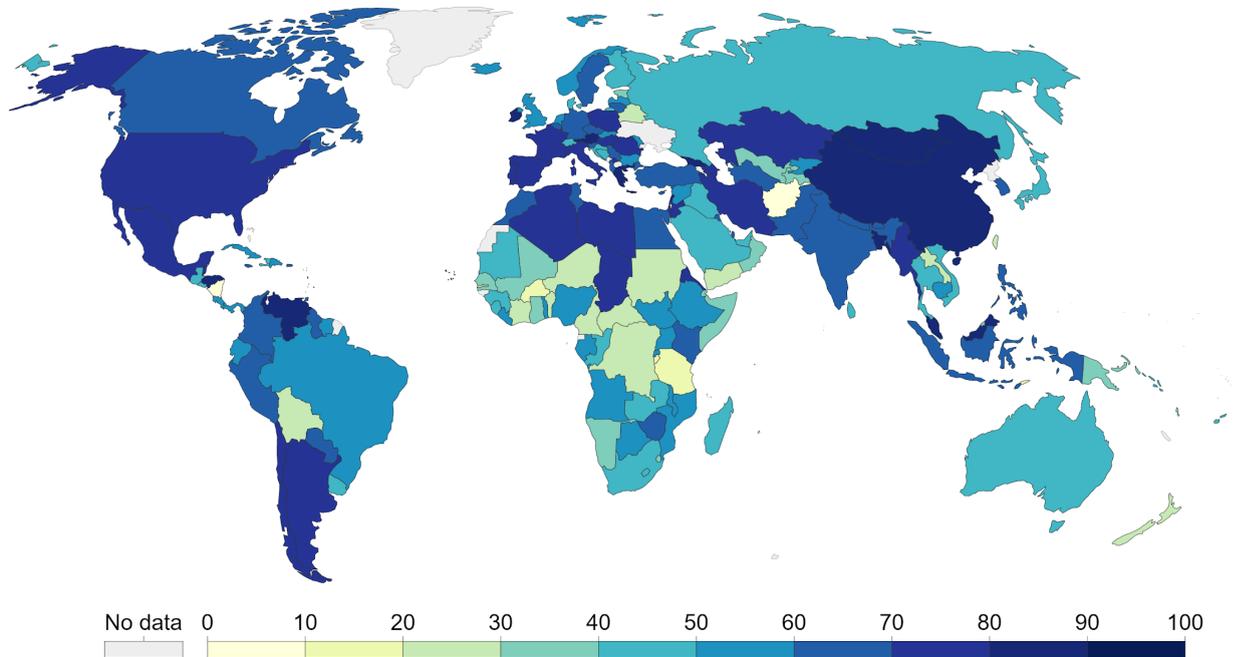
Note: This index simply records the number and strictness of government policies, and should not be interpreted as ‘scoring’ the appropriateness or effectiveness of a country’s response.

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Figure 3c. Resettlement of strict lockdowns in Europe and Americas in December 2020

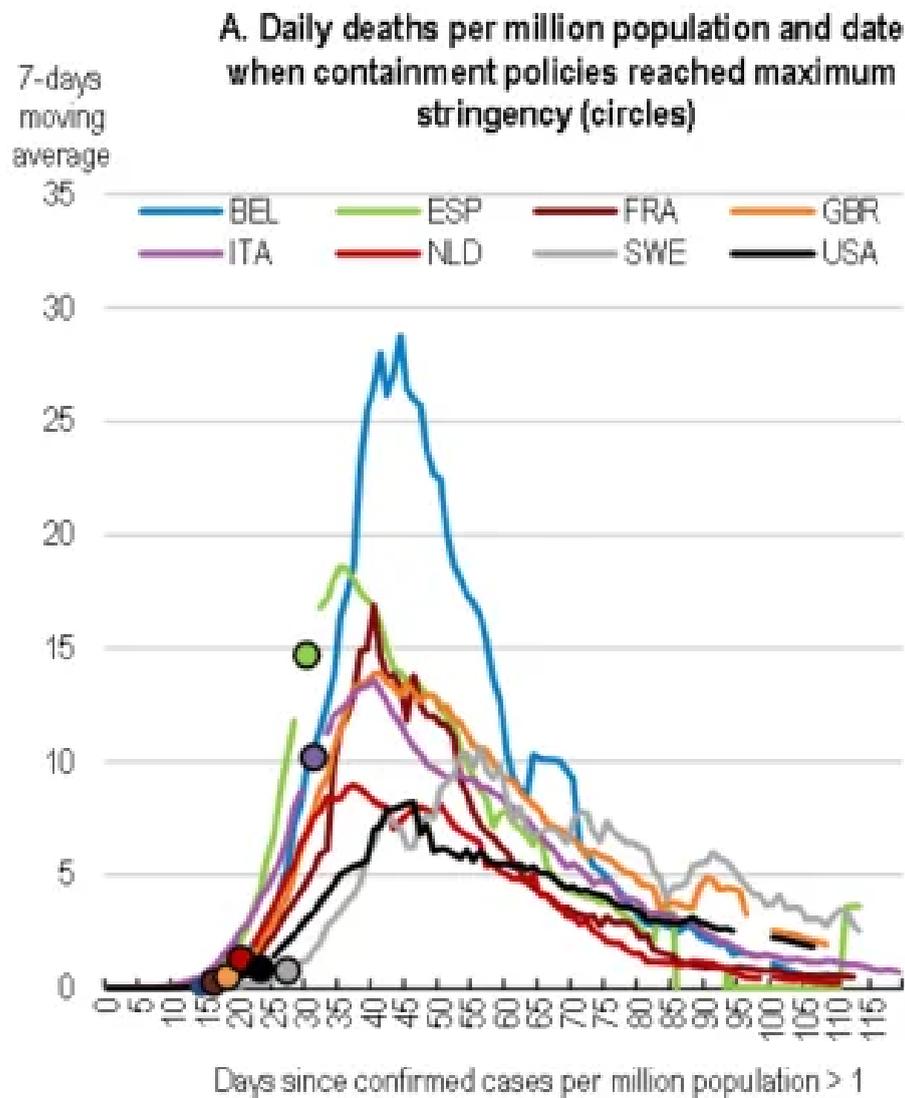
COVID-19: Government Response Stringency Index, Dec 8, 2020

This is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown as the response level of the strictest sub-region.



Source: Hale, Webster, Petherick, Phillips, and Kira (2020). Oxford COVID-19 Government Response Tracker – Last updated 14 December, 16:26 (London time)
 Note: This index simply records the number and strictness of government policies, and should not be interpreted as ‘scoring’ the appropriateness or effectiveness of a country’s response.
 OurWorldInData.org/coronavirus • CC BY

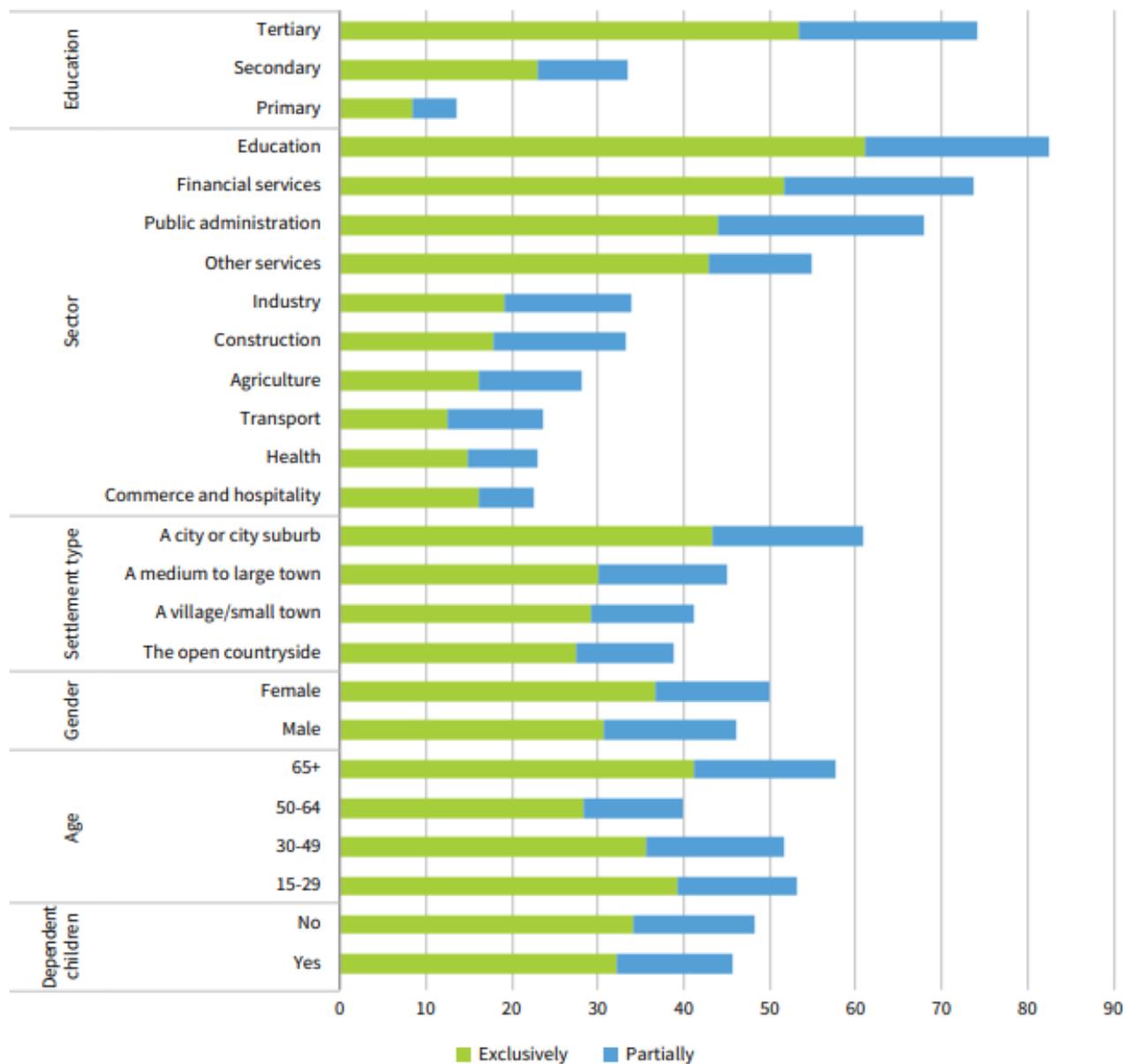
Figure 4. Source: Pareliussen, Jon, et Daniela Glocker. « Lockdown policies and people in the age of COVID-19 : Lessons from the OECD Policy Tracker ».



Note: Average index of containment policies in the OECD COVID-19 Policy Tracker. Methodology for recording deaths changed for Spain (25th May) and United Kingdom (1st June). Methodologies for recording COVID-19 deaths may differ between countries (e.g. some countries may only count hospital deaths, while others include deaths in nursing homes). Country comparisons with any single methodology should therefore be made with caution. An alternative estimate of COVID-19 related deaths, ["Excessive death rates" published by The Economist](#), can for example provide insights on how much official numbers may be underestimated.

Source: OECD COVID-19 Policy Tracker, COVID-19 Case data: European CDC – Situation Update Worldwide and Roser *et al.* (2020).

Figure 4. Working from home during covid-19, EU27 (%). Source: Eurofound (2020), Living, working and COVID-19, COVID-19 series, Publications Office of the European Union, Luxembourg.



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