

SARS-COV-2: THE SECONDARY EXTREMITY SUMMIT OF WHO

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Abstract- Covid-19 made all the countries to close their borders and locked down all citizens as the virus is widening around the globe with a steep speed. This is one of our enemies' plots, dragging the countries to a shutdown. Nobody knew there'd be a pandemic or an epidemic of this proportion. But many who work in infectious disease knew a pandemic like this was coming. As far as the loss of life, a pandemic would match even the tremendous conflicts of the past. The economy will close down, the expense for humankind will be extraordinary, and no nation will be invulnerable from the issue this will create."We estimate there are around 1.5 million viruses in wildlife" that we don't yet know about. Any one of those could be spilling over into human population right now. Expansion of a virus from an animal to human society gives rise to zoonotic Virus, and for decades, these kinds of viruses which have been growing, spreading and causing outbreaks for the society. There's a risk with something like SARS or MERS, that it'll be something for which we're not ready. It is a coronavirus again? We know some pretty lethal ones, but we expect that there are others out there that are more lethal, that are better at being transmitted, where we've got no drugs and no vaccines which ultimately leads to a chancy.

Index Terms—SAES-COV-2; COVID-19; SARS; MERS;

I. INTRODUCTION

Since its emergence in December 2019, COVID-19 has led to a global pandemic, in everything but name. To date, over 242,348,657 people have been infected across the globe, with the vast majority of burden of the infection and of the 492,772,3 deaths so far being borne by China, where the disease originally emerged and 3,13,771 deaths worldwide. USA top in this death list of COVID-19 with numbers of 90,134. A novel coronavirus (SARS-CoV-2) that is zoonotic and causes respiratory disease Human-to-human transmission had been caused, and infected people may have no clinical symptoms and then spread pathogens around. Incubation period is about 14 days for this virus. No drugs or vaccines available for COVID-19 till now.

COVID-19 is a pandemic. The cases continue to increase globally. What we need to do is flatten that down. We're going to have outbreaks in developing countries that are just going to be raging. The campaign against infectious disease can

succeed only if the public cooperates. Viruses were one of the first living things on Earth but they're not alive like we are. They need to hijack other living cells to reproduce, and that's their only goal, to survive and replicate themselves. The official name of this virus is SARS-"COV-2" and COVID-19 is the name of the disease it causes, which stands for "Coronavirus disease 2019." Corona, as in "crown as shown in figure 1. The virus is named for its crown-like spikes. It spreads through droplets when we sneeze, cough, or speak, and can enter us directly through our eyes, nose, or mouth. The virus can also live on a lot of surfaces for hours, so people can pick it up on their hands and infect themselves if they touch their face, something the average person does 20 times an hour.

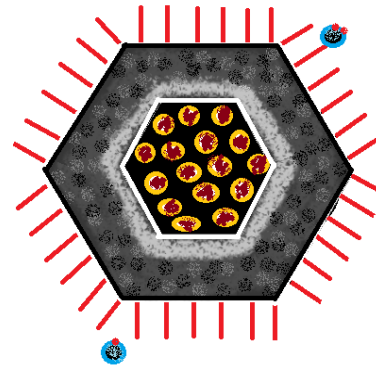


Figure 1: Coronavirus spikes like structure

Research is ongoing. And you can be infected and spread it without any symptoms, or they can be mistaken for the flu. That's what makes this coronavirus so devious. So the most significant diseases are often caused by viruses that are silent and slow, like HIV, or move very rapidly and cause symptoms like coughing and fever that could be confused with other diseases. Going about their life, a person with this coronavirus likely infects a couple other people, and each of those people infects a couple more, and so on, and so on...which is why the number of cases increases on an exponential curve, bling every several days.

Now, this coronavirus is just the youngest in a whole family of seven coronaviruses known to infect humans It's now famous, as are SARS and MERS, because they've killed a lot of people. But these are actually more successful viruses. They're everywhere. Because viruses can actually be better at

spreading. If they don't make their host that sick. Just look at bats. They're teeming with viruses because viruses don't really bother them but they can transform into a new virus once they get into the human population. That's what scientists believe happened with SARS in 2002. Just like this coronavirus, SARS emerged in a live animal market in China. Since it was a new zoonotic virus, there were no treatments and no vaccine. But SARS was a lot less dangerous than this coronavirus. People could only spread it when they had symptoms, so it was easier to contain the virus by just quarantining people who were sick. SARS was also a lot deadlier, which made it harder for the virus to spread. A disease like SARS, it kills 10% of people it infects, and then the survivors probably have some immunity and can't be re-infected. And eventually, the only people the virus can find are those people who have immunity to it. In the end, SARS infected around 8,000 people in at least 29 countries and seven hundred seventy-four of them died. A few years ago, they discovered one that they called "bat coronavirus RaTG13," which met the criteria for low-risk. When scientists sequenced the genome of the virus behind COVID-19, they found that 96% of it was identical to that bat virus. Scientists believe the bat virus likely evolved into this new virus that could infect humans.

II. FAMILY OF CORONAVIRUS

In 1930s, when an acute respiratory infection of domesticated chickens was caused by Infectious Bronchitis Virus known as IBV, it was the first time coronaviruses were discovered. In 1931, a new Respiratory Infection of chicken was described by two scientists named Arthur Schalk and M.C. Hawn in North Dakota. In 1940, two more animal coronaviruses were isolated, named Mouse Hepatitis Virus (MHV) and Transmissible Gastroenteritis Virus (TGEV). None realized that these three totally different viruses were so much relatable. In 1960, Human coronaviruses were discovered like a common cold virus B814. After that, other coronaviruses of the same family were identified as shown in figure 2.

- HC0V-OC43 in the year 1967
- HC0V- in the year 1970s
- SARS-CoV in the year 2003
- HCoV NL63 in the year 2004
- HCoV HKU1 in the year 2005
- MERS-CoV in the year 2012
- SARS-CoV-2 in the year 2019

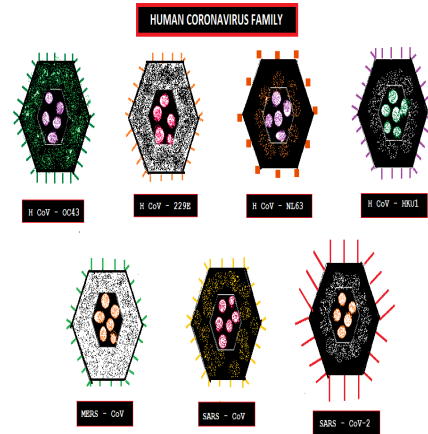


Figure 2: Family of Corona Virus

According to the research, a massive population of bats and avian species which are also known as the host viruses, has enabled enormous evolution and widen the spread of coronaviruses. It is known that many of the human coronaviruses have their origin in bats. Coronaviruses are the family of viruses which includes MERS coronavirus and SARS coronavirus. With no doubt, these viruses are spreading in animals and also some of them are capable enough to communicate between humans and animals. This type of communication or event is known as Spillover Event. Hence, there are no specific treatments for coronaviruses, but their symptoms can be controlled in an early stage. Once inside the body, those spikes act as a key, locking onto the proteins found on the outside of many human cells. Once it's broken in, the virus gives the cell instructions to produce more copies of itself, potentially invading more and more cells, which can lead to a fever, a cough, and fatigue, but not always. All the viruses out there, why did this one end up becoming the kind of pandemic we haven't seen in more than a century. And how does a pandemic like this end? A virus can be just as destructive as a bomb or a missile. We're deeply concerned by the alarming levels of spread and inaction. COVID-19 is a pandemic. The cases continue to increase globally. What we need to do is flatten that down. A group called Eco Health Alliance has been coming to the caves in southern China, catching bats, scanning them for viruses, and flagging the ones that could and they label them as high risk or low risk, depending on how similar they are to viruses that already infect humans. Most easily make the leap to us and when we find them, we raise the alert, and the government of China comes in and tries to reduce the exposure of those populations to viruses. They've found a lot so far, including hundreds of coronaviruses. This one looked too distant. We didn't think it would be able to get into people. It didn't look like it was a clear and present danger. Unfortunate. It's impossible to predict all the ways a virus might evolve. Scientists believe this one may have mutated in another bat or it may have jumped to another species before jumping to us, like a pangolin or a

snake or a fish as shown in figure 3. That same kind of fluke happened on a farm in Kansas over a century ago. Experts aren't certain, but they believe the 1918 flu pandemic could have started when a bird with the flu and a human with the flu met the same pig.

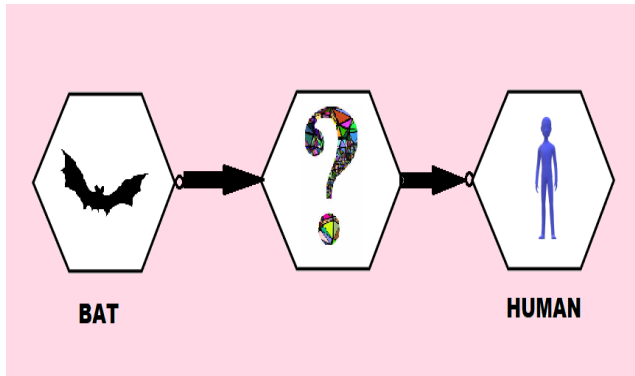


Figure3: Mutation of virus

The bird flu couldn't infect humans, and the human flu couldn't infect birds, but in one of the pig's cells, those two viruses combined, creating a new zoonotic virus, and that new virus definitely could infect humans. Here's the seasonal human flu, while this is the bird flu. And somewhere in this range was the 1918 combination. It was airborne, meaning the virus could hang in the air, infecting anyone who inhaled it. And it's estimated that it infected one in every three people on Earth, and then it killed anywhere from three to 20% of those infected. Medical record-keeping was not great at that time. But that was nothing compared to smallpox, which killed 30% of the people who got it, and was also more contagious. That virus terrorized humanity for thousands of years. In the 20th century alone, it killed hundreds of millions of people. And then there's Ebola, which is even deadlier. But far fewer people have died from it, in part because it's so deadly, people who have it don't infect too many others because they get so sick, they stay home, and then most don't survive. One of the unexpected things about viruses is that sometimes, a virus that has really obvious symptoms, that kills people at a very high rate, doesn't become a pandemic. It can't do that. While a disease like measles, which is far less deadly than Ebola, used to kill millions of people a year. So where does this current pandemic fall? It's not clear yet, but experts place it somewhere around here. Deadlier than the measles, but less contagious. Far less deadly than Ebola, and nowhere near as bad as smallpox. It's close to the lower estimates for the 1918 flu. So, it could be worse. But its balance is just bad enough to be devastating. But that doesn't mean we're doomed to repeat history. We can end pandemics. We've done it before in the 20th century, we discovered antibiotics. So the Bubonic Plague and all these other bacterial diseases became far less deadly. But antibiotics don't work against this coronavirus, or any viruses.

We have effective drugs for some of them, like HIV which can now be far less contagious and deadly. But safe antiviral drugs are really hard to develop. So the best way to defeat a virus through immunity. When certain viruses spread through a population, some infected people die. but others survive. Their immune systems have learned to recognize the virus and fight it off. When that happens in enough people, it's much harder for the virus to spread. This is called herd immunity. The rate of infection slows. And the virus dies out. But with COVID-19, if the world just waited to achieve herd immunity naturally, millions would die, and other coronaviruses don't even give lifelong immunity. For this one, we just don't know yet.

III. WHO MEETING

Leading health experts from around the world have been meeting at the World Health Organization's Geneva headquarters to assess the current level of knowledge about the new COVID-19 disease, identify gaps and work together to accelerate and fund priority research needed to help stop this outbreak and prepare for any future outbreaks. The 2-day forum was convened in line with the WHO R&D Blueprint – a strategy for developing drugs and vaccines before epidemics, and accelerating research and development while they are occurring. China has now reported 75,569 cases to WHO, including 2239 deaths. outside China, there are now 1200 cases in 26 countries, with 8 deaths. As you know, there is one confirmed case on the African continent, in Egypt.

“This outbreak is a test of solidarity -- political, financial and scientific. We need to come together to fight a common enemy that does not respect borders, ensure that we have the resources necessary to bring this outbreak to an end and bring our best science to the forefront to find shared answers to shared problems. Research is an integral part of the outbreak response,” said WHO Director-General Dr Tedros Adhanom Ghebreyesus. “I appreciate the positive response of the research community to join us at short notice and come up with concrete plans and commitment to work together.” The meeting, hosted in collaboration with GloPID-R (the Global Research Collaboration for Infectious Disease Preparedness) brought together major research funders and over 300 scientists and researchers from a large variety of disciplines. They discussed all aspects of the outbreak and ways to control it including:

- the natural history of the virus, its transmission and diagnosis;
- animal and environmental research on the origin of the virus, including management measures at the human-animal interface;
- epidemiological studies;
- clinical characterization and management of disease caused by the virus;
- infection prevention and control, including best ways to protect health care workers;



- research and development for candidate therapeutics and vaccines;
- ethical considerations for research;
- And integration of social sciences into the outbreak response.

On 30 January 2020, the Director-General declared that the outbreak of COVID-19 caused by the 2019 novel coronavirus (SARS-CoV-2) constitutes a Public Health Emergency of International Concern (PHEIC). “This meeting allowed us to identify the urgent priorities for research. As a group of funders we will continue to mobilize, coordinate and align our funding to enable the research needed to tackle this crisis and stop the outbreak, in partnership with WHO,” said Professor Yazdan Yazdanpanah, chair of GloPID-R. “Equitable access – making sure we share data and reach those most in need, in particular those in lower and middle-income countries, is fundamental to this work which must be guided by ethical considerations at all times.” During the meeting, the more than 300 scientists and researchers participating both in person and virtually agreed on a set of global research priorities. They also outlined mechanisms for continuing scientific interactions and collaborations beyond the meeting which will be coordinated and facilitated by WHO. They worked with research funders to determine how necessary resources can be mobilized so that critical research can start immediately. The deliberations will form the basis of a research and innovation roadmap charting all the research needed and this will be used by researchers and funders to accelerate the research response. On the 21st of February 2020, the Director-General appointed six Special Envoys on COVID-19, to provide strategic advice and high-level political advocacy and engagement in different parts of the world. The Special Envoys will work in close collaboration with WHO Regional Directors and country offices to coordinate the global response to COVID-19. The main functions of the Special Envoys on COVID-19 are to:

- Amplify the messages of the Director-General;
- Disseminate WHO guidance on COVID-19 readiness and response;
- Partake in high-level advocacy and political engagement;
- Provide strategic advice on preparedness, readiness and response to COVID-19 outbreaks;
- Engage with regional bodies and national governments;
- Report regularly to the Director-General on their work and the situation in countries.

The six Special Envoys are:

- Professor Dr. Maha El Rabbat, former Minister of Health and Population of Egypt;
- Dr. David Nabarro, former Special Adviser to the United Nations Secretary-General on the 2030 Agenda for Sustainable Development and Climate Change;
- Dr. John Nkengasong, Director of the African Centres for Disease Control and Prevention;

- Dr. Mirta Roses, former Director of the WHO Region of the Americas;
- Professor Samba Sow, Director-General of the Center for Vaccine Development in Mali;
- Dr. Young-soo Shin, former Regional Director of the WHO Region of the Western Pacific.

It’s hard to believe that only 52 days ago, WHO’s country office in China was notified of a cluster of cases of pneumonia of unknown cause in Wuhan city. In just seven weeks, this outbreak has captured the world’s attention, and rightly so, because it has the potential to cause severe political, social and economic upheaval. As you know, WHO declared a Public Health Emergency of International Concern within a month after the first reported cases, as a result of the signs of human-to-human transmission we saw outside China. And because of the major concerns we had that this virus could spread to countries with weaker health systems such as in our continent. With every day that passes, we know a little bit more about this virus, and the disease it causes. We know that more than 80% of patients have mild disease and will recover. But the other 20% of patients have severe or critical disease, ranging from shortness of breath to septic shock and multi-organ failure. These patients require intensive care, using equipment such as respiratory support machines that are, as you know, in short supply in many African countries. And that’s a cause for concern. In 2% of reported cases, the virus is fatal, and the risk of death increases the older a patient is, and with underlying health conditions. We see relatively few cases among children. More research, of course, is needed to understand why. The increasing signs of transmission outside China show that the window of opportunity we have for containing this virus is narrowing. We are calling on all countries to invest urgently in preparedness. We have to take advantage of the window of opportunity we have, to attack the virus outbreak with a sense of urgency. It calls for the intensification of efforts to control the pandemic, and for equitable access to and fair distribution of all essential health technologies and products to combat the virus. It also calls for an independent and comprehensive evaluation of the global response, including, but not limited to, WHO’s performance.

As WHO convened ministers of health from almost every country in the world, the consistent message throughout the two-day meeting—including from the 14 heads of state participating in the opening and closing sessions—was that global unity is the most powerful tool to combat the outbreak. The resolution is a concrete manifestation of this call, and a roadmap for controlling the outbreak. In his closing remarks, WHO Director-General Dr Tedros Adhanom Ghebreyesus said “COVID-19 has robbed us of people we love. It’s robbed us of lives and livelihoods; it’s shaken the foundations of our world; it threatens to tear at the fabric of international cooperation. But it’s also reminded us that for all our differences, we are one human race, and we are stronger together.” WHO is committed to working with all countries to do everything we

can to prevent transmission and detect and treat cases as early as possible. On Monday April 6, WHO will host a virtual meeting to facilitate communication, collaboration and exchange between National Ethics Committees from around the world to help countries respond to the ethical challenges presented by COVID-19. This meeting will be chaired by Hugh Whit tall from the Nuffield Council on Bioethics.

IV. CONCLUSION

A recent WHO report even acknowledged, “There is a very real threat of a rapidly moving, highly lethal pandemic of a respiratory pathogen. The world is not prepared “That was three months before the first case of COVID-19. And our healthcare systems obviously weren't prepared. Doctors and nurses around the world have been forced to use makeshift masks. In the last two days, eight nurses have fallen ill. Healthcare professionals are sick. We need to be protected first so that we'll be able to help. And in China, many of the first people with COVID-19 appear to have caught the disease at a hospital. Well, the world spends a lot of money preparing for war. Military budgets are large, and the new weapons get created.

This belongs right there with war, as something that we plan for. We also need to do more to prevent outbreaks from happening in the first place. Live animal markets like this have remained popular in parts of China and other countries, giving animal viruses all kinds of opportunities to mix and mutate and jump to humans. And when there is an outbreak, we need to respond faster. Three weeks before China began any containment measures against COVID-19. A 33-year-old doctor at Wuhan Central Hospital, Doctor Li Wenliang, sent a group chat to other doctors, alerting them to the outbreak. A few days later, the Wuhan police made him sign a letter, warning that he would receive the full sanction of the law if he "stubbornly persists" in his opinions. By the time the WHO declared a public health emergency on January 30th, Dr. Li Wenliang had likely already contracted COVID-19...because he died of it a week later. Three weeks after that, it's estimated that 114, 000 people in China were infected. China had implemented its containment measures just one week earlier, researchers found it would have looked like this. Two weeks earlier, like this. And three weeks earlier, like this as shown in figure 4 with number of cities affected by covid-19 in china.

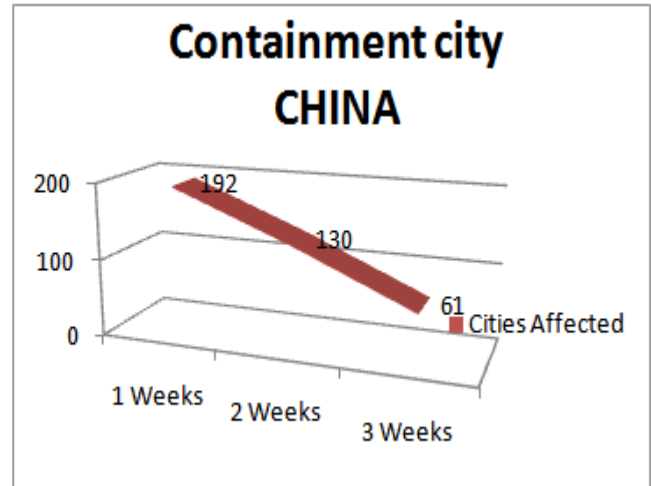


Figure 4: Number of Cities affected during lockdown

The number of cases could have been cut by as much as 95%. And while China was locked down in February, Italy wasn't, and it became the next epicenter of the virus. when Italy locked down in March, the United States didn't, and became the next epicenter. And then cases started to rise in poorer countries where lockdowns are harder, and healthcare systems, already fragile. We need to get faster at containment. Ideally, we want to catch more viruses at the source. It isn't just China, and it isn't just bats. These are the places where a new virus is most likely to make the leap to humans. The frontline for disease emergence are places like the end of the road in a tropical forest where someone's just built a new mining concession. People have moved in, there's no food supply, so they go out and hunt wildlife. Or it's a farm in Southeast Asia that's been expanding and intensifying, that has bats nearby that spread viruses into the pigs in the farm. The truth is, human behavior all over the world has made pandemics like this one inevitable. Deforestation is bringing more wild animals into contact with more people, and factory farming is pushing animals closer together, giving their viruses more opportunities to combine into one that could infect us. Then we give them more ways than ever to spread. I think one of the big lessons about pandemics is, we think that it's something happening over there.

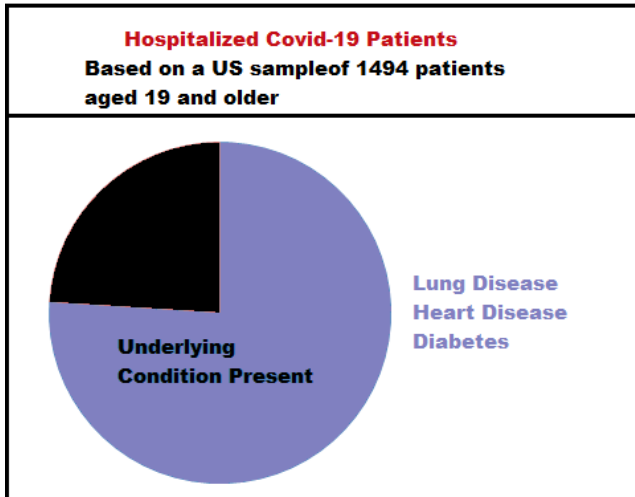


Figure 5: Deaths under diseases

Why the number of cases increases on rapid rate every day. In India after the third lockdown there are 20,000 cases in last four days. Some of those people will end up with a severe lung infection, and certain groups are especially at risk. In one US sample, around three-quarters of people who were hospitalized. Had at least one underlying health condition, like lung disease, heart disease, or diabetes as shown in figure 5. And while the exact numbers vary by country, the risk of dying is clearly greater the older you get, as you can see in this data that Hubei, China reported two months after their outbreak began. And for reasons scientists don't fully understand, the risk is also higher for men, possibly because of some biological factors as shown in figure 6, or because they're more likely to smoke. Or because men, according to some studies, aren't as good about washing their hands. On that note. Wash your hands as often as you possibly can, and I know you're not always in a position to be able to wash your hands, but wash them as much as you can. It's good advice.

WORLD-WIDE COVID-19 DEATHS BY GENDER

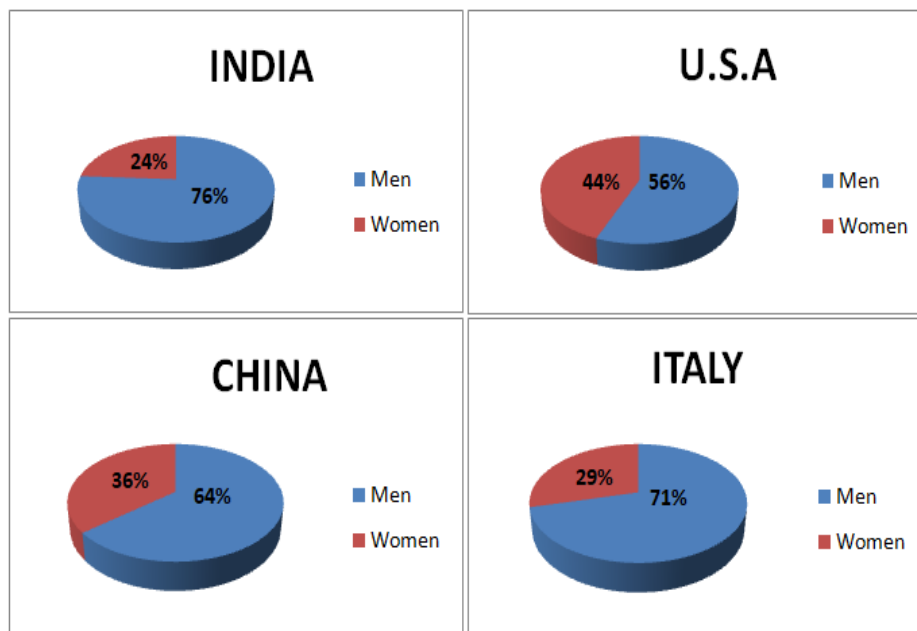


Figure 6: Deaths under biological factors

As Italy learned in March, it's much harder for hospitals to save lives if too many people get infected at once. Medical staff living in the hospital, sleeps in the office. COVID-19 is more perilous to child age below ten years and to those who are above 60 in age because of the weak immune system. According to a survey COVID-19 case fatality by age is shown in figure 7. When you arrive at this point, you realize that you are not enough. We obviously want to avoid that, which is why

many world leaders have made the same plea. Go home and stay home. You must stay at home. During this time, no Indian citizen should step out of their home. Hundreds of millions of people around the world have been waiting this out...finding ways to cope. So countries really have to go on a hardcore national lockdown to really suppress that curve of deaths, and then we have to, at some point, gradually and carefully come out of that lockdown. South Korea is one model.

COVID-19 CASE FATALITY BY AGE

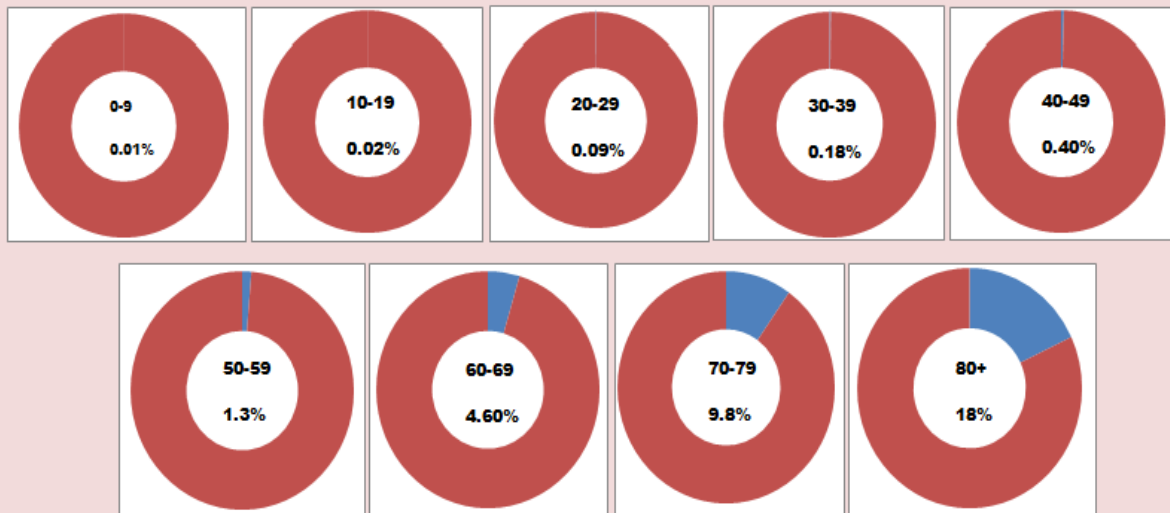


Figure 7: COVID-19 case fatality by age

As of early April, they've managed to rein in their outbreak without a lockdown by testing widely and retracing the steps of people who came back positive. For other places to pull off something similar, they'd need to ramp up their testing. At what point on the other side of the curve do you go back to work? There is no answer. I think the answer's gonna be in testing. If you could test, today, millions of people, you could send them to work tomorrow, right? The problem is if we're not careful, that smoldering outbreak can last a long time. Right there, in November, is when the city decided to end their social distancing policies. The death rate jumped, and the city quickly locked down again. The total number of covid-19 cases and deaths on 16 may 2020 are shown by a chart in figure 8. In a pandemic like this, until you have a vaccine, you have limited options, because the virus had a head start. And this is a situation that experts have always feared. Mother

Nature is the ultimate bioterrorist. There are always going to be things that surprise us and that take our detection by surprise. We could be far more ready for a pandemic like a flu or a SARS. However, if a really fast-moving respiratory pathogen came out, no we wouldn't be able to hold those numbers down. The World Health Organization is meant to lead the global response to a pandemic like this. In 2005, the WHO did draw up a huge blueprint for how the world should prepare and respond to a crisis like this. Among other things, countries had to develop the capacity to detect outbreaks and quickly notify WHO. One hundred and ninety-six countries signed onto this, but most never complied. When a pandemic comes along of any size, we always look back and wish we'd invested more. However, very quickly our memory fades, and other priorities are getting the resources.

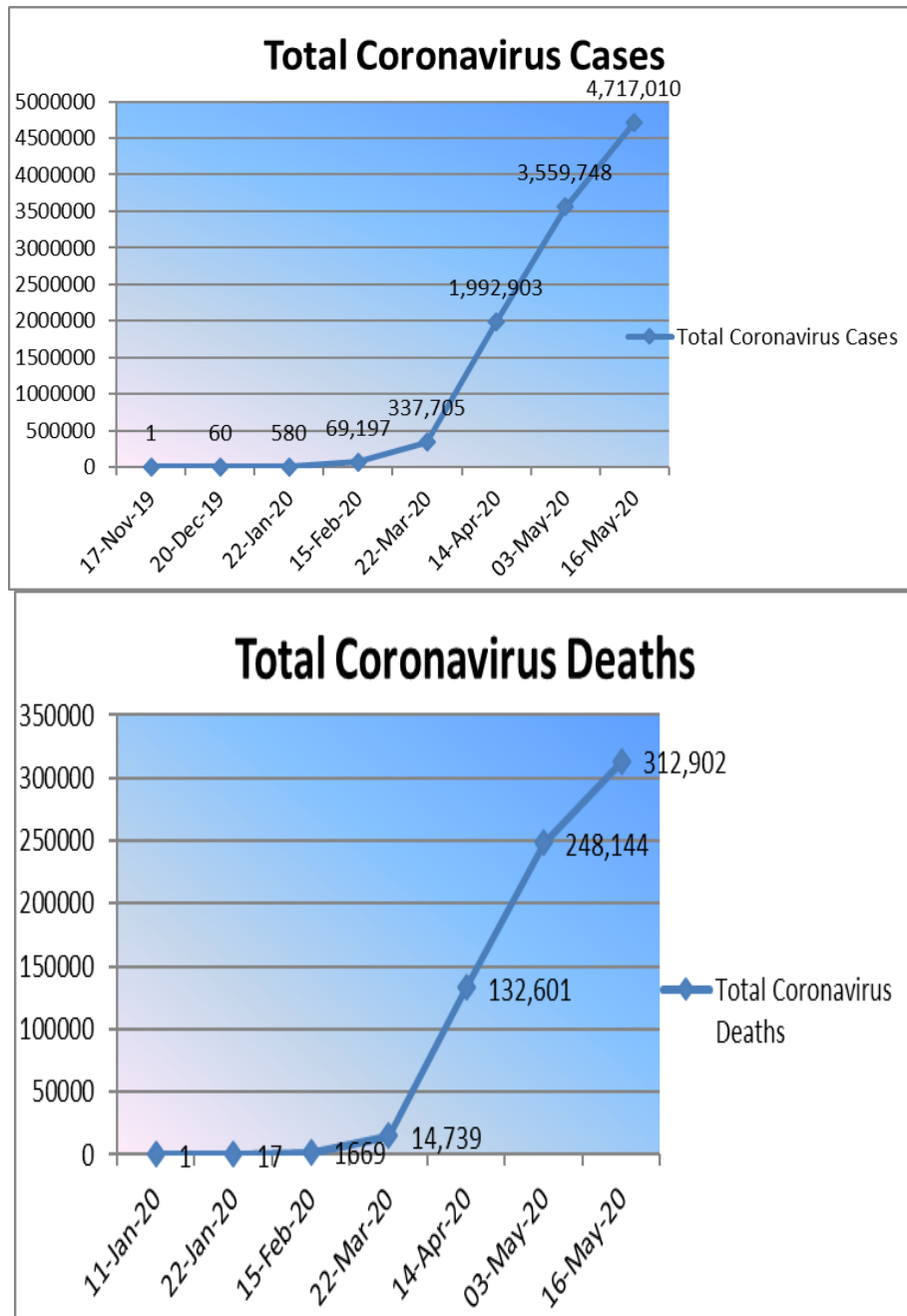


Figure 8: Cases and deaths worldwide due to COVID-19

Well, we know from COVID-19 that is not easy to get over. But if viruses were capable of thinking, they should have also learned their lesson. If their goal is to replicate, they shouldn't start killing us. Because once a virus becomes a pandemic, all of human ingenuity will be brought to bear to bring them down. We should have been more prepared, but when it comes to technology, science, and coordination, we've also never been more prepared. This new virus was identified within days. The sequence was shared a few days later and because of that testing be ganreally, across the globe. Scientists around the

world are committing entire labs to creating a vaccine. The world's fastest supercomputer has run thousands of simulations and identified 77 drug compounds that might effectively stop the virus. It's amazing the way the scientific community has gathered together. We know what it takes, because we've been in this race since life on Earth began, and a virus hasn't beaten us yet. It was unlike anything else in history. For a disease to become a pandemic, spreading around the world in months, leading to potentially millions of deaths, it has to find an extraordinary balance of contagiousness and deadliness. You



can think of a disease on those two scales. And this COVID-19 is one of the infectious diseases that have been humanity's greatest foes.

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