



ECOSF NEWSLETTER



Corona Virus - COVID 19: Situation in Numbers for the ECO Member Countries

Timestamp: 10:00 CET 5 April 2020

Country	Total confirmed cases	Total confirmed new cases	Total deaths
Afghanistan	299	29	7
Azerbaijan	512	69	5
Iran	55,743	2,560	3,452
Kazakhstan	531	71	5
Kyrgyz Republic	147	3	1
Pakistan	2,880	430	45
Tajikistan	-	-	-
Turkey	23,934	3,013	501
Turkmenistan	-	-	-
Uzbekistan	298	57	2
ECO Region Total	84,344	6,232	4,018
World Total	1,133,758	82,061	62,784

Note: So far, no case has been reported for COVID 19 in Tajikistan and Turkmenistan.

Source: World Health Organization (WHO)

Why Accurate Science Communication is Key in the fight against COVID-19?

Courtesy of the World Economic Forum (WEF)

- Misinformation about COVID-19, particularly regarding its risk to the public, leads to greater uncertainty and fear;
- In contrast, scientific findings and projections about the disease, however frightening, at least shine some light into the perilous shadows;
- The world needs more scientists who want to translate their expertise into effective communication on global concerns and anxieties to cut through the noise of fear and assumptions based on the unknown.

As the world experiences the cascading effects of a new pandemic, people everywhere are afraid. Almost every aspect of modern life has been dramatically disrupted by the disease COVID-19, including health, finance, education, transportation and community. Running through all of this is a fear of the unknown. This fear creates an emotional state of anxiety about a lack of knowledge, and thus control, over the situation and uncertainty about the present and future threats.

Much of this uncertainty relates to the nature of a novel pathogen, especially a potentially fatal coronavirus with unprecedented person-to-person transmission. Nobody has previous experience with it, immunologically or otherwise, and there's still much to learn about its wildlife origins and disease dynamics. Emerging without any human history or even a name, the global introduction of SARS-CoV-2 (the virus that causes COVID-19) might seem to many like the opening of an epic horror film.

However, a great deal of the uncertainty about COVID-19 is linked to the misinformation that is circulating about it – particularly misrepresentations of risk to the public, who react more fearfully when kept from the facts. Positive outlooks have disturbing effects when they run counter to reason, truth and evidence, and combined with disingenuity and inconsistency, they're utterly terrifying.

In contrast, scientific findings and projections about the disease, however frightening, at least shine some light into the perilous shadows. Thanks to a steady stream of open data via pre-prints, expedited publications and online repositories, all kinds of research resources and products are widely and freely available for consumption. These include hundreds of SARS-COV-2 genomes to design and evaluate diagnostic tests, epidemiological data to guide Covid-19 surveillance and public health decision-making, and user-friendly tools to visualize and track Covid-19 cases in real-time.

The scientific journals and institutions that support this process are trusted sources of information. Yet direct communication from the scientists themselves is an essential ingredient for a better-informed populace. With interviews, op-eds, podcasts, blogs and social media, scientists are uniquely positioned to lead people out of the darkness and empower them with facts.

The illuminative function of science defines its essential role in society, described beautifully by Carl Sagan in his many works. As an instrument of knowledge, science also has a secondary function as an antidote for fear. "For much of our history, we were so fearful of the outside world, with its unpredictable dangers, that we gladly embraced anything that promised to soften or explain away the terror," Sagan writes in *The Demon-Haunted World: Science as a Candle in the Dark*. "Science is an attempt, largely successful, to understand the world, to get a grip on things, to get a hold of ourselves, to steer a safe course."

Writing at a time when many Americans believed that they were at risk of alien abduction, Sagan saw an urgent need for science – and scientists – to play a much larger role in public education and discourse. The situation is even more serious today. During a public health emergency, anxiety is, of course, an entirely rational reaction to the fear of unknown threats. However, fear is also a potentially dangerous driver of behaviours that can prolong or hasten the spread of disease.

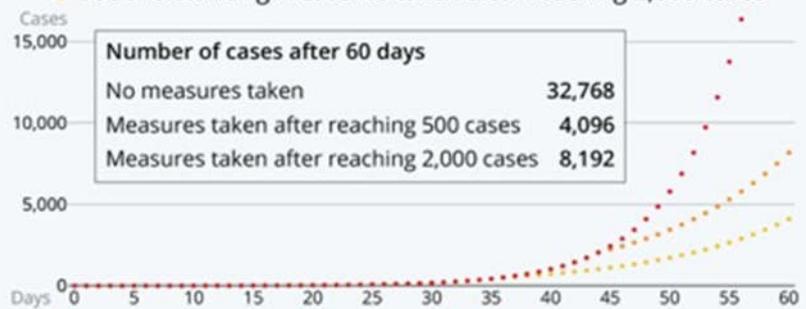
The world needs more scientists who want to translate their expertise into effective communication on global concerns and anxieties. The Young Scientists (YS) of the World Economic Forum apply this model across an enormous diversity of disciplines and problems, taking advantage of communication opportunities – presentations, meetings, workshops and conversations, as well as a variety of media platforms – to develop languages and approaches for different audiences and interests.

As we confront each new challenge, whether it's a pandemic or some other globally destabilizing force, these skills are supremely important to help us guide with science the leaders of business, technology and governance. Their fears of the unknown are no different from those of the general public and voices from the YS community may help to cut through the noise. The fewer people in the dark, the better off everyone will be. We're all in this together.

Why Social Distancing Is So Important

Number of cases assuming cases double every 4 days without and every 8 days with social distancing*

- No intervention
- Social distancing measures taken after reaching 500 cases
- Social distancing measures taken after reaching 2,000 cases



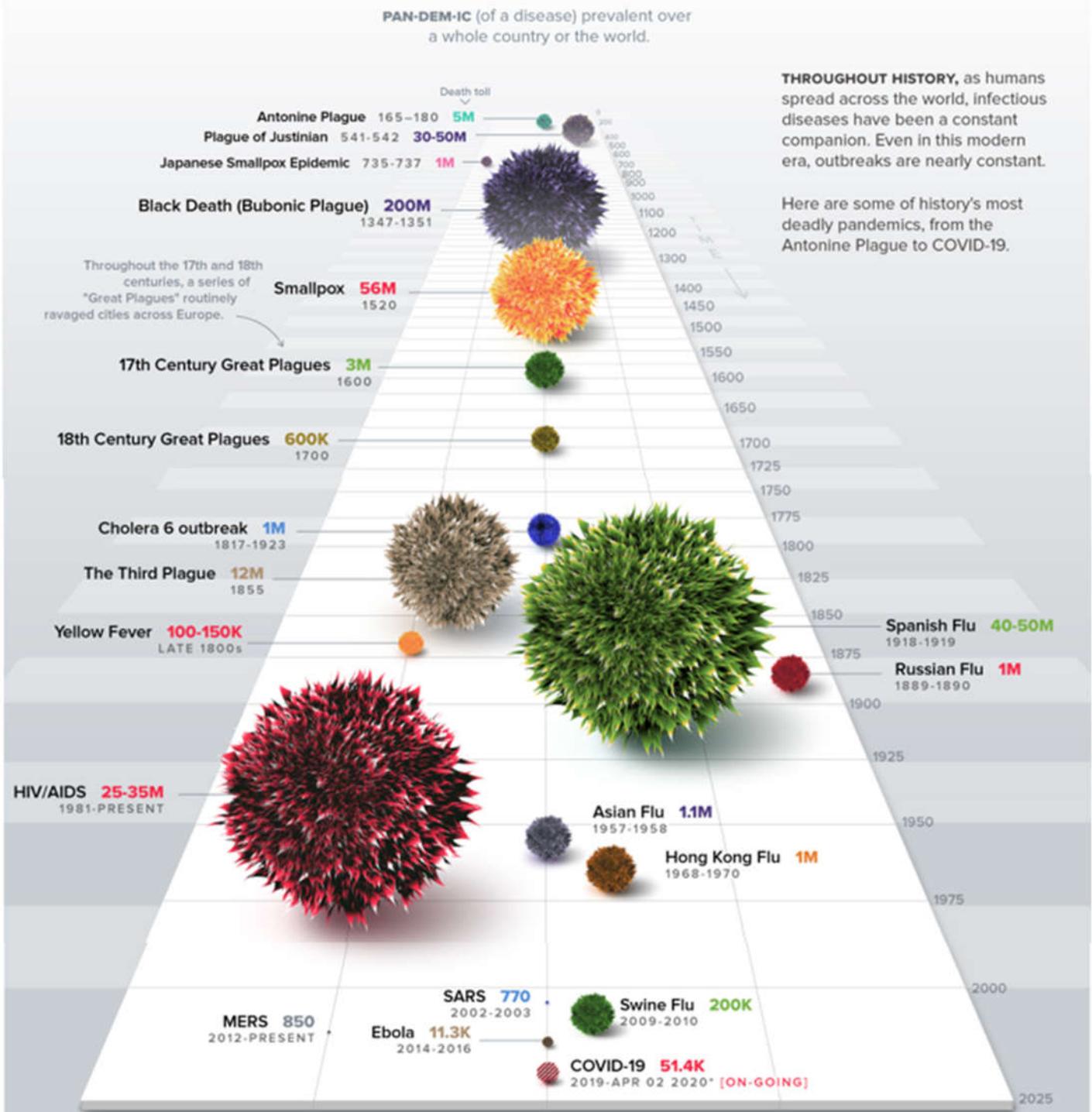
* Please note that the chart is based on simple assumptions. It is merely meant to illustrate the importance of policy measures to slow down the exponential spread of a virus.

Source: Statista

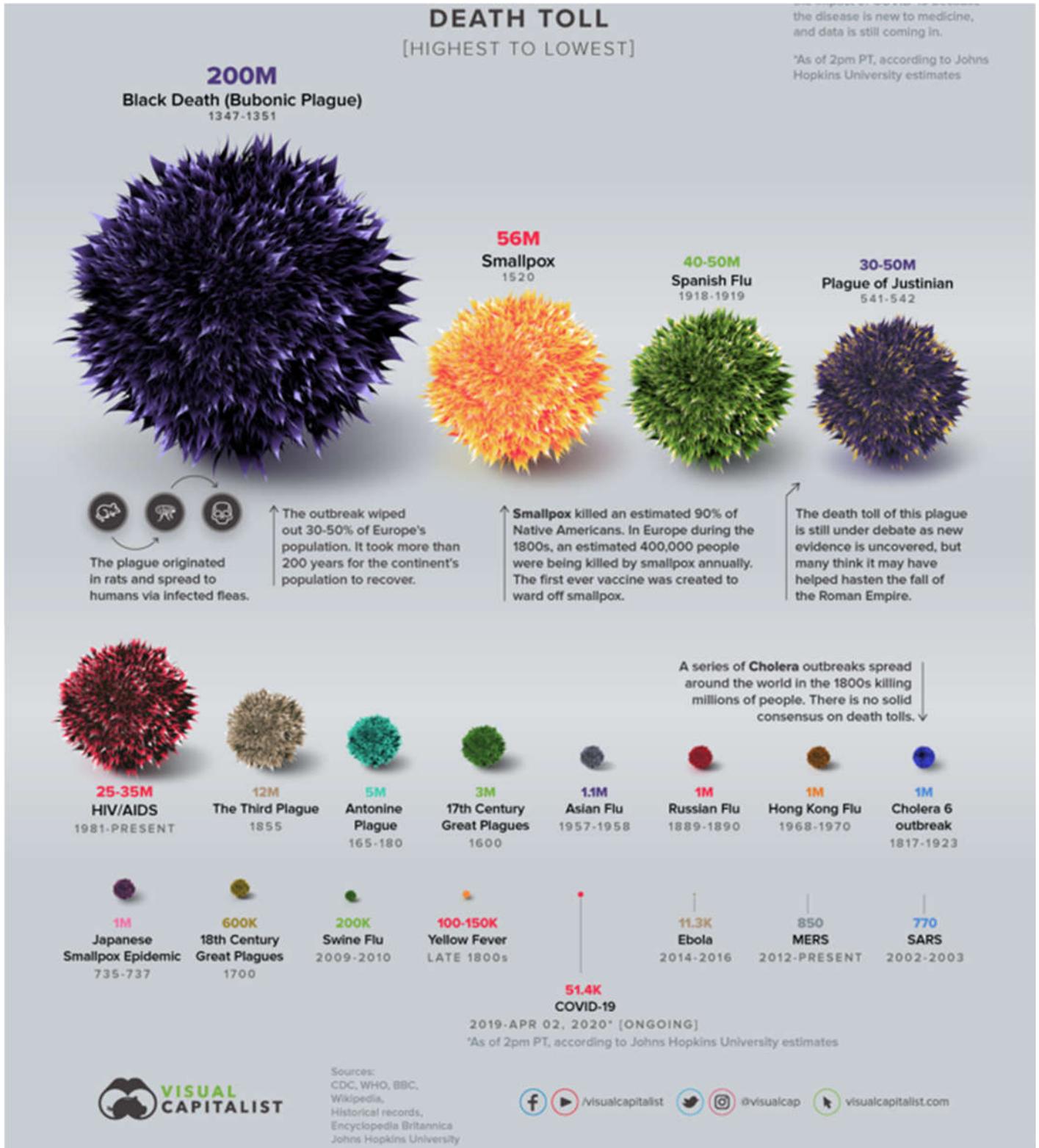
Timeline of Historical Pandemics

Disease and illnesses have plagued humanity since the earliest days, our mortal flaw. However, it was not until the marked shift to agrarian communities that the scale and spread of these diseases increased dramatically. Widespread trade created new opportunities for human and animal interactions that sped up such epidemics. Malaria, tuberculosis, leprosy, influenza, smallpox, and others first appeared during these early years. The more civilized humans became – with larger cities, more exotic trade routes, and increased contact with different populations of people, animals, and ecosystems – the more likely pandemics would occur. Here are some of the major pandemics that have occurred over

HISTORY OF PANDEMIC



time:



Source: <https://www.visualcapitalist.com/history-of-pandemics-deadliest/>

Vaccines and Treatment Development under trial for COVID-19, So Far

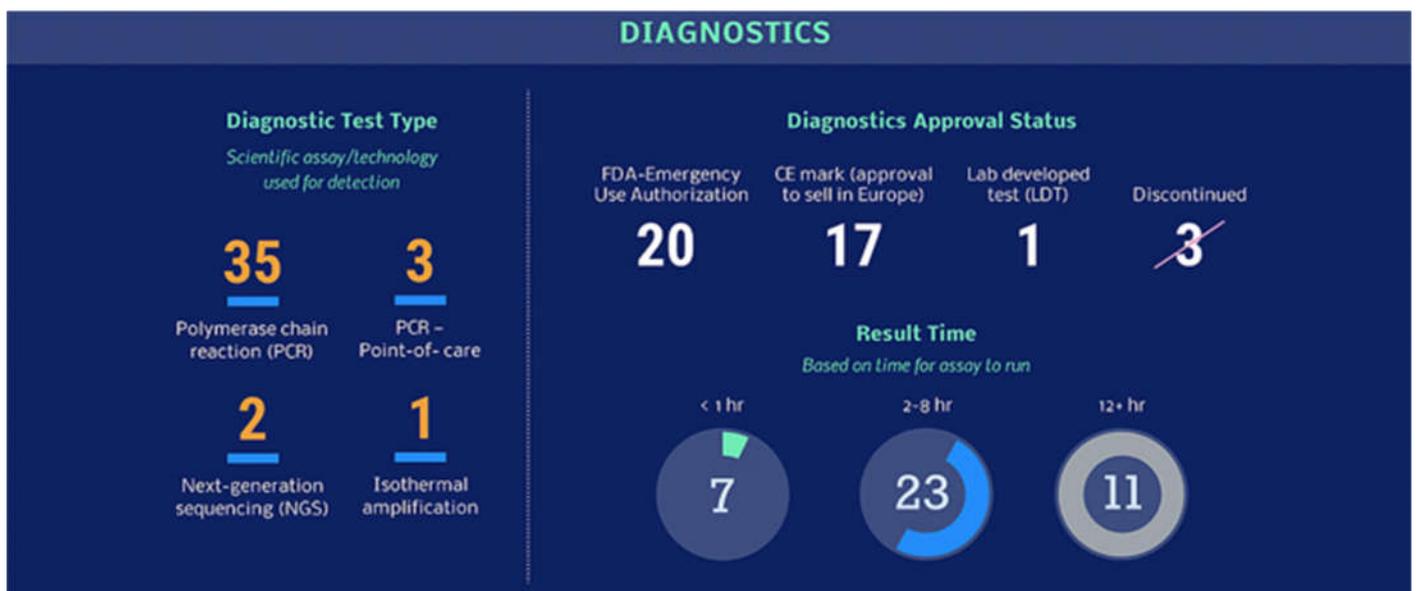
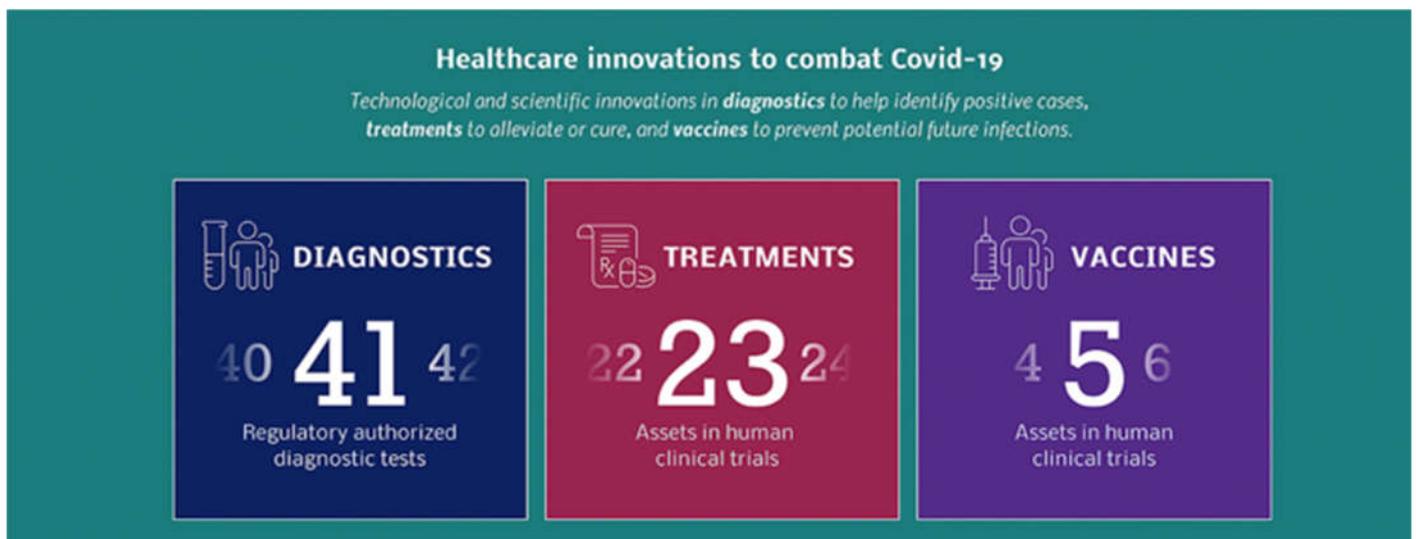
Courtesy of the Visual Capitalist - Published on April 1, 2020 By Nick Routley

As the number of confirmed COVID-19 cases continues to skyrocket, healthcare researchers around the world are working tirelessly to discover new life-saving medical innovations.

The projects these companies are working on can be organized into three distinct groups:

1. **Diagnostics:** Quickly and effectively detecting the disease in the first place
2. **Treatments:** Alleviating symptoms so people who have disease experience milder symptoms, and lowering the overall mortality rate
3. **Vaccines:** Preventing transmission by making the population immune to COVID-19

This graphics provide an in-depth look at who's in the innovation race to defeat the virus, and they come to us courtesy of Artis Ventures, a venture capital firm focused on life sciences and tech investments.



TREATMENTS

Treatment Goal

End purpose of drug being developed



In Development

Preclinical



Phase of Development (Clinical Trials)



VACCINES

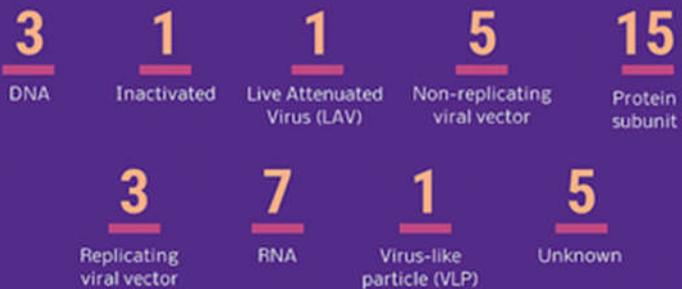
Vaccine Candidates

41

Currently in early development (preclinical)

Vaccine Platform

Mechanism being used for vaccine development



Knowledge is Power

Testing rates during this pandemic have been a point of contention. Without widespread testing, it has been tough to accurately track the spread of the virus, as well as pin down important metrics such as infectiousness and mortality rates. Inexpensive test kits that offer quick results will be key to curbing the outbreak.

Here are the companies and institutions developing new tests for COVID-19:

Product	Company	Test Type	Result Time (hr)	Approval Status
1. RealTime SARS-CoV-2	Abbott	PCR	4-6	FDA - EUA
2. ID NOW COVID-19 test	Abbott	Isothermal amp. - PoC	<1	FDA - EUA
3. AvellinoCoV2	Avellino Labs	PCR	24-48	FDA - EUA
4. Real-Time Fluorescent RT-PCR kit	BGI	PCR	3	FDA - EUA
5. BIOFIRE COVID-19 test	BioMérieux - BioFire Defense	PCR	<1	FDA - EUA
6. 2019-nCoV Real-Time RT-PCR Dx Panel	CDC	PCR	24-72	FDA - EUA
7. Xpert Xpress SARS-CoV-2 test	Cepheid	PCR-PoC	<1	FDA - EUA
8. Simplexa COVID-19 Direct	DiaSorin Molecular	PCR	1	FDA - EUA
9. ePlex SARS-CoV-2 Test	GenMark Diagnostics	PCR	2	FDA - EUA
10. Panther Fusion SARS-CoV-2 Assay	Hologic	PCR	3	FDA - EUA
11. Covid-19 RT-PCR test	LabCorp	PCR	24	FDA - EUA
12. NxTAG CoV Extended Panel Assay	Luminex Molecular Diagnostics	PCR	4	FDA - EUA
13. Accula SARS-CoV-2 test	Mesa Biotech	PCR-PoC	<1	FDA - EUA
14. New Coronavirus RT-PCR Test	PerkinElmer	PCR	4-6	FDA - EUA
15. COVID-19 genesig Real-Time PCR assay	Primerdesign	PCR	2	FDA - EUA
16. Quest SARS-CoV-2 rRT-PCR	Quest	PCR	96-120	FDA - EUA
17. Lyra SARS-CoV-2 Assay	Quidel	PCR	4-6	FDA - EUA
18. cobas SARS-CoV-2 Test	Roche	PCR	24	FDA - EUA
19. TaqPath COVID-19 Combo Kit	Thermo Fisher	PCR	4	FDA - EUA
20. NY SARS-CoV-2 Real-time RT-PCR	Wadsworth Center, NY State Dept of Public Health (CDC)	PCR	24-72	FDA - EUA
21. SARS-CoV-2 + Influenza A & B RT-qPCR Kit	3D Medicines	PCR	4-6	CE Mark
22. REALQUALITY RQ-2019-nCoV	AB ANALYTICA	PCR	4-6	CE Mark
23. Bosphore 2019-nCoV Detection Kit	Anatolia Geneworks	PCR	2	CE Mark
24. SARS-CoV-2, influenza, RSV panel	AusDiagnostics	PCR	4-6	CE Mark
25. AccuPower COVID-19 Real-Time RT-PCR Kit	Bioneer	PCR	8	CE Mark
26. Q-Sens 2019-nCoV Detection Kit	CancerPop	PCR	2	CE Mark
27. VIASURE SARS-CoV-2 Real Time PCR	CerTest Biotec, BD	PCR	3	CE Mark
28. Logix Smart Coronavirus COVID-19 Test	Co-Diagnostics	PCR	1-2	CE Mark
29. VitaPCR SARS-CoV2 Assay	Credo Diagnostics Biomedical	PCR-PoC	<1	CE Mark
30. qCOVID-19, CLART COVID-19	Genomica/PharmMar Group	PCR	5	CE Mark
31. 2019 Real-time PCR Kit	Kogene Biotech	PCR	4-6	CE Mark
32. GeneFinder COVID-19 RealAmp Kit	OsangHealthcare	PCR	4-6	CE Mark
33. QIAstat-Dx Respiratory SARS-CoV-2 Panel	Qiagen (acq. by Thermo Fisher)	PCR	1	CE Mark
34. Allplex 2019-nCoV Assay	Seegene	PCR	4	CE Mark
35. DiaPlexQ 2019-nCoV Detection kit	SolGent	PCR	2	CE Mark
36. SARS-CoV-2 Clinical Sequencing assay	Vision Medicals	NGS	>12	CE Mark
37. Multiple Real-Time PCR Kit	Beijing Applied Biological Technologies (XABT)	PCR	4-6	CE Mark
38. Explify Respiratory	IDbyDNA	NGS	24-48	LDT
39. COVID-19 Home Test Kits	Carbon Health	PCR	72-144	discontinued
40. At-home Covid-19 test	Everlywell	PCR	48	discontinued
41. Covid-19 Home Test Kit	Nurx, Molecular Testing Labs	PCR	48	discontinued

Source: FDA, WHO, company websites, news. Available upon request.

Vaccines under trails for COVID 19

The progress that is perhaps being watched the closest by the general public is the development of a COVID-19 vaccine. Creating a safe vaccine for a new illness is no easy feat. Thankfully, rapid progress is being made for a variety of reasons, including China's efforts to sequence the genetic material of Sars-CoV-2 and to share that information with research groups around the world.

Another factor contributing to the unprecedented speed of development is the fact that coronaviruses were already on the radar of health science researchers. Both SARS and MERS were caused by coronaviruses, and even though vaccines were shelved once those outbreaks were contained, learnings can still be applied to defeating COVID-19.

Vaccine	Company	Platform	Stage	Description	Location
1. mRNA-1273	 Moderna	RNA	Phase I-First Patient Dosed	First to dose a human in the US. Vaccine consists of a synthetic strand of mRNA designed to elicit an immune response to produce antibodies against SARS-CoV-2	
2. Ad5-nCoV	 CanSino Bio	Non-Replicating Viral Vector	Phase I	Benefits from previous success in the Ebola virus (time to market -3 years). The vaccine being developed is based on viral vectors (adenoviruses) to deliver antigens to express the SARS-CoV-2 spike protein	
3. ChAdOx1 nCoV-19	 University of Oxford	Non-Replicating Viral Vector	Phase I/II	Enrolling 500+ individuals to test its vaccine candidate, which uses a non-replicating virus to deliver RNA into cells.	
4. LV-SMENP-DC	 Shenzhen Geno-Immune Medical Institute	Lentiviral	Phase I/II	Begun early testing of its vaccine candidate. The vaccine uses a lentiviral vector to deliver Covid-19 minigenes to modify dendritic cells and activate T cells.	
5. BCG Vaccine	Research Group, Netherlands	Live Attenuated Virus (LAV)	Phase II/III	Repurposing the BCG vaccine, originally for TB, to fight SARS-CoV-2 in healthcare workers at high risk of infection. 1,000 individuals will be enrolled across 8 hospitals to receive the vaccine or placebo.	
6. BCG Vaccine	 Murdoch Children's Research Institute	Live Attenuated Virus (LAV)	Phase II/III	The BRACE trial will conduct a randomized, multi-center study of the TB vaccine in 4,000 healthcare workers across Australia.	

*Trial sponsor
Source: FDA, WHO, company websites, news. Available upon request.

No Clear Finish Line

Unfortunately, there is no silver bullet for solving this pandemic. A likely scenario is that teams of researchers around the world will come up with solutions that will incrementally help stop the spread of the virus, mitigate symptoms for those infected, and help lower the overall death toll. As well, early solutions rushed to market will need to be refined over the coming months.

We can only hope that the hard lessons learned from fighting COVID-19 will help stop a future outbreak in its tracks before it becomes a pandemic. For now, those of us on the sideline can only do our best to flatten the curve.

Originally published at <https://www.visualcapitalist.com/every-vaccine-treatment-covid-19-so-far/>

Math Behind the Social Distancing – (Courtesy of Visual Capitalist)

As scientists and healthcare professionals rush to develop a vaccine for COVID 19, social distancing can be thought of as the first line of defense.

However, for these to be as effective as possible, it is important to remember that we all have a part to play.

THE MATH BEHIND SOCIAL DISTANCING

Social distancing measures can play a critical role in controlling the spread of pandemics, but **only if carried out properly**.

WHAT IS IT?



Keep at least **6ft (2m)** apart from others



Avoid non-essential gatherings and crowds



Limit contact with those at higher risk

WHAT CAN YOU DO?



Work from home whenever possible



Greet with a wave, not handshakes or hugs



Avoid going out, except for essentials

Source: Government of Canada

Scientists measure the intensity of an infectious disease by its reproduction number (R_0).

R_0 : the average number of people a sick person will infect



For COVID-19, this has been estimated at **2.5**

Source: ISGlobal

To illustrate the potential of social distancing, the following assumptions are made:



There is a direct linear correlation between social exposure and R_0



The median incubation period of COVID-19 is approximately five days—after this period, a person will experience symptoms and self quarantine

With these in mind, here's how distancing measures can control the spread of the disease:

REDUCING SOCIAL EXPOSURE BY 75%



REDUCING SOCIAL EXPOSURE BY 50%



NO SOCIAL DISTANCING MEASURES IN PLACE



Handbook of COVID-19: Prevention and Treatment

The Jack Ma Foundation and Alibaba Foundation jointly established the MediXchange for Combating COVID-19 (GMCC) programme, with the support of Alibaba Cloud Intelligence and Alibaba Health, to help combat the global outbreak of the novel coronavirus, COVID-19.

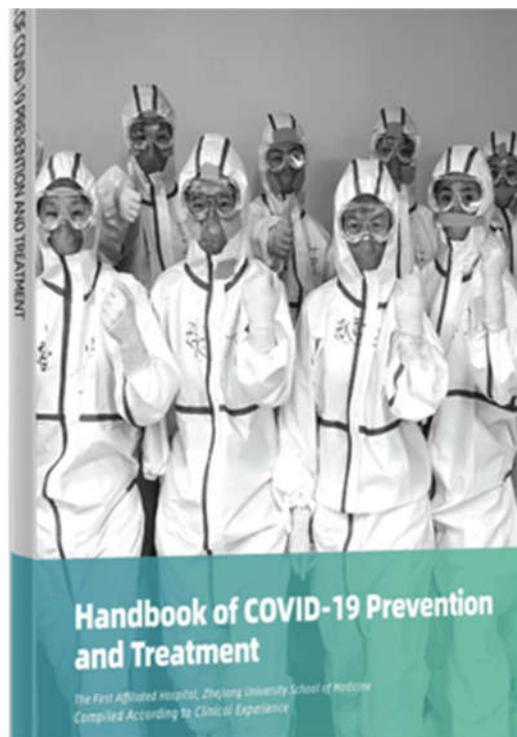
This programme was established to facilitate online communication and collaboration across borders, as well as provide frontline medical teams around the world with the necessary communication channels to share practical experience about fighting the pandemic.

In order to share invaluable practical advice and references with medical professionals around the world, Jack Ma Foundation in collaboration with Zhejiang University School of Medicine published this Handbook of COVID-19 Prevention and Treatment.

Key contents include :

- Technical strategies for prevention and treatment of the epidemic
- Treatment methods to treat the critically ill
- Nursing methods and experience

Website: <https://covid-19.alibabacloud.com>



Upcoming Events posted on ECOSF website and Facebook page

Online Family Science Camp

In the backdrop of Corona Virus situation, ECOSF and Pakistan Science Club are going to launch Online Family Science Camp from 6 April 2020. Online Family Summer Science Camp will be an engaging, learning and healthy experience for not only students of different age group but parents will also enjoy them with their children.

Read More: <http://ecosf.org/Online-Family-Science-Camp>

