Coronavirus pandemic: When will it end?

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Businesses around the world are reacting to a situation that's changing hourly. But they also need to look further ahead. We asked Emilia Skirmuntt, a virologist at the University of Oxford, to set out – with no hyperbole – the possible scenarios businesses must plan for. The views expressed in this article are those of the author and not of the University of Oxford.

In all realistic scenarios, the present outbreak of COVID-19 and SARS-CoV2, the coronavirus that causes it, is likely to have so reduced in intensity within 18 months that the outbreak will have ended. A vaccine will be produced, and 60-70% of people will be immune. It might remain endemic to some areas of the world, where it will be a straightforward public health problem. The virus will be, for practical purposes, eradicated.

The current response to the COVID-19 pandemic is the fastest-ever to a comparable threat. Laboratories are ready to go into clinical trials with new vaccinations and new treatments to help those affected by the virus. The emergence and course of an epidemic are impossible to predict with any certainty. The timing of any outbreak is accidental and depends on a random combination of low-probability independent events. The course of an outbreak can be projected based on well-understood patterns of viral transmission and mutation, but like any complex non-linear phenomenon, the course is difficult to predict.

Three short-term scenarios

Most likely: Recovery in July/August 2020

Some governments and the private sector took rapid action in Q1 2020, but it's not certain how long-lived these actions will be. Logistics and economics will test government resolve, business resilience and citizens' compliance. Transmission of the virus, and the emergence of new cases, is likely to continue through the middle of the year.

The poorest countries with the weakest healthcare systems will be hit hardest, and they will likely be hot spots for re-emergence of COVID-19 after its eradication in other countries. These minor resurgences will make it difficult to restore normal movement and trading.

Best case: Recovery in April/May 2020

If government, commercial and personal actions continue effectively through the period March-May, there is a possibility that transmission will be limited, and mortality and morbidity will reach levels in May that largely reflect seasonal norms. Regional hot spots will remain localized. Because coronaviruses mutate comparatively slowly, COVID-19 will not survive in the human population.

Most dangerous: Resurgence of the pandemic in December

China is containing the spread of this virus by significantly restricting normal economic activity. If quarantine measures taken in China only contain the disease without fully eradicating it, once China fully restarts production and distribution, the virus is likely to reappear and once again to spread.

This scenario, the most serious but least probable, could include the virus spreading globally over travel and trade links restored after the virus was apparently controlled earlier in the year.

Long term: More frequent epidemics and pandemics of zoonotic diseases

The increasing impact of humans on ecosystems makes the emergence of another threatening novel pathogen inevitable. Though we can't accurately predict the nature and time of such a new pathogen, every year the probability increases that a chain of events will result in an emergency.

There are ecological reasons: growth of human populations and the loss of wild areas, which have resulted in animal habitat changes. This disturbed equilibrium has increased contact between wild animals, humans, and livestock. And it has opened new routes for infection of immune-naïve humans with previously unknown pathogens naturally circulating in the animal population.

So-called zoonotic diseases (zoonoses) are infectious diseases present in animals that can be transmitted to humans. They're one of the greatest concerns for global health organizations: more than 70% of all emerging diseases are zoonotic in origin. The rate of discovered zoonoses has increased over time and we're better equipped to detect and differentiate diseases via new diagnostic assays, and study them in greater detail.

For many years now, the scientific community has expected the emergence of a new pathogen that can cause global epidemics. The circumstances of this most recent outbreak were no surprise: a country with dense population (which helps the spread of diseases) and good transport links (which helps to spread diseases quicker and over a larger area).

Long term: Mitigation measures never last

In recent years we've seen the emergence of other epidemics (e.g. SARS, MERS, Ebola) and one pandemic (AH1N1 influenza). In each case, the associated changes in the behavior of individuals were short-lived, and discontinued after the direct threat disappeared.

Many organizations and governments are funding research into treatments and vaccines against SARS-CoV2 and COVID-19. Many of those same research facilities had stopped their development of vaccines and treatments for SARS in 2003 after the epidemics ended and funding dried up.

People stopped taking hygienic measures like washing their hands just six months after the end of the influenza pandemic. That pandemic raised people's trust in vaccination, but this too was short-lived. Soon after the crisis ended, vaccination rates plummeted due to the spread of misinformation from antivaccination groups.

In 2007, the International Health Regulations treaty was introduced to reduce the spread of diseases on an international level. One aspect of the treaty is urging advanced economies to help develop ways to detect and control the spread of diseases, and to provide early warnings of novel pathogens that threaten to become a global epidemic with a high mortality rate.

Sadly, the requirements in the treaty were mostly ignored: to date, not a single country meets them.

Actions required

With the current surge of money for research, new vaccines should be developed and introduced in 2021 at the latest. This should also prevent the "most dangerous" scenario above, but the emergence of another threatening novel pathogen is inevitable.

It's not enough to develop new vaccines and therapeutics for the current pandemic.

We must work on education and awareness associated with pathogen threats. The emergence of these diseases is an accidental process, but improved risk assessments can help with early detection and intervention, which will stop

epidemics and pandemic events.

Another chain of events will bring a disease like this from wild animals to people, and it will be soon. If governments and the private sector can put enduring long-term actions and preventive measures into place, we'll be better prepared.

Emilia Skirmuntt is a postgraduate researcher at the University of Oxford, where she works on the topic of the genome and virus evolution, including the co-evolution of viruses and their hosts. She is also interested in zoonotic viral diseases, their epidemiology and immunology. She is especially interested in bats, known to be one of the major sources of viral infections spread among humans and other animals.

She holds two master's degrees: one in Biomedical Sciences from the University of Westminster, where she worked on tropical viral diseases; and a second in Forensic Medical Sciences from Bart's Hospital and the London School of Medicine and Dentistry. She holds a BSc in Animal Breeding and Genetics from the Warsaw University of Life Sciences.