



Isolation and fear of infection are factors contributing to a rise in anxiety and depression.

COVID'S MENTAL-HEALTH TOLL: SCIENTISTS TRACK SURGE IN DEPRESSION

Researchers are using huge data sets to link changes in mental health to coronavirus-response measures.

By Alison Abbott

As the COVID-19 pandemic enters its second year, new fast-spreading variants have caused a surge in infections in many countries, and renewed lockdowns. The devastation of the pandemic – millions of deaths, economic strife and unprecedented curbs on social interaction – has already had a marked effect on people's mental health. Researchers worldwide are investigating the causes and effects of this stress, and some fear that the deterioration in mental health could linger long after the pandemic has subsided. Ultimately, scientists hope that they can use the mountains of data being collected in studies about mental health to link the impact of particular control measures to changes in people's well-being, and to inform the management of future pandemics.

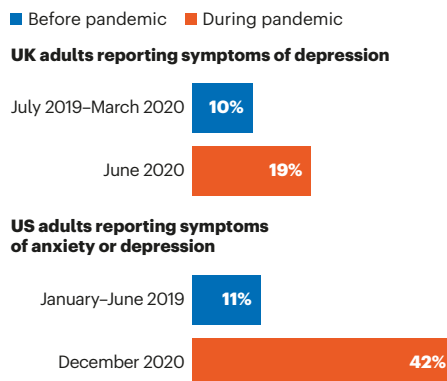
The data that emerge from these studies will be huge, says sociologist James Nazroo at the University of Manchester, UK. "This is really ambitious science," he says.

Some 42% of people surveyed by the US Census Bureau in December reported symptoms of anxiety or depression in December, an increase from 11% the previous year. Data from

other surveys suggest that the picture is similar worldwide (see 'COVID's mental stress'). "I don't think this is going to go back to baseline anytime soon," says clinical psychologist Luana Marques, at Harvard Medical School in Boston, Massachusetts, who is monitoring the mental-health impacts of the crisis in US populations and elsewhere. Major events that have shaken societies,

COVID'S MENTAL STRESS

The percentage of people experiencing symptoms of depression and anxiety has surged amid the COVID-19 pandemic, data from nationally representative surveys show.



such as the 9/11 terrorist attack in New York, have left some people with psychological distress for years, says Marques. A study of more than 36,000 New York residents and rescue workers revealed that more than 14 years after the attack, 14% still had post-traumatic stress disorder and 15% experienced depression – much higher rates than in comparable populations (5% and 8%, respectively; H. T. Jordan *et al. Environ. Health* 18, 12; 2019).

Fear and isolation

The distress seen during the pandemic probably stems from limits on social interactions, tensions among families in lockdown together and fear of illness, says psychiatrist Marcella Rietschel at the Central Institute for Mental Health in Mannheim, Germany.

Studies and surveys conducted so far during the pandemic consistently show that young people, rather than older people, are most vulnerable to increased psychological distress, perhaps because their need for social interactions is stronger. Data also suggest that young women are more vulnerable than young men, and people with young children, or a previously diagnosed psychiatric disorder, are at particularly high risk for mental-health problems. "The things that we know predispose people to mental health problems and conditions have been increased as a whole," says Victor Ugo, a campaign officer who specializes in mental-health policy at United for Global Mental Health, an advocacy group in London.

Scientists running large, detailed international studies say they might eventually be able to show how particular COVID-control measures – such as lockdowns or restrictions on social interaction – reduce or exacerbate mental-health stress, and whether some populations, such as minority ethnic groups, are disproportionately affected by certain policies. That could inform the response later in this pandemic and in future ones, say researchers.

"We have a real opportunity, a natural experiment, in how policies in different countries impact people's mental health," says epidemiologist Kathleen Merikangas at the US National Institutes of Mental Health in Bethesda, Maryland.

To draw studies together, Daisy Fancourt, a psychoneuroimmunologist at University College London, launched the Wellcome-funded CovidMinds programme, which has assembled around 140 longitudinal studies from across more than 70 countries. These recruit large numbers of participants and collect health information at regular intervals. CovidMinds links scientists in different countries and encourages the use of standardized questionnaires so that outcomes can be directly compared in international collaborations. "This may allow us to compare the psychological

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SOURCE: OFFICE FOR NATIONAL STATISTICS (UK DATA); CENTERS FOR DISEASE CONTROL AND PREVENTION (US DATA).

response alongside the political response across countries,” she says.

This collection of studies is a mix of existing population cohorts and studies established early in the pandemic. Existing cohorts are advantageous because their compositions tend to reflect that of the population overall, so their results can be generalized. And because long-running population cohorts will have data on participants from before the pandemic, they can quantify changes in mental health accurately, says epidemiologist Klaus Berger at the University of Muenster in Germany, who chairs the German National Cohort, one of the world’s largest health cohorts.

But large, established cohorts move relatively slowly and sample infrequently. The newer cohorts lack the baseline of data collected before the pandemic, but many can follow the dynamics of the crisis in a nimbler way.

Fancourt leads one of the largest new studies, the UK COVID-19 Social Study. The study recruited – mostly through social media – more than 72,000 UK adults in the first few weeks of the country’s first lockdown, in March. Participants fill in a weekly ten-minute online questionnaire, which includes questions that identify feelings of anxiety or depression.

Real-time data

“With survey responses coming in at a rate of one every 20 seconds, we get information about how people are responding psychologically and socially to the pandemic in real time, and see specifically how it’s changed in response to things like new government measures coming in, or lockdown measures being eased,” says Fancourt. For example, she says,

“We have a natural experiment in how different policies impact people’s mental health.”

the high levels of anxiety and depression the study found in its early weeks reduced during the lockdown, rather than increased as some had anticipated.

“Together, these types of study will tell us how government policies are experienced across different segments of societies and will help us understand how we should manage this pandemic, and future pandemics,” says Nazroo, who is participating in the European Union-wide Survey on Health, Ageing and Retirement in Europe cohort and other surveys related to COVID and mental health.

Another study, called the COVID-19 Health Care Workers Study, aims to quantify how health workers, who have faced unprecedented levels of illness and death, have coped. The study is collecting data in 21 countries,

including low-income nations in Latin America and Africa where mental-health resources are very limited. “We want to compare across countries to know what is happening that is different,” says Olatunde Ayinde, a researcher on the study’s Nigerian arm. He thinks that geographical variations are likely to stem from differences in the quality of mental-health

services, the availability and types of social care on offer and poverty levels. Many countries in Africa have just a fraction of the mental-health practitioners that high-income countries have. “We want to know what is responsible for the differences,” says Ayinde.

Additional reporting by Paul Adepaju.

SCIENTISTS CALL FOR OPEN SHARING OF PANDEMIC GENOME DATA

But others say that certain restrictions encourage faster sharing.

By Richard Van Noorden

Hundreds of scientists are urging that SARS-CoV-2 genome data should be shared more openly to help analyse how viral variants are spreading around the world.

Researchers have posted huge numbers of SARS-CoV-2 genome sequences online since January 2020. The most popular data-sharing platform, called GISAID, now hosts more than 450,000 viral genomes; Soumya Swaminathan, the chief scientist at the World Health Organization (WHO), has called it a game-changer in the pandemic. But it doesn’t allow sequences to be reshared publicly, which is hampering efforts to understand the coronavirus and the rapid rise of new variants, argues Rolf Apweiler, co-director of the European Bioinformatics Institute (EBI) near Cambridge, UK, which hosts its own large genome database that includes SARS-CoV-2 sequences.

In a letter released on 29 January (see go.nature.com/3rtjg5), Apweiler and others call for researchers to post their genome data in one of a triad of databases that don’t place any restrictions on data redistribution: the US GenBank, the EBI’s European Nucleotide Archive (ENA) and the DNA Data Bank of Japan, which are collectively known as the International Nucleotide Sequence Database Collaboration (INSDC).

Anyone can anonymously access the INSDC’s data and use them as they want, but GISAID requires that users confirm their identity and agree not to republish the site’s genomes without permission from the data provider. This means that studies building on GISAID data – such as those that create evolutionary trees analysing how SARS-CoV-2 variants are related – can’t publish full data so that others can easily check their analyses

or further build on their data set. They must instead direct readers back to the GISAID site.

The letter says the scientific community should “remove barriers that restrain effective data sharing”, but doesn’t mention GISAID specifically. It is signed by more than 500 scientists, including the 2020 chemistry Nobel laureate Emmanuelle Charpentier, and the head of the COVID-19 Genomics UK Consortium, Sharon Peacock. Where scientists have already established submissions to other databases, the letter states, “these submissions should continue in parallel”.

But many researchers who work with GISAID say that its terms of access are a benefit, because they encourage hesitant researchers to share data online speedily, without fear that others will use the results without credit. “The reason so many labs have provided SARS-CoV-2 genomes to GISAID is precisely because of the data-access agreement that restricts public resharing,” says Sebastian Maurer-Stroh, a bioinformatician at Singapore’s Agency for Science, Technology and Research. GISAID has worked with many labs to assist them to share data, he says.

GISAID stands for the Global Initiative on Sharing Avian Influenza Data; an international consortium of researchers helped to set it up as a non-profit foundation in 2008, to address researchers’ reluctance to share data on influenza strains. Some nations, including Indonesia, a hotspot for avian flu, feared that pharmaceutical firms would create drugs and vaccines using the sequence data without crediting the original data providers or sharing the benefits of the work with them. But they were persuaded to share sequences rapidly on GISAID; in March 2013, for instance, China published sequences of H7N9 avian flu in the database on the same day it informed the WHO of three infections in people. “GISAID