



GETTY

PANDEMIC DARKENS POSTDOCS' WORK AND CAREER HOPES

Nature's survey of this key segment of the scientific workforce paints a gloomy picture of interrupted research and anxiety about the future.

By Chris Woolston

Eight out of ten postdoctoral researchers say that the global coronavirus pandemic has hampered their ability to conduct experiments or collect data. More than half are finding it harder to discuss their research ideas or share their work with their laboratory head or colleagues, and nearly two-thirds believe that the pandemic has negatively affected their career prospects, according to *Nature's* first-ever survey

of postdocs worldwide (see 'Disruption and distress').

The pandemic has shuttered or reduced the output of academic labs globally, slashed institutional budgets and threatened the availability of grants, fellowships and other postdoctoral funding sources. The fallout adds up to a major challenge for a group of junior researchers who were already grappling with limited funds, intense job competition and

career uncertainties (see Editorial, page 160).

Nature's self-selected survey, which ran from mid-June to the end of July and drew responses from 7,670 postdocs working in academia, included detailed questions on the impact of COVID-19 on the global postdoctoral community. Follow-up interviews with selected respondents and hundreds of free-text comments (see 'The situation is grim' for a selection) filled in an unsettled, precarious picture

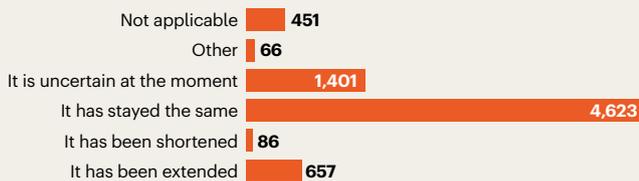
DISRUPTION AND DISTRESS

Nature's first-ever survey of more than 7,600 postdoctoral researchers worldwide uncovered great apprehension and uncertainty around the coronavirus pandemic's effect on respondents' current posts and career aspirations, and gaps in their ability to conduct research, maintain and secure funding, and communicate with their laboratory head and colleagues.

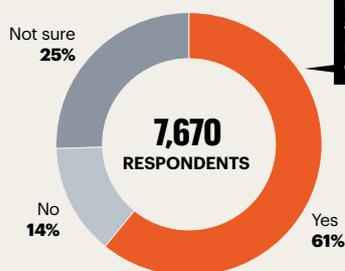
Q: Have you had COVID-19?



Q: Has your fellowship or term been extended because of COVID-19?

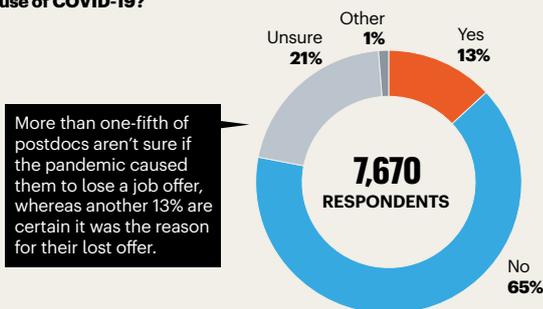


Q: Do you think the coronavirus pandemic has negatively affected your career prospects?



Almost two-thirds of respondents worry about the pandemic's negative effect on their career prospects.

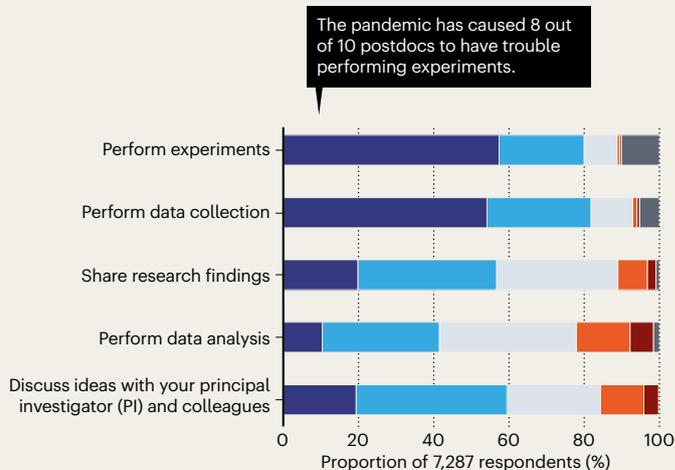
Q: Do you believe you've lost a postdoc or post-postdoc job offer because of COVID-19?



More than one-fifth of postdocs aren't sure if the pandemic caused them to lose a job offer, whereas another 13% are certain it was the reason for their lost offer.

Q: How has COVID-19 affected your ability to do the following?

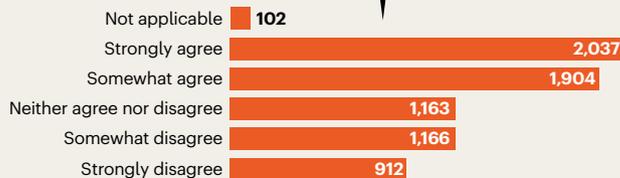
■ Significant negative impact ■ Some negative impact ■ No impact
 ■ Some positive impact ■ Significant positive impact ■ Not applicable



The pandemic has caused 8 out of 10 postdocs to have trouble performing experiments.

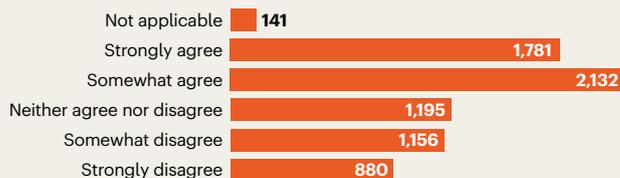
Nearly 6 out of 10 postdocs have trouble discussing ideas with their lab head and colleagues because of the pandemic.

Q: My supervisor/PI has done all I believe they can or should do to support me at this time.



More than half of postdocs feel supported by their principal investigator during the pandemic.

Q: My supervisor/PI has provided clear guidelines on how they will support me to manage any changes in my ability to work.



More than one-quarter of postdocs report a lack of guidance from their principal investigator around their inability to work because of the pandemic.

of postdoctoral research in the era of coronavirus. "The [pandemic] has compounded the pressures that postdocs were already under," says Hannah Wardill, a cancer researcher at the South Australian Health and Medical Research Institute in Adelaide, in an interview.

The survey, created together with Shift Learning, a market-research company based in London, was advertised on nature.com, in Springer Nature digital products and through e-mail campaigns. It was offered in English, Mandarin Chinese, Spanish, French and Portuguese. The

data set relating to the COVID-19 responses is available at go.nature.com/34wrre1. The full results are currently being analysed and will be released in November.

Uncertain job prospects

One per cent of respondents say that they have been diagnosed with COVID-19, and another 9% suspect that they have had the infection but were never tested. But concerns go far beyond the presence or absence of the virus. Some 61% of respondents say that the pandemic has

negatively affected their career prospects, and another 25% say that its cumulative effects on their career remain uncertain.

Worries about one's professional future are especially widespread in South America, where 70% of respondents say their careers have already suffered since the start of the pandemic. A biochemist in Brazil used the survey's comment section to share her own concerns. She notes that postdoctoral contracts in her country usually last for just one or two years, and extensions are far from guaranteed,



Cancer researcher Hannah Wardill had to cut short a promising project abroad to return to her position in Australia.

creating a tenuous situation for researchers who were probably already struggling to get by. “Here, we live in a reality where PhDs need to sell food on the street to support themselves financially, as most are unable to obtain scholarships or jobs,” she wrote.

Julieth Caro, a physicist at the Federal University of Rio de Janeiro in Brazil, worries that the Brazilian government might shorten the length of her scholarship in a cost-cutting move. “The pandemic just makes me remember that science is not important to the government,” she says. She adds that her scholarship prohibits her from taking a job outside her field. With few physics jobs available, she teaches experimental physics as an unpaid volunteer.

Belief that the pandemic had already negatively affected career prospects were also common in North and Central America (68%), Australasia (68%), Asia (61%), Africa (59%) and Europe (54%). In China, where the virus was first detected, 54% of respondents said their career had already suffered and 25% said they weren’t sure.

Perceived impacts varied by area of study. Slightly less than half of researchers in computer science and mathematics thought that their career prospects had suffered, compared with 68% of researchers in chemistry, 67% in ecology and evolution, and 60% in biomedicine.

The impact of the pandemic has now joined the list of the top concerns in the minds of postdocs. Asked to name the three primary challenges to their career progression, 40% of respondents point to the economic impact of COVID-19, nearly two-thirds (64%) note the competition for funding, and 45% point to the lack of jobs in their field.

For those hoping to secure faculty jobs in 2020, the pandemic – and the widespread hiring freezes that have followed – could

“Some 61% of respondents said that the pandemic had negatively affected their career prospects.”

hardly have come at a worse time. A bioengineer in Germany used the comment section to explain his situation. “I had verbal faculty offers from multiple universities. During the COVID-19 pandemic, they practically froze the hiring but they did not even update me about it.”

An HIV researcher in the United States who started looking for tenure-track positions this year comments that the pandemic may be a breaking point. “It’s impossible to understate the impact that COVID-19 will have on our

careers,” he writes. “I’d like to stay in academia, but that may no longer be possible.”

Thirteen per cent of respondents say they have already lost a postdoc job or an offer of one as a result of the pandemic, and 21% suspected the virus had wiped out a job but weren’t sure. More than one-third of researchers in South America report already losing a job, compared with 11% in Europe and 12% in North and Central America.

Sixty per cent of respondents are currently working abroad, a circumstance that only amplifies the pandemic’s potential impact. On top of everything else, many worry about the pandemic’s effect on their visas and their ability to stay in their new country. A biochemist from India who is currently working in the United States wrote, “I’m on a visa that will expire in January 2021. Because of the COVID lockdown, I lost three months of my work. So I might have to leave the lab and the country without being able to publish some of my findings.”

Experimental impacts

Eighty per cent of respondents say that the pandemic has hampered their ability to conduct experiments. One of those is Rakesh Dhama, a photonics engineer at Bangor University, UK. He was meant to travel to France earlier this year to finish experiments on a chip

THE SITUATION IS GRIM

Free-text comments in *Nature's* survey of postdoctoral researchers worldwide detailed the downsides — and a few of the upsides — of the coronavirus pandemic. Researchers in the United States were especially vocal.

- My normal job has effectively halted during the lockdown period. However, I have been able to lead a project looking at COVID-19 as senior author, independent of my lab or institute. *Cell biologist, United Kingdom.*
- Postdoc-ing has a lot of high points... but the lack of job security, life stability and job prospects, especially with the COVID-19 recession to come, tips the overall balance far into the negative. *Food-sustainability researcher, United States.*
- I am immunosuppressed and have an autoimmune disease that puts me at high risk of COVID-19. I'll have to continue working at home for the rest of my postdoc. I'm already losing opportunities to network and prepare for the faculty job market. *Social psychologist, Canada.*
- My interactions with colleagues and professional development opportunities have been positively impacted by COVID-19. Now I have more access to opportunities that are offered online. *Ecologist, United States.*
- The pandemic has directly changed my career plan. I was going to do my postdoc in the United States, but now I am stuck in China. *Biomedical scientist, China.*
- I wish there was more intentional training from my PI about career prospects... the situation in academia may be very dire due to the COVID-19 crisis. I am not willing to wait more than two years for a faculty position.

Geneticist, United States.

- Due to COVID, my current postdoc could end unwillingly, due to the 'hire Americans first' attitude of the US government. My visa may not be renewed, and opportunities in my home country (Canada) are non-existent, especially during COVID. *Agricultural scientist, United States.*
- Due to travel restrictions in the COVID-19 era, I am unable to join an offered postdoc position abroad. Now I am unable to get a new position. Hardly anyone wants to hire a foreign expert. *Engineer, India.*
- We are literally seen as research machines and our health and safety during the COVID-19 pandemic is left up to the discretion of our PIs. Several of my friends have been forced to work as if nothing has changed. *Quantitative health scientist, United States.*
- I love my job, I'm lucky and persevering. But COVID-19 won't allow me to have the hours of investigation I would like to have. *Marine biologist, Argentina.*
- No amount of Zoom meetings or WebEX calls can replace the feeling of going into a laboratory setting and conduct research alongside colleagues. COVID-19 did not change my research goals or career dreams, but now I feel those dreams are out of reach. *Neuroscientist, United States.*
- Under the epidemic, the employment situation is grim. *Biomedical scientist, China.*

designed to kill cancer stem cells. "Everything was scuttled because of the coronavirus," he says. "Now I won't get any credit for planning that experiment." He adds that his supervisor had acquired two pieces of equipment that could improve the accuracy of experiments, but says that no one is around to get the devices up and running. "Scientifically, coronavirus has really affected me," he laments.

Dhama, who is from India, says that his UK visa was set to expire at the end of July, adding extra urgency to a job search that was already hampered by the pandemic. With the clock ticking, he applied for a Marie Curie fellowship from the European Commission in his field of photonics. "I had to put together a 10-page proposal on a new idea in 20 days," he says. The proposal was accepted, and Dhama will start his fellowship at Tampere University in Finland in October, provided that he can get a visa to work in that country.

Experiments aren't the only scientific activities that can suffer during a pandemic. Fifty-nine per cent of respondents said that they had more trouble discussing ideas with

their supervisor or colleagues, and 57% said that the pandemic had made it harder to share their research findings. A molecular biologist in the United States commented, "I haven't met my colleagues yet because of the coronavirus."

"I'm at an important point in my research career, and I'm not as competitive as I would have liked to have been."

Despite the widespread delays caused by the pandemic, slightly less than 10% of respondents say that they have received an extension on their fellowships or work contracts. Nearly two-thirds (63%) say that the duration of their position has remained unchanged, and 19% were currently unsure. Melania Zauri, a cancer biologist with a Marie Curie fellowship at the Spanish National Cancer Research Centre in Madrid, says that she was given the opportunity to take unpaid leave but was not offered

a paid extension of her contract. Zauri notes that Spain is extending the contracts of many researchers supported by the government, but that researchers with prestigious external fellowships are left out. "We are being treated as the last wheels on the carriage," she says.

Strained relationships

The survey included questions about supervisors, a role that takes on extra importance during a crisis. More than half (54%) of respondents said that their supervisor had provided clear guidance on managing their work during the pandemic, but one-third (32%) said that they weren't receiving that sort of support from above. Twenty-nine per cent of respondents strongly or somewhat disagreed that their adviser has done everything they can to support them during the pandemic. Female respondents (28%) were more likely than male respondents (25%) to think that their supervisors fell short.

The free-comment section of the survey underscores how the pandemic has strained some supervisor–postdoc relationships. A molecular microbiologist in the United States expressed her concern about safety protocols during the outbreak. "My principal investigator pretended nothing was going on during the COVID-19 quarantine," she wrote. "He requested everybody to keep working and he refused to wear a face mask until the university made it mandatory." In a similar vein, a mycologist, also in the United States, said that lab members were "forced to continue to work with a lack of secure measures".

Some postdocs have found small consolations in the pandemic. Although more than one-quarter (26%) of respondents say that the pandemic has somewhat or significantly impaired their ability to write papers, 43% say that writing has become easier. "The downtime has allowed me to focus on my writing," Wardill says. "It's a bit of a silver lining."

Still, Wardill thinks that the pandemic has put the brakes on her work and career. As travel concerns grew during March, she felt forced to leave an ongoing research project at the University of Groningen in the Netherlands to return home to Australia. She was hoping the results and papers from that project would give her an edge as she applied for future funding, but now those experiments are on ice. "I'm at an important point in my research career, and I'm not as competitive as I would have liked to have been," she says.

Wardill hopes that funders will take the pandemic into account when assessing the research outputs and productivity of applicants. They should acknowledge the impact," she says. "This is something that's affecting everyone."

Chris Woolston is a freelance writer in Billings, Montana.