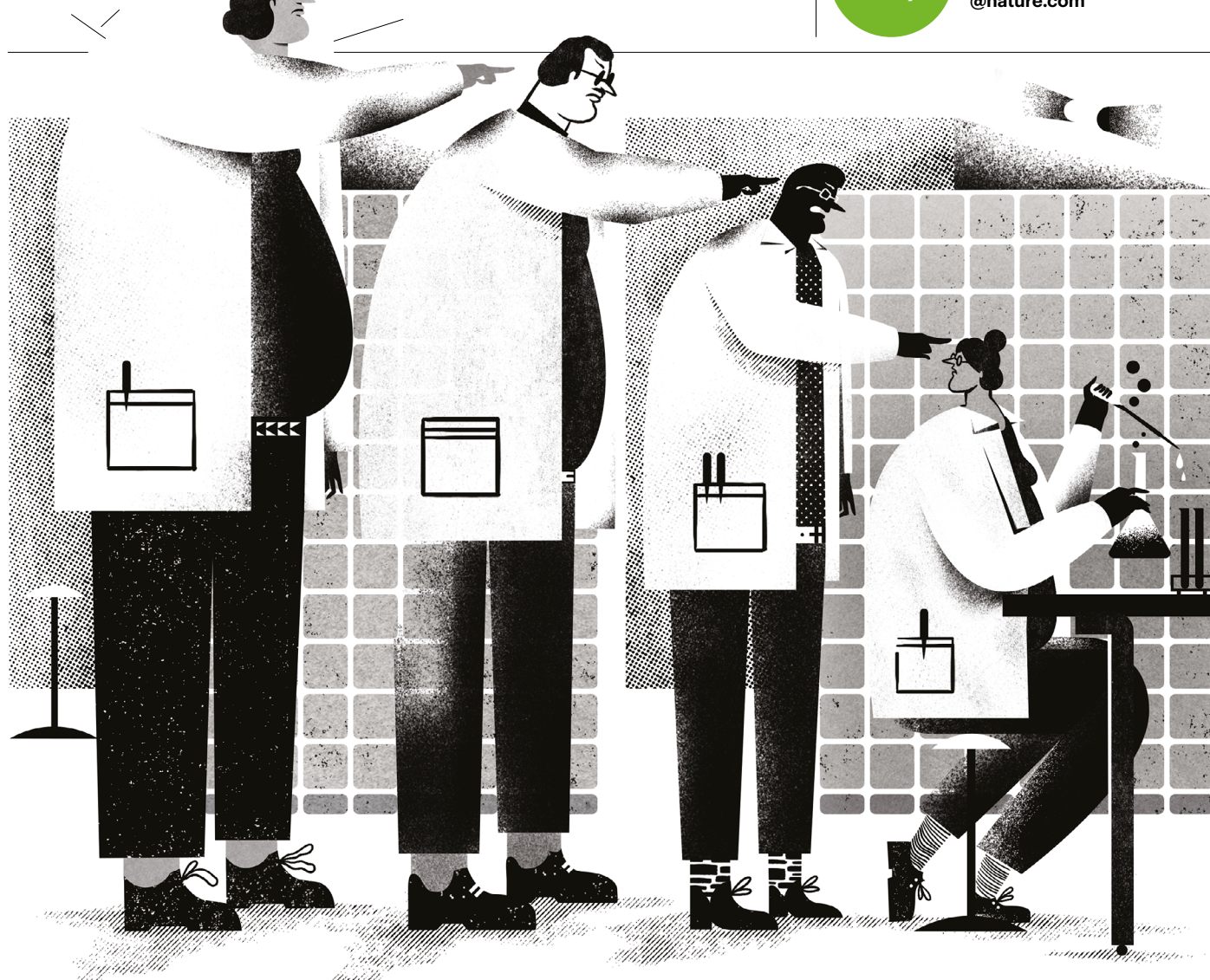


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MIGUEL MONCK

## POSTDOCS UNDER PRESSURE: 'CAN I EVEN DO THIS ANY MORE?'

Stressful hours and insecurity are making many consider quitting science, finds *Nature's* first survey of postdoctoral researchers. **By Chris Woolston**

**D**uring a two-year stint as a postdoctoral researcher in computational microbiology at the University of Liverpool, UK, Adrian Cazares suffered despite his successes. "I published papers but I wasn't happy," he says. "[Postdocs] are under so much pressure all the time. We take it to every part of our lives. It really started to affect my mental health."

Cazares, who in February started his second postdoc – this one at the European Bioinformatics Institute on the Wellcome Genome Campus near Cambridge, UK – was one of more than 7,600 researchers in 93 countries who responded to *Nature's* first-ever survey of postdoctoral scientists. The self-selecting survey, which ran in June and July, included a series of questions designed to illuminate

postdocs' quality-of-life issues, including mental health, working hours and experiences of discrimination and harassment (see '*Nature's* postdoc survey').

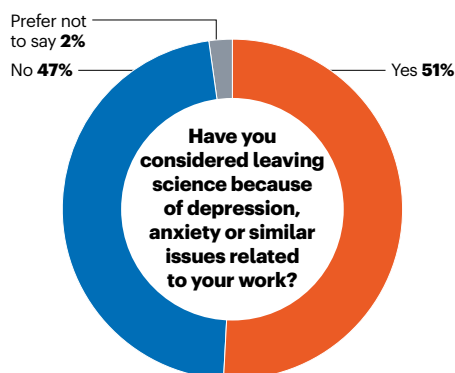
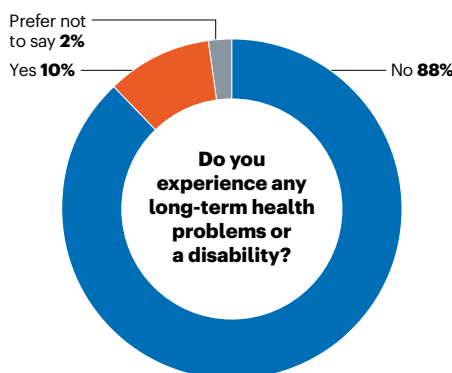
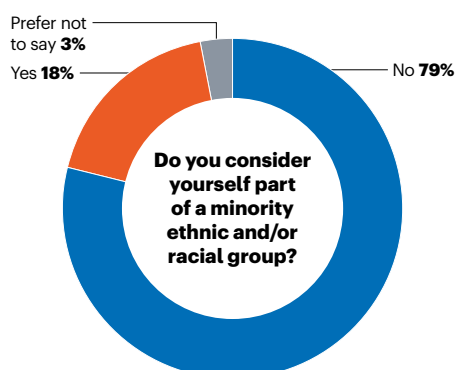
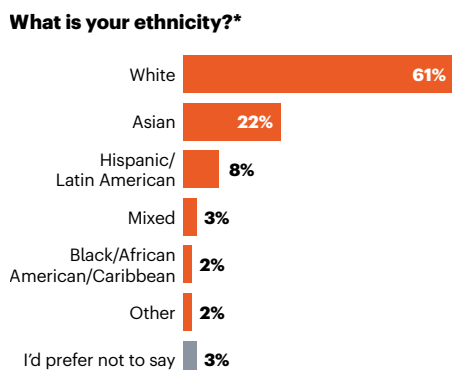
### 'Tipping point'

Through survey answers, free-text comments and follow-up interviews, respondents shared the day-to-day realities of a pivotal, and often

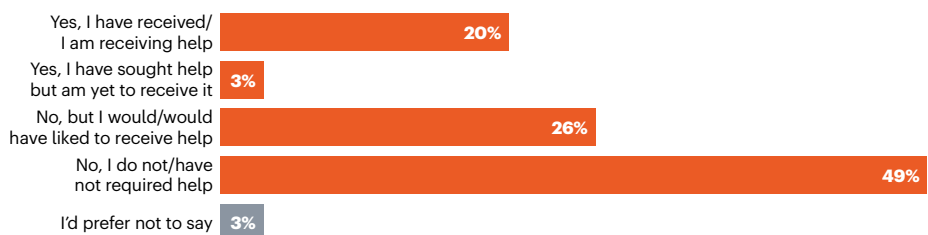
## EXISTENTIAL DOUBTS

Postdoctoral researchers are a diverse, resilient group, but mental and emotional strain has made many question their ability to remain in science. Some have received help for anxiety and depression, but even more have never sought assistance, despite wanting to — a sign that postdocs don't always have clear access to needed services.

### What is your ethnicity\*?



### Have you sought or received professional help for depression or anxiety related to your work\*?



\*Figures have been rounded and so do not add up to 100%.

precarious, stage of a scientific life. Responses uncovered a list of issues — including high pressure, long hours, relatively low wages compared with those for analogous research positions outside academia, and pervasive job insecurity — that can threaten to derail a scientific career. “A postdoc can be a tipping point,” says Renate Ysseldyk, a health psychologist at Carleton University in Ottawa, Canada. Ysseldyk was the lead author of a study published last year that used interviews and a survey to explore challenges facing female postdocs in academia (R. Ysseldyk *et al.* *Front. Psychol.* **10**, 1297; 2019). “It’s a time when career uncertainty collides with the stress of personal life,” she adds. “You reach that point and you have to ask yourself: Is it worth it? Can I even do this any more?”

Many postdocs are asking themselves just that: 51% of respondents said that they had considered leaving science because of mental-health concerns related to their work (see ‘Existential doubts’). Some groups are especially

likely to have such doubts. Fifty-five per cent of female respondents said that they had considered quitting science, compared with 46% of male respondents. And two-thirds of those who reported disabilities said that they had considered leaving because of mental-health concerns.

Ysseldyk is not surprised that so many postdocs doubt their ability to carry on. “That’s certainly how I felt,” she says, citing her own experience that postdoctoral work can seem incompatible with motherhood. “I felt like a professional failure and a negligent mother at the same time,” she says. In their 2019 study, Ysseldyk and colleagues found that concerns about parenthood were common among female postdocs. Some worried about ‘falling behind’ as they started families. “It’s such a tenuous time for women, in particular when they go on maternity leave,” Ysseldyk says. “They can’t put in those hours any more. And yet they are going to be compared to their colleagues.”

Even for those who are not parents, postdoctoral positions can greatly complicate life plans. Kathryn Cutts, a geologist at Rio de Janeiro State University in Brazil, started her two-year placement in May. It’s her second in Brazil and her fourth overall. “I’ve really enjoyed doing postdocs,” says Cutts, who is from Australia. “I’ve been able to travel the world.” But after so many years without a stable, permanent post, her life still feels precarious. When you’re a postdoc, she says, “you’re at the point where you want to start a family and settle down. But you have to have an amazing track record to get a permanent position at a university. There’s a pressure to produce.”

Natalie Sirisaengtaksin, a postdoctoral cancer researcher at the University of Texas Health Sciences Center at Houston, says that she understands why so many postdocs think about quitting. “It all comes down to the mentor,” she says. “Without my mentor, I don’t think I’d still be in science.” She has observed that some postdocs get pushed too far for too long, often at the expense of other parts of their lives. “We have a support group of postdocs who get together monthly to talk about the issues that we have,” she says. Some former members of the group, she adds, have left academia in the hope of improving their mental health.

## Balancing act

Achieving a good work–life balance is an elusive dream for many postdocs. In the survey, just four out of ten respondents said that they were satisfied with the balance in their lives. For many, long hours at work leave little room for other concerns. Thirty-one per cent of respondents said their contracts called for at least 40 hours per week, but contracts are often little more than a piece of paper. Thirty-one per cent of respondents reported putting in at least 10 hours a week beyond their contracts, and 8% said they put in 20 or more extra hours. Almost all (97%) reported working at weekends and on days off, and 49% said they had done so at least 20 times in their career.

Those extra hours are often not compensated, says Anna Coussens, an immunologist at WEHI (formerly known as the Walter and Eliza Hall Institute of Medical Research) in Parkville, Australia, and a former member of the executive committee of the Global Young Academy, a science-advocacy group based in Halle, Germany. One of her previous postdoctoral positions was in the United Kingdom, where she had to sign a waiver stating that she would work extra hours beyond her contract. Even postdocs who didn’t sign such contracts tended to live by the same rule, she says. “Everyone knows that you work beyond the hours that you get paid for.”

## Mental-health toll

The combination of long hours, stress and uncertainty can pose a serious threat to mental

health (see 'Academia has truly ruined my life'). Nearly half (49%) of respondents wanted help for depression or anxiety caused by their work. About one-quarter (23%) had received support, and even more (26%) said that they hadn't sought help but had wanted to do so.

Some groups experience greater distress than do others. Female respondents were more likely than male respondents to have sought help (27% compared with 16%). Field of study matters, too. Twenty-three per cent of researchers in ecology and evolution and 20% of researchers in biomedical sciences said they were already receiving mental-health help. By contrast, only 13% of respondents in chemistry and 11% of respondents in engineering were getting help.

Compared with some groups in other surveys, postdoctoral researchers seem reluctant to seek help for mental-health concerns. In *Nature's* 2019 survey of PhD students, 36% of respondents said they had sought help for depression or anxiety caused by their PhD studies. In a survey of more than 13,000 researchers at various career stages, conducted this year by Cactus Communications, a scholarly-communications company with offices around the world, 37% of respondents said they had sought help for their mental health ([go.nature.com/2utpnel](https://go.nature.com/2utpnel)).

One possible reason for this reluctance is that, for postdocs struggling with mental-health issues, assistance isn't necessarily easy to find. In this year's survey, just over one-quarter (27%) of respondents agreed with the statement that "my university/institution offers adequate mental health support". Less than one-fifth (18%) agreed with the statement that "mental health and wellbeing services in my university are tailored and appropriate to the needs of postdocs".

Because postdocs often fall into a grey zone between staff and students, they might not be eligible for mental-health services that are available to others at their institutions, Ysseldyk says, describing it as "another issue where postdocs are falling through the cracks in the system".

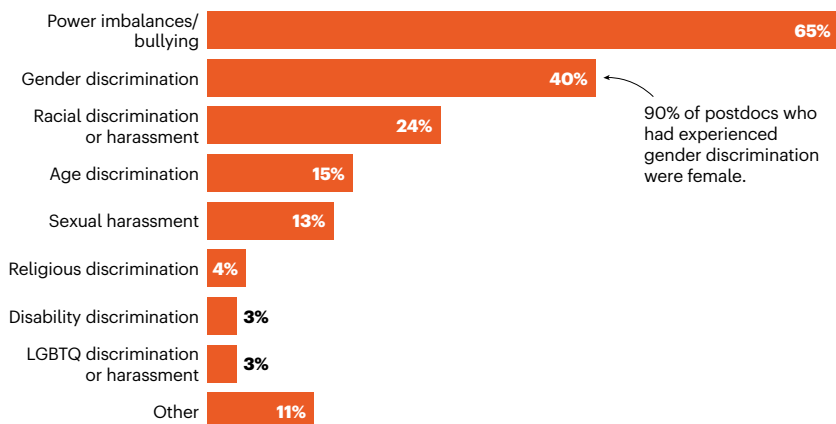
Cazares says that his mental health has suffered in the competitive atmosphere of postdoctoral research, especially during his first postdoctoral stint, at the University of Liverpool. (The university did not respond to requests for comment.) For him, Twitter was a particular source of anxiety. The non-stop chatter about grants, publications and awards has given him an uneasy feeling that he might be falling behind. "Everyone is keen to share success but very few [postdocs] talk about competition and failures, which are actually way more common," he says. "We have to think about the impact of our words on others."

As noted in a previous article (*Nature* 587, 505–508; 2020), respondents to the survey are a diverse, globally mobile group. Sixty-one per

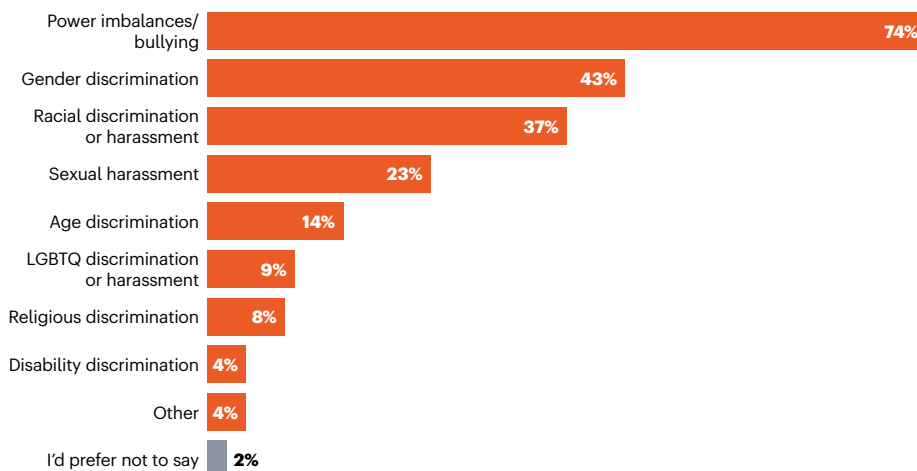
## HARASSMENT AND DISCRIMINATION

Nearly one in four postdocs reported experiencing harassment and/or discrimination in their current positions, much of it coming from the top. Principal investigators are frequent perpetrators, a sign of power imbalances and abuses. Many of these postdocs feel that their institutions aren't doing enough to promote equality.

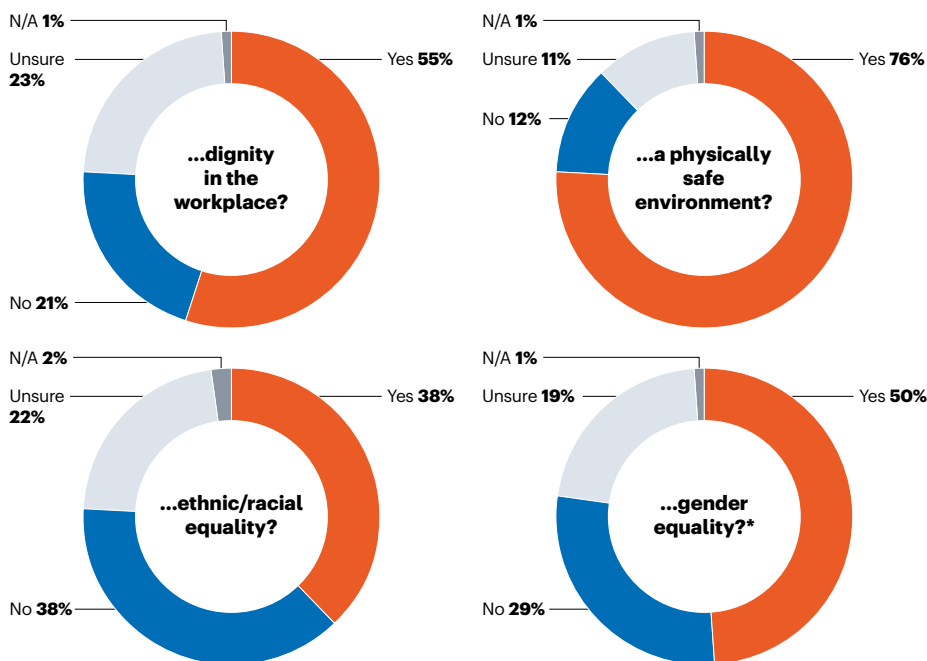
### Which of the following have you experienced directly?



### Which of the following have you observed?



### Do you believe that your postdoc workplace is doing enough to promote...



\*Figures have been rounded and so do not add up to 100%.



## 'Academia has truly ruined my life'

In free-text comments, respondents to *Nature's* inaugural survey of postdoctoral researchers disclosed discontent and disillusionment.

- In Brazil, PhD students need to sell food on the street in order to support themselves financially, as most of them are unable to obtain scholarships or jobs to sustain themselves. *Bioinformatician, Brazil*
- I was told to go out to dinner and drinks with an older male collaborator each time he was in town, but my male colleagues were not required to do the same thing. This man pressured me to tell him where I lived and kept trying to drive me home. *Biomedical researcher, United Kingdom*
- As a Latina postdoc in the United States, I heard racist comments from my principal investigator. My work was never recognized. It was the worst experience. *Biotechnology researcher now working in Europe*
- The lack of stability in a postdoc position is a huge source of anxiety and depression in this group. You cannot plan your life more than for the next two or three years and you are always looking for a new place to live. *Physicist, Denmark*
- There is little support for gay postdoc groups in China. *Healthcare researcher, China*
- I'm facing more gender discrimination than I have at any other stage of training. I fear that this puts me at a significant disadvantage relative to the male postdocs in my lab who started around the same time. We will likely go on the job market at a similar time and I will look less productive. *Biomedical researcher, United States*
- I'm very unhappy about the lack of support from my supervisor and the constant pressure to work ridiculously long hours for a small salary. I'm heavily involved in our local postdoc association to change the conditions for future postdocs. *Biomedical researcher, Canada*
- Academia has truly ruined my life. All of my peers are either married with kids or they're making six figures at their job with only a Bachelor's degree. I am still single, no kids, have depression and extreme anxiety, and I'm still poor. *Biomedical researcher, United States*

cent are currently working outside their home country, and nearly 20% consider themselves to be members of a minority ethnic group. The global reach of postdocs helps to drive scientific innovation, but it also creates opportunities for friction. A geneticist from Africa who is a postdoc at a prestigious research university in the US Midwest wrote in the comment section that it's "difficult to navigate academia as a minority. People assume you are lazy, not intelligent or a diversity hire at all times."

One-quarter (24%) of respondents said they had experienced discrimination or harassment during their current postdoctoral stint (see 'Harassment and discrimination'), a slightly higher proportion than the 21% of PhD students who reported such mistreatment in our survey of graduate students last year (*Nature* **575**, 403–406; 2019). International postdocs (25%) were rather more likely than their peers working in their home countries (21%) to report harassment or discrimination. Thirty-four per cent of respondents who identified as members of an ethnic minority (and 22% of those who don't identify as such) said they had experienced discrimination or harassment. Female respondents (30%) were more likely than male respondents (18%) to report experiencing discrimination and harassment.

### Power imbalance

When asked to identify the type or types of mistreatment they had experienced, most (65%) pointed to power imbalances or bullying, 40% reported gender discrimination and 24% reported racial discrimination. Consistent with previous *Nature* surveys, one in ten respondents who reported gender-based discrimination were male.

Less than half of female respondents (47%) agreed that their institution is doing enough to promote gender equality. One postdoc wrote in the comment section that she had suggested workplace changes that were not implemented, only to see a male colleague praised later for making those same suggestions. Another respondent underscored in her comments how women are often judged harshly for reasons that have nothing to do with the quality of their work. "Age and body size", the commenter wrote, "are implicated in the inability to get a promotion."

Troubling behaviours often come from the top. Asked to identify the perpetrator, 57% of respondents who had experienced harassment or discrimination pointed to their supervisor or principal investigator (PI). "There is a real lack of protection against discrimination and harassment from PIs," wrote a cell biologist from France who is a postdoc at a university on the US East Coast. "And it needs to change." One-quarter implicated another postdoc in their group. Just half (50%) of respondents said that their institution is doing enough to support gender equality; slightly more than one-third (38%)

said that their institutions were adequately addressing racial and ethnic equality.

Some postdocs who participated in the *Nature* survey are also helping to lead the way to change. Philip Scholten, a chemist at the Adolphe Merkle Institute in Fribourg, Switzerland, is part of a postdoctoral group putting together a survey to assess issues of racism and sexism at their institution. The Merkle Institute, which is affiliated with the University of Fribourg, has a small but diverse community. "This institute has a lot of nationalities that bring a lot of richness," Scholten says. "But there is racism and racial inequality in Europe, and it's often overlooked in academia." We should do more to combat those obstacles, he adds.

For his part, Cazares, who is from Mexico, says that he has never sensed any racial discrimination or bias during his time in the United Kingdom. "Liverpool and Cambridge have been very welcoming," he says, adding that he is also trying to do his part to help other postdocs feel comfortable in their positions. "If I see someone who is falling behind or is stressed about their achievements, and if they are working on similar things, I try to reach out to them and propose collaboration instead of competition," he says.

As the survey underscores, many postdocs are struggling. Acknowledging those challenges and hardships can be an important step forward. "People feel better if you tell them that you also fail," Cazares says.

**Chris Woolston** is a freelance writer in Billings, Montana.

## NATURE'S POSTDOC SURVEY

A series of four articles gives a snapshot of the working lives of postdocs in academia.

In September, *Nature* reported survey results about how COVID-19 has affected postdocs and their views of the future. The second article in the series offers an overview of their circumstances worldwide. The third explores postdocs' quality of life, including mental health and experiences of discrimination and harassment. The final article examines respondents' sense of their career prospects, a crucial issue for postdocs as they look ahead. The survey, created together with Shift Learning, a market-research company 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 full survey data sets are available at [go.nature.com/3tmckuq](https://go.nature.com/3tmckuq).