Joy and Stress Triggers: A global survey on mental health among researchers

CACTUS FOUNDATION

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Note from the survey team

Dear Reader,

Thank you for showing that you care for researcher wellbeing by reading this report. If there's anything the COVID-19 pandemic has taught us, it is that researchers are indispensable to our world. Through their passion and dedication, they shoulder our hope for a better tomorrow. But their work environment is often harsh, unforgiving, hyper-competitive, and rife with failure and rejection, and mental health challenges are fairly common in academia.

Through this survey, we set out to understand what aspects of their work bring researchers joy, what aspects cause them stress, and what research institutions can do to create a more supportive and nurturing research culture. This report compiles the opinions of 13,000 researchers from over 160 countries, with strong representation from the top 10 research-producing countries and diverse minority groups. While we are sure it will be a fascinating and insightful read, we would like it to be just the starting point for an important global conversation on mental health in academia and a movement towards a more positive research culture.

We hope that this report gives you all the impetus you need to join the movement for change.

Warm regards,

The CACTUS Mental Health Survey Team and Collaborators

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We also appreciate the support and contribution of all our partners on this survey.

Distribution Partners

Analytics & Reporting Partner

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Executive summary

This report contains an analysis of a survey designed by Cactus Communications and analyzed by Shift Learning, aiming to better understand the area of researcher mental health. It is based on the opinions of 13,000 researchers from over 160 countries, gathered over 8 months using a range of channels.

A large proportion of the survey period was during the COVID-19 pandemic, which has been taken into account when interpreting the results.

INSPIRING WORK ENVIRONMENTS -- Nearly half of respondents indicated that the academic environment they worked in inspired them to work towards their research goals. Many open comments spoke of the support of peers but noted that their wider organization and/or leadership was less supportive and inspiring. More senior respondents were more likely to be inspired by their environment compared to PhD scholars or those having worked in research for under 10 years.

PURPOSE AND FULFILLMENT – Researchers' lives seem to have many positive aspects and 76% agreed their work gave them a sense of purpose or fulfilment. 65% agreed that they enjoyed their non-research responsibilities.

FEELING OVERWHELMED – 38% stated they had felt overwhelmed by their work situation fairly or very often in the previous month. Notably, PhD scholars were consistently more likely to state they felt overwhelmed fairly or very often in the previous month, compared to those with other academic designations.

LONG WORKING HOURS – Researchers in our survey worked long hours, with over 31% reporting that they worked more than 50 hours and 13% reporting that they worked more than 60 hours per week. Researchers working in academic settings were more likely to report working upwards of 50 hours per week (32%) compared to those working in other sectors. Those who worked longer hours were more likely to report feeling overwhelmed fairly or very often.

PRESSURE TO PERFORM – 65% of respondents indicated they were under tremendous pressure to publish papers, secure grants, and complete projects. Similarly, 56% of respondents agreed that they were under continuous pressure to maintain their current good standing or reputation in the research community. These pressures were particularly strong in academic settings.

DISCRIMINATION AND HARASSMENT – While 64% of respondents indicated they felt welcome and included in their organization and with their peers, 37% of respondents had experienced or were experiencing discrimination, harassment or bullying, with 60% of mixed-race researchers, 45% researchers self-identifying as homosexual and 42% of female researchers reporting this. Those who had experienced discrimination, harassment or bullying were more likely to also indicate they had felt overwhelmed in the previous month than those who had not.

THE IMPORTANCE OF WORKPLACE POLICIES – Respondents were highly divided when asked whether their organizations had adequate policies in place around discrimination and harassment, ethics, and work-life balance, perhaps indicating some highly varied practices across the sector. The presence or absence of robust policies seemed to have a strong impact on whether respondents reported experiencing negative behaviors and how often they felt overwhelmed by their work situation. 66% of those who strongly agreed or agreed that their institution lacked strict policies in this area reported having experienced discrimination, harassment or bullying at work, compared to 21% of those who reported being in institutions that had strict policies in place. Similarly, 48% of those who agreed or agreed strongly that "*My organization does not have strict policies to prevent, detect, and take action against any form of discrimination/harassment/bullying*" felt overwhelmed fairly or very often, compared with 32% who disagreed or strongly disagreed with the statement. Strict policies appear perhaps to be a key defining element of a supportive workplace.

SEEKING SUPPORT – 49% of respondents said they would not discuss work-based feelings of severe stress or anxiety with relevant people/authorities in their workplace. Key barriers here were a sense that others would be unable to help, concerns that it might reflect poorly on that individual, fear of not being taken seriously, and a sense that these feelings were part of normal academic life. The sense that stress and anxiety were normal in academic life also often prevented researchers from seeking professional help when they encountered these feelings.

Background

There is a growing body of evidence to suggest that there are systemic issues in academic and commercial research, which can lead to stress, burnout, and both mental and physical illnesses – deeply affecting individuals, the quality of research output, and their wider working environment (for example, Evans et al., 2018; Nuffield Council on Bioethics, 2014; Royal Society, 2017; Van Noorden, 2018; Woolston, 2018).

The rates of burnout, depression, and anxiety are higher among researchers than in the general population (Nagy et al., 2019; Watts and Robertson, 2011) and are comparable with the rates reported in "high-risk" occupations such as healthcare, with loneliness, isolation, and fear of failure looking to be common factors (Cantor, 2020; Iandolo and Silva, 2019; Mahony and Weiner, 2019). Risk is especially pronounced amongst younger researchers (Watts and Robertson, 2011). Looking at PhD scholars, one study found that that one in two experience psychological distress, and one in three are at risk of a common psychiatric disorder (Auerbach et al., 2016). This prevalence of mental health problems is higher than the prevalence reported not only in the general population, but also among highly educated employees (Levecque et al., 2017).

While many researchers report finding their jobs rewarding, this is often despite negative environments characterized by precarity, inequality, and discrimination. Top-down power dynamics are cited as partially responsible for bullying and harassment of all kinds being both widespread and tolerated, with estimates that 25–35% of academics have been bullied in the workplace in the past year, compared to 10–14% of the general population (Keashly, 2015).

Problems highlighted in the literature include:

- The routine undermining, neglect, and devaluing of contributions from the many support staff and students whose work is vital to the practice of high-quality research (Moran et al., 2020, Van Noorden, 2018).
- A focus on narrow measures of performance and productivity over the wellbeing of individuals, also affecting research quality and the relationship of research with society (Moran et al., 2020; Nuffield Council on Bioethics, 2014; Royal Society, 2017, Jones and Wilsdon, 2018).
- A culture of long working hours and an erosion of work-life balance, which disproportionately affects those with caring responsibilities (European Commission, 2012; Rafnsdóttir and Heijstra, 2013).
- Short-term contracts and job insecurity (Iandolo and Silva, 2019; Castellacci & Viñas-Bardolet, 2020; Moran et al., 2020).
- Institutionalized discrimination of groups, including but not limited to women, transgender and non-binary researchers, people of color, working-class academics, and people with disabilities (Pickersgill et al., 2019).

It is these "systemic flaws" that are seen to discourage even the most talented from pursuing research careers, and make it difficult for even experienced investigators to produce high-quality work (Alberts et al., 2014; Moran et al., 2020; Pickersgill et al., 2019). Many research institutions have also been slow to change and implement the recommendations of studies, exacerbating known issues (Davis et al., 2020).

There are some signs of progress. In the UK, September 2019 saw the Wellcome Trust announce a new aim to "Reimagine Research" as creative, inclusive, honest, and supportive of researcher wellbeing – building on work conducted by the Royal Society of London in 2018 and by the Nufield Council on Bioethics in 2014 (Bleasdale, 2019). However, there is much more work to be done. More widely, while mental health issues were once seen as a taboo topic of conversation within the academic and corporate world, these are now more openly discussed at the highest levels. Nevertheless, there is stigma attached to coming forward, with many cultural factors further compounding this (Iandolo and Silva, 2019).

While COVID-19 presents itself as a new and arresting risk factor in the health and wellbeing of us all, this is especially pronounced in research communities, where its impact on mental health is just beginning to be understood (Sharma et al., 2020). In just a few months, a vast volume of research aimed at understanding coronaviruses and developing responses to the pandemic has been carried out, dwarfing many emerging sectors. We have seen researchers across a wide range of disciplines quickly reorienting their studies to meet emerging public health needs and highly enhanced levels of collaboration between individuals and institutes (Porter and Hook, 2020).

Reasons for the study

There are compelling reasons for conducting a survey of this kind. While studies on the topic are not unknown, there is nothing on the same scale in terms of sample size, demographic spread, and geographic reach as this survey. A total of 13,000 responses, representing 169 countries over each of the populated continents, allows for comparison and knowledge creation on an entirely new level.

The scale of the survey gives us the ability to look at mental health issues as they apply even to smaller cohorts of particular demographics and minority groups, for example. In addition, 39% of the survey respondents are from academic faculty, making this one of the biggest studies of that group on this topic.

While many previous studies on research culture prioritize the situation within the UK and US, the data presented here serves to inform a global audience of universities and policymakers about the overall research culture and the mental and physical wellbeing of researchers. It also allows for some comparisons between regions and countries on a scale not achieved before in this area.

Method

Survey design

The survey was designed by Cactus Communications, based on a combination of literature review, anecdotal evidence gathered from interactions with researchers, and the typical components of workplace happiness surveys. The questionnaire was shared with several researchers for feedback before the survey was launched.

It contained 11 demographic questions, including questions around gender, sexual orientation, and ethnicity, followed by four batteries of agreement statements (27 in total) covering a range of topics related to work environment, work culture, personal wellbeing, and attitudes towards work and career options, as well as questions around issues outside the direct academic environment that might impact mental health. The survey ended by asking respondents how often they had felt overwhelmed in the preceding month and some questions about support and barriers to seeking help. It did not contain questions related to clinical or medical conditions, nor any that might be used to detect any clinical conditions.

The survey was hosted on SurveyMonkey (in English, Portuguese, Japanese, Korean, Arabic, French) and on WeChat (in Chinese). It should be noted that those answering the survey outside countries where these languages are spoken may have had to answer the survey questions in their second language. Participation was completely voluntary, and respondents had the option to remain anonymous.

Survey dissemination

The survey was disseminated across a range of channels, including the Cactus Foundation survey landing page; partnerships with relevant organizations; WeChat accounts of Editage and partnering organizations; the social media channels and newsletters of CACTUS, collaborators and partnering institutions; and via articles published by the survey team on CACTUS-owned platforms (Editage Insights, Blank:a). Various research-associated organizations also partnered with CACTUS for survey distribution through their owned channels. See Appendix 2 for details of dissemination channels.

The involvement of specific partners for dissemination may have had an impact on the profile and attitudes of those who responded to the survey.

In addition, it should be noted that due to the survey's dissemination on social media and other open channels, there is no way to validate the identity of respondents or confirm that they truly have a position in research. However, due to the lack of a significant incentive in most countries this is unlikely to have affected the data notably.

Self-selection bias is more of a potential source of bias in this survey: It is possible that those with experiences of mental health challenges would be more likely to get involved in a survey of this nature.

Timing

The survey was launched on October 10, 2019 and closed on July 20, 2020.

A large proportion of the survey dissemination period was during the COVID-19 pandemic. While we have attempted to allow for this when reviewing the data, it should be noted that different countries and even regions or towns have experienced the pandemic very differently and at different times. It is not possible to fully allow for this in the analysis.

It should also be noted that the survey was disseminated more energetically in some territories than others over time, with particular campaigns targeting specific territories launched at different times. This means that the global and regional make-up of the respondent base changed across the live survey period. For example, more promotion was conducted in China, Japan, and South Korea from June to July 2020.

Incentives

Incentives were used only in a subset of countries where CACTUS were advised this was necessary to encourage participation because surveys in these regions are typically accompanied by incentives: in Japan, a discount coupon for an Editage (a CACTUS brand) language editing service was given; in China, respondents were offered a free learning course; and in South Korea, respondents received a Starbucks voucher.

Data processing and cleaning

The survey received a total of 13,356 responses. Shift Learning, CACTUS' analytics & reporting partner on this project, cleaned this data, removing duplicate responses, those answering in under 1.5 minutes, those giving irrelevant responses to the open questions, those "flatlining"' by repeatedly giving the same answer to a series of questions, and those who did not appear to be researchers. Respondents who did not complete the questionnaire fully were kept in the sample if they had answered questions within the main body of agreement statements. Therefore, the total number of analyzed responses may vary across some questions. It should also be noted that response numbers will vary for questions that were not mandatory for participants to answer.

After data cleaning, a final sample size of 13,000 high-quality cases was used for the survey analysis. Due to a lack of reliable data around the population of researchers, a decision was taken not to weight the data.

Shift used Q analysis software to create tabulations and derived variables, enabling analysis of the data by a number of cross-cutting variables including region, gender, sexuality, ethnicity, setting, and role. We also examined the relationship between the different agreement statements, and between them and questions which acted as indicators of good or poor mental health.

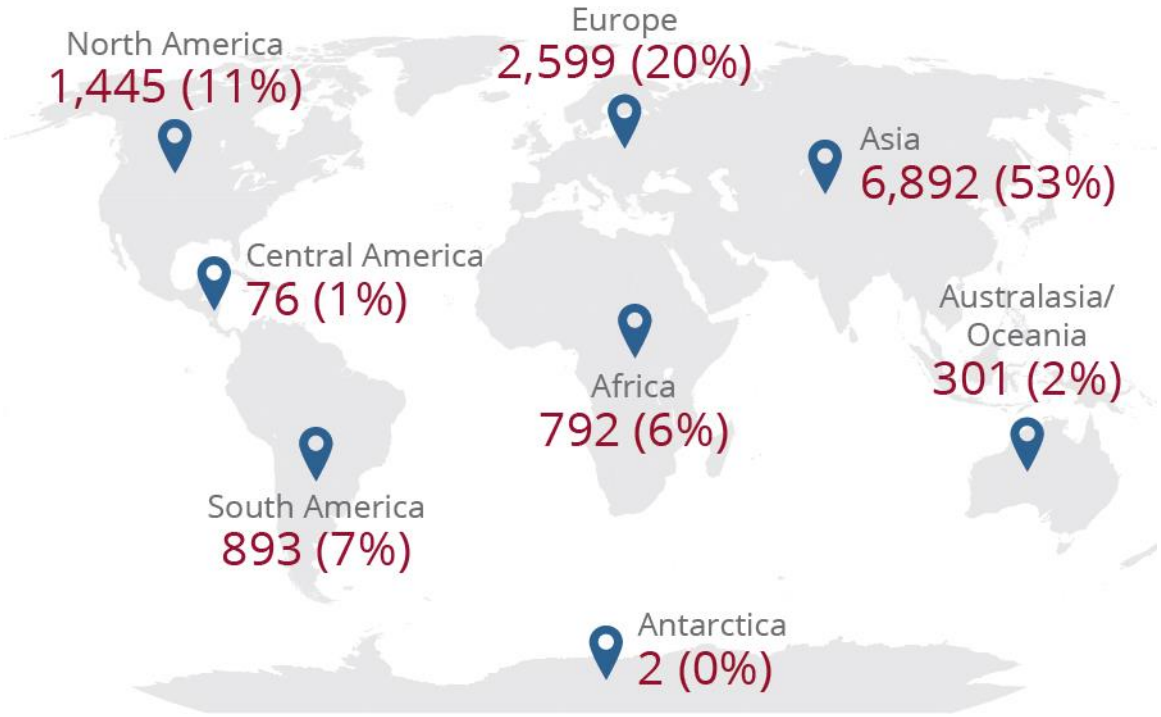
Responses to open questions are being coded, and an analysis of these will be released separately. The respondent quotes shared in this report are those that aligned with the data and added a personal flavor to the results. They are not necessarily reflective of the open responses shared by the entire respondent pool.

Respondent overview

The survey achieved a diverse sample, with strong representation in terms of region, academic designations, and fields of study, and profiling such as ethnicity and gender. Although the majority of respondents were in academia, the sample also includes individuals who identify themselves as researchers across a broad range of settings, such as industry or public sector work. A full respondent profile is included as Appendix 1 in this report.

The chart below indicates the number of respondents working in each region when they took the survey.

Where respondents were working

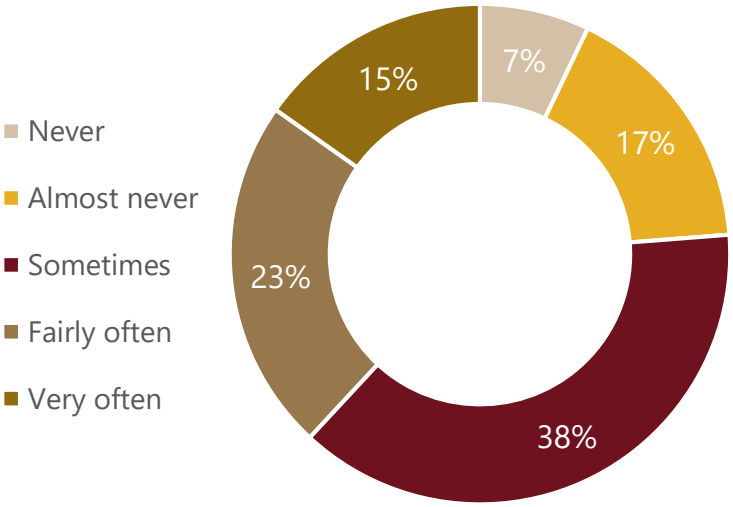


n = 13,000

Feeling overwhelmed at work

The main indicator of mental health used in the survey was a question around how often, in the previous month, respondents had felt overwhelmed by their situation at work. A large proportion (38%) reported feeling overwhelmed frequently, i.e. either fairly or very often.

In the last month, how often have you felt overwhelmed by your situation at work?



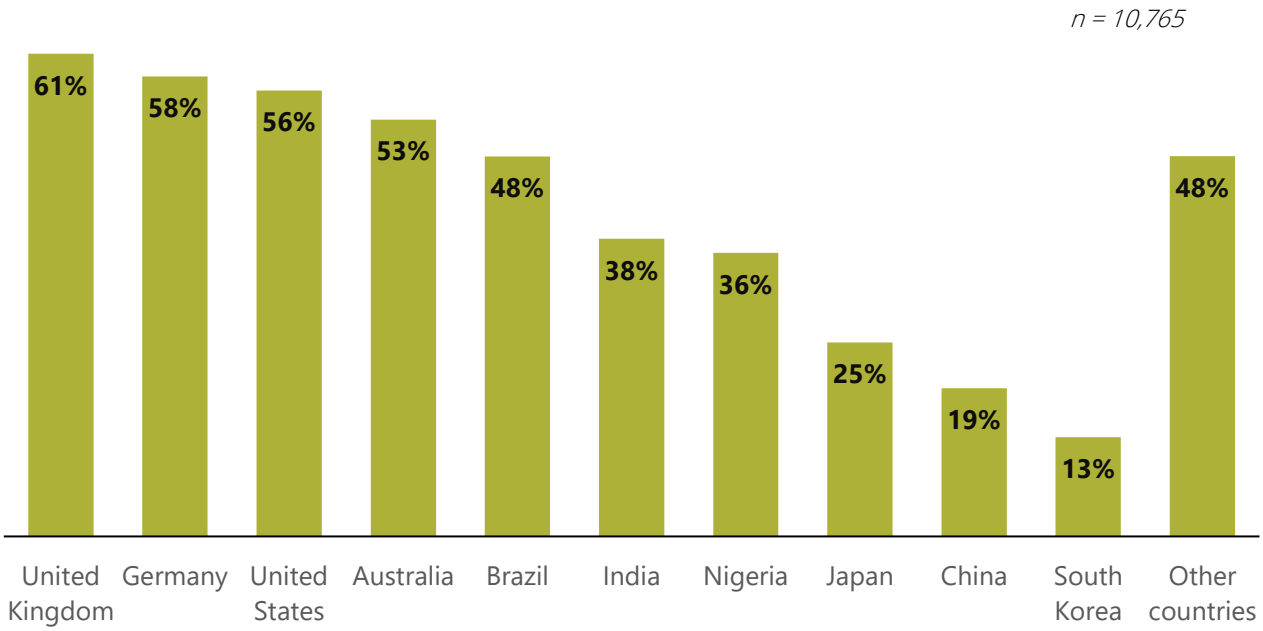
n = 10,765

38% stated that they had felt overwhelmed by their work situation fairly or very often in the previous month

Respondents working in Asia were less likely than those from other regions to state they felt overwhelmed frequently (either fairly or very often).

Looking at the top countries represented in the sample, respondents working in the US, UK, Brazil, Germany, and Australia were more likely to state they felt overwhelmed frequently; those working in Japan, China, and South Korea were less likely to state they felt overwhelmed frequently, despite respondents in Asia being more likely to state they worked more hours.

Proportion of respondents from top 10 countries stating they felt overwhelmed frequently



> Most academics are overwhelmed, even the ones who are successful in terms of being productive researchers, busy teachers and efficient administrators. But, they seem like the norm and everyone who struggles is not, and this needs to be disrupted and changed.
>
> Research fellow/post-doctoral researcher, Africa

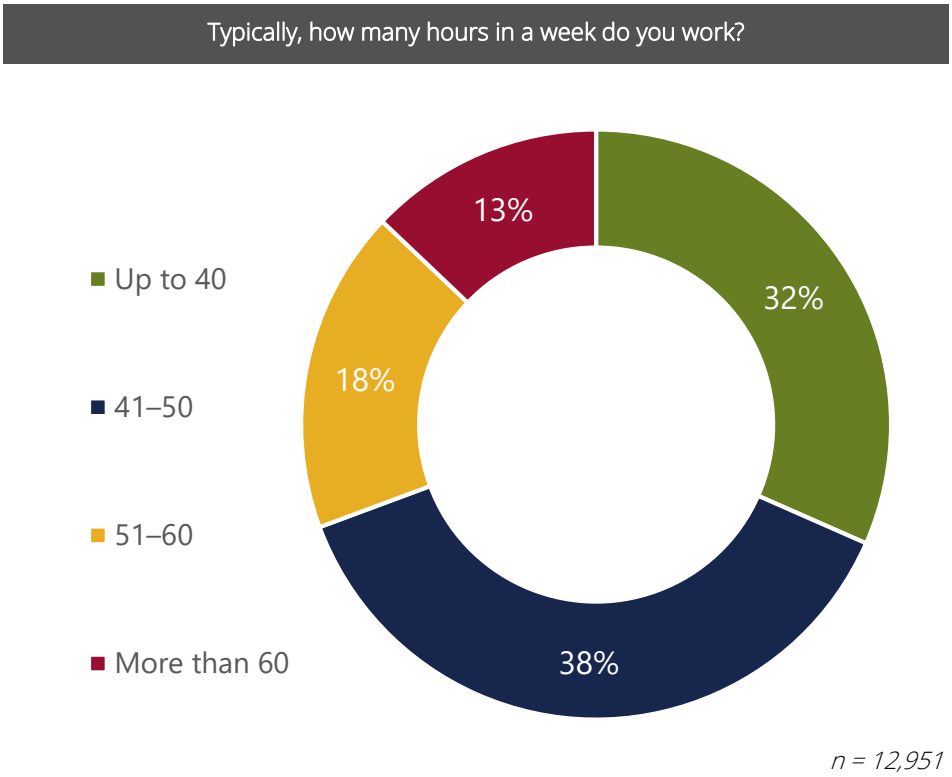
Those respondents working in a different country than their country of origin were also more likely to have felt overwhelmed in the previous month, with 50% indicating that this happened very often or fairly often, compared with 38% across the sample as a whole.

Notably, at the time of being surveyed, PhD scholars were consistently more likely to state they felt overwhelmed frequently in the previous month, compared to those in other academic roles. This is likely linked a higher degree of concern about their career stability coupled with their poor perceptions of personal wellbeing as indicated by their responses to questions related to health and other personal factors contributing to wellbeing, as discussed later in this report.

Female respondents were more likely to indicate that they had felt overwhelmed frequently than male respondents (46% vs. 27%). This was consistently the case across all regions, roles, and levels of seniority.

Work environments in research

Working hours



n = 12,951

31% of surveyed researchers reported typically **working more than 50 hours a week**

Researchers in our survey generally reported **working long hours**, with 31% reporting that they worked more than 50 hours and 13% reporting that they worked more than 60 hours per week. Researchers working in academic settings were more likely to report working upwards of 50 hours per week (32%), compared to those working in government (25%), industry (25%), or not-for-profit sectors (24%).

Those who had spent longer in their careers as researchers were far more likely to state that they work longer hours than those early on in their career journeys; 41% of those who had spent over 20 years in research said they typically worked over 50 hours per week, compared to 26% of those who were less than 5 years into their research careers. This seems consistent with the finding across age groups: 39% of participants aged 51-60 years reported working over 50 hours per week, whereas just 27% of those under 30 years said the same.

Male researchers tended to report working longer hours, with 18% reporting that they worked 60+ hours per week compared to 9% of female researchers. This difference was present at every career stage.

Those participants who worked longer hours were more likely to report feeling overwhelmed frequently, which is the key indicator of mental health used in this study.

Although the study reveals a relationship between reported long working hours and feeling overwhelmed, this relationship is not straightforward. For example, the findings from this survey suggest that early career researchers such as PhD scholars and postdoctoral researchers are more likely to feel overwhelmed. However, more experienced researchers often appear to work far longer hours, perhaps due to additional responsibilities such as managing a team or a department. Other factors are at play here and these are explored throughout this report.

The Wellcome report on research culture (Moran et al., 2020) notes also that the causes of long working hours in academic life are complex and often internally and externally driven, as individuals respond not only to a competitive environment, but also to their own desires and passion for their work. It may be that the *reasons* behind long working hours impact mental health, rather than just the hours worked.

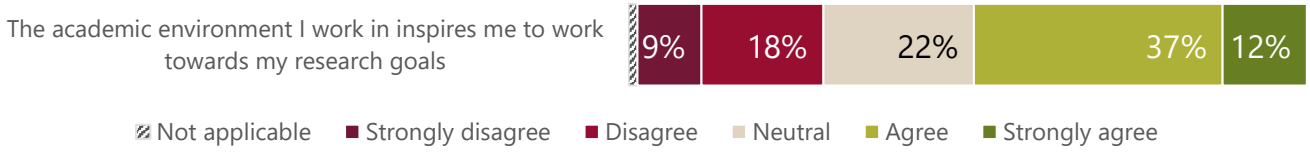
Respondents from Asia were shown to be most likely to work the longest hours. This appears to be particularly true for those who identified their ethnicity as East Asian, with 43% of this group stating they work more than 50 hours per week. This may reflect cultural norms and is certainly consistent with recent data around working hours more broadly. Aleksynska et al. (2019) report that 15% of workers in EU countries work more than 48 hours per week, while over 40% of workers in China and the Republic of Korea do so.

As previously mentioned, it is interesting that despite these longer working hours, Asian respondents were still the least likely to report feeling overwhelmed at work, and a high proportion (59%) reported getting adequate sleep every night.

Inspiring work environments

> I feel differently about my peers than I do about the organization. Mostly positive about the former and uncertain about the latter.
>
> Post-doctoral researcher, North America

Respondents did have positive things to say about their work environment, with nearly half indicating it **inspired them to work towards their research goals**. In open comments, some indicated that their answers reflected finding their colleagues or supervisors within the institution inspiring or supportive, but that the organization itself was less effective in this regard.



n = 12,224

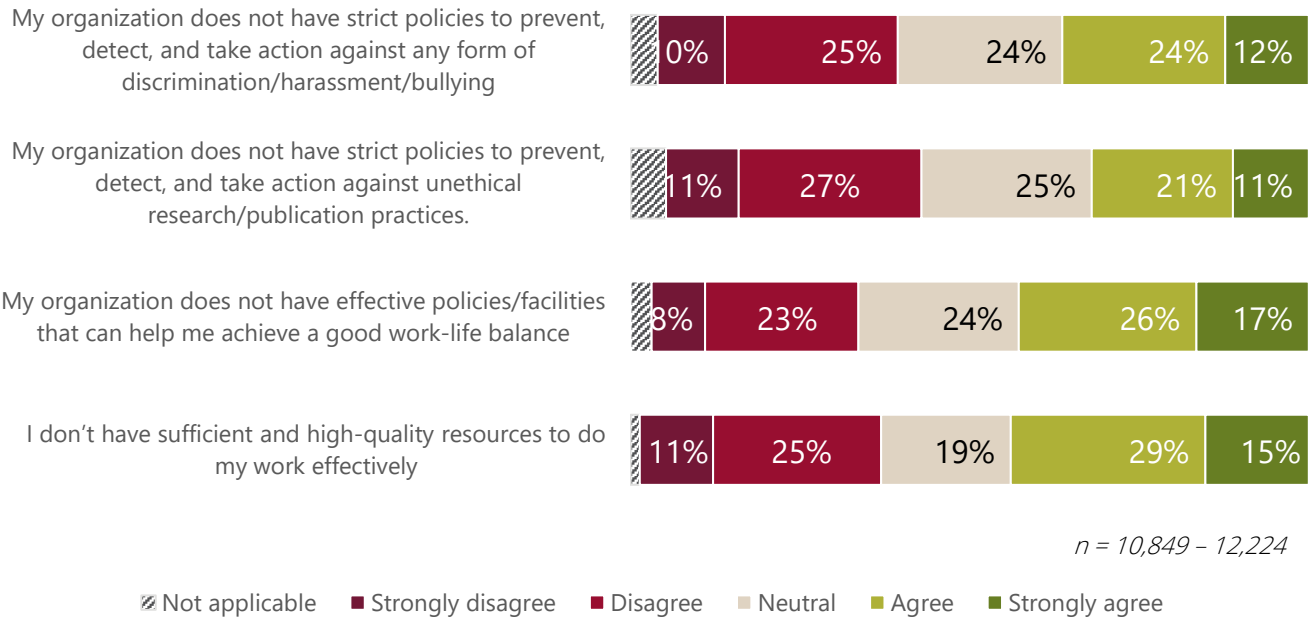
Those in academia were somewhat less likely to agree with the statement around being inspired by their work environment when compared to their peers in industry, though the difference was not large. Similarly, those working in research for over 20 years and those self-identifying as Professors or Principal Investigators were more likely to be inspired by their environment when compared to PhD scholars or those having worked in research for under 10 years.

Those working in the disciplines of education and medicine were more likely to feel inspired by their academic environment than the overall population (57% and 53%, respectively, vs. 49% among the overall sample). There were also some interesting regional differences, with those working in Asia more likely to agree or strongly agree with this statement (57%) compared to those working in Europe (17%).

Respondents who indicated that their academic environment inspired them to work towards research goals were less likely to report feeling overwhelmed frequently. While causality cannot be established, it may be that research workplaces can enhance research staff wellbeing through creating not just a safe environment but also an inspiring one.

Workplace policies in research environments

As shown below, respondents were highly divided when asked about whether their organizations had adequate policies in place around discrimination and harassment, ethics, and work-life balance, perhaps indicating some highly varied practices across the sector.



Across the sample, 36% agreed or strongly agreed that their organization **did not have strict policies around discrimination, harassment, or bullying**. Agreement was particularly strong amongst groups that that are known to face higher rates of discrimination, including:

- Women
- Those working in a different country than their country of origin
- Those identifying as non-binary or gender non-conforming
- Those identifying as bisexual or another queer identity.

48% of those who thought their organizations did not have strict policies against **discrimination, bullying, and harassment** had **frequently felt overwhelmed** at work in the previous month

> I'm worried about sexism in academia in general and this might make me want to leave after finishing my PhD, even though my current work environment is good.
>
> PhD scholar, Europe

In fact, 65% of those agreeing they had experienced discrimination, harassment, or bullying stated they felt their organization didn't have strict policies to prevent, detect, or take action against this. It may be that the personal experiences of these individuals have highlighted deficiencies within organizational policies or that those with experiences of discrimination, harassment or bullying are more aware of policies around these areas in general.

Interestingly, those aged 30 or under were least likely to strongly agree that strict policies in this area weren't present (18%), compared in particular to those who were 31-40 years old (23%). It may be that within this latter age range, participants have been in the system long enough to gain an appreciation of the issues but do not yet have sufficient organizational leverage to strongly influence change.

There were also large differences by participant discipline, with 40% of those working in Life Sciences agreeing or strongly agreeing that strict policies around discrimination, harassment, and bullying were not in place, compared to just 29% of those in Computer and Information Sciences, and 22% of those in Mathematics. However, these differences are not evident when only looking at the views of women and may partially be explained by the fact that men are more strongly represented in these latter disciplines.

There may be a link between feeling overwhelmed at work and not feeling supported by an institution through robust policies preventing negative behaviors: The feeling of being frequently overwhelmed by their work situation in the previous month was reported by 48% of those who thought their organization did not have strict policies in place against discrimination, harassment, and bullying, as against only 31% of those who thought their organization did have such policies. This pattern holds true irrespective of gender or sexual orientation. It may also be that institutions with good policies in this area are in general more supportive of their researchers.

Only 11% indicated strongly that their organization had strict policies against **unethical research or publication practices**.

> And regarding publication ethics I really don't know if any organization has any detecting policy.
>
> PhD scholar, Asia

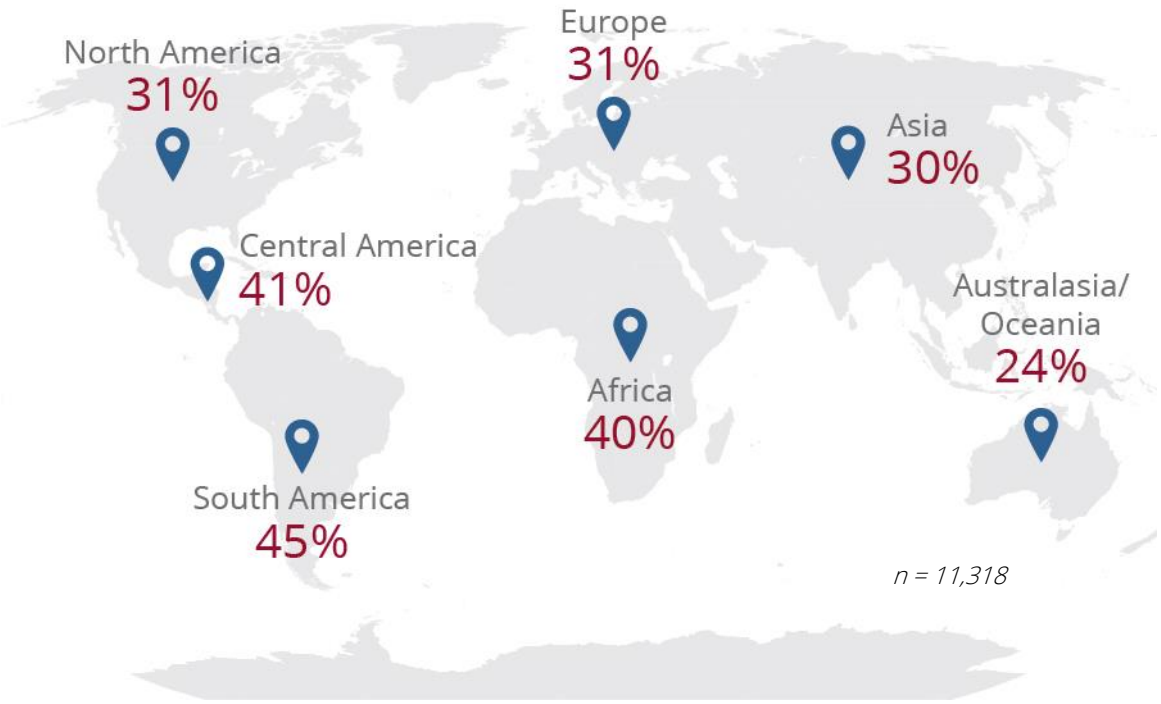
There were some differences between subgroups here, with those working in government settings and in Life Sciences more likely to see a lack of strict policies regarding research and publication ethics than other groups. PhD scholars were less likely to see a deficiency,

> I think academia is fundamentally flawed. The work culture is unhealthy for young researchers, who rarely get opportunities for permanent employment. In my experience, early career researchers are milked of intellectual content, for which senior staff get recognition. Senior staff often act unethically, and because the community is small (at least in my discipline), taking action is complicated because it threatens your future within the discipline. These issues are widely known and discussed amongst early career researchers, but efforts to address it [are] not taken seriously.
>
> Principal investigator, Africa

which may reflect the difficulties of digesting and understanding organizational policies around research and publication early in an academic career. There were big differences globally, as shown below, with those working in Africa, South America, and Central America particularly likely to mention a lack of strict policies around unethical research/publication practices.

As with other areas, those reporting a lack of institutional policies here were also more likely to indicate that they had felt overwhelmed frequently within the previous month.

My organization does not have strict policies to prevent, detect, and take action against unethical research/publication practices (% agree)



Only 8% strongly agreed that their organization had effective policies around work-life balance.

A lack of policies in this area appeared perhaps to have a strong impact on our respondents: 20% of those who strongly agreed that there was a lack of policies around work-life balance were working in excess of 60 hours a week, compared to 13% in the sample overall. In addition, 59% of respondents reporting insufficient work-life balance policies indicated that they had felt overwhelmed very or fairly often in the previous month, compared to 38% of respondents overall and only 28% of respondents who indicated that strict work-life balance policies were in place.

Irrespective of what the respondents' working hours were, those individuals who thought their institutions did not have strict work-life balance policies in place were still more likely to report feeling overwhelmed frequently within the previous month. Those in North America, Africa, and Asia were also more likely to see their institutional policies in this area as inadequate, compared to those in Europe. This may be related to the presence of regional policies in place in Europe, specifically the EU Working Time Directive.

Those who were aged over 60 or in more senior positions were less likely to find problems with their organization's work-life balance policies, perhaps indicating a stronger level of control over working hours later in academic careers, more involvement in the design of such policies, or other personal factors such as less intense childcare responsibilities

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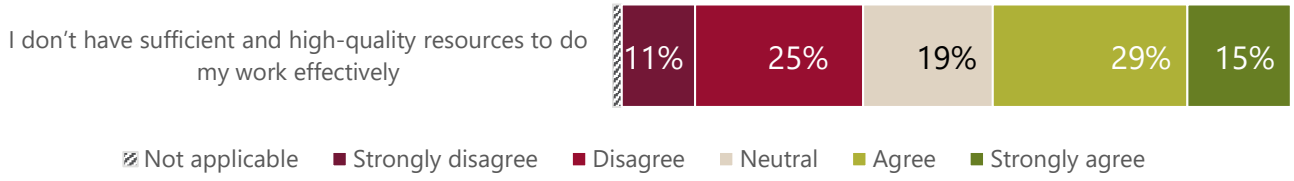
Resources supporting research activities

Across the sample as a whole, **44% of respondents felt that they did not have sufficient and high-quality resources to do their work effectively.** Senior researchers, such as department heads, were more likely to agree or strongly agree (53%) that resources were inadequate than PhD scholars (40%) or postdoctoral researchers (36%).

31% of those who strongly agreed that that their institution does not have good policies around work-life balance reported having felt overwhelmed frequently by their work situation in the previous month.



n = 11,318

Perhaps unsurprisingly, there were large regional differences, with 61% of those working in Africa, 52% of those in South America, and 47% of those in Asia reporting inadequate resources, compared to only 31% in Australia and Oceania and 36% of those working in Europe.

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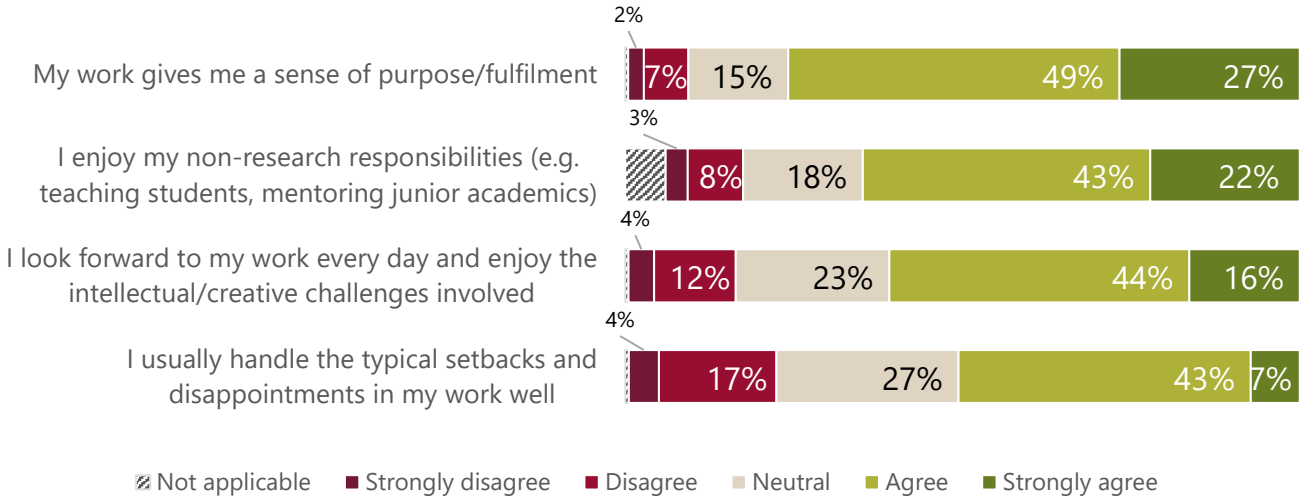
A greater proportion of individuals agreeing about lack of sufficient resources reported feeling overwhelmed within the previous month than those disagreeing with this statement (43% vs. 36%).

Current work and future career outlook

Attitudes towards work

Overall, surveyed researchers appeared to have positive perceptions of their work responsibilities: 76% agreed that their work gave them **a sense of purpose or fulfilment**, and 65% agreed that they **enjoyed their non-research responsibilities**.

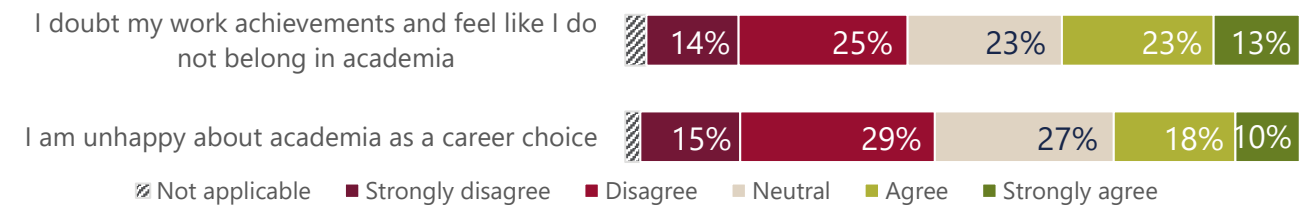
Notably, researchers working in Africa or South America were more likely to agree with these two statements compared to those in other regions (85% and 86%, respectively, vs. 76%).



n = 12,224

83% of those **in senior roles agreed their work gave them a sense of purpose/fulfilment,** compared to 71% in early career roles.

50% of the respondents stated that they handle setbacks and disappointments at work well. Experienced researchers and those in senior roles were more likely to agree with this statement: 66% of department heads, 62% of professors, and 59% of principal investigators agreed or strongly agreed that they usually handled setbacks at work well, compared to 42% of PhD scholars and 48% postdoctoral researchers. It may be that there is a place here for institutions to invest in resilience training for research staff, to help them build resilience to the setbacks that are an inevitable part of a researcher's working life.



n = 10,849

However, 35% of respondents also stated that they doubt their work achievements and felt like they do not belong in academia, and **a notable proportion (28%) were unhappy about academia as a career choice**. Again, a split in attitudes is evident between senior and early career researchers. PhD scholars and research fellows/postdoctoral researchers were more likely to agree with the above statements about academia compared to those in other roles.

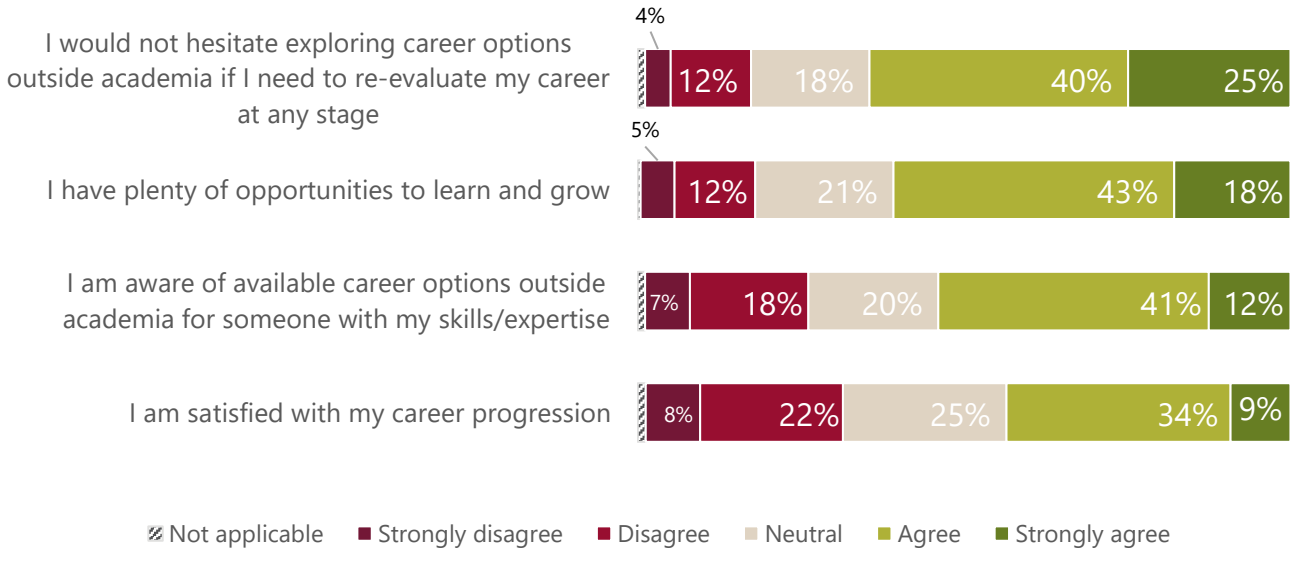
Those working in Europe and North America were also more likely to agree with the two statements above.

Notably, those that agreed with the positive statements about joy, purpose, and fulfilment were more likely to state they had never or almost never felt overwhelmed by their work situations in the previous month.

35% stated they doubt their work achievements.

Attitudes towards their career progression and options

Feelings towards career progression and options outside of academia revealed some interesting insights.



n = 11,782 – 12,224

In terms of career progression, although **61% agreed or strongly agreed that they had plenty of opportunities to learn and grow,** only 43% similarly agreed they were satisfied with their career progression at the time of answering the survey.

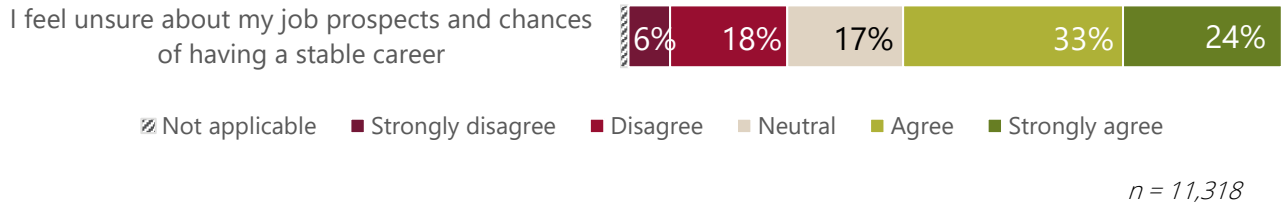
Dissatisfaction about career progression appeared more prominent amongst less senior researchers, with only 33% of PhD scholars satisfied with their progression, compared to 71% of those self-reporting as Professors. Women were also less likely to be satisfied with their career progression (40%) than men (48%). This was the case at all levels of seniority and across all regions.

In addition, those working in Europe and Australasia/Oceania were more likely to disagree that they had opportunities to learn and grow.

Thinking about career options more widely, **64% agreed they wouldn't hesitate to explore careers outside academia if needed.** However, a smaller proportion, 54%, agreed they were aware of suitable options. There are clearly differences between disciplines around knowledge of these options. Those from the disciplines of Business, Finance, and Management; Computer and Information Sciences; and Medicine and Allied Health Sciences were more likely to state they were aware of available career options. Conversely, those working in the disciplines of Humanities and Social Sciences, and Life Sciences were more likely to disagree.

There is a tension here: PhD scholars and postdoctoral and early career researchers were most likely to be dissatisfied with their career progression, more likely to agree they would not hesitate to explore options outside of academia, but also likely to disagree they were aware of the opportunities available to them – potentially leaving them feeling trapped in roles that they don't feel offer them progression. There may be a role institutions can play here in providing more education or guidance at early career stages around the potential roles available outside of traditional academic research.

> "The expectations for me to progress my career require me to work many more hours than I am paid or recognised for, which has significantly impacted my mental wellbeing.
>
> Lecturer, Australasia/ Oceania



n = 11,318

The fact that researchers in the sample appeared uncertain about their career progression is enhanced by the finding that **over half agreed they were unsure about their job prospects and the chances of having a stable career.** This is consistent with the findings of the Wellcome report on research culture (Moran et al., 2020) in which only 38% of researchers indicated that they believed there was longevity in a research career.

> 57% felt unsure about their job prospects

Indeed, this instability appeared to be a bigger concern for PhD scholars and research fellow or postdoctoral researchers. In terms of regional differences, those working in Europe, North America, and Australasia/Oceania appeared more likely to have these concerns than those working in other regions. In addition to these regional findings, those working in a different country than their country of origin were more likely to feel unsure about their job stability compared to those working in their home country.

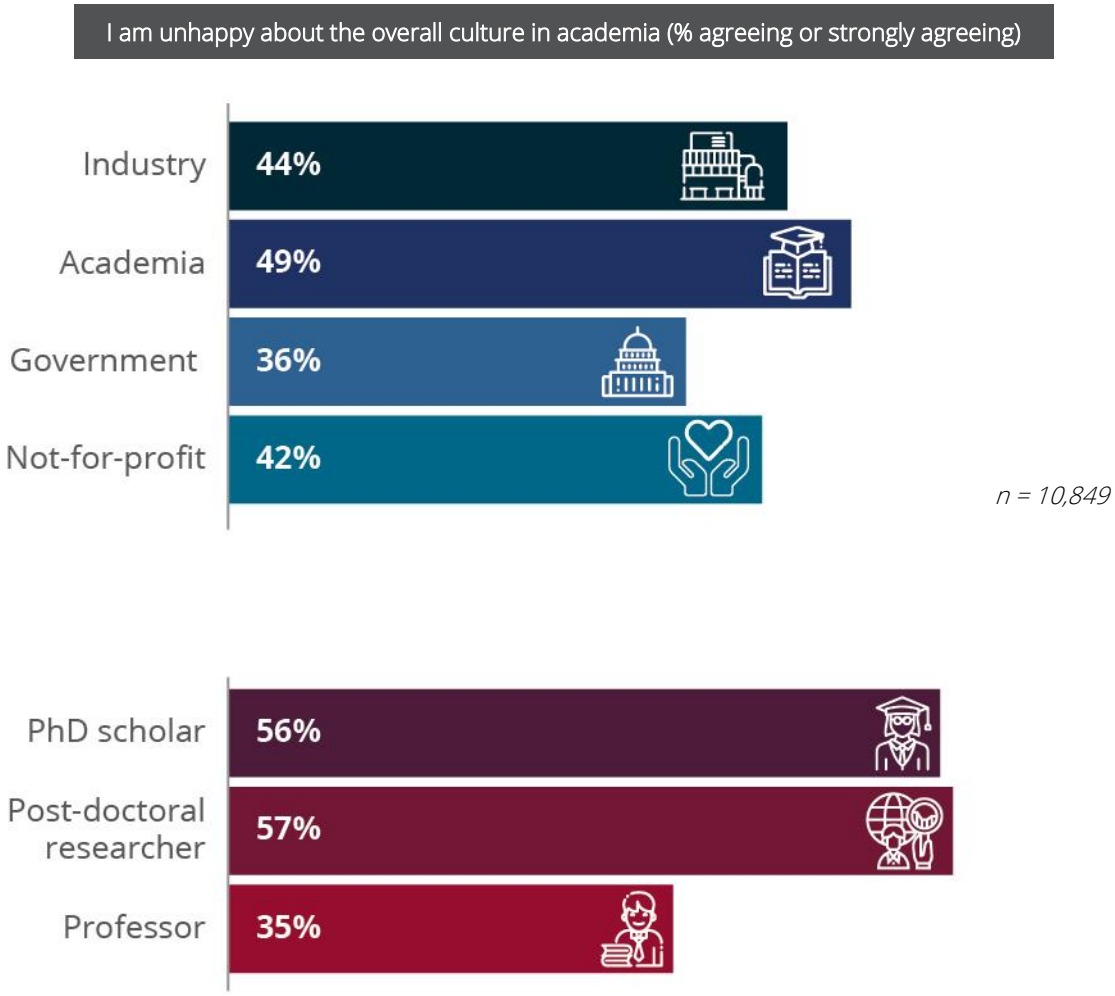
Those that were unsure about job prospects were more likely to state they had frequently felt overwhelmed by their work situation in the previous month, suggesting that job insecurity is an added pressure that takes its toll on researcher mental health.

Work culture in research

Overall culture

Respondents were asked to agree or disagree with *"I am unhappy about the overall culture in academia"*.

Over 29% of respondents indicated that they agreed with this statement, with another 19% strongly agreeing. There were **huge differences by sector and role,** with the highest proportion of respondents who were unhappy about the overall culture being from academia, as shown below:

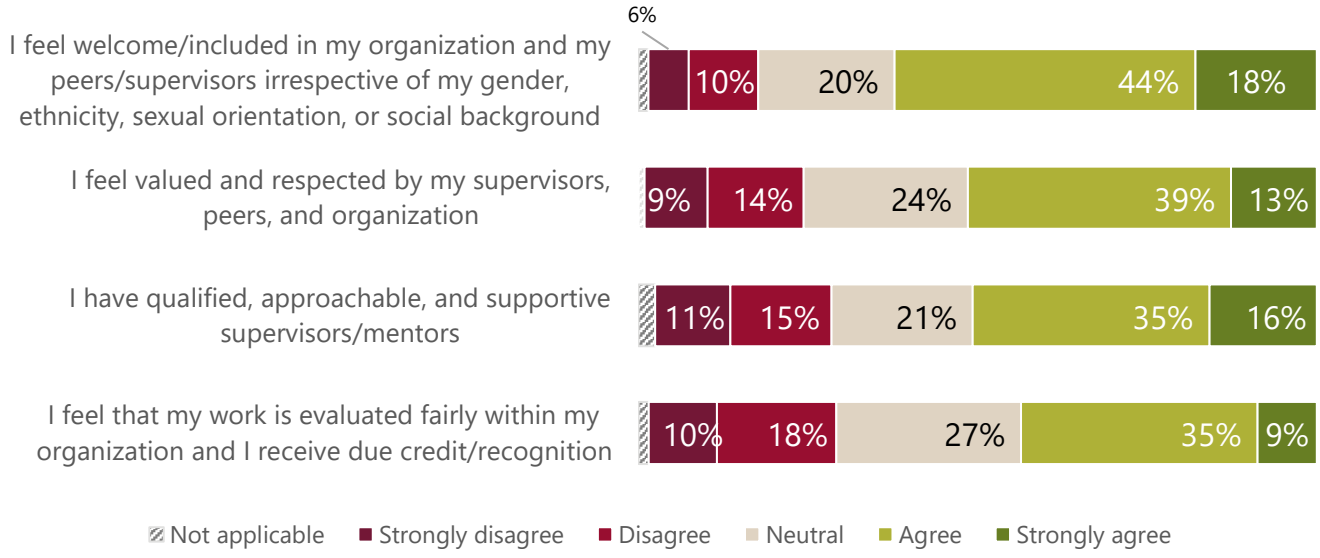


Sector differences may be partly due to the wording of the question, with those working outside academia feeling less able to comment on its culture, though it is also possible that these respondents may be looking back to past experiences of academic life.

There were also some regional differences, with those working in Asia (38%) least likely to agree or strongly agree with the statement, and those in Australasia/Oceania (70%), Europe (64%), and North America (67%) most likely to agree or strongly agree.

Feeling valued

Around half the respondents agreed with the specific statements below, indicating that they experienced some elements of a positive work culture – where they were appropriately mentored, valued, respected, and evaluated.



n = 12,224

While PhD scholars were most likely to indicate they had supportive supervisors or mentors (57%) compared to Professors (38%) and other more senior researchers, these same scholars were less likely to indicate feeling respected and valued (49%), particularly when compared to Heads of Department (68%).

> The role of a PhD is very important in academia but I feel that they aren't given any importance. Nobody cares about them. They are the lowest ones in this food chain.
>
> PhD scholar, India

Open comments from early career researchers commonly highlighted issues around a lack of involvement from supervisors, as well as perceived unfairness around attribution and credit.

This appeared to be particularly the case for postdoctoral researchers: only 40% of these respondents agreed or strongly agreed that their work was evaluated fairly within their organization and that they received due credit and recognition. Those describing themselves as "lecturers" also had lower levels of agreement with this statement (39%) than those identifying as Professors (49%), perhaps as a result of reward systems that focus on research output rather than pedagogical excellence.

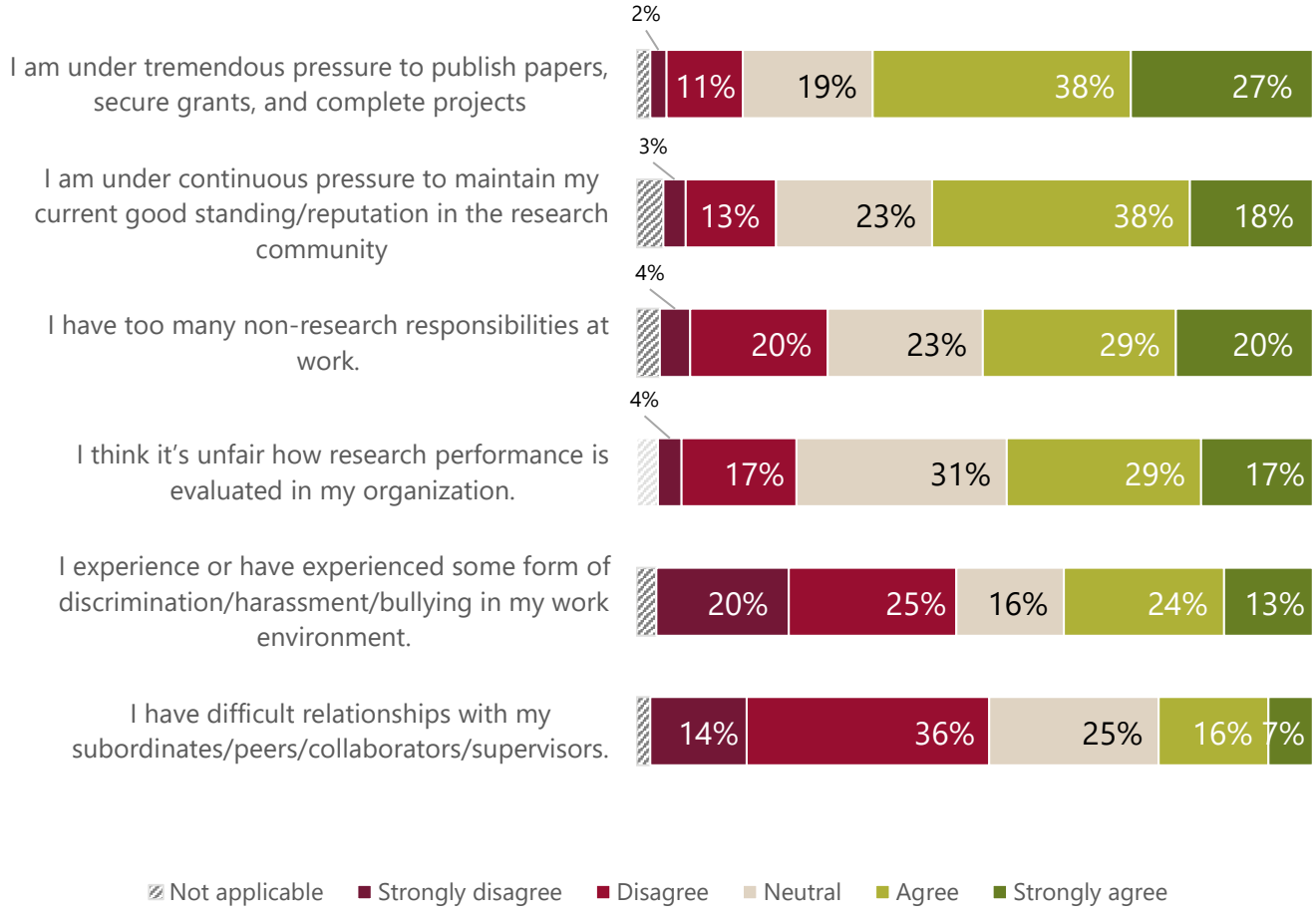
Women too were far less likely to agree or strongly agree with this statement (40%) than men (49%) and also had lower agreement levels for the other statements around recognition and respect.

Work pressures and relationships

65% of respondents indicated that they were **under tremendous pressure to publish papers, secure grants, and complete projects**

Related to these questions of fair evaluation, some other questions were asked around researchers' work pressures, which reveal significant concerns around performance and performance evaluation, as shown in the chart below.

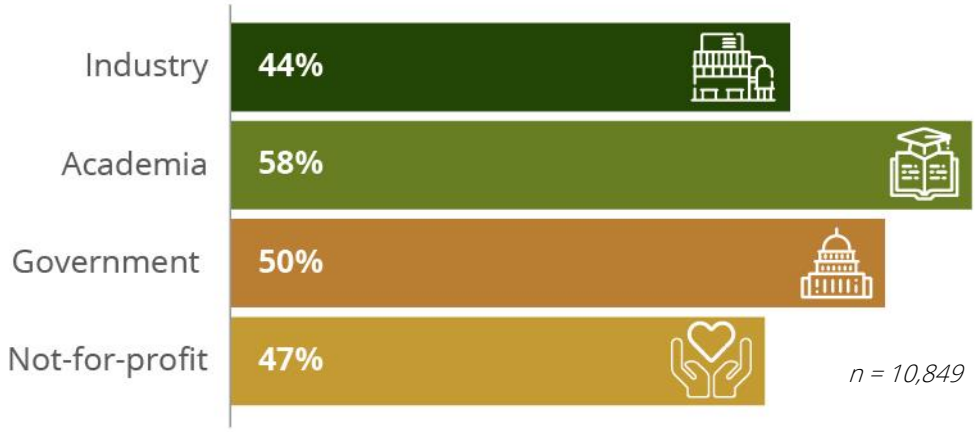
Pressure to publish was particularly strong in academic settings and amongst PhD scholars and postdoctoral researchers. The level of agreement/strong agreement about being under tremendous pressure to publish was more pronounced among respondents in the fields of Life Sciences (70%), Physical Sciences (71%), and Medicine and Health Sciences (63%), particularly when compared to Computing (57%) and Education (56%). It was also particularly high among those working in Africa (72%), Australia (74%), and Europe (69%).



n = 10,849 – 11,318

Similarly, **56% of respondents agreed that they were under continuous pressure to maintain their current good standing or reputation in the research community**, with postdoctoral students again agreeing most strongly. Once again, there were notable differences by work sector, as shown below:

I am under continuous pressure to maintain my current good standing or reputation in the research community (% agreeing or strongly agreeing)



In addition to reported pressures around output and securing funding, 45% of our respondents agreed or strongly agreed with the statement "*I think it's unfair how research performance is evaluated in my organization*".

This was more likely to be reported by those with 6–20 years' experience than by those with under 5 years' or over 20 years' experience. It was also more likely to be expressed by those working in Africa (55%), Australasia and Oceania (54%), Europe (49%), and South America (56%), as well as by female researchers (46% vs. 44% male researchers).

Nearly half (49%) of respondents also indicated that on top of these pressures, **they had too many non-research responsibilities at work.** This unsurprisingly was indicated far more often by those in mid or late career, with over 11 years' experience in research. The level of agreement/strong agreement was higher among those in the disciplines of Agriculture and Allied Sciences (57%), Education (56%), and Medicine and Allied Health Sciences (56%), when compared to Life Sciences (43%) and Physical Sciences (38%).

Only **23% of respondents overall agreed they were having difficult relationships with colleagues.** There were few differences between subgroups here, though women reported this more often, as did researchers working in a different country than their country of origin.

While 62% of respondents indicated they felt welcome and included in their organization and with their peers, there were strong differences by demographic groupings. In particular, women, non-binary respondents, and those with another queer identity (not bisexual or homosexual) were less likely to feel welcome and included when compared to heterosexual men.

60% of mixed-race researchers, **45%** of researchers identifying as homosexual, and **42%** of female researchers had **experienced discrimination, harassment, or bullying at work**

Reports of experiences of discrimination, harassment, or bullying were also more likely to come from these minority groups, as well as from those who had been in research for more than 6 years.

Interestingly, respondents earlier in their careers were more likely to feel welcome and included than those in mid-career stages (65% of those with up to 5 years of experience agreed or strongly agreed vs. 59% of those with 6-10 and 11-15 years' experience), even when differences in gender distribution at these levels were accounted for. It is possible that younger researchers may experience support from more open-minded peers than those in older age groups, or that those who have been in research positions for longer have had more opportunities to be exposed to these negative experiences in their careers already.

While 37% of respondents overall agreed that they had experienced some form of discrimination, harassment, or bullying (compared to 43% in the study by Moran et al., 2020), there were strong variations by territory – with those working in Australasia/Oceania (52%), North America (47%), and Africa (43%) most likely to agree that they had experienced this sort of behavior. This was also the case with 60% of mixed-race respondents and 43% of those describing their ethnicity as Hispanic/Latino.

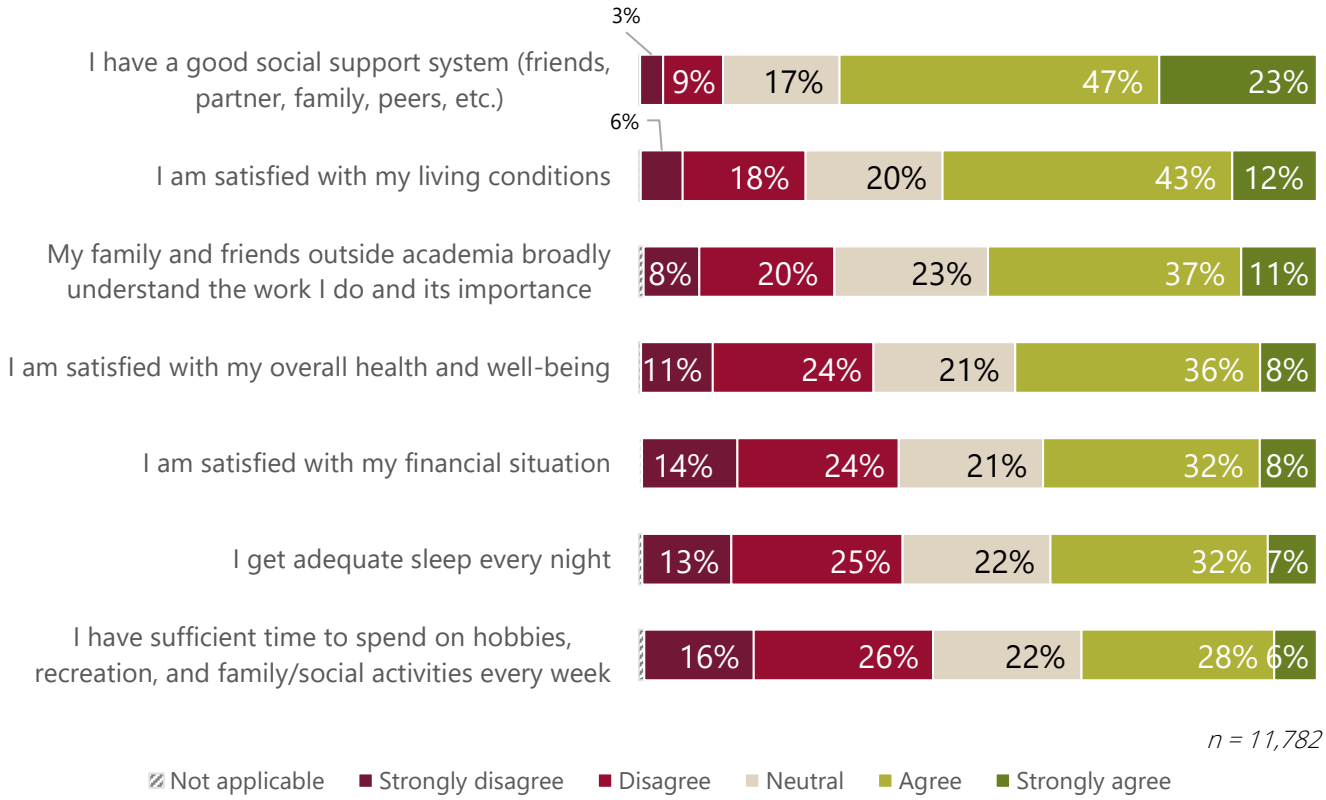
The research seems to point to links between these situations and respondents' mental health. Those who had experienced discrimination, harassment, or bullying were **more likely to also indicate that they had felt overwhelmed in the previous month** than those who had not.

These results are shocking and should represent a wake-up call to the sector. Clearly there is a huge amount of work to be done in this area by institutions and probably also by sector bodies and the whole research community.

Personal wellbeing

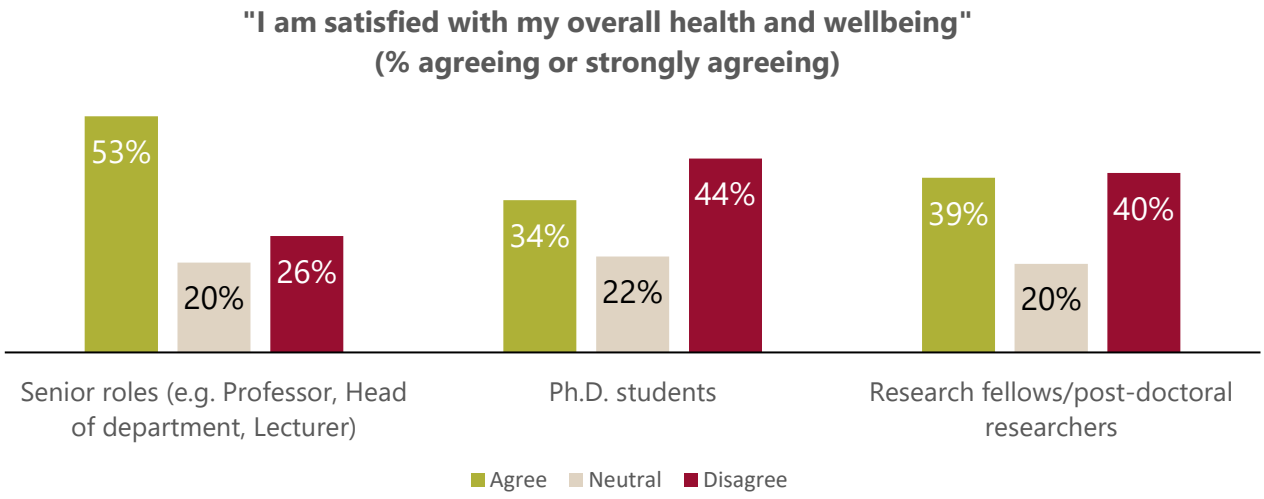
Work-life balance

Researchers were asked to reflect on how they felt about their personal health and wellbeing.



A significant issue emerging from the findings is the **low level of agreement with positive factors related to personal wellbeing.** For example, 43% disagreed they had sufficient time for recreation/other activities and 38% disagreed they get adequate sleep every night or are satisfied with their financial situation. Moreover, those in academia were more likely to disagree than those in other settings, emphasizing that it is a prominent issue here.

> It's not about free time, it's a lack of free energy. Who can do hobbies when you're physically, mentally, and emotionally drained?
>
> Lecturer, North America



n = 11,782

Looking closely at satisfaction with personal health and wellbeing by academic designation, PhD scholars and research fellows/postdoctoral researchers were much more likely to disagree with this compared to those in more senior roles. This further intensifies our abovementioned findings for early-career researchers – career stability, job satisfaction, and wellbeing are key areas of concern.

Those working in countries other than their country of origin were more likely to disagree they were satisfied with their overall health and wellbeing than those in their country of origin. Overall, the wellbeing of this group appeared to be lower than that of others, and this may be something for institutions to consider when planning wellbeing and support initiatives.

The survey findings show a **relationship between personal wellbeing and feeling overwhelmed at work.**

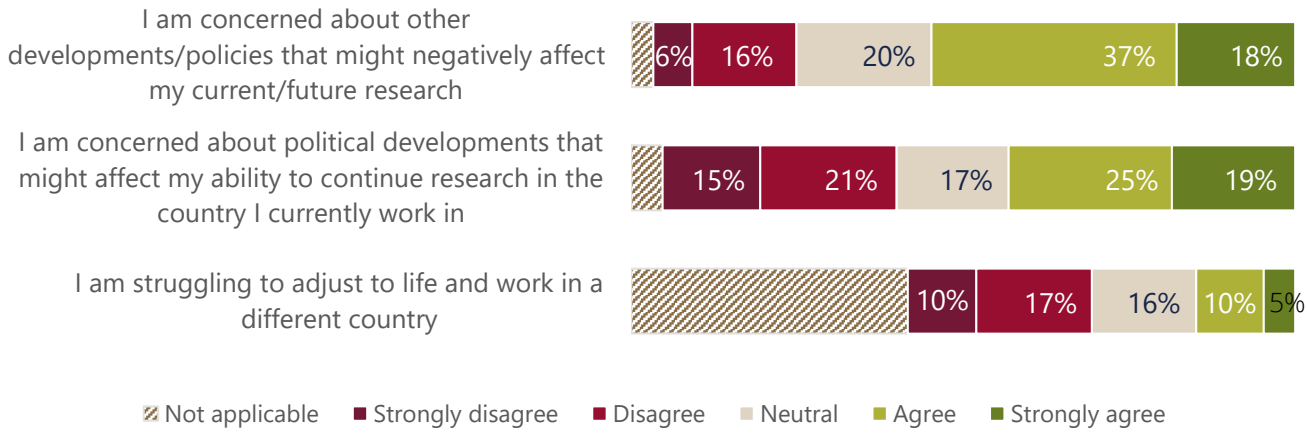
Regionally, the level of agreement/strong agreement about being satisfied with overall health and wellbeing was higher among those working in Africa (55%) and Asia (50%). Conversely, the level of disagreement/strong disagreement was higher among those working in Europe (33%), North America (33%), and Australasia/Oceania (31%). As we saw earlier, respondents working in these latter regions were also likely to have concerns around job stability. However, some cultural differences in perceptions of personal wellbeing may also be at play.

Further analysis indicated a relationship between poor perceptions of personal wellbeing and frequency of feeling overwhelmed at work. Consistently across all the statements related to personal health and wellbeing, those likely to disagree with these positive factors were more likely to state they felt overwhelmed fairly or very often in the previous month.

59% of those who disagreed they were satisfied with their overall health and wellbeing stated they felt overwhelmed frequently. In addition, 60% who disagreed that they had sufficient time for recreation/other activities stated they felt overwhelmed frequently.

External factors

For some, an array of wider concerns also contributed to their overall wellbeing and work pressures.



n = 9,963 – 10,849

55% agreed they **had concerns about developments/policies that might negatively affect their current/future research**

A high proportion stated they were concerned about external developments that may impact their research practice. Those concerned about wider developments or policies were more likely to be working in Africa, Europe, North America, and South America – particularly US, UK, Brazil, Nigeria, and South Africa.

In addition, those concerned about political developments were more likely to be working in Africa, North America, and South America. These concerns were more prominent in late 2019 and early 2020, compared to mid-2020.

Seeking help and support

Seeking workplace support

Overall, there was an almost equal split between researchers who agreed and disagreed that they would discuss feelings of severe work-related stress or anxiety (if experienced) with relevant people/authorities in their workplace so that they could help by taking appropriate action.

If you ever experience feelings of severe stress or anxiety because of your situation at work, would you discuss them with relevant people/authorities in your workplace so that they can help you by taking appropriate action?

n = 10,733

51% Yes 49% No

Some distinct country-based differences were found in how researchers answered this question. Respondents more likely to answer "yes" were based in China (59%) and South Korea (58%), compared with Germany (40%) and the United States (46%).

In terms of ethnicity, those who identified as Hispanic/Latino were the most likely group to say "no" to this question. It looks likely that cultural differences may exist in researchers' openness to discussing stress and anxiety issues in workplaces across the world, though other reasons may also be present.

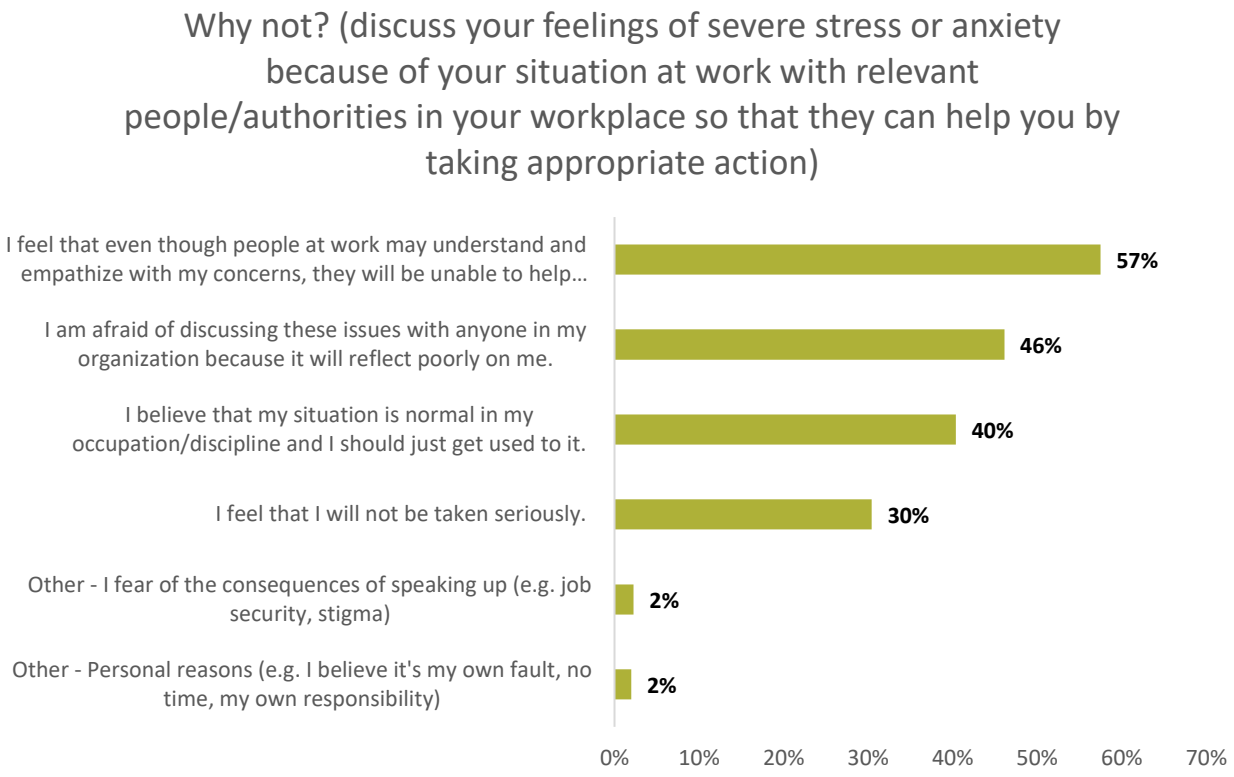
A high proportion of those working in the disciplines of Education (61%) and Medicine/Health Sciences (55%) said they would discuss these issues with appropriate individuals at their workplace. It is possible that better support systems are in place within these research fields, or perhaps these areas of research in particular tend to value and encourage discussions around personal wellbeing. Conversely, 57% of those working in Physical Sciences and 54% of those in Life Sciences answered "no" to this question. These findings signify a need for field-specific consideration around how to enable researchers to have these important conversations and receive the support they require.

> There has to be a way to report abuse that actually leads to support for survivors and consequences for abusers. Very few places have this.
>
> Assistant Professor, Asia

Another concerning finding was that those who said they typically work over 60 hours per week were more likely to say they would not discuss feelings of stress or anxiety with relevant people or authorities at work, while those working 40 or fewer hours per week were far more likely to state they would. This may be linked to the finding that those working longer hours also tend to have spent more years working in research, with the possibility that researchers become less inclined over time to communicate their feelings of stress and anxiety.

Barriers to accessing workplace support

The following were highlighted as key reasons for why researchers would not discuss their experiences of stress or anxiety with appropriate individuals at work:



n = 5,232, respondents were able to select multiple options

Additional barriers given in open "'other" responses, but obtaining <2% of responses, included not having access to the appropriate support, not finding the time, or feeling that it is something they should deal with alone.

Researchers based in Australia/Oceania (66%), North America (62%), and Europe (55%) were most likely to indicate personal concerns that voicing their feelings of stress and anxiety in the workplace may reflect badly on them, whereas 61% of those based in Asia felt that their colleagues may be able to empathize, but not help to address their issues effectively.

Worryingly, researchers who identified as either homosexual, bisexual, or queer were more likely (39%) to have selected "I feel that I will not be taken seriously" as a barrier to discussing feelings of stress or anxiety, compared to those identifying as heterosexual (29%).

Given that around half of researchers surveyed would not discuss their feelings and experiences of stress and anxiety at work, it seems clear that the systems for how researchers are currently expected to communicate need reforming.

Offering anonymous help and support would allow researchers to discuss these issues more freely without fear that they may be stigmatized. It is also important that institutions and leaders assert that feeling overwhelmed by stress is not a "normal" part of the job.

Seeking professional help

When asked whether they had ever sought professional help in dealing with feelings of severe stress or anxiety, most researchers (63%) indicated they had not.

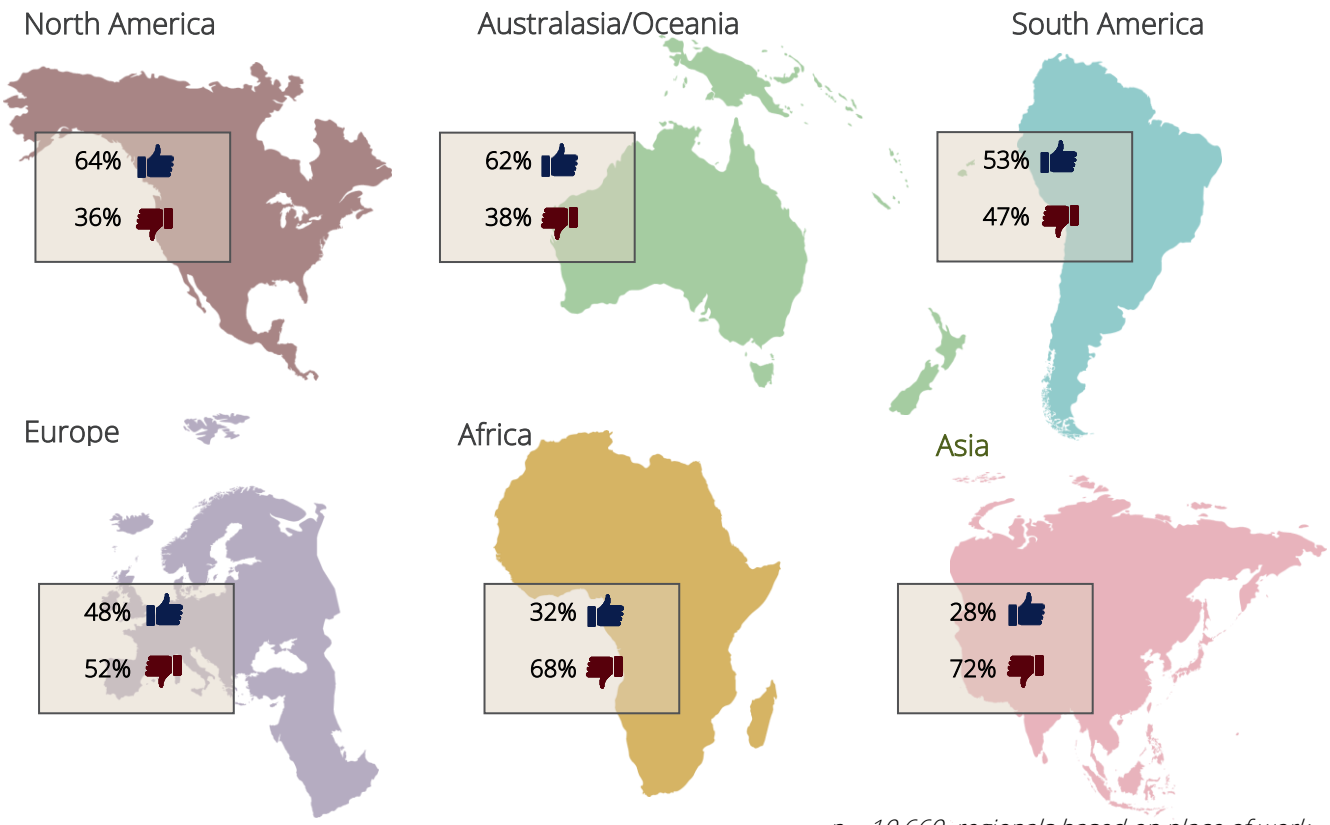
Some stark regional differences were seen in how this question was answered. Researchers who were originally from North America, Australasia/Oceania, or South America were more likely to say they had sought professional help to cope with stress and anxiety at work. Contrastingly, those originally from Africa and Asia were more likely to have not sought professional help at times of need.

It is likely that there are cultural differences at play in the approach to mental health, possibly influenced by stigmas attached to seeking psychological support.

If you have experienced feelings of severe stress or anxiety because of your situation at work, have you ever sought professional help (e.g., counselling, mental health services) in dealing with them?

37% Yes 63% No

n = 10,660



n = 10,660, regionals based on place of work

Researchers who identified as heterosexual were less likely to say they had sought professional help for stress and anxiety than the overall sample.

Early career, younger researchers were more likely to have used professional services for support, compared to senior researchers who were further along in their careers. Our study found that 41% of PhD scholars had sought professional help, a slightly higher figure than the 36% quoted in Nature's 2019 PhD Survey, which asked a similar question but more specifically around dealing with anxiety or depression (Woolston, 2019). This may be linked to a general acceptance and normalization of seeking professional support for mental health concerns amongst younger generations.

Sources of support

Of those who had sought professional help in dealing with feelings of severe stress or anxiety, the majority (67%) said they received private treatment, through going to a private clinic or healthcare professional.

Meanwhile, 40% said they had sought help through their organization, either from counselling services provided internally or via referrals to external services. Of the overall sample, 10% stated they had reached out to their place of worship for support – this was a more prevalent response for those based in Africa and Asia.

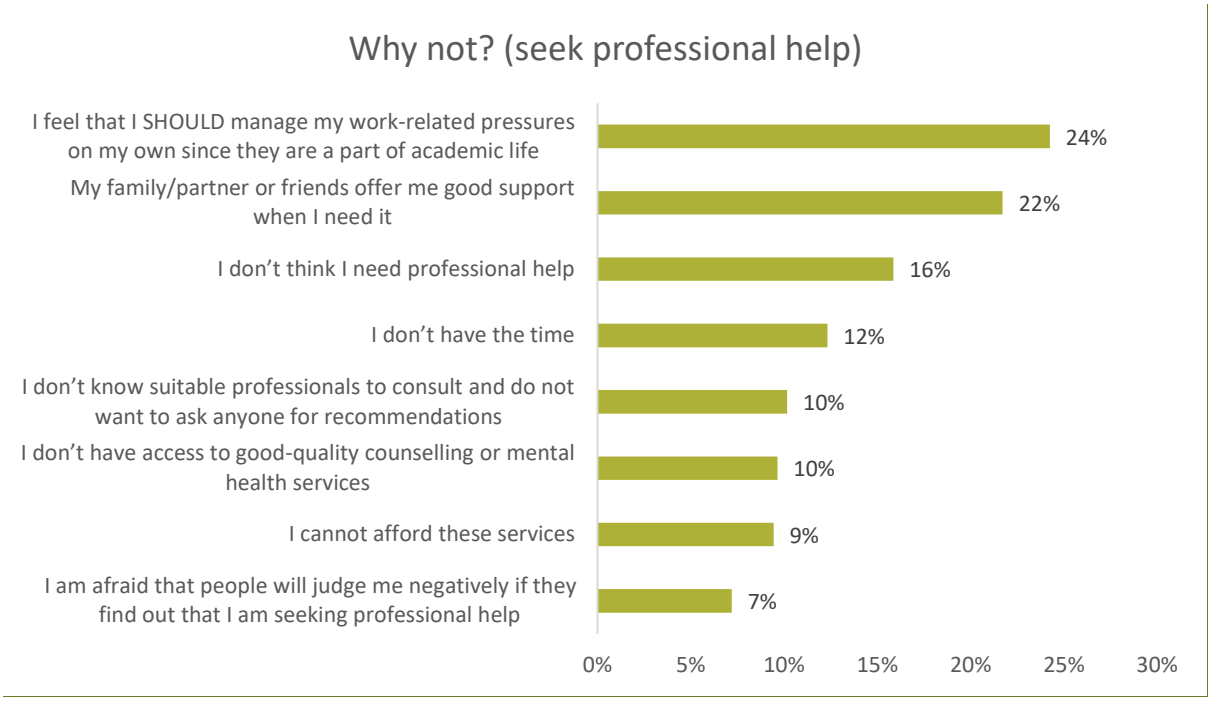
Other sources of support mentioned more infrequently were family and friends, other public healthcare services (e.g. medical doctor), a supervisor or mentor, and making use of personal coping methods such as meditation or exercise.

n = 4,011, respondents were able to select multiple options

Barriers to accessing professional help

The most common barrier to seeking professional help for researchers appeared to be a **feeling that they should accept these pressures as part of the job and manage them on their own.**

This may be linked to the finding that a large proportion of researchers would not seek workplace support because they feel it is normal to feel pressure as part of their occupation. This normalization of overwhelming feelings may be contributing to mental health issues in the academic community. It is therefore an area that needs more focus and consideration of how it can be changed.



n = 6,604, respondents were able to select multiple options

Asian researchers were by far the least likely to say they had sought professional help for work-related issues, and were the most likely to say they felt they should manage work-related pressures on their own. This was particularly the case for researchers based in China, of which 41% selected this response option. This finding indicates a normalization of stress and anxiety in the academic workplace, particularly within some countries. Institutions wishing to promote better mental health and wellbeing might want to consider how to address this. This finding could be linked to the fact that there remains a certain stigma attached to conversations around mental health in some Asian cultures (Kudva et al., 2020). These social barriers may be preventing individuals from accessing support when they need it.

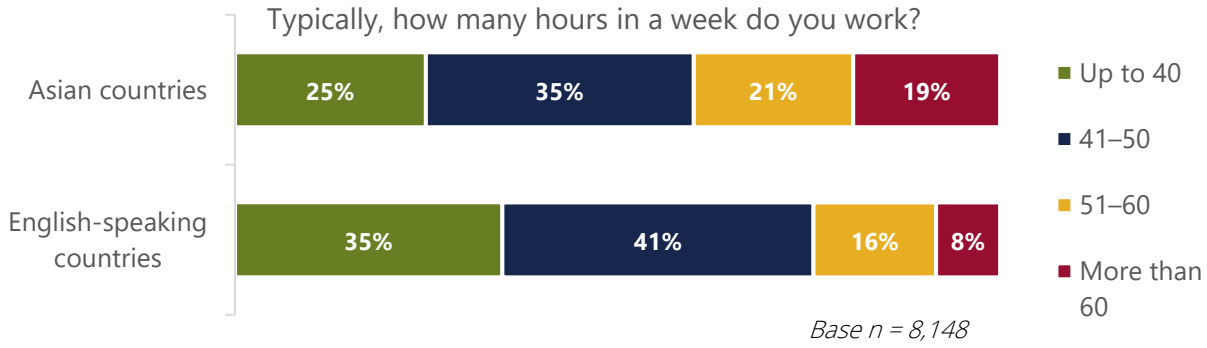
Male researchers were more likely than female researchers to say they don't think they need professional help or that they should manage work-related pressures on their own since these are part of academic life (30% vs. 20%). This finding is consistent with other research around gendered attitudes to mental health and seeking support in general populations (Chandra and Minkovitz, 2005).

Key regional differences

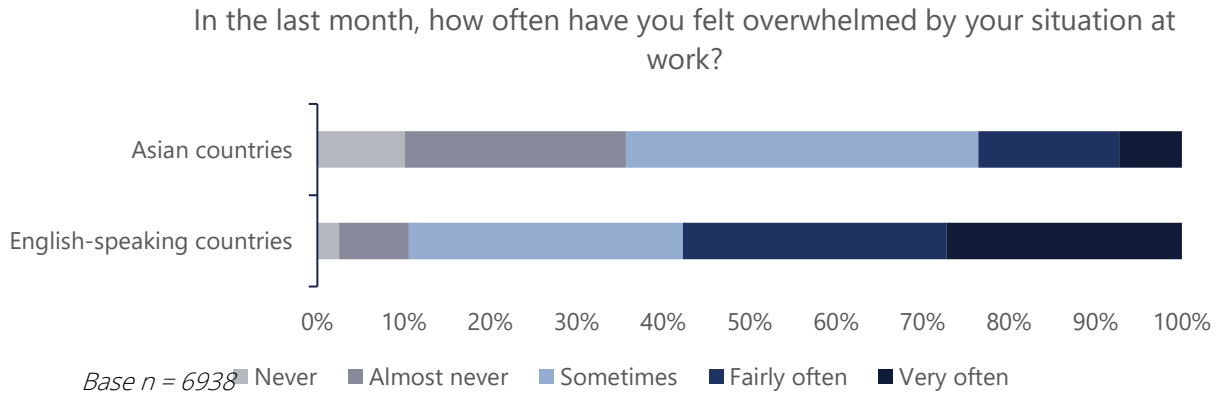
Analysis revealed some stark differences in responses from around the globe – particularly between researchers based in English-speaking countries (the US, UK, Australia, and Canada) and those in South and East Asian countries (specifically China, Japan, South Korea, and India). Considering that a unique strength of this survey is the large sample size from these strong research-producing Asian countries, there was merit in presenting a more detailed comparison of these two groups.

Working long hours and feeling overwhelmed

There was a clear contrast in the number of hours typically worked per week. Researchers based in Asian countries appeared to be working considerably longer hours, with 40% of this group indicating that they typically work more than 50 hours per week, compared to 24% of those in English-speaking countries.



Despite these reported long working hours, researchers in Asian countries were far less likely to say they had felt overwhelmed at work in the previous month. In fact, 36% of this group indicated that they had never or almost never felt overwhelmed by their situation at work over the previous month. Contrastingly, the majority (58%) of those in English-speaking countries said they had felt overwhelmed fairly or very often.



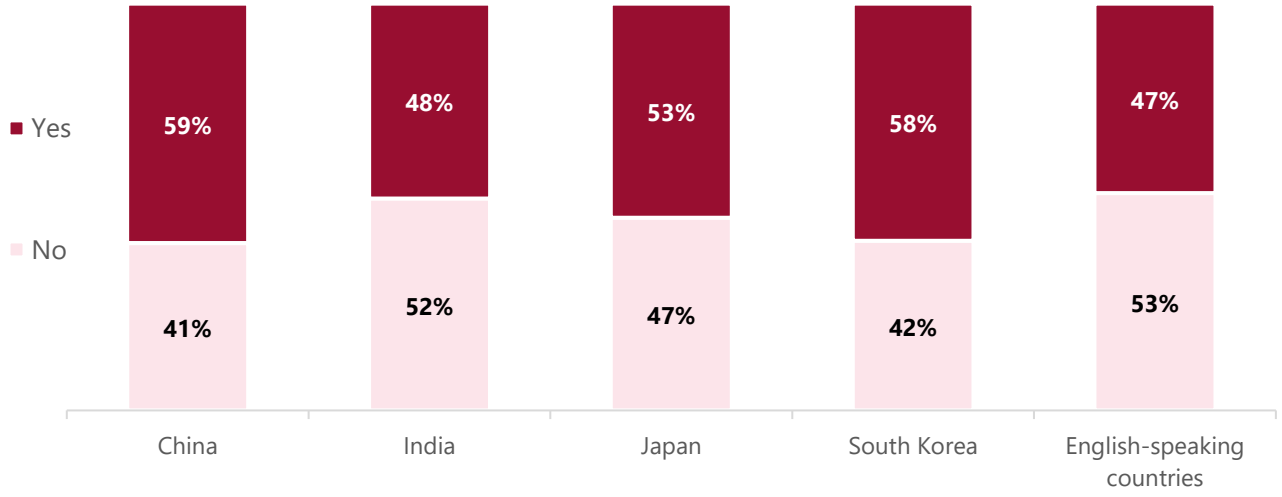
It is difficult to ascertain from survey results the cause of this overwhelmed feeling in English-speaking countries, though it is possibly linked to a general disillusionment with the research culture amongst this group. The majority (70%) of respondents in English-speaking countries either agreed or strongly agreed with the statement 'I am unhappy about the overall culture in academia', compared to 37% of those in Asian countries. Similarly, 52% of those based in English-speaking countries agreed or strongly agreed with the statement "*I doubt my work achievements and feel like I do not belong in academia*", while just 30% of those in Asian countries said the same.

Differences in approach to seeking help and support

Some interesting differences were also found between researchers based in Asian and English-speaking countries in their approach to seeking help and support for stress or anxiety associated with their situation at work.

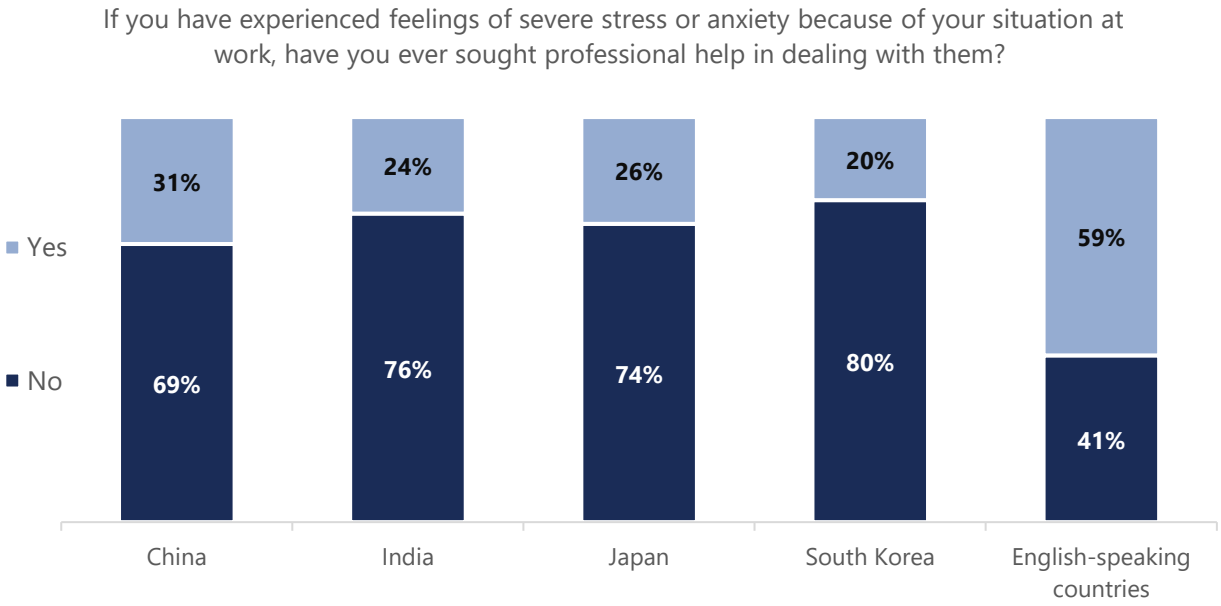
As a whole, researchers based in Asian countries were more likely than those in English-speaking countries to suggest that they would discuss their feelings of stress or anxiety with relevant individuals at their workplace, in order to receive help for these issues (54% versus 47%). However, a deeper look at how specific countries responded to this question revealed that researchers based in India were actually found to be less inclined than respondents overall to speak to individuals in their workplace about experiences of stress and anxiety, whilst those in China and South Korea appeared more likely.

If you ever experience feelings of severe stress or anxiety because of your situation at work, would you discuss them with relevant people in your workplace so that they can help you by taking appropriate action?



Base n = 6,923

However, when asked whether they had ever sought professional help for these work-related issues, 74% of those in Asian countries said they had not, compared to 59% of those in English-speaking countries.



Base n = 6,884

Researchers working in South Korea were the least likely to have sought professional help to deal with feelings of severe stress or anxiety at work. As mentioned earlier, cultural differences in the stigma attached to mental health is likely to play a role here.

When asked why they would not seek professional help, over half of respondents from Asian countries said they felt they should manage work-related pressures alone since these are part of academic life. It seems that in Asia in particular, research institutions and decision makers should make an effort to move away from the normalization of feeling overwhelmed, stressed, or anxious in the research environment.

.

Concluding thoughts

In common with other recent studies in this area, the data collected paints a picture of research careers that have both fulfilling and rewarding elements, but also bring considerable strain for a large proportion of researchers. Patterns and causes are complex, but the following all appear to contribute: long working hours; discrimination, harassment, and bullying; pressure to perform; and a culture in which stress and anxiety are normalized. This appears to be particularly the case in academic settings and English-speaking countries, as well as with younger researchers, women, and ethnic and sexual minorities.

There is plenty to think about here – for individuals, institutions, and other stakeholders in the research ecosystem – and some key potential areas for action, as discussed below.

Key takeaways

> We need to do better to understand and include POC and other minority groups. We need to fight the stigma on mental illness and provide better resources for mental health that go beyond telling someone to take a few deep breaths to calm down. People need genuine long-term emotional support... Stress and burnout come when you give and give and get next to nothing in return and are made to feel guilty that you're never enough.
>
> Research technician, North America

What immediate issues need to be addressed?

Addressing bullying, harassment, and discrimination: A worryingly high proportion of researchers are experiencing these issues at work, or have done so in their careers. This appears to be an immediate issue requiring serious discussion and recognition at the highest levels.

Improving work-life balance: Working hours appear to be extremely long, with 31% reporting typically working more than 50 hours a week and 43% disagreeing that they had sufficient time for recreation/other activities. The data points to a link between work-life balance and mental health. This is not a simple relationship and working hard may often be internally driven, rather than externally prescribed. However, working long hours may still have consequences for researchers and needs to be addressed by the sector.

Changing expectations: There is evidence here of a normalization of high levels of stress and anxiety as just being part of regular academic life. Leadership is required here to change the research culture, with role-modelling from senior academic leaders. Without the academic community as a whole addressing the idea of what is acceptable or not acceptable, changes to researcher wellbeing will probably be slow – with consequences not only for individual researchers, but for the sector itself in terms of losing contributions from talented but more vulnerable individuals.

Understanding and acknowledging pain points: Those who support researchers within the workplace, such as managers, institutional administrators and human resources teams where they exist, should be educated on the day-to-day work that researchers do. It is essential for decision-makers and those who implement policies to have a solid understanding of the nature of research work and the areas where researchers lack support. This can help effect broad-level changes in research environments and culture.

How can institutions respond?

The survey indicates that well-developed institutional policies do make a difference. In particular, the findings point to the following.

Stricter policies against discrimination, bullying, and harassment: The survey appears to show a link between having strict policies against discrimination, bullying, and harassment; how often these types of behaviors are experienced; and researcher mental health. Institutions may consider involving groups that may be at a greater risk of experiencing discrimination and harassment in the development of these policies. These groups may see areas of weakness that are not witnessed by other parts of the researcher community and so ensure that the policies are fit for purpose.

Work-life balance policies: Researchers working long hours and a perceived lack of institutional policies around work-life balance appeared to be related to whether respondents had felt overwhelmed by their situation at work frequently in the previous month. Structured policies around this are likely to have a positive effect on researcher mental health.

Developing confidential support within institutions: Many respondents accessed support outside their institutions and some expressed concerns that seeking institutional support might either be ineffective or reflect poorly on them. A range of highly confidential spaces for researchers to access support within their institution, or supported access to spaces outside the institution, seems to be a need. Those offering support perhaps need to be highly trained in researcher practices in order to support researcher needs fully.

Support for specific groups: Particular researcher segments appear to be disproportionately likely to be overwhelmed at work – particularly PhD scholars and those who are more likely to experience discrimination, including women. Those who were working outside their country of origin also appeared more vulnerable. Institutions might need to consider reasons for this internally and seek to develop more targeted support for these groups.

Promoting researcher resilience: Institutions might consider adding training around resilience development in doctoral training in order to help early-career researchers to stay motivated and handle the inevitable setbacks of a life in research.

Creating inspiring work environments: There appear to be indications here that an inspiring work environment can have a positive effect on researcher mental health. Working on these elements of a researcher's working life may reap rewards for institutions and individuals.

What else needs to change?

Reducing the stigma around mental health: Attitudes towards mental health may to some extent be culturally determined and not specific to the sector. Surveys such as this could be a useful starting point for discussions around mental health in the sector, giving a range of stakeholders a fuller understanding of the stresses that many researchers experience. The research community globally might also have a role to play in helping to reduce stigma amongst the wider communities in which they operate.

Better career stability: Feelings of career instability and stress are prevalent, particularly amongst early career researchers, and appear to be linked to feeling overwhelmed at work. There are issues for the sector as a whole to consider around the way in which younger researchers are employed, in addition to issues around fairness in credit and recognition granted for research output.

Reducing pressure to perform: Many of our respondents indicated that they were under tremendous pressure to publish papers, secure grants, complete projects, and maintain their current good standing or reputation. These pressures were particularly strong in academic settings. The sector could perhaps reflect on the ways in which current systems of research evaluation impact the mental health and wellbeing of researchers, and the impact that this may have in turn on the quality of research output.

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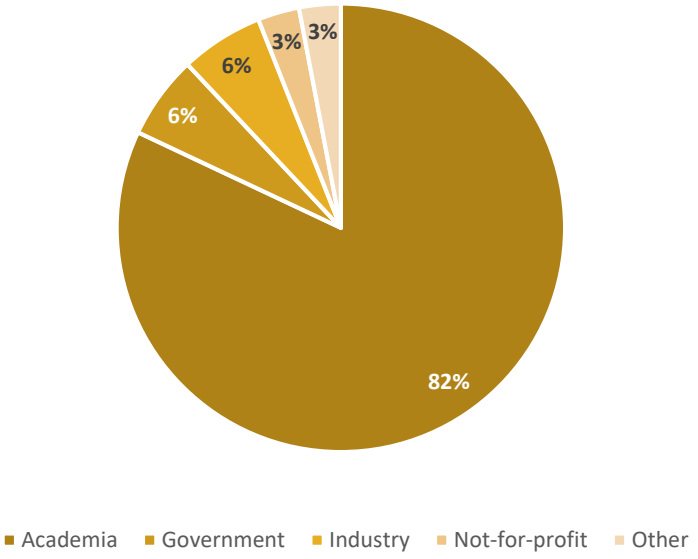
Acknowledgements

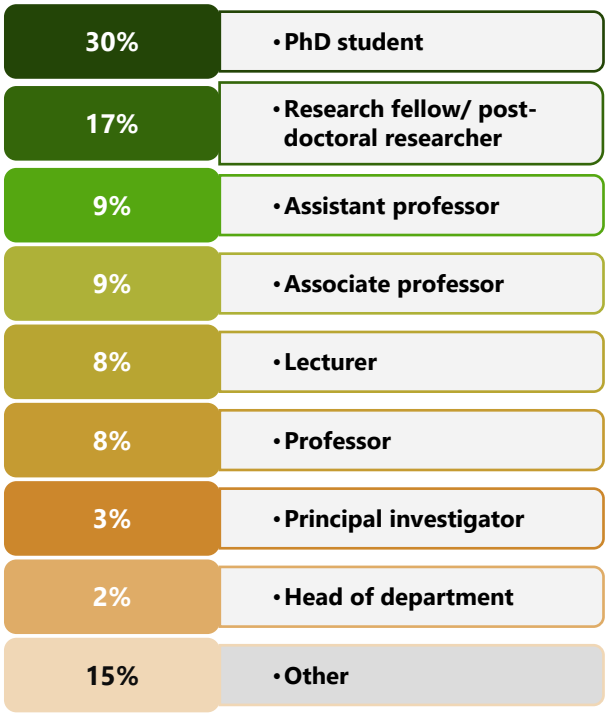
The CACTUS team would like to acknowledge the tremendous efforts of the Shift Learning team in analyzing the data and producing this report, specifically Misha Gorsia, Research Manager; Rhiannon Jones, Research Executive; Matthew Wood, Head of Method; and Jack Wilson, Operations Director. We appreciate their professionalism, dedication, and thoroughness, despite the massive scope of this work and tight timelines. Special thanks also go to the Dragonfly Mental Health team, including Wendy Ingram, PhD, Founder and CEO; Dr. Olga Vvendenskaya, Organizational Team Lead; Linda Corcoran, Accessibility Director; and Adriana Bankston, PhD, Research Team Co-Lead. Their in-depth inputs and critical comments helped us improve the quality of this report.

Appendix 1 | Respondent profile

Which of the following sectors do you currently work in?

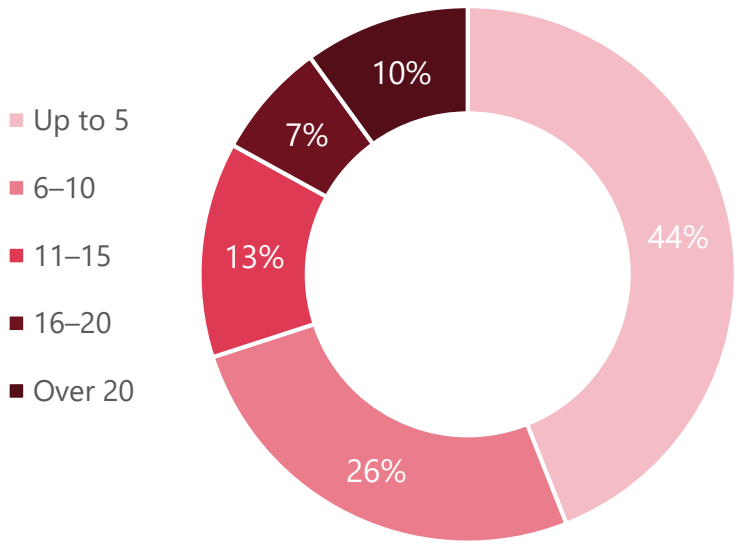


Which of the following most closely describes your current academic designation?



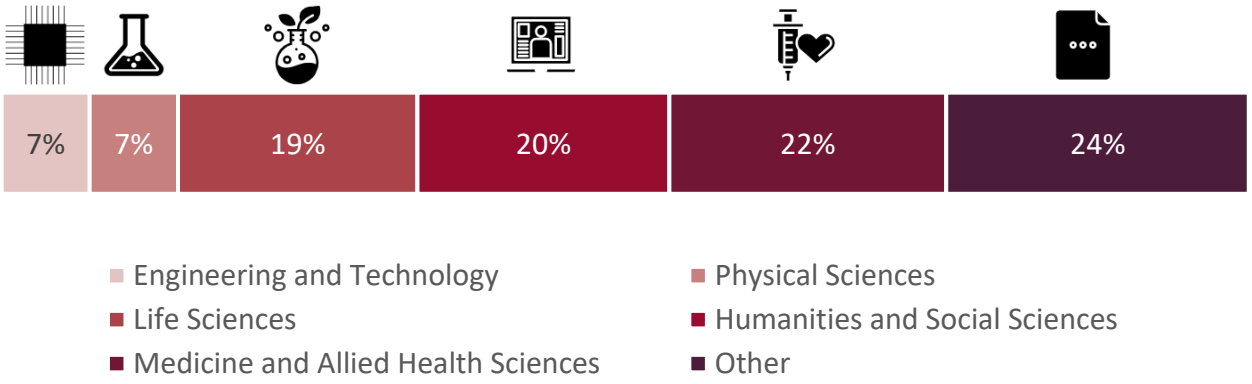
n = 13,000

How many years have you spent as a researcher?



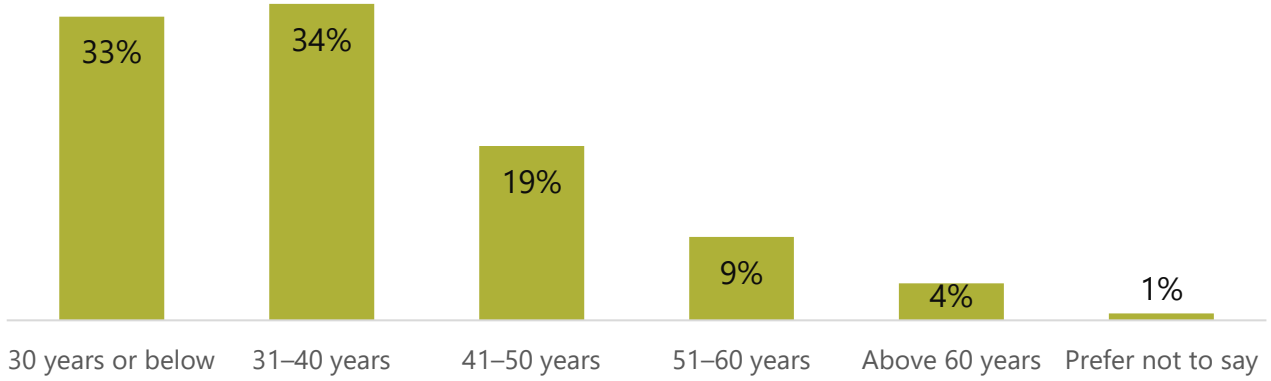
n = 13,000

What is your broad field of study?



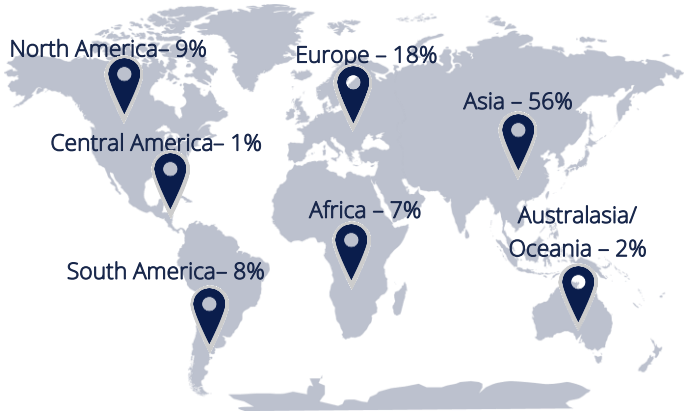
n = 13,000, total adds up to 99% due to rounding error

What is your age?

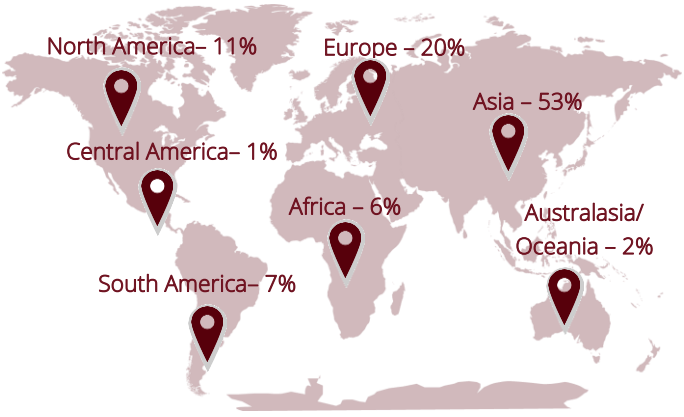


n = 13,000

Which country are you originally from? (Grouped into regions)

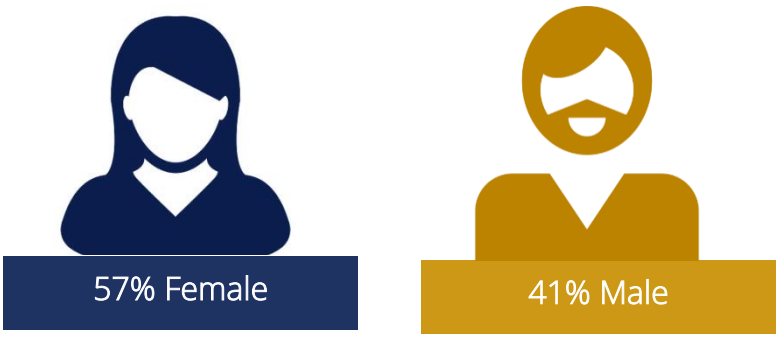


Which country do you currently work in? (Grouped into regions)



n = 13,000

What is your gender?



1% Non-binary/gender non-conforming

1% Prefer not to say

<1% Other identities

n = 13,000

What is your ethnicity?	
Asian (East Asia)	34%
White	30%
Asian (South Asia)	14%
Asian (Other)	7%
Hispanic / Latino	6%
Black	5%
Arab	2%
Other	2%
Asian (Southeast Asia)	<1%
Mixed race	1%
Native American	<1%
Prefer not to say	<1%

n = 13,000

What is your sexual orientation?	
Heterosexual	81%
Prefer not to say	9%
Bisexual	5%
Homosexual	4%
Other queer identity	1%
Other identities	<1%

n = 13,000

Appendix 2| Dissemination approach

Dissemination channels

The following channels were used to disseminate the survey:

1. The Cactus Foundation survey landing page (https://www.CACTUSglobal.com/mental-health-survey)
2. Institution/Organization-specific channels (for partnering organizations)
    - IndiaBioscience
    - Moneague College
    - Mentally Aware Nigeria Initiative (MANI)
    - India Alliance
    - Korean Publishing Science Society
    - SciELO
    - Bioclues Organization
    - Council of Asian Science Editors (CASE)
3. WeChat accounts of Editage and partnering organizations (listed below)
    - Linkresearcher
    - Home for Geoscience
    - Brain News
    - Jijitang
    - National Science Library, CAS
    - Neureality
4. Social media channels owned by CACTUS, collaborators, and partnering organizations (Twitter, Facebook, LinkedIn, Instagram).
5. Newsletter communication done by CACTUS to their researcher base, and newsletter communication done by partnering organizations to their researcher bases.
6. Articles published by the survey team on CACTUS-owned platforms (Editage Insights, Blank:a).
7. An invited article published in Research Professional News

Researchers who had completed the survey were invited to participate in a referral contest, where they could refer other researchers to take the survey and win free access to learning courses on R UpSkill (a CACTUS brand).

Interim results based on a sample of about 5000 participants were shared in Stay Home, Stay Connected, Keep Growing – a virtual conference organized by Cactus Communications in May 2020.

What comes next?

The CACTUS Mental Health Survey Report 2020 is just the beginning!

There's still much to do and talk about in our journey towards initiating and shaping a much-needed change in the global research culture.

Join the conversation about mental health in academia and discuss findings from the survey report on R Voice

JOIN THE CONVERSATION

R VOICE

R Voice is a safe space created for researchers to come together and be themselves, be it bringing forth their academic side or sharing some of their personal achievements and struggles.

R Voice - *A magnetic, thriving, nurturing community of researchers growing together and supporting each other*

About

About Cactus Communications

Founded in 2002, Cactus Communications is a technology company accelerating scientific advancement. CACTUS solves problems for researchers, universities, publishers, academic societies, and life science organizations through innovative products and services developed under the brands Editage, Cactus Life Sciences, R, Impact Science, UNSILO, and Cactus Labs. CACTUS has offices in Princeton, London, Aarhus, Singapore, Beijing, Shanghai, Seoul, Tokyo, Hyderabad, Bengaluru, and Mumbai; a global workforce of over 3,000 experts; and customers from over 190 countries. CACTUS is considered a pioneer in its workplace best practices and has been consistently ranked a great place to work over the last several years.

About Cactus Foundation

Cactus Foundation is an initiative by Cactus Communications aligned with the United Nations Sustainable Development Goals, and it aims to help researchers grow and create global impact through their research. It was established to build a more just, equal, and inclusive society by providing grants, business support, education, and other initiatives to the global research community as well as to aspiring next-generation researchers. Our aim is to contribute to improvements in the quality of life and the greater prosperity of human society. Our commitment to society compels us to create meaningful change that is not only based on appearances but on enabling real impact to solve society's problems.