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End the neglect of young people's mental health

The pandemic, a UNICEF report and a review of the latest research highlight the urgent need for better prevention and treatment of youth anxiety and depression.

Worldwide, at least 13% of people between the ages of 10 and 19 live with a diagnosed mental-health disorder, according to the latest *State of the World's Children* report, published this week by the United Nations children's charity UNICEF. It's the first time in the organization's history that this flagship report has tackled the challenges in and opportunities for preventing and treating mental-health problems in young people. It underscores the complexity of adolescent mental health and how it is understudied and underfunded. These findings are echoed in a parallel collection of review articles published this week in a number of journals published by Springer Nature, which also publishes *Nature*.

Anxiety and depression constitute more than 40% of mental-health disorders in young people (those aged 10–19). UNICEF also reports that, worldwide, suicide is the fourth most-common cause of death (after road injuries, tuberculosis and interpersonal violence) in adolescents aged 15–19. In eastern Europe and central Asia, suicide is the leading cause of death for young people in that age group — and it's the second-highest cause in western Europe and North America.

Sadly, psychological distress in young people seems to be rising. One study found that rates of depression in a nationally representative sample of US adolescents aged 12–17 increased from 8.5% to 13.2% between 2005 and 2017 (ref. 1). There's also initial evidence that the coronavirus pandemic is exacerbating this trend in some countries. For example, in a nationwide study[2] from Iceland, adolescents aged 13–18 reported significantly more symptoms of mental ill health during the pandemic than did their peers before it. And girls were more likely to experience these symptoms than were boys.

Although most mental-health disorders arise during adolescence, UNICEF says that only one-third of the investment in mental-health research is targeted towards young people. Moreover, the research itself is fragmented — scientists involved tend to work inside key disciplines, such as psychiatry, paediatrics, psychology and epidemiology, and the links between research and health-care services are often poor. This means that effective forms of prevention and treatment are limited, and lack a solid understanding of what works, in which context and why.

> **"Young people need to be involved in all aspects of the research process."**

This week's collection of review articles dives deep into the state of knowledge of interventions — those that work and those that don't — for preventing and treating anxiety and depression in people aged 14–24.

For example, researchers have been investigating potential links between depression and inflammatory disorders — such as asthma, cardiovascular disease and inflammatory bowel disease. This is because, in many cases, adults with depression also have these disorders. Moreover, there's evidence that, in mice, changes to the gut microbiota during development reduce behaviours similar to those linked to anxiety and depression in people[3]. That suggests that targeting the gut microbiome during adolescence could be a promising avenue for reducing anxiety in young people. Kathrin Cohen Kadosh at the University of Surrey in Guildford, UK, and her colleagues reviewed existing reports of interventions in which diets were changed to target the gut microbiome. These diets were found to have had minimal effect on youth anxiety[4]. However, the authors urge caution before such a conclusion can be confirmed, citing limitations such as small sample sizes in the studies they reviewed. They say the next crop of studies will need to involve larger-scale clinical trials.

By contrast, researchers have found that improving young people's cognitive and interpersonal skills can be more effective in preventing and treating anxiety and depression under certain circumstances[5]. In addition, Alexander Daros at the Campbell Family Mental Health Institute in Toronto, Canada, and his colleagues report a meta-analysis of 90 randomized controlled trials. They found that helping young people to improve their emotion-regulation skills, which are needed to control emotional responses to difficult situations, enables them to cope better with anxiety and depression[6]. However, it is still unclear whether better regulation of emotions is the cause or the effect of these improvements.

Co-production is essential

It's uncommon — but increasingly seen as essential — that researchers working on treatments and interventions are directly involving young people who've experienced mental ill health. These young people need to be involved in all aspects of the research process, from conceptualizing to and designing a study, to conducting it and interpreting the results. Such an approach will lead to more-useful science, and will lessen the risk of developing irrelevant or inappropriate interventions.

Two young people are co-authors in a review from Karolin Krause at the Centre for Addiction and Mental Health in Toronto, Canada, and her colleagues. The review explored whether training in problem solving helps to alleviate depressive symptoms[7]. The two youth partners, in turn, convened a panel of 12 other youth advisers, and together they provided input on shaping how the review of the evidence was carried out and on interpreting and contextualizing the findings. The study concluded that, although problem-solving training could help with personal challenges when combined with other treatments, it doesn't on its own measurably reduce depressive symptoms.

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The overarching message from these reviews is that there is no 'silver bullet' for preventing and treating anxiety and depression in young people – rather, prevention and treatment will need to rely on a combination of interventions that take into account individual needs and circumstances. Higher-quality evidence is also needed, such as large-scale trials using established protocols.

Along with the UNICEF report, the studies underscore the transformational part that funders must urgently play, and why researchers, clinicians and communities must work together on more studies that genuinely involve young people as co-investigators. Together, we can all do better to create a brighter, healthier future for a generation of young people facing more challenges than ever before.

1. Twenge, J. M., Cooper, A. B., Joiner, T. E., Duffy, M. E. & Binau, S. G. *J. Abnorm. Psychol.* **128**, 185–199 (2019).
2. Thorisdottir, I. E. *et al. Lancet Psychiatr.* **8**, 663–672 (2021).
3. Murray, E. *et al. Brain Behav. Immun.* **81**, 198–212 (2019).
4. Cohen Kadosh, K. *et al. Transl. Psychiatr.* **11**, 352 (2021).
5. Bennett, M. P. *et al. Transl Psychiatr.* **11**, 288 (2021).
6. Daros, A. R. *et al. Nature Hum. Behav.* https://doi.org/10.1038/s41562-021-01191-9 (2021).
7. Krause, K. R. *et al. BMC Psychiatr.* **21**, 397 (2021).

Protect COVID scientists in the public eye

Researchers are facing harassment for speaking out during the pandemic. Their institutions must do more to support them.

The COVID-19 pandemic has seen more scientists than usual enter the public arena, many of them for the first time. Every day, researchers are interviewed in the media, advise policymakers and write social-media posts. They might be discussing the latest coronavirus data; explaining and interpreting new research; or commenting on government policies. Some are now as recognizable as celebrities.

Clear, accurate public communication from scientists is essential in a pandemic. But for a significant minority, the attention has had unpleasant consequences. *Nature* has surveyed a subset of researchers who have spoken to the media about COVID-19, and found that 47 people – some 15% of the 321 respondents – had received death threats and that 72 had received threats of physical or sexual violence (see page 250). In response to other survey questions, the researchers who reported the highest frequency of trolling or personal attacks were more likely to say that it had affected their willingness to speak to the media in the future.

The results are not a random sample: they represent those who chose to respond to *Nature*'s survey, which was based on a poll conducted by the Australian Science Media Centre, an organization that connects scientists to journalists. Other science media centres around the world sent *Nature*'s survey on to researchers in the United Kingdom, Canada, Taiwan, New Zealand and Germany, and *Nature* sent it to scientists in the United States and Brazil. Because those who have received threats might have been more motivated to respond, the overall proportion of scientists experiencing abuse might be lower.

> **"Intimidation risks discouraging researchers from contributing to public discussion."**

But the results are shocking, nonetheless. Intimidation is unacceptable on any scale, and the findings should be of concern to all those who care about scientists' well-being. Such behaviour also risks discouraging researchers from contributing to public discussion – which would be a huge loss, given their expertise, during the pandemic.

Institutions at all levels must do more to protect and defend scientists, and to condemn intimidation. Of those respondents who told their employers about death threats – and not all did – some 20% said their employers were not at all supportive. The proportion was similar for those who had experienced trolling or personal attacks online, although in these cases respondents were less likely to have notified their employer in the first place. Of those who had received death threats, more than 80% had told their employer, compared with just over half of those who had been subject to trolling or personal attacks. Respondents rightly said that scientific societies, funders and governments should talk about the problem and condemn attacks.

Most of the respondents were in Europe and the United States, but threats are being made against researchers all over the world, by both individuals and organized anti-science or anti-vaccination campaigns. The findings show the need for more support, protection and training for scientists in the public eye.

Some researchers in other high-profile fields, such as climate change and animal research, have had to deal with harassment and abuse for many years (see, for instance, *Nature* **562**, 449–450; 2018); partly as a result, their institutions have built up some level of understanding on how to support scientists. The Science Media Centre in London is among organizations that have published advice for those experiencing harassment, including when, whether and how to engage with critics, and who to turn to for support (see go.nature.com/3lyyqlj). Support and information can also be gained from many other fields, ranging from journalism to sport, in which people are targeted by toxic online threats and sometimes real-world attacks.

Taking steps to support scientists who face harassment does not mean silencing robust, open criticism and discussion. The coronavirus pandemic has seen plenty of disagreement and changing views as new data have come in, as well as differing stances on which policies to adopt. Scientists and health officials should expect their research to be questioned and challenged, and should welcome critical feedback that is given in good faith. But threats of violence and extreme online abuse do nothing to encourage debate – and risk undermining science communication at a time when it has never mattered more.