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UK's rupture with Horizon Europe is totally unnecessary

Few ever expected British and EU scientists to be forced apart. Researchers must never take international collaboration for granted.

When Britain left the European Union at the end of January 2020, researchers were assured that this did not mean leaving the EU's research programme, Horizon Europe. Under the terms of the United Kingdom's EU exit, the country would keep paying into the €95.5-billion (US$100.6-billion) fund and researchers would continue to be able to access grants (including prestigious European Research Council (ERC) grants), lead projects and participate in initiatives such as the International Thermonuclear Experimental Reactor facility in France. Scientists let out heavy sighs of relief. Although most had strongly opposed Brexit, access meant that long-standing research partnerships would continue and new ones could be forged.

But a lot has changed since then. Relations between UK and EU policymakers have nose-dived, with researchers trapped in the middle (see page 629). Those awarded ERC and other grants are now expected to lose them. The principal reason is the British government's decision to break some of the terms of the separation agreement that it carefully negotiated with the EU.

The UK government has introduced draft legislation into its parliament that is intended to amend trading arrangements between Northern Ireland (which is part of the United Kingdom) and the independent Republic of Ireland (which is a member of the EU). It is doing this unilaterally, instead of using the official dispute-resolution system. This action has triggered legal action by the EU against the United Kingdom for breaking international law.

While all of this is happening, the EU has halted research cooperation. UK recipients of EU grants have been told they will need to move to an EU institution if they want guaranteed access to the funds. Some are reluctantly preparing to do so. The EU's legal action is likely to make any future UK access to Horizon Europe much more difficult. The legal case will probably take several years to run its course, and Horizon Europe is time-limited: it ends in 2027.

Research leaders in both the EU and the United Kingdom have fought a vocal and high-profile campaign called 'Stick to Science', urging politicians to keep politics out of science. But, barring a last-minute change of heart, a science relationship that has lasted some five decades looks likely to come to an end. If and when that happens, it could be the biggest setback to European science cooperation ever seen. Over the years, researchers in mainland Europe have enriched UK science no end – and vice versa.

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Unsurprisingly, relations between the UK government and the nation's scientists are at one of their lowest points in recent memory. Researchers are exasperated over the uncertainty and the lack of detailed communication about what will come next, and have concerns about inconsistencies in the government's thinking on funding.

UK science minister George Freeman, a biotechnology entrepreneur and intellectual, is preparing a backup global fund for UK researchers that he is informally calling Plan B. Last week, Freeman told a parliamentary inquiry that the government will publish a 'prospectus' for this fund before Members of Parliament go on their summer break on 21 July. He added that the fund will include international fellowships for UK researchers and more funding for high-risk, high-reward science similar to that funded by the US Defense Advanced Research Projects Agency.

One problem for the minister is that the UK Treasury – the department that is providing the funding – needs to know which of the two options to fund. If the country won't be joining Horizon Europe and Plan B isn't ready in time, there's a fear that some of the allocated funds could be diverted to other spending priorities.

Another reason the scientific community has little confidence in Britain's funding ambitions is the government's decision to abruptly end one of the nation's existing (and popular) global funding schemes, the Global Challenges Research Fund (GCRF), along with the decision not to renew a second global fund, the Newton Fund, when it ended in 2021. The unexpected cancellation of the GCRF, in particular, created chaos for existing projects.

It is imperative that the UK government consults with some of the country's experts in research funding on the design of a replacement global fund. Consultation should also include organizations such as the Royal Society, the British Academy and the Royal Academy of Engineering, which were among those responsible for managing and disbursing the GCRF and the Newton Fund.

These funds supported partnerships between researchers in the United Kingdom and international counterparts, including many in low- and middle-income countries, particularly on projects aimed at meeting the United Nations Sustainable Development Goals. The funds transformed research at many universities, both in the United Kingdom and around the world. By 2019, the GCRF was supporting nearly 5,000 researchers working across more than 800 projects in some 120 countries. An evaluation of the lessons learnt from these experiences could be of huge benefit to the designers of the new global fund.

The story of the United Kingdom's scientific decoupling from the EU must stand as a warning to researchers around the world: international cooperation in science cannot be taken for granted. Researchers have come to expect that those elected to lead will understand that science and knowledge thrive on partnerships and international exchange – and that in times of political tension, disagreement or conflict, research, knowledge and scholarship should continue in spite of those differences. But the way

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that the United Kingdom's rupture with the EU has spilt into science shows that this is not necessarily the case.

As the world enters a much more uncertain phase following the pandemic and Russia's invasion of Ukraine, we urge all researchers to redouble their efforts to maintain and boost collaborations. No action is too small. Added together, acts of solidarity keep collaborations alive in the absence of formal ties, just as they did in previous times of tension and conflict.

Randomized controlled trials must include equity

Scientists need to ensure that the benefits of experiments reach the people who need help the most.

More than two decades ago, researchers began using rigorous experiments to test policies designed to improve the lives of some of the world's poorest citizens. The movement grew, and randomized controlled trials (RCTs), once reserved for drugs and other health interventions, are now part of the mainstream in the research community that studies global development.

The knowledge resulting from RCTs of all kinds has helped people across the world. It has led to better drugs and new health interventions, as well as educational opportunities, improved agricultural technologies and effective programmes to distribute desperately needed cash. But these benefits have not necessarily flowed equitably, or helped those who need it the most.

The pernicious and pervasive effects of inequality in all its forms are all too clear, as *Nature* reports this week. A special collection of articles (see nature.com/collections/inequality) includes content that looks at the ways in which COVID-19 has deepened inequality; factors that contribute to gender inequality in science; and an analysis of interventions designed to alleviate poverty (see page 640).

Researchers are working to understand and measure the root causes, as well as the symptoms, of social inequities. At the same time, like so many others, they are also confronting their own role in a complicated socio-economic system in which benefits such as wealth and opportunity too often flow to those who already experience such advantages.

One of the first things that researchers can do is to ensure that their work is not contributing to outstanding social inequities. Sadly, all too often, the benefits of public-health research are distributed inequitably. Health interventions ranging from COVID-19 vaccines or drugs to new technologies can improve overall public health, but if they reach people in rich countries, or people who already have access to high-quality health care, before those who have fewer advantages, they will also contribute to inequality.

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Furthermore, even when the interventions being tested aim to relieve poverty, they don't necessarily have that effect. Many studies show that the poorest and most disadvantaged people often benefit the most from RCTs of measures such as different types of cash transfer. But economists worry that some RCTs might not be helping the people who are worst off. One reason for their concern is that many trials do not gather enough information to let researchers assess accurately whether they are actually reducing poverty. For example, an RCT might show that an educational programme helps children to stay in school for longer, but that does not necessarily mean that poverty (and inequality) are being reduced. Unless scientists collect and report data on the socio-economic status of their participants before and after the trials, we simply don't know.

Things are starting to change: researchers are thinking about ways to improve the design of RCTs to account for equity and inclusion from the outset. A primary goal must be to ensure that researchers capture factors such as participants' ethnicity, culture and socio-economic background when they are relevant.

Real life is complex, and running trials that are large enough to achieve statistically valid observations about particular sub-populations is difficult. Scientists need to include people from poor and under-served populations as equal partners in studies, taking their perspectives into account from the design phase. Researchers must also collect and report data in ways that allow them to be aggregated in systematic reviews of the literature.

In the modern world, acute poverty and ill health exist alongside extreme wealth concentrated in the hands of relatively few people. This is morally reprehensible. In 2015, world leaders committed to eliminating poverty in all its forms by 2030, as one of the United Nations Sustainable Development Goals. Before the COVID-19 pandemic, the world had been making steady, albeit much too slow, progress on this front. But then the pandemic reversed the trend and sent millions back into extreme poverty. Today, the World Bank's best estimate is that at least 657 million people – 8% of the global population – survive on less than US$1.90 per day. That is 36 million more than projections for where we would have been in 2020 if the pandemic hadn't happened, and 76 million more than such projections for 2022.

Ultimately, the world needs a new generation of technologies and policies that can both eliminate poverty and reduce inequality – while still protecting the environment. Economists and other social scientists need every tool in their bag as they seek to help policymakers to solve these grand challenges of our time. That will include RCTs – but to truly succeed, trials must have equity baked in.