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UNESCO must reform to stay relevant

At 75, the UN agency with a focus on science cooperation is fighting for its future role.

UNESCO was born on 16 November 1945, just a few weeks after the end of the Second World War. Its founders had been persuaded that science — along with culture and education — could help to cement peace between countries, protect human rights and improve living standards. Now, as the United Nations and UNESCO turn 75, the Paris-based agency is struggling to determine its future.

There's a lot to show for those 75 years. Today, UNESCO operates the system that has awarded World Heritage status to more than 1,100 important historical sites; the agency has also established a global network of more than 700 biosphere reserves. It holds nations to account on their commitments to get every child into school, and monitors threats to journalists around the world.

But among the UN's family of specialized agencies, UNESCO has never been properly funded — and it has been trying to recover from a funding crisis for the past decade. It spent US$1.1 billion in the 2-year period from 2010 to 2011, but in 2012–13, spending was down by 16% after the Palestinian Authority was granted full membership and the United States and Israel stopped their financial contributions in protest. Although its spending was back to $1.1 billion by 2018–19, inflation has greatly reduced its spending power. UNESCO is now in the middle of a transformation designed, in part, to enable it to live within its means.

When *Nature* spoke to UNESCO's current and former staff, as well as to researchers who study and collaborate with it, we found immense affection for the organization and respect for its past achievements. However, there was also a sense of frustration over its future. UNESCO needs to put these concerns to rest once and for all.

Pulling together

UNESCO's history is a stellar example of science's power to advance both knowledge and diplomacy. In the wake of two world wars, and especially during the cold war, the agency helped to unlock the doors to international scientific cooperation, particularly in the physical sciences.

In 1951, it hosted the meeting that led to the creation of CERN, Europe's particle-physics laboratory. Since then, CERN has mushroomed from a project intended to reunite and stimulate Europe's physicists to a place where scientists from all over the world can collaborate. It has spawned a number of technological spin-offs and has maintained its commitment to global knowledge-sharing.

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When nations were reluctant to share their oceans data, UNESCO hosted the first meeting of the International Oceanographic Commission in 1961. The commission still has a role in international efforts to sustainably manage ocean resources. And UNESCO's efforts to connect scientists from countries with difficult relationships continued with SESAME, the Middle East's first synchrotron light source. That project was launched in 1999 and provides an essential tool to researchers in a range of fields, from medicine to materials science. Getting scientists from Iran and Israel, or Cyprus and Turkey — all SESAME member countries — to work together is no small achievement.

That same year, UNESCO co-organized the World Conference on Science in Budapest. One of the outcomes was the creation of SciDev.Net, one of the first open-access platforms for sharing the results of scientific research, on which *Science* and *Nature* worked together to share some of their content with low- and middle-income countries.

And all of this happened in an organization that might never have had an 'S' in its title. UNESCO was originally conceived to protect and promote education and culture. It made room for science after leading scientists and science media (including *Nature*) helped to persuade the UN's founding nations that their vision of a world at peace could not be a world without science.

And yet, for all its external successes, UNESCO has faced difficulties in how it is treated by some of its larger member states. That, in turn, has affected the ability of its staff to get things done. It hasn't helped that some countries have treated their membership of UNESCO like a revolving door, joining and leaving as they wish, with little regard for the consequences for the agency's work when their funding stops. The United States has left twice, and the United Kingdom and Singapore have also withdrawn in the past, then returned some years later.

When richer countries stop paying, projects on the ground suffer, but so does trust in those nations' commitment to UNESCO's goals. It means officials at UNESCO's headquarters are forced to spend time and energy raising funds from other sources, and reorganizing staff and management structures to fit changing priorities — and end up spreading themselves too thinly. Time spent fire-fighting is time taken away from other priorities.

In 2013, UNESCO's leadership responded to its loss of income with a proposal that would probably have led to most of its work in its communication and information sector being abolished. But this was seen as a step too far and rejected by member states. Now, the director-general Audrey Azoulay is trying a different approach — intended, in part, to take some of the political heat out of UNESCO's work by focusing on things more countries can agree on, and playing to the agency's strengths as cultural guardian, ethical compass and laboratory of ideas.

Azoulay and her team have initiated a "strategic transformation" to spearhead internal reform and programme change — the latter requiring approval by member states late next year. Meanwhile, she is prioritizing five areas: rebuilding and reviving the devastated Iraqi city of Mosul; promoting open science; working on much-needed

nature

common standards on the ethics of artificial intelligence; a long-term vision for education; and biodiversity. The last of these is a belated, but much-needed recognition of UNESCO's long-standing experience in the study of Indigenous and local knowledge across research fields. Its importance is bolstered by the results of a UNESCO survey that asked 15,000 people what they saw as the biggest threats to peace – two-thirds of respondents said biodiversity and climate change were their greatest concern.

There's also a strong argument for reviving UNESCO's earlier science mission. In today's fractured world, fundamental and applied science could once again be used to help bring people and societies together. In the Middle East, for example, UNESCO could help to reconnect scientists in Qatar with those in neighbouring countries. At present, researchers are unable to collaborate because of a regional dispute. The agency could have a greater role in South Asia's science, which is affected by the strained relations between India and Pakistan. And UNESCO could do more for researchers in Europe, where fractures are developing between members of the European Union.

UNESCO should seek to reconnect people through science, as it has done before. But there can be no illusions about how hard the task will be. After 75 years, UNESCO is facing one of its toughest tests. Member states must make every effort to pull together with the agency's headquarters and its field staff. UNESCO's potential in a crisis-ridden world should not be underestimated. If UNESCO ceased to exist, the world would need to recreate it.

The challenges for COVID vaccination efforts

As positive results emerge at last, researchers must help the world to address vaccine hesitancy, supply logistics and price.

A year on from the first known case of COVID-19, the world has been hungry for good news. This month, vaccine makers have provided welcome nourishment.

Large clinical trials of four vaccine candidates are showing remarkable promise, with three exceeding 90% efficacy – an unexpectedly high rate – according to results released so far. None reported worrying safety signals and one has shown promise in older adults, a demographic that is particularly vulnerable to SARS-CoV-2 but sometimes responds less well to vaccines.

Early studies had shown that these candidate vaccines could stimulate an immune response. The latest trials show that this immune response can protect people against COVID-19 – a major achievement. Vaccine development is fraught with possibilities for failure, and even the most ardent optimist might not have expected to have a highly effective vaccine against a new virus less than a year after its genome was sequenced.

> **"An outbreak anywhere is an outbreak everywhere."**

But there is still much work for researchers and clinicians to do. First, they need to determine how well the vaccines work in people who are at high risk of COVID-19, including older individuals, people with obesity and those with diabetes. Second, it isn't clear how well some of the vaccines protect against severe COVID-19. Third, it is also not clear to what extent the vaccines prevent those who have been vaccinated from passing the virus on to others.

Some people are understandably concerned that the speed of both scientific review and vaccine regulation could compromise safety – despite assurances to the contrary from vaccine developers and regulators. To build confidence in vaccination, it's important that regulators, companies and their research partners keep promises they have made to ensure transparency, publish data and engage with open discussion of those data as they arrive.

Much of what we know about the latest trials has been communicated through press releases and media interviews, rather than papers that have been subject to independent peer review. Such speed of communication is necessary in an emergency. But more-complete data should not be held back, and the teams involved must be prepared to provide access to all relevant data as soon as this is practically possible, to allow others to scrutinize their findings and test their claims.

Vaccine distribution poses another challenge, and is accompanied by questions such as how much it will cost and who will pay for it. One of the vaccines that have shown success in late-stage trials was developed by researchers at the University of Oxford, UK, and the pharmaceutical firm AstraZeneca in Cambridge, UK. This vaccine can be stored in a normal refrigerator, which makes rapid distribution more feasible than it would be for the vaccine developed by Pfizer in New York City and BioNTech in Mainz, Germany – which needs to be stored at temperatures below −70 °C.

Importantly, AstraZeneca and Oxford have also pledged to provide their vaccine at cost price to all during the pandemic, and to maintain this price for middle- and low-income countries after the pandemic. But, as *Nature* went to press, neither Pfizer nor Moderna, a drug company in Cambridge, Massachusetts, with a similarly promising vaccine candidate, had committed to keeping prices down once the current pandemic is over. They need to change this stance.

A number of countries – most of them wealthy – have already pre-ordered nearly four billion doses. COVAX, a global alliance seeking to ensure that middle- and low-income countries get adequate vaccine provision, has been able to secure vaccines for only around 250 million people – nowhere near enough. Once prices start to rise, the poorest countries will be even less able to pay than they are now.

Not making the vaccine affordable for them would be morally wrong. It would also be short-sighted, because, as infectious-disease researchers often say, an outbreak anywhere is an outbreak everywhere.