

CHINA BANS CASH REWARDS FOR PUBLISHING

New policy tackles perverse incentives that might encourage questionable research practices.

By Smriti Mallapaty

Chinese institutions have been told to stop paying researchers bonuses for publishing in journals, as part of a new national policy to cut perverse incentives that encourage scientists to publish lots of papers rather than focus on high-impact work.

In an order released last week, China's science and education ministries also say that institutions must not promote or recruit researchers solely on the basis of the number of papers they publish, or their citations. Researchers are welcoming the policy, but say that it could reduce the country's competitiveness in science.

In China, one of the main indicators used to evaluate researchers, allocate funding and rank institutions is metrics collected by the Science Citation Index (SCI), a database of articles and citation records for more than 9,000 journals. Since 2009, the number of articles in these journals written by authors from Chinese institutions increased from some 120,000 a year to 450,000 in 2019. Some institutions even pay researchers bonuses for publishing in them.

These practices have incentivized researchers to publish lots of papers at the expense of quality, says Jin Xuan, a chemical engineer at Loughborough University, UK. Evidence suggests that the focus on metrics has also driven a rise in inappropriate practices, such as researchers submitting plagiarized or fraudulent papers, or inappropriately citing their own or a colleague's work to boost citations (L. Tang *et al.* *J. Assoc. Inf. Sci. Tech.* **66**, 1923–1932; 2015).

The goal of the new policy is not to discourage Chinese researchers from publishing papers in SCI-listed journals, but to stop inappropriate publishing and citation practices, says Tang Li, a researcher of science and technology policy at Fudan University in Shanghai, China.

Xuan adds that the policy aligns well with global declarations, such as the San Francisco Declaration on Research Assessment, that aim to move away from an over-reliance on these types of metric in research appraisals and to limit perverse incentives that drive researchers to engage in questionable research practices.

As part of the new policy, researcher assessments will now need to use indicators of the quality of research, such as how innovative the work is, and whether it represents a significant scientific advance or contributes to solving important societal problems. These evaluations should also rely more heavily on the professional opinions of expert peers, and consider research in journals published in China, many of which are not listed in the SCI.

But Futao Huang, who studies higher-education policy at Hiroshima University, Japan, says it is not clear what exactly the new evaluation system will look like, because

the ministry's notices lack specific, practical recommendations.

Huang thinks the new measures could result in a drop in the number of low-quality or fraudulent papers, but might also trigger a decline in China's total publications in indexed journals as researchers feel less pressure to publish to gain degrees, promotions or funding.

And fewer Chinese papers in indexed journals could affect the country's research competitiveness, says Huang. International researchers might be less inclined to collaborate with Chinese academics without a publication record in these journals, and fewer papers could push Chinese universities lower down in international rankings, he says.

Xuan says the focus on assessing researchers on the basis of their work in Chinese journals is controversial because a lot of them publish in Mandarin, and the journals are unknown to scientists outside China.

Other scientists have raised concerns about the new assessments relying too heavily on peer reviews, which are subjective and could create conflicts of interest or place too much emphasis on personal relationships.

MYSTERY DEEPENS OVER ANIMAL SOURCE OF CORONAVIRUS

Pangolins are a prime suspect, but a slew of genetic analyses has yet to find conclusive proof.

By David Cyranoski

Scientists are racing to identify the source of the coronavirus causing havoc around the world. Last month, Chinese researchers suggested, on the basis of genetic analyses, that the scaly, ant-eating pangolin was the prime suspect. But scientists have now examined those data – along with three similar genome studies – and say that although the mammal is still a contender, the mystery is far from solved.

Health officials want to pin down the virus's source so they can prevent new outbreaks. Scientists assume that the pathogen jumped to people from an animal, as other coronaviruses have; for example, the virus that causes severe acute respiratory syndrome (SARS) is thought to have jumped to humans from civets in 2002. Dozens of people infected early in the current outbreak worked at a live-animal market in the Chinese city of Wuhan, but tests of coronavirus samples found at the market have yet to identify a source.

Three separate Chinese teams are trying to trace the origin of the coronavirus. Researchers at the South China Agricultural University in Guangzhou suggested pangolins as the animal source at a press conference on 7 February. Pangolins are sought-after in China for their meat and scales. Although the animals can't be sold in China owing to a worldwide ban, they are still smuggled in from elsewhere in Asia and Africa. The researchers said they had found a coronavirus in smuggled pangolins that was a 99% genetic match to the human virus.

But the result did not pertain to the entire genome. In fact, it related to a specific site known as the receptor-binding domain (RBD), say the study's authors, who posted their analysis¹ on the preprint server bioRxiv on 20 February. The press-conference report was the result of an "embarrassing miscommunication between the bioinformatics group and the lab group of the study", explains Xiao Lihua, a parasitologist at the South China Agricultural University and a co-author of the paper. A whole-genome comparison found that the



Pangolins are often smuggled into China, where there is demand for their meat and scales.

pangolin and human viruses share 90.3% of their DNA.

The RBD is a crucial part of coronaviruses that allows them to latch on to and enter a cell. Even a 99% similarity between two viruses' RBDs is not necessarily enough to link them, says Linfa Wang, a virologist at Duke–National University of Singapore Medical School.

Three similar comparison studies were also posted on bioRxiv last month. One, posted on 18 February, found² that coronaviruses in frozen cell samples from illegally trafficked pangolins shared between 85.5% and 92.4% of their DNA with the virus found in humans.

Two other papers^{3,4} published on 20 February studied coronaviruses from smuggled

pangolins. These showed 90.23% and 91.02% similarity, respectively, to the new coronavirus.

Higher genetic similarity is needed before the host can be definitively identified, says Arinjay Banerjee, who studies coronaviruses at McMaster University in Hamilton, Canada. He notes that the SARS virus shared 99.8% of its genome with a civet coronavirus.

So far, the closest match to the new coronavirus has been found in a bat in China's Yunnan province. A study⁵ published on 3 February found that the bat coronavirus shared 96% of its genetic material with the virus that causes COVID-19. Bats could have passed the virus to people, but scientists think it was probably transmitted through an intermediate host.

But if pangolins are a host, and they came from another country, it raises the question of why there haven't been reports of people being infected there, asks Jiang Zhigang, an ecologist at the Chinese Academy of Sciences Institute of Zoology in Beijing.

1. Xiao, K. et al. Preprint at bioRxiv <https://doi.org/10.1101/2020.02.17.951335> (2020).
2. Lam, T. T.-Y. et al. Preprint at bioRxiv <https://doi.org/10.1101/2020.02.13.945485> (2020).
3. Liu, P. et al. Preprint at bioRxiv <https://doi.org/10.1101/2020.02.18.954628> (2020).
4. Zhang, T., Wu, Q. & Zhang, Z. Preprint at bioRxiv <https://doi.org/10.1101/2020.02.19.950253> (2020).
5. Zhou, P. et al. *Nature* <https://doi.org/10.1038/s41586-020-2012-7> (2020).

Fundación BBVA

13th Edition BBVA Foundation Frontiers of Knowledge Awards

With the collaboration of



The **BBVA Foundation Frontiers of Knowledge Awards** recognize and reward world-class research and artistic creation, prizing contributions of singular impact for their originality and significance. The name of the scheme is intended to denote not only research work that substantially enlarges the scope of our current knowledge – pushing forward the frontiers of the known world – but also the meeting and overlap of different disciplinary areas and the emergence of new fields.

The Frontiers of Knowledge Awards honor fundamental disciplinary or interdisciplinary advances across a broad expanse of the knowledge map of the 21st century.

The BBVA Foundation is assisted in the award process by the **Spanish National Research Council (CSIC)**.

Fundación BBVA
Plaza de San Nicolás, 4 · 48005 Bilbao · Spain
Paseo de Recoletos, 10 · 28001 Madrid · Spain
awards-info@bbva.es

Categories

- 1/ **Basic Sciences (Physics, Chemistry, Mathematics)**
- 2/ **Biology and Biomedicine**
- 3/ **Information and Communication Technologies**
- 4/ **Ecology and Conservation Biology**
- 5/ **Climate Change**
- 6/ **Economics, Finance and Management**
- 7/ **Humanities and Social Sciences**
- 8/ **Music and Opera**

In Humanities and Social Sciences, the award will alternate annually between these two disciplinary domains, with this thirteenth edition dedicated to the Humanities.

Nomination

Nominations are invited from scientific or artistic societies and organizations, public or private R&D centers, university and hospital departments, schools of music, orchestras, and organizations working on or around the issue of climate change, as well as other institutions specified in the call conditions.

Entry submission

The nomination period concludes at **23:00 GMT on June 30, 2020**.

www.frontiersofknowledgeawards-fbbva.es