

► and new wells and water-treatment plants came online. But Cape Town's reservoirs have drained faster than predicted: households and businesses have not conserved water as much as the government had hoped during the current dry summer.

According to Cape Town's disaster plan, what water remains in reservoirs on Day Zero — when their levels drop to 13.5% of capacity — will go to hospitals and informal settlements that already rely on communal taps. Most of Cape Town's nearly 4 million residents will have to collect allotments of water from 200 distribution points — a situation that the mayor fears could lead to anarchy.

As recently as 18 January, the University of Cape Town said that, at this stage, it “is not facing the risk of any research activities having to be curtailed as a result of the water crisis”. But researchers there and at other nearby institutions aren't so confident. They're anxious to know whether they might have access to municipal water after the shutdown; although some researchers might be able to import tanks of water from other parts of the country, cost and availability could make that approach difficult to sustain. “The University of Cape Town and its sister institutions are in deep discussions with the city of Cape Town to get clarity” about how much water they will receive, says Valerie Mizrahi, an infectious-disease researcher at the University of Cape Town.

#### UNDERFUNDED AND UNDERPREPARED

Kevin Winter, who directs the university's Water Task Team, which manages water use across its campuses, lists several reasons why institutions are underprepared for the crisis. Faculty members are just returning to campus after the summer break, as the situation

pivots from hopeful to dire. And although universities have considered water-saving strategies in the past, including water-recycling systems, Winter says that tight budgets have made it difficult to apply those plans. For instance, in recent years, universities responded to student protests demanding free education by agreeing to hold their fees steady despite inflation. “It's not simple to say, give me two to three million dollars towards pipes and pumps and geological surveys,” Winter says. “We are scraping our way through a crisis that might have been averted if we had had the means to do so.”

Now, scientists across Cape Town are drawing up contingency plans for their labs. The first step is estimating how much water they will require for basic needs, such as caring for lab animals. Experiments that use less water will be favoured over those requiring more, and at least one biomedical researcher is arranging to move some studies to foreign labs. Many principal investigators are weighing the risks of running experiments that could expose people to fire or chemical injury at a time when water is limited.

Cape Town is a hub for research on HIV and tuberculosis, and medical care associated with those studies will continue. But the water crisis could curtail community outreach on public-health issues. Linda-Gail Bekker, deputy director of the Desmond Tutu HIV Centre, says there would be consequences to interrupting her group's efforts to provide reproductive-health services to young women at high risk of teenage pregnancy and HIV. Bekker worries

that her staff will be unable to work if they must wait in long lines each day to collect water for their households. “I plan to get ahold of the mayor's office this week to see if we can figure something out,” she says.

Robert Wilkinson, director of the Wellcome Centre for Infectious Diseases Research in Africa at the University of Cape Town, spoke to *Nature* from a supermarket where shoppers were snatching up bottled water before it could reach the shelves. Earlier that day, he and his colleagues had discussed how to cut back their clinical trials once Day Zero arrives. Participants would continue to receive medical care, but research would be curtailed; the scientists might request fewer samples of bodily fluids to save the water that would be needed to process them, even for storage.

Wilkinson says that if water is scarce, the urgent priority is to maintain health. “I immediately think about the potential for water-borne illnesses if people — particularly people in poor living conditions — aren't able to maintain personal and institutional hygiene,” Wilkinson says. He also worries about the city's economy, which is reliant on tourism and agriculture.

Then there is Miller, who felt another flash of anxiety recently as she dumped a jug of recycled water on her bare, dirt yard. “It just sat there,” she says. “The water didn't sink in because the land is so parched.” She thought about how droughts and fires can give way to landslides and floods when rain comes. And she considered how pipes can crack when plumbing lies dry for too long. “To be honest, I can't wrap my head around what's happening — a major metropolitan city running out of water,” Miller says. “There are enormous ramifications to this.” ■

or to factors related to the applicant, such as gender.

Past studies have looked at gender inequalities in grant funding, but most examined grant programmes that didn't separate their application pool as the CIHR programmes did. Some also didn't consider other factors, such as whether research fields had different ratios of male to female scientists<sup>2</sup>. The new analysis, which took into account applicants' research areas and age — a proxy for career stage — allowed the study authors to draw “more robust conclusions”, says Holly Witteman, a health-informatics researcher at Laval University in Quebec City, Canada, who led the study.

Witteman and her colleagues calculated that, of all the applications submitted to CIHR grant programmes between 2011 and 2016, 15.8% were likely to be successful. And in the conventional grant programmes, the success rate for male applicants was 0.9% higher than the rate for female applicants. When the team analysed the CIHR grant programme that

came out of a 2014 decision by the Canadian Institutes of Health Research (CIHR) to phase out conventional grant programmes, in which reviewers evaluated both the science and the investigator. Instead, the CIHR started one programme that focused its evaluation on the applicants and another that focused mostly on their research. This created a natural experiment that allowed the scientists to analyse the outcomes of nearly 24,000 grant applications and to test whether funding differences were due to the quality of the applicants' research

#### FUNDING

# Gender bias tilts success of grant applications

*But it goes away when reviewers focus on the science.*

BY GIORGIA GUGLIELMI

Women lose out when reviewers assess the researcher, rather than the research, according to a study on gender bias. But training reviewers to recognize unconscious biases seems to correct this imbalance, despite previous work suggesting otherwise.

The findings were first posted in December on the bioRxiv<sup>1</sup> preprint server and are currently in review at a journal. They

came out of a 2014 decision by the Canadian Institutes of Health Research (CIHR) to phase out conventional grant programmes, in which reviewers evaluated both the science and the investigator. Instead, the CIHR started one programme that focused its evaluation on the applicants and another that focused mostly on their research. This created a natural experiment that allowed the scientists to analyse the outcomes of nearly 24,000 grant applications and to test whether funding differences were due to the quality of the applicants' research

focused on the researchers' science, the gap in success rate was the same as in the conventional programmes. But in the grant programme that focused on the applicants' experience and qualifications, the success rate for male applicants was 4% higher than for female applicants. "That's a significant difference," Witteman says.

### A RANDOM ACT

However, Witteman warns that the study was not randomized, meaning that there may be differences between male and female applicants, such as their publication records, which might help to account for the different success rates. Her team was unable to account for such factors, because it didn't have access to those data.

"That's a big problem," says Beate Volker, a social scientist at the University of Amsterdam. She says that the CIHR results would reflect bias if they could show that two applicants had similar publication records, but one was preferred over the other. It would be relatively easy to test this by looking at the number and quality of publications for each applicant. But until the researchers do that, the bias is "unproven," Volker says.

Donna Ginther, an economist at the University of Kansas in Lawrence, who analysed racial bias in grant programmes at the US National Institutes of Health<sup>3</sup>, echoes this concern. But she says it's interesting that the gender differences in funding outcomes disappeared after the CIHR implemented new policies, which included asking reviewers to complete a training module about unconscious bias.

Previous work, Ginther notes, showed that training might stir biases and be counterproductive<sup>4</sup>. The effects of the new CIHR policies suggest the opposite: in the 2016–17 grant cycle, female scientists were as successful as men in both science- and person-focused grant programmes. "It would be helpful to know what kind of training it was," Ginther says.

The CIHR is committed to eliminating bias against women and minorities by educating and evaluating reviewers, says Robyn Tamblyn, scientific director of the CIHR Institute of Health Services and Policy Research in Montreal. "We're just at the beginning," she says.

Witteman now plans to look at the reviewer-training module, to see whether it might help to reduce biases. ■

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An upper jaw and teeth are thought to be the earliest evidence of *Homo sapiens* outside Africa.

### PALAEANTHROPOLOGY

# Israeli fossils hint at early migration

*Bones suggest humans left Africa 180,000 years ago.*

BY EWEN CALLAWAY

The oldest human fossils ever found outside Africa suggest that *Homo sapiens* might have spread to the Arabian Peninsula around 180,000 years ago — much earlier than previously thought. The upper jaw and teeth, found in an Israeli cave and reported in *Science* on 25 January<sup>1</sup>, pre-date other human fossils from the same region by at least 50,000 years. But scientists say that it is unclear whether the fossils represent a brief incursion or a more-lasting expansion of the species.

Researchers originally thought that *H. sapiens* emerged in East Africa 200,000 years ago, then moved out to populate the rest of the world. Until discoveries in the past decade countered that story, scientists surmised that a small group left Africa some 60,000 years ago. If so, it would mean that signs of earlier travels were from failed migrations. That evidence includes 80,000–120,000-year-old skulls and other remains from Israel, uncovered in the 1920s and 1930s.

However, recent discoveries have muddied that simple narrative. Some *H. sapiens*-like fossils reported last year from Morocco<sup>2</sup>, which are older than 300,000 years, have raised the

possibility that humans evolved earlier and perhaps elsewhere in Africa. Teeth from southern China<sup>3</sup> hint at long-distance migrations some 120,000 years ago. And genome studies have sown more confusion, with some comparisons of global populations pointing to just one human migration from Africa<sup>4,5</sup>, and others suggesting multiple waves<sup>6</sup>.

### EARLY START

In the early 2000s, archaeologist Mina Weinstein-Evron, at the University of Haifa in Israel, and palaeo-anthropologist Israel Hershkovitz, at Tel Aviv University, began a project to excavate a series of Israeli caves. "We called it 'Searching for the Origins of the Earliest Modern Humans'. This was what we were looking for," says Weinstein-Evron.

Their team discovered the jaw fragment in 2002, in Misluya Cave. It is just a few kilometres away from the Skhul cave, one of the sites where the 80,000–120,000-year-old remains were found in the 1920s and ▶

**"People were coming and going through this land corridor from one continent to another."**