

► DNA sequencer, which could be used to determine ancestry, eye colour and other physical characteristics from genetic samples.

The report also gives details of a nationwide database that began in the early 2000s and has accrued 44 million entries from 40 million individuals, including 1.5 million from samples, such as cigarette butts, found at crime scenes. China's police have said that the database is for solving crimes. But Human Rights Watch says it has found evidence of “campaigns to amass biometrics from ordinary citizens”.

Many countries use DNA fingerprinting to solve crimes, reunite kidnapped children with their parents and identify bodies, and some

researchers say that the boost in Xinjiang's DNA-analysis capacity does not, by itself, stand out. “Expansion of police surveillance is expected by any civilized nation,” says Sara Katsanis, who researches the applications of genetic testing at Duke University in Durham, North Carolina.

Still, Katsanis and others worry about how DNA is being collected in China and especially in Xinjiang. Last year, Human Rights Watch reported that citizens in Xinjiang were required to give a blood sample to get a passport. And in March, Chinese state media detailed the conclusion of a 4-month programme during which 17.5 million people — who were predominantly

Uighurs — were given health checks, including blood tests. Last week, reports emerged that many of the people who underwent these examinations had been forced to do so.

Megan Allyse, a biomedical-ethics researcher at Mayo Clinic in Rochester, Minnesota, says that DNA profiling is especially fraught in China, because there seems to be no clear framework governing how the samples can be collected, transferred or stored, or when they are allowed to be used in court, and other matters. She hopes that countries can work together to use the data justly. “We need broad, international consensus on the appropriate use of DNA in national-security collections,” she says. ■

PUBLIC HEALTH

Decline in Zika throws trials into doubt

Large studies to assess the risks of Zika are in jeopardy as scientists struggle to find cases.

BY DECLAN BUTLER

Studies of thousands of pregnant women that were set up to probe the link between Zika and birth defects may not provide definitive answers because of a sharp drop in the number of new cases, researchers have warned. The unexpected development is making the disease harder to study, and threatens to hamper trials of experimental vaccines that might protect pregnant women in future outbreaks.

“We’re seeing few, if any, cases, particularly in southern Brazil, which we thought might be

the next big area to be hit this year,” says Oliver Brady, an epidemiologist at the London School of Hygiene and Tropical Medicine.

Seventy countries have reported mosquito-borne Zika virus transmission since 2015, with the most intense epidemics sweeping South America and the Caribbean. Phylogenetic research suggests that the virus first entered Brazil in late 2013 or early 2014 (see <http://dx.doi.org/10.1038/nature22495>), although it was not detected until mid-2015. The virus has been linked with a range of birth defects, including microcephaly, in the fetuses and newborns of

women infected during pregnancy — a pattern of abnormalities known as congenital Zika syndrome. But reliable data on the absolute risks are lacking, and gathering such information is one of the objectives of the affected studies.

The two largest studies each intend to recruit 10,000 or more pregnant women. The Zika in Infants and Pregnancy (ZIP) study was launched last June by the US National Institutes of Health (NIH) and the Fundação Oswaldo Cruz-Fiocruz (Fiocruz), a national scientific agency in Brazil, and has so far recruited almost 3,000 women. The other study is just beginning to recruit. It is being carried out by the ZIKAlliance, a multidisciplinary consortium of 53 research centres that launched in December with €12 million (\$13.5 million) from the European Union. Both trials are taking place across multiple sites in South America and the Caribbean.

But with the drop in new cases (see ‘Decline and fall’), the ZIKAlliance is now reconsidering its plan. “We are going to be pragmatic, we are going to try, but if there are not enough infected cases, then there is little point,” says the consortium’s scientific coordinator Xavier de Lamballerie, a virologist at Aix-Marseille University and French national biomedical agency INSERM.

The ZIKAlliance intends to capture what cases it can at its sites, and is considering focusing resources in sites where Zika has been rarer, such as Bolivia, where future flare-ups might be more likely. “We will track cases there where they are,” he says, “It’s a race against the clock.”

The ZIP study is similarly faced with low



Zika infection in pregnancy can cause birth defects, but a fall in cases means risks may not be understood.

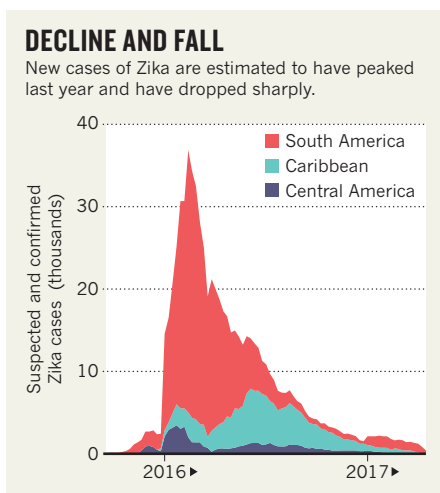
MAURICIO LIMA/NYTF/EVERETT

SOURCE: PAHO/WHO

numbers of Zika cases, says Anthony Fauci, director of the NIH's National Institute of Allergy and Infectious Diseases (NIAID). "That's good for the population — if making it more difficult to get reasonable data for the study," he says. The low level of cases will also affect field trials of experimental vaccines, he adds. One such trial, the NIH VRC 705 phase II trial, began in March and aims to enrol at least 2,490 volunteers in 7 countries in the Americas.

But Fauci says that capturing enough data in an outbreak, where numbers of cases fluctuate from place to place and over time, and, at times, dry up altogether, is always an issue. "That's just a risk you accept," he says. "Sometimes a study that you think would take two years, winds up taking four or five years. But ultimately we hope that we can get some meaningful data."

Epidemiologists say that they are unsure why the number of cases of the mosquito-borne disease has declined so steeply, and whether it will spike again in some region in South America or elsewhere. Often, the disease causes no symptoms, so most cases go undetected; it's possible that the rapid spread of the disease in



the Americas has meant it has burnt itself out because enough people have become immune to the virus.

Large-scale trials inevitably take time to organize. But delays incurred in obtaining ethical and other approvals in the trials' host countries have slowed the process further, as

have a lack of clear rules for matters such as the shipping and ownership of samples.

It's unlikely that Zika infection will disappear completely, however, says Fauci. "One doesn't know what is going to happen with the Zika situation and whether or not there will be flare-ups in one country more than another," he says. Spreading trial sites across different countries helps, he notes. "We try to build into the system enough flexibility, where you can assign slots depending on where the outbreak activity is."

Researchers are still hopeful that despite lower than expected disease activity, the trials could produce useful results. Learning from other disease outbreaks such as Ebola, the main research agencies and groups involved in combating Zika last year agreed on common methodologies and designs for the latest studies. This means that the raw data from ZIP and the ZIKAlliance's study, as well as from other cohort studies, can be pooled to increase the sample size.

"It's the first time that we have achieved such a degree of harmonization of research protocols at an international level," de Lamballerie says. ■

EARTH OBSERVATIONS

Commercial space sensors go high-tech

Firms seek to develop sophisticated science instruments to match government offerings.

BY GABRIEL POPKIN

Never have so many private eyes looked down at Earth. In the past decade, about a dozen companies have formed to launch Earth-observing satellites. Few have sought to compete with sophisticated government-built instruments, but that is changing.

Private firms have begun to develop satellite radar systems and other advanced technologies in a bid to court scientists and other users, even

as the US government is threatening to pare back its stable of satellites. Later this year, for example, the Finnish firm Iceye plans to launch a prototype radar instrument — the first step, the company says, towards a constellation of 20 such probes. Until recently, commercial firms had shied away from pursuing radar satellites because they require heavy instruments and consume a lot of power.

For some scientists, the growing variety of commercial data is enabling previously

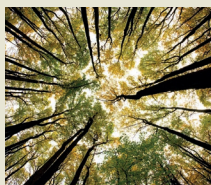
impossible research projects. But others fear that increasing reliance on private satellite observations could short-change science over time, by making data more costly or creating other barriers to access. "If you go the commercial way, you're going to shrink the user base and you're going to shrink the amount of knowledge you gain from it," says Matthew Hansen, a geographer at the University of Maryland in College Park who uses some private data.

Remote-sensing companies typically sell their data to the government and to businesses such as private weather forecasters and agricultural firms. They have tended to focus on collecting data in just a few wavelength bands, to provide sharper and more frequent images than government spacecraft can. But various trends — the falling costs of components, the development of small satellites such as CubeSats and improved engineering and manufacturing processes — have allowed firms to pursue more-complex technologies.

Several firms are looking to develop satellites equipped with radar, which can gather data at night and through cloud cover — situations



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