

protocol, says Dias, because it will build trust between them and local people, which could lead to better access to organisms. In the past, “no one trusted anyone”, he says. The protocol could also help countries to access treatments that are developed using disease samples taken from their own people.

But although scientists understand the need for ABS agreements, many worry that they will have destructive consequences.

The protocol has the potential to hamper disease monitoring, according to the London-based biomedical research charity the Wellcome Trust. Red tape could make it harder to quickly share samples across borders, which in turn could cripple efforts to monitor drug resistance in malaria, for example, or outbreaks of *Escherichia coli*. “There need to be equitable arrangements for sharing benefits, but it is absolutely critical that policy-makers ensure they do not hinder these international partnerships that are so vital to protect global public health,” says David Carr, a policy adviser at the Wellcome Trust.

The new rules will also present challenges for synthetic biologists, who combine genetic code from many different organisms to create

drugs or sensors. This could require dozens of ABS arrangements for a single product, says Tim Fell, chief executive of Synthace, a biotechnology company in London. Such bureaucracy could push European companies to countries — particularly the United States — that are not signatories, he adds.

“If I compare two sequences, is that utilization? I don’t know.”

International research collaborations may face a bureaucratic challenge if their members operate under different laws, says the London-based BioIndustry Association.

There is also uncertainty about the protocol’s reach, particularly for genetic sequences. A possible interpretation of the rules is that anyone who uses sequence data would have to complete ABS paperwork. Christopher Lyal, who studies weevils at London’s Natural History Museum, helps to run a CBD website that provides advice about the protocol. Even he is unsure of how it will affect him: “If I compare two sequences to reach a conclusion on identification, is that utilization? I don’t know.”

The BioIndustry Association also says

that the threat of criminal charges for non-compliance — the UK government is considering jail terms of up to two years — could have a chilling effect on research.

Some researchers think that the protocol could even hurt the countries it is intended to help. Kazuo Watanabe, director of the Gene Research Center at the University of Tsukuba in Japan, fears that red tape surrounding access to and exchange of specimens will hinder field studies in disciplines such as taxonomy and ecology. This, in turn, will make it harder to help conservation efforts.

Dias acknowledges the potential problems, but says that people will have to deal with them: “There will be a cost for a transition phase, yes, but it should be for the better.”

Elisa Morgera, who specializes in global environmental law at the University of Edinburgh, UK, agrees. There may be uncertainty in the short term, with “difficult negotiations and possible missteps”, she says, but the protocol offers a way to rebuild trust. “Those genuinely interested in the long-term viability and reputation of bio-based research and innovation would be well advised to constructively contribute to this process,” she says. ■

INFECTIOUS DISEASE

Ebola obstructs malaria control

Outbreak is shutting down prevention and treatment programmes in West Africa.

BY ERIKA CHECK HAYDEN

As the Ebola death toll spirals into the thousands in West Africa, the outbreak could have a spillover effect on the region’s deadliest disease. The outbreak has virtually shut down malaria control efforts in Liberia, Guinea and Sierra Leone, raising fears that cases of the mosquito-borne illness may start rising — if they haven’t already.

So far, at least 3,000 people are estimated to have died of Ebola in Guinea, Sierra Leone and Liberia in the current outbreak, although World Health Organization (WHO) staff acknowledge that official figures vastly underestimate the total. By contrast, malaria killed more than

6,300 people in those countries in 2012, most of them young children. Overall, malaria deaths have fallen by about 30% in Africa since 2000 thanks to national programmes supported by international funding agencies such as the Global Fund to Fight AIDS, Tuberculosis and Malaria, the US Agency for International Development and the WHO’s Roll Back Malaria initiative. The schemes distribute free bed nets to protect sleeping children from mosquitoes, train health workers to find malaria cases and offer tests and treatment at no charge to patients.

But the Ebola outbreak has brought those efforts to a standstill in the three affected countries. “Nobody is doing a thing,” says Thomas Teuscher, acting executive director of the Roll

Back Malaria Partnership, based in Geneva, Switzerland.

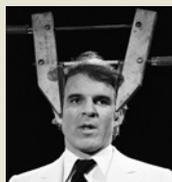
He says that malaria drugs are sitting in government warehouses, especially in Liberia and in Guinea, where medical supply trucks have been attacked by people angry with the government’s handling of the Ebola outbreak. Liberia had planned a national campaign to distribute bed nets this year, but Teuscher says that it may be difficult to launch that now.

Routine health care has collapsed during the outbreak, because both patients and providers have shunned clinics for fear of infection. As a result, tens of thousands of people could die from treatable causes, says Estrella Lasry, a tropical-medicine specialist for medical



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► charity Médecins Sans Frontières (also known as Doctors Without Borders) in New York. Those include complications of child-birth; trauma and other acute conditions requiring surgery; and causes such as diarrhoeal disease, respiratory viruses and especially malaria. With proper treatment malaria can usually be cured completely, but if left untreated it can develop into a severe form that is often fatal.

“It’s a disaster in all ways possible,” says Lasry. “The public-health impact will be huge.”

As of August, the WHO had not seen a year-on-year increase in people with malarial symptoms reporting to clinics in Guinea, the only Ebola-affected country where such data

“It’s a disaster in all ways possible. The public-health impact will be huge.”

are available. In fact, malaria deaths in Guinean clinics decreased for the first half of this year compared with 2013. But that is not necessarily good news, says Teuscher. It could mean that the ill people have been staying away from clinics, scared off by the Ebola outbreak, and their deaths have gone unnoted.

Furthermore, the symptoms of malaria mimic Ebola, so many people who might have malaria are avoiding clinics for fear of learning the worst, says Alice Johnson, a nurse and clinical mentor for Last Mile Health, an organization in Boston, Massachusetts, that trains health workers in rural Liberia.

Ebola’s impact on malaria programmes is likely to linger long after the outbreak ends. In Guinea, for instance, authorities bury Ebola victims with their bed nets to prevent the spread of infection; this has raised suspicion that the nets have some inherent connection to Ebola.

And health workers are afraid to do blood tests to confirm malaria because Ebola is spread by blood and other bodily fluids. That could lead to people who do not have malaria being given antimalarial medication, which can contribute to the development of drug resistance in the parasite that causes the disease.

It is important to get malaria control programmes back on track, says Teuscher, in part because they could help to fight Ebola.

For instance, in Sierra Leone about 2,000 community health workers have been trained to go into villages to find and treat malaria. They could also be trained to detect Ebola and help infected people to get care, he says.

“Potentially, we have an army of people available in these countries who have experience delivering malaria treatments,” says Teuscher. “They’re still there; they just need to be helped to do a good job.” ■

CLIMATE SCIENCE

Tibetan plateau gets wired up for monsoon prediction

Largest and highest plateau in the world has outsized impact on climate.

BY JANE QIU IN LHASA

The gigantic, remote Tibetan plateau is being flooded with sensors in an unprecedented attempt to understand its influence on climate — especially the Asian monsoons, which caused deadly flooding in India and Pakistan in September. The US\$49-million Chinese effort could help to predict extreme weather — both in Asia and as far afield as North America — and give scientists a steer on how climate change affects these events.

Sitting at an average height of around 4,000 metres above sea level, the plateau protrudes into the middle of the troposphere, where most weather events originate. As the biggest and highest plateau in the world, it disturbs this part of the atmosphere like no other structure on Earth. But there are little data on the impact that this has on climate.

In central and western Tibet, where weather observations are particularly lacking, researchers jointly funded by the China Meteorological Administration and the National Natural Science Foundation of China began, in August, to place temperature and moisture detectors in the soil and to erect 32-metre-high towers laden with sensors that measure cloud properties. In recent weeks, the team has begun deploying sensors mounted on weather



The Tibetan plateau, often called the third pole, will be monitored by balloons, drones and ground sensors.

balloons and unmanned aerial vehicles.

Such sensors will eventually monitor a vast swathe of the plateau’s ground and air — across diverse landscapes such as desert, grassland, forest and farmland. “The data should help determine the extent to which different types of land surface heat up the overlying air, and how this might vary in response to factors

such as snow cover and vegetation changes,” says Wu Guoxiong, an atmospheric scientist at the Institute of Atmospheric Physics of the Chinese Academy of Sciences (CAS) in Beijing and a principal investigator of the project.

Scientists agree that Tibet plays a key part in the climate system, but many of the details are a mystery. The plateau’s remoteness, altitude

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