POLITICS

UK government appoints chief science adviser

A pharmaceuticals boss will help to chart Britain's exit from the European Union.

BY ELIZABETH GIBNEY

Patrick Vallance, currently president of research and development at the pharmaceutical giant GlaxoSmithKline, has been appointed as chief scientific adviser, the UK government announced on 8 November.

Vallance, a clinical pharmacologist and former academic, will replace Mark Walport in April 2018. Walport has left the government to become head of a powerful new funding body called UK Research and Innovation.

As chief scientific adviser, Vallance will advise the prime minister and her cabinet, the government's most senior decision-making body. He will also lead the Government Office for Science, which promotes the use of evidence in policymaking across government.

A major part of his role will be to ensure that high-quality advice is available across government departments as they deal with the legal and regulatory consequences of Britain's decision to leave the European Union, says Graeme Reid, a science-policy researcher at University College London. The United Kingdom needs to manage Brexit's impact on nuclear regulation and Britain's role in fusion research, as well as its effect on environment policy and other science-related issues. "Patrick Vallance's experience in both business and universities will be of huge value," says Reid.

Brexit is likely to boost the day-to-day importance of the chief scientific adviser's role, but Vallance will also have to reinvent other, more informal aspects of the position, says Kieron Flanagan, a science-policy researcher at the Alliance Manchester Business School. The creation of UK Research and Innovation, intended to increase the power of UK research-funding bodies, means Walport will continue to wield great influence over science in government. The chief scientific adviser has traditionally been the voice of science in government, Flanagan says.

The relationship between Vallance and Walport will be an interesting dynamic to watch, says James Wilsdon, a research-policy specialist at the University of Sheffield, UK. He hopes that Vallance will act as a bridge between the science community and policymakers, and be open to a range of people and perspectives. ■

Hurricane Maria, which hit Puerto Rico in mid-September, disrupted water supplies in some areas.

MARIO TAMA/GETTY

PUBLIC HEALTH

Science scramble after storm

Public-health researchers in Puerto Rico are regrouping to study the aftermath of Hurricane Maria.

BY SARA REARDON

Nightfall sets a hard deadline for a team of public-health researchers in Puerto Rico. Since Hurricane Maria hit on 20 September, leaving large swathes of the island without a reliable power supply, the scientists have rushed home each night to avoid being in the streets after dark. Many of the researchers lack running water, and most have limited telephone access.

Yet the team — co-led by José Cordero of the University of Georgia in Athens — has managed to contact several hundred women to begin assessing whether Hurricane Maria has worsened drinking-water contamination, stress and infectious disease that could harm developing fetuses. This wasn't what the researchers set out to study six years ago, when they started a project to assess the impact of pollution on pre-term births. But Cordero's team is one of several research groups that have scrambled to quantify Hurricane Maria's immediate health impacts, even as team members struggle to meet their own basic needs.

The devastation that Cordero saw on a recent visit to Puerto Rico, his birthplace, shocked him. "I thought I was prepared, but I wasn't," he says.

Even before the hurricane, the island's 18 'Superfund' sites — areas so polluted that the US Environmental Protection Agency deems them hazardous to human health or the environment — posed a potential risk to pregnant women, says Ingrid Padilla, an environmental engineer at the University of Puerto Rico at Mayagüez. Twelve of these sites sit on karst, a type of porous terrain that allows toxic chemicals to flow down from the surface into groundwater.

Padilla's previous research suggests that flooding and other disturbances can quickly bring toxic substances in groundwater back to the surface, and carry them into the water supply. Now, she and her colleagues are collecting hair and blood samples from the research cohort to determine whether pregnant women are being exposed to hazardous chemicals, such as phthalates and chloroform. Since the hurricane hit, the researchers have begun to collect and test groundwater

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from karst regions and tap water from the homes of people living there.

Other research teams are worried that water that has pooled in hurricane debris could provide a breeding ground for disease-carrying mosquitoes. At the height of the Zika epidemic in 2016, experts debated whether a massive hurricane would destroy mosquito habitat or enhance it, says Carmen Zorrilla, an obstetrician and gynaecologist at the University of Puerto Rico in San Juan. The evidence is still unclear, she says, and logistical problems may make it impossible for researchers to gather enough data to provide answers.

In some areas where hospitals faced extensive storm damage, the only medical care available is emergency treatment. Screening for the Zika virus is a low priority, and infected adults rarely experience severe symptoms and are unlikely to seek medical treatment.

There are also few labs on the island that can test samples for Zika and other mosquito-borne diseases. Like many Puerto Rican facilities, the US Centers for Disease Control and Prevention (CDC) dengue lab in San Juan lost power during the hurricane and was closed for a week.

Diesel generators kept its freezers running to preserve blood and other biological samples, but the lab is still running on generator power and is behind on testing some samples. Shipping delays destroyed reagents that the lab had ordered, because the chemicals were not kept consistently cold during transport.

Lab director Stephen Waterman says that the CDC is collecting data on the incidence of mosquito-borne disease and other hurricane impacts. But its priority is to help US government workers and local communities recognize mosquito breeding grounds, and to provide technical help on efforts to control the spread of the insects. Agency staff would also like to verify reports that leptospirosis — a waterborne bacterial disease that is spread by rats — has made dozens of people ill. "We're focused on preventing disease," Waterman says.

Yet the ruined facilities and lack of power continue to tax public-health workers' ability to know where hazards lie. Take the numerous diesel generators running on the island, which produce visible plumes of grey smoke. Benjamin Bolaños, a microbiologist at the University of Puerto Rico in San Juan, worries that these emissions could harm people with respiratory illnesses, but that the effect will be difficult to quantify. "We are blind because probably the [air-quality] monitors were destroyed by the hurricane," he says.

This makes the prospect of more months without reliable power even more frightening. "The kind of work we're doing is not because it would be interesting to do," Cordero says. "It has to be done now, because a few years from now, it's too late." ■

KEVIN FRAYER/GETTY

CLIMATE CHANGE

CO_2 emissions set to spike in 2017

Increased coal use in China appears to be driving the first rise in global greenhouse-gas output since 2014.

BY JEFF TOLLEFSON

Humanity's carbon-dioxide emissions are likely to surge by 2% in 2017, driven mainly by increased coal consumption in China, scientists reported on 13 November[1–3]. The unexpected rise would end a three-year period in which emissions have remained flat despite economic growth.

Researchers with the Global Carbon Project, an international research consortium, presented their findings at the United Nations climate talks in Bonn, Germany. Countries there are ironing out details of how to implement the 2015 Paris climate accord, which calls for limiting global warming to a rise of 1.5–2 °C. If the latest analysis proves correct, global CO_2 emissions will reach a record-breaking 41 billion tonnes in 2017.

"We were not particularly surprised that emissions are up again, but we were surprised at the size of the growth," says Corinne Le Quéré, a climate scientist at the University of East Anglia in Norwich, UK, and co-author of the work, which was published in three journals. "If 2018 is as big as 2017, then I will be very discouraged," she says.

Several factors caused the world's CO_2 emissions to level out from 2014 to 2016, including an economic slowdown in China, the world's largest emitter; a shift from coal to gas in the United States; and global growth in the use of renewable energies such as solar and wind. Many climate scientists and policymakers had hoped that the pause represented a shift in energy use that would eventually cause global emissions to peak — and then decline.

The latest analysis projects that carbon emissions in the United States and the European Union will continue to decline — by 0.4% and 0.2%, respectively, in 2017 — although at a slower pace than in recent years. And emissions growth in India is set to slow, rising by just 2% this year, compared with an average of 6% per year over the past decade.

"If 2018 is as big as 2017, then I will be very discouraged."

But the picture is very different in China. This year, the country's emissions of CO_2 are expected to surge by 3.5%, to 10.5 billion tonnes. The main causes are increased activity at the country's factories and reduced hydroelectric-energy production, the Global Carbon Project analysis finds.

The effort highlights nagging uncertainties about greenhouse-gas emissions trends, particularly in China, India and other countries with economies that are rapidly growing and changing, says David Victor, a political scientist at the University of California, San Diego. He is not convinced that government actions — at the national or international level — have driven the recent levelling of emissions. And although emissions are projected to grow this year, Victor says that China is still on a trajectory that would see its emissions peak well before 2030.

Taken together, the projections for 2017 reinforce the notion that the world has far to go before it solves the climate problem, says Glen Peters, a climate-policy researcher at the CICERO Center for International Climate Research in Oslo and a co-author of the Global Carbon Project's 2017 analysis.

"We are not safe yet," Peters says. "We can't be complacent." ■

China is trying to reduce its coal use.

1. Peters, G. P. *et al. Nature Clim. Change* http://dx.doi.org/10.1038/s41558-017-0013-9 (2017).
2. Jackson, R. B. *et al. Environ. Res. Lett.* **12,** 110202 (2017).
3. Le Quéré, C. *et al. Earth Syst. Sci. Data Discuss.* http://dx.doi.org/10.5194/essd-2017-123 (2017).

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CORRECTION

The News story 'Science scrambles after storm' (*Nature* **551,** 282–283; 2017) erred in its description of karst. Karst is not a type of rock formation, but a variety of landscape formed by the erosion of rock.

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