The Sydney Morning Herald

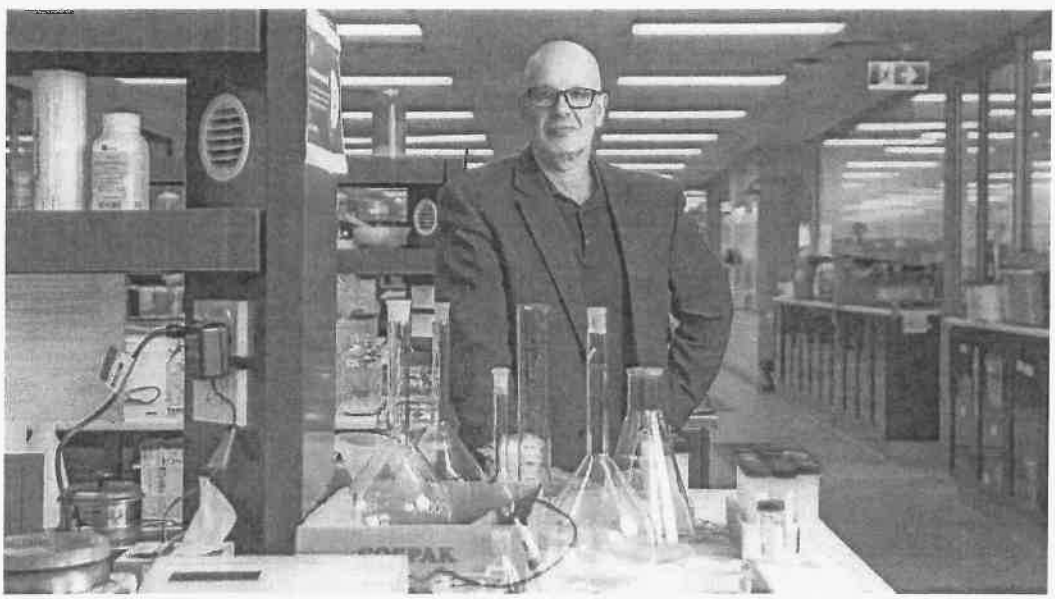
EXCLUSIVE NATIONAL NSW CORONAVIRUS PANDEMIC

Virus rebel Professor Edward Holmes named NSW Scientist of the Year

By Kate Aubusson
October 27, 2020 — 5.45am

The man who first published the genome sequence of the coronavirus for the world to see has been named NSW Scientist of the Year.

The University of Sydney's Professor Edward Holmes would like to think the accolade is in recognition of his 30 years unravelling the mysteries of elegantly designed parasites rather than one rebellious act on a Saturday morning in January when he hit "upload".



NSW Scientist of the Year Professor Edward Holmes. LOUIE DOUVIS

But this was the moment the world began to understand the virus, SARS-CoV-2, enabling scientists to develop first rapid tests and start vaccine development.

For his troubles, Professor Holmes will be awarded $60,000 from the NSW government on Tuesday night, after not a single day off in the past nine months, and a steady battering of online harassment and death threats from conspiracy theorists.

"In the great scheme of things, I am extraordinarily lucky to have a job, when a lot of people are really struggling right now," he said.

A study has found the Oxford University's coronavirus vaccine triggers a strong immune response in people over the age of 55.

Setting loose the virus code

Holmes is quick to point out that it was his colleague, Professor Yong-Zhen Zhang at Fudan University in China, who initially sequenced the SARS-CoV-2 genome code on January 5.

"I helped him work out what it meant," Professor Holmes said.

But Chinese authorities had told them all not to publish, Professor Holmes said.

"I think they wanted to reduce panic or wanted their own publication to come out first. But we strongly felt we had a duty to release this data as soon as possible."

At 8am the following Saturday, sitting in his home study, Professor Holmes called Professor Zhang to ask a burning question: "Should we release this sequence?"

He took a moment, and called his Australian colleague back.

"He said: 'OK, let's release it'," Professor Holmes said.

He then woke his colleague in Edinburgh, Professor Andrew Rambaut, who runs the website virological.org.

"I told him we need to get this on online ... I was shaking as I pressed send, and off it went."

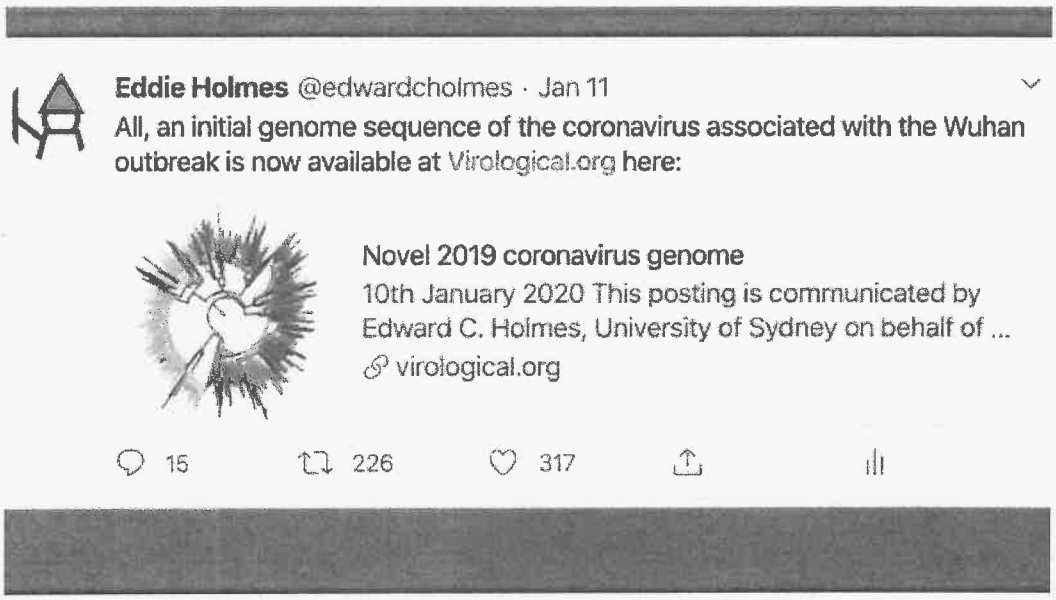
It took 52 minutes from receiving the code from Professor Zhang to publishing – Professor Holmes timed it. But he had forgotten to double-check the sequence.

"I could have uploaded anything. I thought, oh god what have I done? I quickly checked the sequence and breathed a sigh of relief.

"Almost immediately people were saying 'this is fantastic, now we can start doing the science'."

The Chinese authorities were not happy, he said.

"We did the right thing and I would do it again in a heartbeat."



The tweet that sent the SARS-CoV-2 genome code around the world. TWITTER

The Chinese government published its data within 36 hours. "I'm absolutely convinced they wouldn't if we hadn't ... they would have waited maybe a few days or weeks."

NSW Chief Scientist and engineer Professor Hugh Durrant-Whyte said Professor Holmes' early identification of the devastating potential of the coronavirus "cannot be overstated".

An unpredictable pandemic

The emergence of a new coronavirus in humans was "totally predictable" to Professor Holmes and his colleagues. SARS-CoV-2 is the fifth coronavirus to affect humans in the past 20 years.

But the magnitude of the pandemic was less foreseeable.

Professor Holmes initially suspected this virus would run a similar course to the first SARS outbreak, which resulted in just over 8000 cases.

"We didn't know this would be an event that would stop the world," he said. "It was way more infectious than anyone realised."

Professor Holmes in his lab at the Australian Technology Park in Sydney. LOUIE DOUVIS

NSW has been one of the real highlights of the world, he said.

"I thought we would end up with a pretty decent epidemic but it has been handled ... extraordinarily well.

He said Australia could have fared a lot worse.

The contagion effect of conspiracy theories

One of the main gripes scientists have is about the film *Contagion*, which depicted one or two US scientists working almost entirely independently to develop a vaccine to stop the spread of a virus.

But *Contagion* did get a lot right, Professor Holmes said, particularly the character played by Jude Law, who embodied the potency of social media to sow misinformation, panic and conspiracy.

Professor Holmes became the target of unrelenting online attacks after he co-authored a paper in *Nature Medicine* debunking the pervading conspiracy theory that the virus was engineered in or escaped from a laboratory in Wuhan.

"Our conclusion was no, we couldn't see anything to indicate this could be anything other than a natural event," he said.

His work with Chinese researchers and universities have fostered erroneous accusations that he is paid by the Communist party. Last week he was accused of mass murder for failing to support the lab theory.

"It's ridiculous, but I'm completely used to it. It just washes over me now," Professor Holmes said.

"The bottom line is, it is very difficult to find where this virus has come from. There are a huge number of animals in China that could potentially be reservoirs and we could be looking for a particular bat in a particular cave. This is needle-in-a-haystack stuff that won't be resolved for a long time."

The next pandemic

Once the autopsy of this pandemic has been completed, the many faults in the world's preparedness and response will be plain to see, from not heeding the early warnings from scientists to the delayed response of many Western governments.

"We have to learn from this. We have to do a lot better next time, because this could easily happen again," he said.

What will the next pandemic-causing virus be?

The three frontrunners are another coronavirus, influenza, or a Hendra-like paramyxovirus.

His guess carries more weight than most, being among the world-leading experts in the genetics, evolution and origin of many viruses including hepatitis C, HIC, Influenza, West Nile, Dengue, Zika and Ebola.

Ten other leading researchers, innovators, engineers and educators will be honoured at the 2020 Premier's Prizes for Science and Engineering.

For the first time in the award's history, female recipients outnumber males.

Planning and Public Spaces Minister Rob Stokes said it was a great honour to present these often "unsung heroes" with their awards on behalf of Premier Gladys Berejiklian.

"The awards are a reminder of the incredible talent we have here in NSW in cutting-edge technologies that help safeguard our future," Mr Stokes said.

The 10 category prize winners will each receive $5000

Category 1: Excellence in Mathematics, Earth Sciences, Chemistry or Physics Winner: Distinguished Professor Suzanne O'Reilly, Macquarie University

Category 2: Excellence in Biological Sciences (Ecology, environmental, agricultural and organismal) Winner: Professor Ian Wright, Macquarie University

Category 3: Excellence in Medical Biological Sciences (Cell and molecular, medical, veterinary and genetics) Joint winners: Distinguished Professor Antoine van Oijen, the University of Wollongong and Professor Merlin Crossley, University of NSW

Category 5: Excellence in Engineering or Information and Communications Technologies Winner: Distinguished Professor Zaiping Guo, the University of Wollongong

Category 6: NSW Early Career Researcher of the Year (Biological Sciences) Winner: Dr Rachael Gallagher, Macquarie University

Category 7: NSW Early Career Researcher of the Year (Physical Sciences) Winner: Dr Jelena Rnjak-Kovacina, University of NSW

Category 8: Leadership in Innovation in NSW Winner: Professor Ewa Goldys, University of NSW

Category 9: Innovation in NSW Public Sector Science and Engineering Winner: Dr David Hopkins, NSW Department of Primary Industries

Category 10: Innovation in Science, Technology, Engineering or Mathematics Teaching in NSW: Winner: Ms Sophie Poisel, Emanuel School

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Kate Aubusson is Health Editor of The Sydney Morning Herald.