

Make science-based decisions part of our DNA



Chang Ai-Lien

Science Editor

It has been almost a decade since gastroenterologist Andrew Wakefield's paper alleging that vaccines triggered autism was retracted.

His work was found to be fraudulent, his research was widely discredited and he lost his medical licence.

Time and again, researchers have debunked his work, yet his theory continues to be repeated widely, giving rise to a legion of anti-vaxxers who refuse to let their children get their shots.

Anti-vaxxers believe there is a connection between vaccination and autism, despite there being no scientific evidence supporting that theory.

This has fuelled the resurgence of old-time diseases, with disastrous consequences.

Measles, for one, has shot up by 30 per cent globally.

In fact, the World Health Organisation has named vaccine hesitancy – the “reluctance or refusal to vaccinate despite the availability” – as one of the top threats to global health this year.

Prime Minister Lee Hsien Loong referred to anti-vaxxers this week, noting what they believe is not based on evidence, and that Singapore must never get into this situation.

“We can't afford to have people who are fearful and distrustful of science, who are held captive by totally groundless anti-scientific beliefs,” he said at a press conference after the 11th Research, Innovation and Enterprise Council Meeting on Wednesday.

In an age of fake news – which has fuelled the beliefs of climate change sceptics, people who believe the earth is flat, and those who think eating genetically modified food will alter their DNA, just to name a few – it is more important than ever to get the facts right and embrace evidence-based



Pupils observing the different stages of butterfly metamorphosis at the Science Centre. Developing an open, scientific mindset starts with getting young children passionate about science and technology, and how these impact the world they live in, says the writer. ST PHOTO: TIMOTHY DAVID

decision-making, say experts.

National University of Singapore senior deputy president and provost Ho Teck Hua said: “Science promotes curiosity and logical thinking, and having an open, scientific mind is essential to living in a digital world.”

Important concepts such as hypothesis testing, which is the cornerstone of science, can be applied to everyday life, he noted.

“We are constantly bombarded and overloaded with different kinds of information. The scientific approach of collecting data from multiple sources, verifying the information and drawing evidence-based conclusions will help us to make decisions wisely.”

Developing this mindset starts with getting young children

passionate about science and

technology, and how these impact the world they live in. What they learn and how it teaches them to think could be not just the foundation for a strong talent base of researchers doing groundbreaking work, but could also become entrenched in the DNA of others who do not go into the field, guiding them in their daily life decisions.

As PM Lee put it: “All our schools, the whole education system, have a role to play, to inculcate knowledge of science and maths and also a scientific rational mindset in our people.”

Helping people to think independently will also help them make rational choices, noted Professor Chong Siow Ann, vice-chairman of the medical board (research) at the Institute of

FEAR LEADS TO IRRATIONALITY

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Mental Health. “Fear can make people think and behave irrationally, and a better grounding will make people fear science less.”

Science Centre Singapore chief executive Lim Tit Meng added: “Science is everywhere. The idea is to develop a scientific-thinking mindset in society, so people are more scientifically aware and question what they hear instead of believing something blindly.”

To this end, the Science Centre, together with the Education Ministry, rolled out an applied learning programme in Stem (science, technology, engineering and mathematics) to secondary schools, which is into its fifth year and is set to be implemented across all primary schools by 2023.

There are no exams for the

programme; schools chose topics to focus on, ranging from aerospace engineering and robotics to environmental sustainability and healthcare.

Students get to visit companies where they can see research in action and interact with scientists, for instance, or participate in activities such as space camp in Houston in the United States.

“They come back so fired up and excited, we can really see a difference,” said Associate Professor Lim.

“They suddenly realise that their PSLE scores don't define them and they can really see how what they learn is applied in real life.”

After they graduate, budding scientists need interesting and challenging jobs, with competitive salaries and recognition, both by their peers and by society, said Prof Ho.

But not all science graduates end up in labs wearing white coats, noted former Science Centre chief Chew Tuan Chiong, who holds a PhD in engineering from Cambridge University.

“Training in science also prepares one adequately for a myriad of possibilities, including, of course, finance and management, while the converse is not true,” he said. “An engineer can transition into banking, but it is much harder for a banker to practise engineering.”

He is a case in point, having transitioned to become a successful chief executive officer of a \$2 billion listed real estate trust after heading the Science Centre for 14 years.

Even in modern Singapore, he added, there are still people who believe in astrology or the compatibility of Chinese zodiac animal signs, for instance.

“If we were to conduct a scientific audit of our everyday behaviour, it is certain to reveal ways in which we can improve our lives to the benefit of self and others.”

To help the public, scientists must do a better job of explaining things, and there should be better education and awareness in the media, said Prof Chong.

There also needs to be open debate guided by not just scientists but politicians and religious leaders, he added.

Professor Ho suggested that Singapore could identify national challenges where scientists can play a critical role in finding solutions. “In this way, the general public can also begin to appreciate the roles science and scientists play in daily life.”

Dr Lee Chee Wee, technology adviser for Temasek Polytechnic, said: “Everybody does research every day in their own way, and we all have the ability to ask the right questions.”

“Now, in this age of fake news, it's especially important to use your brain before you believe, to think before you share.”

ailien@sph.com.sg