**Human security, data**
**Way Kuo**

Security has always been a matter of concern for both individual human beings and entire countries. We are living in a world characterized by increasing insecurity and the emergence of new and unprecedented risks touching every sphere of life: economic, social, political, cultural, and religious.

Contemporary technological innovations bring many benefits. Unfortunately, it also has the power to magnify the scale and severity of the risks and hazards we experience in our everyday life.

The growth of the internet in the 1980s, for example, made large volumes of highly useful data possible.  At the same time, it brought all kinds of new risks such as cyberbullying and online fraud.  It has also been used to disseminate fundamentalist propaganda and recruit fighters for Jihadist campaigns.

**Terrorism**
The worst terrorist attacks so far, in US history and on US soil at least, were the 9/11 attacks in 2001. The economic losses have amounted to $105 billion, in addition to the 2,977 deaths. Nearly 5,500 first responders and local residents have been diagnosed with cancers linked to the toxic smoke and dust created by the attacks.

According to Brown University's "Costs of War" project, the economic cost and human losses triggered directly or indirectly by 9/11 may amount to $4 trillion.

In the meantime, 6,800 US service members have died as of December 2014, and another 6,900 more US military contractors have been killed. The civilian losses in Afghanistan, Iraq, and Pakistan are even worse, estimated at 210,000 by an updated Brown University report in April 2015.

Since the spring of 2015, several terrorist attacks have taken place in Ankara and Istanbul in Turkey, the Iraqi city of Tikrit, Egypt's capital Cairo, and Syria's capital Damascus.  At the time of writing, the latest was a car bomb targeted at an evacuation convoy leaving Aleppo led by the Syrian government on 15 April 2017.

Hundreds of people of different ages, faiths, and cultures died in similar attacks between January 2015 and April 2017 in Berlin, Brussels, Nice, Paris, Quebec and St Petersburg.

**Social, ecological, and mass transportation hazards**
Today, the malicious ransomware WannaCry is spreading fast, hitting computers in over 100 countries around the world. Human security is also threatened by hazards caused by economic crises, social degradation and inequality, epidemic diseases, air travel and mass transportation, food poisoning, ecological destruction and climate change.

On 8 March 2014, the world was shocked by the mysterious disappearance of Malaysia Airliner MH370. No one knows for sure what happened.  Another Malaysian airplane, Flight MH17, was shot down over Ukraine on 17 July 2014.  On 24 March 2015, the co-pilot of a commercial airplane flying from Barcelona in Spain to Dusseldorf in Germany deliberately crashed into the French Alps, killing all 150 people on board. On 31

October the same year, Airbus A321 was shot down in the mountainous area of Hassana in eastern Egypt.

Rail accidents can also cause huge disasters. For example, an Indian train derailed on 20 November 2016, killing 133 people. But the death toll of all these air and rail disasters added together constitute only a very small percentage of the total number of deaths in traffic accidents every year, which amounts to 1.25 million people.

Food poisoning, air pollution and emerging epidemics are also sources of major hazards.  According to the World Health Organisation (WHO), the number of people who die from food safety problems stands at 2 million annually.

For air pollution, according to a 2015 WHO report, 6.5 million deaths were associated with indoor and outdoor air pollution together.  Nearly two-thirds of the deaths occurred in Southeast Asia and Western Pacific regions.

Its impact is far worse than all these existing disasters put together. Looking back at the Fukushima nuclear power plant accident triggered by the earthquake on 11 March 2011, Japan decided to suspend the operation of its nuclear plants for safety inspections, only to see the return of the long-gone smog in Tokyo. At the same time, not a single person has died from radiation-related diseases, according to the latest United Nations' report. As a result of actual needs and the threat of air pollution, Japan restarted some of its idled nuclear power plants in July 2015.

Furthermore, the WHO report updated on 27 September 2016 showed that 90% of the deaths caused by air pollution were from low- and middle income countries. One third of the world's 7.5 billion population lives just above the poverty line, without electric power, clean water, uncontaminated food, basic education and medical services. As a result, life expectancy is short – about 50 years on average. Yet these impoverished people have to bear the consequences of the air pollution created by the other 5 billion people who live in relative affluence.

Notice, too, that the poverty-stricken and energy-deficient regions are plagued by various kinds of diseases such as AIDS, SARS, Ebola, Zika and other rare viruses that, in turn, spread to the other 5 billion residents on Earth who have created the air pollution.

**Big data, small data**
In order to provide society with a reasonable level of security, we urgently need to improve our knowledge and strengthen our capacity to mitigate against risks, both locally and globally. Knowledge accumulation requires data as its fuel.  In this regard, advancement in big data technology offers enormous possibilities for understanding the complexities and uncertainties of human behavior and the globalized world.

Ironically, the biggest crisis we face today is the risk of having insufficient data, or no reliable data, for how to analyze, predict, prevent and respond to the numerous crises and hazards, potential or real, in our everyday life.  This is true with the 9/11 terrorist attacks, the 3/11 Fukushima accident as well as with the problems of smog, environmental protection, epidemics and national security, among others.

We need a paradigm to adopt a pragmatic approach and to make use of scientific analysis to improve predictions and responses, free from the interference of ideological biases and presuppositions. Moving forward, policymakers need to have the right mind-set and an open attitude to invest energy and resources to harness the predictive power of data or without data to enhance human security in all spheres of life, at both the global and the local level.

**Note**: This article is adapted from the plenary speech delivered by the author, President of City University of Hong Kong, at the Electrochemical Society's annual meeting in New Orleans, USA, on 29 May 2017.