

Safeguarding tomorrow's health

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Judging by the extent of the slash-and-burn activities in Indonesia, the recent 2015 Southeast Asian haze crisis is already proving to be just as, if not more, serious than similar incidents in the past years. While it may be too early to place a dollar value on the losses, it is possible to make an educated guess. During the 1997 Southeast Asian haze crisis, experts

estimated that damages totalled about US\$300 million for Singapore and about US\$9 billion for Southeast Asia as a whole.

The short-term economic impacts are clear. Besides declines in businesses, tourism revenue and worker productivity, healthcare spending is likely to increase significantly. In fact, during the recent haze episode, doctors in Singapore reported an increase in patients with haze-related health issues such as asthma and throat and lung infections.

But what are the long-term impacts of the haze? Would it be possible that the health shocks of today—especially on infants and pregnant mothers—may manifest themselves as negative outcomes in the future? These are some of the questions that Assistant Professor Kim Seonghoon from the Singapore Management University (SMU) School of Economics seeks answers to.

Multi-generational problem

As an economist, Professor Kim is primarily concerned with public policies and their effects on health, labour and development outcomes. For example, in labour economics, Professor Kim is interested in how incentives, such as promotions, remunerations and day offs, may impact worker productivity in an organisation and, in turn, across the entire workforce.

In the last two decades, economists are increasingly looking at healthcare systems and health-affecting behaviours, prompting Professor Kim to examine early-life health shocks and their impact on the economy at large.

In the paper titled *The Lasting Impact of Parental Early Life Malnutrition on Their Offspring: Evidence from the China Great Leap Forward Famine*, Professor Kim, together with his research team,

discovered that infants born during China's Great Leap Forward Famine—which led to the death of more than 30 million people in the two years—were at a higher risk of developing health problems such as stroke, walking and vision disabilities, and lower mental acuity later in life.

Further research on the famine presented an even more startling discovery. In *The Long-term Health Effects of Foetal Malnutrition: Evidence from the 1959-1961 China Great Leap Forward Famine*, Professor Kim and his team analysed data from the China Health and Retirement Longitudinal Study (CHARLS) and discovered that the second generation of Chinese children born after the famine were affected by the famine too, despite the elapsed time. This was because the first generation who experienced the famine had a higher tendency to develop various ailments, which may have lowered the human capital development among their children. The paper posited that the second generation children might, as a result, experience deficiencies in scheduled brain and body development during prenatal periods, which would in turn impact other areas of their adult life, such as earning capacity, income and marriage.

Professor Kim's study on the effects of malaria exposure in colonial Taiwan echoed similar results. Malaria, an infectious disease transmitted through the bites of infected mosquitoes, destroys red blood cells in the body which as a result disrupts the supply of oxygen and nutrients to organs and tissues. His paper, *Long-term Health Effects of Malaria Exposure around Birth: Evidence from Colonial Taiwan*, detailed his findings which suggested that people who were born in environments with high risk of malaria were more likely to have high blood pressure, heart diseases, and lower cognitive functions at old age.

The big picture

Professor Kim's research findings add further credence to the growing body of evidence that early-life health shocks can have long-lasting impact on human capital development such as literacy, employment, earnings, family formation and health.

But what does that mean for the economy?

"Health is a major determinant of labour productivity," Professor Kim explains. "Economists study these health issues because we now know that health shocks do not just affect health itself, but also marital status, literacy, income and housing. You can easily relate these to larger economic outcomes. At the basic level, if somebody is in bad health, it is not surprising that he is less able to be productive at work. That alone will have direct economic impact across the workforce."

Even though Professor Kim's research papers are mostly about the long-term effects of famine and malaria outbreak—both unlikely occurrences in modern day Singapore—the research methodology developed can, in fact, be adapted to Singapore, he explains.

For instance, should a link be established between the 2015 Southeast Asian haze crisis as an early-life health shock and adult outcomes, the methodology developed can be applied to children born during and around the time of the haze. Researchers can make predictions of these children's growth outcomes and recommend proper measures for the allocation of healthcare provisions to children and pregnant women.

"What studies like these can do is to give us very strong support for government intervention here in Singapore. The distribution of N95 masks to pregnant mothers during the haze, for one, may have a long-term impact, especially on their foetuses."

A different perspective

From the academic standpoint, Professor Kim says that tackling early-life health shocks from an applied economist's point of view can help to deepen existing knowledge in medical science and public health. This is because applied economists are used to handling big data, allowing them to see the issue from a completely new perspective. "Most medical sciences or clinical studies are based on relatively small-scale, randomised controlled trials. Applied economists like myself handle nationally representative data, and come up with research designs that have strong policy implications. This makes our studies more representative of what is actually happening in Singapore – something that is harder to attain in clinical studies."

Professor Kim adds, "If you provide enough nutrition for children now, it has a multiplier effect. This means that the amount you invest today will have a much greater economic effect 50 or 60 years down the road. You are not just protecting the children right now – you are safeguarding the [health](#) of the adults of tomorrow."

Provided by Singapore Management University

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