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Research projects to study impact of climate change on diseases in S'pore

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As climate change looks set to result in hotter temperatures here, some researchers suggest that a heat warning system could help in managing the impact of chronic diseases exacerbated by heatwaves.

During heatwaves, where increased temperatures last for several days, such a warning system could be used to alert people with conditions such as diabetes, hypertension or a history of heart problems – who are at greater risk of adverse health effects due to the heat – to stay indoors, said Assistant Professor Borame Dickens from the National University of Singapore's Saw Swee Hock School of Public Health.

This comes as Singapore's third National Climate Change Study, released in January, suggested the Republic could experience more extreme weather by the end of the century, such as more frequent dry spells and hotter days.

Data from the Meteorological Service Singapore's 2023 Annual Climate Assessment Report showed that 2023 was the fourth-warmest year on record for the Republic, with temperatures possibly getting even hotter in 2024.

A team of researchers, led by Prof Dickens, is looking at the long-term impact of climate change on such diseases here.

Their work uses agent-based modelling, in which computer simulations study interactions between different autonomous factors, to investigate the effects of climate change on health, she said.

The method could, for example, simulate the impact of increased temperatures on the number of cases of strokes and heart attacks, she noted.

"We are actually still trying to learn a lot more about how climate affects disease."

She said the team is concerned about the interaction between air pollution and increasing temperatures, noting that this could have a significant effect on long-term respiratory illnesses such as chronic obstructive pulmonary disease.

In the longer term, the research could look at whether other measures are needed, such as closing public parks during heatwaves or redesigning Housing Board blocks to be cooler.

Meanwhile, another project is looking at the repercussions of environmental changes on vector-borne diseases, which include dengue and malaria.

Computer simulations will be used to show how climate change will impact health risks from such mosquito-borne diseases, said Assistant Professor Lim Jue Tao from Nanyang Technological University's Lee Kong Chian School of Medicine.

The simulations will also examine the economic effect of such diseases becoming more prevalent, such as how much the average person will have to pay for the treatment of dengue and productivity costs from rising absenteeism.

Prof Lim said climate change could increase the geographic range of diseases such as dengue by allowing mosquitoes to breed in more temperate regions.

And in places with multiple seasons, which typically experience such diseases in the summer, mosquitoes may be able to breed into autumn due to warming temperatures, he said.

These would increase the risk of travellers importing such diseases into Singapore, he added.

"This means that there's a higher likelihood that diseases which are not already in Singapore have a higher potential to be imported into the country," said Prof Lim, pointing to mosquito-borne pathogens such as the Japanese encephalitis virus and yellow fever virus, which are currently not found here.

Rough findings from most climate change scenario projections in Singapore point to a significant increase in the mosquito population here, he added.

This could require the country to expand mosquito control initiatives such as Project Wolbachia or introduce vaccination programmes for mosquito-borne diseases, he suggested.

The two projects receive grants from the National Research Foundation (NRF) as part of the $23.5 million Climate Impact Science Research Programme.

The programme is helmed by the National Environment Agency's Centre for Climate Research Singapore, and looks at the long-term impact of climate change in Singapore.

"There is growing awareness that climate change affects human health, but research in this area is still nascent," said NRF director for urban solutions and sustainability Ni De En.

"Working alongside other government agencies, NRF's sustained investments in these research areas will allow scientists to observe trends and develop a better understanding of the evolving impacts of climate change on human health," he added.

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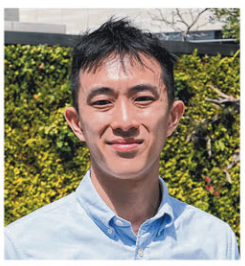
Assistant Professor Borame Dickens from the National University of Singapore's Saw Swee Hock School of Public Health is leading a research team looking at the long-term effects of climate change on chronic diseases here. PHOTO: NATIONAL UNIVERSITY OF SINGAPORE



Assistant Professor Lim Jue Tao from Nanyang Technological University's Lee Kong Chian School of Medicine is part of another project looking at the repercussions of environmental changes on vector-borne diseases. PHOTO: NANYANG TECHNOLOGICAL UNIVERSITY

GAINING DEEPER UNDERSTANDING

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