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New NUS Medicine facility aims to cut carbon footprint of healthcare sector

It will also prepare doctors and nurses for potential flood of climate-related ailments

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The healthcare sector has outpaced ship and plane exhaust in polluting the earth with its biggest planet-warming carbon emitters, including life-saving anaesthesia, asthma inhalers and MRI scans. This is an area a local medical school wants to examine further.

A new centre at the National University of Singapore Yong Loo Lin School of Medicine (NUS Medicine) will focus on decarbonising the healthcare sector and preparing doctors and nurses to better handle a potential flood of patients suffering climate-related ailments in the future.

As a start, the first-of-its-kind Centre for Sustainable Medicine – to be launched in December during the COP28 climate summit in Dubai – will calculate the carbon footprint of Singapore's healthcare.

Healthcare contributes up to 8 per cent of the world's greenhouse gas emissions, while shipping and aviation, around which there are more discussions on cutting emissions, contribute about 3 per cent each.

One of the major global warming culprits in hospitals is an anaesthetic gas called desflurane. Using one bottle of the anaesthetic is equivalent to burning 440kg of coal, said Professor Nick Watts, director of the Centre for Sustainable Medicine.

Inhalers are needed by patients with asthma, but with every puff of medication, the common L-shaped metered dose inhalers release hydrofluoroalkanes – potent gases that are 1,000 times more powerful than carbon dioxide in heating up the planet. The alternative is the circle-shaped dry-powder inhaler, which releases 90 per cent less greenhouse gases.

About 70 per cent of healthcare's emissions comes from its supply chain – the production, transport and disposal of pharmaceuticals, chemicals, medical devices and hospital equipment.

Prof Watts, who was formerly the chief sustainability officer of England's National Health Service (NHS), said healthcare is a tough sector to bring to net zero because each patient will require a different strategy to reduce his carbon footprint.

"Patients present with thousands of different things that are specific and complex... If doctors prescribe something to a patient, they should ask if this is definitely the lowest carbon and is the most clinically appropriate for (him). This has to be integrated into the very DNA of what it means to be a doctor," said Prof Watts.

In March 2024, the new centre will embark on the first comprehensive assessment of Singapore's healthcare carbon footprint, from hospitals to primary care clinics.

The baseline data is needed to develop a robust net-zero strategy for healthcare here, said Dr Amanda Zain, the new centre's deputy director and assistant dean of sustainability at NUS Medicine.

The centre's researchers will use health expenditure data from health institutions and clinics here, and use those figures to complete the emissions profile. They aim to finish the project by end-2024.

Prof Watts said: "You reach out everywhere. Some of it is energy and estates data. Some of it is procurement data. Carbon is everywhere, so you need to work with everyone, from doctors and nurses to pharmacists and physiotherapists."

440kg

Using one bottle of the anaesthetic desflurane is equivalent to burning this amount of coal, said Professor Nick Watts, director of the Centre for Sustainable Medicine.

The new centre will also offer a master's programme in sustainable medicine to help healthcare professionals understand the climate-health link.

Climate change could turn epidemic diseases such as malaria endemic in some places, said Prof Watts. The surge in patients from climate-related ailments could chip away at how well hospitals can cope, he added.

Prof Watts cited a 2003 heatwave episode in France which killed 14,800 people within days amid an overwhelmed health system. Ambulances could not reach vulnerable people quickly enough, and hospitals did not have enough clinicians on staff.

Starting in 2024, the master's programme will be open to policymakers and department leads in healthcare institutions.

The medical syllabus for undergraduates in NUS Medicine will also be refreshed over the next few years to incorporate lessons about sustainability and environment health.

During Prof Watts' first year as chief sustainability officer of the NHS, its carbon emissions was reduced by the amount of energy needed to power 1.1 million homes.

The NHS aims to meet net-zero by 2045, and the first things it did were find alternatives for the more pollutive drugs, build the world's first zero-emission ambulances and make hospitals more energy-efficient.

Those were worthwhile changes which led to a return on investment in just 3.6 years, said Prof Watts.

He is encouraged to see that some hospitals here are phasing out the use of desflurane and have achieved some Green Mark certifications.

Prof Watts also noted that healthcare innovates well, citing reusable personal protective equipment and electric ambulances.

He added: "When you can apply health's full innovative potential to something like climate change, it will be impressive."

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