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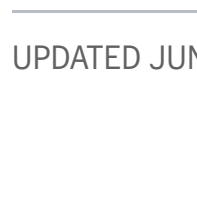
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Shortage of organ donors in S'pore; potential pool could be those who died of cardiac arrest



Secondary 2 student Isaac Loo's organs were donated after he was declared brain-dead on May 25. ST PHOTO: GAVIN FOO



Joyce Teo

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SINGAPORE – Two weeks ago, news of a mother who [donated her 14-year-old son's organs after he was declared brain-dead](#) made the headlines. Her Secondary 2 son had collapsed during a run in school and died after three weeks in a coma.

His kidneys, liver, pancreas, corneas and skin saved at least four patients, said a spokesperson for the National Organ Transplant Unit (Notu) at the Ministry of Health (MOH).

Among the organ donors from 2019 to 2023 were four dead donors below the age of 21, and the organs they donated included the heart, liver, kidneys, pancreas, corneas and heart valves, the spokesperson said.



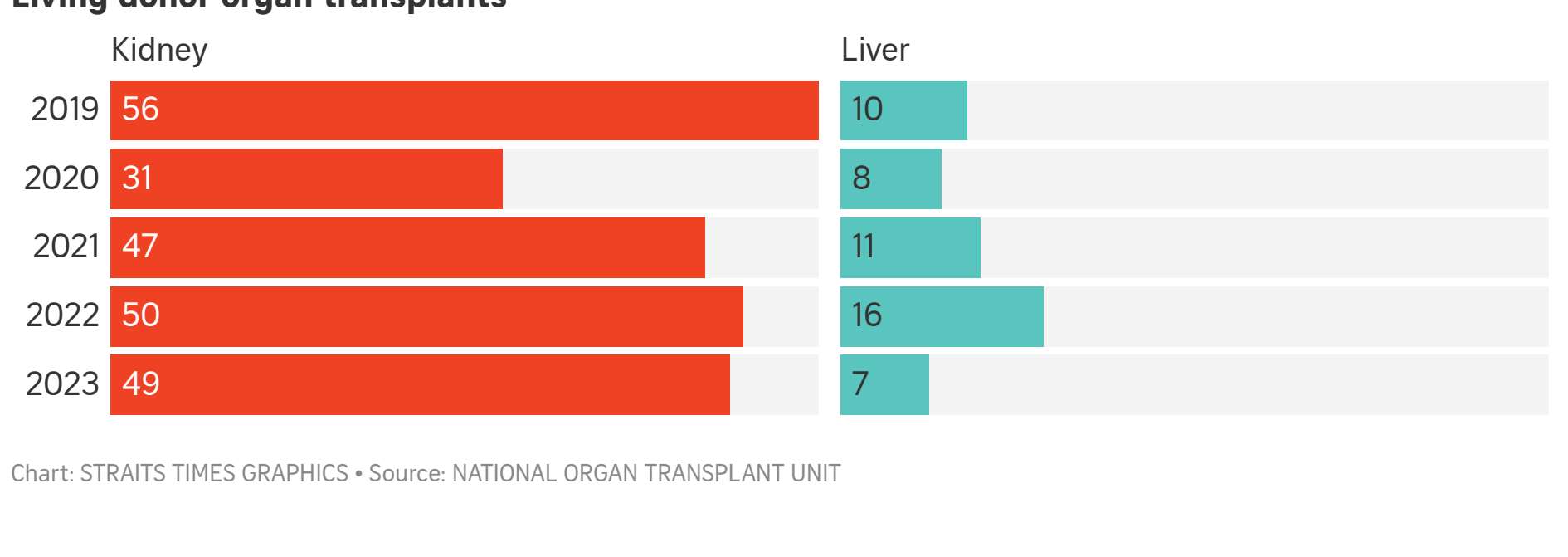
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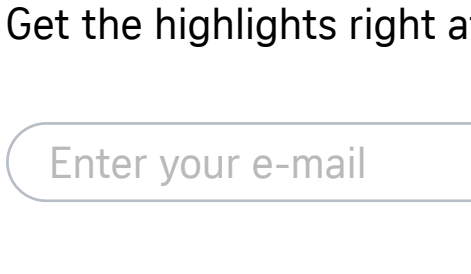
Transplants from dead donors were greatly impacted during the Covid-19 pandemic, but they have since returned to pre-pandemic levels.

In particular, Notu data shows that in 2023, a total of 39 kidney transplants from dead donors and 49 kidney transplants from living donors were done, compared with 33 and 56, respectively, in 2019.



However, the waiting list for an organ remains long.


The longest wait is for cadaveric kidneys, which are taken from dead donors. Kidneys can also be transplanted from living donors.



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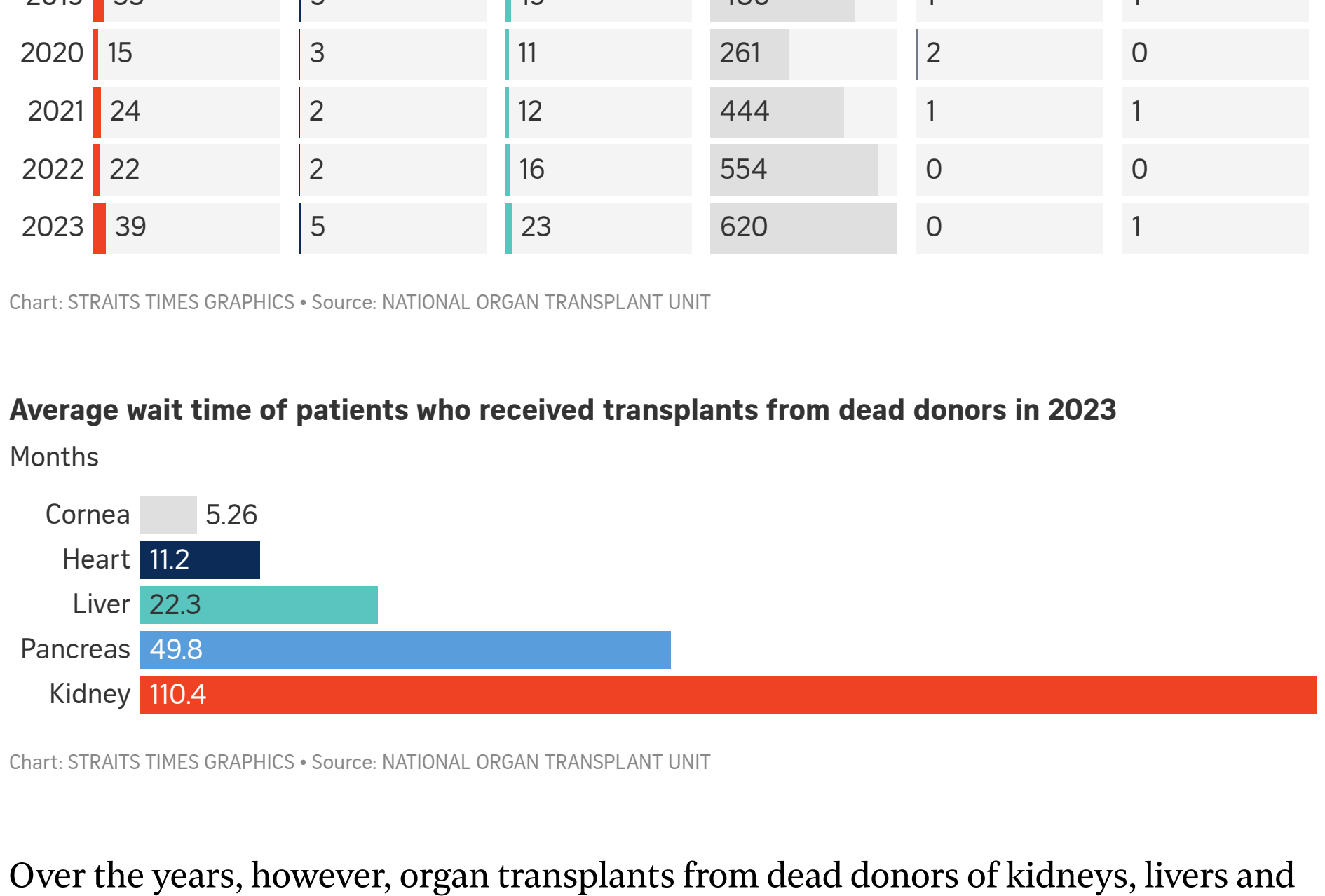
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Those who received cadaveric kidneys in 2023 waited around nine years on average.

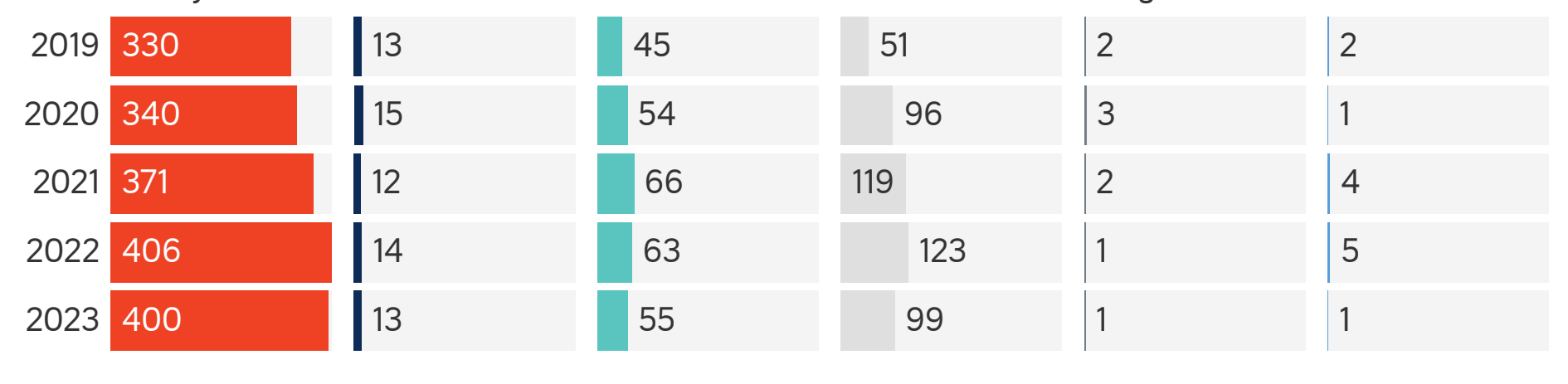
As at end-2023, 400 patients were waiting for a cadaveric kidney transplant, 55 were waiting for a cadaveric liver transplant, and 13 were hoping for a heart transplant.

“Right now, less than 10 per cent of kidney failure patients actually get the opportunity to receive a transplant, and that’s the best treatment for kidney failure,” said Professor A. Vathsala, co-director of the National University Centre for Organ Transplantation (Nucot) at the National University Hospital (NUH).



Over the years, however, organ transplants from dead donors of kidneys, livers and hearts have risen. In 2023, the transplant rates reached 6.59, 3.89 and 0.85 per million population (pmp) respectively, up from 6.3, 3.52 and 0.74 pmp in 2013, according to Notu.

“While many patients have benefited from organ transplants, there is still room to improve the organ transplant rates in Singapore,” said the Notu spokesperson.



Potential new source of donors

Raising awareness of the life-saving nature of organ donation can help increase transplant rates.

Singapore also needs to continue to rely on living donations as an important source of organs for transplantation, said Prof Vathsala, Associate Professor Shridhar Iyer, who is the other co-director at Nucot, and Associate Professor Jeyaraj Prema Raj, the head of SingHealth Duke-NUS Transplant Centre.

But the donations from dead and living donors will not be enough, particularly given that Singapore is rapidly ageing and has a small population of six million, with low death rates from substance abuse or road traffic accidents.

To save more lives with transplants, one way is to use organs from those who had died of cardiac arrest in hospital, which means that their blood circulation had stopped permanently, said Prof Vathsala.

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Organ transplants from those who had died of cardiac arrest are known as donations after circulatory death, or DCD. This is still relatively new in Singapore but is widely recognised in Western countries like the UK, US, and Spain, which has the highest rate of organ donations from dead donors in the world.

So far, only a handful of DCD operations have been done in Singapore, Prof Vathsala said.

As for donations from brain-dead people, they can be made only after a rigorous process of brain death certification, which occurs in the intensive care unit (ICU) when a critically ill person dies sometime after being placed on life support.

Organs are typically retrieved within 24 to 48 hours of death, as the body is kept artificially ventilated, and the heart will eventually deteriorate and stop functioning.

Donations after circulatory deaths are more challenging because the window for harvesting the organs is very small, as organs rapidly deteriorate when blood flow stops.

“The bigger challenge is that there is also a very short period to talk to the next of kin about the possibility of donating the organs after the heart has stopped and to get them to understand the process and proceed with donation,” said Prof Vathsala.

“Conversations need to take place much earlier – for example, when the heart has stopped the first time and there is no hope of saving the patient’s life – and not after the second cardiac arrest has taken place.”

Singapore has an opt-out system for the donation of kidneys, livers, hearts and corneas under the Human Organ Transplant Act, which applies to those who are at least 21 years old.

The transplant centre directors said the opt-out rate is low, at around 2 per cent. This means the majority are presumed to have consented to be donors.

However, there is a cultural bias surrounding death that leads to a reluctance to discuss or consider organ donation after death, said Prof Vathsala. If the intent to donate is not conveyed, grieving families may be at a loss as to what to do.

She said that in some cases, families who are reluctant to donate the organs of their loved ones have either elected for the patients not to go into the ICU or for their life support to be removed before an assessment of brain death can be conducted.

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[Seven-year-old gets new lease of life after mum donates kidney to her](#)

[She couldn't eat or drink, and needed nutrient infusions until intestinal transplant at age 9](#)

Preserving organs for a longer time

Meanwhile, there is a new method of preserving organs called hypothermic machine perfusion that can keep organs in a viable condition for longer and help drive up donation rates, including donations made after circulatory deaths, said Prof Iyer.

This method ensures that the vessels in an organ are continuously flushed with fluid, which mimics blood circulation. This makes it superior to the traditional static cold storage method.

In early 2023, NUH said it successfully trialled the method on donated kidneys. Doctors can also use the advanced method to check the condition of the organs to reduce the risk of renal failure after implantation.

Prof Iyer said the machine perfusion method will soon be extended to donated livers, to increase supply. This will benefit liver failure patients who cannot afford to wait as long as kidney failure patients, who can undergo dialysis while waiting.

Those with acute liver failure have high mortality rates, which can sometimes be within days or weeks, said Prof Iyer. Many on the waiting list for a cadaveric liver, such as those with chronic liver failure and liver cancer, die while waiting for a donor or drop out because of disease progression, he added.

Prof Prema Raj said that about 10-20 per cent of livers retrieved are not suitable for transplantation, but with the perfusion method, these livers can be treated.

Apart from engaging the public on organ donation, medical professionals working in ICUs can help to identify the right patients for donations, he said.

In the US, xenotransplantation, which is the use in humans of organs from other species, is being explored owing to the shortage of organs. [The first living person to receive a kidney from a pig died in May 2024](#), about two months after his transplant.

Nevertheless, this is an area Singapore is keeping an open mind on. Prof Prema Raj said the transplant centres are identifying partners like laboratories that can help alter animal organs with human genes for transplantation, but it will take a few years to see if xenotransplantation can be successful, he added.

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[Second man in the world to receive an altered pig's heart dies](#)

[Spanish baby gets pioneering intestine transplant](#)

While new technological advancements can help to increase donation rates and transplant success, more donors are needed.

The Notu spokesperson said that Notu and MOH will continue to encourage Singaporeans to support organ donation, including conducting various activities to educate the public to facilitate shifts in societal attitudes and views on organ donation.

For instance, Notu's annual Live On Festival encourages participants, in particular youth, to express their thoughts on organ donation and transplantation through a design and essay competition.

As part of the festival, interactive talks are conducted in schools to allow students to appreciate organ donation and encourage them to have discussions with their families and peers.

Such discussions should become the norm, said Prof Vathsala.

“I feel it would be a tragedy if I die and I don’t donate my organs after my death. That’s because one deceased donor can save five to six lives,” she said.

“With each kidney transplant, you can give somebody 15 years of life, with a liver transplant, another 15 years of life. The heart and the lung, another 10 to 15 years of life. That’s so many years that you can add to a person’s life.”

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Living donor organ transplants

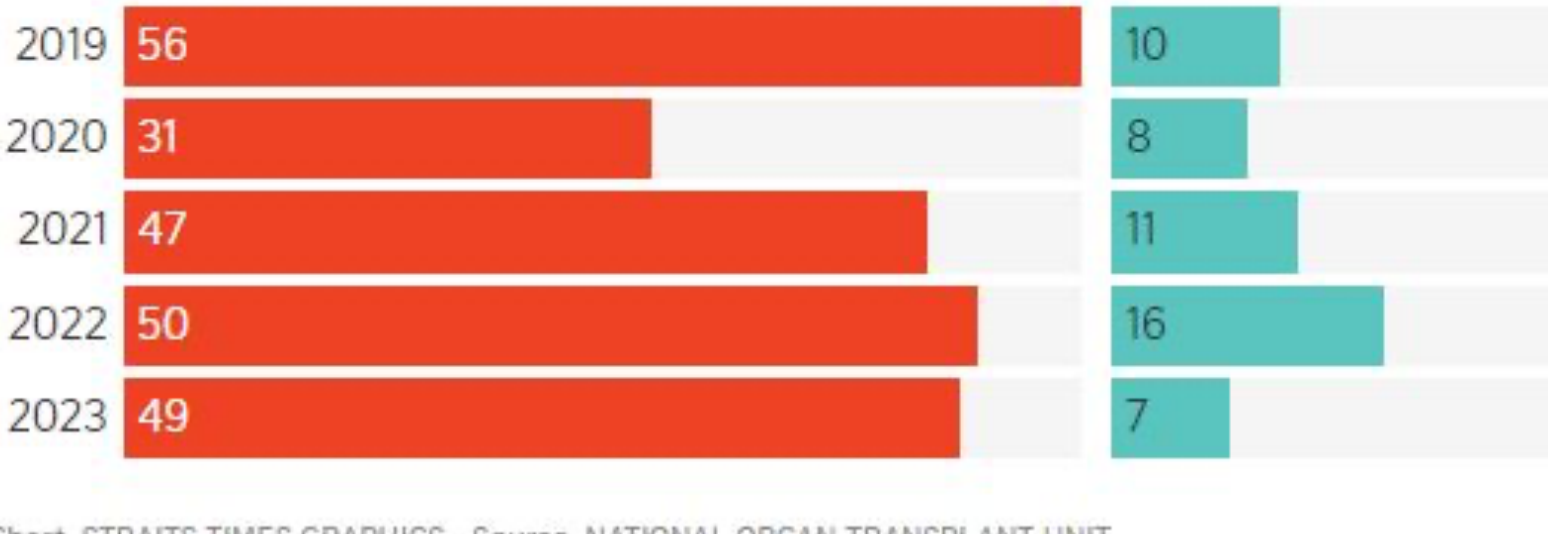


Chart: STRAITS TIMES GRAPHICS • Source: NATIONAL ORGAN TRANSPLANT UNIT

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Deceased donor organ transplants

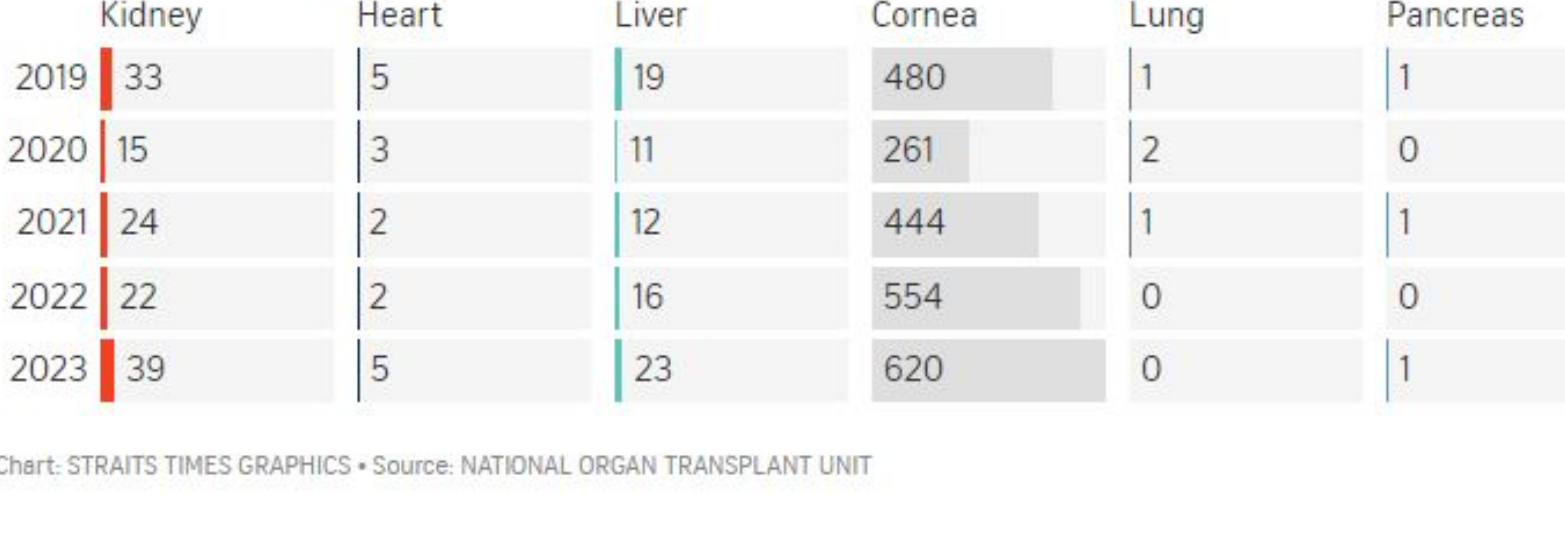


Chart: STRAITS TIMES GRAPHICS • Source: NATIONAL ORGAN TRANSPLANT UNIT

Average wait time of patients who received transplants from deceased donors in 2023

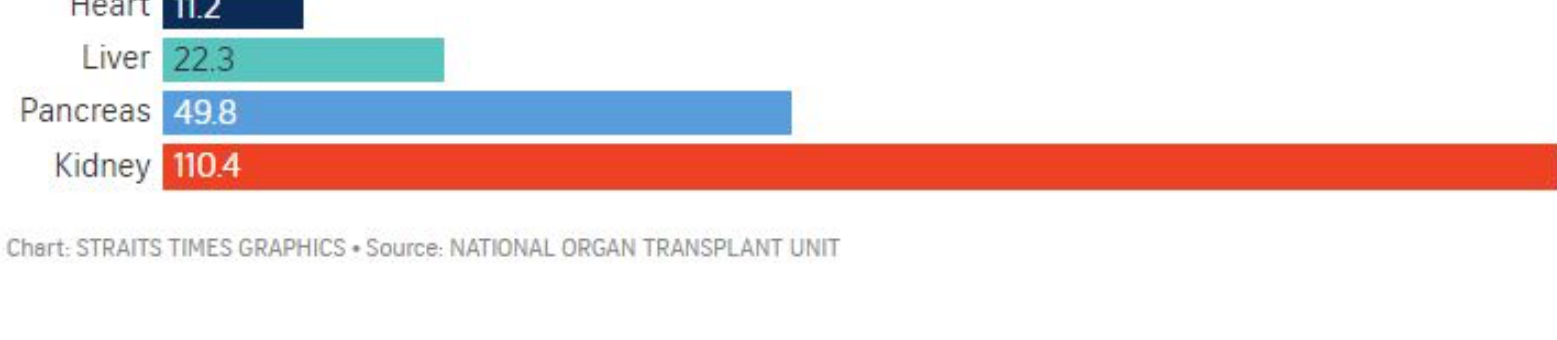


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Waiting list for organ transplants

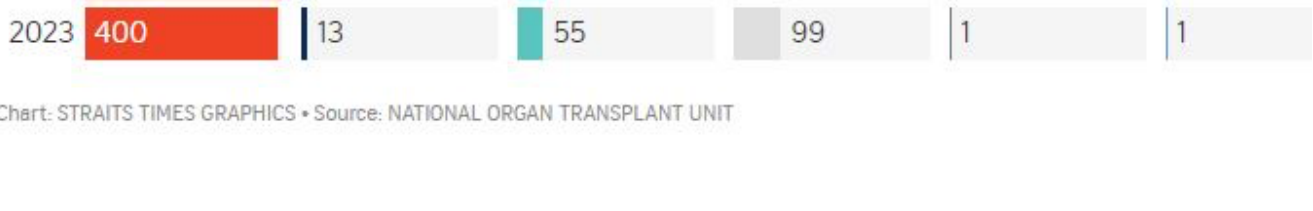


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