



Surgery and risk in Aotearoa New Zealand

Te pōkanga me te tūponotanga i Aotearoa

This infographic summarises information about surgery in Aotearoa New Zealand in 2023, including the risks associated with having surgery. It covers elective surgery (surgery planned in advance) and emergency surgery (surgery for an urgent medical condition).



Remembering the late Rob Vigor-Brown and his service to the Perioperative Mortality Review Committee as a consumer representative.

In 2023, there were:



5,223,100

people living in
Aotearoa New Zealand



210,500

surgeries



99.4%

of people were alive 30
days after their surgery*

*Being alive 30 days after surgery is an internationally recognised way to measure the success of a surgery. For those who die, it is referred to as 'all-cause mortality,' meaning that the death could have been due to any reason, not just directly related to the surgery.



A person's chance of surviving their surgery is affected by factors such as the urgency and complexity of their surgery, and how unwell they are. Other factors include their age, sex and any underlying medical conditions.

If you are unwell, talk to your doctor early. There are benefits and risks to every surgery. Your doctor will help you decide if surgery is right for you.



Elective surgery is safer than emergency surgery



Elective surgery

Elective surgery is planned in advance. It can improve a person's quality of life or stop their medical condition from becoming worse.

The chance of dying after elective surgery is very low.

In 2023, there were:

145,400 elective surgeries

266 deaths after elective surgery

99.8% of people were alive 30 days after their surgery

Emergency surgery

Emergency surgery is for an urgent medical condition. Most people who need emergency surgery will die if they don't have it.

It is less common than elective surgery; in 2023, less than one in three surgeries was for an emergency.

In 2023, there were:

65,100 emergency surgeries

1,068 deaths after emergency surgery

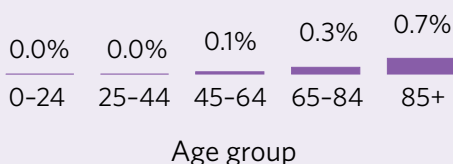
98.4 % of people were alive 30 days after their surgery

The risk of dying after surgery is higher for older people

Elective surgery

The risk of dying after elective surgery is very low. Elective surgery is slightly safer for younger people.

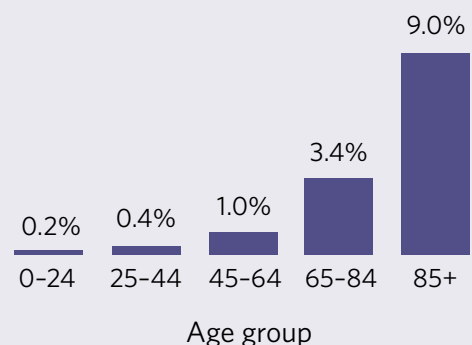
Percentage of people who died within 30 days of their elective surgery



Emergency surgery

Emergency surgery is usually done to save someone's life. Emergency surgery is safer for younger people.

Percentage of people who died within 30 days of their emergency surgery



Males had a slightly higher risk of dying after emergency surgery

This might be explained by differences in the types of surgery and reasons for why the surgery is needed, such as males being more likely to have serious injuries.

Elective surgery

Percentage of people who died within 30 days of their elective surgery:



Emergency surgery

Percentage of people who died within 30 days of their emergency surgery:



Māori and Pacific peoples had higher rates of death after emergency surgery than Pākehā and Other ethnicities

There is a combination of reasons for inequities. These reasons include lesser access to best-practice care, greater likelihood of living in socioeconomic deprived areas, and greater likelihood of having multiple comorbidities.¹

Elective surgery

Percentage of people who died within 30 days of their elective surgery:

Māori	0.1%
Pacific peoples	0.1%
Asian	0.1%
Pākehā/Other ethnicities	0.1%

Emergency surgery

Percentage of people who died within 30 days of their emergency surgery:

Māori	1.4%
Pacific peoples	1.6%
Asian	0.9%
Pākehā/Other ethnicities	0.9%

For comparisons by sex and ethnicity, we have accounted for differences in the age distribution for each group. This accounts for the fact some groups have more old or young people than other groups.

¹ The Perioperative Mortality Review Committee has investigated the ethnic inequities in surgery death rates in its previous reports. See: <https://www.hqsc.govt.nz/resources/resource-library/summary-of-perioperative-mortality-review-committee-pomrc-reports/>

Most common elective surgeries



This page shows the most common elective surgeries between 2019 and 2023.

The most common elective surgery was ophthalmic surgery, which is surgery on the eye. Between 2019 and 2023, there was an average of 18,678 eye lens surgeries per year. Cataract surgery is performed on older people, whose death could have been due to any reason, not just directly related to the surgery.

Ophthalmic (eye) surgery

Example: Cataract surgery

Average per year:

 **18,678** surgeries

0.1% | **25** people
died within 30 days

Obstetric surgery for pregnancy and childbirth

Example: Elective caesarean section and procedures immediately after delivery

Average per year:

 **16,954** surgeries

Less than **0.1%** | **1** person
died within 30 days

Surgery on the uterus

Removing tissue from the uterus or removing the whole uterus (hysterectomy)

Average per year:

 **7,248** surgeries

Less than **0.1%** | **3** people
died within 30 days

Knee surgery

Example: Knee scopes and removal of the meniscus

Average per year:

 **5,945** surgeries

0.1% | **6** people
died within 30 days

Surgery on the pelvis, hip or thigh bone

Example: Hip replacement

Average per year:

 **5,769** surgeries

0.3% | **17** people
died within 30 days

Hernia repair

Example: Inguinal or umbilical hernia repair

Average per year:

 **5,428** surgeries

Less than **0.1%** | **3** people
died within 30 days

Surgery on the ears, nose or throat

Example: Removal of tonsils (tonsillectomy) and/or removal of adenoids

Average per year:

 **5,074** surgeries

Less than **0.1%** | Less than 1 person per year
died within 30 days

Breast surgery

Example: Mastectomy, or other excision procedures on breast

Average per year:

 **4,457** surgeries

Less than **0.1%** | **2** people
died within 30 days

Surgery on the hand or finger

Example: Finger joint replacement

Average per year:

 **3,399** surgeries

Less than **0.1%** | **1** person
died within 30 days

Elective surgeries with the highest risk




This page shows the elective surgeries with the highest death rates between 2019 and 2023.

Some surgeries have higher rates of death than others. The elective surgery with the highest risk between 2019 and 2023 was surgery on the aorta. Between 2019 and 2023, there was an average of 115 aortic surgeries per year, and an average of five people (4.5 percent) died within 30 days of this surgery. The risk of dying after elective aortic surgery is much lower than the risk of dying if the surgery is not done.

Aortic surgery

Example: Repair or replacement of the aorta. The aorta carries blood from your heart to the rest of your body.

Average per year:

 **115** surgeries

4.5% | **5** people died within 30 days

Vascular surgery or aneurysm repair

Example: Treatment of an abnormal swelling of an artery (aneurysm) in the neck and/or limbs. This category excludes aortic surgery (left)

Average per year:


 **137** surgeries

3.6% | **5** people died within 30 days

Pancreatic surgery

Example: Removal of part or the whole of the pancreas

Average per year:

 **161** surgeries

2.6% | **4** people died within 30 days

Heart surgery

Example: Repair or replace a heart valve. This category does not include coronary artery bypass graft (see bottom right)

Average per year:

 **672** surgeries

2.3% | **15** people died within 30 days

Chest surgery

Example: Repair a hernia in the diaphragm

Average per year:

 **176** surgeries

1.9% | **3** people died within 30 days

Neurosurgery for brain tumours

Example: Open the skull to remove brain tumours

Average per year:

 **743** surgeries

1.7% | **13** people died within 30 days

Surgery on the (tissue) sac that surrounds the heart

Example: Drain fluid from the sac around the heart (pericardium)

Average per year:

 **129** surgeries

1.7% | **2** people died within 30 days

Vascular bypass surgery

Example: Bypass surgery of arteries in the legs

Average per year:

 **211** surgeries

1.7% | **4** people died within 30 days

Coronary artery bypass graft

Example: Placement of a graft to bypass a blocked artery so that blood can get to the heart muscle

Average per year:

 **791** surgeries

1.7% | **13** people died within 30 days

Most common emergency surgeries



This page shows the most common emergency surgeries between 2019 and 2023.

Emergency surgery is usually done to save a person's life. The most common emergency surgery was surgery for a fractured pelvis, hip or thigh bone. Between 2019 and 2023, there was an average of 6,733 pelvis, hip or thigh bone surgeries per year. An average of 355 people per year (5.3 percent) died within 30 days of their surgery.

Surgery for fractured pelvis, hip or thigh bone

Example: Repair of fractured hip or thigh bone

Average per year:

 **6,733** surgeries

5.3% | **355** people died within 30 days

Surgery for appendicitis

Example: Removal of the appendix

Average per year:

 **4,793** surgeries

0.1% | **3** people died within 30 days

Generalised orthopaedics

Examples: Remove infection, external fixation, repair of muscles and tendons

Average per year:

 **4,025** surgeries

1.4% | **56** people died within 30 days

Ankle and foot surgery

Example: Surgery for a broken ankle or foot

Average per year:

 **3,617** surgeries

0.4% | **16** people died within 30 days

Gall bladder and biliary tract surgery

Example: Removal of gallbladder (cholecystectomy)

Average per year:

 **3,554** surgeries

0.3% | **10** people died within 30 days

Surgery on the anus and rectum (bottom)

Example: Treatment of an infection (abscess) of the bottom

Average per year:

 **2,821** surgeries

0.2% | **6** people died within 30 days

Obstetric surgery for pregnancy and childbirth

Example: Emergency caesarean section, and other procedures immediately after delivery

Average per year:

 **2,606** surgeries

Less than **0.1%** | Less than 1 person per year died within 30 days

Surgery on hand or finger

Example: Repair of fracture of the hand

Average per year:

 **2,388** surgeries

0.1% | **2** people died within 30 days

Surgery for fractured forearm

Example: Repair and/or manipulation of fractured forearm

Average per year:

 **2,314** surgeries

0.1% | **2** people died within 30 days

Emergency surgeries with the highest risk



This page shows the emergency surgeries with the highest death rates between 2019 and 2023.

Emergency surgery is usually done to save a person's life. The emergency surgery with the highest risk was laparotomy. Between 2019 and 2023, there was an average of 185 laparotomies per year. An average of 34 people per year (18 percent) died within 30 days of their surgery.

Laparotomy

Example: Major surgery on the abdominal organs after a serious injury (trauma) or an infection

Average per year:

 **185** surgeries

18% | **34** people died within 30 days

Neurosurgery for brain aneurysms

Example: Open the skull to treat a brain aneurysm (abnormal swelling of artery)

Average per year:

 **107** surgeries

16% | **17** people died within 30 days

Chest surgery

Example: Repair injury to chest wall

Average per year:

 **111** surgeries

9.9% | **11** people died within 30 days

Neurosurgery for brain tumours

Example: Open the skull to remove brain tumours

Average per year:

 **1,057** surgeries

8.3% | **88** people died within 30 days

Colon surgery

Example: Removal of part of the colon

Average per year:

 **1,153** surgeries

6.3% | **72** people died within 30 days

Surgery on the small bowel

Example: Release adhesions, or relieve a blockage

Average per year:

 **843** surgeries

6.0% | **51** people died within 30 days

Stomach surgery

Example: Removal of part of the stomach for uncontrolled bleeding from ulcers or cancer

Average per year:

 **219** surgeries

5.7% | **12** people died within 30 days

Blood vessel surgery

Example: Remove a blood clot from a blood vessel or artery

Average per year:


 **306** surgeries

5.6% | **17** people died within 30 days

Heart surgery (not on coronary artery)

Example: Replacement of a heart valve

Average per year:

 **173** surgeries

5.3% | **9** people died within 30 days

About the Perioperative Mortality Review Committee | Mō te komiti

The Perioperative Mortality Subject Matter Experts advise the National Mortality Review Committee and Te Tāhū Hauora on how to reduce the number of perioperative deaths in Aotearoa New Zealand.

The Perioperative Mortality Review Committee's past work can be found here:

<https://www.hqsc.govt.nz/our-work/national-review-of-avoidable-deaths/mortality-review-workstreams/>

Useful resources | Ngā rauemi papai

Healthline, for general health advice:

<https://www.healthy.org.nz/>

Free call: 0800 611 116

Let's plan for your next health care visit:

<https://www.hqsc.govt.nz/resources/resource-library/lets-plan-for-your-next-health-care-visit/>

What is anaesthesia?:

<https://www.anzca.edu.au/patient-information/anaesthesia-information-for-patients-and-carers>

Preparing for surgery:

<https://healthify.nz/health-a-z/s/surgery-preparing-for/>

Let's plan to leave hospital:

<https://www.hqsc.govt.nz/resources/resource-library/lets-plan-to-leave-hospital/>

How we calculated the data | Te tātari raraunga

In this document, 'surgeries' are hospital admissions that involved a surgery performed by a surgeon in a theatre. This is a change from our last infographic published December 2022 where 'surgeries' were hospital admissions that involved a general or neuraxial anaesthetic. Results cannot therefore be directly compared. Only publicly funded hospital admissions and the most complex surgery in a hospital stay are included.

The riskiest surgeries only show surgeries that occurred more than 500 times between 2019 and 2023.²

Because surgery is safer for younger people, we used 'age standardisation' to adjust for differences in the age distribution of different groups. For comparing

males with females, we standardised with the age distribution of surgeries (all ethnicities) in 2023.

For comparing different ethnicities, we used the age distribution of all surgeries for Māori in 2023.³ In this document, we have used 'prioritised ethnicity,' which is commonly used by the health sector. Prioritised ethnicity assigns people to only one ethnic group.⁴ This method gives Māori highest priority, followed by Pacific peoples, Asian, other ethnic groups and then European. In practice, if someone identifies as both Māori and Pacific, they will be counted in the Māori group. If someone identifies as both Pacific and European, they will be counted in the Pacific group.

As a result, a person's prioritised ethnicity may not represent their preferred ethnic identity.

² We followed the methodology of Gurney JK, McLeod M, Stanley J, et al. 2020. Postoperative mortality in New Zealand following general anaesthetic: demographic patterns and temporal trends. *BMJ Open* 10: e036451. DOI: 10.1136/bmjopen-2019-036451. We used a modified version of surgery groupings from Campbell D, Boyle L, Soakell-Ho M, et al. 2019. National risk prediction model for perioperative mortality in non-cardiac surgery. *British Journal of Surgery* 106: 1549-57. DOI: 10.1002/bjs.11232

³ Gurney JK, McLeod M, Stanley J, et al. 2022. Regional variation in post-operative mortality in New Zealand. *ANZ Journal of Surgery* 92: 1015-25. DOI: 10.1111/ans.17510.

⁴ Ministry of Health. 2017. HISO 10001:2017 Ethnicity Data Protocols. Wellington: Ministry of Health. URL: https://www.tewhātuora.govt.nz/assets/Our-health-system/Digital-health/Health-information-standards/hiso_10001-2017_ethnicity_data_protocols_21_apr.docx (accessed 25 September 2024)

Talk to your health professional for advice that is specific to you.
For more general advice ring Healthline: 0800 611 116

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