Extract taken from the full report, *National point prevalence survey of healthcare-associated infections | Tiro whānui ā-motu mō te maimoa hauora – mate urutā,* which is available online at: www.hqsc.govt.nz/resources/resource-library/pps-report-2022 (published May 2022 by the Health Quality & Safety Commission). Enquiries to: info@hqsc.govt.nz.

Executive summary | He whakarāpopotonga matua

This report describes the approach to and findings of Aotearoa New Zealand's first national point prevalence survey (PPS) of healthcare-associated infections (HAIs). The infection prevention and control team of the Health Quality & Safety Commission (the Commission) led the survey, with the aim of estimating the total burden (prevalence) of HAIs among adult patients in Aotearoa New Zealand public hospitals. This information will help us identify targets for quality improvement.

Planning for the PPS began in July 2020. A team of trained surveyors then conducted the survey between February and June 2021. A total of 5,469 adult patients were included, representing 313 wards across 31 hospitals from all 20 district health boards (DHBs). The survey followed international methodology and used standard HAI definitions.

Results showed 361 patients had at least one HAI, and together had a total of 423 HAIs. The national point prevalence of HAIs was 6.6 percent and the HAI rate was 7.7 infections per 100 patients. The national rate is similar to rates reported in other countries and regions such as Wales, Switzerland and the European Union.

The following were key findings from the PPS:

- HAIs were more common in intensive care (23 percent) and surgical (8 percent) patients than in medical patients (4 percent) ($p < 0.001$).
- Four HAI types contributed 74 percent (rounded) of all HAIs: surgical site infections (SSIs) (25 percent); urinary tract infections (UTIs) (19 percent); pneumonia (18 percent); and bloodstream infections (BSIs) (13 percent).
- Of all patients in the survey, 66 percent had at least one invasive device in place. The most common types of devices were peripheral intravenous catheter (PIVC) (53 percent of all patients), central venous catheter (CVC) (10 percent) or urinary catheter (18 percent).
- Univariate analyses do not show any association between higher HAI rates and ethnicity, gender of patients or referral of patients from regional DHBs.
- Age, presence of a device and emergency admission were associated with higher HAI rates.
- *Clostridioides difficile (C. difficile)* infection was uncommon (1.7 percent).

Specific pathogens were identified in 301 of the 423 HAIs. The most common isolates were *Staphylococcus aureus* (*S. aureus*) (21 percent), *Escherichia coli* (20 percent) and *Enterococcus* species (12 percent). Of the isolates, 42 (14 percent) had antimicrobial resistance; 13 percent of *S. aureus* were methicillin-resistant *S. aureus* (MRSA) and 28 percent of enteric Gram-negative bacilli had cephalosporin or carbapenem resistance. No *Enterococcus* isolate was vancomycin resistant.

These findings will inform planning to reduce HAIs. Obvious focus areas include:

Reduce *S. aureus* infections associated with intravascular catheters

- Prevention of peripheral intravenous catheter infections
- Prevention of central venous catheter infections

Reduce SSI due to *S. aureus*

- Expand the use of the 'anti-staphylococcal' bundle across all clean surgery

Reduce all infections associated with medical devices

- Introduce care bundles for urinary catheter use
- Introduce care bundles for ventilator-associated and hospital-acquired pneumonia

Key findings | Ngā tino kitenga

Healthcare-associated infections (HAIs)

1 in 15 patients
(approximately) had an HAI

Of these:
60%
a microorganism was reported

14% were resistant organisms

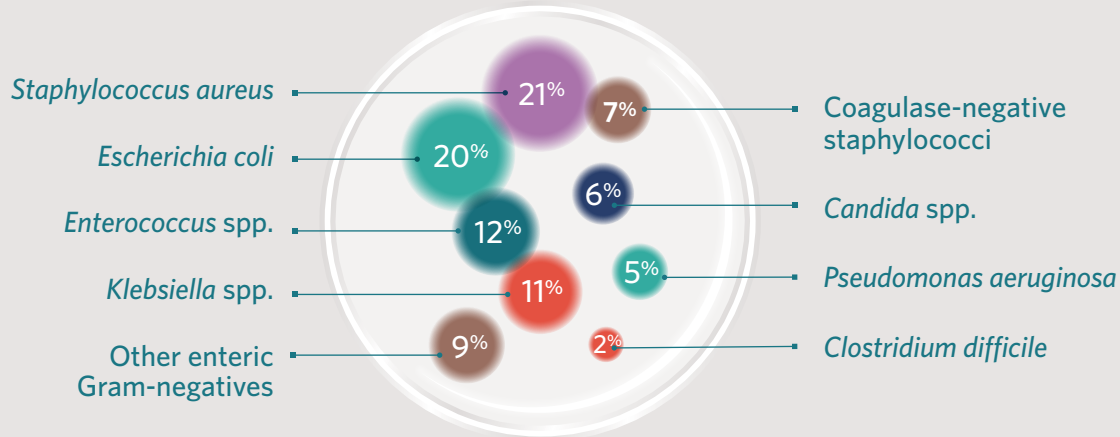
Antimicrobial usage

Approximately **1 in 3** of all patients were taking antimicrobials

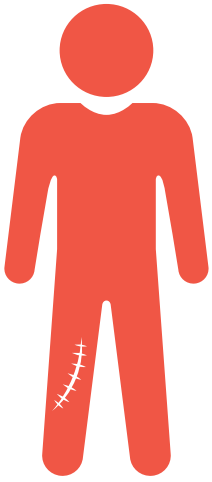
Types of HAIs

- Pneumonia/lower respiratory tract — 18%
- Urinary tract — 19%
- Surgical site — 25%
- Bloodstream — 13%
- Systemic — 4%
- Skin/soft tissue — 4%
- Other — 17%

The most frequently reported microorganisms in HAIs



Key findings – surgical site infection (SSI) | Ngā tino kitenga – mate wāhi kokoti



SSI accounted for **25% of all healthcare-associated infections**

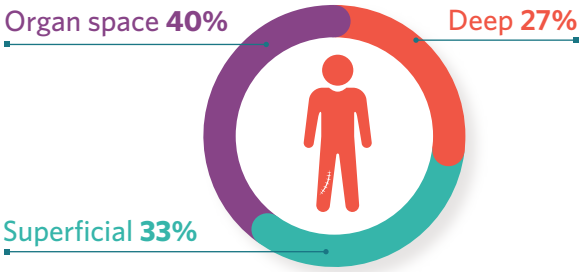
Proportion of surgical patients with an SSI

5.2% of surgical patients had an SSI (1:20)

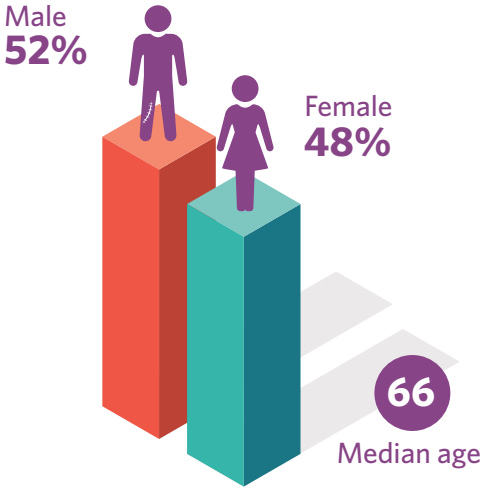
Surgical specialities

Speciality	%
General surgery	21
Orthopaedic	41
Cardiac	12
Obstetrics/gynaecology	7
Other	19

SSI type



SSI demographics



SSI causative microorganisms

Top 5	%
Staphylococcus aureus	31
Other enteric Gram-negatives	21
Escherichia coli	13
Enterococcus spp.	9
Klebsiella spp.	6

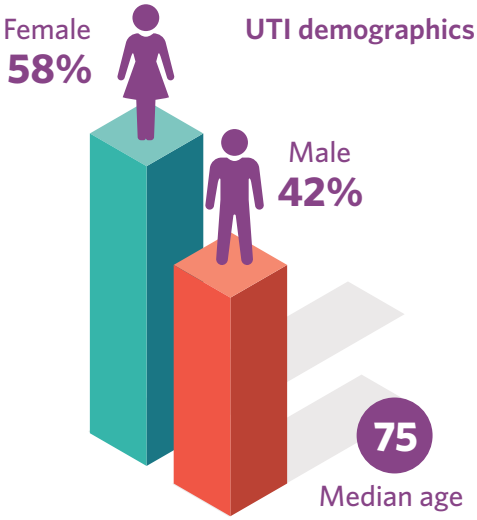
Key findings – urinary tract infection (UTI) | Ngā tino kitenga – mate roma mimi

UTI accounted for
19% of all healthcare-associated infections

UTI causative microorganisms

Top 5	%
Escherichia coli	41
Klebsiella spp.	15
Enterococcus spp.	14
Other Gram-negatives	13
Candida spp.	9

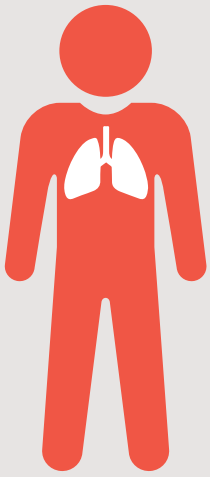
UTI demographics



Urinary catheterisation

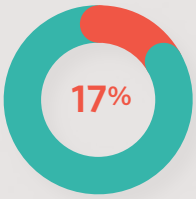
49% of patients with a UTI had a catheter in situ within 7 days before onset of infection

Key findings – pneumonia | Ngā tino kitenga – niumōnia



Proportion of pneumonia

Pneumonia accounted for **18% of all healthcare-associated infections**



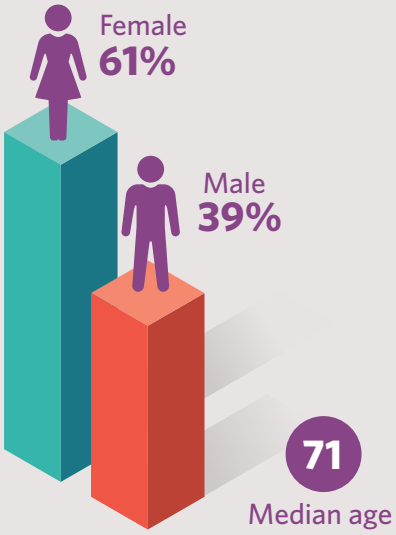
Intubation

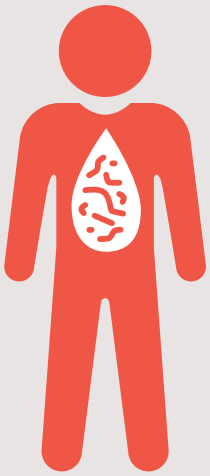
17% of patients with pneumonia were intubated within 48 hours before infection

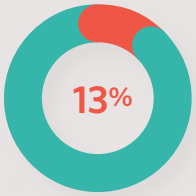
Pneumonia causative microorganisms (n = 17)

Top 3	%
Other Gram-negatives n=8	42
Staphylococcus aureus n=3	18
Klebsiella spp. n=3	18

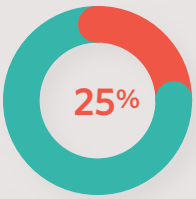
Pneumonia demographics







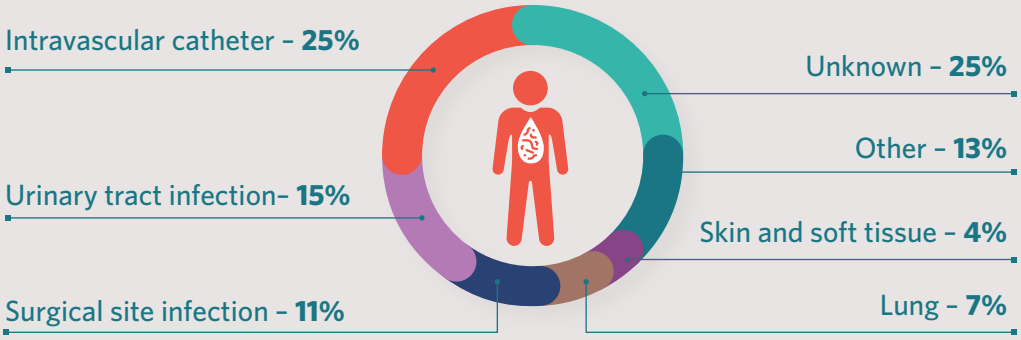
Healthcare-associated BSI accounted for **13% of all healthcare-associated infections**



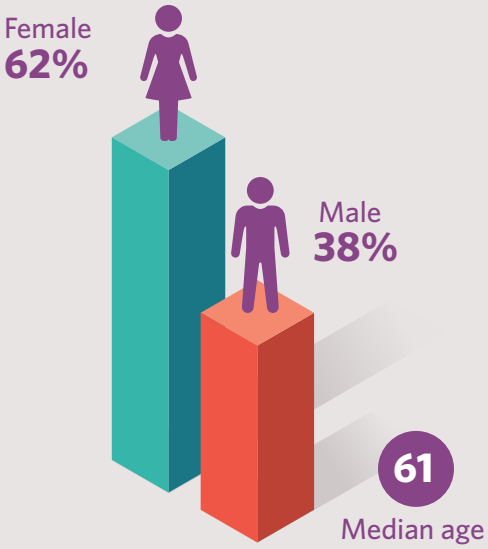
Vascular catheterisation

25% of patients with a BSI had a vascular catheter in-situ within 48 hours before infection

BSI source



BSI demographics



BSI causative microorganisms

Top 5	%
Staphylococcus aureus	25
Other enteric Gram-negatives	17
Escherichia coli	15
Enterococcus spp.	15
Klebsiella spp.	14

Patient perspectives | He kupu kōrero a ngā tūroro

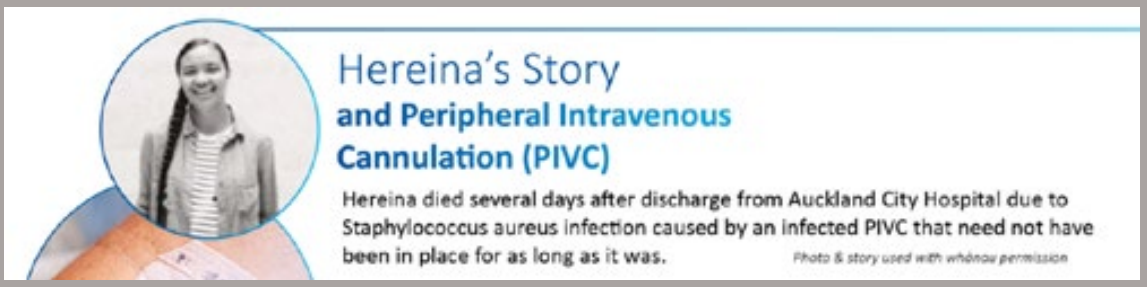
Healthcare-associated infections (HAIs) can negatively impact on the physical and mental health of patients and their whānau, resulting in a poorer quality of life. Patients with an HAI can suffer pain and anxiety, as well as being more at risk of secondary complications such as delayed wound healing or a bloodstream infection. In addition, an HAI can extend their length of stay in hospital, get them re-admitted to hospital or require multiple follow-up appointments. All of these experiences can result in significant disability, along with social, financial and emotional distress for the patient and their whānau.

It is important that we listen to our consumers and understand the effect HAIs have on their lives. The following stories and case studies provide consumer perspectives of having an HAI.

We are grateful to all those who have been generous in sharing their experience with us.

Hereina's story

Hereina Te Moana Matenga Searancke passed away on 21 January 2017 aged 20 years. She died from complications resulting from an infection associated with a peripheral intravenous catheter. Her family shared her story to help prevent other patients from getting an HAI. Hereina's story features in a poster that highlights the serious risk of morbidity and mortality associated with using peripheral intravenous cannulation. Her whānau gave their permission for us to include part of the poster here.



Hazel's story

In the video below, Hazel talks about the physical, emotional and financial impacts of having a surgical site infection following a total hip replacement. https://vimeo.com/241770442.

Case studies

The following case studies come from district health board (DHB) reports on adverse events that have resulted from HAIs. They provide a snapshot of the impact that an HAI can have on patients, including unexpected complications, longer treatment times, hospital re-admissions, unplanned surgery and intravenous antibiotics.

HAI requiring re-admissions to hospital

A 66-year-old man had an inpatient urological procedure and was discharged home two days later. He presented to hospital four days later with signs of sepsis. Three blood cultures were taken on the day of his re-admission; he was started on amoxicillin and discharged two days later. However, the blood culture grew *P. aeruginosa* so he was recalled to hospital for three days of intravenous (IV) antibiotics. He was then discharged to complete a seven-day course of antibiotics.

HAI resulting in clotting and longer treatment with IV antibiotics as an outpatient

A 66-year-old woman with a diagnosis of breast cancer had a portacath placed (implanted venous access device) to make it easier for her to have chemotherapy. Several months later, the hospital saw her as an acute patient because she had fever, swelling and pain associated with the portacath site. Blood cultures grew a methicillin-resistant *Staphylococcus aureus* (MRSA).

The planned treatment was two weeks of vancomycin given through a peripherally inserted central catheter (PICC). However, after six days of treatment she returned to hospital with fever again and further blood cultures grew MRSA. A computerised tomography (CT) scan showed a thrombus (clot) in the left internal jugular vein as well as a localised collection at the exit site of the portacath.

In total, the woman completed six weeks of intravenous (IV) antibiotic treatment with vancomycin, which the district nursing service administered daily. She also required six months of anticoagulation therapy to manage the thrombus.

HAI requiring lifelong antibiotics

A 75-year-old man was admitted for a neurosurgical procedure for a brain tumour. Five days after the operation, he developed fever and headache. Blood and cerebrospinal fluid grew *Serratia marcescens* and an organ space SSI was diagnosed. He required 21 days of intravenous antibiotics, leading him to spend one month in hospital in total. After he was discharged, he had to have lifelong oral antibiotics.

HAI requiring two additional operations

A 34-year-old man had an orthopaedic procedure on his left tibia (shinbone) at a private surgical hospital and returned two weeks later with an infected haematoma. He was admitted to the local DHB hospital for ongoing management. He grew *Staphylococcus aureus* in his blood and from pus and tissue collected in the operating theatre. He required two operations and 28 days of IV antibiotics to manage the infection. He remained on oral antibiotics for a further four months.