Out-of-Hospital Cardiac Arrest Registry

Rēhita Mate Manawa mō waho i te Hōhipera

Aotearoa New Zealand, National Report 2023/24

Hato Hone St John

WELLINGTON FREE AMBULANCE
kia ora te tangata

AUT

WHAKARATONGA IWI
FIRE EMERGENCY NEW ZEALAND

About this report
Mō tēnei pūrongorongo

The data presented in this report are for all OHCA attended by the Hato Hone St John and Wellington Free Ambulance EAS in the period from 1 July 2023 to 30 June 2024.

The data presented in this report primarily relate to events that were either 'attended' or where there was a 'resuscitation attempted' by EAS personnel. 'Attended' refers to all OHCA where EAS personnel arrived at the scene regardless of whether or not a resuscitation attempt was made. 'Resuscitation attempted' refers only to those events where an attempt at resuscitation was made by EAS personnel or successful defibrillation occurred prior to the arrival of EAS personnel.

Unless otherwise stated, all analyses exclude cardiac arrests witnessed by EAS personnel. Unless otherwise stated, survival refers to survival to 30 days post cardiac arrest.

All population figures in this report are derived from either Statistics New Zealand population data or the Te Whatu Ora Health NZ populations web tool.

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Publication date: February 2025

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ISSN 2703-4100 (Online)

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Introduction
Whakatakinga

Every year in New Zealand over 2,000 people are treated for a cardiac arrest that occurs in the community.

Cardiac arrest is the sudden loss of heart function, where the heart cannot effectively pump blood to vital organs. Without rapid intervention, cardiac arrest will always result in death. For every minute without CPR or defibrillation, a patient's chance of survival falls by 10–15 percent. Every New Zealander can make a difference in the chain of survival.

I ia tau i Aotearoa nei, nui ake i te 2,000 tāngata e haumanu ana i te mate manawa i te hapori.

Ko te mate manawa te ngaro ohorere o te mahi manawa, ā, tē taea e te manawa te whakarere toto pai ki ngā whēkau whakahirahira. Nā te korenga o te hāpaiora wawe, ko te otinga nui, ko te mate i ngā wā katoa. I ia miniti me te korenga o te CPR, o te whakahihiko manawa rānei, ka heke iho te āheinga o ngā tūroro ora tonu ai i te 10–15 paihēneti. He mana tō ngā tāngata katoa o Aotearoa i te raupapa whakaora.

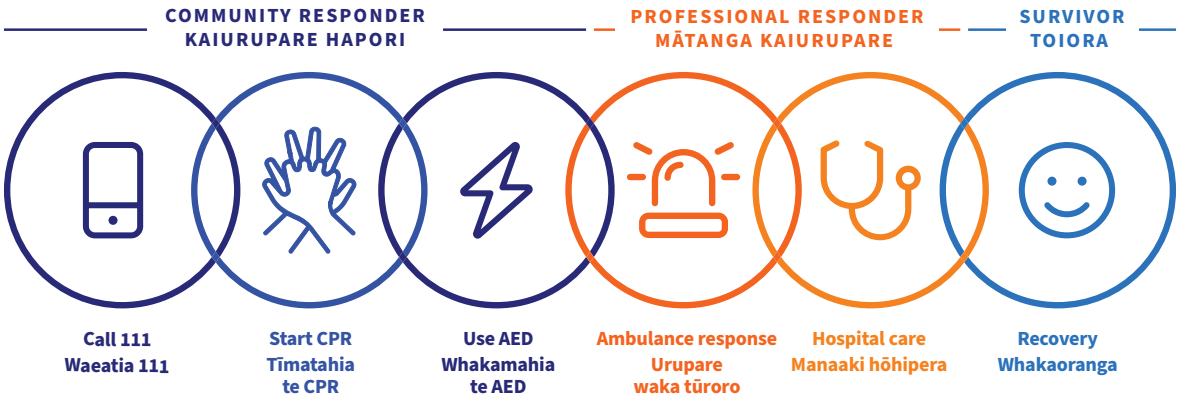


Figure 1: Chain of survival.[A]

Survival from out-of-hospital cardiac arrest (OCHA) is largely due to the quick actions of bystanders who initiate CPR and use a defibrillator (or AED). Community initiatives such as free CPR awareness training, Shocktober, CPR in schools and the GoodSAM smartphone application prepare and enable everyday New Zealanders to respond.

Alongside the community, ambulance and fire services have a strong influence on outcomes. In this report, we benchmark ourselves internationally on our resuscitation performance, from the community response to advanced life support.

A Chain of survival adapted from: https://www.sca-aware.org/about-sudden-cardiac-arrest/the-chain-of-survival

How we respond to out-of-hospital cardiac arrest in New Zealand

Aotearoa New Zealand (NZ) has an estimated population of 5.3million, with 77% residing in the North Island. The median age of a New Zealander is 38 years and the life expectancy at birth for male New Zealanders is 80 years and females is 84 years (stats.govt.nz).

The data presented in this report are for all out-of-hospital cardiac arrests (OHCA) attended by Hato Hone St John (HHStJ) and Wellington Free Ambulance (WFA). WFA services the greater Wellington and Wairarapa region (approximately 10% of NZ's population) and HHStJ services the remaining 90%. Clinicians from both ambulance services receive regular training in high-performance CPR and operate under the Aotearoa New Zealand National (EAS) Clinical Practice Guidelines. These guidelines include advice on when it is appropriate to start and cease resuscitation attempts.

In NZ, phoning 111 will connect you with the Initial Call Answering Platform, who then forward the call to the appropriate emergency service provider (Police, Fire, Ambulance). Our ambulance communication centres use the Medical Priority Dispatch System for telephone triage.

When telephone triage indicates a potential cardiac arrest event, the following procedures are initiated:

1. The six closest GoodSAM responders within the designated alert radius of the incident are automatically notified.

2. Incident details are sent to the Fire Service for co-dispatch of Fire and Emergency (FENZ) personnel.

3. The closest available ambulance resource is immediately dispatched to the incident.

4. The closest available Critical Care Paramedic is concurrently dispatched to the incident.

5. An alert is broadcast over the relevant ambulance radio frequency, enabling nearby resources that may not be visible to the dispatcher to respond.

6. Whenever possible, the call handler provides telephone CPR instructions and may guide bystanders to the closest defibrillator.

Executive summary
Tuhinga whakarāpopoto nui

2,547
people this year were treated for an out-of-hospital cardiac arrest in New Zealand.
3.6% increase from previous year
69% male

Median age (years)

59	62	70
Māori	Pacific Peoples	Non-Māori/ Non-Pacific Peoples

72%
of cardiac arrests occurred at home

83%
of witnessed OHCA received bystander CPR

2.8×
increased survival when a witnessed OHCA received bystander CPR[A]

2.3×
increased survival for patients with an initial shockable rhythm if community defibrillation occurred[A]

7%
received defibrillation by a Community Responder prior to ambulance arrival

1.6×
increased survival when a GoodSAM responder is on scene[A]

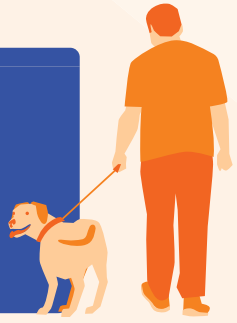
24%
of events were attended by a GoodSAM responder

94%
of events were co-responded to and attended by Fire and Emergency New Zealand

24%
had a pulse on arrival at hospital

The median time in which an EAS ambulance reached a patient was **9 minutes** in urban communities and **12 minutes** in rural and remote communities

11%
of patients survived to 30 days post the event. **(31% survival in the Utstein cohort)**



All events, adult, resuscitation attempted: includes adults (≥ 15 years old), all-cause, resuscitation attempted. Excludes children, and EAS personnel witnessed events.

A Odds ratio adjusted for age and sex

Key metrics
Pūnaha matua

Over the last 5 years the number of OHCA events with attempted resuscitation has increased. 30 day survival has remained constant at 11% for the past 4 years (figure 2).

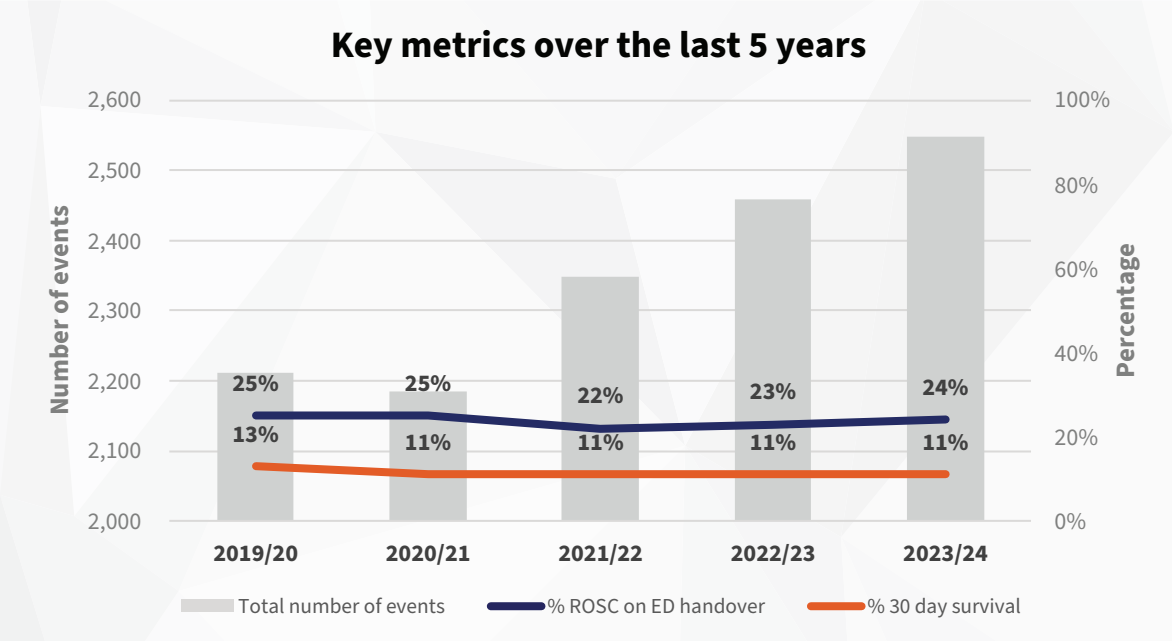


Figure 2. Key metrics over the last 5 years.[A]

A Includes adults (≥15 years), resuscitation attempted. Excludes EAS witnessed events

Utstein comparator group
Utstein whakataurite rōpū

One important international comparison uses a carefully standardised subgroup of patients known as the 'Utstein Comparator Group'. This subgroup requires that the following criteria be met: includes adults (≥15 years old), all-cause, resuscitation attempted, shockable presenting rhythm and bystander witnessed. Excludes children, EAS witnessed and no resuscitation attempt.

In the 2023/24 year, the survival rate for the Utstein comparator group increased from the previous two years (figure 3).

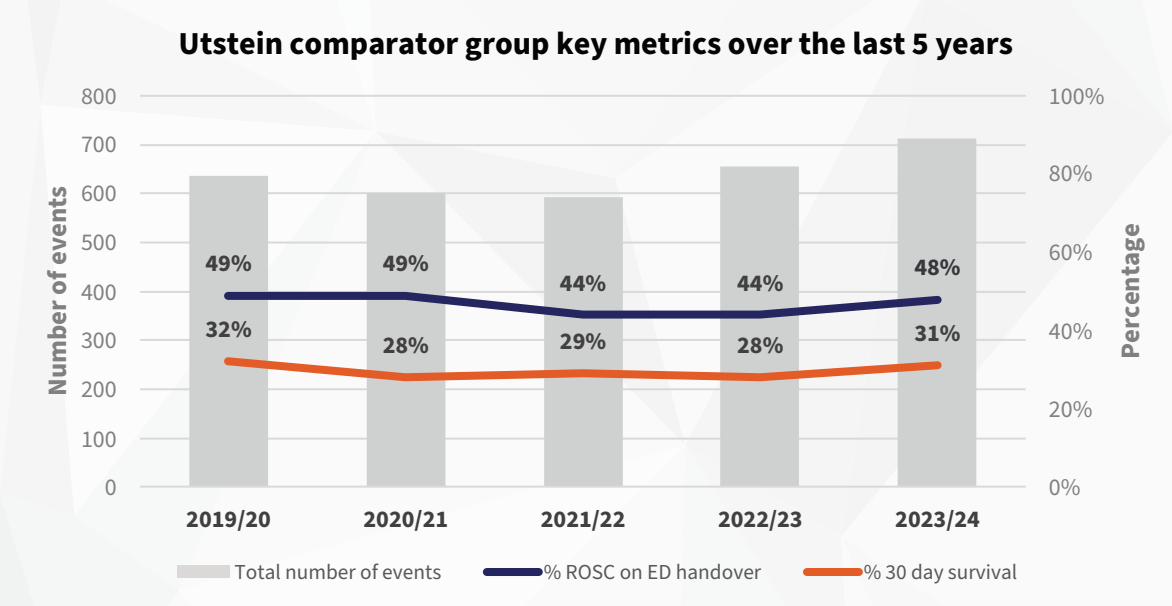


Figure 3. Utstein comparator group key metrics over the last 5 years.[A]

Figure 4 compares the NZ Utstein comparator group survival rate with that of other ambulance services.

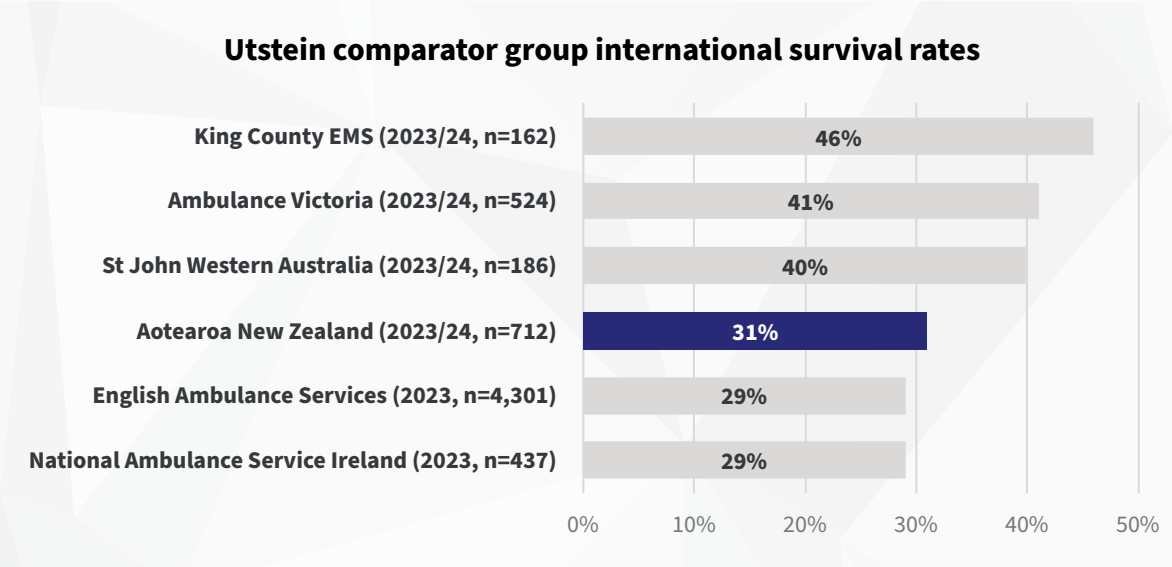


Figure 4. Utstein comparator group international survival rates.[A,B,C,D]

A Includes adults (≥15 years), resuscitation attempted, shockable presenting rhythm, bystander witnessed. Excludes EAS witnessed events.
B NZ, English Ambulance Services, and St John Western Australia report on survival to 30 days, all other services report on survival to hospital discharge.
C English Ambulance Services report on all ages. National Ambulance Service Ireland reports on patients ≥17 years old.
D King County EMS exclude cardiac arrests with penetrating or blunt trauma mechanisms.

Incidence and demographics
Taupori pāpātanga me Taupori āhuatanga

Incidence

The overall incidence of OHCA has been increasing over the last 5 years. In 2023/24 the incidence of OHCA for adults was 134 per 100,000 person-years. For children, it was 13 per 100,000 person-years.

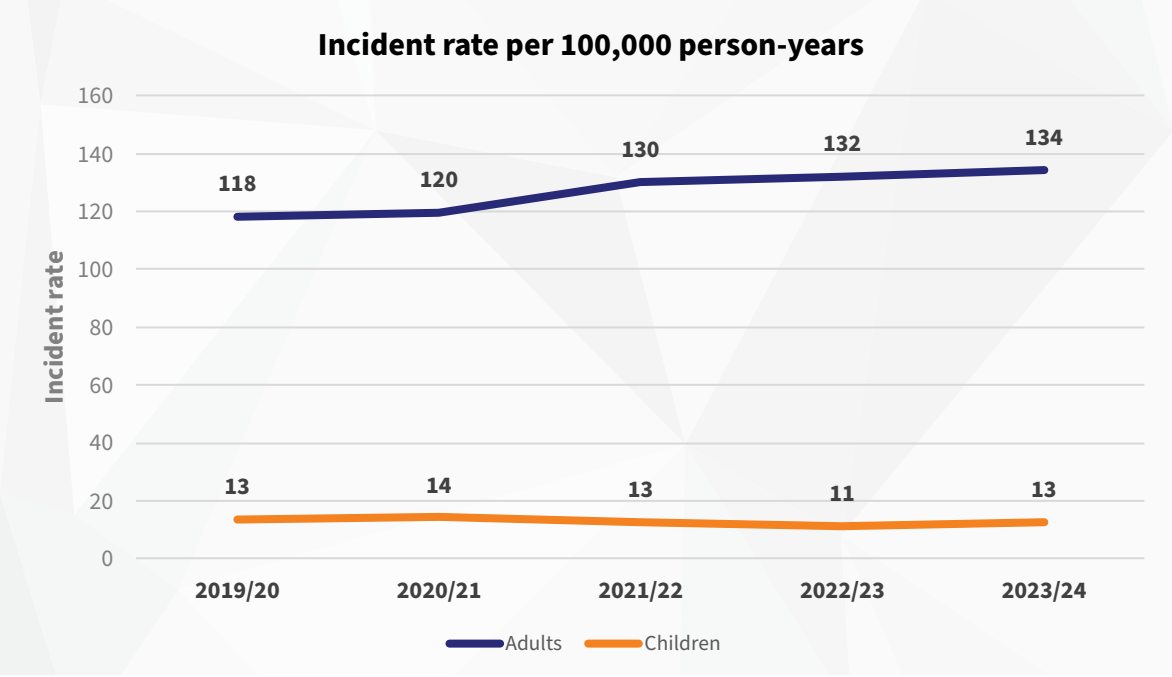


Figure 5. Incident rate per 100,000 person-years.[A]

A All events, attended, all cause, resuscitation attempted and no resuscitation attempted. Excludes EAS witnessed events. Population rates from Te Whatu Ora Health NZ populations web tool.

Subgroup comparisons of incidence rates

Figure 6 compares OHCA incidence by sex, rurality, ethnicity, and deprivation. Odds ratios above 1 mean that incidence is higher in the cohort of interest than the comparison group. An odds ratio below 1 means the incidence is lower in the cohort of interest. The horizontal bars show the 95% confidence interval.

In 2023/24 males had 1.9 times higher incidence of OHCA than females, and OHCAs located in rural areas had 1.3 times higher incidence than those in urban areas. The most deprived had 2.2 times higher OHCA incidence than the least deprived.

Māori and Pacific Peoples had 1.3 times higher incidence than non-Māori and non-Pacific Peoples respectively. Asians had a lower incidence of OHCA than non-Asians.

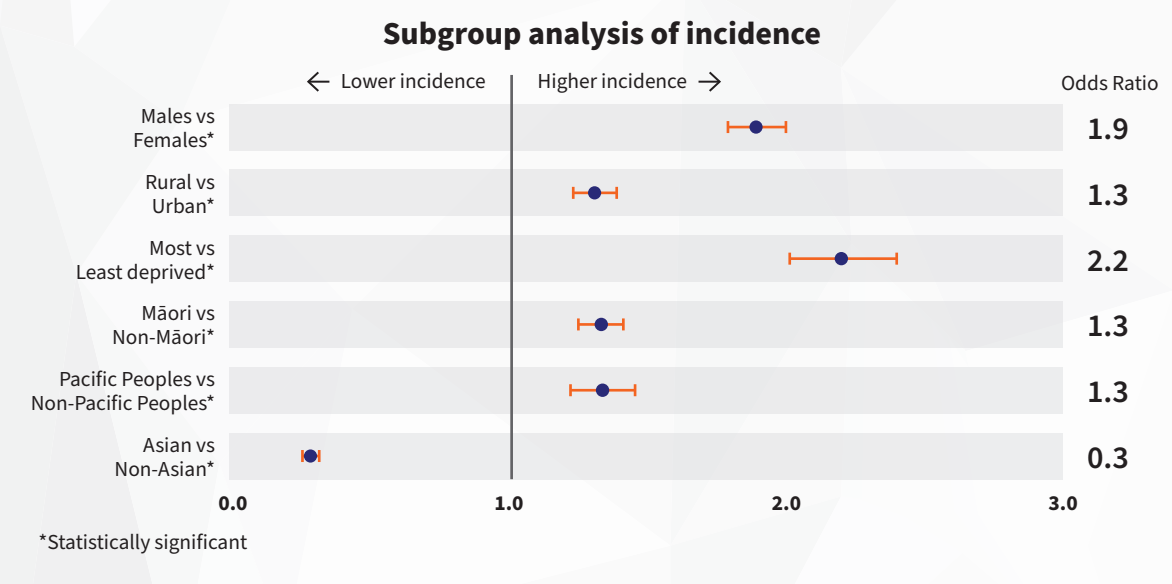


Figure 6. Subgroup analysis of incidence.[A]

A All events, attended, all cause, includes adults and children, resuscitation attempted and no resuscitation attempted. Excludes EAS witnessed events. Ethnicity-specific rates were calculated based on the Manatū Hauora Ministry of Health prioritised ethnicity categories. Population rates for sex, ethnicity, and deprivation are from Te Whatu Ora Health NZ populations web tool. Rural and urban populations are derived from the Geographical classification for Health.

Key demographics

	Adults (≥15 years)	Children
Number of OHCA events	5,850	123
% Male	65%	64%
% Bystander witnessed	32%	26%
% Resuscitation attempted	44%	69%

Figure 7: Key demographics.[A]

Median age (years)

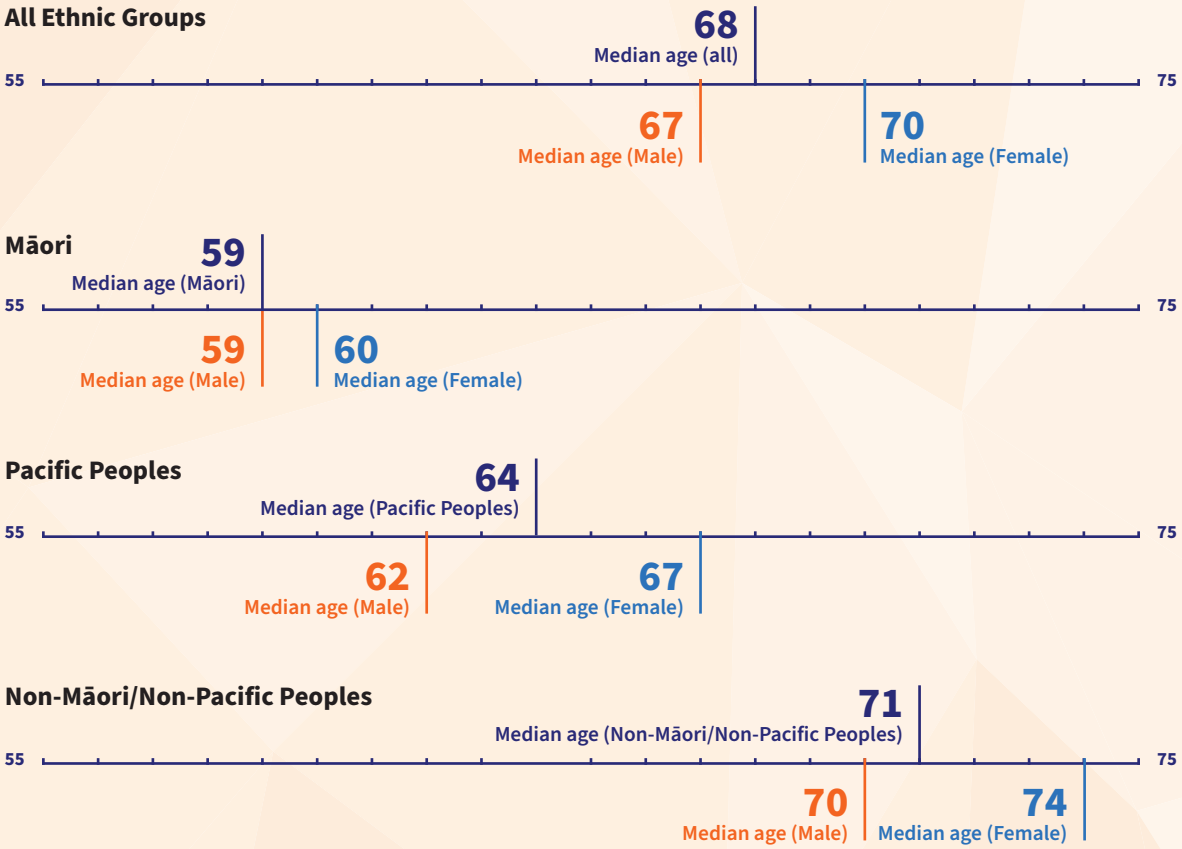


Figure 8: Median age of OHCA patients (years).[A]

A All events, attended, all cause, resuscitation attempted and no resuscitation attempted. Excludes EAS witnessed events.

Precipitating events

The most common aetiology of OHCA was that of a presumed cardiac cause (76%). An OHCA event is presumed to be of cardiac aetiology unless there is another clear cause.

The leading cause of OHCA in under 5-year-olds was respiratory causes followed by Sudden Unexpected Death in Infancy (SUDI).

In the 15–24 year age group, asphyxia (including hanging) and trauma were the most common causes (figure 9).

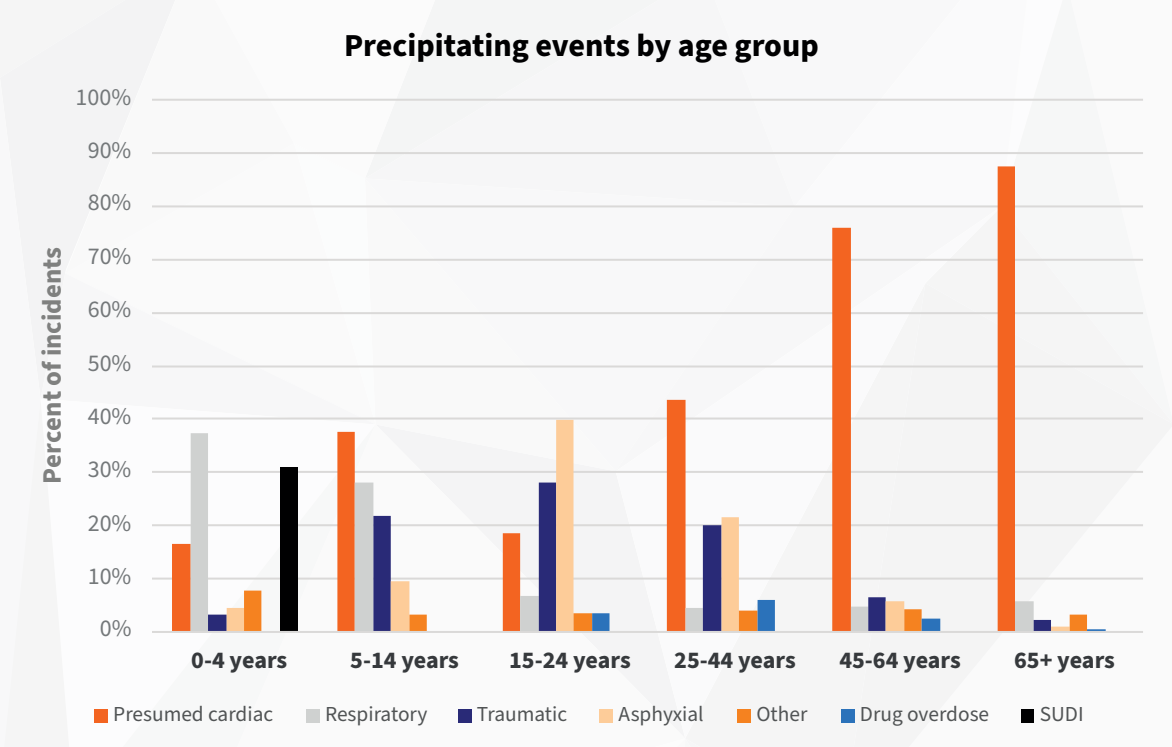


Figure 9. Precipitating events by age group.[A]

OHCA location

The most common place for an OHCA to occur is in a person's home (76%) followed by a public area (15%), which includes the workplace, street, shopping centre or similar (figure 10).

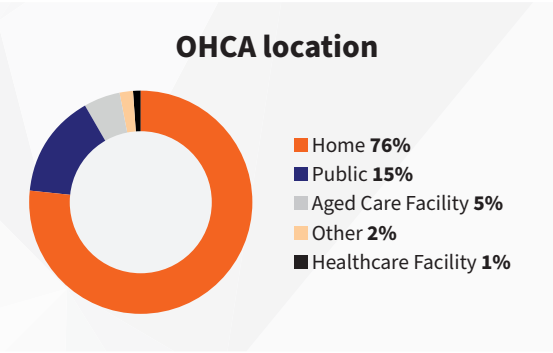


Figure 10. OHCA location.[A]

A All events, attended, all cause, resuscitation attempted and no resuscitation attempted. Excludes EAS witnessed events.

Interventions
Wawaotanga

Response times

There have been small fluctuations in both urban and rural EAS response times in the past 5 years (figure 11).

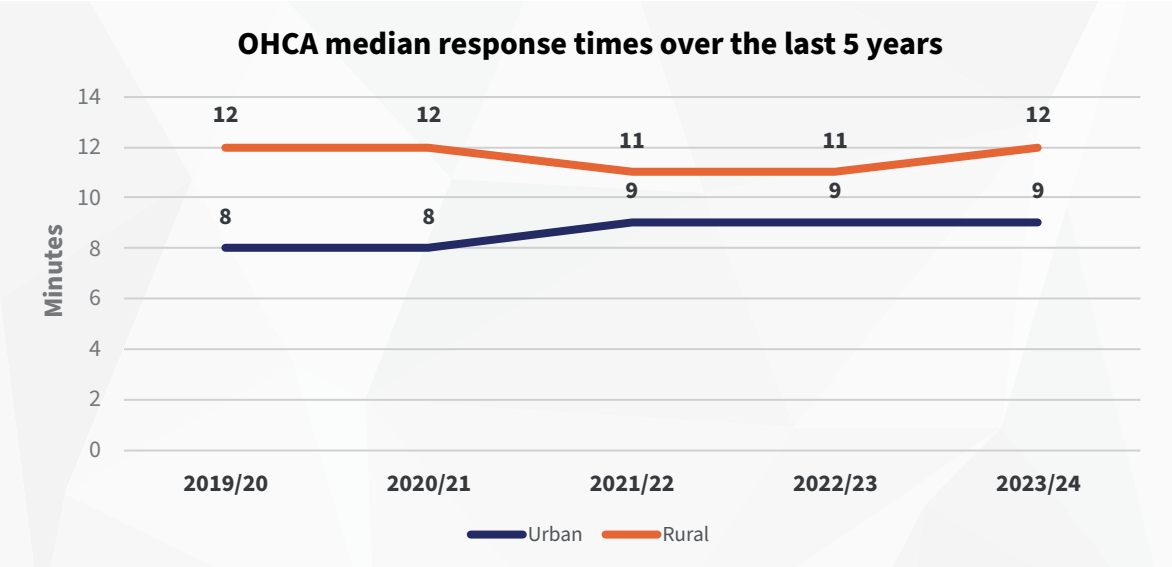


Figure 11. OHCA median response times over the last 5 years.[A]

Bystander CPR

There has been a slight increase in bystander CPR rates over the last 5 years. In 2023/24, 83% of bystander witnessed OHCA with resuscitation attempted had bystander CPR prior to EAS arrival (figure 12).

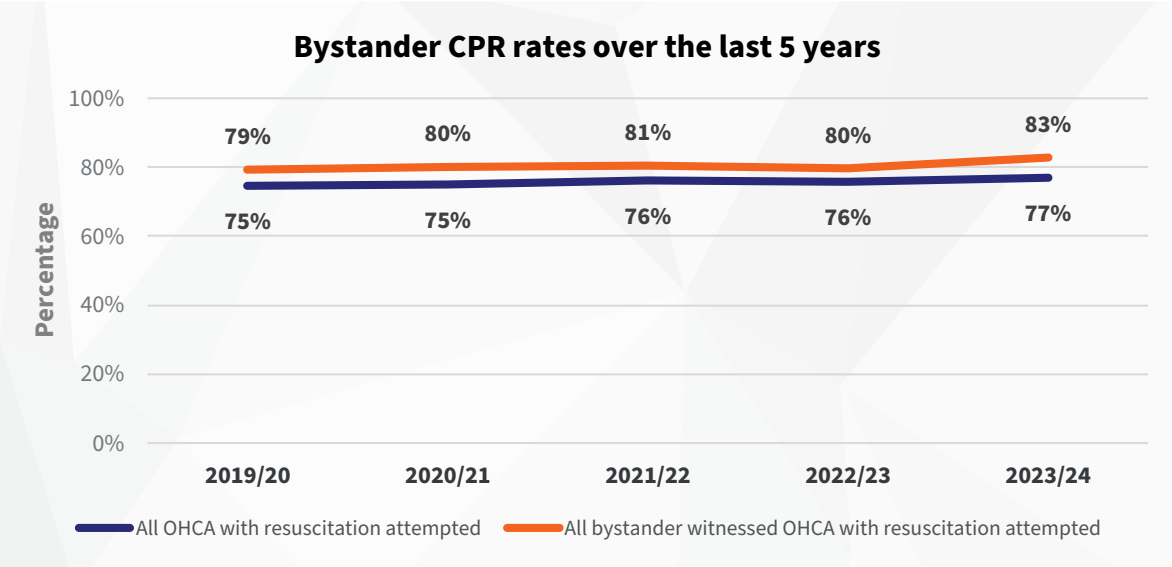


Figure 12. Bystander CPR rates over the last 5 years.[A]

A Includes adults (≥15 years), resuscitation attempted. Excludes EAS witnessed events.

Subgroup comparisons of bystander CPR

Figure 11 compares bystander CPR rates by sex, rurality, ethnicity, and deprivation. Ratios above 1 mean the odds of bystander CPR are higher in the cohort of interest than the comparison group. A ratio below 1 means the odds of bystander CPR are lower in the cohort of interest. The horizontal bars show the 95% confidence interval.

OHCA that occurred in the most deprived areas had 40% reduced odds of bystander CPR compared to those that occurred in the least deprived areas (figure 13).

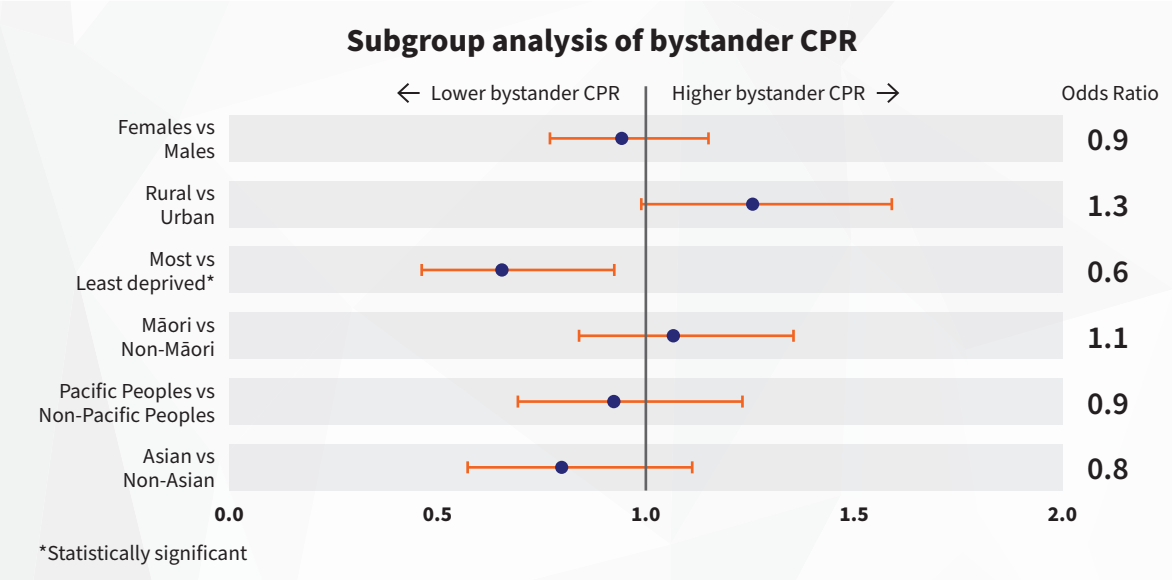


Figure 13. Subgroup analysis of bystander CPR.[A]

CPR awareness sessions

Knowing CPR means you could save the life of a friend, a colleague, a member of your whānau or someone on the street.

Ngā Tohu Whakaora e Toru – 3 Steps for Life

The mission of 3 Steps for Life is to empower members of the community to step forward when help is needed, and increase out-of-hospital cardiac arrest survival rates. Delivered by volunteer Community Educators, this programme consists of public awareness sessions around basic CPR and AED training. It gives participants the skills and confidence to take action in responding to someone in cardiac arrest by:

1 Calling 111 **2 Starting CPR** **3 Using an AED**

You can find out details about this course and how to attend by visiting **stjohn.org.nz/3stepsforlife** or email **3stepsforlife@stjohn.org.nz**

Lloyd Morrison Foundation Heartbeat Programme

If you are in the Greater Wellington and Wairarapa area, Wellington Free Ambulance provides the Lloyd Morrison Foundation Heartbeat programme interactive training session free of charge. During the session you will learn everything you need to know about CPR and using an AED.

You can find out details about this course and how to attend by visiting **wfa.org.nz/heartbeat** or email **heartbeat@wfa.org.nz**

A Adults, resuscitation attempted. Excludes EAS witnessed events. Adjusted for age and sex, with exception of females vs males which is adjusted for age only.

Community defibrillation

Defibrillation by bystanders or volunteer community responders has been increasing over the last 5 years. In 2023/24, 18% of adult patients with an initial shockable rhythm received community defibrillation (figure 14).

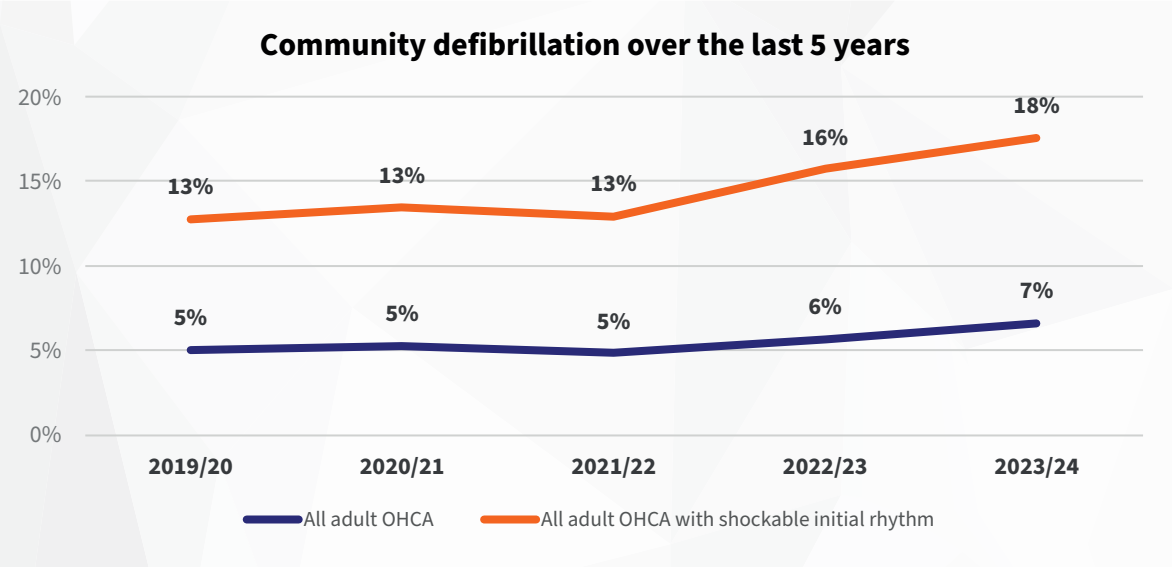


Figure 14. Community defibrillation over the last 5 years.[A]

Subgroup comparisons of community defibrillation

Figure 15 compares community defibrillation rates by sex, rurality, and ethnicity.

Females had 60% lower odds of community defibrillation than males. Asians, Pacific Peoples, and those who live rurally have lower proportions of community defibrillation, although these trends do not meet statistical significance.

Deprivation is not shown due to low numbers in each cohort.

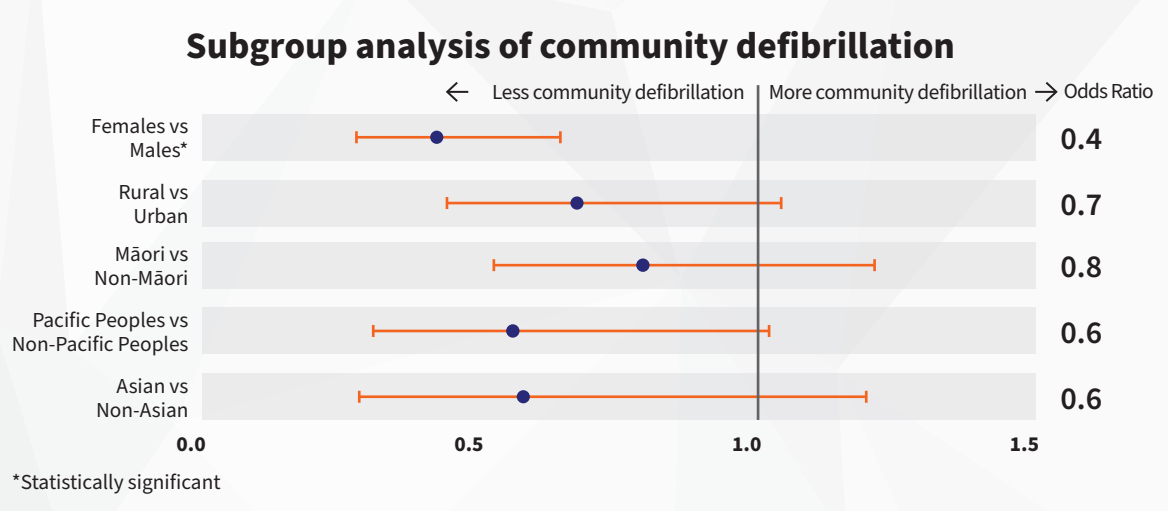


Figure 15. Subgroup analysis of community defibrillation.[B]

A Adults, resuscitation attempted. Excludes EAS witnessed events.

B Adults, resuscitation attempted. Excludes EAS witnessed events. Adjusted for age and sex, with exception of females vs males which is adjusted for age only.

Defibrillation by FENZ

In 2023/24, Fire and Emergency NZ (FENZ) attended 94% of OHCA events and arrived before EAS at 36% of them[A]. FENZ defibrillated 21% of adult OHCA with a shockable initial rhythm.

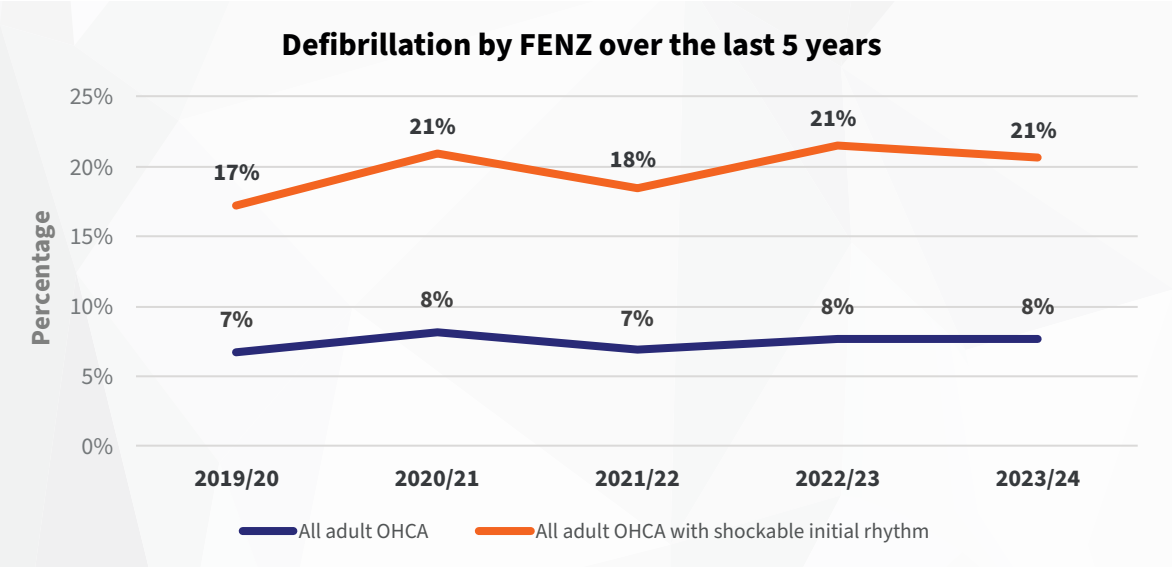


Figure 16. Defibrillation by FENZ over the past 5 years.[A]

A Adults, resuscitation attempted. Excludes EAS witnessed events.

GoodSAM responders

GoodSAM (Good Smartphone Activated Medics) is a cell phone application that alerts community responders to nearby cardiac arrests (www.goodsamapp.org). Anyone who is trained in CPR and how to use an AED is able to register as a Good SAM responder (www.goodsamapp.org/regResponder).

Currently there are 13,502 people registered as GoodSAM responders in NZ.

Over the past 5 years, the proportion of OHCA events with a GoodSAM responder in attendance has increased. In the 2023/24 year, 24% of all OHCA events had a GoodSAM responder present (figure 17).

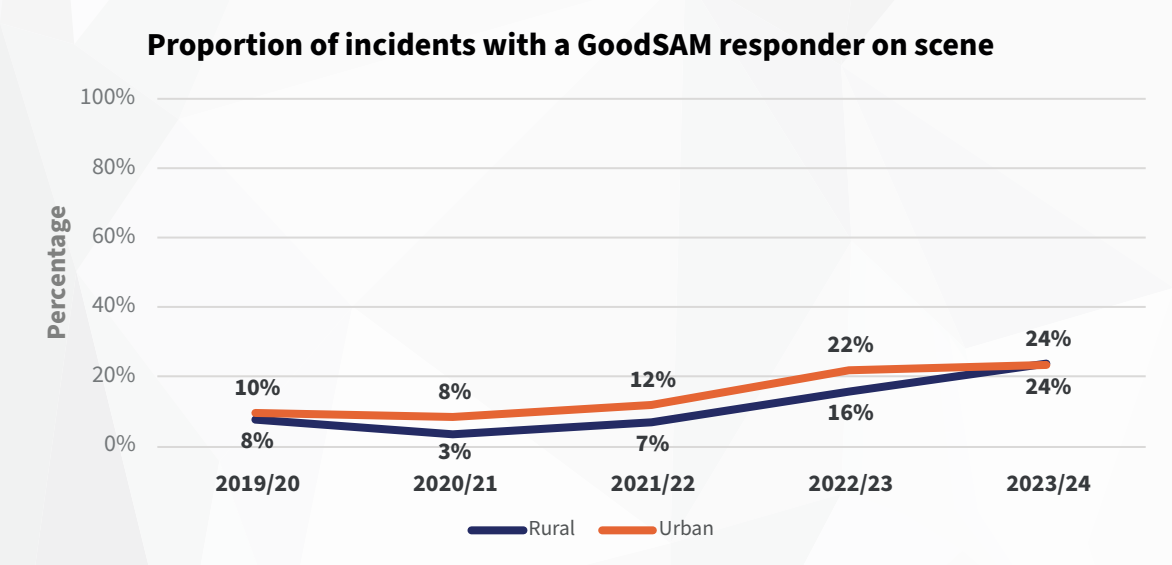


Figure 17. GoodSAM responders attendance at OHCA.[A]

Subgroup comparisons of GoodSAM responder on scene

Figure 18 compares rates of GoodSAM responders on scene by sex, rurality, ethnicity, and deprivation. OHCA patients of Māori and Pacific ethnicities have lower odds of GoodSAM attendance compared with non-Māori and non-Pacific Peoples respectively.

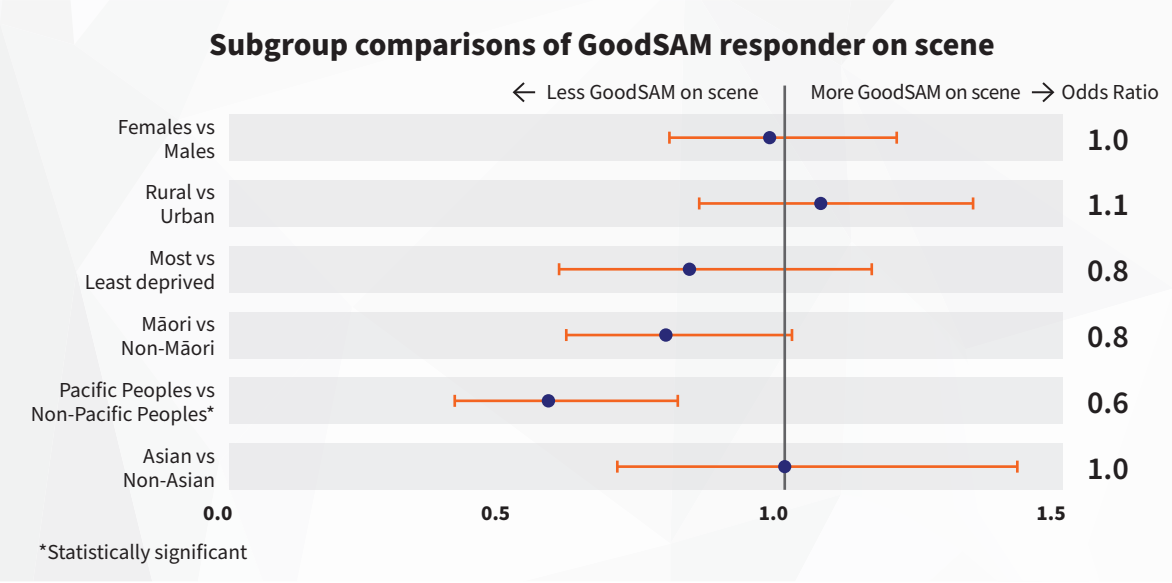


Figure 18. Subgroup comparisons of GoodSAM responder on scene.[B]

A Adults, resuscitation attempted. Excludes EAS witnessed events.

B Adults, resuscitation attempted. Excludes EAS witnessed events. Adjusted for age and sex, with exception of females vs males which is adjusted for age only.

Outcomes
Whakataunga

The 30-day survival rate for 2023/24 for adult OHCA with resus attempted was 11%. For the Utstein comparator group this was 31%.

In 2023/24, there were 66 OHCA survivors per million population. Figure 19 shows the rolling two year OHCA survival per million population.

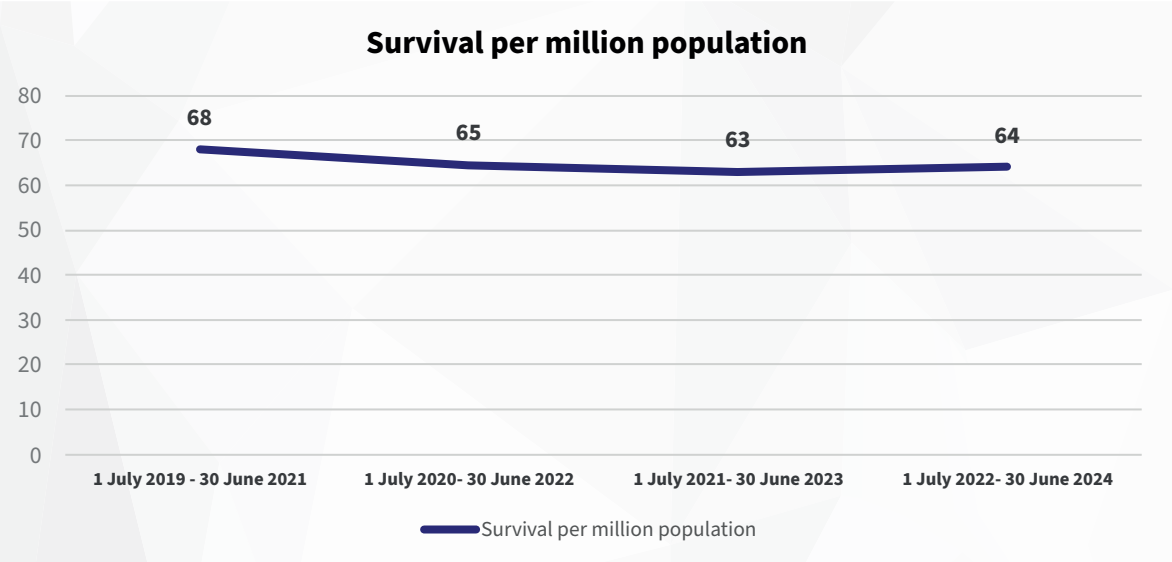


Figure 19. Survival per million population.[A]

In 2023/24 the OHCA mortality across all ethnic groups was 503 per million population. Figure 20 shows the rolling two year OHCA mortality per million population. OHCA mortality per million is higher in Māori and Pacific Peoples, and lower in the Asian ethnic group.

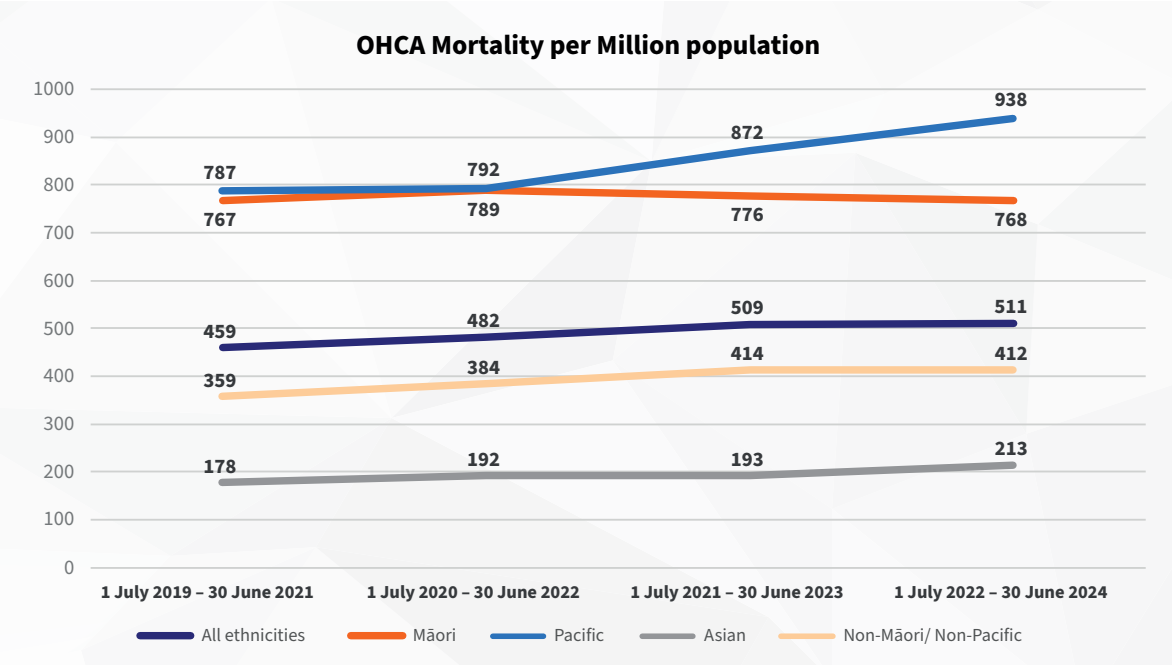


Figure 20. OHCA Mortality per Million population.[B]

A Adults, resuscitation attempted. Excludes EAS witnessed events. Population rates from Te Whatu Ora Health NZ population web tool.

B Adults, resuscitation attempted. Excludes EAS witnessed events. Population rates from Te Whatu Ora Health NZ populations web tool. Ethnicity-specific rates were calculated based on the Manatū Hauora Ministry of Health prioritised ethnicity categories.

Subgroup comparisons of 30-day survival – demographics

Figure 21 compares 30-day survival rates by sex, rurality, ethnicity, and deprivation. Females and OHCA occurring in rural locations have 50% lower odds of survival than their comparator groups.

Although not statistically significant, figure 21 also shows a trend toward lower survival for Māori, Pacific Peoples, Asians and those in the most deprived areas.

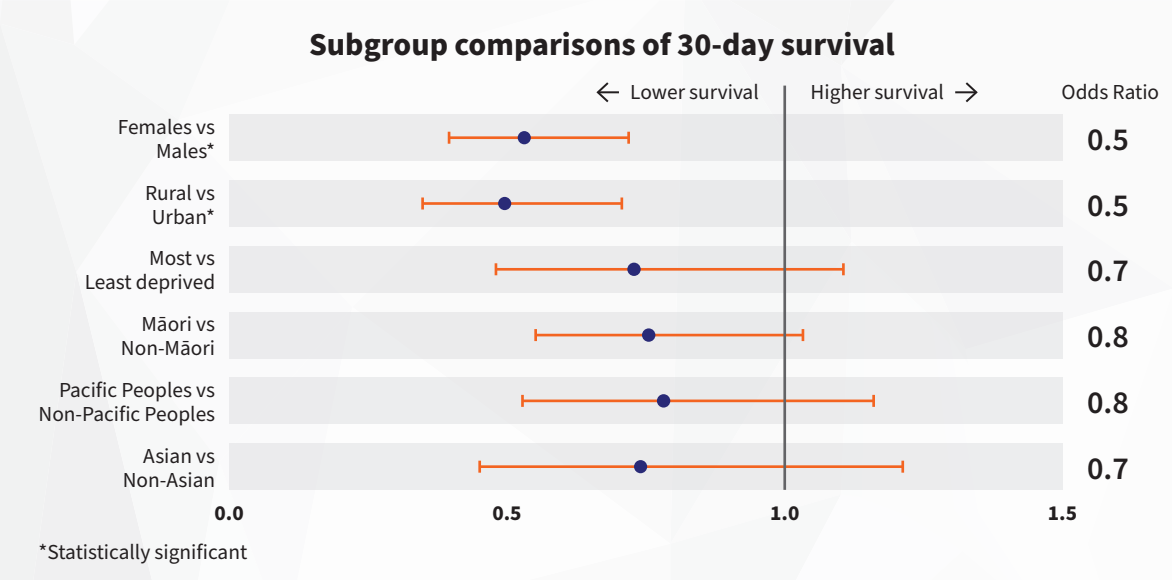


Figure 21. Subgroup comparisons of survival – demographics.[A]

Subgroup comparisons of 30-day survival – interventions

Figure 22 shows the influence of community interventions, and EAS witnessed events on 30-day survival. All these factors increase the odds of survival.

OCHA events that occur while EAS is in attendance have 2.5 times higher odds of survival compared to when cardiac arrest happens prior to EAS arrival.

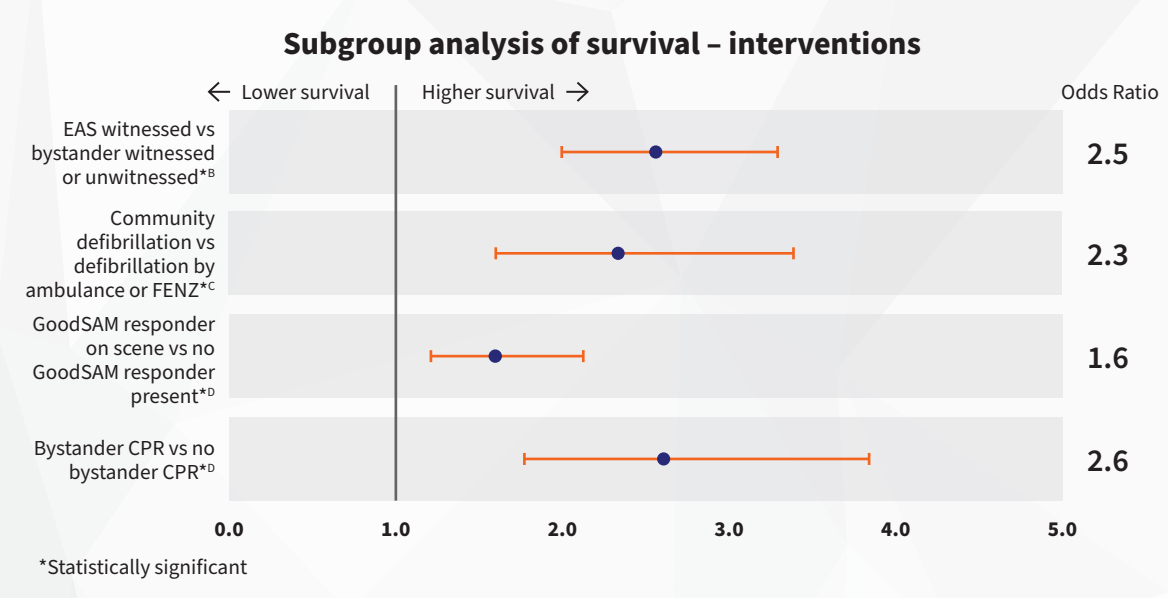


Figure 22. Subgroup analysis of survival – interventions.

A Adults, resuscitation attempted. Excludes EAS witnessed events. Adjusted for age and sex with exception of females vs males which is adjusted for age only.
B Adults, resuscitation attempted. Adjusted for age and sex.
C Adults, resuscitation attempted, shockable initial rhythm. Excludes EAS witnessed events. Adjusted for age and sex.
D Adults, resuscitation attempted. Excludes EAS witnessed events. Adjusted for age and sex.

Conclusion
Mutunga

The data presented in this report represent the 2023/24 results from the Aotearoa New Zealand National OHCA registry. Year on year, these reports provide an update on how the EAS is performing in the crucial management of OHCA.

Appendices

The Out-of-Hospital Cardiac Arrest Registry

The Hato Hone St John OHCA Registry was formally established in September 2013. In 2019, the Hato Hone St John and Wellington Free OHCA Registries were merged to create a National OHCA Registry.

In 2022, the national OHCA Registry was further integrated into the Aotearoa New Zealand Paramedic Care Collection (ANZPaCC) database. ANZPaCC includes all routinely collected clinical data from the electronic Patient Report Form (ePRF) for patients attended by road emergency medical services. It is co-governed by Hato Hone St John and Wellington Free Ambulance.

Analysis is conducted in collaboration with Wellington Free Ambulance by Hato Hone St John Clinical Evaluation, Research, and Insights investigators Heather Hutchinson and Sarah Maessen, along with Auckland University of Technology's ANZPaCC Principal Investigator Bridget Dicker.

Eligibility

The registry captures data on all OHCA events attended by EAS. A cardiac arrest is defined as a patient who is unconscious and pulseless with either agonal breathing or no breathing.

Inclusion and exclusion criteria are described in Table A1 and Table A2.

Data capture

The data is collated in the registry using a reporting template based on international definitions outlined in the Utstein style of reporting and the variables developed by the Australasian Resuscitation Outcomes Consortium (Aus-ROC).

In the data collection process there are three separate points where data is acquired:

- Computer Aided Dispatch (CAD) and supporting systems
- On scene by the EAS personnel in attendance
- Mortality data from the New Zealand National Health Index (NHI) records.

Computer aided dispatch

Patient and event details are collected by the Ambulance Communications Centre when a 111 call is received and an ambulance is dispatched, with data being entered into the CAD system. Data specifically related to cardiac arrest is obtained from the CAD system and transferred into the OHCA Registry.

Table A1: Inclusion criteria (all of the following).

1	Patients of all ages who suffer a documented cardiac arrest
2	Occurs in New Zealand where the ambulance service or one of its participating co-responders is the primary treatment provider
3	› Patients of all ages who on arrival of the EAS are unconscious and pulseless with either agonal breathing or no breathing **or** › Patients of all ages who become unconscious and pulseless with either agonal breathing or no breathing in the presence of EAS personnel **or** › Patients who have a pulse on arrival of EAS personnel following successful bystander defibrillation

Table A2: Exclusion criteria (any of the following).

1	Patients who suffer a cardiac arrest in a hospital facility where the EAS may be in attendance but are not the primary treatment providers
2	Patients who suffer a cardiac arrest during an inter-hospital transfer where the EAS may be providing transport but are not the primary treatment providers
3	Bystander suspected cardiac arrest where the patient is not in cardiac arrest on arrival of the EAS personnel, and where defibrillation did not occur prior to ambulance arrival or no other evidence verifying a cardiac arrest state is present

On scene collection

Ambulance officers on scene attending a patient in cardiac arrest are required to record specific data. This is recorded on an electronic Patient Report Form (ePRF) and submitted electronically to a secure server.

NHI patient outcome data

The patient's NHI is collected by EAS personnel on scene or at hospital handover. If the NHI was not available at the time of the event then the NHI is determined by cross-reference of the patient's date of birth and name to the NHI database.

If a patient dies, the date of death is updated by the Manatū Hauora Ministry of Health identity data management team after matching NHI identity with the official death registrations on a monthly basis.

Data quality

The registry is subject to quality improvement processes which involve continual auditing of existing data and updating of the registry entries as appropriate.

Registry reports are generated on a monthly and quarterly basis and these are analysed for variances in the numbers of cases and patient outcomes. These results are compared with international data from EAS that are similar to New Zealand.

Ethical review

The OHCA Registry has been approved by the New Zealand Health and Disability Ethics Committee (Aotearoa New Zealand, Paramedic Care Collection (ANZPaCC), 13415).

The registry is also subject to EAS internal research governance processes that include a locality review and locality authorisation as per the Standard Operating Procedures for Health and Disability Ethics Committees.

The OHCA Registry is held on a secure server which requires active directory permissions. At no stage is data that could identify individual patients or individual hospitals publicly released from this registry.

OHCA flowchart for system effectiveness (attempted resuscitation, all ages, includes EAS wtinessed)[A]

Population served	
5,325,900	
Cardiac arrest attended	**Cardiac arrest not treated**
6,680	**DNAR** 475
	Futile 3,079
Cardiac arrest treated	
3,126	
Patient characteristics	
Male sex	1,964 (207 unknown)
Initial shockable rhythm	1,118 (75 unknown)
Medical aetiology	2,816
Witnessed by bystander	1,408
Witnessed by EAS	494
Bystander CPR	2,026
Public location	636
Patient outcomes	
Any ROSC	1,088
Survived event	838
Survival to 30 days	411 (67 unknown)

OHCA flowchart for system effectiveness (Utstein comparator, all ages)[A]

Population served	
5,325,900	
Cardiac arrest attended	**Cardiac arrest not treated**
6,680	**DNAR** 475
	Futile 3,079
Cardiac arrest treated	
3,126	
Bystander witnessed	**Other witness**
1,408	**Not witnessed** 1,224
	EAS witnessed 494
Initial shockable rhythm	**Initial non-shockable rhythms**
716	**Asystole** 402
	PEA 225
	Non shockable 35
	Unknown 30
Patient outcomes	
Any ROSC	404
Survived event	347
Survival to 30 days	210 (30 unknown)

A Flowchart template from Grasner et al, 2024.

Abbreviations

AED	Automated external defibrillator
CAD	Computer aided dispatch
CPR	Cardiopulmonary resuscitation
DNAR	Do not attempt resuscitation order
EAS	Emergency ambulance service
ED	Emergency Department
EMS	Emergency medical services
FENZ	Fire and Emergency New Zealand
GoodSAM	Good Smartphone Activated Medics
HHStJ	Hato Hone St John
OHCA	Out-of-hospital cardiac arrest
PEA	Pulseless electrical activity
ROSC	Return of spontaneous circulation
SUDI	Sudden unexpected death in infancy
VF	Ventricular fibrillation
VT	Ventricular tachycardia
WFA	Wellington Free Ambulance

Glossary of terms

Adjusted rates	Rates are standardised to a control population.
Adult	Patients aged 15 years or older.
Asystole	The absence of any cardiac electrical activity.
Children	Patients aged less than 15 years.
Community responder	A member of the community who is not part of the EAS service who provides assistance at an OHCA event. For example, a member of the public, or an off duty ambulance officer or an off duty doctor or nurse.
EAS attended	This is the population of all patients following cardiac arrest where EAS personnel attended regardless of whether emergency treatment was provided.
EAS personnel	Emergency ambulance crews dispatched to a medical emergency.
Least deprived	Quintile 1 from NZDep2018.
Most deprived	Quintile 5 from NZDep2018.
Presumed cardiac aetiology	An OHCA is presumed to be of cardiac aetiology, unless it is known or likely to have been caused by trauma, drowning, poisoning or any other non-cardiac cause.
Resuscitation attempted	Performance of chest compressions (or other emergency care for cardiac arrests secondary to trauma) by responding EAS personnel, or the delivery of a shock at any time (including before ambulance arrival).
Return of spontaneous circulation	The patient shows clear signs of life in the absence of chest compressions for more than 30 seconds. Signs of life include any of the following: normal breathing, palpable pulse, increasing end tidal CO_2 or active movement.
Rural and remote service area	Assigned according to the Geographic Classification for Health. **Rural includes:** R1, R2 and R3.
Shockable rhythm	Ventricular fibrillation, ventricular tachycardia or unknown shockable (AED).
Specific rates	Rates for specific segments/groups of the population (e.g. sex, age, ethnicity).
Survival to 30-days	The patient is alive at 30-days post-OHCA event.
Survived event	The patient has sustained ROSC to handover at hospital.
Urban area	Assigned according to the Geographic Classification for Health. **Urban includes:** U1 and U2.
Witnessed event	A witnessed cardiac arrest is one that is seen or heard by another person.

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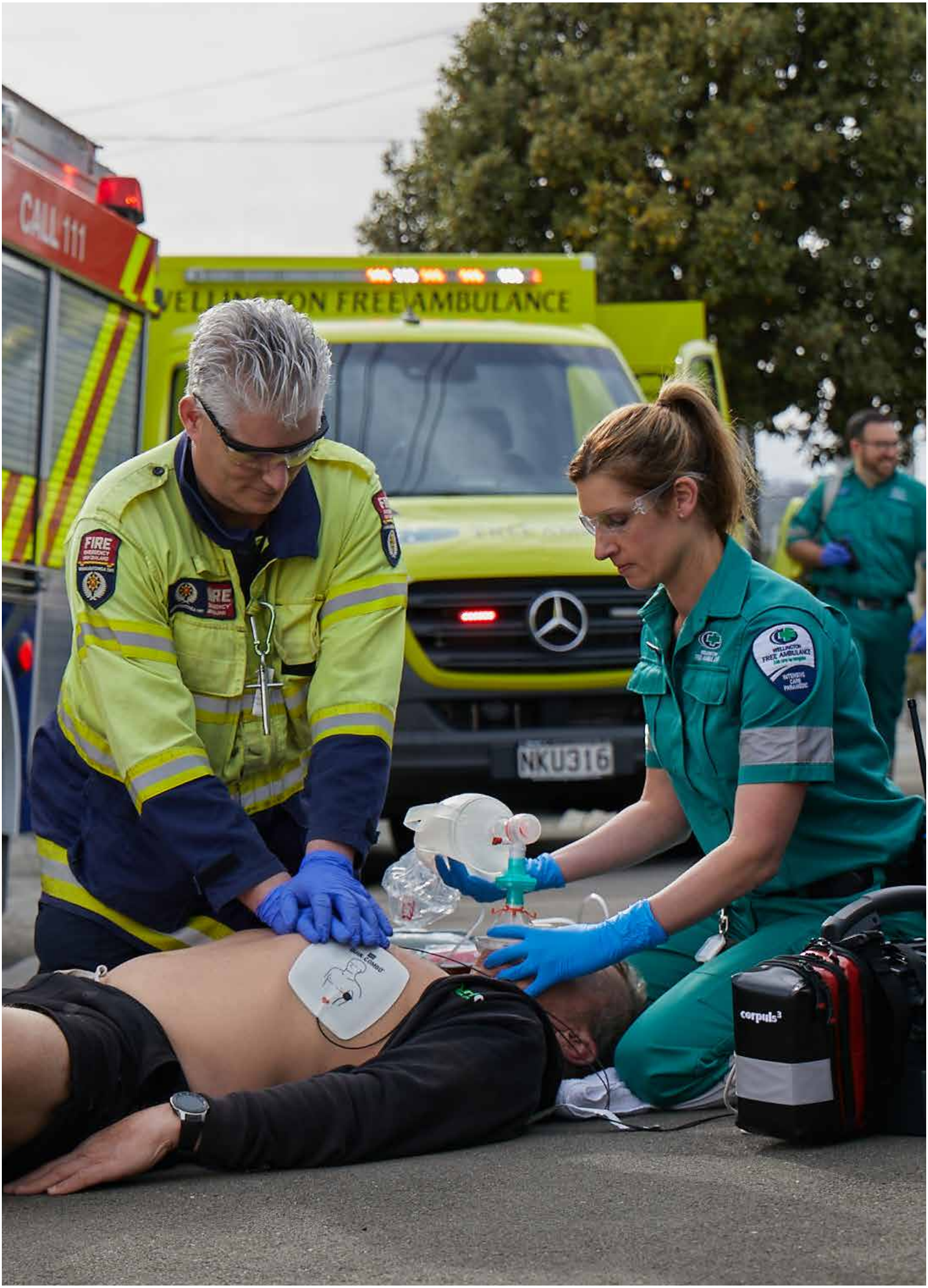
Notes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