



**St John**  
Here for Life

# Out-of-Hospital Cardiac Arrest Registry

**Summary Report 2019/20**



---

**Clinical Audit and Research**

**Enquiries email:** [CART@stjohn.org.nz](mailto:CART@stjohn.org.nz)

**Publication date:** February 2021

**Authors:** Bridget Dicker, Verity Todd, Graham Howie, Norm Wilkinson, Glen Stewart

ISSN 2703-4089

© Copyright St John New Zealand 2021. Not to be reproduced in part or in whole without permission of the copyright holder.

## Jay's story

**Jay was having lunch with his colleagues at a central Auckland food court when he became unconscious and stopped breathing.**

On the way to lunch, he had noticed he was having trouble breathing, but continued on to the food court. While ordering lunch, he felt tired and his colleagues noticed he was moving awkwardly and unable to support himself in the chair. Jay lost consciousness and stopped breathing. Not knowing what had happened, his colleagues moved him onto the floor.

They took immediate action and called 111 for an ambulance. Although Jay's colleagues had never done CPR, the ambulance communications call handler talked them through what to do while ambulance and Fire and Emergency crews were on their way.

When the fire and ambulance crews arrived, they took over resuscitation and the ambulance officers were able to restart his heart with a defibrillator and lifesaving medications. Jay had been clinically dead for 19 minutes.

Jay spent two weeks in a coma. Medical staff talked to his wife about palliative care but she urged them to keep treating him. Eventually Jay woke from his coma and remarkably, after 44 days in hospital, he was able to return home.

At only 34 years of age, Jay's story shows that anyone can have a cardiac arrest, regardless of age or medical history. In these time-critical emergencies, bystanders can be the difference between life and death, as for every minute that goes by without CPR



Photo courtesy of Stuff Limited



Photo courtesy of Stuff Limited

or use of a defibrillator, the chance of survival drops by 10–15 percent.

"The bystanders and my colleagues who performed CPR on me are the reason I am alive today," says Jay.

One of the ambulance officers who responded, St John Intensive Care Paramedic Rainbow Fasher, says that CPR is a critical step in the cardiac arrest chain of survival. She explains that CPR keeps blood flowing around the body and to the brain and without it, many cardiac arrest survivors suffer from brain damage. "Thanks to CPR, the use of a defibrillator and lifesaving drugs, Jay is not only alive, but is neurologically intact," says Rainbow.

St John Head of Clinical Audit and Research Professor Bridget Dicker says that quick action by bystanders can increase the chance of survival by 50 percent. "Clinical expertise and intervention can only save a life if CPR has been started early," says Bridget. "It is crucial that people are confident to take action if someone goes into cardiac arrest."

Jay's journey to recovery has not been easy, but he is grateful to have had the chance. He has had to learn how to walk properly and regain his balance, and also needed speech therapy. But Jay says he managed to get back on track with not only the help and support of his family but understanding from the team he works with too. Amazingly, less than three months after being discharged from hospital, Jay was able to return to work.

Jay and his wife have since had their first baby, and Jay is thankful for his workmates, the ambulance officers and fire crew who responded to him on that day. "I am forever thankful. They deserve all the praise and good wishes." ■

# About this report

## **Cardiac arrest remains a considerable public health issue, with ischaemic heart disease being the second most prevalent cause of death in New Zealand.**

Internationally, survival rates following out-of-hospital cardiac arrest (OHCA) are highly variable and can range from less than 6% to greater than 50%. Benchmarking survival from OHCA is a key measure of the clinical quality of an Emergency Ambulance Service (EAS) and is fundamental to making improvements in OHCA survival. Knowledge of New Zealand OHCA outcomes is a key driver to help identify and address areas for improvement in clinical care.

The data presented in this report is for all OHCA attended by the St John EAS in the period from 1 July 2019 to 30 June 2020.

The data presented in this report primarily relates 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.

Unless otherwise stated, all analyses exclude cardiac arrests witnessed by EAS personnel. In cases where it was not recorded whether the patient was an adult or a child, the patient was assumed to be an adult and was included in that category.

Unless otherwise stated, survival refers to survival to 30 days post cardiac arrest. ■



# Executive summary



**5 people a day**

(approx) were treated for an out-of-hospital cardiac arrest by St John (around 2,000 per year)

32% female,  
68% male



**75%**

of patients received  
bystander CPR



The median time in which a St John ambulance reached a patient was **8 minutes** in urban communities and **12 minutes** in rural and remote communities



**5%**

received defibrillation by a  
Community Responder prior  
to ambulance arrival



**95%**

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



**25%**

of patients survived the event (had a pulse on arrival at hospital)










**12%**  
of patients  
survived

**All events, adult, resuscitation attempted:** includes adults ( $\geq 15$  years old), all-cause, resuscitation attempted. Excludes children, and EAS personnel witnessed events. Annual comparisons for these figures are shown in Table 1.

# Benchmarking executive summary

## Key figures for all-cause events

Table 1: Key figures for all-cause events<sup>A</sup>

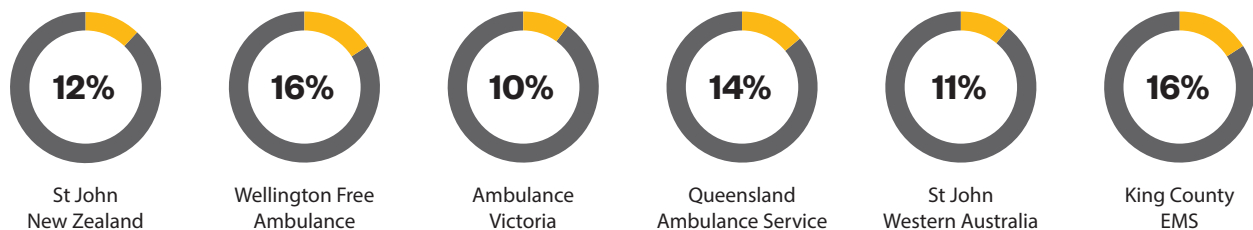
Year	Total number events	 % Bystander CPR	 % Community Responder AED use	 Urban median response time	 Rural & remote median response time	 % Attended by Fire & Emergency New Zealand	 % ROSC on handover	 % Survival
2013/14 (9mo)	1,101	75%	3.9%	8	11	45%	27%	13%
2014/15	1,690	74%	3.7%	8	10	82%	28%	12%
2015/16	1,696	72%	4.5%	7	10	79%	25%	11%
2016/17	1,792	72%	4.6%	5	8	82%	27%	12%
2017/18	1,927	74%	5.1%	6	9	84%	28%	13%
2018/19	1,808	76%	4.0%	8	13	92%	27%	13%
2019/20	2,003	75%	5.0%	8	12	95%	25%	12%

### Benchmarking (all-cause events)

The outcomes of OHCA for international benchmarking compare rates of return of spontaneous circulation (ROSC) sustained to hospital handover and survival. This group requires that the following criteria be met: includes adults ( $\geq 15$  years old), all-cause, resuscitation attempted. Excludes children, and EAS personnel witnessed events.

Table 2: Benchmarking survival outcomes for all-cause events<sup>A</sup>

Ambulance Service	Collection period	Total number events	% ROSC on handover	% Survival <sup>B</sup>
St John New Zealand	1 July 2019 to 30 June 2020	2,003	25%	12%
Wellington Free Ambulance	1 July 2019 to 30 June 2020	209	32%	16%
Ambulance Victoria <sup>1</sup>	1 July 2019 to 30 June 2020	–	28%	10%
Queensland Ambulance Service <sup>2</sup>	1 January 2019 to 31 December 2019	2,210	31%	14%
St John Western Australia <sup>3</sup>	1 July 2019 to 30 June 2020	902	19%	11%
King County EMS <sup>4</sup>	1 July 2019 to 30 June 2020	895	43%	16%



<sup>A</sup> **All events, adult, resuscitation attempted:** includes adults ( $\geq 15$  years old), all-cause, resuscitation attempted. Excludes children, and EAS personnel witnessed events.

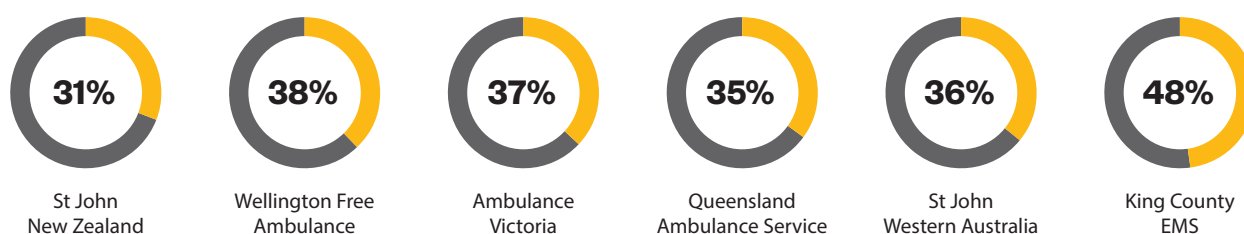
<sup>B</sup> St John New Zealand, Wellington Free Ambulance, and Queensland Ambulance Service report on survival to 30-days, all other services report survival to hospital discharge.

## Benchmarking (Utstein Comparator Group)<sup>A</sup>

The outcomes of OHCA for international benchmarking compare rates of ROSC sustained to hospital handover and survival for a specifically selected subgroup of patients. This subgroup is referred to as the Utstein Comparator Group and requires that the following criteria be met: includes adults ( $\geq 15$  years old), all-cause, resuscitation attempted, shockable presenting rhythm and bystander witnessed. Excludes children, EAS witnessed and no resuscitation attempt.

**Table 3: Benchmarking survival outcomes for adults (Utstein Comparator Group)<sup>A</sup>**

Ambulance Service	Collection period	Total number events	% ROSC on handover	% Survival <sup>B</sup>
St John New Zealand	1 July 2019 to 30 June 2020	568	48%	31%
Wellington Free Ambulance	1 July 2019 to 30 June 2020	69	55%	38%
Ambulance Victoria <sup>1</sup>	1 July 2019 to 30 June 2020	-	-	37%
Queensland Ambulance Service <sup>2</sup>	1 January 2019 to 31 December 2019	335	51%	35%
St John Western Australia <sup>3</sup>	1 July 2019 to 30 June 2020	197	44%	36%
King County EMS <sup>4</sup>	1 July 2019 to 30 June 2020	153	75%	48%



- A Utstein Comparator Group:** includes adults ( $\geq 15$  years old), all-cause, resuscitation attempted, shockable presenting rhythm and bystander witnessed. Excludes children, EAS witnessed and no resuscitation attempt.
- B** St John New Zealand, Wellington Free Ambulance and Queensland Ambulance Service report on survival to 30-days, all other services report survival to hospital discharge.



# The Global Resuscitation Alliance 10 Steps to improving outcomes

-  **1** **Establish a cardiac arrest registry**
-  **2** **Provide telephone CPR instructions with ongoing training and quality improvement**
-  **3** **Provide high-performance CPR with ongoing training and quality improvement**
-  **4** **Use rapid dispatch**
-  **5** **Measure resuscitation performance using the defibrillator recording**
-  **6** **Begin an AED programme for first responders, including police officers, guards, and other security personnel**
-  **7** **Use smart technologies to notify volunteer bystanders so they can respond to provide early CPR and defibrillation**
-  **8** **Make CPR and AED training mandatory in schools and communities**
-  **9** **Be accountable – publicise annual reports**
-  **10** **Provide a culture of excellence**

The concept of the Resuscitation Alliance is that all members of the Global Resuscitation Alliance, of which St John NZ is one, will use and promote the 10 Steps for Improving Survival from Cardiac Arrest thus extending the best practices in cardiac arrest survival internationally.

Each of the 10 Steps consists of a number of elements that are outlined in detail within the update from the Global Resuscitation Alliance here: <https://www.globalresuscitationalliance.org/resources/>





1

## Establish a cardiac arrest registry

The St John OHCA Registry was established in October 2013 and now contains over 30,000 records of OHCA. This continuous measuring and reporting

sets the stage for implementing change and making improvements over time.



2

## Provide telephone CPR instructions with ongoing training and quality improvement

The Ambulance Communications Centre personnel play a pivotal role in the rates of early bystander CPR. As soon as emergency Call Handlers suspect a patient is in cardiac arrest they provide instructions to the caller over the phone on how to perform CPR. This Call Handler directed CPR has been in place since 2002.

Call Handlers are also adept in directing callers to the location of AEDs. When AEDs are logged with AED Locations (<https://aedlocations.co.nz>), Call Handlers may access the AED Locations website and guide callers to the location of an AED. Alternatively, when AED details are provided directly to St John they are entered into our dispatch system. Then, when someone calls 111, Call Handlers can automatically visualise the AEDs within a 200m radius of the person calling. Also, if the caller states the patient is located at a different address, the Call Handler will be able to search the system and guide the caller to the AED.

### Rates of bystander CPR

Of the OHCA where resuscitation was attempted, 75% of these had bystander CPR performed prior to ambulance arrival. This figure is similar to previous years (Figure 1).

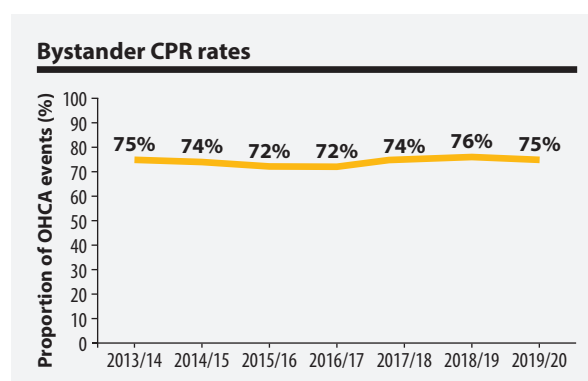


Figure 1: Bystander CPR rates (all events, adult, resuscitation attempted)<sup>A</sup>.

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





3

## Provide high-performance CPR with ongoing training and quality improvement

The St John Clinical Development team provides St John and co-responder personnel with CPR training through a programme of Continuing Clinical Education (CCE). Since July 2017 specialised manikins that measure chest compression performance have been routinely used during CCE so that staff are able to use these scores to measure and improve their performance.

A New Zealand specific model of High Performance CPR has been jointly developed by St John, Wellington Free Ambulance, Fire and Emergency New Zealand and the Auckland University of Technology. This was introduced to ambulance crews nation-wide between April and December 2019. A video outlining the principles employed within the New Zealand model can be found here: <https://youtu.be/7L45-AsO4bA>.

High performance CPR depends on delegated roles and coordinated choreography within the resuscitation team. This highly choreographed team model of care relies on continuous high frequency short duration practice sessions, preferably quarterly. However, the financial constraints experienced by emergency ambulance services have prevented investment in funding this level of education and training for ambulance staff. This is likely to have impacted on the quality of care delivered to patients, particularly the ability to perform high performance CPR.



4

## Use rapid dispatch

With time to defibrillation being crucial, St John has protocols to ensure that patients in cardiac arrest are reached in the shortest possible time by responders trained in CPR and with access to a defibrillator. Ambulance Communications Centre staff give a cardiac arrest the highest priority and dispatch the closest resource immediately.

The time between when an emergency call is answered in the Ambulance Communications Centre to when an ambulance arrives is critical. This is one of the key performance indicators for St John EAS and the target is to get trained personnel with a defibrillator to the patient as quickly as possible.

For OHCA where resuscitation was attempted by St John EAS, the median response time (from call pick up in the Ambulance Communications Centre to arrival of the first vehicle on scene) was 8 minutes in urban areas and 12 minutes for rural and remote areas.



**Median urban  
response time<sup>A</sup>**  
**8 minutes**



**Median rural  
response time<sup>A</sup>**  
**12 minutes**

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



5

## Measure resuscitation performance using the defibrillator recording

There is now a range of defibrillators on the market that are able to monitor and record the quality of CPR being performed at the scene. These defibrillators are currently deployed within the ambulance sector. However, a significant resource is required (approximately 60hrs – 70hrs/week) to

review and provide feedback to staff in order to improve resuscitation performance. Due to financial constraints within the ambulance sector such resourcing is not possible and this is likely to impact survival outcomes.



6

## Begin an AED programme for first responders, including police officers, guards, and other security personnel

When there is a suspected cardiac arrest the Ambulance Communications Centre immediately dispatches the closest resource, regardless of qualification. This may be an emergency ambulance or any other co-responder including the St John Patient Transfer Service, Fire and Emergency New Zealand, local first response groups or Primary Response in Medical Emergencies (PRIME) doctors and nurses. By dispatching the nearest resource, defibrillation and CPR can occur as quickly as possible, which may be before EAS arrival.

### Fire and Emergency New Zealand

Since December 2013, Fire and Emergency New Zealand has been part of the team of professionals available to co-respond to an OHCA.

During this reporting period, Fire and Emergency New Zealand attended 95% of adult OHCA events where resuscitation was attempted by EAS. Fire and Emergency New Zealand personnel were also fundamental in the early defibrillation of 154 adult patients in cardiac arrest. Of these patients, 21% survived to 30 days post-event.

Defibrillation of a patient by Fire and Emergency New Zealand or First Response Groups prior to the arrival of EAS has steadily risen over time (Figure 2).

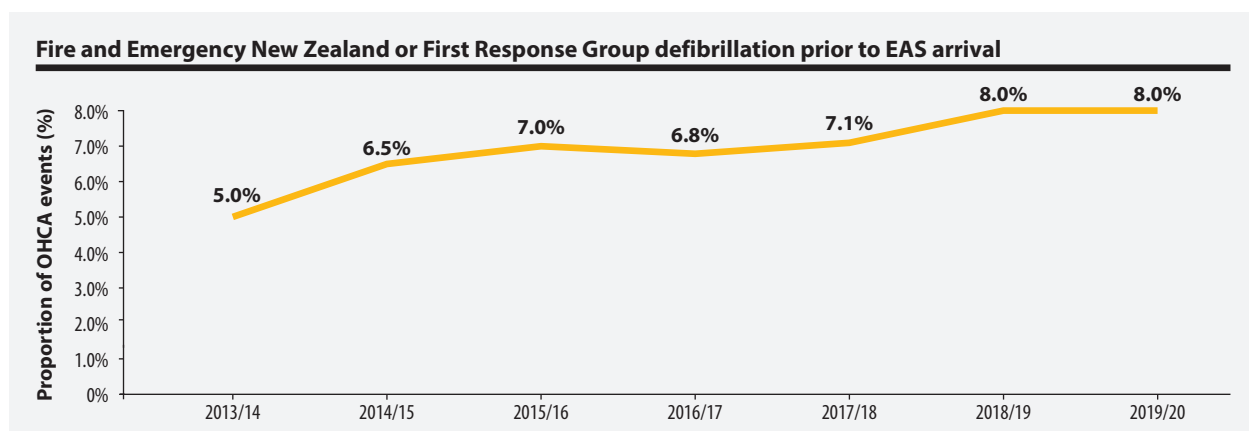


Figure 2: Proportion of events defibrillated prior to EAS arrival by Fire and Emergency New Zealand or First Response Groups (all events, adult, resuscitation attempted)<sup>A</sup>.

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



## Use smart technologies to notify volunteer bystanders so they can respond to provide early CPR and defibrillation

Public access defibrillators and community training have a large role to play in early defibrillation. If an emergency Call Handler suspects they are dealing with a cardiac arrest, one of the first questions they ask is, "Is there an AED available?". If so, they provide instructions on how to use it, as well as on how to perform CPR.

In this reporting period around 5% of the total OHCA events were defibrillated by a community member using an AED prior to EAS arrival (Figure 3).

In April 2018 the GoodSAM (Good Smartphone Activated Medics) application that alerts community responders to nearby cardiac arrests was launched in New Zealand ([www.goodsamapp.org](http://www.goodsamapp.org)). Anyone who is trained in CPR and how to use an AED is able to register as a GoodSAM responder. Responders are carefully verified through provision of a copy of a formal identification such as a driver licence, passport or St John ID.

**Table 4: GoodSAM statistics 2019/20**

Total number of people registered as GoodSAM responders <sup>B</sup>	6,194
Total number of confirmed cardiac arrests with a GoodSAM responder at scene (adults, resuscitation attempted)	9% (179/2003)

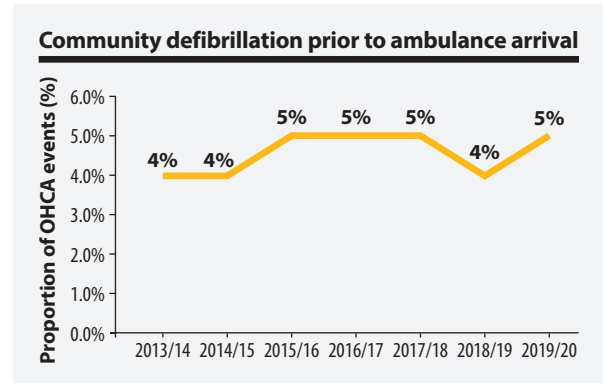
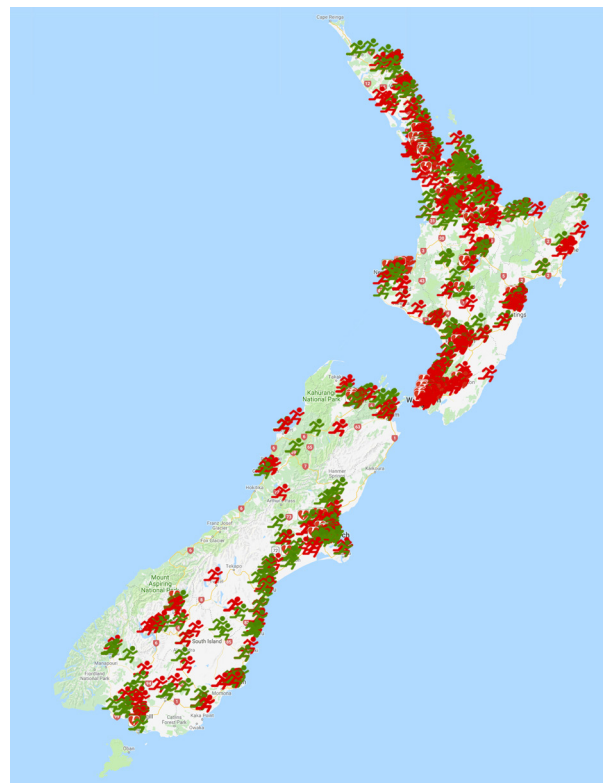


Figure 3: Proportion of events defibrillated prior to EAS arrival by Community Responders (all events, adult, resuscitation attempted)<sup>A</sup>



Location of Community Responders who are using the GoodSAM app across New Zealand. The red and green figures on the map represent the different organisations that a responder belongs to (eg. Green – St John, Red – Public)

- A All events, adult, resuscitation attempted:** includes adults ( $\geq 15$  years old), all-cause, resuscitation attempted. Excludes children, and EAS personnel witnessed events.
- B** This does not include responders enrolled under Fire and Emergency New Zealand or Wellington Free Ambulance.



## Make CPR and AED training mandatory in schools and communities

To improve the rates of bystander CPR and AED use, St John supports several community initiatives. These include the 3 Steps for Life community awareness programme, the ASB St John in Schools programme, and the National Marae OHCA Project.

### 3 Steps for Life

<https://www.stjohn.org.nz/What-we-do/Community-programmes/3-steps-for-life/>

3 Steps for Life is designed to give all New Zealanders the confidence and awareness to take action when somebody suffers a cardiac arrest by:

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

This initiative is an opportunity for our people to deliver free community awareness sessions with the potential to save up to 500 lives a year. All St John personnel who are qualified at First Responder (or above), along with certified St John tutors, can volunteer to run a one-hour CPR and AED 3 Steps for Life awareness session for community groups such as sports clubs, retirement villages and marae communities.

### ASB St John in Schools

<https://www.stjohn.org.nz/What-we-do/Community-programmes/ASB-St-John-in-Schools-Programme/>

St John recognises that children also have a role to play in a community response to an OHCA. Between 1 July 2019 and 30 June 2020, the ASB St John in Schools programme trained 148,126 children in CPR.

### National Marae OHCA project

Māori are more at risk of cardiac arrest than non-Māori. St John is working with marae around New Zealand to engage with Māori and provide support through improving access to AEDs and training in CPR.

### Online resources

St John has developed several online videos and a smartphone application which are freely available to the public to help them learn CPR and how to use an AED:

- The St John CPR App: <https://www.stjohn.org.nz/First-Aid/CPR-App/>
- Learn how to do CPR and to use an AED, 3 Steps for Life: <https://www.stjohn.org.nz/What-we-do/Community-programmes/3-steps-for-life/>

### Engagement with the Ministry of Education

St John supports the New Zealand Resuscitation Council, who are engaging with the Ministry of Education to discuss the possibility of adding first aid training to the compulsory education curriculum, including CPR and how to use an AED.

### World Restart A Heart Day, October 16 (Annually)

World Restart A Heart Day promotes the 3 Steps for Life (**1.** Call 111, **2.** Start CPR, **3.** Use an AED). Public events take place throughout New Zealand, along with a strong advertising and a social media campaign ([restartaheart.co.nz](http://restartaheart.co.nz), #restartaheart). The aim of this wide-reaching promotion is to grow the numbers of community responders and trained members of the public.



9

## Be accountable – publicise annual reports

All St John OHCA Registry Annual Reports are publicly available. The current report and all previous reports can be downloaded from the St John website: <http://www.stjohn.org.nz/News--Info/Our-Performance/Cardiac-Arrest-Annual-Report/>



10

## Provide a culture of excellence

To achieve change and a culture of excellence, St John relies on evidence gathered through research and audit. The St John Clinical Audit and Research Team frequently publishes in peer reviewed journals, presents at leadership meetings, analyses data in conjunction with the Medical Directors and uses data to inform training.

Scientific publications by or in collaboration with the Clinical Audit and Research team can be found on the St John website <https://www.stjohn.org.nz/what-we-do/research-stjohn/>.

## Conclusion

**The data presented in this report indicates that the service provided by St John in treating OHCA has remained at a similar level over time.**

This report identifies an ongoing plateau in improvement for OHCA survival. This result must drive future investment and resourcing into the “10 Steps” to ensure that we are improving our survival rates in line with international comparators. By investing in the systems of care for patients in OHCA St John can also increase future rates of survival.

International studies, including those within Australia, have demonstrated significant declines in survival from OHCA during the COVID-19 pandemic<sup>5-7</sup>. These decreases in survival have been associated with changes to the system of care or directly due to viral illness. It is noteworthy that there is no evidence within this reporting period that St John has seen any such decreases in survival within our system of care. ■



# Appendices

## The St John Out-of-Hospital Cardiac Arrest Registry

**The St John OHCA Registry was formally established in September 2013. Since the registry was established, data for cardiac arrests attended by St John has been successfully captured for more than 20,000 patients.**

The St John OHCA Registry is overseen by Prof. Bridget Dicker, St John Head of Clinical Audit and Research and Auckland University of Technology Adjunct Professor, Paramedicine Department.

### Eligibility

St John captures data on all OHCA events attended by the St John EAS. St John defines a cardiac arrest 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 Australian 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.

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

<b>1</b>	Patients of all ages who suffer a documented cardiac arrest
<b>2</b>	Occurs in New Zealand where St John or one of its participating co-responders is the primary treatment provider
<b>3</b>	<ul style="list-style-type: none"> <li>➤ Patients of all ages who on arrival of the St John EAS are unconscious and pulseless with either agonal breathing or no breathing <b>or</b></li> <li>➤ Patients of all ages who become unconscious and pulseless with either agonal breathing or no breathing in the presence of St John EAS personnel <b>or</b></li> <li>➤ Patients who have a pulse on arrival of St John EAS personnel following successful bystander defibrillation</li> </ul>

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

<b>1</b>	Patients who suffer a cardiac arrest in a hospital facility where St John EAS may be in attendance but are not the primary treatment providers
<b>2</b>	Patients who suffer a cardiac arrest during an inter-hospital transfer where St John EAS may be providing transport but are not the primary treatment providers
<b>3</b>	Bystander suspected cardiac arrest where the patient is not in cardiac arrest on arrival of the St John EAS personnel, and where defibrillation did not occur prior to ambulance arrival or no other evidence verifying a cardiac arrest state is present
<b>4</b>	Patients who suffer a cardiac arrest where Wellington Free Ambulance is the primary treatment provider

### 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 St John OHCA Registry.

### 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.

The date of death is updated by the 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. Where appropriate, these results are compared with international data from EAS that are similar to St John.

## Missing data

The 2019/20 year included full electronic data capture of EMS records. Results may vary from those in 2018/19 as the 2018/19 period had a 6-month hiatus (Dec 2018 to July 2019) whereby St John EMS used paper data capture due to industrial action. This hiatus is likely to have affected the quality of data captured during that period.

This data does not include any patients from the Whakaari / White Island eruption that occurred on December 9th 2019.

## Ethical review

The St John OHCA Registry has been approved by the New Zealand Health and Disability Ethics Committee (Ethics reference: 19/NTB/187).

The registry is also subject to St John 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 St John 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 released from this registry. ■

# Abbreviations

<b>AED</b>	Automated external defibrillator	<b>GoodSAM</b>	Good Smartphone Activated Medics
<b>CAD</b>	Computer aided dispatch	<b>OHCA</b>	Out-of-hospital cardiac arrest
<b>CPR</b>	Cardiopulmonary resuscitation	<b>PRIME</b>	Primary Response in Medical Emergencies
<b>DHB</b>	District Health Board	<b>ROSC</b>	Return of spontaneous circulation
<b>EAS</b>	Emergency ambulance service		



# Glossary of terms

<b>Adjusted rates</b>	Rates are standardised to a control population.
<b>Adult</b>	Patients aged 15 years or older.
<b>Asystole</b>	The absence of any cardiac electrical activity.
<b>Children</b>	Patients aged less than 15 years.
<b>Community responder</b>	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.
<b>EAS attended</b>	This is the total population of all OHCA patients which St John EAS attended, regardless of whether emergency treatment was provided or not.
<b>EAS personnel</b>	Where St John EAS personnel respond to a medical emergency in an operational capacity as part of an organised response team.
<b>Presumed cardiac aetiology</b>	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.
<b>Resuscitation attempted</b>	The performance of CPR by or under the direction of responding EAS personnel, or the delivery of a shock at any time (including before ambulance arrival).
<b>Return of spontaneous circulation</b>	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, normal end tidal CO <sub>2</sub> or active movement.
<b>Rural and remote service area</b>	<p><b>Includes:</b></p> <p>Minor urban area: these are centred on smaller towns with a population between 1,000 and 9,999.</p> <p><b>and</b></p> <p>Rural centre: defined as rural settlements or townships with population between 300 and 999.</p> <p><b>and</b></p> <p>Other: those areas not classified as urban or rural centres with population under 300. (<a href="http://nzdotstat.stats.govt.nz/wbos/Index.aspx">http://nzdotstat.stats.govt.nz/wbos/Index.aspx</a>)</p>
<b>Shockable rhythm</b>	Ventricular fibrillation, ventricular tachycardia or unknown shockable (AED).
<b>Specific rates</b>	Rates for specific segments/groups of the population (e.g. sex, age, ethnicity).
<b>Survival to 30-days</b>	The patient is alive at 30-days post-OHCA event.
<b>Survived event</b>	The patient has sustained ROSC to handover at hospital.
<b>Urban area</b>	<p><b>Includes:</b></p> <p>Main urban area: centred on a city or major urban area with a minimum population of 30,000.</p> <p><b>and</b></p> <p>Secondary urban area: centred on large regional centres with a population between 10,000 and 29,999.</p> <p>(<a href="http://nzdotstat.stats.govt.nz/wbos/Index.aspx">http://nzdotstat.stats.govt.nz/wbos/Index.aspx</a>)</p>
<b>Witnessed event</b>	A witnessed cardiac arrest is one that is seen or heard by another person.

## References

1. Smith, K. and J. Ball. *Victorian Ambulance Cardiac Arrest Registry 2019-2020 Annual Report*. 2020; Available from: <https://www.ambulance.vic.gov.au/about-us/research/research-publications/>.
2. Queensland Ambulance Service. *Out of hospital cardiac arrest in Queensland 2019 annual report* [cited February 2021]; Available from: <https://www.ambulance.qld.gov.au/publications.html>
3. Ball, S. et al, *St John Western Australia: OHCA statistics 1 July 2019 to 30 June 2020*. 2021: Personal Communication. Email 4 February 2021.
4. Drucker, C., *Public Health-Seattle & King County, Division of Emergency Medical Services, King County, Washington, USA: OHCA statistics 1 July 2019 to 30 June 2020*. 2021: Personal Communication. Email 6 February 2021.
5. Fothergill, R.T. et al., *Out-of-Hospital Cardiac Arrest in London during the COVID-19 pandemic*. *Resusc Plus*. 2021 Mar;5:100066. doi: 10.1016/j.resplu.2020.100066. Epub 2020 Dec 21.
6. Ball, J. et al., *Collateral damage: Hidden impact of the COVID-19 pandemic on the out-of-hospital cardiac arrest system-of-care*. *Resuscitation*. 2020 Nov;156:157-163. doi: 10.1016/j.resuscitation.2020.09.017. Epub 2020 Sep 19.
7. Marijon, E. et al., *Out-of-hospital cardiac arrest during the COVID-19 pandemic in Paris, France: a population-based, observational study*. *Lancet Public Health*. 2020 Aug;5(8):e437-e443. doi: 10.1016/S2468-2667(20)30117-1. Epub 2020 May 27.



LIFEPAK 15 MONITOR/DEFIBRILLATOR

NO LP024

PHYSIO CONTROL  
MEDXIS 0800 937 346  
SAFETY & PERFORMANCE TEST  
MEDXIS JOB # 23401  
DATE 12/15/15 TECH DS  
NEXT TEST DATE 12/15/16  
SAFETY TESTED TO AS/NZS 3083:2015

12-LEAD  
TRANSMIT  
CODE SUMMARY  
PRINT



1 ON  
2 CPR ENERGY SELECT  
3 ANALYZE CHARGE  
LEAD SIZE  
SYNC  
NIBP  
ALARMS PAGER  
OPTIONS RATE  
EVENT CURRENT



**St John**

Here for Life

**ST JOHN NATIONAL  
HEADQUARTERS**

604 Great South Road  
Ellerslie  
Private Bag 14902  
Panmure  
Auckland 1741  
Tel: 09 579 1015

**ST JOHN NORTHERN  
REGION HEADQUARTERS**

604 Great South Road  
Ellerslie  
Private Bag 14902  
Panmure  
Auckland 1741  
Tel: 09 579 1015

**ST JOHN CENTRAL  
REGION HEADQUARTERS**

63 Seddon Road  
Private Bag 3215  
Hamilton 3240  
Tel: 07 847 2849

**ST JOHN IN WELLINGTON**

55 Waterloo Quay  
PO Box 10043  
Wellington 6143  
Tel: 04 472 3600

**ST JOHN SOUTH  
ISLAND REGION  
HEADQUARTERS**

PO Box 1143  
Christchurch 8140  
Tel: 03 353 7110

**[stjohn.org.nz](http://stjohn.org.nz)**

**0800 ST JOHN (0800 785 646)**

**[info@stjohn.org.nz](mailto:info@stjohn.org.nz)**

**Follow St John:**

 [facebook.com/StJohnNewZealand](https://facebook.com/StJohnNewZealand)

 [twitter.com/StJohnNZ](https://twitter.com/StJohnNZ)

 [linkedin.com/company/St-John-New-Zealand](https://linkedin.com/company/St-John-New-Zealand)

 [instagram.com/stjohnnz](https://instagram.com/stjohnnz)