Defib in your street: placement of Automated External Defibrillators (AED) in Reservoir, Victoria

Project Report

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St John Ambulance Victoria

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Lay description: St John Ambulance Victoria implemented a one-year pilot project to increase public access to automated external defibrillators (AED) in the suburb of Reservoir, Victoria. This postcode (3073) was selected as it has been identified with the 5th highest number of sudden cardiac arrests in the state. This study aimed to determine the extent of the deployment of AEDs and understand the experience of hosts of AEDs in Reservoir.

Background:

Ambulance Victoria attended 6,934 out-of-hospital cardiac arrest events from July 2020 to June 2021 [1]. More than three-quarters of these cases occurred in private residences. The use of defibrillators by bystanders is likely to increase the survival rate of victims. Most defibrillators are placed in public spaces, including shopping vicinities and workplaces and available during business hours.

St John Ambulance Victoria initiated a pilot project to increase CPR training and public access to AEDs in the Melbourne suburb of Reservoir. This locale has been identified as having the 5th highest number of sudden cardiac arrest cases in Victoria and a high proportion of sudden cardiac arrests relative to population.

This pilot project, implemented from March 2022 to March 2023, had a three-prong approach:

i. To increase public awareness of sudden cardiac arrest among Reservoir residents.
ii. To train 33% of the Reservoir residents in cardiopulmonary resuscitation CPR and AED use.
iii. To place AED in publicly accessible areas, including residences, throughout Reservoir where every person (including GoodSAM* responders) is no more than 400 meters from an AED.

This study focused on the third prong, that is determining if the AEDs deployed have been placed where they are reachable within 400 meters of every person and determining the service area population. Specifically, geo-spatial focused research questions were raised:

Research Question 1a: What is the service area population and number of cardiac arrests over the last 5 years, within 400 metres of each AED?

Research Question 1b: What is the travel time to closest AED for each mesh block and for each cardiac arrest which has taken place over the last 5 years?

Research Question 2. What is the relationship between socioeconomic and demographic characteristics on the geographic variability of access to, and capacity of, service locations.

To complement the geo-spatial analysis, the insights of residents and business owners who hosted the AEDS were sought to inform on their engagement processes with SJAV and extent of contribution towards community capital.

Research Questions 3: What were the experiences of the hosts of an AED in having the device located on their premises?

Ethics: Ethics approval was granted for this project by the La Trobe University Human Ethics Committee (HEC23311) and a Data Access Agreement, dated 1 November 2023, was executed between La Trobe University and Ambulance Victoria.

This report comprises two main sections – Section A: Research Questions 1 and 2, and Section B: Research Question 3.

Section A: Research Questions 1 and 2

METHODS

Methods aligned with each research question have been detailed below, under each research question.

Research Question 1a: What is the service area population and number of cardiac arrests over the last five years, within 400 metres of each AED?

Research Question 1b: What is the travel time to closest AED for each Mesh Block and for each cardiac arrest which has taken place over the last five years?

Approach: Spatial analysis was undertaken to establish the service area population, and number of cardiac arrests within the last five years, within 400 metres of each AED. Additionally, travel time to the closest AED for each Mesh Block (A Mesh Block is the smallest geographical structure and typically includes between 30-60 dwellings [2]) within Reservoir (Mesh Blocks within Reservoir and 400 metres outside of the Reservoir border were considered), and travel time from each cardiac arrest to the closest AED.

Data Sources: The addresses and geolocations for SJAV AEDs and non SJAV AEDs were sourced from St John Ambulance Victoria [3] and Ambulance Victoria [4]. The geolocations of cardiac arrests experienced within Reservoir within the last 5-years were received from Ambulance Victoria (AV). The population for each Mesh Block was derived from the Australian Bureau of Statistics (ABS) Census of Population and Housing [5]. Data surrounding the population aged 55 and older, 65 and older, the population which spoke a language other than English at home, and the Index of Relative Socioeconomic Disadvantage (IRSD) [6] within each Statistical Area 1 (Statistical Area 1 is the second smallest geography structure) [2], and was sourced from the Australian Bureau of Statistics (ABS) Census of Population and Housing [5]. Statistical Area 1 data was used as age level and IRSD level data for each Mesh Block is not made public. Road network data was obtained from OpenRoadStreetMap [7].

Data Analysis: Data was stored in a PostgreSQL V 12 [8] database and all spatial analysis was conducted via PostGIS, with a combination of PostGIS functions and SQL commands. Due to the lack of Mesh Block-specific data for all population variables and the IRSD, these values were estimated from Statistical Area Level 1 (SA1) data. For each Mesh Block, the value was calculated as a geographic-weighted average based on the SA1s it intersected. For example, if a Mesh Block intersected two SA1s, its total population was derived from the proportional area it covered within each SA1. To establish the service area population covered within 400 metres of service locations, a service area analysis was conducted, establishing the walking area covered within 400 metres of each AED. A service area analysis establishes the area accessible outside of a distinct address, given a road network [9]. After, the total population, Culturally and Linguistically Diverse (CALD) population [CALD established based on number of people who spoke a language other than English at home], population aged 55 years and older and 65 years and older residing within the Mesh Block area covered within each service area, and number of cardiac arrest cases within the last five years within each service area was calculated. For population values, a geographically weighted average was calculated based on the Mesh Blocks intersected by the service area. Similarly, the weighted IRSD was calculated for the Mesh Blocks within a service area. For cardiac arrests, the total number within the service area was aggregated.

To establish the travel time to the closest service location, first, a centroid (a point representing the centre of an area) was placed within each Mesh Block. After using the Open Source Routing Machine [10], the walking travel time from each Mesh Block to the closest AED and travel time from each cardiac arrest over the last five years to the closest AED was established (comparable to work completed by researcher AL previously [11]. The walking speed used was 10 KM/hr, comparable to the average running time established via Strava user data [12].

Research Question 2. What is the relationship between socioeconomic and demographic characteristics on access to, and capacity of, service locations?

Approach: Inferential analyses using SPSS, of data produced while addressing RQs 1a and 1b was conducted. Differences between groups and the association between demographic variables and access to (travel time in minutes), and capacity of (number of people per AED), service locations was tested [6].

Data Sources: Data utilised in addressing RQ1a and RQ1b, and outcomes from RQ1a and RQ1b (travel time and number of people per AED) will be used. Additionally, individual cardiac arrest level data (age, and gender of people who have experienced a cardiac arrest) was utilised. Cardiac arrest level data has been provided by Ambulance Victoria.

Data Analysis: Relevant analysis was established based on the distribution of outcome data (capacity: population per provider, and availability: travel time). Specifically, parametric methods were used for normal data, while non-parametric methods were used for non-normal data. Distinct inferential analyses were progressed for service area level data, Mesh Block level data, and cardiac arrest level data.

Service Area: Within this study, a service area is defined as the region within a 400-meter radius around any AED, measured based on the road network. In relation to service area analyses, to investigate differences in populations serviced, the number of cardiac arrests, and IRSD scores between non-SJAV AED and SJAV AED service areas, tests (either Independent-Samples Mann-Whitney U Test or Independent Sample t-test) for significant differences in total service area population, service area population aged 55 and older, service area population aged 65 and older, CALD population within the service area, weighted IRSD score within the service area, and number of cardiac arrests within the service area, between both groups were conducted. While, to investigate the relationship between socio-demographic characteristics and AED capacity (total population serviced within an AED service area), a correlation analysis was conducted, testing for a bivariate relationship between the following socio- demographic variables and Total Population within the Service Area: Percentage of CALD Population in Service Area, Percentage of Population Aged 55 and Older in Service Area, Percentage of Population Aged 65 and Older in Service Area, and Service Area Weighted IRSD.

Cardiac Arrest: Individual cardiac arrest data, including age and gender, provided by Ambulance Victoria, was utilized. In relation to cardiac arrest relevant analyses, to investigate differences in AED service area population serviced (capacity), and travel time to closest AED (access) prior to and subsequent to the inclusion of SJAV AEDs, tests (related-Samples Wilcoxon Signed Rank Test is the Paired Sample t-Test) for significant differences in AED service area population and travel time to the closest AED for each cardiac arrest location were conducted. While, to investigate the relationship between socio-demographic characteristics and AED capacity (total population serviced within an AED service area) and AED access (travel time to the closest AED) a correlation analysis was conducted, testing for a bivariate relationship between the following sociodemographic variables and travel time to closest AED prior to and after inclusion of SJAV AEDs and, population within the service area of the closest AED prior to and after inclusion of SJAV AEDs: Gender of Person, Age of Person, IRSD in Mesh Block where Cardiac Arrest Occurred, Percentage of CALD Population in Mesh Block where Cardiac Arrest Occurred, Percentage of Population Aged 55 and Older in Mesh Block where Cardiac Arrest Occurred, Percentage of Population Aged 65 and Older in Mesh Block where Cardiac Arrest Occurred.

Mesh Block: A Mesh Block is the smallest Australian geographical area and typically includes between 30-60 dwellings [2]. In relation to Mesh Block relevant analyses, it largely mirrored the Cardiac Arrest relevant analyses. To investigate differences in AED service area population serviced (capacity), and travel time to closest AED (access) prior to and subsequent to the inclusion of SJAV AEDs, tests (related-Samples Wilcoxon Signed Rank Test is the Paired Sample t-Test) for significant differences in AED service area population and travel time to the closest AED for Mesh Block were conducted. While, to investigate the relationship between sociodemographic characteristics and AED capacity (total population serviced within an AED service area) and AED access (travel time to the closest AED), a correlation analysis was conducted, testing for a bivariate relationship between the following sociodemographic variables and travel time to closest AED prior to and after inclusion of SJAV AEDs and, population within the service area of the closest AED prior to and after inclusion of SJAV AEDs: IRSD in Mesh Block, Percentage of CALD Population in Mesh Block, Percentage of Population Aged 55 and Older in Mesh Block, Percentage of Population Aged 65 and Older in Mesh Block.

FINDINGS

Findings have been clarified in line with the domains: Service Area Analysis, Cardiac Arrest and Mesh Block Analysis.

Service Area Data

Research Question 1: In relation to the 400-m service area data, raw data has been provided within Table 1 – below. Furthermore, descriptive statistics were produced to establish the population serviced (overall population, number of 55 years old plus, number of 65 years old plus, and number of CALD people), IRSD, and number of cardiac arrests located within the service area of all SJAV and non-SJAV AEDs (see Table 1). The SJAV AED service areas have a higher mean population (573.01) compared to the non-SJAV AED service areas (238.36), with a wider range in the non-SJAV group (0 to 777) than in the SJAV group (320 to 905). In terms of the number of people Culturally and Linguistically Diverse (CALD), the SJAV AED service areas have a higher mean (195.61) compared to the non-SJAV AED service areas (88.80), with a narrower range in the SJAV group (83 to 307) than in the non-SJAV group (0 to 248). The number of people aged 55 and older and 65 and older is also higher in the SJAV AED service areas, with means of 152.17 and 93.87, respectively, compared to 65.40 and 42.46 in the non-SJAV AED service areas. The Index of Relative Socio-economic Disadvantage (IRSD) is slightly higher in the SJAV AED service areas (mean of 973.39) than in the non-SJAV AED service areas (mean of 959.33). Lastly, the number of cardiac arrests is higher in the SJAV AED service areas (mean of 4.19) compared to the non-SJAV AED service areas (mean of 1.88).

In relation to descriptive data within Table 2, SJAV AED service areas tend to have larger median populations, including higher numbers of CALD individuals and older adults, and experience a higher median number of cardiac arrests compared to non-SJAV AED service areas. These differences highlight the importance of considering these demographic and health-related factors when planning and allocating resources for emergency services and interventions in different service areas. Relevant maps after referenced tables further illustrate these differences.

Table 1: **Individual AED Data**

AED Provider	Address	postcode	SJAV AED (y/n)	IRSD	Total Population	CALD Population	Population Aged 55 and Older	Population Aged 65 and Older	Number of Cardiac Arrests
DAREBIN CITY COUNCIL - OPERATIONS CENTRE RESERVOIR	15 CARAWA DRIVE, RESERVOIR 3073 VIC	3073	n		0	0	0	0	0
7 CHEFS PTY LTD	4/106 MCBRYDE STREET, FAWKNER 3060 VIC	3060	n	907	322	159	74	48	0
ICON EQUIPMENT P/L	13-17 HILLWIN STREET, RESERVOIR 3073 VIC	3073	n	979	20	5	4	2	0
PRESTON TOYOTA	687-705 HIGH STREET, PRESTON 3072 VIC	3072	n	1026	777	240	175	100	0
MCG CRANES PTY LTD	258 MAHONEYS ROAD, THOMASTOWN 3074 VIC	3074	n	953	38	14	11	7	0
SVC PRODUCTS PTY LTD	2 CHAFFEY STREET, THOMASTOWN 3074 VIC	3074	n	885	0	0	0	0	0
WYNCITY KEON PARK	16 KEON PARADE, THOMASTOWN 3074 VIC	3074	n	984	98	33	21	10	0
GABBIN PAPER TUBES	15 DUNSTANS COURT, THOMASTOWN 3074 VIC	3074	n		0	0	0	0	0
RDSA	65 CRISSANE ROAD, HEIDELBERG WEST 3081 VIC	3081	n	1002	11	1	1	0	0
DAHLSENS THOMASTOWN	246 MAHONEYS ROAD, THOMASTOWN 3074 VIC	3074	n	958	164	58	48	29	1
DAREBIN CITY COUNCIL - RESERVOIR COMMUNITY & LEARNING CENTRE	23 EDWARDES STREET, RESERVOIR 3073 VIC	3073	n	981	133	56	28	16	1
HOLY NAME PRIMARY SCHOOL	6-20 ROBB STREET, RESERVOIR 3073 VIC	3073	n	1035	562	144	141	84	1
COLES SUPERMARKET - RESERVOIR	325 SPRING STREET, RESERVOIR 3073 VIC	3073	n	1003	344	141	60	29	2
WILLIAM RUTHVEN PRIMARY SCHOOL	60 MERRILANDS ROAD, RESERVOIR 3073 VIC	3073	n	933	337	166	129	94	4
COLES SUPERMARKET - SUMMERHILL	850 PLENTY ROAD, RESERVOIR 3083 VIC	3083	n	818	380	157	156	116	5
MAHARISHI SCHOOL	2-8 DUNDEE STREET, RESERVOIR 3073 VIC	3073	n	967	628	248	197	144	16
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	12 BARTROP STREET, RESERVOIR 3073 VIC	3073	y	981	428	182	186	130	0
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	1 LUKE STREET, RESERVOIR 3073 VIC	3073	y	1000	486	116	137	82	1
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	6 CHAUVEL STREET, RESERVOIR 3073 VIC	3073	y	987	679	214	185	125	1
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	33 Ramleh Road, RESERVOIR 3073 VIC	3073	y	983	383	119	110	65	1
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	43 KINSALE STREET, RESERVOIR 3073 VIC	3073	y	1023	417	83	100	55	2
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	2 RONA STREET, RESERVOIR 3073 VIC	3073	y	1032	904	257	195	110	2
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	13 GRIMWADE STREET, RESERVOIR 3073 VIC	3073	y	989	440	140	115	74	2

ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	7 NEWTON STREET, RESERVOIR 3073 VIC	3073	y	873	601	279	156	86	2
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	1/49 WINTER CRESCENT, RESERVOIR 3073 VIC	3073	y	878	510	216	118	71	2
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	35 STURDEE STREET, RESERVOIR 3073 VIC	3073	y	976	401	170	109	55	3
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	15A DELAWARE STREET, RESERVOIR 3073 VIC	3073	y	1014	583	149	128	73	3
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	2 LIPSCOMB COURT, RESERVOIR 3073 VIC	3073	y	942	342	189	147	109	3
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	9 BRYAN STREET, RESERVOIR 3073 VIC	3073	y	1016	610	134	169	93	4
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	11 TAYLOR AVENUE, RESERVOIR 3073 VIC	3073	y	1006	838	218	161	81	4
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	3 CRAWLEY STREET, RESERVOIR 3073 VIC	3073	y	1024	830	234	190	102	4
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	14 GODLEY STREET, RESERVOIR 3073 VIC	3073	y	940	436	208	181	137	4
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	895 HIGH STREET, RESERVOIR 3073 VIC	3073	y	989	468	202	101	54	4
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	4 MCCARTEN STREET, RESERVOIR 3073 VIC	3073	y	1062	519	98	151	80	4
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	1/157 CHEDDAR ROAD, RESERVOIR 3073 VIC	3073	y	961	720	256	165	95	4
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	66-68 DREDGE STREET, RESERVOIR 3073 VIC	3073	y	953	405	188	177	134	5
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	64 GLASGOW AVENUE, RESERVOIR 3073 VIC	3073	y	952	607	238	243	193	5
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	42 COMPTON STREET, RESERVOIR 3073 VIC	3073	y	982	783	307	168	90	7
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	2C CUTHBERT ROAD, RESERVOIR 3073 VIC	3073	y	908	539	195	130	81	7
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	55 MIRANDA ROAD, RESERVOIR 3073 VIC	3073	y	1003	905	277	186	113	7
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	26 PALM AVENUE, RESERVOIR 3073 VIC	3073	y	921	618	221	125	64	8
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	847 PLENTY ROAD, RESERVOIR 3073 VIC	3073	y	907	320	143	99	70	9
ST JOHN AMBULANCE VICTORIA DEFIB IN YOUR STREET	1/119 CHEDDAR ROAD, RESERVOIR 3073 VIC	3073	y	980	696	249	176	113	15

Table 2: AED Summary Statistics

Variable	Group								Percentile	
		N	Mean	Median	SD	Range	Min	Max	25th	50th	75th
Total Population	SJAV AED	27	573.01	539.17	172.50	585	320	905	428.44	539.17	696.34
	Non-SJAV AED	16	238.36	148.3	250.55	777	0	777	13.02	148.3	370.89
CALD Population	SJAV AED	27	195.61	202.33	58.43	224	83	307	142.85	202.33	237.55
	Non-SJAV AED	16	88.8	57.08	88.91	248	0	248	2.06	57.08	158.26
Population Aged 55 and Older	SJAV AED	27	152.17	156.25	36.18	144	99	243	117.89	156.25	180.62
	Non-SJAV AED	16	65.4	37.58	70.72	197	0	197	1.96	37.58	138.47
Population Aged 65 and Older	SJAV AED	27	93.87	86.47	31.50	139	54	193	71.31	86.47	112.81
	Non-SJAV AED	16	42.46	22.49	48.88	144	0	144	0.45	22.49	91.6
IRSD	SJAV AED	27	973.39	981.7	46.87	188	873	1062	941.7	981.7	1005.59
	Non-SJAV AED	14	959.33	972.8	58.40	216	818	1035	926.23	972.8	1002.16
Number of Cardiac Arrests	SJAV AED	27	4.19	4	3.14	15	0	15	2	4	5
	Non-SJAV AED	16	1.88	0	4.06	16	0	16	0	0	1.75

Figure 1: Non-SJAV AED 400-Metre Service Area

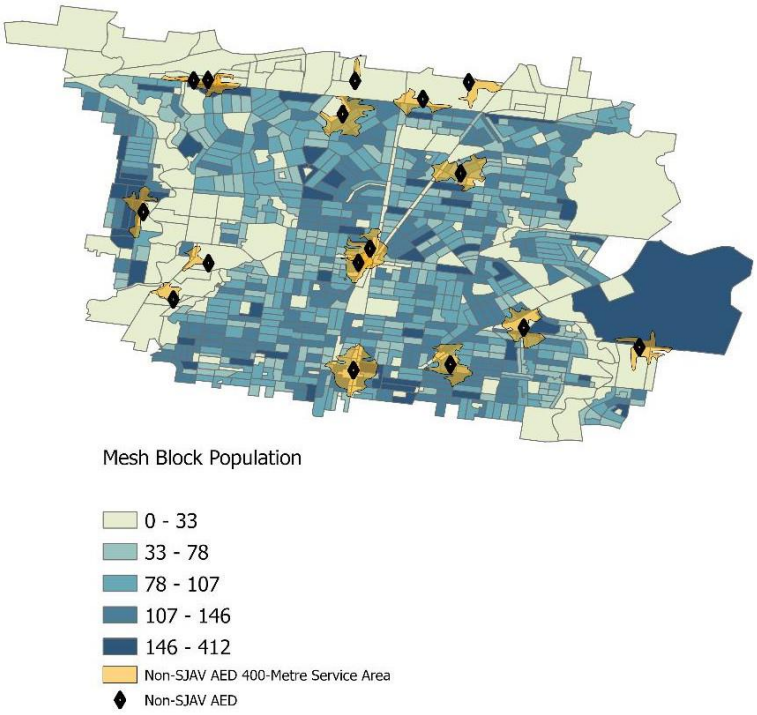


Figure 2: SJAV 400-Metre Service Area

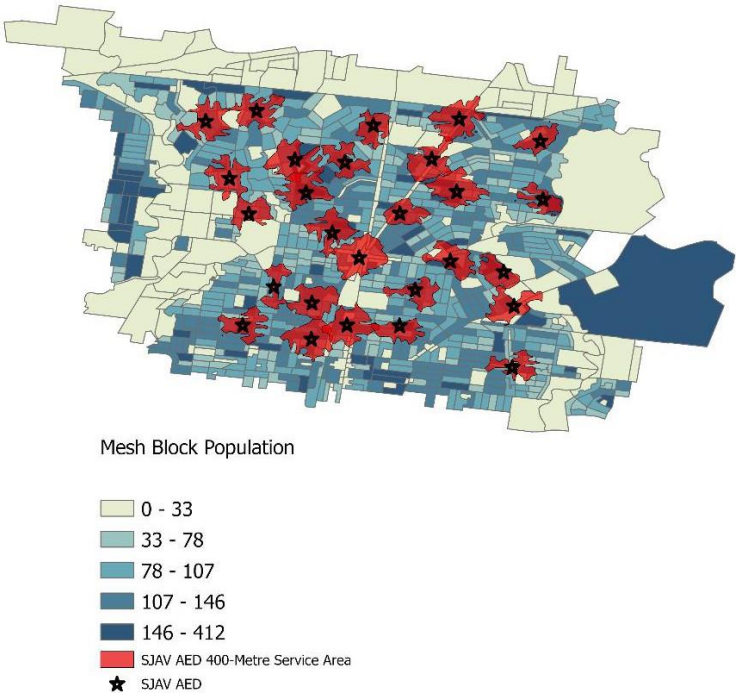


Figure 3: Cardiac Arrests and AED Service Areas

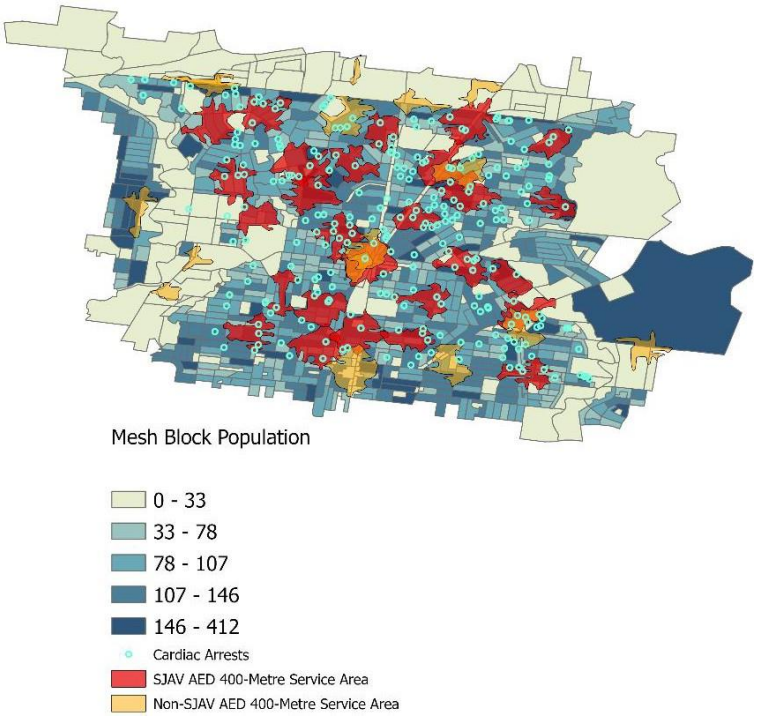


Figure 4: AED Locations and Population Aged 55 and Older

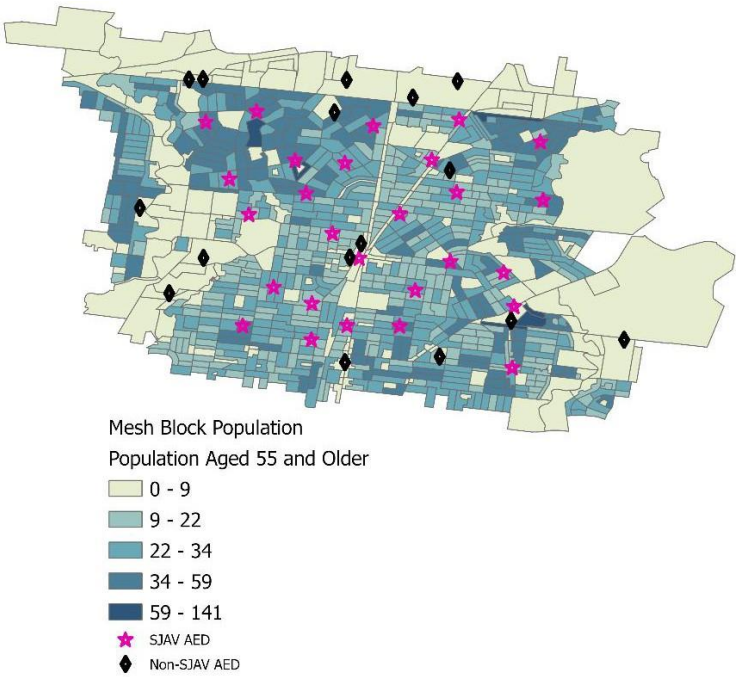


Figure 5: AED Locations and Population Aged 65 and Older

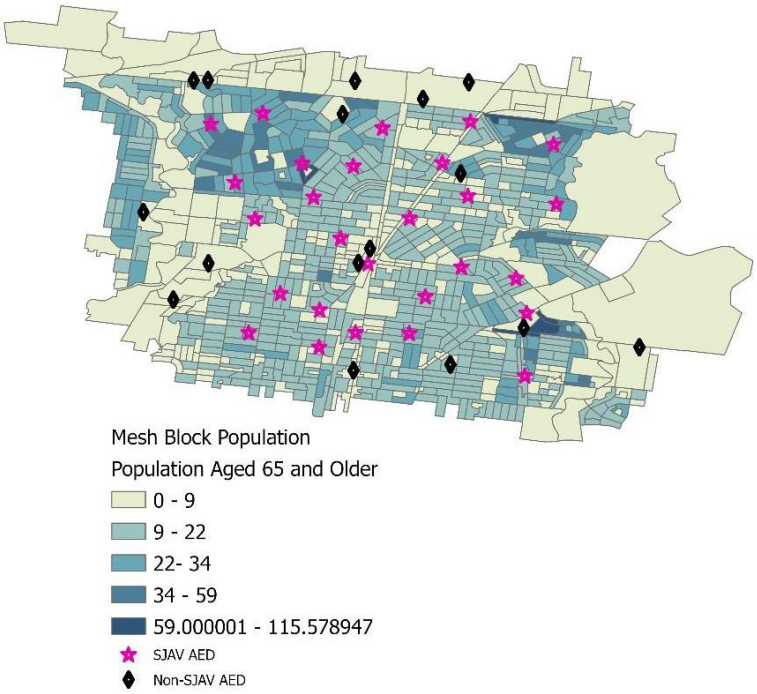


Figure 6: AED Locations and CALD Population

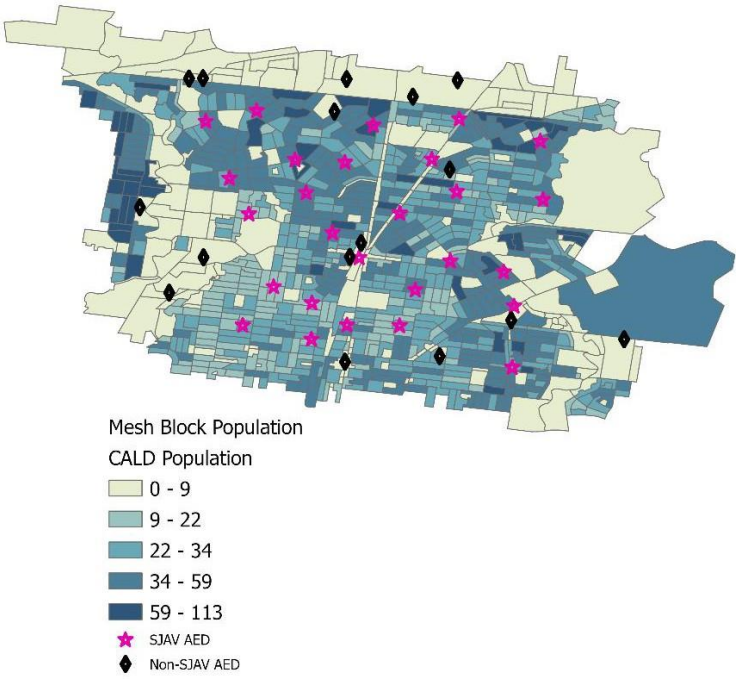
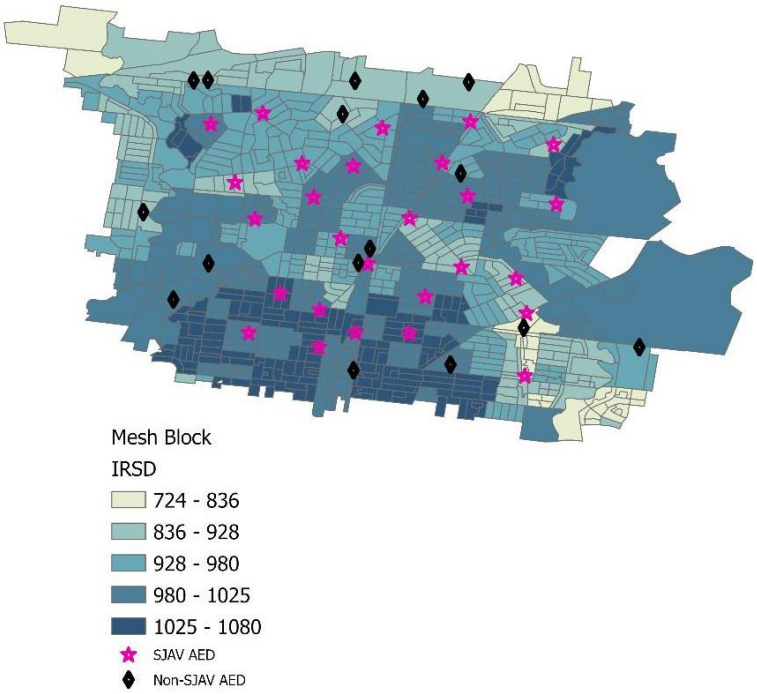


Figure 7: AED Locations and Mesh Block IRSD



Research Question 2: The Shapiro-Wilk test was utilized to assess the normality of the distribution of outcome, informing the choice of inferential tests (parametric vs non-parametric). The test revealed two groups based on their significance. For the weighted IRSD score and CALD population, the test statistics are .952 and .953 with p-values of .080 and .086, respectively. These results trend towards significance, indicating a potential, though not definitive, deviation from normality. This proximity to the conventional alpha level of 0.05 justifies the consideration of non-parametric methods for further inferential analyses involving these variables.

Conversely, the number of people aged 55 and older (test statistic of .925 and a p-value of .010), the percentage of people aged 55 and older (test statistic of .913 and a p-value of .004), and the percentage of people aged 65 and older (test statistic of .896 and a p-value of .001), all showed significant deviation from a normal distribution, with a test statistic of .925 and a p-value of .010. The number of Vacar arrests also indicates a significant non-normal distribution, with a test statistic of .808 and a p-value of less than .001. Therefore, non-parametric methods are clearly warranted for analyses involving these variables.

The proportion of CALD people, number of people aged 65 and older and the total population, have test statistics of .962, .970, and .965 and p-values of .181, .348 and .243 respectively, thus, no significant deviation from normality is indicated. However, considering the moderate sample size of 41, and the fact that other comparable variables either deviate from normality or trend towards it, a non-parametric approach for inferential analyses involving these variables remains a prudent choice. This strategy ensures consistency in analysis methods and guards against potential non-normality not detected by the Shapiro-Wilk test.

An Independent-Samples Mann-Whitney U Test was conducted to investigate differences in populations serviced, the number of cardiac arrests, and Socio-Economic Indexes for Areas (SEIFA) scores between non-SJAV AED and SJAV AED service areas. The test revealed significant differences in the median population serviced, with SJAV AED service areas having a higher median population (539.17) compared to non-SJAV AED service areas (148.30), $U = 371.00$, $p < .001$, $N = 43$. This significant difference suggests that SJAV AEDs are placed in more densely populated areas, which might be strategic for ensuring greater coverage and accessibility in areas with higher population densities. The median CALD population was also significantly higher in SJAV AED service areas (202.33) than in non-SJAV AED service areas (57.08), $U = 353.00$, $p < .001$, $N = 43$. Significant differences were found in the median number of people aged 55 and older, with SJAV AED service areas reporting a median

of 156.25 compared to 37.58 in non-SJAV AED service areas, U = 354.00, p < .001, N = 43. For the population aged 65 and older, the median was higher in SJAV AED service areas (86.47) versus non-SJAV AED service areas (22.49), U = 338.00, p = .002, N = 43. However, the median SEIFA scores did not significantly differ, with SJAV AED service areas at 981.70 and non-SJAV AED service areas at 972.80, U = 212.00, p = .541, N = 41. Lastly, the median number of cardiac arrests was significantly higher in SJAV AED service areas (4.00) compared to non-SJAV AED service areas, which had a median of 0, U = 351.00, p < .001, N = 43.

Spearman's rho correlation analysis was conducted to investigate the bivariate relationship between the following socio-demographic variables and Total Population within the Service Area (capacity): Percentage of CALD Population in Service Area, Percentage of Population Aged 55 and Older in Service Area, Percentage of Population Aged 65 and Older in Service Area, and Service Area Weighted IRSD. Correlation coefficients have been included within Table 3, below. The percentage of the CALD population within a service area exhibited a negative correlation with the total population within the service area (rho = -0.174), although this relationship was not statistically significant (p = 0.276). Similarly, the percentage of the population aged 55 and older (rho = -0.096, p = 0.552) and the percentage aged 65 and older (rho = -0.059, p = 0.714) within the service area also showed negative correlations with the total population within the service area, neither of which reached statistical significance. The service area's weighted Index of Relative Socio-economic Disadvantage (IRSD) was significantly positively correlated (rho = 0.384, p = 0.013) with the total population within the service area. This suggests that service areas with higher socioeconomic status have higher populations. These findings highlight the relationship between socioeconomic status and population size. They suggest the importance of being aware of how socioeconomic status, population size, and resource allocation interact. It is particularly crucial to ensure that areas with lower socioeconomic status and potentially smaller populations do not miss out on resource allocation.

Table 3: Service Area and Key Demographic Correlation Coefficients

Variable		Total Population within Service Area
Percentage of CALD Population in Service Area	Spearman's rho	-0.174
	Sig. (2-tailed)	0.276
	N	41
Percentage of Population Aged 55 and Older in Service Area	Spearman's rho	-0.096
	Sig. (2-tailed)	0.552
	N	41
Percentage of Population Aged 65 and Older in Service Area	Spearman's rho	-0.059
	Sig. (2-tailed)	0.714
	N	41
Service Area Weighted IRSD	Spearman's rho	.384*
	Sig. (2-tailed)	0.013
	N	41

Cardiac Arrest

Research Question 1: The following Table 4 presents descriptive statistics for the three variables: travel time to closest AED after inclusion of SJAV AEDs, and travel time to AED prior to the introduction of to SJAV AEDs and improvement in travel time due to inclusion of SJAV AEDs. A total of 294 valid cases of cardiac arrests were analysed with no missing data. The cardiac arrest data is from before the introduction of SJAV AEDs. Thus, any findings indicate potential changes to travel time that could have been experienced if SJAV AEDs had been in place. The mean, median, range, minimum, maximum, and percentiles (25th, 50th, 75th) are reported for each variable. The inclusion of SJAV AEDs would have led to a reduction in travel time from cardiac arrest sites, with the mean travel time decreasing from 5.3624 minutes before SJAV AED inclusion to 2.7369 minutes after. The median improvement in travel time could be 2.3500 minutes, with a range of improvement between 0 and 9.55 minutes. This substantial reduction in travel time suggests that the placement of SJAV AEDs could greatly enhance the speed of emergency response, potentially improving outcomes for individuals experiencing cardiac arrest.

The data show that the inclusion of SJAV AEDs would have improved proximity to the closest AED for people experiencing cardiac arrest. The addition of SJAV AEDs would also have resulted in an increase in the average number of people served by the nearest AED from 370.88 to 557.40. The change indicates that SJAV AEDs have been placed in dense areas, which were previously unserved and lacking a proximate AED (see Figures 1 and 2 where this is illustrated). The change of population served (mean 186.52, and ranging from a increase of 720.01 to a decrease of 285.83) suggests that while travel times improved, the capacity to serve the increased population at the nearest AED locations could present a challenge.

Table 4: Descriptive Statistics for Cardiac Arrest Travel Times to Closest AED and Number of People in Service Area of Closest AED

	N							Percentiles		
Variable	Valid	Mean	Median	SD	Range	Minimum	Maximum	25	50	75
Travel Time to Closest AED After Inclusion of SJAV AEDs	294	2.74	2.73	1.18	5.85	0.05	5.90	1.75	2.73	3.50
Travel Time to Closest AED Prior to the Inclusion of SJAV AEDs	294	5.36	5.38	2.31	11.45	0.75	12.20	3.74	5.38	6.76
Improvement in Travel Time Due to the Inclusion of SJAV AEDs.	294	2.63	2.35	2.35	9.55	0.00	9.55	0.54	2.35	4.15
Number of People in Closest AED Service Area After Inclusion of SJAV AEDs	294	557.40	601.07	189.80	867.50	37.96	905.46	404.58	601.07	679.33
Number of People in Closest AED Service Area Prior to the Inclusion of SJAV AEDs	294	370.88	344.22	221.41	777.31	0.00	777.31	163.70	344.22	628.13
Change in Number of People in Closest AED Service Area*	294	186.52	159.39	246.22	1005.85	-285.83	720.01	0.00	159.39	284.16

*** Population Change= Service Area Population of Closest AED After SJAV AED Introduction – Service Area Population of Closest AED Before SJAV AED Introduction**

Research Question 2: In relation to travel time to the closest AED from the location where someone has experienced a cardiac arrest, results from the Shapiro-Wilk test indicated that the data for travel time to closest AED after inclusion of SJAV AEDs ($p < .05$), and travel time to AED prior to the introduction of SJAV AEDs ($p < .05$), and improvement in travel time due to the inclusion of SJAV AEDs ($p <.001$) were not normally distributed, with statistics of .984, .985, and .912 respectively. Similarly, the population within AED service areas both prior to and after the inclusion of SJAV AEDs were not normally distributed ($p<.001$), with statistics of .922 and .967 respectively. Thus, non-parametric tests were progressed to analyse this data.

In examining the differences between the duration of the travel time to closest AED after inclusion of SJAV AEDs, and travel time to AED prior to the introduction of to SJAV AEDs, a Related-Samples Wilcoxon Signed Rank Test was conducted. The test revealed a statistically significant difference in the median values of the two conditions, ($W=27966.00$, $SE=1049.88$, $z=13.319$, $p<.001$) leading to the rejection of the null hypothesis which posited that there were no differences in travel times. The results confirm a significant difference in the duration of travel time as a result of the introduction of SJAV AEDs. Similarly, the Related-Samples Wilcoxon Signed Rank Test was applied to assess population differences in the closest AED service area following the inclusion of SJAV AEDs. The test yielded a significant result ($W = 25148.00$, $SE = 1049.749$, $z = 10.636$, $p < .001$), indicating that the differences in service area populations before and after the inclusion of SJAV AEDs are statistically significant. This suggests that the inclusion of SJAV AEDs was significantly associated with an increase in the number of people served within the closest AED service area. This is likely due to SJAV AEDs being strategically placed in densely populated areas which were previously unserved (once again illustrated in Figures 1 and 2).

In the analysis using Spearman's rho correlation coefficients, the relationships between demographic factors and AED accessibility were investigated, both before and after the inclusion of SJAV AEDs. Notably, no significant correlations were identified between the gender or age of a person and the travel times to the nearest AED or the population within the closest AED service area. The analysis revealed a positive correlation between the IRSD in the Mesh Block where a cardiac arrest occurred and the closest AED service area population. Before the inclusion of SJAV AEDs, there was a stronger positive correlation between the Index of Relative Socio-economic Disadvantage (IRSD) and the number of people serviced by the closest AED (.342) compared to after the inclusion (.145). This suggests that, following the inclusion of SJAV AEDs, areas with higher socio-economic status experienced an improvement in the capacity of their closest AED (lower population within the service area), indicated by a lower population being serviced.

Table 5 below includes correlation coefficients between sociodemographic variables and travel time to the closest AED and closest AED service area population. The percentage of the CALD population within the Mesh Block where a cardiac arrest occurred was negatively correlated with travel times to the closest AED prior to the inclusion of SJAV AEDs, the negative relationship remained the same, yet was not significant after the inclusion of SJAV AEDs (-.175, $p = 0.003$ to -0.096, $p = 0.104$). Furthermore, the percentage of the population aged 55 and older, as well as those 65 and older, was strongly negatively correlated with the number of people within AED service areas. This correlation became even more pronounced after the inclusion of SJAV AEDs (from -.386 to -.332 for ages 55+ and from -.229 to -.184 for ages 65+, with $p < 0.001$ after inclusion). This indicates that the inclusion of SJAV AEDs may have improved the capacity of closest AEDs for cardiac Mesh Blocks with ageing populations.

Table 5: Correlation Coefficients between Sociodemographic Characteristics and Travel Time to Closest AED and Number of People within Closest AED Service Area for Cardiac Arrest Data

			Travel time to closest AED after the inclusion of SJAV AEDs	Travel time to closest AED prior to the inclusion of SJAV AEDs	Number of People within AED Service Area after the Inclusion of SJAV AED	Number of People with AED Service Area prior to the Inclusion of SJAV AED
Spearman's rho	Gender of Person	Correlation Coefficient	0.004	0.033	-0.079	-0.027
		Sig. (2-tailed)	0.951	0.573	0.178	0.644
	Age of Person	Correlation Coefficient	-0.032	0.016	-0.035	-0.081
		Sig. (2-tailed)	0.585	0.788	0.552	0.166
	IRSD in Mesh Block where Cardiac Arrest Occurred	Correlation Coefficient	0.047	0.055	.145*	.342**
		Sig. (2-tailed)	0.426	0.349	0.013	0.000
	Percentage of CALD Population in Mesh Block where Cardiac Arrest Occurred	Correlation Coefficient	-0.096	-.175**	-0.065	-.229**
		Sig. (2-tailed)	0.104	0.003	0.272	0.000
	Percentage of Population Aged 55 and Older in Mesh Block where Cardiac Arrest Occurred	Correlation Coefficient	-0.056	0.051	-.386**	-.229**
		Sig. (2-tailed)	0.345	0.392	0.000	0.000
	Percentage of Population Aged 65 and Older	Correlation Coefficient	-0.063	0.007	-.332**	-.184**

in Mesh Block where Cardiac Arrest Occurred	Sig. (2-tailed)	0.282	0.908	0.000	0.002

Mesh Block Data

Research Question 1: Descriptive statistics detailing the travel time to the closest AED after the inclusion of SJAV AEDs, travel time to the closest AED prior to the inclusion of SJAV AEDs, improvement in travel time due to the inclusion of SJAV AEDs, the number of people in the closest AED service area after the inclusion of SJAV AEDs, the number of people in the closest AED service area prior to the inclusion of SJAV AEDs, and the change in the number of people in the closest AED service area due to the inclusion of SJAV AEDs have been detailed in Table 6, below. While subsequent maps illustrate travel time from Mesh Blocks to the closest AED prior to and subsequent to the inclusion of SJAV AEDs. The dataset from 923 Mesh Blocks demonstrates that the inclusion of SJAV AEDs led to a notable reduction in travel time to the nearest AED, with the mean travel time decreasing from 5.87 to 3.55 minutes. The median travel time also saw a significant reduction, moving from 5.60 to 3.30 minutes. This improvement in travel time is indicative of enhanced access to AEDs. In addition to improved travel times, the average number of people within the service area of the closest AED increased from a mean of 398.83 before SJAV AED inclusion to 527.92 after. The median population served similarly rose from 344.22 to 562.30. This increase in the population served suggests better coverage. Specifically, SJAV AEDs have been strategically placed in densely populated areas which were previously unserved (see Figures 1 and 2). These AEDs cater to a large number of people, and it is important to consider that they may experience capacity issues compared to non-SJAV AEDs as a result (something which has not been measured as a part of this study).

Table 6: Descriptive Statistics for Mesh Block Travel Times to Closest AED and Number of People in Service Area of Closest AED

Variable	N	Mean	Median	Std. Deviation	Range	Minimum	Maximum	Percentiles 25	50	75
Travel Time to Closest AED After Inclusion of SJAV AEDs	923	3.55	3.30	1.84	17.00	0.00	17.00	2.30	3.30	4.50
Travel Time to Closest AED Prior to the inclusion of SJAV AEDs	923	5.87	5.60	2.70	20.70	0.00	20.70	4.00	5.60	7.50
Improvement in Travel Time Due to the Inclusion of SJAV AEDs.	923	2.31	1.75	2.41	9.80	0.00	9.80	0.00	1.75	3.85
Number of People in Closest AED Service Area After Inclusion of SJAV AEDs	923	527.92	562.30	222.80	1095.23	0.00	1095.23	401.02	562.30	628.13
Number of People in Closest AED Service Area Prior to the Inclusion of SJAV AEDs	923	398.83	344.22	258.19	1095.23	0.00	1095.23	163.70	344.22	628.13
Change in Number of People in Closest AED Service Area *	923	129.09	68.20	223.27	1205.35	-485.34	720.01	0.00	68.20	270.08

*** Population Change= Service Area Population of Closest AED After SJAV AED Introduction – Service Area Population of Closest AED Before SJAV AED Introduction**

Figure 8: Travel Time in Minutes to Closest AED Before SJAV AED Installation

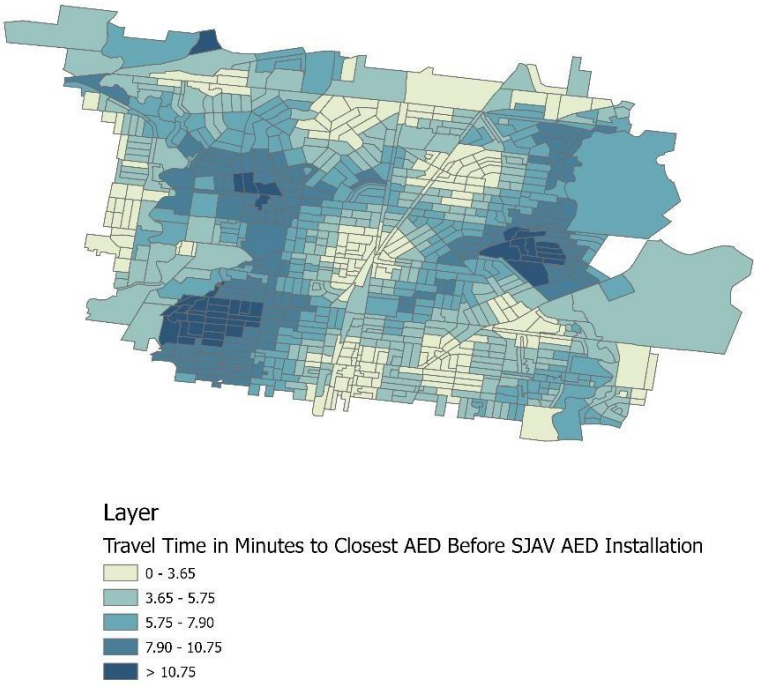
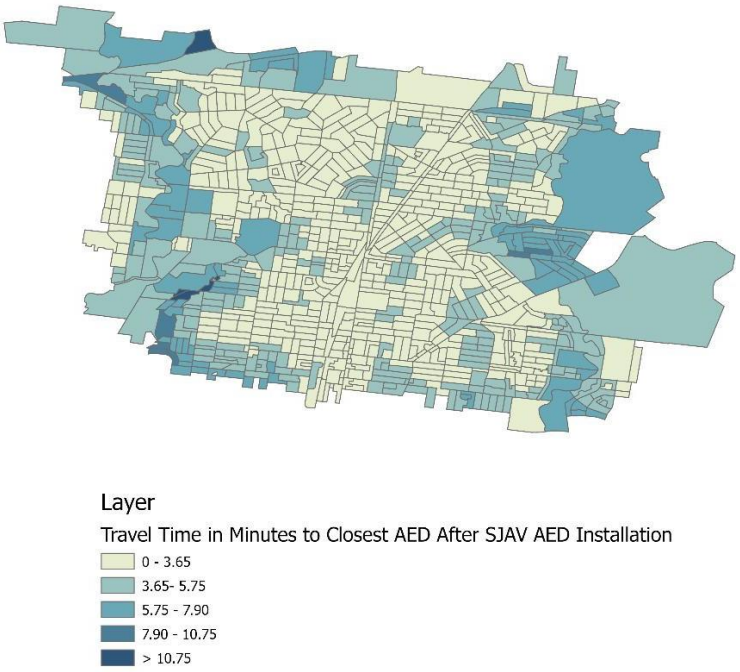


Figure 9: Travel Time in Minutes to Closest AED After SJAV AED Installation



Research Question 2: In relation to travel time to the closest AED for Mesh Blocks within Reservoir results from the Shapiro-Wilk test indicated that the data for travel time to closest AED after inclusion of SJAV AEDs ($p < .001$) and travel time to AED prior to the introduction of to SJAV AEDs ($p < .001$) were not normally distributed, with statistics of .913, and .970 respectively. Similarly, in relation to population serviced within the service area of the closest AED, for Mesh Blocks within Reservoir, results from Shapiro-Wilk test indicated that data for service area population of the closest AED after the inclusion of SJAV AEDs ($p < .001$) and service area population of the closest AED prior to the introduction of SJAV AEDs ($p < .001$) were not normally distributed, with statistics of .969, and .942 respectively. Thus, non-parametric tests were progressed to analyse this data.

In examining the differences between the duration of the travel time to closest AED after inclusion of SJAV AEDs, and travel time to AED prior to the introduction of to SJAV AEDs, a Related-Samples Wilcoxon Signed Rank Test was conducted. The test revealed a statistically significant difference in the median values of the two conditions, ($W= 199396.00$, $SE= 4581.03$, $z= 21.763$, $p<.001$) leading to the rejection of the null hypothesis which posited that there were no differences in travel times. The results confirm a significant difference (reduction) in the duration of travel time as a result of the introduction of SJAV AEDs. Similarly, the Related-Samples Wilcoxon Signed Rank Test was applied to assess population differences in the closest AED service area following the inclusion of SJAV AEDs. The test yielded a significant result ($W = 170535.00$, $SE = 4602.448$, $z = 15.254$, $p < .001$), indicating that the differences in service area populations before and after the inclusion of SJAV AEDs are statistically significant. This suggests that the inclusion of SJAV AEDs was significantly associated with an increase in the number of people served within the closest AED service area. Once again, due to SJAV AEDs being strategically placed in dense areas, which were previously unserved and lacking a proximate AED (see Figures 1 and 2 where this is illustrated).

The Spearman's rho correlation coefficient was employed to evaluate the statistical relationships between various demographic factors and both travel time to the closest AED after the inclusion of SJAV AEDs and the number of people serviced within the AED service area before and after the inclusion of SJAV AEDs (correlation coefficients are included in Table 7, below). Initially, there was a significant negative correlation between the percentage of the CALD population within Mesh Blocks and travel time to the closest AED ($r = -.234$, $p < .001$), indicating that areas with a higher CALD population was correlated with shorter travel times. Post-inclusion, this correlation weakened ($r = -.089$, $p = .014$). The weakened correlation indicates that the addition of more AEDs has made the relationship between CALD population percentage and travel time less significant. This does not mean that travel times have increased for CALD areas, but rather that travel times are now more uniform across different areas. For the number of people served within the AED service area, the correlations were negative both before ($r = -.180$, $p < .001$) and after ($r = -.205$, $p < .001$) SJAV AED inclusion, implying that areas with higher CALD populations might have experienced a slight decrease in the population served by the closest AEDs after the inclusion of SJAV AEDs, potentially reflecting an improved capacity.

For Mesh Blocks with higher percentages of the population aged 55 and older, there was a slight positive correlation with travel time after SJAV inclusion ($r = .086$, $p = .018$), indicating marginally longer travel times. However, a strong negative correlation with the number of people within the AED service area ($r = -.336$, $p < .001$) suggests a reduced population serviced post-inclusion. For the population aged 65 and older, there was no significant change in travel time correlation post-inclusion ($r = .058$, $p = .109$), but a marked negative correlation with the number of people within the AED service area ($r = -.317$, $p < .001$), indicating a decrease in serviced population and potential improvement in capacity for this demographic.

The IRSD showed no significant correlation with travel time post-inclusion ($r = .003$, $p = .929$), but a strong positive correlation with the number of people within the AED service area remained ($r = .362$, $p < .001$), consistent with pre-inclusion ($r = .391$, $p < .001$), suggesting areas with greater socio-economic disadvantage continue to have larger populations serviced by closest AEDs, indicative of these Mesh Blocks being closer to AEDs with perhaps reduced capacity.

Table 7: Correlation Coefficients between Sociodemographic Characteristics and Travel Time to Closest AED and Number of People within Closest AED Service Area for Mesh Block Data

			Travel time to closest AED after the inclusion of SJAV AEDs	Travel time to closest AED prior to the inclusion of SJAV AEDs	Number of People within AED Service Area after the Inclusion of SJAV AED	Number of People with AED Service Area prior to the Inclusion of SJAV AED
Spearman's rho	Percentage of CALD Population in Mesh Block	Correlation Coefficient	-.089*	-.234**	-.205**	-.180**
		Sig. (2-tailed)	0.014	0.000	0.000	0.000
	Percentage of Population Aged 55 and Older in Mesh Block	Correlation Coefficient	.086*	.174**	-.336**	-.081*
		Sig. (2-tailed)	0.018	0.000	0.000	0.024
	Percentage of Population Aged 65 and Older in Mesh Block	Correlation Coefficient	0.058	.109**	-.317**	-0.049
		Sig. (2-tailed)	0.109	0.003	0.000	0.176
	IRSD in Mesh Block	Correlation Coefficient	0.003	.115**	.362**	.391**
		Sig. (2-tailed)	0.929	0.000	0.000	0.000

DISCUSSION

Summary of Findings

The comprehensive analysis of service area, cardiac arrest, and Mesh Block data reveals significant findings following the inclusion of SJAV AEDs:

Service Area Data: The analysis of 400-m service areas surrounding SJAV and non-SJAV AEDs showed that SJAV AED service areas have a higher mean population of 573.01, compared to 238.36 for non-SJAV AED areas. This suggests a targeted placement of SJAV AEDs in more densely populated areas. Moreover, SJAV AED areas also have higher mean numbers of CALD individuals (195.61 vs. 88.80) and older adults (152.17 for those aged 55 and older, and 93.87 for those aged 65 and older, compared to 65.40 and 42.46, respectively, for non-SJAV areas). These demographic differences highlight the strategic placement of SJAV AEDs in areas with potentially higher needs for emergency medical services.

Pre-Program Cardiac Arrest Data: The inclusion of SJAV AEDs has led to a significant reduction in travel time to the nearest AED for cardiac arrest incidents. The mean travel time decreased from 5.87 minutes before SJAV AED inclusion to 3.55 minutes after, with the median improvement in travel time being 2.35 minutes. This improvement in accessibility is critical for enhancing the chances of survival for cardiac arrest victims. However, the data also indicate an increase in the average number of people served by the nearest AED, from 370.88 to 557.40. This is likely due to SJAV AEDs being strategically placed in densely populated areas which were

previously unserved (once again illustrated in Figures 1 and 2).

Mesh Block Data: The analysis of 923 Mesh Blocks further corroborated the trends observed in the service area and cardiac arrest data. There was a notable decrease in travel time to the closest AED post-SJAV AED inclusion, with the mean travel time reducing from 5.87 to 3.55 minutes. Additionally, the average number of people within the service area of the closest AED increased from 398.83 to 527.92, with the median population served rising from 344.22 to 562.30. This increase in the population served, especially in areas with higher socio-economic status, underscores the need to address potential capacity issues to ensure that AEDs can effectively meet the demands of larger service areas. The introduction of SJAV AEDs has significantly improved travel times to the nearest Automated External Defibrillator (AED) for individuals experiencing cardiac arrest, with a notable decrease in travel time to the closest AED after their inclusion. This finding is crucial, as rapid access to AEDs is a critical factor in increasing the survival rate of cardiac arrest victims. The improvement in travel time was consistent across different demographic variables, including gender, age, and socioeconomic status, suggesting that the benefits of SJAV AEDs are widespread and not limited to specific groups.

Impact of Sociodemographic Factors

In the cardiac arrest analysis, the relationship between socio-demographic factors and AED accessibility showed mixed results. The percentage of CALD population within a cardiac arrest Mesh Block had a negative correlation with travel time to the closest AED, which weakened post-SJAV inclusion. For the population aged 55 and older, a slight negative correlation with travel time post-inclusion indicates potentially marginally shorter travel times, which is favourable given their higher risk of cardiac arrest. However, the strong negative correlation with the population serviced suggests that the capacity to respond to cardiac emergencies in this age group may have improved. The population aged 65 and older showed no significant change in travel time correlation post-inclusion, but the negative correlation with the population serviced indicates better capacity for this demographic. The lack of significant correlation between the Index of Relative Socio-economic Disadvantage (IRSD) and travel time post-inclusion suggests that socio-economic factors may not strongly influence travel times to AEDs, but the positive correlation between higher socioeconomic status and population serviced by closest AED, indicates that areas with greater socio-economic advantage continue to have larger populations serviced by AEDs.

The service area analysis revealed significant differences between SJAV and non-SJAV AED service areas in terms of population demographics and the number of cardiac arrests. SJAV AED service areas have higher mean populations, particularly in terms of CALD individuals and older adults (aged 55 and older, and 65 and older), compared to non-SJAV AED areas. This indicates that SJAV AEDs are strategically located in areas with higher population densities and greater diversity, potentially enhancing the reach of emergency medical services to vulnerable populations. In the service area analysis, the correlation between the percentage of CALD population and the total population within the service area was negative but not statistically significant. Similarly, negative correlations were observed between the percentages of the population aged 55 and older, and 65 and older, with the total population within the service area, though these were also not statistically significant. However, there was a statistically significant positive correlation between the service area's weighted Index of Relative Socio-economic Disadvantage (IRSD) and the total population within the service area, suggesting that areas with higher socio-economic status tend to have larger populations within service areas, indicating that people with higher socio-economic status may have access to AEDs which have a greater population to service, which may be indicative of reduced capacity.

The Mesh Block analysis provided insights into the impact of SJAV AED inclusion on travel times and the population serviced within AED service areas. The slight reduction correlation with travel time for the population aged 55 and older post-SJAV inclusion, coupled with the strong negative correlation with the population serviced, indicates that while travel times might be longer for older populations, the capacity to serve

these populations has likely improved with the inclusion of SJAV AEDs. The strong positive correlation between IRSD and the population serviced post-inclusion underscores the role of socio-economic factors in determining AED reach, with areas of greater socio-economic advantage having larger populations serviced by AEDs.

Implications for Policy and Practice

The findings from the service area, cardiac arrest, and Mesh Block analyses have several important implications for public health policy and emergency medical service practices:

Strategic Placement of AEDs: The higher mean populations in SJAV AED service areas, especially in terms of CALD individuals and older adults, highlight the strategic approach to AED placement. AEDs should certainly be strategically located in areas where AEDs are absent, especially when dense areas do not have access. Specifically, they should be available in areas with higher population densities and greater diversity to enhance the reach of emergency medical services to vulnerable populations.

Accessibility and Capacity: The significant reduction in travel time to the nearest AED following the inclusion of SJAV AEDs is a positive development. However, the increase in the average number of people served by the nearest AED suggests potential capacity challenges. Capacity must be taken into account when placing an AED in a densely populated area. In some instances, it may be advantageous to install multiple devices at a single location to ensure adequate capacity levels are maintained. To the knowledge of the authors, a definitive AED to population ratio indicative of favourable capacity is non-existent, further work in this area is perhaps warranted. In summary, policies should aim to balance accessibility and capacity to ensure that AEDs can effectively meet the demands of larger service areas.

Socioeconomic Factors: The positive correlation between the Index of Relative Socio-economic Disadvantage (IRSD) and the population served within AED service areas indicates that socio-economic factors play a significant role in determining AED reach. Policies should consider socio-economic status in AED placement to address health inequities and ensure equitable access to life-saving AEDs.

Improved Capacity for Older Populations: The improved capacity to serve older populations, as indicated by the strong negative correlation with the population serviced, is a positive development. Policies should continue to focus on enhancing capacity for these demographics, given their higher risk of cardiac arrest.

Ongoing Monitoring and Evaluation: The findings underscore the importance of ongoing monitoring and evaluation of AED service areas. Regular assessments of population demographics, the number of cardiac arrests, and the accessibility and utilization of AEDs in different areas are essential to optimize the distribution of AEDs and enhance the overall effectiveness of emergency medical services.

In summary, the inclusion of SJAV AEDs has had a positive impact on travel time to AEDs for individuals experiencing cardiac arrest. However, the findings highlight the need for a nuanced approach to AED deployment that considers various demographic and socio-economic factors to ensure equitable access and optimal capacity for responding to cardiac emergencies.

Limitations

This study has limitations where are important to consider. This study's exploration of the impact of SJAV AEDs on accessibility and service capacity carries several limitations primarily associated with the data used. The imputation of Mesh Block demographic data based on overlap with SA1 data may not accurately represent the specific demographics within each Mesh Block, potentially impacting the precision of the analysis. Additionally, the ABS data, accurate as of the 2020 census, does not account for population changes post-SJAV AED inclusion, which could affect the analysis of current population demographics and AED accessibility. The exclusion of certain publicly available community AEDs and slight variations in the OpenStreetMap road network could further impact the accuracy of AED accessibility and travel time calculations.

In terms of inferential analyses, the study employed G-Power to establish well-powered samples. For the Mesh Block and cardiac arrest analyses, the samples were adequately powered given a medium effect size of 0.5, an alpha level of 0.05, and a power of 0.80, requiring a minimum sample size of 34. The Mesh Block analysis involved a sample of over 900, and the cardiac arrest analysis approached 300, thus ensuring that these analyses

were well powered. However, the service area analysis, comparing SJAV AED service areas to non-SJAV AED service areas, may have been slightly underpowered. For testing a significant difference between independent samples with a large effect size of 0.8, an alpha level of 0.05, and a power of 0.80, a sample of 26 in each group was required. The analysis involved 27 SJAV AED service areas and 16 non-SJAV AED service areas, indicating potential underpowering. As a result, greater emphasis should be placed on descriptive statistics rather than inferential findings for this particular analysis.

Section B: Research Question 3 - What were the experiences of the hosts of AED in having the device located on their premises?

METHODS

To meet the research aim, t***o explore the experiences of hosts of AED of their participation in the 'Defib in your street' project***, qualitative study design utilising semi-structured in-depth interviews were carried out. This approach allowed us to garner experiences of participants who had been hosting the defib device.

Sampling

Purposive sampling was chosen for this project given that the focus was a specific population within a certain geographic area. Potential participants were considered eligible for inclusion in the study if they hosted an AED at their private residence or business premise within the suburb of Reservoir, Victoria. Other inclusion criteria for potential participants included over 18-years of age and conversant in English.

Recruitment and data collection

St John's Ambulance Victoria informed all hosts (n=27) including both resident and non-residential hosts of this study. Participants who expressed willingness to participate (n=9) in the study were approached by a member of the research team (SG) via email or phone depending on the participants' preference. Subsequently, a mutually convenient time for the interview (and location if face-to-face) was decided upon. Majority of the interviews were conducted online via Zoom with one in-person interview. Prior to the commencement of the interview, the participant information and consent form was discussed with the participants and voluntary participation explained. All participants provided consent to participate in the study.

All interviews were conducted by a member of the research team (SG) in English, audio recorded and transcribed verbatim. The interviews consisted of questions related to reasons for hosting an AED and their experiences of being a host, engagement with SJAV and their neighbouring community, and recommendations for SJAV. The interview guide is included as Appendix 1 and was developed by the researchers SG and SC. Both SG and SC are experienced qualitative researchers and have published in areas related to accessibility and healthcare. Interviews were conducted between October – December 2023. Interviews were approximately 40 minutes in duration. On completion of the transcription, all participants were sent a copy of their interview transcripts as part of the participant validation process and to ensure accuracy [13].

Participants

Of the nine potential participants who expressed willingness to participate in the study, one did not show at the decided time of the interview and did not respond to the follow up email. Another participant had personal extenuating circumstances that arose and declined to participate. A total of seven participants were finally included in the study. Six of these participants hosted the AED device at their private residence with one at a non-residential premise (i.e., community centre). The age ranges of the hosts varied from the '18-31 years' to the 'over 61 years' categories. Four participants identified as female and three as male. Participants self-identified their ethnicity with just over half identifying as Australian and the others from various culturally and linguistically diverse groups. All participants spoke English however, several additional languages that they spoke were mentioned. Most were currently employed, and all had gained post-secondary education. All participants had received CPR/AED training however, none had used the AED device. Full demographic details are included in Table 7, below. All participant quotes have been assigned a code ranging from P1-P7 to maintain confidentiality.

Table 7: Participant demographic

Variable	Number of participants
AED location	
private residence	6
business premise	1
Age range of host	
18-30 years	1
31-40 years	1
41-50 years	2
51-60 years	1
Over 61 years	1
missing data	1
Gender	
Female	4
Male	3
Other	0
Self- identified ethnicity	
Italian Australian	1
Half Indian/Half Iranian	1
Lebanese Maronite	1
Australian	4
Languages	
English	7
Hindi	1
Gujrati	1
Arameic (Syrian dialect)	1
Arabic	2
French	1
Japanese	1
Employment status	
Self-employed	1
Retired	1
currently employed	5
Education	
Certificate/Diploma level	2
University	5
CPR/AED training	
Yes	7

No	
Used an AED previously	
Yes	
No	7

Analysis

SG read and coded each interview with the support of the software Nvivo. Codes and themes were developed using the principles of inductive thematic analysis using Braun and Clarke's step-by-step guide [14]. SC coded one interview independently. Once coding for all interviews had been completed by SG, the themes and subthemes arising from the coding were discussed with SC to ensure reflexive practice, interrater reliability and trustworthiness of interpretations [15]. All participant quotes included below are representative of responses received.

FINDINGS

There were two overarching themes that emerged from the analysis of the data: 1) Participants' experience with the **Defib in your street** program and the hosting of the AED device: and 2) Participants engagement with SJAV and the broader Reservoir community. The coding matrix including subthemes is shown in Table 8, below.

Table 8: Coding matrix

1) Participants' experience with the **Defib in your street** program and hosting of the AED device	1.1 Information about the Defib program
	1.2 Decision making around hosting the AED device
	1.3 AED installation site, case, alarm and aesthetics
	1.4 Non-Defib in your street program AEDs
2) Participants engagement with SJAV and broader Reservoir community	2.1 Training uptake related to the AED device use
	2.2 Contact and interaction with SJAV personnel
	2.3 Community connectedness

Participants described how they learned about the program, the reasons they decided to have an AED installed at their residence or premises, and their interactions with SJAV and their friends, family, and neighbours as a result of hosting an AED.

1. Participants' experience with the **Defib in your street** program and hosting of the AED device

1.1 Information about the Defib program

Participants found out about the program through various community platforms including stalls at local shopping centres, online shopping websites, social media, flyer drop in the mailbox and in the case of the non-residential host, they were directly approached by Darebin City Council. As described by the following participants:

> *I was up at my local shopping centre, which is Summerhill … I overheard the St. John's person talking to another community member about it, … it's in alignment with my some of the work that I do and my interest. And so, I grabbed a little flyer and and yeah, I think it came from there. I hit them up and yeah, ended up being selected. It was all really fortuitous. And I'm actually really proud of it. I I tell everybody (big smile) that it's there. (P3)*

> *I usually look out for deals on a site called Oz Bargain and on that there was a St. John's free CPR course that I was interested in. So, I signed up for that. And that's where I think they [SJAV] grabbed my details, and someone mentioned that they also doing these installs. "Would you be interested?" I was like, sure if it suits my location because I just moved to Reservoir as well. That's how I found out about it. And they reached out over an email. (P7)*

> *I think I heard about it, through the local [Mum's in City of Darebin] Facebook group…Yeah, I think I looked it up on the website and saw the map [of AED locations] and saw that there was a gap around my house…I actually, emailed to suggest the toilets near the skate park and the tennis court … and then have the conversation of oh actually your house would be better. (P4)*

1.2 Hosting the AED device

Most participants spoke about contributing and supporting their local community as the main reasons for volunteering to have an AED device installed. There appeared to be a heightened sense of the need for community engagement for the 'common good'. The following participants expressed:

> *I feel really strongly about community health and community engagement… I'm a community builder. That's what I do. So, the idea of, you know, having more input into the health and wellbeing of people in my neighbourhood where I own a home is really, really important to me.* (P3)

One participant mentioned that they felt socially connected to the community in Reservoir. She had previously lived in another area and possibly may not have volunteered to host the device there. She explained:

> *…it's [Reservoir] an amazing community… I don't know if I'd have done it in [name of other suburb] because you couldn't even get the people up there to say hello to you…Is [community in Reservoir] just lovely.* (P1)

This participant added that she would like to be able to support the community should the need have arisen for the use of the AED.

> *…I'd be thrilled if someone got benefit from it. Not that I want someone to have a heart attack, I I mean, since we've been here, our neighbour across the road, his old dad, who was maybe late 80s, so that's not so old anymore … he died in the night and I don't know what he died of, but possibly if this defibrillator had been here and he had a heart attack … Like he'd still be around. So yeah. You know, I love having the potential to help someone.* (P1)

Prior experience in first aid training or CPR were also factors that contributed towards participants' decision to host an AED.

> *I've done lots of first aid training and I know how important defibs are…lots of deep in training. I know how important they are. I thought it was a great initiative…And I've got lots of elderly neighbours, so I thought it would be a good thing to have it around in reach of them.* (P4)

> *I'm a safety officer, actually for events…I've had 20 years of operational and logistics roles at music festivals. So, I have seen the gamut of human emergencies! Basically, I've seen a lot of human*

emergencies, not just humans. I've seen all the emergencies that you could see based on music festivals, so I'm an emergency responder. (P3)

I've had to perform CPR. In 2013 when I was in India. That's where I'm from. It was an accident. No one knew what to do. So, I, actually had, I was part of the National Credit Corps, or NCC, as they call it. That's where I got what trained in basic medical trainings. I was able to help out. And a defib would have helped because the patient did lose consciousness, and we couldn't find a pulse for a bit. And the ambulance took a while, but they were fine eventually. That's what I thought. Probably having a defib, somewhere around me would be handy. (P7)

In addition, the heritage of the St John Ambulance Association and its engagement with communities in many countries was mentioned by one participant as an influencing factor in having an AED installed at their residence.

So, it's [St John's] organisation that I'm always ready to support. So, anything with their logo on it, automatically gets my attention. That's point number one. Point number 2, AED machines obviously working in healthcare, I understand how important they are, and they made a lot of sense to me to have it installed…It's their history all the way since, since Jerusalem…their role as St. John's hospitallers, and being from Lebanon…like the role that they played…historically with us. (P6)

The non-residential host, however, was approached directly by SJAV if they would like to have an AED installed at their site. This was due to their organisation's location within Reservoir as well as the clientele they supported. This participant expanded:

And because they [SJAV] were probably best situated to identify different pockets of the community where there might be the best places to house the Defibs. From there Darebin [Council] had spoken to us because I run a community centre and is the facility operator…we host senior activity, 3 day, 4 days a week, which means at some stage we may have up to 100-120 seniors...Probably some of our audience would be more likely for those incidents [cardiac arrests] to happen without profiling them. Well, I think as part of the facility operation, we do high traffic flow. So that means we have congregations of audiences. The third reason would be we are the furthest point of Darebin LGA …This pocket of the world [has]… many single seniors living alone in houses as well…more high risk potentially because we're just dealing with senior people. We're talking not, 65, 70, we're talking sort of 80, 90 plus who are visiting this facility as well. (P2)

1.3 AED installation site, case, alarm and aesthetics

Site of device

All participants shared how they decided on the spot where the AED was installed on their premises. The site was mutually decided on following their discussions with the SJAV liaison staff who provided guidance on factors to consider, such as visibility of the AED from the street and access to the AED by first responders.

It's actually on the exterior front fence because I have a fence around my front yard, so it's visible from the street, but it's like a couple of steps down the driveway... It was decided because uh, I share a driveway with the house at the rear and so there was no way we could put it on that side because the driveway is so narrow for the car to get down and um (thinking) Yeah, that, that, that's about it really. There was nowhere else to put it, you know? (P3)

The decision I allowed it to the St. John's person to just look at the house and make the decision on the best location and they made that decision based off accessibility. (P6)

A few participants mentioned that SJAV installed CCTV cameras and protection from weather related elements, as well as visibility and accessibility of the AED, were deciding factors for the location of the device.

…it's [site] also got cameras, which was apparently important. So, I've got camera coverage because apparently, there were thefts. (P7)

The fact that it's visible to CCTV. And protection from the elements like rain and direct sun…and visible from the street. (P6)

There was no point putting it on my veranda that, as I said, tiny [the veranda]. So [SJAV staff] and I had discussed that length where it should go and he visited and he talked about, you know, it should be, how it should be housed and weatherproof box and all that stuff. And then we settled on the wall of the house that the driveway leads to without having to go through my back gate. (P1)

Not quite [when asked whether the box was visible]. Bushes have grown. That was the original idea, but big bushes have grown in the meantime. It is the minute you step on; I've got no fence. So, the minute you step onto the footpath, you can see around sort of the corner and see it on the porch. It's pretty obvious. Very little porch too, so. Anyone being given directions there should be able to find it pretty quickly… The original, the original instructions were it had to be visible from the street. But when I talked to people, they said, that's okay, it's, it's a very open kind of space. I am planning to 'train' the bushes. (P4)

I think they [SJAV] said in the email they kind of there was a few specifications like it had to be out of the rain and undercover. (P5)

AED device case and alarm function

Another aspect participants discussed in relation to the AED was the case of the device, that it was well protected and had an alarm function.

First one [AED] was little, and it was in a cabinet, and then it got some water leakage, and the alarm stopped working due to the water. So, they've now put like stand there, it's like a big red looking stand thing and…it's equally as obvious. It's a bit more of a big structure, but it's a bit lower down. So, it's still visible, but now it's in this like stand that has a, it's waterproof basically…I didn't actually know [there was a leakage in the casing]. They [SJAV] just came around to do a checks on it and then we discovered it together when we…because I hadn't even opened it up in the year that I had been there or whatever. But we opened it up and there was a few inches of water that had pooled in the bottom… it had this alarm and when we opened the door, it went 'peeooburp' [sound of alarm going dead]. The new one makes a ***really loud****, way louder sound…you are not going to (laughter) get away with that. (P3)*

…[case] not that big. It's like…bigger than A4 sheet, yeah. Maybe more like A3. Well, the device itself is sitting inside a weatherproof metal box with glass window and then so the device itself is not very big, but the box is a bit bigger…but if you open it, it screams the place down. It makes a ***terrible*** *noise! So, I would definitely hear that noise in the house if someone comes to steal it… open the door, take it out. It screams the place down. Shut the door. It's the opening and closing of the door that activates the alarm. (P1)*

A few participants reported that they regularly checked on the AED battery indicator (i.e., green light) to ensure the device is in working order.

I do check the, you know, how there's a green thingo on top. That's what I usually look at because I have to come through that way anyways just have a glance on it, sometimes open the door, check if the alarms working. (P7)

There's a light. That fits to the front of our building and it's on that wall so you would see it when you drove through, and you've got the St. John's label. It's pretty explicit. (P2)

One participant elaborated that hosting an AED device came with responsibilities towards the community.

The whole point of having the community involved [in the Defib program], is to rely on the community to keep the thing alive [AED device] … So, if you've got a person prepared to host it, then that person I think should also be inclined to be a person who will keep the thing alive. (P1)

Several participants offered comments on the aesthetics of the case for the AED as they were aware there were people who did not view them positively. However, participants mentioned that they were not "bothered" by the appearance of the case.

It's on the outside of my property and I mean it's a first aid device. I don't think it's an eyesore. I think it needs to be visible so that people know it's there. (P3).

> *… I don't care. I think safety is a bit more important than aesthetics for me in general.* (P7)

> *If you're on the footpath and you look at my house, it's what you'll see. It's the thing that's most obvious. Yeah. Much to my mum's dislike. (laughter) ... she likes things looking pretty. She doesn't like a big white, red box. And I'm like, I don't care. (laughter)* (P4)

1.4 Non-Defib in your street program AEDs

A couple of participants mentioned that they had previously installed AED devices prior to the **Defib in your street** program. One participant mentioned that due to a medical need in their family, they had a device previously installed through St John's. When they heard of the program, they donated their personal device to the **Defib in your street** program.

> *Because we had a defibrillator that we bought through St. John's… we just had it here inside. It was just one that we had because when I was going through a few issues and we thought maybe we needed one…So yeah, we just we kind of like donated it so to speak to the greater cause like…Yeah, we used to take it everywhere with us to the shops and everything. But we don't need it really anymore. OK. And so, we just thought we'd put it out there. (P5)*

The non-residential participant reported that prior to the participation in the **Defib in your street** program, their oganisation had purchased AEDs as they have a large clientele of elderly people. Moreover, the organisation was affiliated to the Darebin Council, and it was mandated by the Council to install adequate AEDs across the buildings in use.

> *We are an extension of Darebin City Council. So local government were expected to have these, you know, available, accessible. So, I think the outlay was about, I don't know, $4000 maybe I mean, it's not a lot, but we've got 5 buildings, so we had to buy 3. (P2)*

This participant added that the AED devices they had purchased were no different to the SJAV supplied AED.

> *So, if you talk about the Defib as such, I don't think the St. John one is any more revolutionary than the one we've got because I think the principle behind is make it as basic and as user friendly because someone's heart is going to be beating at 100 miles an hour trying to administer it when someone's under stress.* (P2)

2. Participants engagement with SJAV and broader Reservoir community

All the participants discussed the various ways they engaged with the SJAV team including the maintenance of the AED and/or training on the use of the device. A few participants commented on the ease of being able to contact SJAV staff, such as to report the malfunction of the device, as elaborated by the following participant.

> *I'll give him [liaison person from SJAV] a call… What I would have done if that green light wasn't there, is, I'll go on some of my emails from St John and whoever is the allocated person because somebody emails us from time to. And I'll just call his number or email him. (P6)*

The promptness of SJAV attending to malfunctioned device was also cited by a participant, "very quickly, within a day…It [AED] wasn't out of action for very long at all." (P1)

2.1 Training uptake related to the AED device use

A few participants informed that training on the use of the AED device was offered by SJAV. This was in the form of formal training sessions and on-the-spot 'refreshers' when SJAV staff visited AED hosts to service the device.

> *it [the AED device] started making loud beeping noises, and one of the pads… had expired, had its use by date…and they had to replace the pad…. I've called them because it was beeping and just said this is driving us nuts. (laughter) The beeping is pretty loud and obviously there's something wrong and the little green light that says everything's OK, had gone red or orange or something. So, they came and replaced it*

and when she replaced it, that involved opening the whole thing up. So that was when she showed me how to use the machine – a two-minute lesson on how to do it. (P1)

Some participants explained that they did not attend SJAV's training as they had previously had CPR training at their workplace or had self-learnt through online platforms.

A couple of participants shared different reasons for not participating in the SJAV training opportunities. As one participant stated:

I actually made a conscious decision not to [attend CPR session] because I didn't want to be part of the life and death responsibility… it's a hell of a responsibility and I was happy to provide the device, but I wasn't prepared to go so far as to risk a life or death situation. Having said that, I do know how to use it and recently a part had to be replaced and the woman who came and replaced the part, showed me how to use it, which I kind of in theory already knew. I haven't had the proper St. John's training for it. (P1)

She continued to say that the instructions from triple 0 (emergency number) could be relied upon if the device were to be used, hence, she did not feel the need to undertake the CPR training offered by SJAV.

So, if you're here and you're having a heart attack and I called triple O and they say, where are you? … well, there's a defibrillator on the wall outside. So triple O is aware of where all the defibrillators are [Note: Emergency Services may not have access to defibrillator location site details]. And they would say go and grab the defibrillator, bring it in. I'll talk you through how to use it. (P1)

2.2 Contact and interaction with SJAV personnel

The participants spoke about their positive experiences interacting with SJAV personnel, describing staff as friendly, responsive and professional in their interaction with AED hosts.

So, the people I've engaged with…have both been incredibly lovely people and very easy to deal with. Very friendly, you know, really lovely people. There's kindness about them, and it's easy to deal with kind people. (P1)

I found the communication really good. Lots of emails…was very really easy to get in contact with and communicate with…I think the communications been really good. The support…I think it's been good. (P4)

Regular communication and it was very transparent communication and so on and he [SJAV liaison person] didn't send too much pointless communication. He just got to the point and made it clear. (P6)

*I think they've done an incredible job and…if we would need something or want further information, we would [approach them]…*I*t should be acknowledged that we were part of this program and it wasn't just sticking the Defib on the wall, they constantly liaise with us. Came out, helped us with signage. (P2)*

One participant appreciated the regular correspondence from SJAV staff.

We're so used to it [the device]. We just walk past it… forget it's there. So, I think that [reminder] was kind of good. Just to check that it was there and that it was working…just a little reminder to check that the battery is OK every now and then or whatever, probably is good. (P5)

2.3 Community connectedness

The outreach by SJAV with the broader Reservoir community was noted by a couple of participants. They felt that in-person events where local residents and AED hosts could interact with SJAV facilitated social connections.

They had they had a high tea organized…which was good to go to. Be a part of the community…which is good. (P7)

One participant suggested that, in addition to social media posts and letter drops, increased visibility of SJAV in public venues would be useful.

> *I think it would be prudent to do an annual letter drop to go, "hey, still here, they [defibs] still work. Here's another location or whatever it is, you know?". The other thing is the outreach at malls...there is so many people here [Northland] on a weekday…There's lots of people all around and there's people from all different cultures, all different ages, tradies… kids I just think, the more people that know about it, the better... (P3)*

Many participants described having visitors and neighbours ask about the AED. Participants viewed this as an opportunity to increase awareness about the Defib program and connect with neighbours and other local community members.

> *Just that it makes every person that visits my house feel like safer anyway. You know, like every time I have to tradie over to quote some work, we have a little joke about how I'll defib him if anything goes wrong (laughter). You know, so it does actually make people feel a bit safer, you know?* (P3)

> *he [neighbour] asked is it he asked things like how long have you had it there? Is it just a normal defib like you see in other places? Is it something we can just come and grab? How would I know how to use it? So, I just talked about, look, you ring 000 as usual and they direct you, they know where it is, they'll tell you what to do, they'll talk you through it. So, I think any time I've had conversations with people, it's been a good education point about just in any emergency anywhere you are, just ring 000, they will direct you to the closest one, they will tell you how to use it. [Note: Emergency Services may not have access to defibrillator location site details]. It's very simple. If you're worried, go and get a first aid course. That's my spiel.* (P4)

DISCUSSION

We aimed to gain an understanding of the experiences of AED hosts in relation to their participation in the **Defib in your street** program. Analysis of the results indicate that two overarching themes emerged: 1) Participants' experience with the Defib program and hosting of the AED device, and 2) Participants engagement with SJAV and the broader local community.

The promotion of the **Defib in your street** was widely distributed and noticed by the Reservoir community. Participants learned about the Defib program through various platforms, ranging from traditional to digital marketing channels. These included social media, flyers, posters, stalls in local shopping centres and via direct approach by SJAV. To expand on the outreach to the local community to promote the Defib program, participants suggested additional public presence, such as pop-up stalls at the shopping centres to distribute CPR and AED related materials, to communicate directly with community members. Furthermore, SJAV's participation at local events, like the local park run, is a useful approach to build rapport with residents and fosters partnerships with community leaders and other stakeholders.

Notably, participants' willingness to participate in the Defib program indicate a shared set of values that relate to contributing towards the well-being of the community. These included their generosity in allowing the installation of the AED on their premises and their sense of care and civic responsibility towards their neighbours and community. They recognised that providing access to a defibrillator was a proactive measure that could make a difference in a cardiac arrest incident, potentially saving a life.

The participants highlighted their positive interactions with SJAV staff, stating that staff were approachable and friendly. SJAV personnel provided prompt and responsive service, attending to participants concerns in a timely and efficient manner. The clear instructions and information provided about the AED contributed to developing participants' confidence in participating in the Defib program.

The participants spoke favourably about being meaningfully consulted by SJAV regarding the placement of the AED on their premises, with both parties jointly agreeing to the site where the device would be placed. They related that guidance from SJAV staff to consider factors including accessibility, visibility and protection from weather elements was useful for their decision-making. The participants expressed that they clearly understood their responsibilities of hosting an AED and would regularly check if the device was in working order. These behaviours suggest a sense of social responsibility and goodwill towards the community, an asset for organisations such as SJAV in managing emergency situations.

The aesthetics of the AED case was brought up by several participants. They mentioned they did not have concerns about the appearance or 'look' and placement of the device case. A couple of participants shared that some of their friends and family members viewed the AED as an eyesore, which might dissuade the latter from participating in the Defib program.

Several participants commented on the diverse demographic of Reservoir, in terms of ethnicity, languages, gender, age, socio-economic status, and family situation (e.g., single or multi-generational households). They suggested that SJAV consider tailoring promotion and outreach pertaining to the Defib program and CPR training to specific communities (e.g., information and training materials in various languages). As an example, one participant proposed conducting information and training sessions designed for elderly CALD community members who frequented community centres. This group has a higher risk of cardiac arrest, and it would be prudent to place an AED device at such venues. Similarly, another participant suggested for SJAV to explore collaboration with religious leaders of churches, mosques and other places of worships to extend the Defib program, as these settings draw communities who otherwise may not be reached through conventional approaches.

Implications for Defib program expansion

Community development and individual skills building: To involve more of the diverse communities in the Defib program in Reservoir, a tailored and intentional approach to outreach and raising awareness about and developing skills to respond to sudden cardiac arrest should be considered. These approaches could range from building relationships with community leaders (e.g., working with ethnic and faith-based groups) to adapting training resources in accessible format and delivery in languages of culturally and linguistically diverse communities.

Promotion of ***Defib in your street***: Sustaining the visibility and presence of SJAV and the Defib program should extend to regular presentations at public spaces and community events, letter drops (e.g., with emergency assistance information), and active social media interactions to demonstrate the organisation's commitment as a partner invested in the community's health and wellbeing.

Strengths and limitations

Various strategies were used to recruit participants, including emails promoting the study to AED hosts. Despite these approaches, only seven AED hosts agreed to participate. This sample may be construed as a small number; however, rich insights were captured as hosts shared their experiences in hosting an AED. Theoretical saturation was reached given similar codes and sub-themes were derived after analysis of three interviews.

CONCLUSION

The **Defib in your street** program aligns with the key action areas listed in the Ottawa Charter for Health, including contributing to the health and wellbeing of the community [16]. This initiative has supported the facilitation of creating supportive environments and strengthening community action and developing personal skills, thus adding tangible human resource and life-saving devices to the community's assets-base.

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"Defib in your street: placement of Automated External Defibrillators (AED) in Reservoir, Victoria" – St John Ambulance Victoria pilot project

Semi-structured interview schedule

Section A: Socio-demographic questions: AED hosts

1. AED location

    - ○ Private residence
    - ○ Business premise

2. What is your age?

    - ○ 18 - 30 years
    - ○ 31 – 40 years
    - ○ 41 – 50 years
    - ○ 51 – 60 years
    - ○ Over 61 years

3. What gender do you most identify with?

    - ○ Please specify …….

4. What is your ethnicity?

    - ○ Arab
    - ○ Greek
    - ○ Italian
    - ○ Macedonian
    - ○ Vietnamese

- ○ Chinese
- ○ Somali
- ○ Spanish
- ○ South Asian
- ○ Other……..

5. Which languages can you speak and read?

   ○ Please specify …… ☐ Write ☐ Speak

6. What is your occupation? _____

7. What is the highest level of education you have achieved?

   ○ No formal education ○ Secondary school ○ University

   ○ Primary school ○ TAFE

8. Have you had CPR and AED training?

9. Have you or someone in your household/business used an AED (in emergency situation)?

<u>Section B: AED related questions</u>

1. How did you hear about the “Defib in your street” program?
2. Why did you decide to have an “Defib in your street” AED located at your residence/business premise?
3. When was the AED placed (installed/deployed) at your location? Where is it installed (position)?
4. Has the AED been used?
   a. If yes, by who? Tell me about when the AED was taken by a GoodSAM responder (eg were you home, etc.)
   b. How long before the AED was replaced?

5. What has your experience been in hosting an AED? EG the location, neighbours, GoodSAM responder, trespassers, etc.

6. Would you recommend your contacts (e.g., family and friends) to host an AED? Why, or why not?

7. What suggestions would you have for the program (e.g., location of the AED, length of program, etc)?

8. Is there anything else you would like to tell me about your experience in having an AED at your house/business premise?