

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Australia's awareness of cardiac arrest and rates of CPR training: results from the Heart Foundations' Heart Watch Survey.
AUTHORS	Cartledge, Susie; Saxton, Danielle; Finn, Judith; Bray, Janet E

VERSION 1 – REVIEW

REVIEWER	V Anantharaman Singapore General Hospital
REVIEW RETURNED	31-Aug-2019

GENERAL COMMENTS	<p>Thank you for submitting this manuscript.</p> <p>The study aims to provide the first Australian-wide estimates of CPR training and willingness to learn CPR. The authors have obtained data from the Heart Foundations of Australia's "HeartWatch" Survey, a quarterly survey conducted using a purposive, non-probability sampling method with quotas for age, gender and area of residence, in order to reflect the wider Australian population. Also, respondents of the survey belong to an online survey panel.</p> <p>1. Do the authors presume that the respondents would be representative of the general Australian population? While the authors admit that the study may be open to selection bias, they attempt to justify their selection method by stating that since the results are consistent with previous Australian and international research, this would justify the method used to obtain the data. One cannot presume that previous Australian state-based research conducted more than a decade earlier would be representative of the CPR training status in those states. Moreover, the population that would be more likely to participate in a Heart Foundations of Australia's "HeartWatch" Survey may be different from the general Australian population. It would be more appropriate to state that the results are applicable to those who would tend to respond to on-line surveys of this nature.</p> <p>2. The authors stated that many respondents described the absence of a pulse and that when they added absence of a pulse as a correct descriptor of cardiac arrest 14.2% (n = 153) of respondents had the answer coded as correct. Is a pulse check taught in Australia as part of lay responders' evaluation for cardiac arrest. Please clarify.</p> <p>3. The authors mentioned that the barriers to performing CPR in this survey population included not being trained previously, not feeling confident, physical inability and concern over legal issues. There was no mention made by respondents of fear of infection transmission or other reasons for not performing mouth-to-mouth ventilation. Yet the authors mention that mouth-to-mouth ventilation is a barrier to performing CPR, when such a response was not forthcoming from the respondents and even though there</p>
-------------------------	--

	is a dearth of studies on the unwillingness of members of the public to perform mouth-to-mouth ventilation (the bulk of studies being amongst healthcare workers). Suggest that the authors review their statement on mouth-to-mouth ventilation being a barrier to public performance of CPR. Attitudes of health-care workers may not necessarily equate with attitudes of non-healthcare members of the public, even if guidelines are influenced by views expressed in surveys of healthcare workers.
--	---

REVIEWER	Jonathan Duff University of Alberta Canada
REVIEW RETURNED	10-Sep-2019

GENERAL COMMENTS	<p>General Comments:</p> <p>Thank you for the opportunity to read this paper. It describes a national survey detailing the prevalence of CPR training in Australia. The paper is well written and easy to follow. Overall, I have no major concerns about the paper as it is. My only comment is could the authors expand on a “purposive, non-probability sampling method” as that term is unfamiliar to me (though I am not a survey expert).</p>
-------------------------	---

REVIEWER	Joshua Reynolds, MD, MS Michigan State University College of Human Medicine, United States
REVIEW RETURNED	23-Oct-2019

GENERAL COMMENTS	<p>The authors utilized an ongoing, periodic nation-wide survey conducted by the Australian Heart Foundation to include questions pertaining to citizens' knowledge of cardiac arrest and CPR, and willingness to perform CPR.</p> <p>I have a few comments listed below. Otherwise, the manuscript is organized and easy to follow. The study design seems appropriate for survey methodology. The purposeful, cross-sectional sampling of this Heart Foundation survey is a strength of the study design.</p> <ol style="list-style-type: none"> 1) Page 5, line 59: Please describe how the survey questions were generated? Were any particular constructs targeted in generating the questions? Was there any type of iterative piloting or refinement process? 2) Page 5, line 54-56: Was the coding of free text responses performed in parallel by both investigators? Was there an a priori process for resolution of disagreement? 3) Page 6, line 14: How many persons were invited to complete the survey? (in order to estimate a response rate) 4) Page 6, line 52-57: Very devious subjects!
-------------------------	---

VERSION 1 – AUTHOR RESPONSE

Reviewer 1	
<p>1. Do the authors presume that the respondents would be representative of the general Australian population? While the authors admit that the study may be open to selection bias, they attempt to justify their selection method by stating that since the results are consistent with previous Australian and international research, this would justify the method used to obtain the data. One cannot presume that previous Australian state-based research conducted more than a decade earlier would be representative of the CPR training status in those states. Moreover, the population that would be more likely to participate in a Heart Foundations of Australia’s “HeartWatch” Survey may be different from the general Australian population. It would be more appropriate to state that the results are applicable to those who would tend to respond to on-line surveys of this nature.</p>	<p>We agree with your suggested wording and have added this, in addition to some more detail to the limitations paragraph as follows:</p> <p><i>Our study is subject to a number of potential limitations. Firstly, the online survey may be subject to selection bias and the results may only be applicable to those who respond to online surveys. However, rationale of the sampling method used was to generate a sample which matched the characteristics (e.g. age, sex, nationality) of the underlying Australian population.</i></p>
<p>2. The authors stated that many respondents described the absence of a pulse and that when they added absence of a pulse as a correct descriptor of cardiac arrest 14.2% (n = 153) of respondents had the answer coded as correct. Is a pulse check taught in Australia as part of lay responders' evaluation for cardiac arrest. Please clarify.</p>	<p>We agree that this may be confusing for readers, especially those outside of Australia. We have updated this sentence to read:</p> <p><i>However, many respondents described the absence of a pulse (“no heart beat”, “heart stops”), which has been removed within the last decade as a criteria for cardiac arrest in accredited Australian CPR training, and from emergency call dispatch CPR instructions.⁴</i></p>
<p>3. The authors mentioned that the barriers to performing CPR in this survey population included not being trained previously, not feeling confident, physical inability and concern over legal issues. There was no mention made by respondents of fear of infection transmission or other reasons for not performing mouth-to-mouth ventilation. Yet the authors mention that mouth-to-mouth ventilation is a barrier to performing CPR, when such a response was not forthcoming from the respondents and even though there is a dearth of studies on the unwillingness of members of the public to</p>	<p>Mouth-to-mouth is a common barrier to <u>lay</u> rescuers performing CPR – we neglected to qualify this statement in our discussion, but have since added additional references from studies with lay people – thank you for alerting us to this.</p> <p>As this has been such a common barrier in past literature, we went back and checked our data and while fear of infection was only mentioned by two participants in the group unwilling to</p>

<p>perform mouth-to-mouth ventilation (the bulk of studies being amongst healthcare workers).</p> <p>Suggest that the authors review their statement on mouth-to-mouth ventilation being a barrier to public performance of CPR. Attitudes of healthcare workers may not necessarily equate with attitudes of non-healthcare members of the public, even if guidelines are influenced by views expressed in surveys of healthcare workers.</p>	<p>provide CPR to a stranger – we have now outlined this with the other barriers.</p> <p><i>In those that responded no (n = 132, 12.3%) the most common response was not being trained in CPR (n = 57, 43.2%) or not feeling confident (n = 26, 19.7%). Fear (n = 9, 6.8%), a physical inability (n = 5, 3.8%), or concern over legalities (n = 5, 3.9%) were other factors mentioned, with only two (1.5%) mentioning fear of infection.</i></p>
<p>Reviewer: 2</p>	
<p>General Comments:</p> <p>Thank you for the opportunity to read this paper. It describes a national survey detailing the prevalence of CPR training in Australia. The paper is well written and easy to follow. Overall, I have no major concerns about the paper as it is. My only comment is could the authors expand on a “purposive, non-probability sampling method” as that term is unfamiliar to me (though I am not a survey expert).</p>	<p>Thank you – we are glad the paper is clear and easy to follow.</p> <p>The sampling method is where you sample respondents so that you can match criteria and in this case we matched for age, gender and area of residence. We have added “...in order to reflect the characteristics of the wider Australian population” for increased clarity.</p> <p>This sampling method is stronger than convenience sampling and makes results more generalizable.</p>
<p>Reviewer: 3</p>	
<p>The authors utilized an ongoing, periodic nationwide survey conducted by the Australian Heart Foundation to include questions pertaining to citizens' knowledge of cardiac arrest and CPR, and willingness to perform CPR.</p> <p>I have a few comments listed below. Otherwise, the manuscript is organized and easy to follow. The study design seems appropriate for survey methodology. The purposeful, cross-sectional sampling of this Heart Foundation survey is a strength of the study design.</p>	<p>Thank you.</p>

<p>1) Page 5, line 59: Please describe how the survey questions were generated? Were any particular constructs targeted in generating the questions? Was there any type of iterative piloting or refinement process?</p>	<p>The survey questions were generated from previous surveys and we have now added the references to support this statement.</p>
<p>2) Page 5, line 54-56: Was the coding of free text responses performed in parallel by both investigators? Was there an a priori process for resolution of disagreement?</p>	<p>We agree that more information is required here. This sentence now reads:</p> <p><i>Free text responses were categorically coded by two health care professionals (Registered Nurse [SC] and Paramedic [DS]) in parallel, both of whom are experienced community first aid trainers. These authors met several times to compare and discuss coding frameworks with outstanding disagreements referred to a third author (JB).</i></p>
<p>3) Page 6, line 14: How many persons were invited to complete the survey? (in order to estimate a response rate)</p>	<p>Because of the nature of the online survey – we don't have this information. Additionally, due to the nature of the sampling method this wouldn't be accurate because participants are part of an online survey group.</p>
<p>4) Page 6, line 52-57: Very devious subjects!</p>	<p>Yes, they were! We were shocked initially, but we think this is a consideration all future online surveys when they want to gauge a participants understanding of a concept.</p>

VERSION 2 – REVIEW

REVIEWER	Josh Reynolds, MD, MS Michigan State University College of Human Medicine United States
REVIEW RETURNED	21-Nov-2019
GENERAL COMMENTS	The authors have satisfied my Reviewer Comments