

Characteristics and outcomes of non-traumatic out-of-hospital cardiac arrest during the COVID-19 pandemic: policy notes

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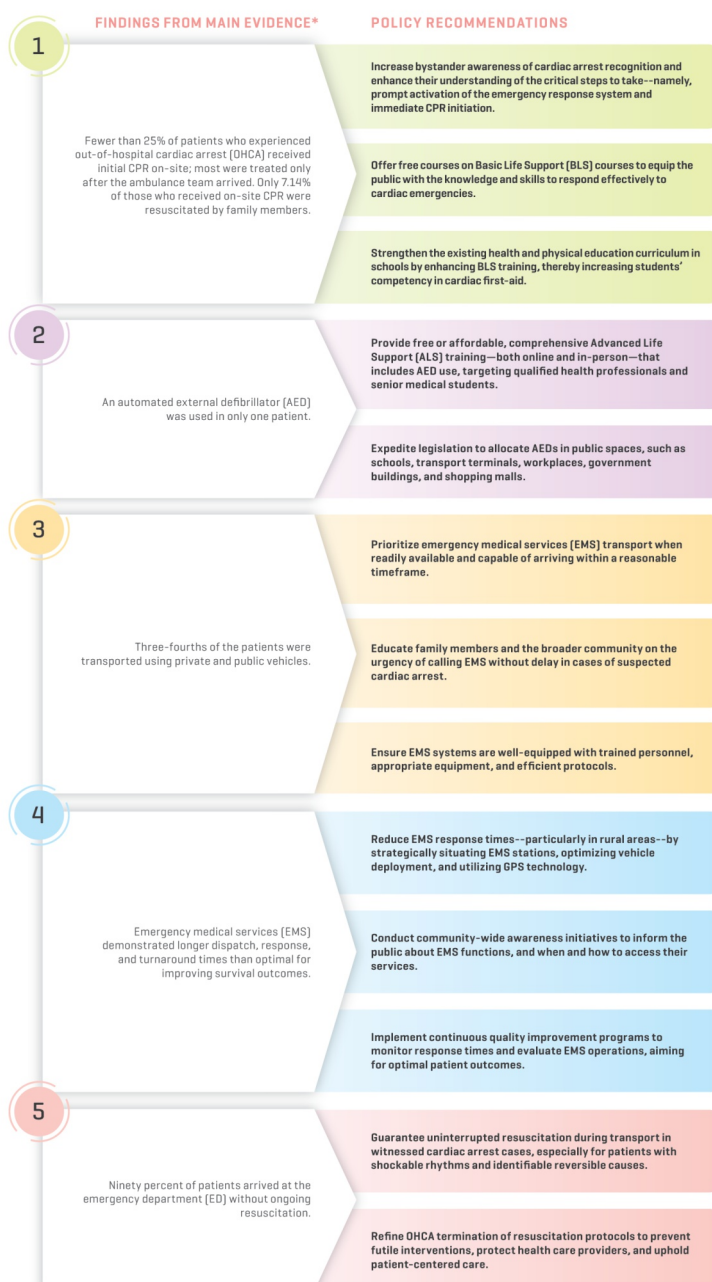
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EVIDENCE to POLICY



*Nonesa KD, Hago JM, Mesa-Gaerlan FJ. Characteristics and outcomes of pediatric and adult non-traumatic out-of-hospital cardiac arrest during the COVID-19 pandemic: descriptive study. *SPMC J Health Care Serv.* 2023;9(2):5. <https://n2t.net/ark:/76951/jhcs3hm86q>.



INTRODUCTION

Out-of-hospital cardiac arrest (OHCA) presents a significant public health challenge, marked by high global mortality rates. The worldwide incidence of OHCA managed by emergency medical services (EMS) ranges from 30 to 97.1 per 100,000 individuals, with survival to hospital discharge estimated at 8.6%–9.9%.¹ In the Philippines, the incidence is 1.1%, with a return of spontaneous circulation (ROSC) or resuscitation success rate of 9.5%.²

The COVID-19 pandemic markedly affected the incidence and outcomes of OHCA worldwide. Regions with a high COVID-19 burden experienced an uptick in OHCA cases and a decrease in bystander-initiated cardiopulmonary resuscitation (CPR).³ Cardiac arrests increasingly occurred at home, while incidence in public settings declined.⁴ Additionally, patients with chronic conditions often deferred their regular medical check-ups and avoided emergency departments (ED) for fear of infection. These factors—delays in emergency medical response, reduced bystander CPR, and limited health care services utilization—significantly undermined OHCA survival rates.⁵

This article aims to recommend health care policies informed by findings from a study conducted at a tertiary hospital in Davao City, examining the characteristics and outcomes of non-traumatic OHCA during the COVID-19 pandemic.

MAIN EVIDENCE

The study of Nones, et al. in 2023⁶ aimed to describe the demographic, clinical, and logistical characteristics of patients who experienced OHCA during the peak of the COVID-19 pandemic and were subsequently brought to the Southern Philippines Medical Center (SPMC) ED, at a time when vaccines were not yet available in the country. The study utilized data from the cardiac registry of the Pan-Asian Resuscitation Outcomes Study Clinical Research Network (PAROS CRN), to which the SPMC ED has been contributing since 2018. The study included 194 patients who experienced OHCA between March 15 and December 31, 2020. The majority of arrests (76.80%) occurred at home, with less than a quarter (21.65%) receiving initial CPR on-site. Of those, only 7.14% were resuscitated by family members. Most received CPR by ambulance crew upon

arrival. An automated extracorporeal defibrillator (AED) was used on-site in only one (0.52%) patient. Most patients (75.77%) were transported using non-ambulance (private and public) vehicles. EMS average dispatch time (from call receipt to ambulance departure from the station), response time (from call to on-site arrival), and turnaround time (from call to ED arrival) were 8, 19, and 56 minutes, respectively. Notably, 90.72% of patients were transported to the ED without continuous resuscitation. Upon arrival at the ED, 94.84% had an unknown arrest rhythm. Only one patient (0.52%) achieved ROSC and was immediately admitted to the ICU. The remainder (99.48%) expired within 10 to 15 minutes of arrival.

Policy recommendations based on these findings are outlined in the evidence-to-policy diagram in the previous page.

RELATED EVIDENCE

The clinical outcomes of OHCA are significantly affected by the “chain of survival,” which includes early recognition and activation of the emergency response system, bystander CPR, timely defibrillation, and EMS.^{7–8} This sequence of interventions was greatly disrupted during the COVID-19 pandemic, particularly in prehospital settings.⁹

Only a small proportion of patients experiencing OHCA receive bystander CPR on-site. Most are resuscitated only upon the arrival of ambulance personnel. During the pandemic, hesitancy among first responders to initiate CPR was noted,¹⁰ likely due to concerns about exposure and inadequate personal protective equipment (PPE). In 2021, the Department of Education issued the implementing rules and regulation for Republic Act 10871—the Basic Life Support Training in Schools Act—which integrates emergency cardiovascular care into the health and physical education curriculum of elementary and secondary schools.¹¹

Raising public awareness of cardiac arrest signs and equipping bystanders with the knowledge and confidence to perform CPR are crucial. The timing of CPR initiation is the main factor influencing survival and recovery following an OHCA, rather than the technical skills of the individual administering it. Timely CPR, even if not perfectly executed, greatly enhances the likelihood of a favorable

outcome compared to late CPR.¹²

EMS providers rely on AEDs, which detect shockable rhythms and deliver appropriate shocks. The presence of an initial shockable rhythm in OHCA is linked to better survival outcomes.¹³⁻¹⁵ To support early interventions, Public Access Defibrillation (PAD) systems place AEDs in public spaces such as airports, malls, and government buildings. These systems are associated with improved OHCA survival rates.¹⁶ However, timely AED access remains a challenge in low to middle-income countries (LMICs). In 2024, the Philippine Heart Association called on legislators to expedite legislation mandating AED availability in public spaces.¹⁷ Some local government units in Metro Manila have begun implementing PAD systems.¹⁸ Policies should also be formulated to improve public awareness of AEDs and encourage their use, which can be achieved through education, training, and strategic placement.¹⁶

In Vietnam, research suggests that non-EMS transport (e.g., private vehicles or taxis) is frequently used because it is perceived as faster and more accessible, especially in congested urban areas.¹⁹ EMS response may also take longer in rural or remote settings due to geographic and logistical constraints.²⁰ While private transport can shorten time to hospital arrival, it may limit access to critical interventions during transit, unless bystanders are trained in life support techniques. Conversely, EMS crews can deliver Advanced Life Support (ALS), including CPR, defibrillation, and medications, provided they are properly equipped.¹⁹ However, one study found lower survival rates among patients transported by EMS compared to those using non-EMS transportation modalities.²¹ These findings

highlight the importance of considering patient condition, transport timing, and local EMS capacity when determining the most effective mode of transport.

Longer dispatch, response, and turnaround times have a documented negative impact on survival rates. During the pandemic, many studies reported approximately one-minute delays in EMS response, partly due to time spent donning PPE.^{4 22 23} Each minute of delay reduces the likelihood of detecting a shockable rhythm by 8%.²⁴ Shorter response times are consistently associated with better outcomes, including higher survival rates and reduced risk of neurological damage. Ideally, EMS should be dispatched immediately upon receiving the call, with a target response time of 6.5 to 8 minutes when bystander CPR is performed.^{25 26} Response time improvements may be achieved through protocol optimization and training,²⁷ expanded AED accessibility, and technological solutions—such as GPS-based localization systems that alert first responders to episodes of fatal arrhythmia.²⁸

Globally, OHCA survival remains low—ranging from 8-15.8% in a few high-income Western and Asia-Pacific countries,²⁹⁻³¹ and dropping to 1-3% in many LMICs in Asia.^{32 33} For countries with developing EMS infrastructure like the Philippines, a multi-faceted approach is essential. This includes strategic ambulance and PAD deployment, robust communication networks using GPS, and enhanced public awareness through community-based programs and mass media campaigns emphasizing early recognition, activation of emergency services, and high-quality CPR. Strengthening these pillars holds great promise for improving OHCA outcomes.

Contributors

CMPA, and RCR contributed to the conceptualization of this article. CMPA, and RCR wrote the original draft. Both authors performed the subsequent revisions, approved the final version, and agreed to be accountable for all aspects of this article and its corresponding infographic.

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