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Consensus Statement | Emergency Medicine

Resuscitation of Drowned Persons During the COVID-19 Pandemic
A Consensus Statement

Ana Catarina Queiroga, PhD; Cody Dunne, MD; Leonardo Andres Manino, MSEM; Theo van der Linden, BSc; Tom Mecrow, MSPH; Joost Bierens, MD, PhD

Abstract

IMPORTANCE Resuscitation is a niche example of how the COVID-19 pandemic has affected society in the long term. Those trained in cardiopulmonary resuscitation (CPR) face the dilemma that attempting to save a life may result in their own harm. This is most of all a problem for drowning, where hypoxia is the cause of cardiac arrest and ventilation is the essential first step in reversing the situation.

OBJECTIVE To develop recommendations for water rescue organizations in providing their rescuers with safe drowning resuscitation procedures during the COVID-19 pandemic.

EVIDENCE REVIEW Two consecutive modified Delphi procedures involving 56 participants from 17 countries with expertise in drowning prevention research, resuscitation, and programming were performed from March 28, 2020, to March 29, 2021. In parallel, PubMed and Google Scholar were searched to identify new emerging evidence relevant to each core element, acknowledge previous studies relevant in the new context, and identify knowledge gaps.

FINDINGS Seven core elements, each with their own specific recommendations, were identified in the initial consensus procedure and were grouped into 4 categories: (1) prevention and mitigation of the risks of becoming infected, (2) resuscitation of drowned persons during the COVID-19 pandemic, (3) organizational responsibilities, and (4) organizations unable to meet the recommended guidelines. The common measures of infection risk mitigation, personal protective equipment, and vaccination are the base of the recommendations. Measures to increase drowning prevention efforts reduce the root cause of the dilemma. Additional infection risk mitigation measures include screening all people entering aquatic facilities, defining criteria for futile resuscitation, and avoiding contact with drowned persons by rescuers with a high-risk profile. Ventilation techniques must balance required skill level, oxygen delivery, infection risk, and costs of equipment and training. Bag-mask ventilation with a high-efficiency particulate air filter by 2 trained rescuers is advised. Major implications for the methods, facilities, and environment of CPR training have been identified, including nonpractical skills to avoid being infected or to infect others. Most of all, the organization is responsible for informing their members about the impact of the COVID-19 pandemic and taking measures that maximize rescuer safety. Research is urgently needed to better understand, develop, and implement strategies to reduce infection transmission during drowning resuscitation.

CONCLUSIONS AND RELEVANCE This consensus document provides an overview of recommendations for water rescue organizations to improve the safety of their rescuers during the COVID-19 pandemic and balances the competing interests between a potentially lifesaving intervention and risk to the rescuer. The consensus-based recommendations can also serve as an example for other volunteer organizations and altruistic laypeople who may provide resuscitation.

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Key Points

Question How can water rescuers provide cardiopulmonary resuscitation to a drowned person while minimizing risk of infection in the COVID-19 pandemic?

Findings In this consensus statement, a cohort of 56 subject matter experts and professional society leaders conducted 2 consecutive modified Delphi procedures and identified 7 core elements, grouped in 4 categories, each with their own specific recommendations. The panel agreed that during challenging times, drowning prevention efforts should be prioritized; several ventilation techniques were advised and ranked in terms of skill level, oxygen delivery, and infection risk.

Meaning The expert panel identified key core elements and created guidelines to support water rescue organizations in guiding their rescuers during drowning resuscitation in the COVID-19 pandemic.

+ Supplemental content

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Introduction

The COVID-19 pandemic has had a substantial effect on health care workers since January 2020. Much discussion has occurred around improving their physical and psychological safety during these unprecedented times. However, out-of-hospital first responders and other laypeople with a duty to respond to medical emergencies (such as water rescuers or lifeguards) have faced similar practical and ethical challenges.[1,2] This issue has not received the attention it deserves.

Owing to the airborne threat of COVID-19, many resuscitation councils have advised against ventilation for lay rescuers.[3-11] However, evidence suggests that drowning individuals have better outcomes after resuscitation that incorporates ventilation compared with compression-only CPR.[12] Water rescuers prepared to perform ventilation in the interest of the drowned individual are therefore at greater risk of infection and must balance the best interest of a drowning person against protecting their own health and that of others.

In March 2020, water rescue organizations identified the urgent need for a position statement that clarified the dangers and opportunities for first responders performing out-of-hospital resuscitation of a drowned person. The resulting consensus statement highlights several novel aspects and consequences of the COVID-19 pandemic for water rescue organizations. Further, the process undertaken to develop this consensus statement may also serve as a model for how other volunteer organizations can collaborate to create industry-specific recommendations during a crisis rapidly, namely concerning medical interventions that are a common part of their activities.

Methods

This consensus statement is based on 2 consecutive rounds of development. The first version was developed from March 28 to May 29, 2020; the second version, from November 11, 2020, to May 31, 2021. The reporting of the consensus-oriented methodology has followed the framework of the Revised Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) reporting guideline where appropriate and necessary. A flowchart of the process is presented in the eFigure in the Supplement.

In March 2020, after recognizing the potentially devastating consequences of an airborne virus for the resuscitation of drowned person, a working group was formed. The group consisted of 6 nominated representatives from the International Drowning Researchers' Alliance, the International Life Saving Federation, and the International Maritime Rescue Federation. Together these membership organizations represent 267 water rescue organizations and 81 drowning prevention researchers. The working group's first step was to assemble a group of participants who would represent global input of existing experiences and practices with drowning resuscitation during the COVID-19 pandemic and who were able to assess the acceptance and practical implications of the recommendations that were expected to arise from this project. When participants had formal positions within related organizations, it was expected that they also included the organization's viewpoints in their input and would inform the organization about the outcomes.

In April 2020, the working group circulated an electronic survey to a representative and international sample of available expertise within the 3 organizations to initiate the development of specific recommendations. Participants from Argentina, Australia, Belgium, Brazil, Canada, Denmark, Greece, Ireland, Italy, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, the UK, and the US were asked to share whether and how their local pre-COVID resuscitation guidelines had been adapted owing to the pandemic, to share their experiences implementing these adaptations, and to share suggestions on how water rescuers could mitigate coronavirus infection while having the responsibility to resuscitate a drowned person (eFigure in the Supplement). Although the rescue of a drowned person from the water often precedes resuscitation, it was decided at the beginning of the consensus process to exclude the rescue component to allow for a narrow, distinct, and palatable focus. The survey answers were aggregated, analyzed, and categorized by the working group into 7

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core elements: prevention of drowning, infection risk mitigation, personal protective equipment (PPE), resuscitation techniques of drowned people, education and training, organizations unable to meet recommended guidelines, and responsibilities and ethical aspects of water rescue organizations.

Although most participants held operational roles and had experience in rescue or prehospital medicine, we considered that an additional literature search would complement their input and strengthen the recommendations. For this reason, extended, repeated, explorative, narrative searches were conducted during the process via PubMed and Google Scholar to identify new emerging evidence relevant to each core element, acknowledge previous studies relevant in the new context, and identify knowledge gaps. The search terms included *COVID-19* and *resuscitation* and/or *drowning* and MeSH terms *COVID-19* and *resuscitation*. Forward and backward citation searches of relevant publications were also conducted.

Despite the rapidly emerging knowledge regarding COVID-19, and although these publications provided data on the impact of COVID-19 on the education, organization, logistics, patient characteristics, and outcomes of resuscitation, hardly any evidence relevant for this consensus statement could be found. If identified as relevant, evidence was integrated into the recommendations. Most publications were at a very low or low level of evidence as expert opinion, consisting of descriptive case series with no controls, or historical case-control studies. No study reported about the effects of an intervention. Only 31 relevant references were identified in this initial process. The scarce results from the literature review were combined with the feedback from the survey to develop a set of initial recommendations. These, along with associated rationales, formed the initial consensus statement draft.

From May 2020 onward, this draft was circulated back to the participants for 3 iterative rounds of consultations via an online modified-Delphi process. When recommendations incited strongly opposing opinions between participants, breakout sessions via internet conferencing were organized between the participants and members of the working group. For each disputed recommendation, the wording was adapted in such a way that the critical participants had no objections. In a few controversial items, a more generalized formulation of a recommendation was crafted to ensure no strong objections. All recommendations received majority approval before inclusion. The final version of the first consensus statement was accepted in June 2020 by the 3 international organizations involved. Through the multiple rounds of discussion, 56 individuals contributed to the first version of this statement.

Three months after the consensus statement was published, a follow-up survey was sent to all participants to learn about the reception of the recommendations in different regions, any barriers to implementation, and any further changes requested. Based on the feedback, the working group drafted the revision of the second version of the consensus statement. A similar process to obtain consensus was followed as the first version (eFigure in the Supplement).

In parallel, a scoping review of research in PubMed and Google Scholar regarding resuscitation during the COVID-19 pandemic used the search terms (*COVID-19* [MeSH] or *SARS-CoV 2* [MeSH] or *COVID-19* or *SARS-CoV 2*) and (*Resuscitation* [MeSH] or *Cardiopulmonary Resuscitation* [MeSH] or *resuscitation* or *cardiopulmonary resuscitation*) and (*Out-of-Hospital Cardiac Arrest* [MeSH] or *out-of-hospital cardiac arrest*). This review resulted in 14 publications.[1,13-25]

The total list of publications collected during this second stage extended beyond 200 publications. Some were relevant as a general orientation on the subject or for use during discussions with participants (eg, regarding the risk of children being infected and the efficacy, safety, and education of the several ventilation techniques). The document included 104 references. Through the multiple rounds of discussion, 44 individuals contributed to the second version of the consensus statement. The second version of the consensus statement was accepted by all participants. Once this acceptance was achieved, the representatives of the 3 international aquatic organizations involved formally contacted their organizations to seek organizational approval of the second version of the consensus statement. Thereafter, the full document was placed on the websites of the 3

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organizations and distributed to members via email. Once this process was completed, it was believed that the document was relevant enough to be summarized and submitted for publication in a peer-reviewed open access journal.

Results

Seven core elements were identified by the participants and analyzed by the working group and were then grouped into 4 categories: (1) prevention and mitigation of the risks of becoming infected, (2) resuscitation of drowned persons during the COVID-19 pandemic, (3) organizational responsibilities, and (4) organizations unable to meet the recommended guidelines.

Prevention and Mitigation of the Risks of Becoming Infected

Prevention of Drowning

A complex ethical dilemma results when rescuers, aware of the infection risk, must risk their health supervising people at often overcrowded aquatic locations.[26] When COVID-19 disease burden is high, forbidding all aquatic activities at guarded locations to minimize rescues and resuscitations is reasonable; however, such lockdowns are not practical for extended periods. The first waves of COVID-19 showed that many people will seek out unsupervised aquatic environments, which in turn increases drowning risk.[27] By implementing measures that limit the number of visitors, lifeguarded locations can remain open while reducing the overall risk of drowning (eTable 1 in the Supplement).

It is expected that drowning, and thus drowning resuscitations, will decrease when drowning prevention measures are intensified. Authoritative organizations should become more active in public awareness campaigns to reduce drowning beyond their local setting of guarded locations.[28,29] The World Health Organization's *Global Report on Drowning*[30] and *Preventing Drowning: An Implementation Guide*[31] are the authoritative, evidence-based documents that endorse this recommendation.

Infection Risk Mitigation

Complete risk elimination is unrealistic in any rescue attempt; however, it is possible to minimize harms through mitigation and reduction strategies.[10,32-35] A relatively simple strategy is the organization of social distancing and the implementation of a reliable COVID-19 symptom screening process for anyone entering facilities. A more complex strategy to reduce unnecessary exposure is to set guidelines for rescue organizations to decide when a resuscitation is futile. Prolonged submersion time, prolonged time before the start of resuscitation, and prolonged arrival of advanced care are all poor prognostic factors. Several publications may be helpful to guide recommendations.[36-42]

Although most COVID-19–infected individuals only experience mild disease or remain asymptomatic, there is an increased morbidity and mortality for those who are older than 60 years, are unvaccinated, and/or have comorbidities.[34,41,43-48] Organizations should not deploy rescuers with high risk levels to duties that place them in direct contact with other people during resuscitation attempts.

Personal Protective Equipment

Because direct contact is necessary for resuscitation, PPE should be used. At minimum, PPE includes gloves, a face mask (preferably N95, FPP2 [aerosol filtration of at least 94% of 0.3-μm particles], or FFP3 [aerosol filtration of at least 99% of 0.3-μm particles]), and eye protection.[49,50] There are indications that the use of PPE in drowning situations and lifeguard settings may be more complex than in emergency medical services (EMS) or in hospital settings. Proposals for alternative PPE that would significantly reduce the time to start CPR without having to put on a full protective gown have been reported.[51,52] Further, organizations must have protocols in place for safe decontamination and disposing of PPE and offer training to rescuers on these processes.

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Emergency medical services should arrive with a higher level of PPE but may also intervene with aerosol-generating medical procedures such as endotracheal intubation. Rescuers should remove themselves from the resuscitation area as soon as they are able and safely decontaminate themselves and their equipment. Video instructions, webinars, online water safety conferences, and other media communications have proven to be instrumental to allow the organizations to update rescuers.[53,54]

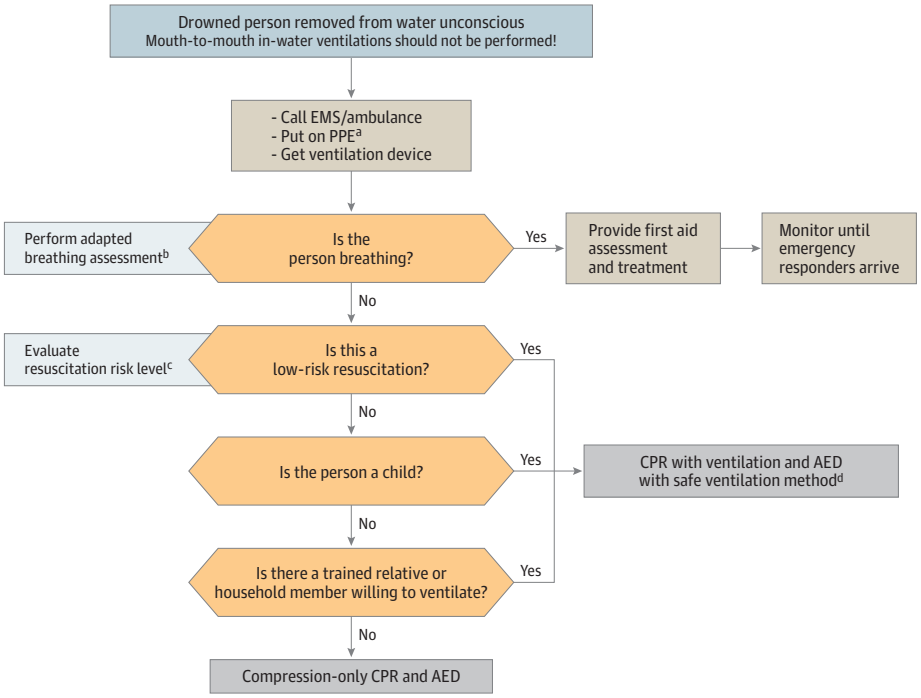
Resuscitation of Drowned Persons During the COVID-19 Pandemic

Almost uniformly, international and national resuscitation councils recommended against laypeople providing ventilation during CPR after the initial manifestation of the COVID-19 pandemic.[3-11] Compression-only CPR is a reasonable alternative in an arrest primarily cardiac in origin; however, in drowning, the arrest is secondary to hypoxia and reversal is critical for survival. As a result, ventilation is essential; compression-only CPR significantly reduces survival in drowning.[12]

The dilemma between performing optimal resuscitation and ensuring rescuer safety was understood by all participants.[55-58] A new resuscitation strategy was needed to ensure a reduced risk of COVID-19 transmission. To achieve this risk reduction, a combination of risk mitigation steps and selected ventilation techniques were assembled into the COVID CPR algorithm for water rescuers (**Figure 1** and eTable 2 in the Supplement).

Several situations are recognized in which the risk of infection due to ventilation can be considered very low. For example, in children,[8] ventilation is recommended in pediatric cardiac arrest guidelines owing to the likelihood of a hypoxic cause and the low infection risk. Based on the high occurrence of transmission between family or household members, it is reasonable to assume that mouth-to-mouth ventilation is still recommended if someone of the same household is present, trained, and willing to perform ventilation. In addition, a low likelihood of becoming seriously infected may be present when (1) there is a low burden of disease in the community, (2) there are strict admission screening procedures in place, (3) the rescuer is from a low-risk demographic, and

Figure 1. COVID Cardiopulmonary Resuscitation (CPR) Algorithm for Water Rescuers



Postresuscitation care includes washing hands with soap and water or an alcohol-based sanitizer and disposing of or decontaminating all equipment safely. AED indicates automated external defibrillator. Reprinted with permission from Luis Miguel Pascual Gomez, BS.

[a] Personal protective equipment (PPE) minimum requirement includes gloves and face mask with eye protection.

[b] Consists of checking whether the chest is moving or if there are signs of breathing without getting close. Rescuers should not bring their cheek close to the mouth to feel the person's breathing.

[c] Low-risk resuscitation means PPE is available and a safe ventilation method can be used, with at least 1 of the following: (1) facility screening process in place, (2) low prevalence of disease locally, and (3) low-risk rescuer (ie, younger and healthy).

[d] In order of preference, includes: (1) 2-rescuer bag-mask ventilation with high-efficiency particulate air (HEPA) filter; (2) mouth-to-mask ventilation with head strap and HEPA filter; and (3) supplemental oxygen with nonrebreather masks and head strap.

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(4) further protection is obtained by the rescuer using appropriate PPE. If none of these situations is present, compression-only CPR is recommended over no resuscitation.[58,59]

If proceeding with ventilations, 3 potential strategies are recommended. Each technique has advantages and disadvantages regarding the required skill level, the amount of oxygen delivered, and the risk of infection (**Table**, **Figure 2**, and **Figure 3**).[9,60] The preferred ventilation technique is bag-mask ventilation with a high-efficiency particulate air (HEPA) filter providing supplemental oxygen by 2 trained rescuers. Water and foam obstruct HEPA filters, which may need safe replacements frequently.

A paucity of evidence is available on the safety of ventilation techniques. For this reason, it is recommended that national rescue organizations critically consider within their settings the advantages and disadvantages of each ventilation technique and the combination of risk mitigation measures.

In-water ventilations should not be attempted. Rescuers should focus on removing the victim from the water as quickly as possible and start resuscitation.

Organizational Responsibilities

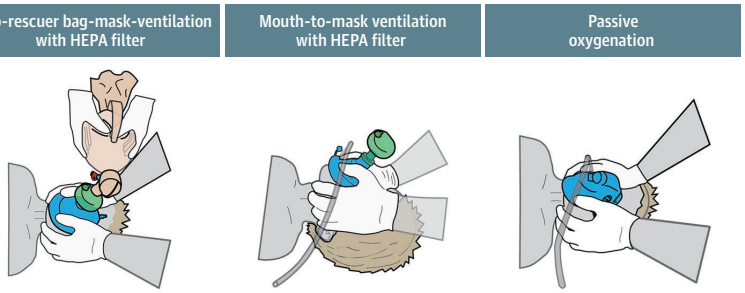
Due to the rapid spread of COVID-19, many organizations were unprepared, resulting in stressful circumstances for rescuers, cancellations of educational programming, and few opportunities for rescuers to develop and maintain resuscitation skills throughout 2020 and 2021. The effects of this disruption are not fully known. However, lessons should be learned from the past year to avoid future disruption (eTable 3 in the Supplement)

Table. Summary of Ventilation Techniques for the Resuscitation of Drowned Persons During the COVID-19 Pandemic for Rescuers Wearing PPE

Technique	Description
2-Rescuer bag-mask ventilations with HEPA filter and supplemental oxygen	This technique provides adequate ventilation and low infection risk to rescuers who wear PPE. One rescuer maintains a 2-handed tight seal and an open airway throughout the ventilations (Figure 3). The second trained rescuer performs chest compressions and pauses to squeeze the bag.
2-Rescuer mouth-to-mouth mask ventilations with head strap, HEPA filter, and supplemental oxygen	This technique provides adequate ventilation but has a higher infection risk to rescuers. The infection risk can further be reduced when the rescuer ventilates via a surgical mask (Figure 3). Consider this technique for a single rescuer.
1-Rescuer passive oxygenation	This technique uses a mask tightly strapped to the face and supplemental high-flow (15 L/min) oxygen to allow passive diffusion oxygenation while cardiac compressions are performed. There is no active ventilation. Maintenance of an open airway is important. The technique is relatively simple and safe.

Abbreviations: HEPA, high-efficiency particulate air; PPE, personal protective equipment.

Figure 2. Characteristics of the 3 Recommended Ventilation Methods Using HEPA (High-Efficiency Particulate Air) Filter and Supplemental Oxygen



	Two-rescuer bag-mask-ventilation with HEPA filter	Mouth-to-mask ventilation with HEPA filter	Passive oxygenation
Skill level	High	Moderate	Low
Oxygen delivery	High	Moderate	Low
Infection risk	Moderate	High	Low

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Responsibilities to the Rescuer

Organizations have an ethical obligation to act in the interest of the rescuer's safety. COVID-19 makes risk assessment for each rescue more difficult because rescuers must decide whether to attempt to save a life at the potential cost of the health of themselves, their families, and their colleagues.[13,61]

To prevent undue confusion and stress, organizations must communicate clear guidance early, acknowledge areas of uncertainty, and update as new data become available. In the face of uncertainty, rescuers who revert to compression-only CPR for a drowned person owing to safety concerns must be supported and not penalized. Further support can be provided through infection prevention and mitigation educational campaigns, providing sufficient PPE, adhering to recommendations regarding self-isolating and return-to-work timelines, and offering debriefing sessions following resuscitations. Organizations should strongly advocate rescuers be among the first to be tested and vaccinated, as with other first responders and health care workers.

Educational and Training Programs

All organizations should determine what training can be offered online vs in-person. This will require a flexible mindset as the traditional resuscitation teaching format is challenged.

In-person training has a higher risk for disease spread. Organizations need to monitor local disease burden and cancel programs if that burden is high. Once the risk is acceptable, several in-person risk mitigation steps include wearing a face mask when not in the water,[51] practicing hand hygiene, using training bubbles within a class, and not sharing training equipment between bubbles[61-63]; practicing outdoors when able, maintaining physical distance and good ventilation of training locations, and minimizing the instructor-to-participant ratio[8]; and practicing at least a portion of the training in full PPE to be prepared for a real resuscitation. These steps improve performance in real situations.[64,65]

If disease burden is high, educational options include prerecorded sessions, online interactive education, or teleconferencing.[66,67] When candidates may not have common training equipment, it

Figure 3. Demonstration of Mouth-to-Mask Ventilation Method

The method uses head tilt and jaw thrust with a V-E technique (ie, the position of the hands that should form the letters V and E while performing the head tilt and jaw thrust) and high-efficiency particulate air filter, while the rescuer is also using a surgical mask. This image is reprinted with permission from Leonardo Andres Manino.

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is advised to be adaptable (eg, use a plastic water bottle with balloon lungs as a CPR mannequin) to ensure training can continue. For organizations unable to produce online training material, there are many examples of open access resources available.[68]

As well as reviewing training methods, COVID-19 has forced organizations to reconsider what is being taught. Newly emphasized skills for rescuers include both technical (eg, donning and doffing, 2-rescuer bag-mask ventilation with HEPA filter) and nontechnical (eg, minimizing rescuers and bystander exposure, supervising correct use of PPE, collecting and disposing of used materials) skills.[58,69]

Organizations Unable to Meet the Recommended Guidance

Some organizations/regions will face difficulties meeting the proposed recommendations.[70] In these circumstances, we advise adopting the International Liaison Committee on Resuscitation guidance for standard (nondrowning) bystander resuscitation.[10] Although this guidance may result in a lower likelihood of survival for drowned persons, they balance rescuer safety while still providing some form of resuscitation in nonideal circumstances. Above all, prevention of drowning is the most impactful and cost-effective measure to reduce risk to both the patient and the rescuer, independent of COVID-19. Therefore, organizations should follow World Health Organization recommendations on implementing effective drowning prevention interventions.[30,31]

Discussion

The COVID-19 pandemic has required a sudden paradigm shift for all first responders—but in particular for water rescuers—on how to mitigate the risk of infection. Although there was an absence of guiding evidence, in some areas the number of drowned people who needed CPR seemed to increase.[27,71] First responders were unpreparedly tasked to balance their own safety, and the safety of friends and family, with their duty to save lives. Their organizations faced complex challenges of ensuring staff and volunteer welfare while maintaining operational capability. All these factors meant that this consensus statement was needed to help water rescue organizations and their rescuers to navigate the dilemmas.

Water rescuers were not the only first responders to face such dilemmas. Other first responders and EMS workers have also had to operate in this pandemic with uncertainty about the risk they were taking. Although vaccination rollout may help reduce these risks, it is still unclear how this will affect water rescuers as well as other first responders and EMS workers and factor into public health guidance.

The process to produce a consensus statement on the resuscitation of drowned people was started as soon as the consequences of the COVID-19 pandemic were realized. This has resulted in a document that had multidisciplinary and international input. Despite having different focuses and representing vastly different global regions, involved parties came together quickly to agree on a single statement. The process efficiently consolidated learning across the drowning prevention sector and is a suitable model for others with a similar objective in other sectors.

The statement ensures the safety standards needed for resuscitation, while providing drowned persons with the best chance of survival. This is possible by addressing the importance of drowning prevention, infection risk mitigation, rescuer safety, use of PPE, distribution of information to rescuers, ventilation techniques that reduce infection risk, and safer training methods.

Until now no drowning resuscitation data have been available, and how COVID-19 has affected CPR outcomes in drowning is still unclear. To further understand how COVID-19 affects the resuscitation of drowned persons, more data are needed.

Despite our increasing ability to manage the impact of COVID-19, either through risk mitigation strategies or vaccine rollout, it is likely that COVID-19–modified resuscitation guidelines will be in place for the foreseeable future. More research attention is needed to ensure that water rescue

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organizations can adequately respond to the needs of a drowning person while ensuring rescuers and their associates can stay healthy.

Limitations

This study has several limitations. Foremost, despite the overwhelming amount of literature on COVID-19, there is an absence of evidence concerning its impact on drowning resuscitation and how to protect rescuers. At the same time, although a scoping literature search was performed regarding resuscitation and COVID-19, we did not produce narrative reviews on each of the other elements in this statement. These topics were seriously debated between the participants, and the arguments were underlined by publications when available. The references reflecting these debates have been included and may be considered to represent the key literature during the consensus process.

This consensus statement only refers to the resuscitation of drowning people on land and does not include a water rescue component. This decision was made at the beginning of the process to allow for a narrow, distinct, and palatable focus of the consensus process. The airborne threat of COVID-19 during rescue was considered relatively less relevant. The final document, however, shows that many of the recommendations also affect a safer rescue.

At the time of the consensus process, the worldwide, unevenly distributed vaccination programs had yet to be implemented. However, the need for a significant modification of any of the recommendations seems unlikely, even in communities with high vaccination coverage.

During the development process, the working group realized the difficulty of obtaining consensus given that the participants represented countries that differed markedly in the ways that COVID-19 has affected social life, political decision making, and measures taken to organize rescue and health structures. Despite these differences, the working group was able to integrate the diversity of opinions to find common ground and consensus among participants.

Conclusions

This consensus statement, which was developed by the representatives of 3 international water rescue organizations and members from 17 countries, provides recommendations for water rescue organizations to improve the safety of rescuers in the resuscitation of drowning persons during the COVID-19 pandemic. This document can be used to guide future work of water rescue organizations and may serve as a model for other international organizations of first responders and EMS workers.

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Corresponding Author: Ana Catarina Queiroga, PhD, EPIUnit (Unidade de Investigação em Epidemiologia), Instituto de Saúde Pública da Universidade do Porto, Rua das Taipas No. 135, 4050-600 Porto, Portugal (queirogaac@gmail.com).

Author Affiliations: EPIUnit (Unidade de Investigação em Epidemiologia), Instituto de Saúde Pública da Universidade do Porto, Porto, Portugal (Queiroga); ITR (Laboratory for Integrative and Translational Research in Population Health), Porto, Portugal (Queiroga); International Life Saving Federation, Leuven, Belgium (Queiroga, Dunne, Manino, Bierens); International Drowning Researchers' Alliance, Kuna, Idaho (Queiroga, Dunne, Manino, Mecrow, Bierens); Department of Emergency Medicine, University of Calgary, Calgary, Alberta, Canada (Dunne); Costanera Rosario, Civil Defense Rosario Municipality, Rosario, Argentina (Manino); Equipo Professional de Salvamento Acuático, Buenos Aires, Argentina (Manino); Royal Dutch Lifeboat Institution, IJmuiden, the Netherlands (van der Linden, Bierens); International Maritime Rescue Federation, Enfield, United Kingdom (Mecrow); Royal National Lifeboat Institution, Poole, United Kingdom (Mecrow); Research Group Emergency and Disaster Medicine, Vrije Universiteit Brussels, Brussels, Belgium (Bierens).

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Author Contributions: Dr Queiroga had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Queiroga, Dunne, Manino, Bierens.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Queiroga, Dunne, Mecrow, Bierens.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Queiroga.

Obtained funding: Bierens.

Administrative, technical, or material support: All authors.

Supervision: Queiroga, Bierens.

Conflict of Interest Disclosures: Dr Bierens reported serving as consulting governor for Koninklijke Maatschappij tot Redding van Drenkelingen (founded 1767). No other disclosures were reported.

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SUPPLEMENT.

eFigure. Consensus Decision-making Flowchart
eTable 1. Summary of Recommendations for Prevention and Mitigation of Risk
eTable 2. Summary of Recommendations for Resuscitation
eTable 3. Summary of Recommendations for Organizations

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