

# Lifesaver VR

Estela Oliva and Mandy George

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**Project name:** Lifesaver VR  
**Project owner:** Resuscitation Council (UK)  
**Release date:** 2017  
**Locale:** Worldwide  
**Languages:** English  
**URL:** <https://www.resus.org.uk/apps/lifesaver-vr/>  
**XR medium:** Smartphone VR  
**Hazards:** Health  
**Activity:** Training  
**Age group:** 12+

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# #1

## Project Background

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*Lifesaver VR* is an immersive live-action virtual reality (VR) training tool which puts the user into the heart of the action as three young people are faced with a life-or-death situation. By controlling their movements, users make crucial decisions and learn essential CPR life-saving skills.

*Lifesaver VR* is the latest innovation in the *Lifesaver* family of educational life-saving apps created by the Resuscitation Council (UK), a professional body set up in 1983 with the primary objective of promoting high-quality, scientific, resuscitation guidelines that are applicable to everybody and to contribute to saving lives through education, training, research and collaboration.

Following the success of the original *Lifesaver* CPR learning app, which is available for computer, tablet and mobile devices, the Resuscitation Council (UK) joined forces with award-winning production company UNIT9 to develop a new virtual reality version: *Lifesaver VR*, an innovative new way to learn CPR using immersive technologies. The VR version was written and directed by BAFTA award-winner director Martin Percy and produced by UNIT9.

The original *Lifesaver* app was launched in May 2013 and contains three further scenarios, including a choking scenario, as well as one scenario featuring actress Daisy Ridley (*Star Wars: Episode VII - The Force Awakens*). In September 2017 it was

updated to include a brand-new scenario focused on young people which is also a branch of the *Lifesaver VR* virtual reality version.

The project was produced in response to the fact that 30,000 people each year in the UK have an out-of-hospital cardiac arrest<sup>1</sup> where the ambulance services attempt resuscitation - and less than 10 per cent of those people will survive<sup>2</sup>. However if a bystander starts CPR they could double a person's chance of survival<sup>3</sup>.

The *Lifesaver* project has received several awards including E-Learning Awards 2013, BAFTA Awards: Nomination, The Webby Awards: People's voice winner, IPA Best of Health Awards: Digital Media GOLD, Digital Media Best of Show and FWA awards Site of the Day.

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1 Ambulance Service Association, National Out-of-Hospital Cardiac Arrest Project, 2006  
2 BHF analysis of OHCA figures  
3 <https://resus.org.uk/publications/resuscitation-to-recovery/>

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# #2

## Aims & Rationale

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Lifesaver VR aims to generate awareness about cardiac arrests issues and to teach emergency CPR skills to the wider public, especially to young people.

Specific goals to provoke behaviour change include:

- ▶ Call emergency services (911 in USA and 999 in the UK)
  - ▶ Perform CPR
  - ▶ Ask for an AED machine (automated external defibrillator)
- 

### Why Now?

CPR training has remained largely unchanged in the last 50 years. One concern has been the lack of realism that a bystander would experience during a real emergency event. Resuscitation organisations such as the American Heart Association (AHA) have called for innovative

solutions using new digital technologies including mobile apps and immersive technologies. The success of the Lifesaver mobile app experience proved the immense benefit of new technologies, and the refreshed virtual reality application provides more user immersion in reality.

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# #3

## Audience

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Lifesaver VR is aimed to be suitable for everyone, however it is specifically designed to help young people gain skills and the confidence to use them. The app rating on the Apple App store is +12 years old. This also matches with the standard rating of +13 for VR experiences. However the Google Play store, sets the rating to PEGI 3, this might be because generally AR games are usually classified like this.

The VR scenario is specifically designed to

engage young people in life-saving education, and shows teenage characters coming to the rescue when their friend collapses.

The broader target audience is the general public. The Resuscitation Council (UK) believe that by promoting and increasing public awareness of cardiac arrest and the knowledge of how to respond, survival rates will improve.



# #4

## Experience

The virtual reality experience is presented as a film played like a game. It throws the user into a situation where someone will be dead in ten minutes unless they do the right thing. The user learns by doing. If it is done wrong, the consequences can be seen in the story.

As the app begins the user is requested to take something to push on, like a cushion or a blanket. It is also recommended to use a CPR mannequin if possible. Next, instructions are provided about how to push and a safety warning is presented to advise that VR might cause sickness. The beginning of the story is in VR Cinema mode, which shows a screen inside the virtual world. When the CPR starts, the screen goes into full interactive VR mode along with the

headset; or alternatively VR 360 if used without a headset.

**TRAILER:** <https://youtu.be/QuUJavS3WSAI>

The initial scene depicts three teenage friends playing football in the garden. One of them suddenly feels unwell and goes inside the house. The affected person, Harry, has a cardiac arrest and collapses. His friends realise and go over to attend to him. At this point, the view goes into first person-view and the user becomes one of the characters in the scene. A voice over starts narrating and introduces the gamification features by asking the user to make a choice. This voice continues being the main guide through the rest of the experience. With the clock ticking, the user

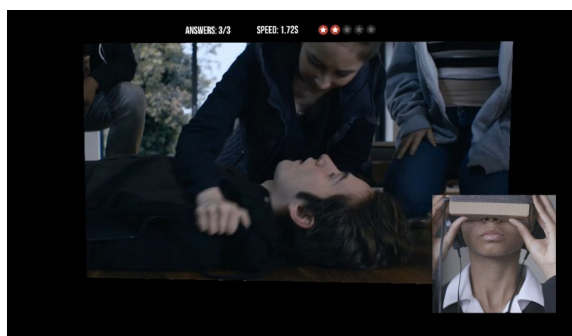
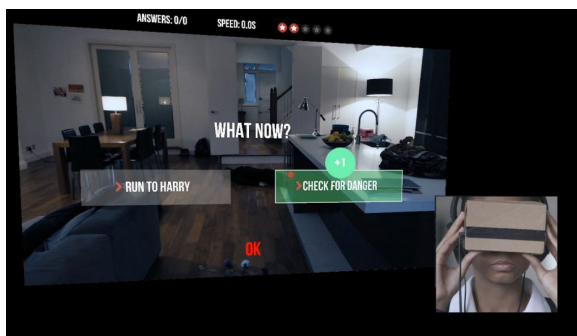


has to start making choices about how to help Harry. Each option has two choices and provides a score which can be seen on screen. When you, as the user, start CPR, the camera points down and helps you perform real CPR movements on the chest, combined with breathing interactions. If you have a VR headset, you are invited to take a prop like a cushion to practice the chest compression movements. If you do not have a VR headset you can still go through the training by using your phone and moving it up and down to practice.

The training teaches you to count the chest compression, what rhythm to use and how to apply mouth-to-mouth. In the

meantime, it prompts to call the emergency services and interact with them on the phone. After each CPR you get a score from 'Try Harder' to 'Good' or 'Excellent'. If you do not do well, the experience allows you to practice again until the learning goal has been achieved.

Once the emergency services arrive, the experience ends and a final score is provided ranging from 0 to 5 heart badges and verbal feedback is obtained from other characters. Harry is seen coming back to a normal state and the experience ends in a happy mood, with emotive footage of the friends hugging, as you have saved the affected person.





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# #5

## Technology

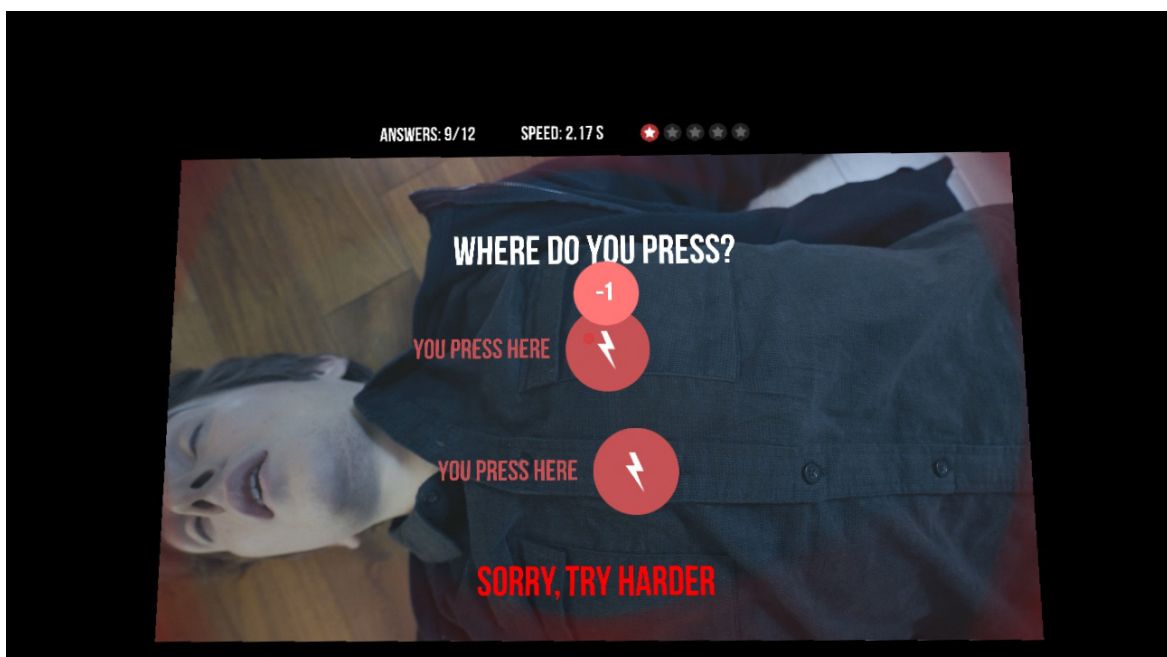
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The VR application integrates a smartphone with a VR headset viewer for a multisensory immersion. To scale this experience to as many people as possible, UNIT9 built it for Google Cardboard running both on iOS and Android devices. The app uses the user's mobile phone accelerometer, a sensor which measures the tilting motion and orientation of a mobile phone. This allows the app to track user movements and give them feedback on how well they are doing CPR to change the film depending on their performance.

The app is quite large and requires at least 1.4GB of free space on iPhone devices.

The app uses interactive gaze functionality to guide the user experience, which allows to make choices and select menus in real time by pointing the eye to a specific point on the screen. The interface is designed with a two choice question and it provides instant feedback on the choice selected. When the choice is correct a +1 green bubble appears, if the choice is incorrect a -1 red bubble shows.

The app is available to be downloaded for free from the Apple and Google Play stores. There is also a branded VR headset available for sale on the Resuscitation Council





(UK) [shop](#) for playing Lifesaver VR as well as other virtual reality games. The headset is a branded variation of Google Cardboard headset comes flat-packed and is simple to assemble. It includes foam nose and forehead protectors for comfort, and an adjustable velcro strap makes it suitable for different ages. It can be ordered from the online shop for 11.00 GBP.



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## #6

# Production & Distribution

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The production took a total of six months and involved different parties from the Resuscitation Council, UNIT9, paramedics and other contractors. Other parties involved were BAFTA award winning director Martin Percy, who directed the video. There were three clinicians involved in the development and production: RC (UK) Vice-President Dr. Andrew Lockey, RC (UK) Executive Committee member Dr. Jasmeet Soar, and paramedic Mike Smyth. Resuscitation Council contracted UNIT9 to produce Lifesaver. Dr Lockey and Dr Soar worked with Martin Percy (Director) to produce the script and sign off on the clinical accuracy of the content so that it met the UK Guidelines.

The distribution is managed by the Resuscitation Council (UK) via app stores for Apple and Android phones, and is currently available in English language only.

The Resuscitation Council (UK) are currently trying to ensure that the UK Department for Education includes *Lifesaver* in guidance for schools as part of the drive to include CPR in the PSHE curriculum. This piece of work is still in its infancy but they hope to have positive news soon.

# #7

## Outcomes and Future Planning

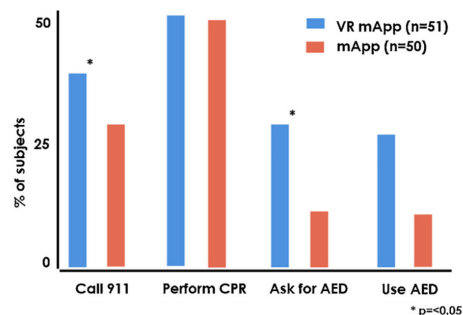
Over a million people have accessed the *Lifesaver* platform (not just the VR app) since it was launched in spring 2013, but there are no stats correlating *Lifesaver* VR data and therefore number of app downloads is unknown.

*Lifesaver* is known to have saved a life<sup>4</sup>; 48 hours after playing *Lifesaver*, Adam Kelly put his recently learned skills into practice and saved the life of a man having an out of hospital cardiac arrest.

There are at least three academic papers related to the *Lifesaver* project, written by different researchers including university academics. In 2017 school Lifesavers study - a randomised controlled trial comparing the impact of *Lifesaver* only, face-to-face training only, and *Lifesaver* with face-to-face training on CPR knowledge, skills and attitudes in UK school children - concluded that *Lifesaver* use combined with face-to-face training leads to improved learning outcomes for several key elements of successful CPR.

*Lifesaver* VR has had different evaluation and feedback mechanisms. In 2019 a controlled trial of digital CPR training com-

4 <https://www.resus.org.uk/features/community-stories/lifesaver-saving-lives/>



VR m App Chain of survival response compared with mApp.

paring the VR app with the mobile version without VR<sup>5</sup> included 105 subjects enrolled of which 52 took the VR app training and 53 the mobile app training. The results concluded the following:

- Bystander response: call emergency services, perform CPR, ask for an AED. The percentage of bystanders who responded according the Chain of Survival was significantly higher in the VR app compared to the mobile app. The VR app improved the bystander response metrics for calling 911 and asking for, and using defibrillator, compared with standard video-only mobile app.
- CPR quality: chest compression rate

5 Resuscitation. Comparing bystander response to a sudden cardiac arrest using a virtual reality CPR training mobile app versus a standard CPR training mobile app - Paper

and chest compression (CC) depth. When examining CPR quality, the trial saw that the CC depth was significantly decreased in VR app arm.

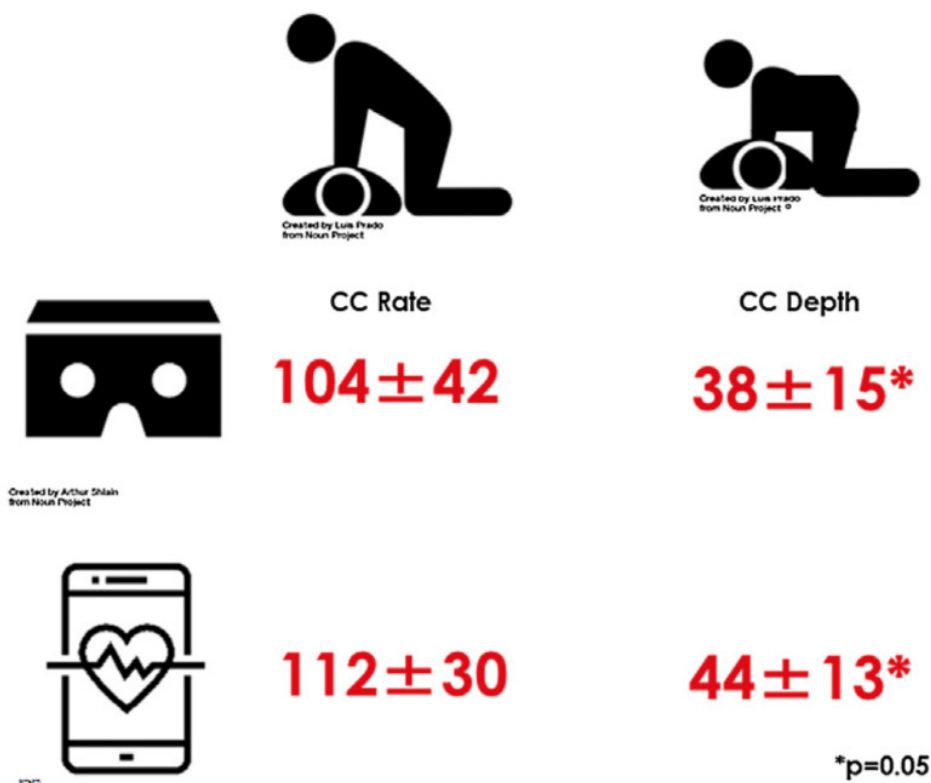
In another test, *Lifesaver VR* delivered results, with a selection of schoolchildren, teenagers' confidence in performing CPR increased from 38 per cent to 85 per cent. All those tested said they were more likely or much more likely to perform CPR in a

real emergency.<sup>6</sup>

The *Lifesaver App* has a good rating on the Apple Store of 4.9 (7 ratings only). It has one comment which with a positive review, however it claims that the app crashes.

*Lifesaver* is currently used as a CPR training tool by the South Central Ambulance Service (UK) as part of their paramedic training program, however there is no feedback about the current status.

<sup>6</sup> Unit 9 website projects section <https://www.unit9.com/project/lifesavervr/>



CPR Quality based on randomization of VR mApp versus mApp

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# #8

## Internal Evaluation and Learnings

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The LifeSaver VR experience is an example of a high quality designed experience integrating storytelling, real film and interactive learning features. The production quality, along with the first person perspective and the gaming features make it a highly effective learning tool for users.

Since the experience is presented from a storytelling angle it engages with the user's emotions, as you feel close to the characters, generating empathy. The voice of the narrator provided also plays an important role to help understand the context and learn the skills while playing. The experience's technical capabilities are innovative

and make excellent use of the accelerator features on smartphones to allow people to practice real CPR. The interface is simple yet very effective, providing quick feedback about performance in real time and generating a sense of urgency. The use of eye tracking features to allow users to make choices is easy to use and effective at providing an effective hands-free experience, to allow the user to practice real hands-on CPR. The sound design is very appropriate and it provides an important addition to the visual experience, generating tension and immersion in the scene. Overall Life-saver VR will give you the feeling that you really have saved someone's life.

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### Scalability

The choice of using smartphone features to provide a full VR experience is very efficient and allows the app to have a high number of downloads, reaching a wider number of people.

Although the upfront cost of the app was relatively high, the exposure it has had so far has made it a successful case:

*“we feel we have achieved rather well with its exposure thus far.”*

The app is offered for free on the app stores and also provides access to different versions depending on the device available, from immersive VR or 360 video if the headset is not available.

The combination of a free VR experience with an accessible VR viewer, makes the experience highly scalable, however it only is offered in English language.

### Top key take-aways:

- ▶ Lifesaver use combined with face-to-face training leads to improved learning outcomes for several key elements of successful CPR
- ▶ The VR version is successful at providing more skills than mobile application as participants are able to interact and perform real tasks with instant feedback on their performance
- ▶ The use of a real life prop adds to the immersive experience
- ▶ High engagement is achieved through timed game-style decision-making activities
- ▶ Emotional connection is generated through strong storyboarding and scripting and user immersion into the characters
- ▶ Provides formative feedback at each decision level, hence contributing to knowledge acquisition
- ▶ The sense of emergency that maintains tension until the end makes the experience memorable
- ▶ Investing in a high quality app, partnering with renowned agency and director meant that the app got excellent feedback and wide distribution, making it scalable in relation to the cost per user.
- ▶ Research papers showing evidence prove the importance of the tool in improving people's skills. These can be used for advocacy as well as to further develop the tool.



#### Contact information

Global Disaster Preparedness Center  
<https://www.preparecenter.org/>  
email: [gdpc@redcross.org](mailto:gdpc@redcross.org)  
431 18th St NW  
Washington, DC 20006  
USA



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