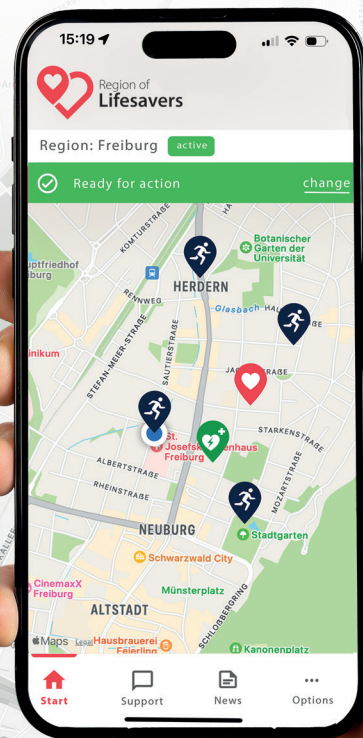




Region of
Lifesavers

Saving lives
together.



**THE INNOVATIVE APP-BASED FIRST RESPONDER SYSTEM
WITH SCIENTIFICALLY PROVEN, BEST-IN-CLASS PERFORMANCE.**

Your help?
Just a click away.



Leading cause of death

With over 250,000 cases per year, sudden cardiac arrest (SCA) is one of the leading causes of death in Europe. Only about 10% of those affected survive.

The only real chance of survival without lasting damage is if resuscitation begins within the first five minutes. Chest compressions, ventilation, and, where appropriate, defibrillation cannot wait until an ambulance arrives.

Some countries have achieved bystander CPR rates of 80 percent or higher. However, the quality of chest compressions delivered by laypeople is often low. Medically trained individuals are frequently nearby when an emergency occurs—they simply need to be alerted, routed, and assigned a specific task.

Emergency medical services are fast, but not fast enough in cases of sudden cardiac arrest

On average, it takes an ambulance between eight and fifteen minutes to reach a patient. It is very rare for emergency services to arrive within five minutes of the call—too late to reliably achieve a good neurological outcome after cardiac arrest.

Use of a defibrillator often vital

Around one in four cardiac arrest patients has a shockable arrhythmia, such as ventricular fibrillation or pulseless ventricular tachycardia. In these cases, a targeted electric shock from an automated external defibrillator (AED) can restore an effective cardiac rhythm and blood flow. In the best-case scenario, the heart resumes its normal function and the patient can continue life without major limitations. However, chest compressions remain even more important than defibrillation, and a lone rescuer should never leave the patient unattended to fetch an AED.

What we need
is a sustainable solution
for the treatment



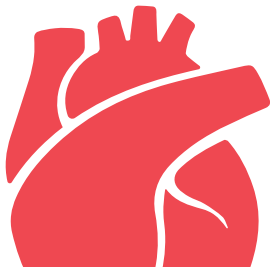
Most effective way to increase survival

As emphasized in the 2025 resuscitation guidelines, trained first responders in the vicinity of a suspected cardiac arrest should be notified via a smartphone app which is linked to an AED registry.

sudden
cardiac arrest



Region of
Lifesavers

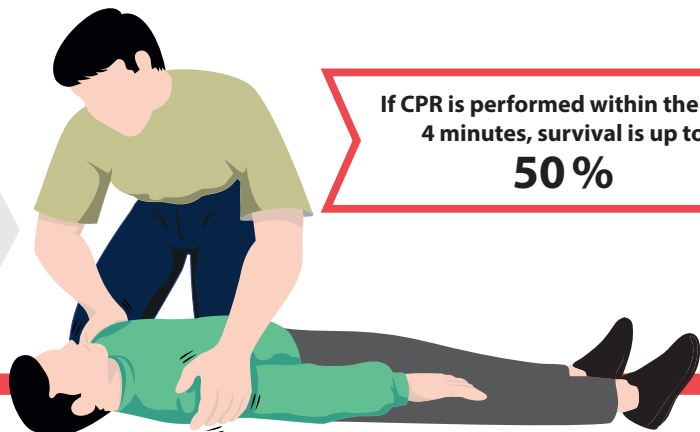


>250.000

survival typically
10% – 15%

If CPR is performed within the first
4 minutes, survival is up to

50%



Every second counts

Reducing time to first chest compressions

- The first responder with the shortest estimated arrival time is sent directly to the patient.

Reducing time to first defibrillation

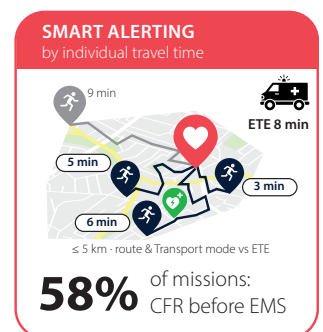
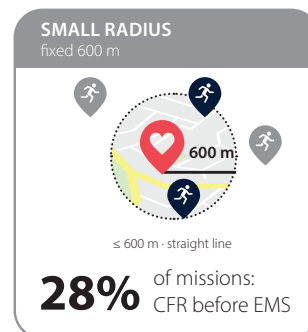
- For a minimum time to shock, a first responder who can be on the scene in the shortest possible time while being routed over a publicly accessible AED, is chosen to go the extra distance and fetch it.

Optimal app-based first responder system

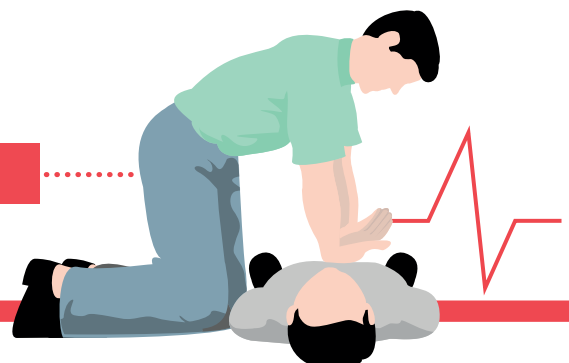
- A smartphone alerting system **fully integrated** into the emergency dispatch centre through a bidirectional interface.
- Responders are selected based on **predicted arrival** times—only those who can reach the scene before the emergency services are alerted.
- Alerts are **appropriately targeted**—only the number of first responders necessary for the situation are notified.
- Tasks are **allocated efficiently**—the fastest responder is sent directly to the patient, while those arriving slightly later are routed to collect an AED, as retrieval may take two to ten minutes¹ depending on its public location.

What should be avoided?

- **Mass alerting** (e.g., 30 or more responders): Relying on the chance that “someone” will arrive first often results in many arriving too late and reduces motivation to respond again.
- **Sending the closest responder to fetch the AED:** This significantly delays the start of chest compressions.
- Registering untrained laypeople: The best outcomes are achieved when medically trained volunteers—experienced in emergency situations—are deployed, ensuring high-quality chest compressions.



We reduce the time
to resuscitative actions
to a minimum.



¹ Auricchio A, Resuscitation 2019; 141: 182

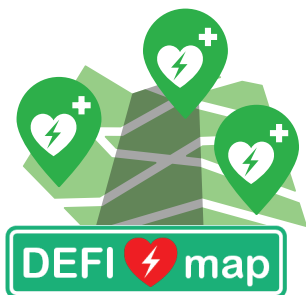
AED integration in the lifesaver system

Early defibrillation is a crucial link in the chain of survival. This is also emphasised in the ERC Guidelines 2025 in the chapter on "Systems Saving Lives": Life-saving app-based first responder alert systems should be linked to AED registries. Integration with dispatch centres and prioritisation of AED accessibility are recommended. The workflow of the Region of Lifesavers/DEFI Map architecture is configured accordingly.

After receiving the pre-alert, first responders in the Region of Lifesavers system indicate whether they are carrying an AED when they accept a request. If no AED is available at the scene and none of the first responders is carrying a personal AED, our integrated database identifies the nearest publicly accessible AED. This ensures that both qualified first responders and essential equipment, such as an AED, reach the scene of the emergency as quickly as possible, improving the efficiency of the emergency response and significantly increasing the patients' chance of survival.

Key features in daily operation

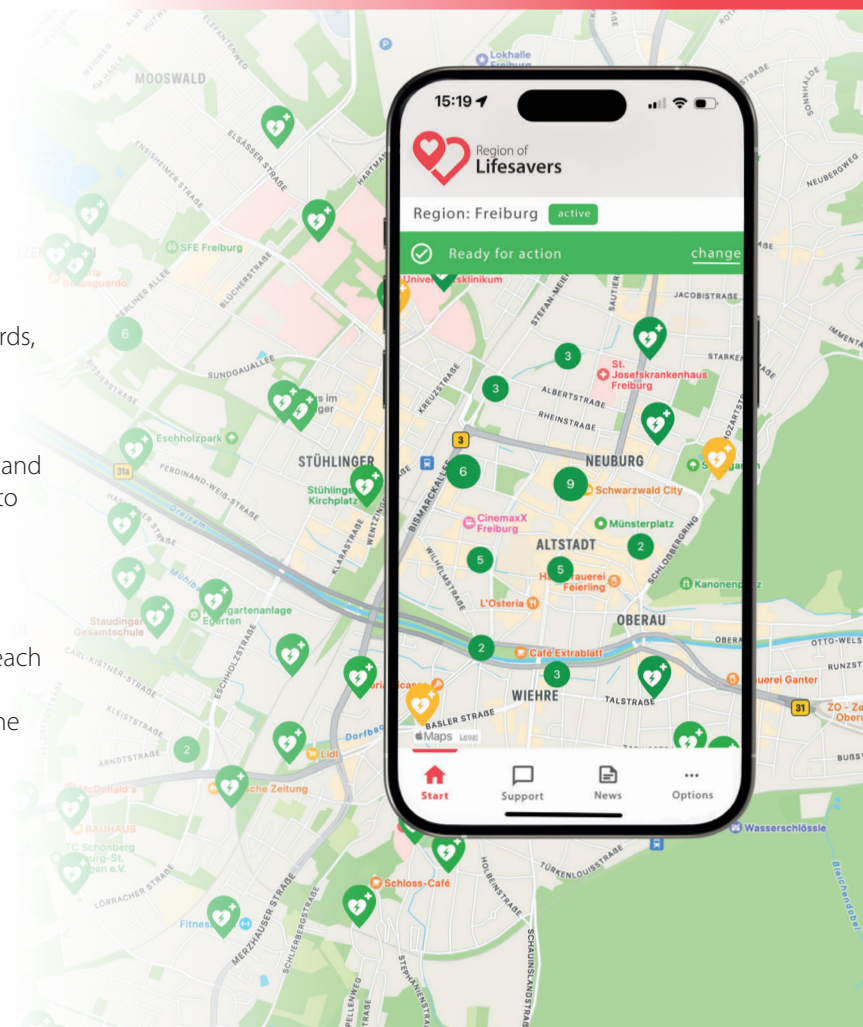
- Digital registration of publicly available AED locations.
- Digital management of all locations, images, and information.
- Listing of all AED-operator data, including detailed location and access information, images, public access times and availability .
- All verified AEDs are visible in the responder app.
- Additional view for the dispatch centre: Dispatchers can query the database for a nearby AED location during telephone-assisted cardiopulmonary resuscitation if no app responder accepts the alarm and more than one bystander is present.



DEFI-map is maintained to the highest data quality standards, as the system automatically directs responders to these devices.

Entries include access times, detailed location descriptions, and images. Dispatch centres can also query DEFI-map directly to guide bystanders to an AED during telephone-assisted CPR when no app responder is available.

Within the responder app, all verified AEDs are visible, and routing logic ensures that an AED is only selected if it can reach the patient before the emergency medical services (EMS). Responders who already carry an AED can indicate this in the app, further reducing the time to first shock.



Strategic placement of publicly accessible AEDs

Although placing AEDs in easily accessible locations with a high probability of cardiac arrest significantly improves survival rates, most countries still lack a comprehensive strategy for public AED deployment. Currently, few regions have an adequate, well-distributed network of publicly accessible.

We are committed to closing this gap. We provide expert advice to private and public partners on strategically selecting AED locations, often as part of donation or sponsorship projects.

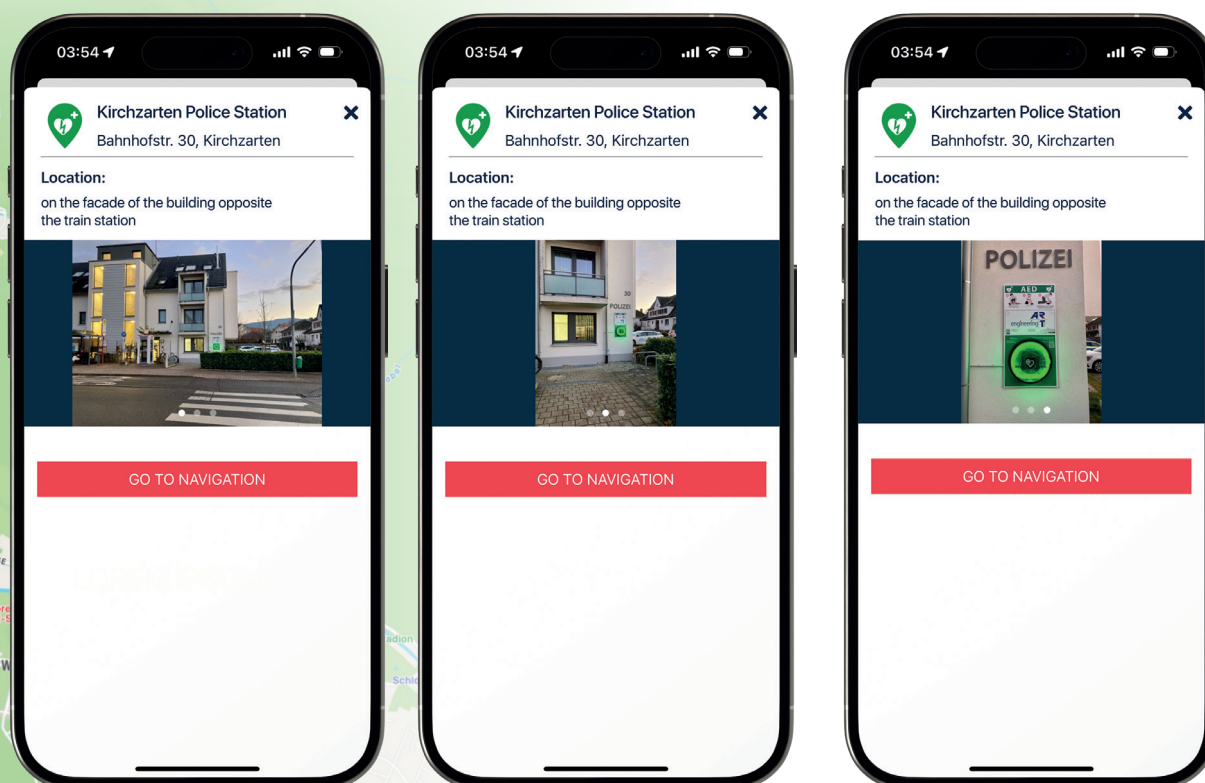
New devices are installed, registered, and maintained under our operational responsibility. Each publicly available AED is insured, regularly checked for functionality, and replenished with consumables after use.

Integration of AED drones

If no first responder indicates that they are carrying an AED -and route calculations show that none can collect one and arrive before EMS -the first responder alerting server automatically checks whether an AED drone is available nearby.

If the drone's estimated flight time is shorter than the ambulance's arrival time, the system deploys it to deliver an AED directly to the emergency location.

This innovative integration extends rapid defibrillation coverage to remote or sparsely populated areas — or areas with problematic topography like mountains, lakesides or bays - providing life-saving access where every second counts.



Our system and our algorithm

Region of Lifesavers

is not just an app; it is a comprehensive, sustainable life-saving system. Multiple components work together to achieve the shortest possible response times and the earliest possible defibrillation. Because every second counts, we continuously refine the platform -and we are relentlessly improving one of the most sophisticated alerting algorithms in the field.



How the system works

- **Bidirectional link to emergency systems:** Dispatch centres are connected to our alerting server via a bidirectional interface.
- **Verified AED registry:** Our system maintains a database of publicly accessible defibrillators (AEDs). Only verified locations are listed, complete with GPS coordinates, detailed access descriptions, photos, and public access times. All locations are visible in the first responder app.
- Our database also allows dispatch centres to access this information. During emergency calls, operators can provide callers with details of AEDs located near the incident.
- **Dispatcher prompt for suspected sudden cardiac arrest:** When a call indicating cardiac arrest is received, the dispatcher is prompted to activate our system. Once confirmed, the relevant data and the estimated arrival time (ETA) of the ambulance are transmitted to our alerting server.
- **Localisation and pre-alerting of first responders:** The system identifies registered first responders near the scene and sends them a pre-alert via the app.
- **Mode of transportation and AED status:** Each volunteer is asked to confirm their mode of transport (on foot, by bicycle, or by car) and whether they have an AED with them.
- **Predicting individual arrival times:** Our server calculates the turnout time and travel time for each responder, also considering potential detours to retrieve an AED. Based on these calculations, every volunteer receives an individual assignment.
- As soon as four volunteers have been allocated tasks, all others -whose predicted arrival times are longer—are notified and released from the call.



Four responders-three tasks

In our standard cardiac arrest deployment, **four responders** are alerted to perform **three tasks**:

- **Tasks 1 and 2** are identical and involve direct patient care.
- **Task 3** focuses on fetching and delivering the AED.
- **Task 4** provides support for the arriving emergency services and assistance to eye-witnesses / bystanders.

This configuration minimises the time to first chest compression and first shock, ensuring stable and efficient operations until the emergency medical services (EMS) arrive.

Task 1 & 2-proceed directly to patient

The two fastest first responders are sent straight to the patient. Their role is to deliver high-quality chest compressions, assess responsiveness and breathing, and initiate ventilation according to their level of training. Working in tandem, they alternate every two minutes to maintain consistent, effective resuscitation until defibrillation is available, and EMS take over.

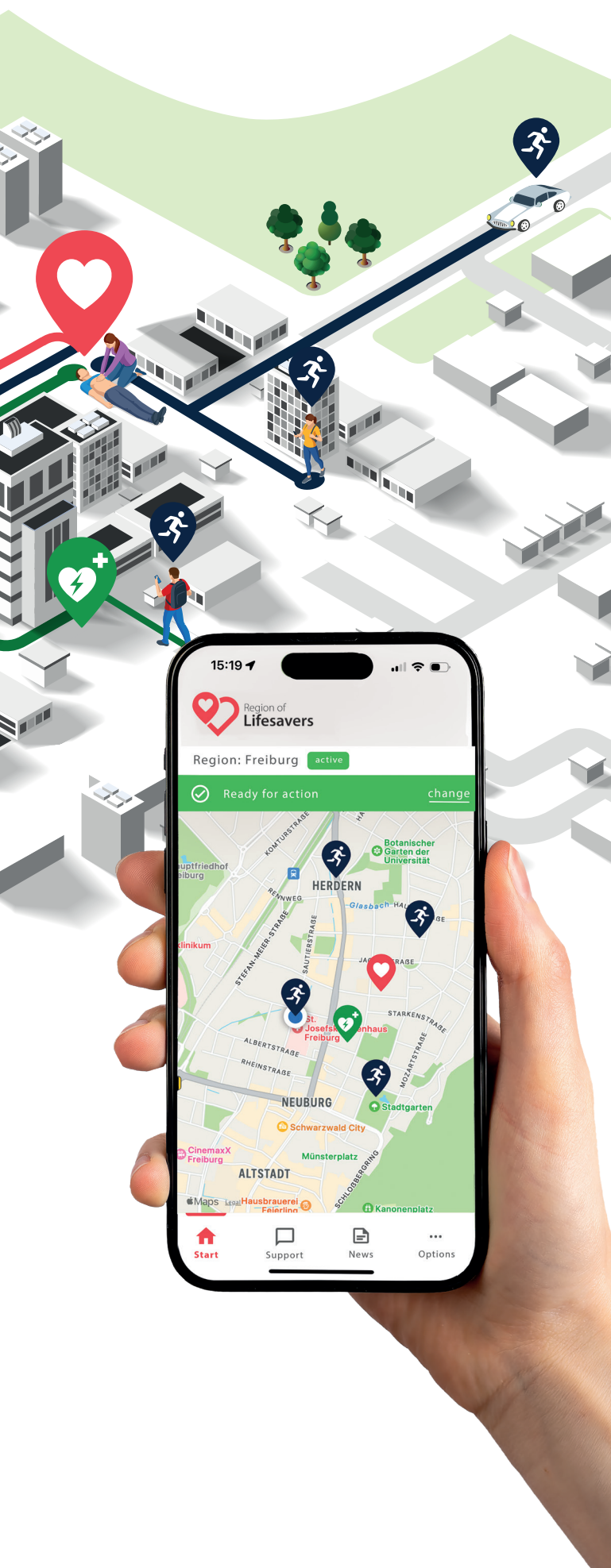
Task 3-fetch an AED

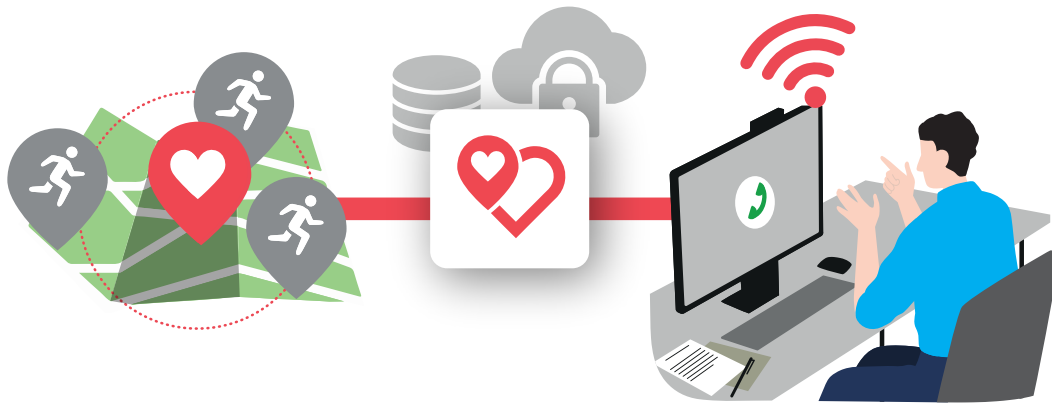
The third responder is guided by the system to a verified public AED, selected to ensure the shortest possible time to shock.

They bring the device to the scene, power it on, and attach the electrodes — all without interrupting chest compressions. If indicated, shocks are delivered with minimal pauses in resuscitation.

Task 4-on-site support

The fourth responder provides crucial operational and logistical support: Securing access for ambulance personnel, guiding EMS to the patient, caring for relatives and bystanders, fetching equipment, and relaying up-to-date information to the dispatch centre as needed. This responder also ensures privacy and safety at the scene. If required, they may assist with ventilation, switch roles, or help prepare the patient for transport.





App system features

Applicability for dispatch centres

- Cross-regional alerting with defined georeferencing.
- Certain areas can be excluded from the alerting system according to specifications from the control centre.
- Controlled mission tracking: The positions of assigned first responders are visible during operations, providing a real-time overview.
- Early mission termination: Operations involving potential hazards can be cancelled during the emergency call assessment stage.
- Enhanced communication: Dispatchers have access to contact details for assigned first responders; phone calls can be initiated directly from the dispatch system.
- Performance dashboard: Displays key operational statistics for dispatch centre staff, supporting quality assurance and research.

Multi-client admin console for regions and organisations

- Role-based access: Multi-tenant backend allowing multiple responsible units within a region or organisation to operate independently, each with appropriate access rights.
- Data curation: Review, approve, and update responder records.
- Verification: Document upload during in-app onboarding with secure electronic storage in the admin area for eligibility checks.
- Organisational autonomy: Independent master-data management for organisational units (e.g. Red Cross, fire service, other aid organisations).
- Consent workflows: Managed acceptance of privacy and participation terms, including the associated data protection information.
- Targeted communications: Notify individuals or groups via an integrated news and messaging function.
- After-action support: Manage debriefing requests.
- Operational dashboard: Key statistics at a glance for regional leads and dispatch supervisors.

Settings and applications for first responders

- Intuitive app user interface.
- Test alarm for app users.
- Setting off-duty times.
- Digital first responder ID card in the app to identify themselves as first responders at the emergency site.
- Mission report.
- Support request: Registered first responders can request a debriefing in the app at any time.

Data protection for first responders

- **Consent as legal basis:**
The collection, storage, and sharing of personal data are based on the responder's explicit in-app consent (Art. 6(1)(a) GDPR).
- **Pre-alert for positioning:**
The system sends a "pre-alert" (push notification) to determine the precise current position of nearby responders.
- **Highest possible accuracy:**
If the last known position indicates suitability for the incident, the app requests an updated location to maximise accuracy.
- **Operational data sharing:**
Position data are transmitted only for responders participating in the incident, and only to the dispatch centre for incident management (where technically feasible).
- **Contact channels:** During an incident, selected first responders can contact each other in-app or be contacted by the dispatch centre.

Data protection for patients

- **Tactical information only:**
Only information strictly necessary to reach and treat the patient is transmitted, such as the incident type (dispatch code) and the patient's name.
- **Extended incident data:**
Where operationally necessary, extended data (e.g., incident number, involved rescue resources) may be provided to assigned responders.
- **Need-to-know principle:**
Personal data of emergency patients are visible only to first responders with an assigned task.



Legal basis

Security and compliance by design

- **ISO/IEC 27001 certification:**
Our information security management system is certified in accordance with the ISO/IEC 27001 standard.
- **EU hosting, GDPR-compliant:**
All core services are hosted on GDPR-compliant servers within the European Union.
- **State-of-the-art encryption:**
All data traffic between the app and the server is encrypted in transit according to current best practice.

Legal framework and agreements

- **Documented GDPR concept:**
We operate a legally robust and audited GDPR data-protection concept.
- **Data processing agreement:**
We conclude data-processing agreements under Art. 28(3) GDPR Governance and access control.
- **Vetted community:** All participating first responders are verified and approved by authorised administrators.
- **In-app terms acceptance:**
Use requires agreement to the terms of use and participation conditions within the app.

Retention and deletion

- **24-hour retention (position data):**
Stored to verify system functionality and support quality assurance.
- **2-week retention (selected profile data):** For responders involved in an incident, limited master data are retained for up to two weeks for organisational follow-up (e.g., potential exposure notification).
- **Post-incident deletion on devices:**
All incident data on participating responders' smartphones is deleted 20 minutes after the incident ends.
- **Server-side minimisation:**
The patient's name is removed from the server after each incident. Thereafter, data are pseudonymised and stored solely for scientific evaluation, with export options only where appropriate and authorised.

Research-driven continuous technological progress

patent
pending

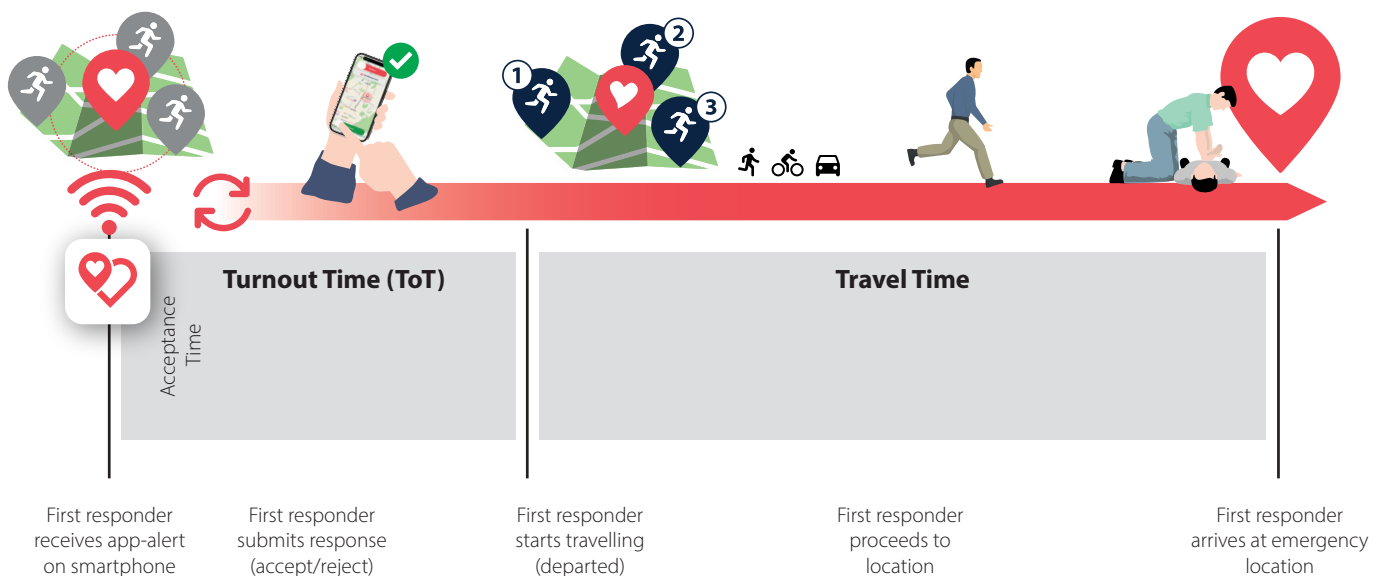
The first app-based systems alerted community first responders, whose radial distance to the emergency location was below a specific value, e.g. less than 1,000 meters. Some systems send the alert to 30 or even 40 first responders, assuming that the volunteer with the shortest response time is among them.

Cardiac arrest is among the most time-critical medical emergencies — every second counts. Our research group therefore works continuously to improve the system, guided by ongoing studies and the latest research insights.

After years of joint development between researchers and software engineers, we created the **most advanced alerting algorithm to date**. During the alerting process and task allocation, the server performs real-time routing calculations, taking into account each responder's mode of transport, whether on foot, by bicycle, or by car.

By deploying only those with the shortest expected travel times, our **third-generation alerting system** has achieved a significant reduction in average response times.

Process times from alert to arriving on scene





CRISIS Response

Volunteer community first responders can also be an important resource for civil protection during extraordinary emergencies. The Region of Lifesavers system can be configured for a range of alerting scenarios. Depending on the use case, responders with specific qualifications and equipment can be alerted within any required radius and expected arrival time.

Recent crises have highlighted challenges in civil protection, especially coordinating command staff and political leaders with field operations and, where appropriate, the civilian population. At the same time, spontaneous volunteers have proven to be a valuable resource. Our system provides tools to structure and coordinate these efforts.

Specifically configurable workflows

The aim is to systematically integrate volunteer helpers into civil protection operations.

In crisis situations, their spontaneous willingness to help can play an important role.

The key lies in the proactive and structured integration of independent helpers to support existing aid organisations, make use of additional material resources in society, and strengthen citizens' capacity to help themselves.

Examples of special workflows include:

- Accidents with mass casualties
- Situations involving violence
- Infrastructure failures
- Increasing risk of natural disasters due to climate change.

What comes next?

We are already developing the **next generation** of our system and are eager to study its impact on response times. The next major step is to anticipate **turnout times (ToT)** -the time it takes a responder to begin travelling after receiving the alert-directly into the predictive model.¹

A system capable of factoring in both turnout and travel times will be even more efficient in identifying those who can reach the scene first. The result will be a **completely new generation** of the system.

Scientific research

In 2024 an international research group established a **reporting standard** for describing first responder systems, smartphone alerting systems, and AED networks.² **Uniform reporting of data** in this field of research fosters collaboration between research groups and allows meaningful comparison of study results across different regions and systems.

Our research group has a clear vision

To alert only those volunteers who can reach the patient before the ambulance arrives. When more first responders than needed are close to the scene, the system should select those who will arrive first.



**We are convinced that, together,
we can build a strong and efficient
civil protection and disaster response
community.**

¹ Ganter J Resuscitation 2025: 110772 (in press)

² Müller MP Resuscitation 2024;195:110087

The non-profit organisation **Region of Lifesavers** was established in 2017 in Germany by leading emergency and intensive care physicians and various aid organisations.

Its mission is to ensure that patients with suspected cardiac arrest receive **life-saving assistance before the arrival of emergency medical services (EMS)** -wherever possible.

This is achieved through the **voluntary participation of medically trained personnel** and the **use of advanced digital technologies** designed to mobilise help within seconds.



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By alerting first responders via their smartphone, we can reduce the time until the start of resuscitation by 50%. By doing this, we can save thousands of people every year.



Prof. Dr. med. Michael Müller, Chair



In our ICU, we repeatedly treat patients after a cardiac arrest who, despite modern intensive therapy, do not survive without subsequent impairments. The sooner resuscitation efforts are started, the more likely it is that the patient will be able to resume normal life.



Prof. Dr. med. Hans-Jörg Busch, Vice Chair



My objective is to further develop the system based on scientific evidence, as early resuscitation efforts and an efficiently functioning chain of survival have a truly decisive influence on survival.



Dr. Julian Ganter, Head of Research Group



With my daily work I can make a difference: Making good ideas public, helping shape our society-in short: Doing something meaningful.



Dr. Judith Joos, CEO

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Your support
saves lives.

