World Health Organization

POST-CRASH RESPONSE

Supporting those affected by road traffic crashes

Post-crash response: Supporting those affected by road traffic crashes

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INTRODUCTION

The Decade of Action for Road Safety (2011–2020) was established by UN General Assembly Resolution 64/255 (2010) to accelerate coordinated international action aimed at reducing the number of deaths due to road traffic injuries. The 2030 Agenda for Sustainable Development has recently reiterated this priority by setting a target for **50% reduction in road traffic deaths and injuries by 2020.**

The Decade of Action provides a framework for key activities that governments, international agencies, civil society organizations and other stakeholders can use to guide their efforts, see http://www.who.int/roadsafety/decade_of_action/en/. Central to the framework are five "pillars" that address a range of road safety aspects, including vehicles, roads and road users (Figure 1).

This document addresses pillar 5: the post-crash response.

FIGURE 1: PILLARS OF THE DECADE OF ACTION FOR ROAD SAFETY (2011–2020)

Survivors and families affected by road traffic crashes have a range of physical, psychological and legal needs. Consequences of crashes may include physical injuries and resulting disability, psychological trauma that can impair reintegration into work and family life, and a range of economic and legal sequelae. A broad and integrated approach to support can mitigate the short and long-term effects of experiencing a crash and can help those affected return to function and independence at home and at work. An effective post-crash response requires integration of injury care, mental health services, legal support and legislation, and data on crashes and injuries.

The World Day of Remembrance was established in remembrance of those affected by road traffic injuries, and to pay tribute to post-crash responders. The day was formally recognised by the UN General Assembly in 2005 and offers the opportunity for recognition of the enormous scale and impact of road traffic injuries and the urgent need for intervention. The theme for 2016's World Day of Remembrance is 'Vital post-crash actions: Medical Care, Investigation, Justice!'. For more information, see http://worlddayofremembrance.org/ as well as the World Day of Remembrance for Road Traffic Victims: a guide for organizers, co-published by WHO, the European Federation of Road Traffic Victims (FEVR) and Road Peace, see http://www.who.int/violence_injury_prevention/road_traffic/activities/remembrance_day_handbook/en/

Support for crash survivors and their families

The Development Bank of Latin America, *Federación Iberoamericana de Asociaciones de Víctimas contra la Violencia Vial*, and the *Fundación MAPFRE* have created a comprehensive guide that centres on the experience of those affected by a crash, and addresses emergency assistance and data collection, as well as psychological support, and legal and financial guidance. See http://scioteca.caf.com/handle/123456789/933 for more information.

2016 poster for The World Day of Remembrance

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THE IMPACT OF ROAD TRAFFIC INJURIES

Road traffic injuries kill more than 1.25 million people every year and are the number one cause of death among 15–29 year olds. Over 50 million people are also injured in non-fatal crashes every year, causing an enormous burden of disability. Road traffic injuries disproportionately affect a young working population and the cost to individuals, families and governments is enormous. Injuries and their associated healthcare costs are a common cause of poverty and bankruptcy, and the overall cost is as high as 5% of GDP in some low- and middle-income countries (*1*).

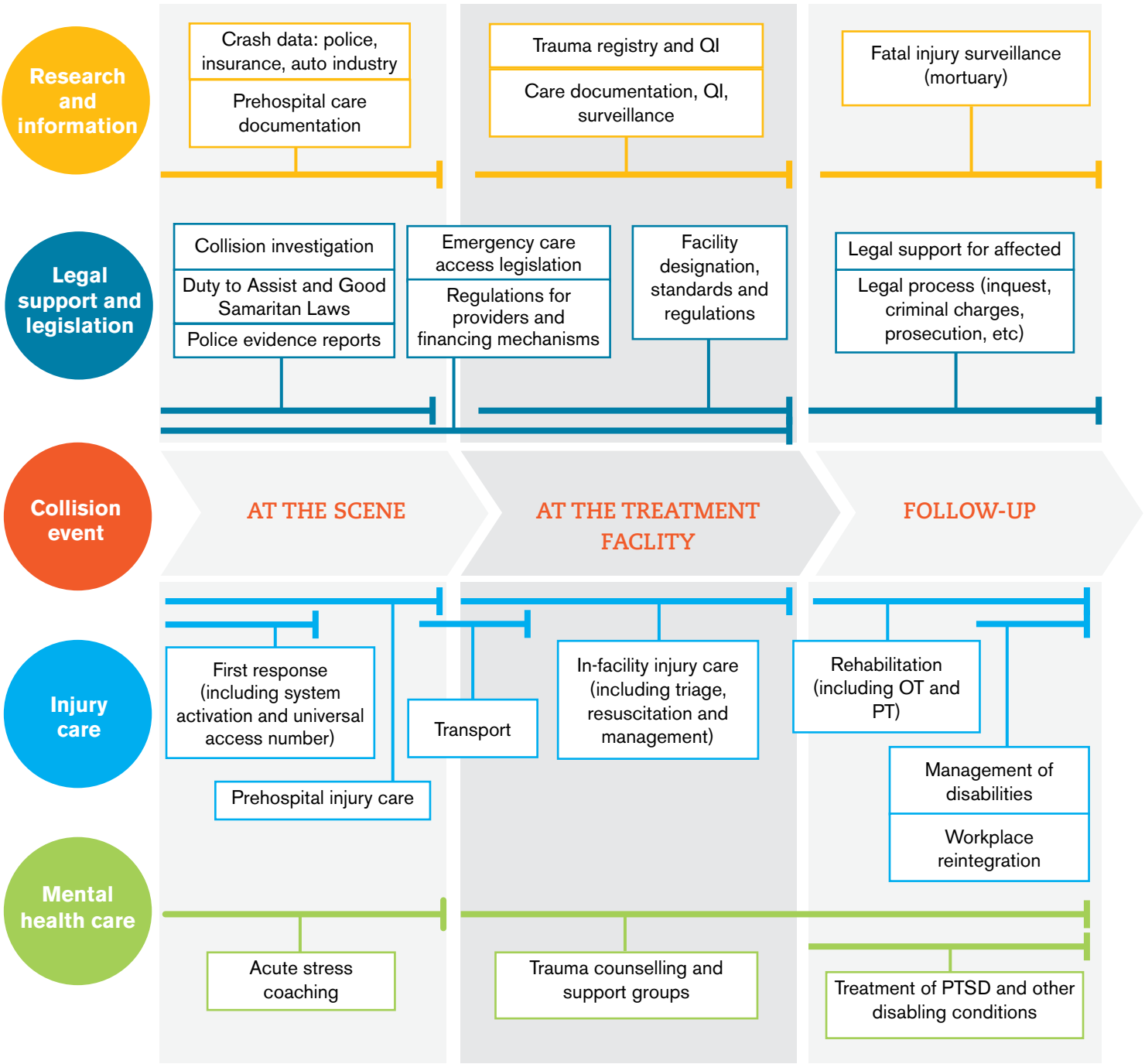
ELEMENTS OF POST-CRASH RESPONSE

Pillar 5 promotes the improvement of health care and other systems to provide the key elements of post-crash support: emergency care and rehabilitation for injury, mental health care, legal support, and data on crashes and injuries (Figure 2).

FINANCIAL BURDEN OF ROAD TRAFFIC INJURIES IN INDIA

Those injured in road traffic injuries face out-of-pocket health expenditures more than double those of any other condition requiring hospitalization, in many cases constituting a catastrophic financial burden to those affected by crashes (*2*).

FIGURE 2. KEY COMPONENTS OF THE POST-CRASH RESPONSE



QI = Quality Improvement; PT = Physiotherapy; OT = Occupational Therapy

EMERGENCY CARE SYSTEMS TO ENSURE TIMELY CARE FOR THE INJURED

Emergency care for injury is at the core of the post-crash response. Effective care of the injured requires a series of time-sensitive actions, beginning with activation of the emergency care system, and continuing with care at the scene, transport, and facility-based emergency care (See Figure 3 on the WHO Emergency Care System Framework). In addition, early and long-term rehabilitation are essential to limit the physical and psychological impact of injuries, and to maximise the impact of emergency and surgical care.

The WHO Emergency Care System Framework and Emergency Care System Assessment

The WHO framework describes the essential functions of an emergency care system and the associated assessment tool allows policy-makers to identify gaps and create context-relevant priority action plans for system development. See http://www.who.int/emergencycare for more information.

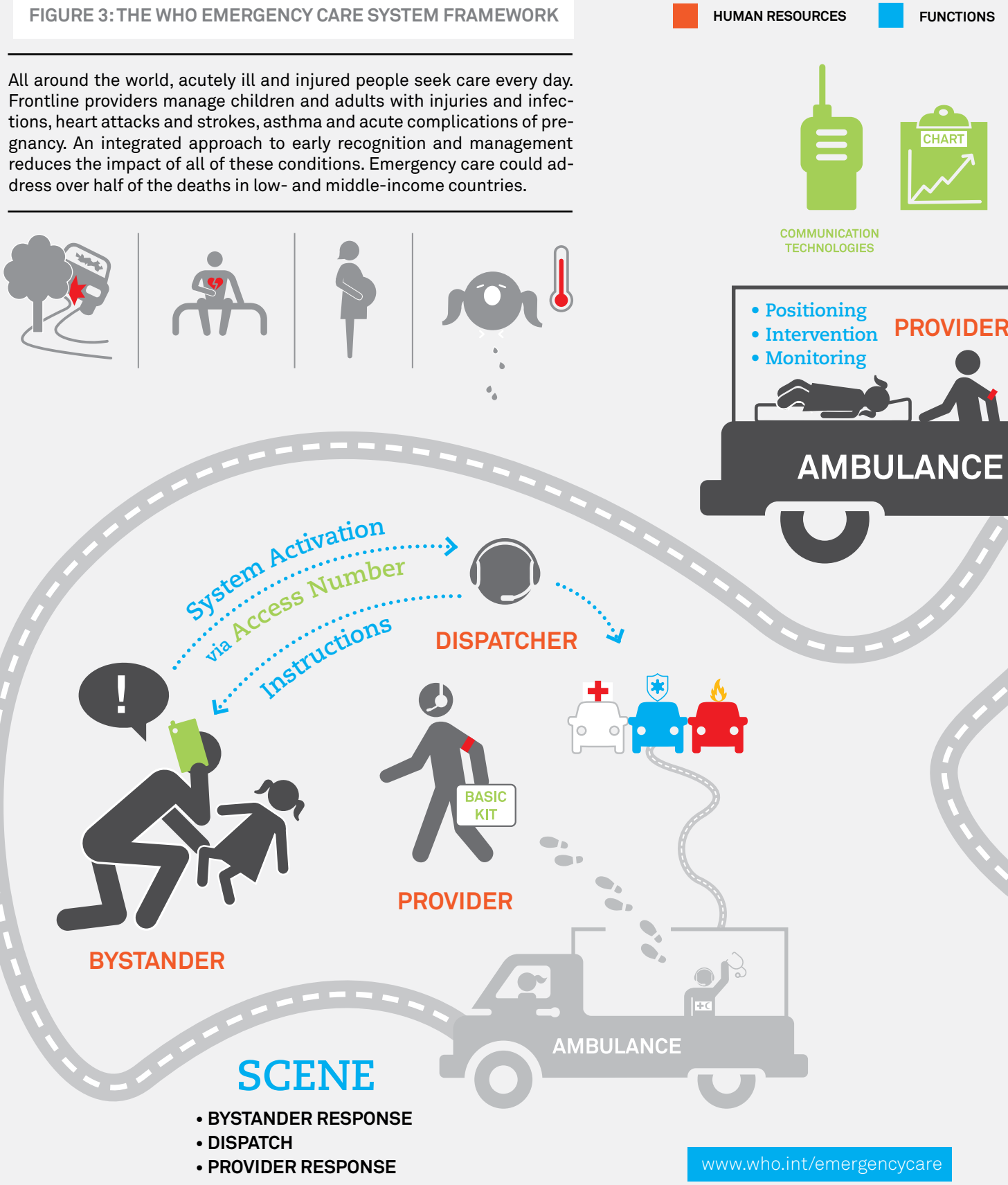
THE WHO GLOBAL ALLIANCE FOR CARE OF THE INJURED (GACI) is an international collaborative network of governmental, intergovernmental and nongovernmental organizations, including professional societies that work to improve prehospital, in-hospital and rehabilitative care for the injured. By providing technical guidance on essential trauma services to governments and policymakers, GACI aims to significantly improve care of the injured in a sustainable and affordable manner. See http://www.who.int/emergencycare/gaci/en for more information.

The role of bystanders in the emergency care system

Even the most sophisticated emergency care system is ineffective if bystanders fail to recognize a serious injury or do not know how to call for help. While a single universal access number that is valid country-wide and linked to centralised ambulance dispatch is optimal, simple systems requiring only mobile phones and well-designed protocols can also greatly improve care.

FIGURE 3: THE WHO EMERGENCY CARE SYSTEM FRAMEWORK

All around the world, acutely ill and injured people seek care every day. Frontline providers manage children and adults with injuries and infections, heart attacks and strokes, asthma and acute complications of pregnancy. An integrated approach to early recognition and management reduces the impact of all of these conditions. Emergency care could address over half of the deaths in low- and middle-income countries.



www.who.int/emergencycare

TRANSPORT

- PATIENT TRANSPORT
- TRANSPORT CARE

FACILITY

- RECEPTION
- EMERGENCY UNIT CARE
- DISPOSITION
- EARLY INPATIENT CARE

Universal emergency care access numbers

Ideally, there should be a single nationwide or regional telephone number that is:

- valid throughout the country
- available as a free call from every telephone (landline or mobile)
- easy to remember and dial (limited to three or four digits)
- linked to a dispatch centre that can rapidly send an equipped ambulance with trained personnel
- able to guarantee the confidentiality of the caller

Currently, only 50-60% of countries have a national emergency telephone number (*1*).

Beyond recognising injury and calling for help, bystanders may also play a key role by delivering first aid prior to the arrival of formal providers (*3*). Over half of European countries require first aid training for drivers before issuance of driving licenses (*4*), and many countries require that all drivers carry basic first aid supplies (see pg 51 http://tinyurl.com/zlnve4c for a list of supplies required by European drivers). First aid programmes have proven effective, in particular when incorporated into existing training programmes for other professionals, such as police and taxi drivers.

FIRST THINGS FIRST: UGANDA

A targeted first aid training programme was delivered to police, taxi drivers and community leaders in Kampala, Uganda, where there is no formal prehospital system. The low-cost programme trained participants to deliver basic life-saving measures at the roadside, and provided each participant with a first aid kit comprised of locally-available materials. On follow up, providers had maintained their skills over time, and many injured patients had received potentially life-saving attention (*5*).

Care at the scene

The proportion of patients who die before reaching hospital in low-income countries is twice that in high-income countries, suggesting that strengthening prehospital systems could have enormous global impact. Optimal prehospital care is provided by a responsive system that can rapidly dispatch equipped ambulances with trained providers – and extrication services where needed – but where this is not available, there are many ways to improve basic care at the scene of a crash.

In countries where there are areas with limited or delayed access to care, protocols for mobile phone notification of community-based lay responders have been shown effective as a bridge to formal prehospital care. In the many countries without any ambulances or certified prehospital providers, organised systems for training and dispatching trained lay providers have been shown to improve care.

TRAINING MATATU DRIVERS IN KENYA

ASIRT Kenya, a road safety advocacy group, equips *matatu* (public mini-bus) drivers and traffic police with the knowledge and skills to attend to road crash survivors until professional medical personnel arrive on the scene. Trainees become road safety ambassadors and advocates (*6*).

EMERGENCY FIRST AID RESPONDER (EFAR) SYSTEM: SOUTH AFRICA

The EFAR training system was developed in a township of South Africa. Targeted at community members, the training system formally equips local residents with the potentially life-saving first aid skills required to care for the injured until professional assistance is available. The EFAR system has proven effective in organising community members to act formally as first responders (*7*).

FIRST AID IN MONTE PLATA, DOMINICAN REPUBLIC

In a survey of motorcycle taxi drivers in the city of Monte Plata, Dominican Republic, two-thirds of taxi drivers reported having witnessed a traffic collision, and 41% of taxi drivers reported having transported crash survivors. Only 15.8% had ever attended a first aid course, and 84.5% expressed interest in attending one if available (*8*).

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Targeted at community members, the EFAR training system formally equips local residents with the potentially life-saving first aid skills required to care for the injured until professional assistance is available.

Safe and rapid transfer of the injured

Transfer of the injured, either from the scene of an injury to a facility, or between facilities, has two distinct components: transport, and care during transport. Well-equipped ambulances with trained staff are ideal: they best allow the delivery of uninterrupted, live-saving care before reaching hospital. A recent review identified eight studies on the impact of prehospital care from six low- and middle-income countries (Afghanistan, Brazil, Islamic Republic of Iran, Iraq, Mexico and Trinidad and Tobago), and combined analysis suggested that implementation of prehospital care can reduce risk of death in injured patients by 25% (*9*).

In countries without formal prehospital care systems, however, taxis and private vehicles are often used to transport the injured, and may be the only way to reach healthcare services (*10*). At present, in over 40% of the countries in the world, fewer than half of seriously injured people are transported to hospital by ambulance. In over a quarter of countries, 10% or less of the seriously injured are transported by ambulance (*1*). Providing basic training (on haemorrhage control and safe positioning, for example) for those who are commonly called on to transport the injured is a low-cost means of improving safety when ambulance transport is not available.

DISPATCHING RAPID EMERGENCY CARE FOR CRASH VICTIMS IN VIET NAM

A project in Hanoi dispatched emergency care providers by motorcycle to road traffic crashes. The average response time was **5.18** ± 4.5 minutes, compared to an average ambulance response time of **11.16** ± 6.2 minutes (*11*).

In urban centres where there is severe congestion, like Hanoi, dispatching EMS providers by motorcycle has been shown to reduce time to emergency care.

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Matching patients to appropriate facilities

Many seriously injured people are seen in and transferred through lower-level clinics and hospitals before arriving at a facility equipped to care for them. When this happens, care is delayed and critical time is lost, resulting in worse outcomes and avoidable deaths. Ensuring that an injured person is taken as soon as possible to a hospital with the right equipment and personnel to provide the needed care is crucial. A system of centre designation can set standards for injury care and designate certain hospitals as trauma centres. Clear protocols direct prehospital providers to take seriously injured persons directly to these higher-level facilities for treatment, while those with minor injuries may be treated at closer, lower-level facilities. Matching injury severity to facilities in this way allows for more effective use of limited resources, reduces delays in life-saving treatments, and has been shown to improve patient outcomes overall (*12, 13*). Even in countries without formal ambulance systems, public education programmes and simple advice lines can help direct the injured to appropriate facilities.

Hospital-based emergency care for the injured

Even short delays to critical interventions can mean lives lost. Effective emergency care at hospital requires a dedicated emergency area or unit, a core of non-rotating providers who are assigned to the unit and trained in the care of injuries, protocols and checklists to ensure a systematic approach to every injured patient, and essential equipment for diagnosis and treatment of injuries. Operative care is an essential part of emergency care for injuries, and any facility that is certified to care for the seriously injured should have 24-hour access to surgical, anaesthesia and critical care services.

The WHO Basic Emergency Care course and Trauma Care Checklist

The WHO Basic Emergency Care (BEC) Course is an open-access resource designed for frontline prehospital and facility-based providers working in limited resource settings, including nurses, medics, clinical officers and general doctors. The course introduces a systematic approach to management of acute and life-threatening conditions, and the package includes a participant workbook and facilitator guide, as well as a full set of presentation slides.

The WHO Trauma Care Checklist is a simple tool designed to improve the initial resuscitation and evaluation of injured patients, and a recent multi-country study of its implementation showed a range of improvements in the delivery of emergency care for the injured.

See http://www.who.int/emergencycare for more information.

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Course facilitators demonstrate infant resuscitation during the Tanzania pilot of the WHO BEC course.

Special considerations for injured children

While strengthening a country's emergency care system is the best way of improving outcomes for all road crash survivors, a range of medical, legal and developmental considerations must be taken into account when children are involved. Legal issues of guardianship may be raised and special arrangements may be required to ensure protection of legal rights and to meet the distinct psychological and developmental needs of children. Fortunately, due to their young age and extraordinary capacity for recovery, children benefit from timely and high-quality injury care more than any other group.

Key strategies for improving the care of injured children

- Providing caregiver and teacher education on safe immediate stabilization of injuries;
- Establishing advance plans for activating formal or informal paediatric transportation systems;
- Educating prehospital and facility-based providers about the distinct treatment needs of children;
- Equipping emergency vehicles and healthcare facilities with child-sized medical equipment and supplies;
- Making healthcare facilities as "child-friendly" as possible to minimize additional trauma for injured children;
- Improving access to counselling services both to mitigate the psychological impact of road traffic injury on children and their families and to address practical considerations, including legal and financial queries; and
- Improving paediatric-specific rehabilitation services, especially home-based rehabilitation, and including access to community-based rehabilitation centres.

Emergency care research and data collection to guide post-crash response

Data on injuries and injury events can be used to optimise post-crash services and inform large-scale injury prevention strategies. Trauma registries are case-based databases that include details on injury events and patterns, clinical interventions and health outcomes. Proven benefits of trauma registries in high-income countries include identification of risk factors for injury occurrence or for poor outcomes after injury, and identification of specific gaps in quality of care. Trauma registries are largely under-developed in low- and middle-income countries, hampering the development of context-relevant quality improvement and prevention initiatives. WHO has developed guidelines for community- and facility-based injury surveillance, as well as a standardised data set to facilitate clinical quality improvement and prevention activities (see http://www.who.int/violence_injury_prevention/surveillance/en/).

Certificate course: *Road Traffic Injury Control and Prevention in Low- and Middle-Income Countries*

The Johns Hopkins International Injury Research Unit, a WHO collaborating centre, offers a comprehensive certificate course on road traffic injury, including a module on setting up injury surveillance systems and trauma registries (http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-international-injury-research-unit/training/).

Children benefit from timely and high-quality injury care more than any other group.

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Specific techniques presented in the WHO *Guidelines for Trauma Quality Improvement Programmes* include 'morbidity and mortality' case reviews, panel reviews of preventable deaths, medical record audits and targeted monitoring for complications and errors. All of the above ideally lead to identification of quality gaps and subsequent implementation of *corrective strategies*. Examples of corrective strategies include the implementation of management guidelines and protocols, targeted provider education, and improvement of infrastructure and communication.

TRAUMA REGISTRIES TO IMPROVE CARE

In Khon Khaen, Thailand, a quality improvement programme was instituted and used a trauma registry to identify correctable problems, including insufficient resuscitation of patients in shock and prolonged time to reach emergency surgery. The hospital administration set up a trauma review committee and gave it the power to make changes. Corrective action included increasing senior staffing levels in the emergency department at peak times, and a radio system in the hospital to alert specialists when they were needed. Preventable deaths and overall trauma mortality decreased.
For more information, see http://who.int/emergencycare/trauma/success-stories/en/

REHABILITATION AND RE-INTEGRATION

Long after a crash, survivors and their families can suffer persistent physical and psychological conditions that, when not appropriately treated, restrict their ability to function normally in their work and personal lives. Adjusting to long-term physical impairment and associated disability or disfigurement can also put individuals at increased risk of developing psychological disability. Rehabilitation can help to alleviate suffering, prevent further risk of harm, and optimise functioning, allowing for restoration of independence and reintegration into society.

Rehabilitation involves professionals from a wide range of medical and paramedical disciplines working together to help achieve treatment goals. Where no services are available, family members may provide basic rehabilitation care, see http://www.who.int/disabilities/care/en/ for more information.

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SARAH NETWORK OF REHABILITATION HOSPITALS, BRAZIL

Run by the *Associação das Pioneiras Sociasis*, an independent institution created under Brazilian Federal Law, rehabilitation within the SARAH programme is not restricted to the hospital environment. Placing the focus on patient strengths, specialists work with patients and their families to customise individual rehabilitation programs with facility and home-based components. For more information, see http://www.sarah.br/en-us/a-rede-SARAH/

AUSTRALIA-INDIA TRAUMA SYSTEM COLLABORATION (AITSC)

As part of AITSC, a rehabilitation prescription was developed for parts of India and Australia to improve post-hospital care. An in-hospital assessment identifies the rehabilitation goals of each patient according to their functional, occupational, and family goals. The rehabilitation prescription defines the appropriate ongoing resources for each patient, and the role of family members and other caregivers, to ensure shared objectives and allow patients to achieve their optimum functional potential. For more information, see http://aitsc.org/.

Facing long-term impairment and associated disability

The spectrum of physical and psychological disability affecting crash survivors is broad. While some may achieve excellent recovery and return to their original level of functioning rapidly, many survivors may require extended support to re-integrate into work and home life. Supportive services range from home modification, organisation of caregivers and access to assistive products or medical supplies, to vehicle adaptation, employment counselling and emotional support. Unfortunately, despite an increasing need for multidisciplinary rehabilitation services, these services are non-existent or extremely limited in many parts of the world (*14*).

PSYCHOLOGICAL SUPPORT

Road traffic crashes, along with any resulting injury or death, have a profound psychological impact on survivors. A large proportion of crash survivors experience acute and long-term psychological conditions (*15*), with the most common conditions being post-traumatic stress disorder (PTSD), major depressive disorder and anxiety disorders (*16*). Prevalence of PTSD following road traffic crashes ranges from 6% to 45% (*17*) and it remains one of the most common consequences of road traffic incidents (*4*). Additional responses include grief, panic and bereavement. Mental health support can mitigate many of these conditions and help prevent psychological distress from becoming a disability that interferes with re-integration into work and social life.

Personnel responding to a crash can assist in a number of ways. Not only do they provide a sense of order and security at the scene, they can also be trained to identify individuals at greatest risk for acute psychological stress and offer emotional support up to and through treatment at a facility. Beyond the immediate aftermath, the extended post-crash response should include counselling and organised support groups to help affected persons navigate a path to recovery and prevent psychological disability.

EFFECTS OF DEPRESSION ON ROAD TRAFFIC INJURIES SURVIVORS

Australian patients who were injured due to a road traffic crash were followed for up to one year after injury. In this group, survivors with symptoms of depression were 3.5 times less likely to return to work (*18*).

STOP *Accidentes*

This nongovernmental organization has designed an intervention package called "Road Violence Victims Care" to provide psychological support for survivors. Actions include:

- Creation of a supporter network of social workers and psychologists;
- Dedicated training for hospital workers in psychological support; and
- An established support protocol that includes designation of a quiet physical environment in hospitals to receive families and a written guide for survivors on psychological, social and legal matters.

See http://stopaccidentes.org/ for more information.

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LEGAL SUPPORT AND LEGISLATION

Effective post-crash response includes policy and legislation to protect the injured, their families, and bystanders who deliver first aid; to facilitate legal and financial accountability and ensure compensation; and to promote post-injury recovery and reintegration into work and home life. These may include laws that enable access to timely care; laws that ensure adequate crash investigation; laws that mandate adequate liability insurance for drivers; legal protections to facilitate civil and criminal justice processes, including reparations, and legal protections for those with disability resulting from injury (Table 1).

TABLE 1. SUMMARY OF LEGISLATIVE ACTIONS

Enabling care	• Emergency care access legislation. • Legal requirements for drivers and vehicles. • Legal requirements for third-party liability insurance. • Mandates regarding licensing requirements and scope of practice for care providers. • Mandates regarding ambulance, facility, and rehabilitation accreditation and servicing standards.
Crash investigation	• Requirements for crash investigation procedures. • Police evidence reports. • Data reporting/data sharing requirements to ensure accurate reporting of injuries and outcomes, and for monitoring and feedback on services quality. • Records maintenance and confidentiality requirements.
Legal process	• Legal support for affected. • Legal Process (Inquest, criminal charges, prosecution and sentencing, etc.) • Survivors' rights and compensation.

Source: adapted from http://www.who.int/violence_injury_prevention/road_traffic/countrywork/legislation_manual/en/

THE PARLIAMENTARY ADVISORY COUNCIL FOR TRANSPORT SAFETY (PACTS)

PACTS advises members of the UK Parliament on road safety issues in order to facilitate legislative action. For example, in 2015 PACTS compiled district based casualty reports for local members of parliament, via the interactive 'Parliamentary Constituency Road Safety Dashboard', giving them the essential support for policy action on road safety issues. See http://www.pacts.org.uk/ for more information.

Specific legislation to enable emergency care includes laws that ensure access to care without regard to ability to pay; laws that protect those who offer help (Good Samaritan Laws); first aid training mandates for drivers; mandated standards for prehospital and facility-based care; and laws designating financing or health insurance mechanisms for emergency care, including requirements for third-party liability insurance for drivers. Legislation may also mandate accreditation processes that govern licensing and scope of practice for providers, and ensure that designated trauma centres meet certain standards.

Thorough crash investigation is essential both to inform prevention initiatives, including those addressing vehicle and road infrastructure, and to guide processes for compensation and civil and criminal accountability where relevant. Data from crash investigations may be linked with data from community and facility-based research efforts to better inform prevention and care improvement initiatives.

The "Brussels Declaration"

In May 2009, a unified body of 70 nongovernmental organizations recommended that governments:

- Conduct thorough crash investigations in order to identify all causes and employ all available measures to prevent recurrence;
- Apply an effective, proportionate and deterrent legal response to road law violations with procedures and verdicts delivering justice for those affected;
- Conduct national situational reviews to monitor road collision investigation capability, number of criminal prosecutions in cases of road death and injury, and standard of services for those affected by road traffic injury.

Source: http://www.who.int/roadsafety/ministerial_conference/ngo_declaration.pdf?ua=1

Justice and the Post-Crash Response

The European Federation of Road Traffic Victims (FEVR) and RoadPeace have published *Justice and the Post-Crash Response in the UN Decade of Action for Road Safety* to raise awareness of issues of justice for those affected by road traffic crashes. This comprehensive briefing providing a review of the following areas:

- Collision investigation
- Criminal prosecution
- Civil compensation
- Victims' rights

RoadPeace has also initiated a campaign to improve the quality of crash investigation, which includes calls for:

- National standards and regular reviews of investigations
- Nationally accredited training programmes
- Better resourcing of police
- Transparency with regard to investigation outcomes, budgets and procedures
- Better procedures to keep victims informed and incorporate lessons from their experiences

See http://www.roadpeace.org/resources/ for more information.

CONCLUSION

Survivors and families affected by road traffic crashes have a range of physical, psychological and legal needs. An effective post-crash response integrates injury care, mental health services, legal support, and legislation with systematic collection of data on crashes and injuries. The goal of Pillar 5 is to reduce the impact of road traffic crashes, to ensure appropriate legal process, and to facilitate recovery of those affected.

For further information

The United Nations Road Safety Collaboration is chaired by the World Health Organization and was established as a follow up to UN General Assembly Resolution 58/289 to bring together international organizations, governments, non governmental organizations, foundations and private sector entities to accelerate coordinated action to address the global road safety crisis.
See http://www.who.int/roadsafety/

The World Health Organization offers a range of initiatives to support assessment, training and planning relevant to the post-crash response. See http://www.who.int/emergencycare for more information.

The Global Alliance of NGOs for Road Safety representing over 140 member NGOs active in more than 90 countries works to facilitate sharing of best practices and collective advocacy for road safety and the rights of survivors. See http://roadsafetyngos.org/ for more information.

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Or visit the following websites:

http://www.who.int/roadsafety/decade_of_action/en/index.html

http://www.who.int/emergencycare