Strengthening care for the injured:

Success stories and lessons learned from around the world

World Health Organization

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Preface

Injury accounts for a significant proportion of the world's burden of disease. Each year 5.8 million people die from injury and millions more are disabled. The response to this global health problem needs to include a range of activities, from better surveillance to more in-depth research, and primary prevention. Also needed are efforts to strengthen care of the injured. The World Health Organization (WHO) has responded to this need with a variety of actions. It has supported countries in setting up trauma care programmes and in developing their capacity to care for the injured. It has also developed, in consultation with global experts, guidelines to assist with the organization and planning of trauma care, such as *Prehospital trauma care systems, Guidelines for essential trauma care,* and *Guidelines for trauma quality improvement programmes.* These publications have been used in many countries and have helped to stimulate 'on the ground' improvements and policy changes.

Efforts to improve care of the injured globally received a major boost in 2007 when the World Health Assembly (WHA) adopted resolution WHA60.22 on trauma and emergency care services. This called upon governments and WHO to increase their efforts to improve care for victims of injury and other medical emergencies. It also called upon WHO to raise awareness about affordable ways in which trauma and emergency care services can be strengthened, especially through universally applicable means such as improvements in organization and planning. Similarly, resolution WHA58.23 on disability, including prevention, management, and rehabilitation, requested WHO to provide support to countries in developing rehabilitation services for people with disabilities.

In response to these requests WHO collected this set of case studies, documenting success stories and lessons learned from several countries. Through this publication, WHO seeks to increase communication and the exchange of ideas among those working in the field of trauma care, whether in the prehospital setting, in acute care in hospitals, or in longer term rehabilitation; to increase communication among those involved in planning, administering, advocating for, or directly providing trauma care services; and to increase communication among those working in the field of trauma care in different countries worldwide.

This publication contains only some of the innovative and significant work being done by many individuals, institutions, and governments globally. We have provided a range of case studies, including those from prehospital, hospital-based, rehabilitation, and system-wide settings, and from countries in all regions of the world and at all socioeconomic levels. These case studies have common themes and lessons learned. One of the most important of these is the need for perseverance, as many of the improvements took years to implement. Another lesson is the need for attention to detail. There was no magic bullet involved. Improvements occurred primarily by attention to detail in planning and organization. There are also important lessons learned about the role of health policy in extending trauma care improvements nationwide, beyond centres of excellence, and about the importance of using advocacy to increase political commitment, whether at the national, provincial or institutional level. Finally, the case studies show that improvements can be made even in the poorest and most difficult of circumstances, and that even well-resourced environments can benefit from improved organization and monitoring of trauma care services.

On behalf of the many people who have contributed to this publication, I call upon all of those working in the field of trauma care, and all who would like to see improvements in care of the injured, to make use of the lessons learned from the noteworthy examples in this publication.

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Executive summary

The response to the global problem of injury needs to include strengthening care of the injured (i.e. trauma care). There are many excellent examples of improvements in care of the injured in different countries worldwide, and at all economic levels. Those who care for the injured, or who plan, administer, or advocate for trauma care services, can learn much from each others' efforts.

The goal of this publication is to share some of the valuable lessons learned by those working on different but overlapping aspects of trauma care worldwide. It focuses on practical, affordable and sustainable efforts, identifying useful methods and strategies that could be adapted for use in other places. This publication also seeks to dispel the view that little can be done to improve trauma care, especially in low- and middle-income countries.

Each case study follows a similar structure – a statement of the problem, a description of interventions made and the results of these interventions. Practical aspects are emphasized, so that people working in other similar environments can adapt the methods. We examine the results by looking at one or more of the following: **structure, process, outcome.**

Outcomes data on decreased mortality or other tangible patient benefits, such as decreased morbidity, improved functional outcome or decreased costs are presented where available. Where not available, important lessons can still be learned from the results of improvements in the **process** or **structure** of care. These include measures such as decreased time to emergency procedures or increased appropriate use of particular life-saving procedures **(process)**. They also include more ready availability of the human and physical resources needed to provide quality care, or improved administrative ability to monitor and supervise such care **(structure)**.

Included are case studies from across the spectrum of prehospital care, acute hospital care, longer term rehabilitation both in the health-care setting and the community, and system-wide improvements.

1. Prehospital care

In post-conflict, landmine-ridden rural areas of Cambodia and Iraq, there were no formal emergency medical services (EMS). An innovative programme created a two-tier network of village 'first responders' (villagers who had completed a 2-day basic first aid course) and paramedics (trained on a 450-hour course). Mortality among injured people declined dramatically, from 40% to 9%. This programme supplied training and basic equipment, but no ambulances or other vehicles. Over time, the system grew and adapted to a changing epidemiological pattern, caring for increasing numbers of road traffic crash victims and other medical emergencies.

In Ghana, a large number of injured people die in the field (i.e. in the prehospital setting), without any possibility of accessing medical care. In response, the government created the National Ambulance Service. This was created with a well-organized structure of administration, clearly defined standards for staff training and for equipment carried in ambulances, well-defined operating procedures, accurate recording of data of cases handled, and use of that data for management and quality improvement. Since its inception, use of the service has grown steadily and key performance indicators, such as response time and scene (case handling) time, have consistently improved.

In an already established, basic prehospital EMS in Mexico, several affordable and sustainable improvements in infrastructure and training were made. These included wider distribution of satellite ambulance stations and use of in-service training courses for paramedics. This resulted in decreased prehospital times, increased use of appropriate manoeuvres for spinal immobilization and airway maintenance, and decreased mortality.

In both Colombia and Romania, nationwide legislation on EMS was enacted. This established more uniform and nationwide standards for training levels for prehospital EMS staff, for equipment in ambulances, and for operating procedures for ambulance systems. Mechanisms were put in place to allow government to enforce these standards. Development of the legislation involved close collaboration between government and EMS professionals.

2. Hospital-based care

In Thailand, a quality improvement programme was instituted at one of the main hospitals. The hospital administration set up a trauma audit committee and gave it the power to make changes. It used a trauma registry to identify correctable problems, including insufficient resuscitation of patients in shock and prolonged time to reach emergency head surgery. Corrective action included increasing senior staffing levels in the emergency department at peak times, and a radio system in the hospital to better alert neurosurgeons and other specialists when they were needed. Preventable deaths and overall trauma mortality decreased.

At the main hospital in Qatar, care of the injured was better organized by creating a formal trauma service. This consisted of trauma teams with designated leaders and multidisciplinary members (including doctors of several specialities, nurses, pharmacists and social workers), who worked together to provide comprehensive care to the injured. There was also better monitoring of care with a well-developed quality improvement programme. These improvements resulted in better quality of care, such as decreased times to emergency surgery, and improved resource utilization, such as decreased length of stay.

In Viet Nam, an assessment was made of trauma care capabilities in the network of clinics and hospitals in the capital, Hanoi, and surrounding rural areas. This demonstrated several opportunities for improvement, many in low-cost resources. Training programmes were instituted, as was greater attention to detail in the stocking and procuring of equipment and supplies for trauma care. There had been considerable improvement in trauma care capabilities when the assessment was completed the following year, despite no extra budget being allocated to trauma care.

3. Rehabilitation

In Brazil, rehabilitation services were unable to keep up with the growing number of people severely disabled by road traffic crashes and other types of injury. An innovative rehabilitation team was created at a busy acute care hospital. This provided consultation for patients with severe injuries soon after admission, and a rapid start on rehabilitation work (including training family members). No longer were there delays in rehabilitation while waiting for a place in a separate rehabilitation facility. Complications such as pressure sores, urinary tract infections and joint deformities declined dramatically.

The earthquake in Gujarat, India, left a large number of people with paraplegia, for whom existing