

Acute Care in Mass Casualty Incident

World Congress of Pediatric Critical Care
Session: Transport of the Critically Ill
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Mass Casualty Incident (MCI)

- An incident that produces a large number of injured victims more than available resources can manage using routine procedures
 - Thus linked to
 - System capacity
 - Operational procedures

- Goal – Optimize care for the maximum number of salvageable patients
- Basic principle
 - Immediate care
 - Delayed Care
 - Unsalvageable

Triage

MCI – Goals (Field)

■ Find & START

- Simple Triage and Rapid Treatment
 - Trained rescue team

■ Minimize further injury

- External factors
 - Smoke, fire, hypothermia (Evacuate)
- Internal factors
 - Hypoxia, hypotension, hypovolemia (Oxygen, IV fluids etc)

■ Transport safely

- Technical expertise
 - Trained rescue teams, adequate ambulances, equipment etc

Whilst maintaining your safety

The Time - Matters

- **Alerting Mechanism**
 - **24 hour Call centre**
- **Preparedness**
 - **24 hours**
- **Fast access**
 - **Road, Air**
- **Transport**
 - **Capable hospital**



PARAMEDICS

THE COMPREHENSIVE APPROACH

“PPRR”



Courtesy – Ken Kurtz Australian Paramedics

PPRR

■ PREVENTION (OR MITIGATION)

- Reduce the severity of hazard impact

■ PREPAREDNESS

- Staff, Equipment, Community



■ RESPONSE

- Providing and effective response immediately



■ RECOVERY

- Providing for recovery of the community affected

Pre-Hospital Care (In terms of ambulance practice)

Patient Assessment

- Primary Survey
 - DRABCODE
- Secondary Survey
 - Vital Signs

DRABCDE

DANGER (you, public, patient)



RESPONSE (patient alert/no)



AIRWAY (protect C-spine)



BREATHING (look, listen, feel)



CIRCULATION (Control H'ge)



DISABILITY (neurological)



EXPOSE (log roll see back)



Secondary Survey

Secondary Survey

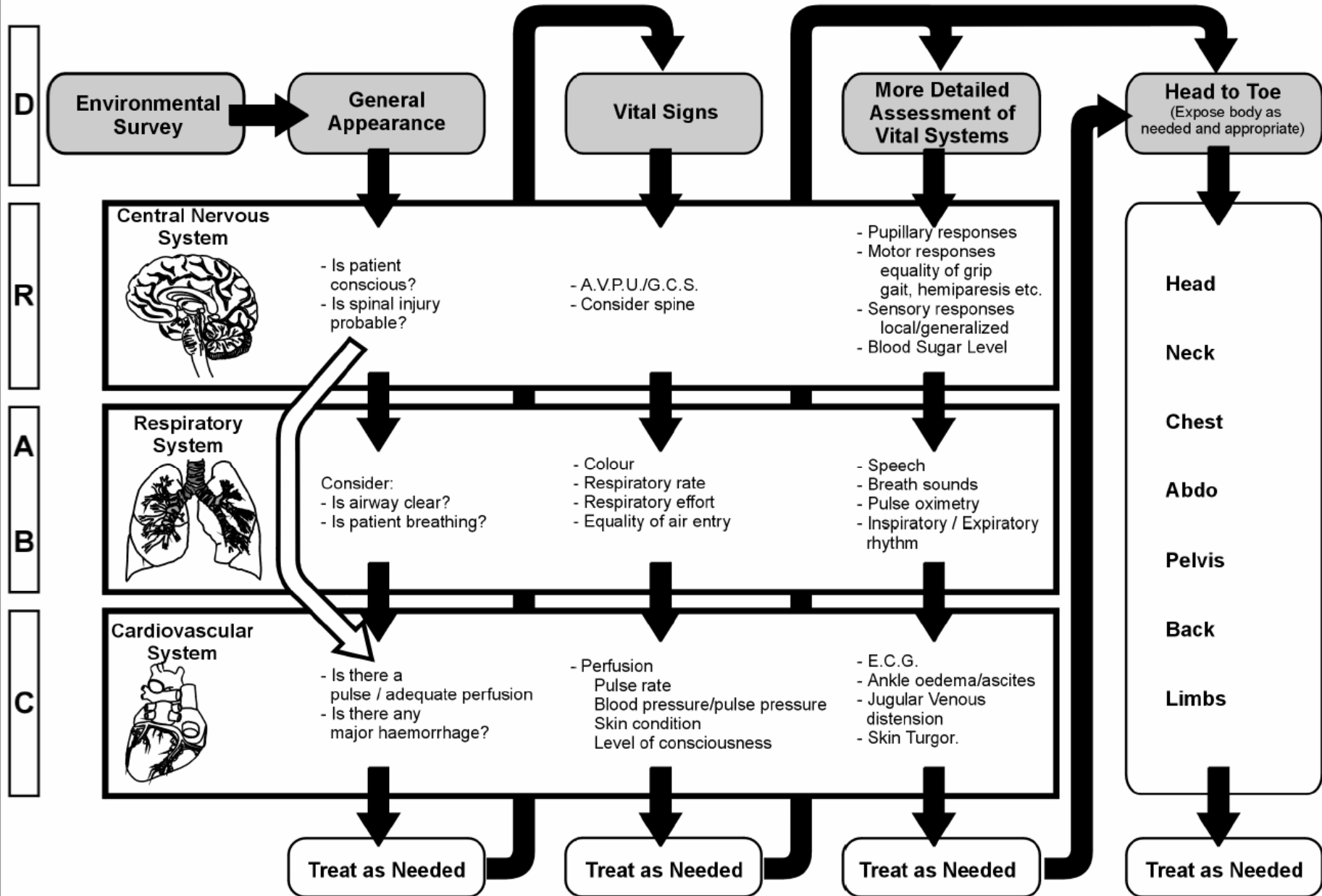
- History Taking
- Vital Signs survey
- Physical Examination

Vital signs

Survey & recording

- Blood Pressure
- Capillary Refill
- Respirations
- Conscious state
- Pupil size and response
- Pulse Oximetry

Systematic Patient Assessment



This system is not rigid and must be adapted to specific circumstances. Transport is a component of treatment and should be prioritised appropriately. History should be gathered concurrently with patient assessment.

Triage Categories

Field

■ Red: Immediate/ emergency

- Tension pneumothorax, hemorrhage, femur fracture, asthma, rib fractures, airway obstruction

■ Yellow: Urgent

- Humerus fracture, scalp laceration, shoulder dislocation

■ Green: Non urgent

- Walking wounded, small laceration, ankle sprain, orphaned child

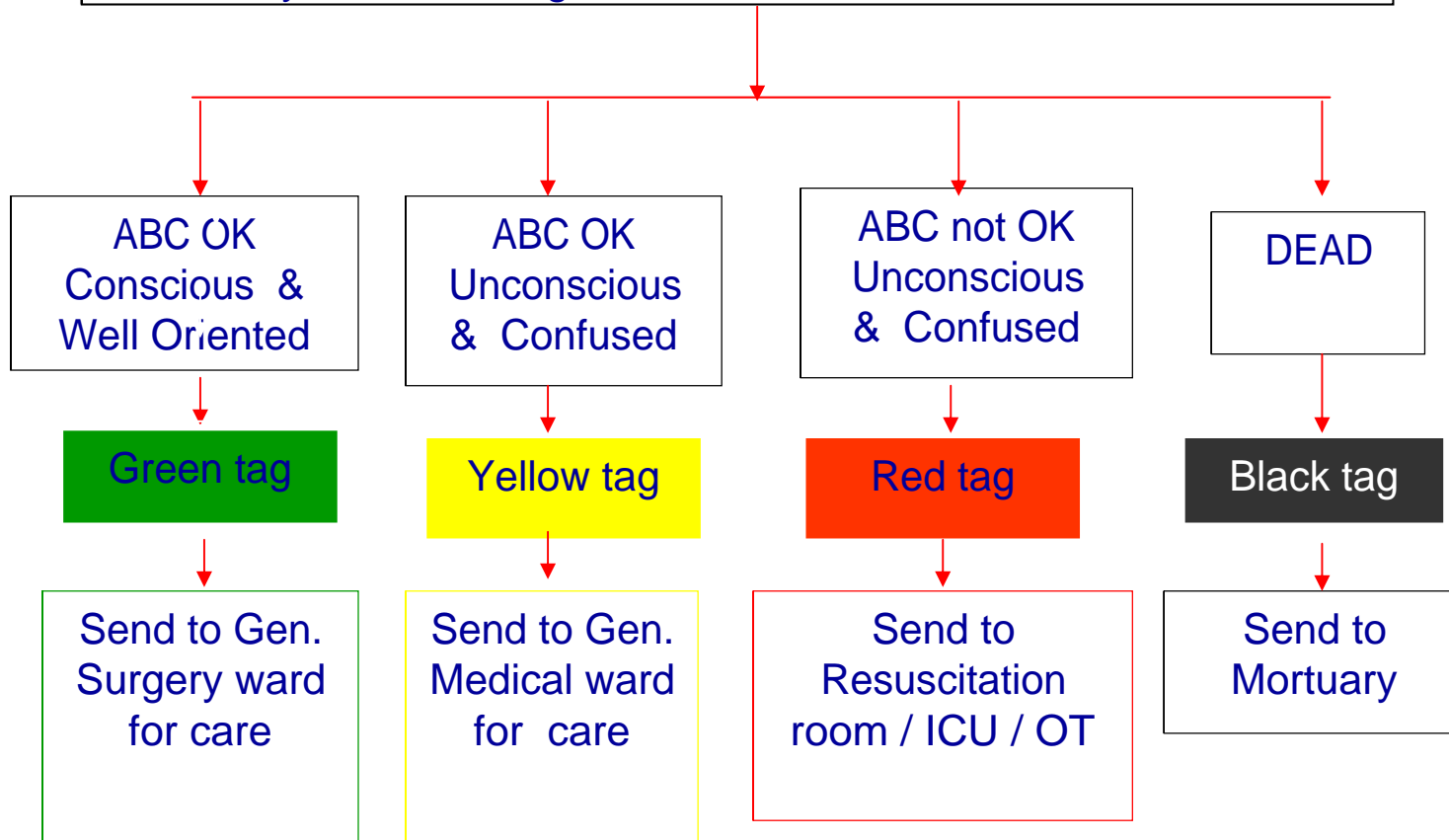
■ Black: dead expected to die

- Cardiopulmonary arrest, open head injury

Medical Responsibilities

MASTER DISASTER CONTINGENCY PLAN FOR HOSPITALS (for display in hospital emergency care areas)

Arrange
Triage team to assess
A - airway, B - breathing, C – circulation & Level of consciousness



EMERGENCY MEDICINE

TRIAGE

Emergency Units (UK)

Hospital

- Immediate resuscitation (Red)
 - see doctor immediately
- Very urgent (orange)
 - see doctor within 5-10 minutes
- Urgent (Yellow)
 - see doctor within 1 hour
- Standard (green)
 - see doctor within 2 hours
- Non urgent (Blue)
 - See doctor within 4 hours

Children

- **Difficult to triage – few objective signs**
 - Should be prioritized – controversial
- **Israel – blue tag**

When children are involved

Challenges to Emergency Departments

■ Having

- adequate number of pediatric supplies
- pediatric decontamination equipment and protocols
- an effective response plan to manage a large number of children
- staff skilled in assessing young non-verbal children

■ Creating

- a system for identifying, tracking and reuniting children with their families

■ Identification

- of alternative sites to deal with children

■ Allocating

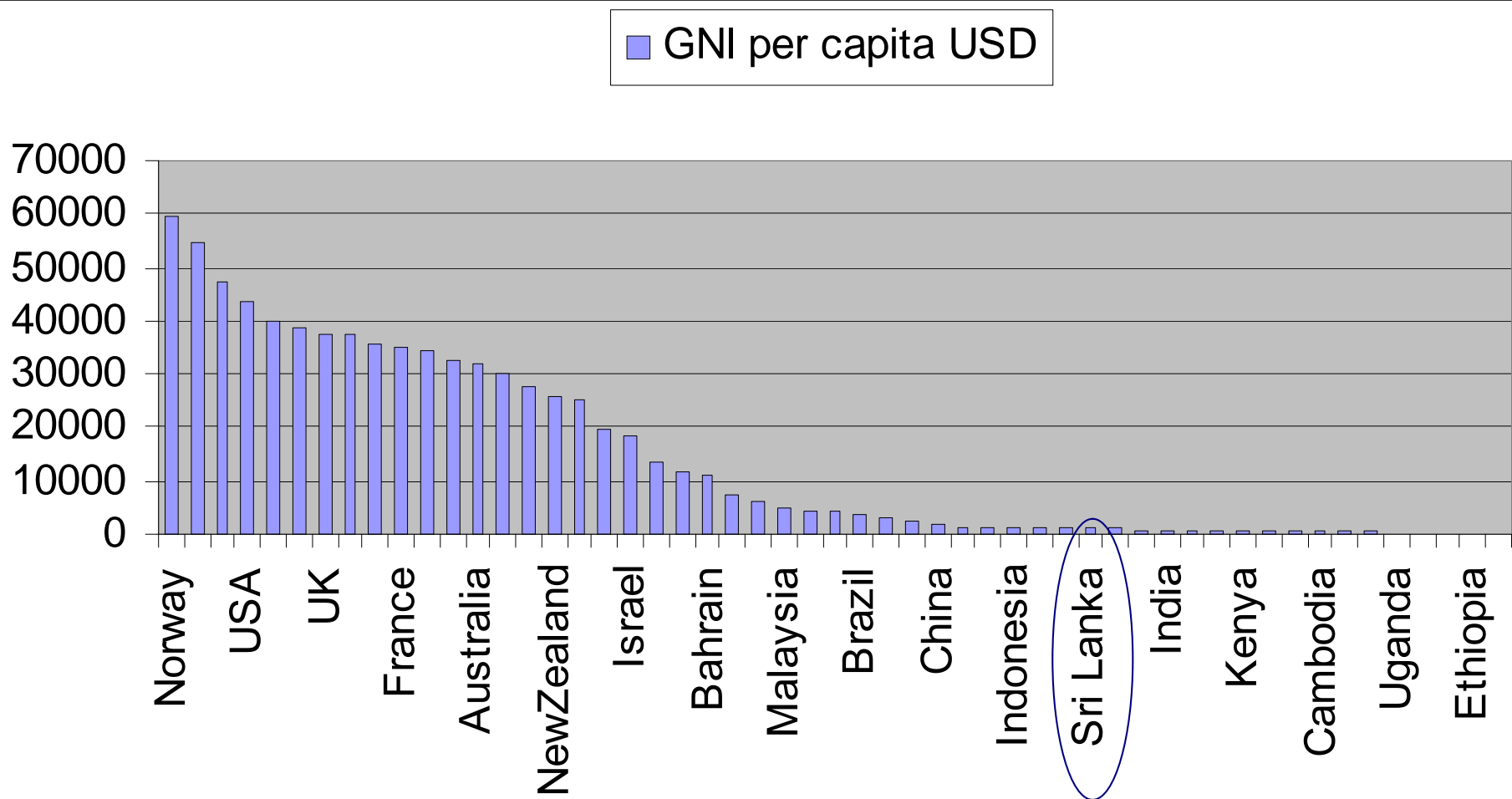
- resources to treat a second wave of patients

Psychological issues

Children

- Shelter and Security
- Children interpret disaster as a personal danger to themselves and those they care about
 - Result in severe anxiety
 - Pediatric mental health expertise needed to deal with fear, anxiety, post traumatic stress and depression

A uniform model to fit us all ??



Low-income countries

NO way to ADOPT
but
only
ADAPT

The Time - Matters

- **Alerting Mechanism**
 - **Call centre**
- **Preparedness**
 - **24 hours**
- **Fast access**
 - **Road, Air**
- **Transport**
 - **Capable hospital**

Cheap patient transport

The 'Tuk-Tuk'



Over 200,000 in the country
Accessed anywhere – within 5 minutes
Health Care facility – 2.2 miles
Free access to hospital

Bucking the time delay



Tsunami – 26th Dec 2004

Worst ever tragedy in Sri Lanka History



The most powerful earthquake in 40 years erupted under the Indian Ocean near Sumatra on Dec. 26, 2004. It caused giant, deadly waves to crash ashore in nearly a dozen countries, killing tens of thousands. A long stretch of Sri Lanka's coast was devastated by these killer waves, with more than 40,000 dead and staggering 2.5 million people displaced. Although 1,600km from the epicentre, the waves struck with huge force and swept inland as far as 5 kilometers. Waves as high as six meters had crashed into coastal villages, sweeping away people, cars and even a train with 1700 passengers. It was the worst human disaster in Sri Lanka history.

► See first 300 minutes of Tsunami in Animation

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Lanka launches US\$3.5 billion recovery drive

"Let the tsunami tragedy be the start of a new beginning to rebuild our nation,"



Health Emergency and Disaster Management Training: Post Tsunami initiative



Courtesy – South Australian Paramedics

Pre-hospital care A change to save lives



2004



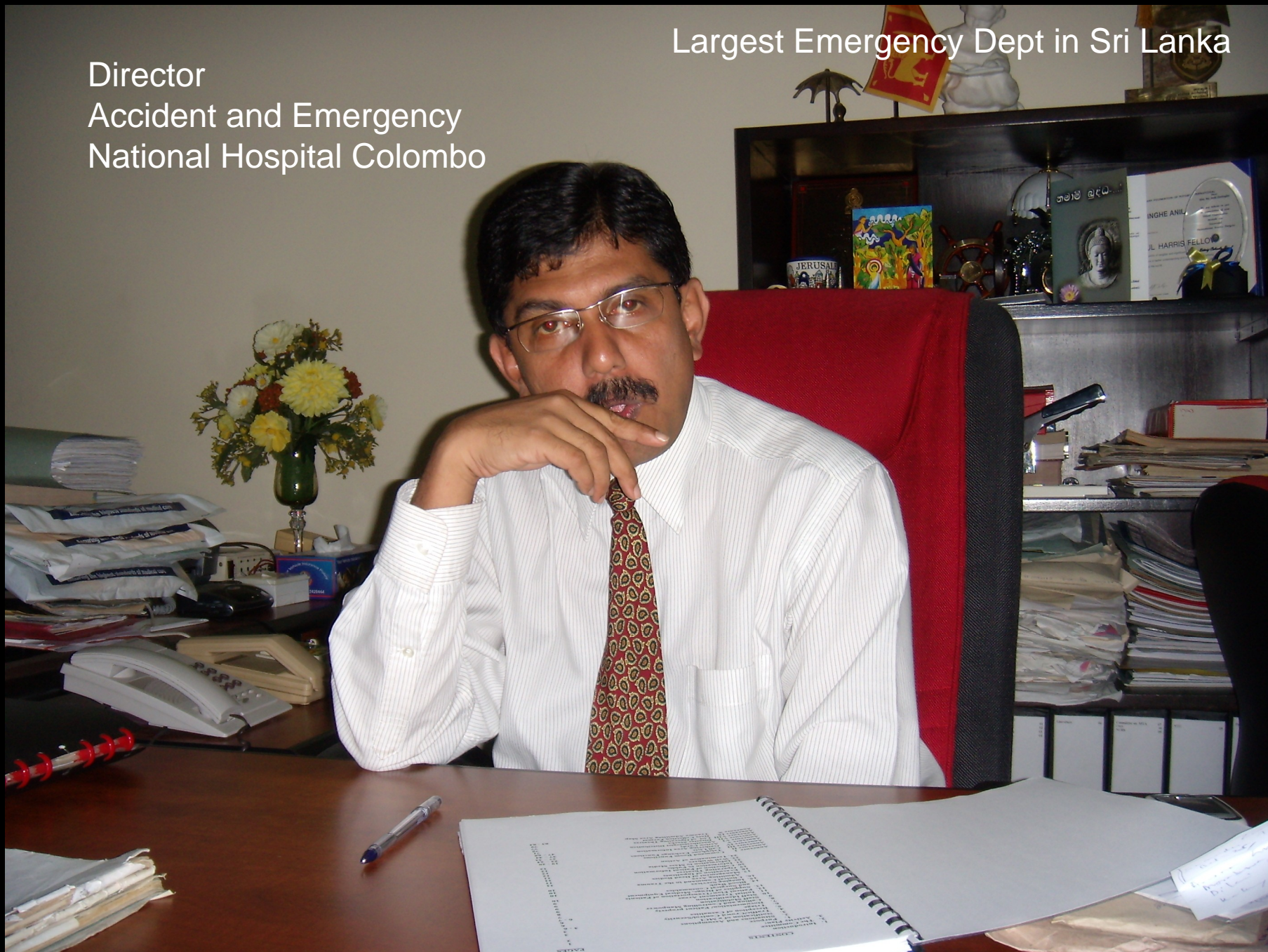
At least in the capital cities

2006



Director
Accident and Emergency
National Hospital Colombo

Largest Emergency Dept in Sri Lanka



Resuscitation area: NHSL A&E





Emergency Trolleys

1. Triage! (START)
2. One-way?
3. Chest/ Head CT only

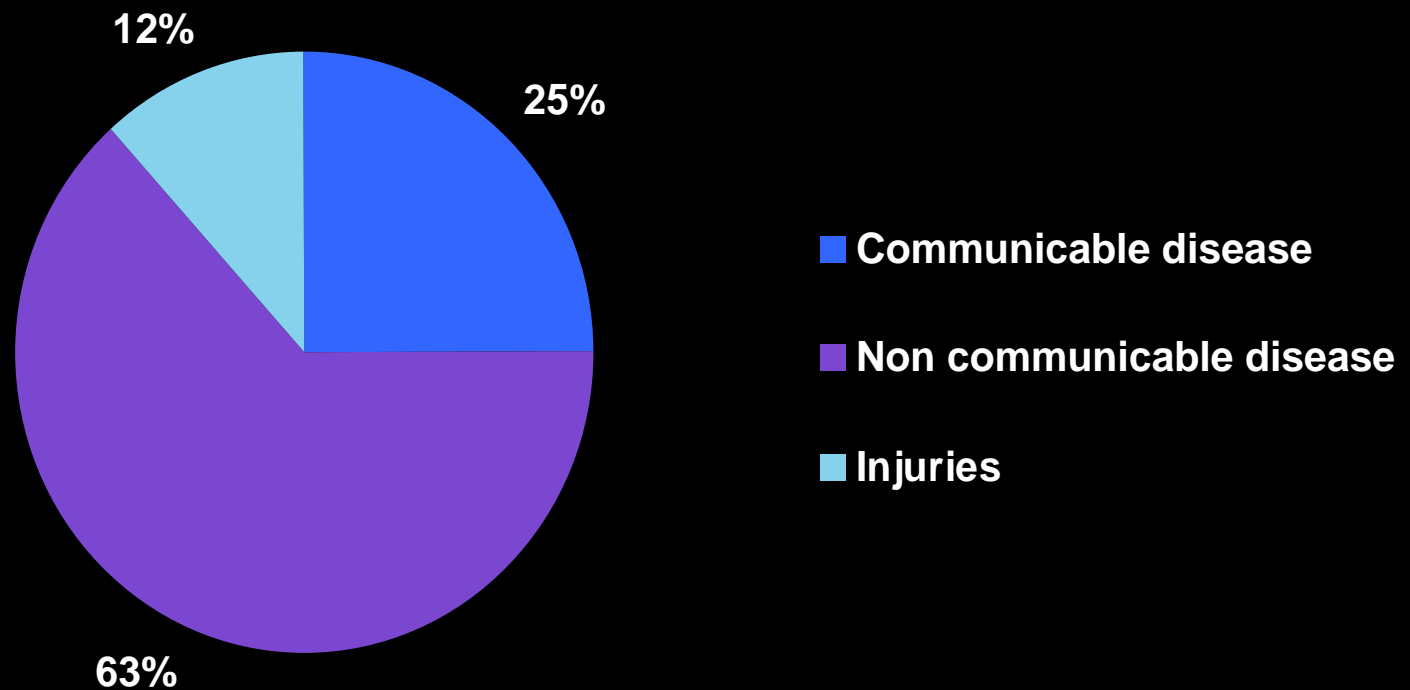


Emergency Kits

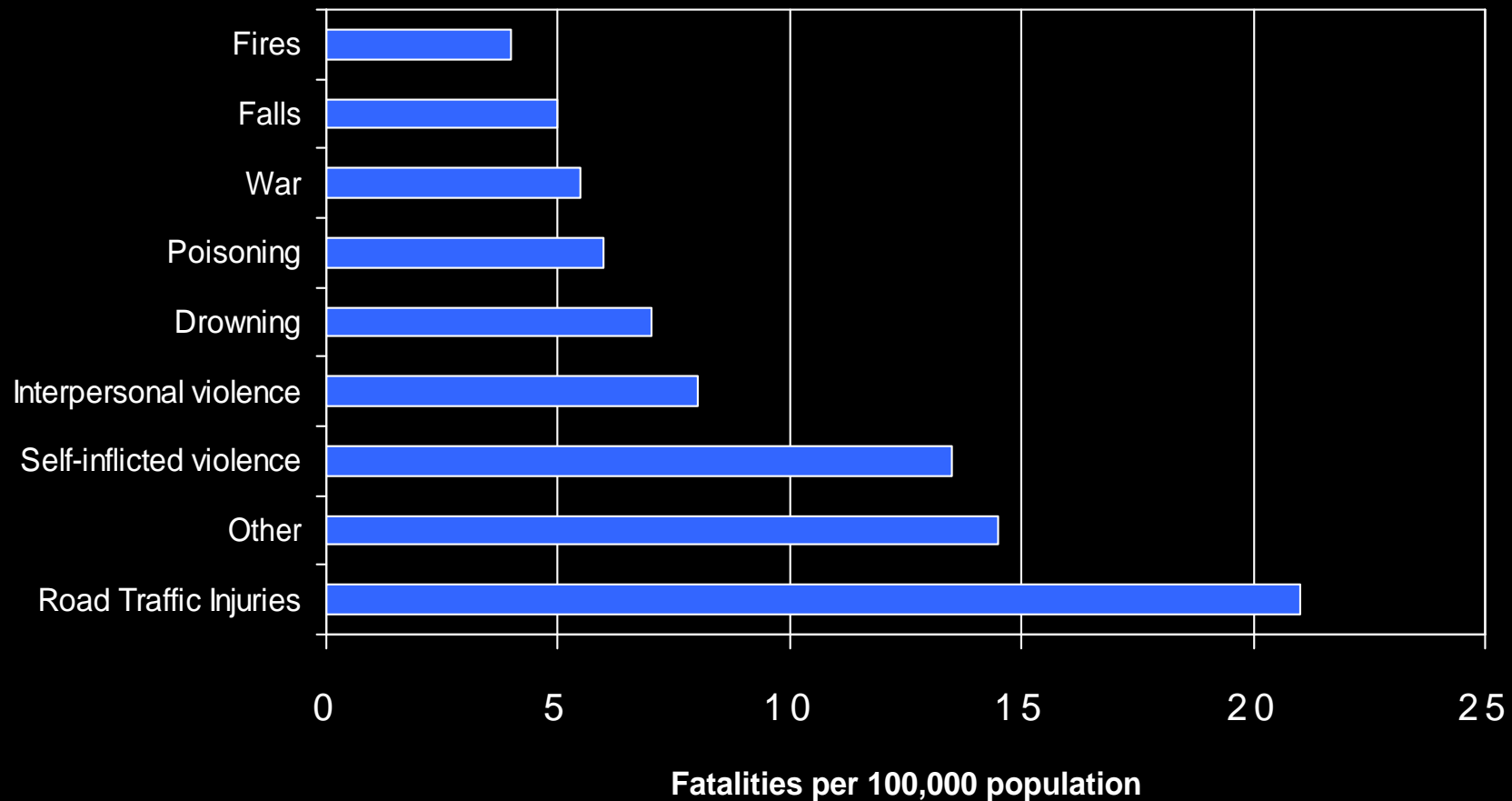
Low - income countries
Trauma Care

Treatment or Prevention?

Global Mortality



Global Injury Mortality Rates by Cause Year 2000



Worldwide, road traffic injuries are responsible
for the highest injury mortality rates

(WHO)

Road Fatalities

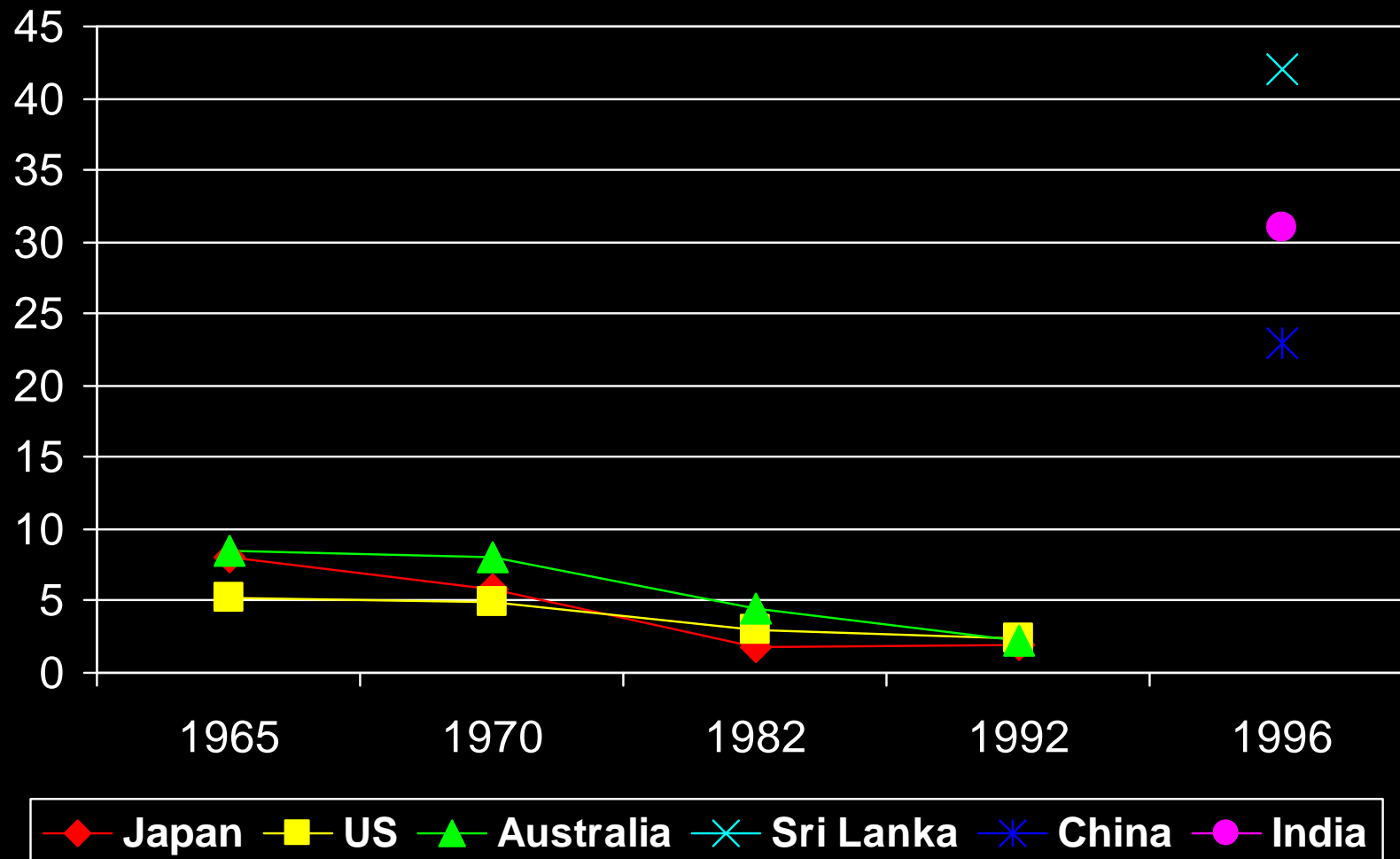
Developing Countries

- 87% of the world's road fatalities occur in the developing countries

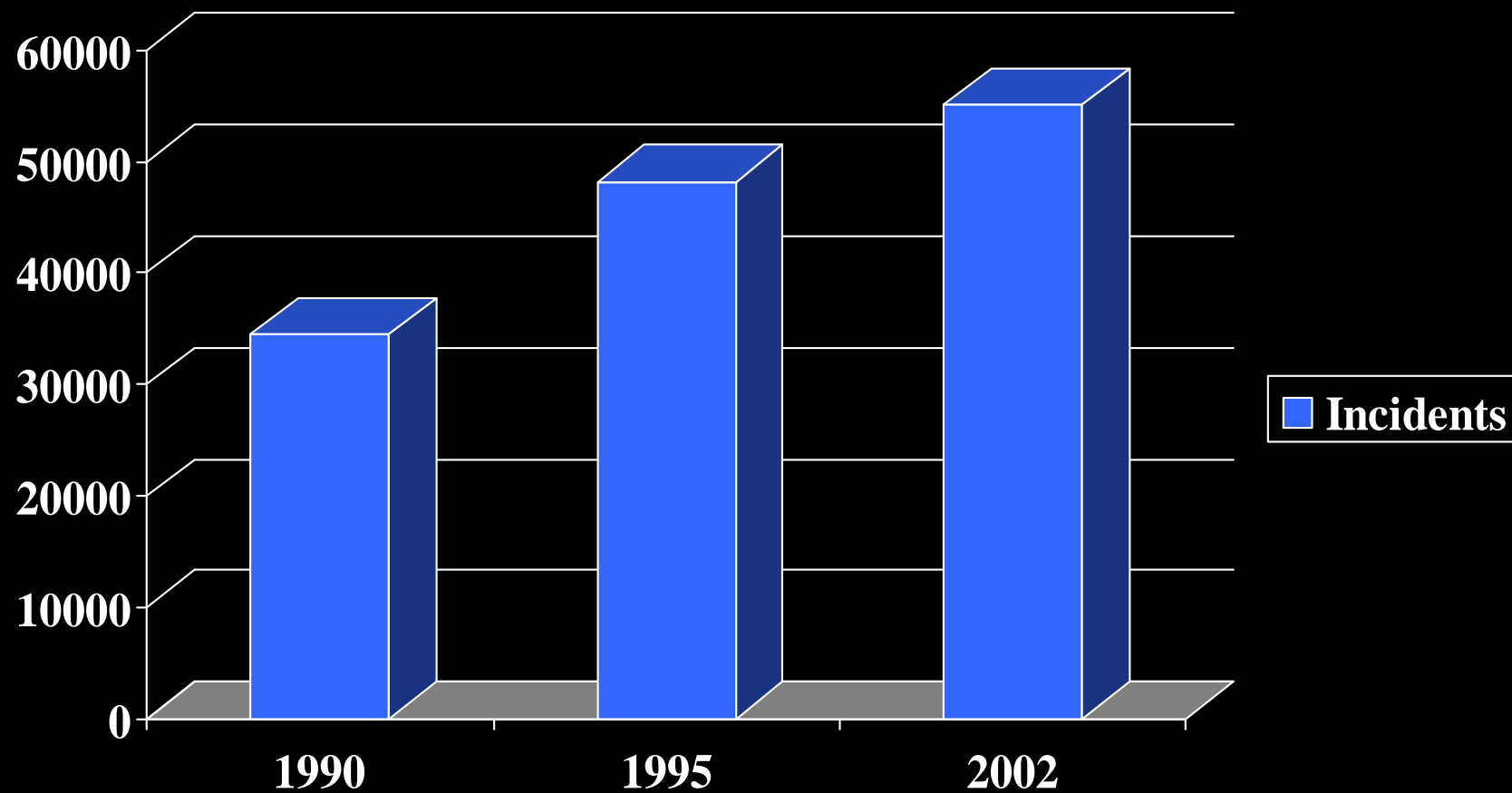
Asia and Pacific Region

- 44% of the world's road deaths occur in this region
- Yet only 16% of the world's motor vehicles are found in this region

Annual fatalities per 10,000 registered motor vehicles



Road Traffic Accidents in Sri Lanka



Prevention-focus

1. Driver discipline
2. Pedestrian discipline
3. Vehicle condition
4. Road conditions
5. Disproportionate speed

Pedestrian indiscipline



A typical Bus Stop!

(Only in Sri Lanka)





Photograph :Courtesy Jayalath Edirisinghe, E-Fac, Peradeniya

School children: Travel safety?



Photograph : Jayalath Edirisinghe, E-Fac, Peradeniya

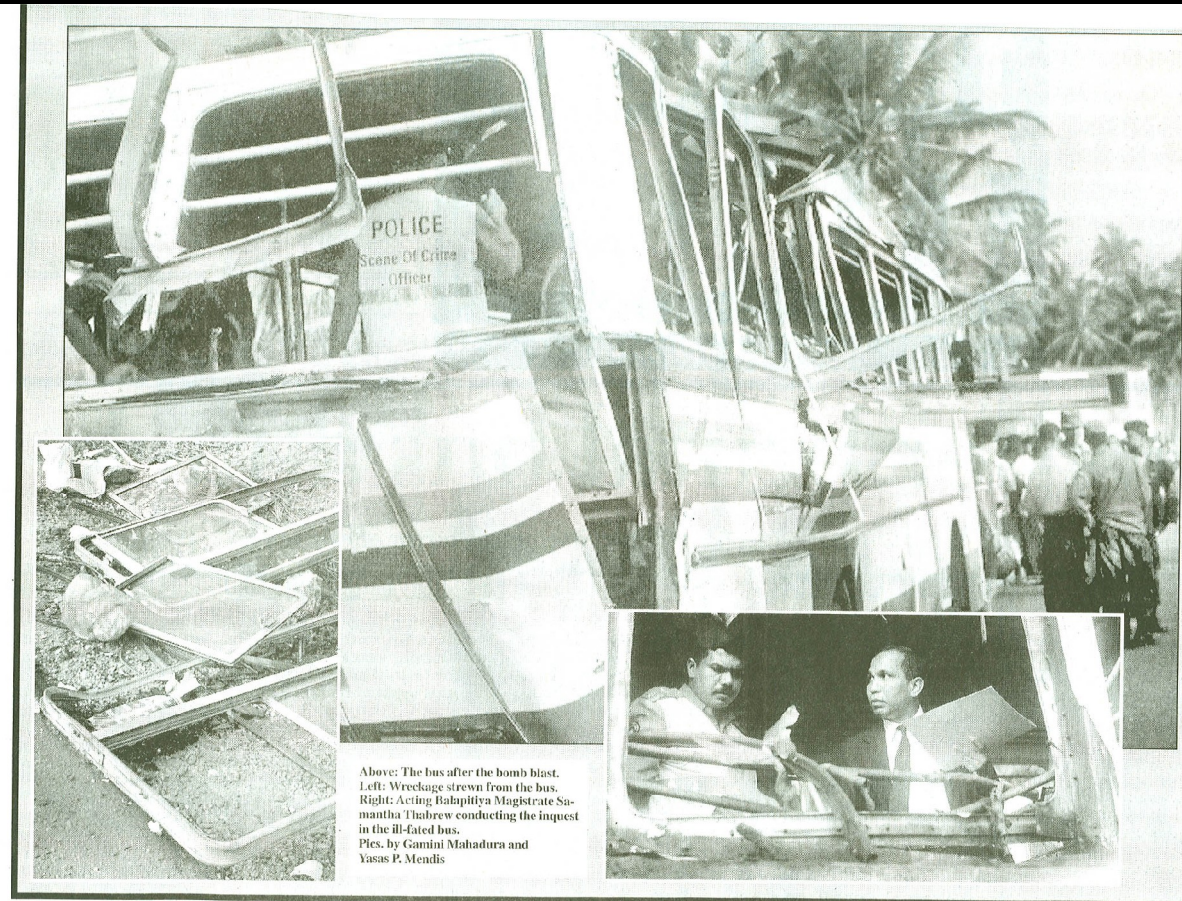


Photograph : Jayalath Edirisinghe, E-Fac, Peraden

Mass Casualty Incident

- Road trauma/ accident (soft tissue, bony injuries)
- Earth quake (crush)
- Floods (food, shelter, rescue)
- Fire (inhalational injury)
- Earth slips (crush)
- Explosions (burns, lung injury)
- Extreme temperatures
- Chemical Attack (poison)
- Radiation attack (poisonings)
- Food poisoning (Methyl alcohol)

BOMB BLAST



Above: The bus after the bomb blast.
Left: Wreckage strewn from the bus.
Right: Acting Magistrate Samanth Thabrew conducting the inquiry in the ill-fated bus.
Photos by Gani Mahadura and Yasin P. Mendis

Vehicle wheeler deals: In parts or under cover

REUTERS/AGF

In a statement issued by its embassy here, Japan expressed sympathy to the relatives of those killed and wounded in the two blasts and said the attacks which deliberately targeted innocent common people must be condemned as cowardly acts of terrorism. "Such incidents must not be repeated in future," the statement said.

Blast adds to hoteliers' woes

In the aftermath of yesterday's bus bomb at Godagama in Hikkaduwa, hoteliers said the blast dealt another blow to the tottering tourism industry.

Industry sources said yesterday's blast occurred at a time when the country had been experiencing low tourist arrivals in spite of the peak season.

Senaka De Silva, who heads an association representing hoteliers in the south, said the numbers would further decrease in the face of recent escalation of violence.

"When tourists learn of incidents such as the Godagama blast, they will certainly think twice before coming to Sri Lanka. Besides road closures and security checks also discourage the tourists from visiting Sri Lanka," he said.

Many hoteliers said they did not inform the guests about the blast because they did not want to cause unnecessary panic.

"If they inquire about the situation we inform them very briefly. We do this to avoid worrying our guests unnecessarily," said a Galle hotel official.

Passenger security: Busmen, Railways, CTB face dilemma

By N. Dilshath Banu

In the wake of the recent bomb explosions in buses, security precautions are being tightened at the Central Bus Stand (CBS) in Pettah and the Fort Railway Stations.

However these steps are causing practical problems with the checking likely to delay



No honeymoon, lots of globetrotting, some missteps and ...

Page 5

'Flem' at the helm as New Zealand enters golden era

Page 15

Stamp out highway terror!

See Editorial on page 8

Men, women, children die in highway inferno: 25 dead, over 50 injured

Truck driver was asleep at the wheel?

Mother and baby locked in embrace burnt to death



by Norman Paliyawa
L. Manawadi
Amblanagoda Co

Issued with
THE SUNDAY TIMES

KANDY TIMES

SUNDAY FEBRUARY 4, 2007

Twenty five people killed and over 50 injured when a bus and a container truck collided head on in Galle

The container truck carrying beer collided with the bus

Fire at Kandy Library claims life of child

Firemen sans water to douse flames, say witnesses Fire Dept. denies charges

By L.B. Senarathne

Firemen turned up late and were minus water to battle Friday's raging fire at the D.S. Senanayake Public Library which claimed the life of a child and caused extensive damage to the building and the priceless collection of books, Municipal Councillors and eyewitnesses said.

Kandy Municipal Council members had called Mayor L.B. Aluvihare to conduct an inquiry about the delay of the Fire Brigade arriving and their failure to supply water to control the fire.

A part of the Fire Brigade is located adjoining the premises which caught fire while the other hosemen were parked at the new building put up along William Gopollawa Mawatha.

The firemen were booed by onlookers while they struggled to find the hydrants and eventually the Bogambara Prisons had to

that the fire engines had arrived late.

JVP Municipal Councillor Anura Gonawala told The Kandy Times that he would call upon the Mayor to conduct an inquiry into the actions of the Fire Department.

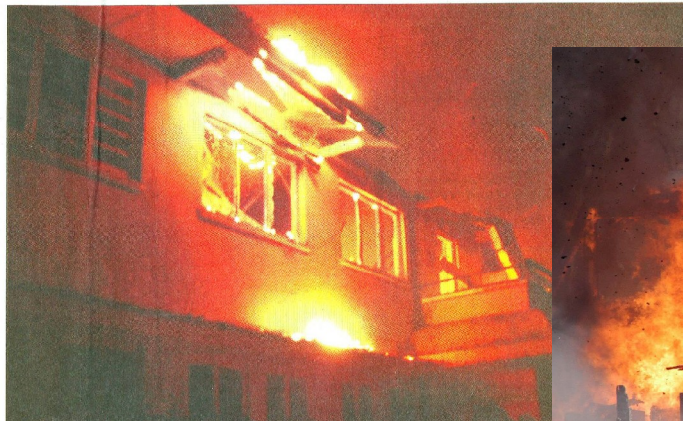
Allegations were also levelled at the firemen that some of them were under the influence of liquor when they arrived at the scene.

The fire broke out during a rehearsal for a musical show and several persons were trapped upstairs prompting bystanders and prison guards to break open the glass window panes to rescue them.

A large number of books were damaged in the fire while some others had become soaked in the water used to control the fire.

The Library has a valuable collection of books and documents.

One of the former Librarians of the Kandy Library Daya Ratnayaka, who is now attach-



FIRE



EARTH SLIPS



Our photographer Shane Seneviratne captured these earthslips that harmed life and damaged property in Pussellawa, Suduhumpala and Peradeniya recently

Living on the edge: What is safe and what is not

By Dhananjani Silva and Nadia Fazlulhaq

Disturbing reports day in and day out. A landslide in Peradeniya, in the wake of which the main Colombo-Kandy Road is closed not only for vehicular traffic but also for pedestrians, at this crucial town. Houses damaged in

Peradeniya town controversy

Many are the protests against the decision to relocate Peradeniya, with residents claiming that the town is safe.

"The decision to relocate the town has already been taken because the risk is increasing. The shops should be shifted. The problem is not from the land area where the landslide took place but the riverside. Shops are now hanging over the Mahaweli river and it is very dangerous. We cannot endanger people's lives," stressed Governor Tikiri Kohbekaduwa justifying the decision to relocate the town



Earth quake – Pakistan: mostly crush injuries...

Courtesy



Crush injury : the need for mechanical ventilation



Courtesy



Bioterrorism

■ Use of biological pathogens as a weapon

- E.g.: Brucellosis, Anthrax, Plague, Botulinum toxin, Viral haemorrhagic fevers, viral encephalitis

■ Bioterrorism preparedness

- Assess surge capacity
 - Education and training
 - Facilities and equipment
 - Resource deployment in a MCI
- Develop protocols

Is Sri Lanka prepared? NO

Special needs of children

■ Biological event

- Children have an immature immune system – thus greater morbidity and mortality

■ Chemical event

- It is a challenge to assess, manage and guide decontamination

■ Radiological event

- Children are more susceptible to consequences – cancer

Some times

■ System fails.....

- Example: Hurricane KATRINA – USA

■ No System.. but

- Tsunami – Sri Lanka
- Makeshift arrangement – effective
- Volunteer help / cultural

Command centre – TV Channel
Workforce - volunteers

Summary

MCI

■ The Key

- Preparedness
- Efficiency

Low-income countries

Prevention

Peradeniya Teaching Hospital: 600 beds



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