### Risk factors for Motorcycle injuries and outcomes

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# Purpose

 Recognise the role and importance of risk factors in motorcycle crashes

2. Identify need for addressing risk factors

3. Risk reduction approaches for strengthening road safety





#### New face of Motorisation



With changing face of motorisation, road crashes will increase and also lead to new emerging problems

Nearly one third of road deaths occur in African region. In Kenya, nearly 3000 persons die due to a road traffic crash. An estimated 1,00,000 persons are likely to seek medical care. Majority are young men Vulnerable road users contribute most. The economic losses are huge and unmeasured.

#### What do we know

**RTIs are multifactorial in nature Poor knowledge of risk factors in LMICs RTI prevention and control needs** multiple solutions **Evidence based – integrated** coordinated approaches work Use risk assessment and reduction strategies and approaches

# In RTIs

Energy generation, transfer, tolerance of human body and methods of protecting people and making them safer are crucial for prevention and control

#### Road user category in Indian Epidemiological studies



Pedestrian Motorcyclist Bicyclists Car Occupants Public TV Others

What do we need to know? **Knowledge of risk factors Contribution of risk factors Risk assessment methods Risk reduction strategies and** approaches **Building a systems approach by** integrated actions

# **Risk factor(s)**

- Risk factor is defined as "an individual attribute or exposure ,presence or absence of which, is associated with the occurrence of crashes or poor outcomes from crashes".
- Increased probability of occurrence of crash / poor outcomes of risk factors
- Risk factors are often suggestive or precede the onset of a crash or a poor outcome.

### **Risk factors Influencing**



# Exposure

- Economic growth and progress
- Extent of motorisation
- Migration and movement of people
- Transportation patterns and available choices
- Demographics
- Land use patterns and road networks
- Safety systems and awareness
- Socio cultural aspects
- Several others .....

#### State wise distribution of RTIs in India, 2007 (Rate / 100,000 population; National average 10.1/ population)

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>15

9-15

<9

THE TIMES OF INDIA, BANGALORE THURSDAY, JANUARY 29, 2009

#### 'More die on highways'

A study by NIMHANS and other hospitals revealed that accident deaths were fewer within city limits than on highways

#### RESULTS OF THE STUDY (for Bangalore)

 Nearly 115 fatal bus crashes in a year

 Injuries accounted for 21% of emergency room registrations
 10% admissions and 30% deaths

 Majority of those who died/ got injured are between 16-45 years old, mostly male

Road traffic injuries (1,000 deaths); suicides (2,400 deaths)

 In 2007, 4,450 died due to injuries; 62,000 accident victims were admitted in 21 hospitals

#### SAVE YOUR LIFE

Wear helmet
Don't drink and drive
Wear seatbelt

TIMES NEWS NETWORK

Bangalore: There were fewer deaths and cases of injuries due to motor accidents within city limits. Forty per cent of accidents happened on major highways. Over 30% accident deaths were due to influence of alcohol, and two-wheelers drivers and pillion-riders along with cyclists were the worst hit.

These are the findings of a study jointly done by 26 hospitals, including NIMHANS and Bangalore police. The study 'Injury/road traffic injury surveillance programme' has been appraised by the Indian Council of Medical Research and WHO.

"If these factors are taken into consider- dents in 2007.

ation, we can minimize injuries, identify risks and causes, implement programmes, and evaluate solutions," NIMHAMS director D Nagaraj said at the study's consultation meeting on Wednesday.

"With 20-30% emergency cases related to accidents and 30% deaths due to this single cause, road traffic injury becomes a public health issue," he explained.

Head of epidemiology with NIMHANS G Gururaj said communicable diseases have been controlled with effective measures while cases of road traffic injuries have been on the rise.

In Karnataka, there were 35,000 deaths and two lakh cases of injuries due to accidents in 2007.

# **Crash Involvement**

- Heterogeneous traffic mix
- Age and vulnerability
- Presence of alcohol and drugs
- Inappropriate and excessive speed
- Fatigue and sleep deprivation
- Visibility factors
- Use of cell phones
- Design,development,maintainence of roads
- Vehicle design and crashworthiness
- Several others .....

#### Age of drivers involved in crashes in 2007





# **Crash Severity**

- Collision patterns
- Excessive speed and overtaking
- Non usage of protective devices like seatbelts and child restraints
- Non usage of helmets by 2 wheeler occupants
- Presence of alcohol
- Crash worthiness of vehicles
- Several others .....



New roads, high speeds, no road safety audits

Two wheeler occupant injuries & deaths NIMHANS Experience

- In deaths & injuries over a decade
- Risk of mortality by 2.5 times in the absence of helmets
- Risk of severe brain injury by 4 times in the absence of helmets
- Risk of skull fracture by 2 times in the absence of helmets

**HELMETS AS A SAFETY MEASURE** 

# Injury outcomes

- Lack of pre hospital and emergency care systems
- Inadequate preparedness of hospitals
- Delays in reaching hospitals
- lack of first aid
- Inappropriate referrals
- absence of triage
- Cost of health care
- Several others .....

#### Mode of transportation in rural Bengaluru (%)





### PRIMARY PREVENTION

- Roads
- Vehicles
- People
- Systems

# SECONDARY PREVENTION

2

- Emergency care
- Acute Trauma care

# TERTIARY PREVENTION

3

- Hospital care
- Rehabilitation



# Knowledge of risk factors helps in

- Recognizing risk factors
- Identify what is possible for change
- Prioritization amongst several
- Developing Integrated prevention and control strategies
- Building capacity of policy makers, professionals and others along with other isuues.

# Example of Haddon's matrix as applied to two wheeler road traffic injury

	Human	Vehicle	Environment
Pre- event	Increase aware- ness about safe driving, helmet wearing, drink driving etc.	Increase visibility of vehicle	Implement safety features on roads
Event	Early transfer to hospital and required care	Increase breaking systems of two wheelers	Crash protective road side stationary objects
Post- event	Rehabilitate and improve services	Improve safety technologies and components	Facilities for early rescue of injured persons

### **Road Safety Interventions**

Policy Interventions Regulatory Interventions Educational Interventions Technological Interventions

Enabling Environment (Financial, Social, Physical) Enforcement of road safety laws Beliefs & Behaviours (Community; Individual)

Modifications of roads & vehicles

**Desired Change** 

Wide differences between developed & developing countries in :

- \* The behaviour, knowledge, attitude, culture and habits of road users.
- Road conditions, vehicles & characteristics of traffic.
- Societal mechanisms of dealing with the problem.
- \* Effectiveness of interventions



#### **DECCAN**<sup>2</sup> HERALD

#### METRO

### Life as usual after mishap

#### **DH NEWS SERVICE**

BANGALORE: The shock of witnessing the thoroughly smashed car and two injured persons at the unauthorised railway crossing at Lingarajapuram has not created any fear psychosis in the minds of habitual users of the track.

A visit to the spot on Thursday revealed that life went on as usual there:

The constant stream of busy traffic, the wheels of vehicles getting stuck in the uneven space on either side of the tracks and adults and schoolchildren running across the tracks were all in place.

The only change was words 'Trespassers will be moved. There was a traffic of the police," Harish said. hold-up on Hennur Main



that the posters bearing the Motorists seem to have not learnt a lesson from Wednesday's incident.

two pillars had been re- It should have been the duty **Barricades** coming

of the track." The Railways seems firm

prosecuted, SWR', pasted on mangled car from the track. week to procure them and to solve the crisis brewing install them on either side between the two parties was offered by Nasiruddin. "A pedestrian bridge

#### We know, life is not "as usual" for affected individuals, families and children