



Risk Factors for Pedestrian Injuries in India and South East Asian Countries

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Purpose

- To review burden of pedestrian deaths and injuries
- To identify patterns, risk factors and causative mechanisms
- To identify issues and challenges in promoting safety of pedestrians



	DEVELOPED REGIONS	DEVELOPING REGIONS
POPULATION	18%	72%
DEATHS	25%	75%
MOTOR VEHICLES	68%	32%
TRUCKS & BUSES	5%	95%
TWO WHEELERS	2%	98%




Distribution of Population and road deaths in South East Asia (Source: GRSR 2010) (estimated ~ 2,00,000 road deaths)

Country	Pop.	Deaths	Rate (1,00,000)	Share of deaths (%)	Peds.(%)
Bangladesh	158 m	3160	2	2.1	54
Bhutan	0.7 m	111	17	0.1	-
India	1.2 b	1,06,725	10	71	13
Indonesia	231 m	16,548	7	11.1	15
Maldives	0.3 m	8	2	-	-
Myanmar	48 m	1638	3	1.7	30
Nepal	29 m	962	3	1.1	-
Korea	48 m	6166	12	4.1	37
Sri Lanka	20 m	2334	12	1.5	33
Thailand	64 m	12492	19	8.3	8
Timor-Leste	1.1 m	46	3	-	-

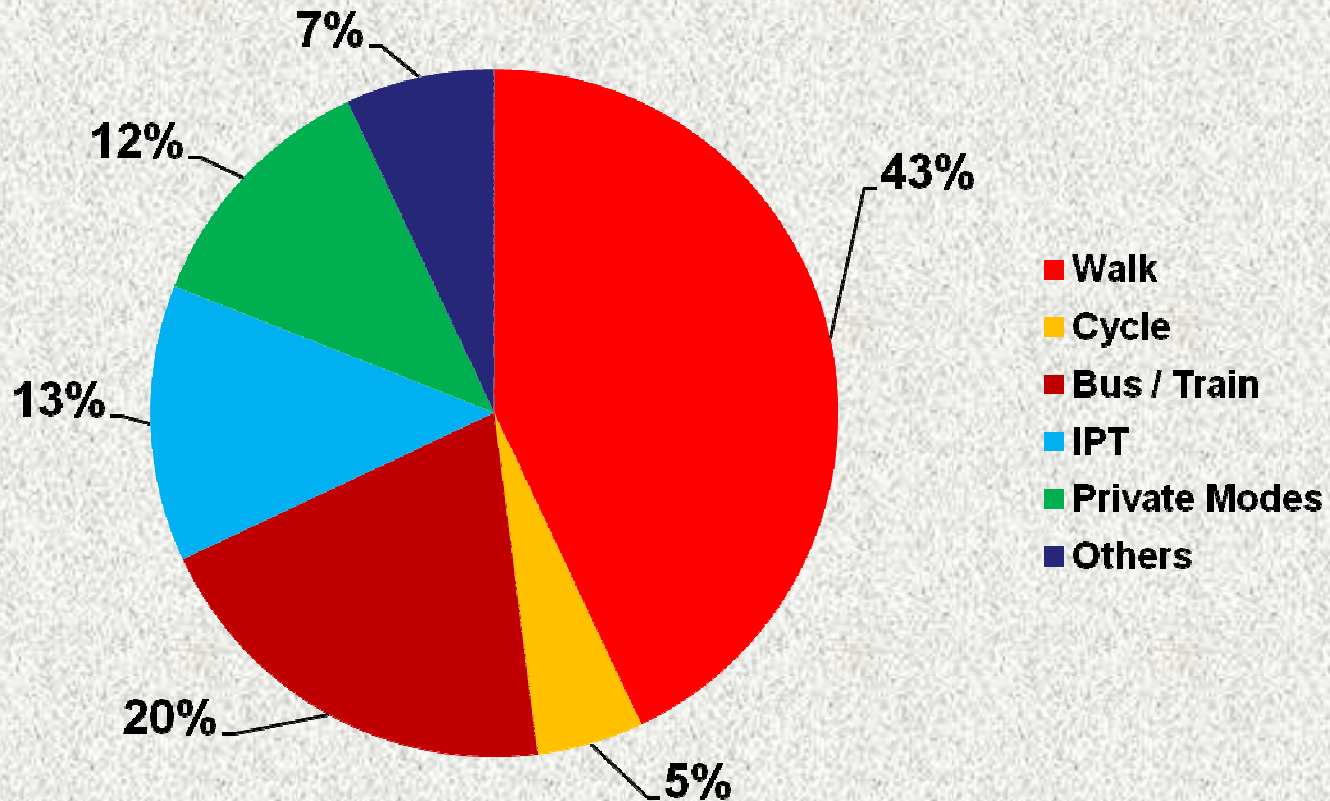


Walkability issues

- Large populations
- Accelerated economic growth - vehicles 
- Countries are urbanizing fast
- Significant transport challenges
- Walking and cycling remain important modes in both urban and rural areas
- Greater exposure in heterogeneous traffic environments
- Lack of defined urban – rural transport policies with a focus on pedestrians

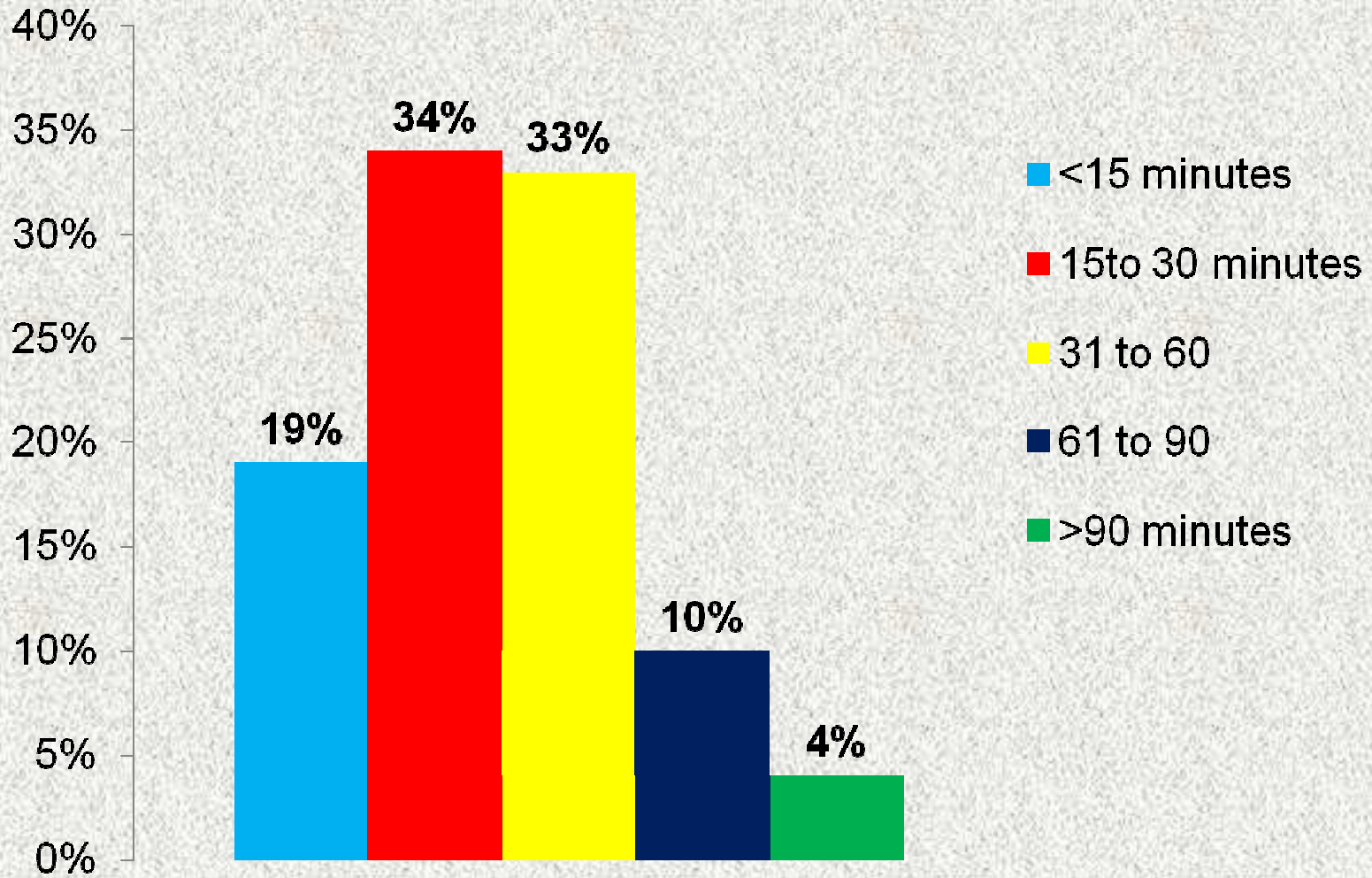


Travel Mode Share of Respondents (survey of 6 cities in India)



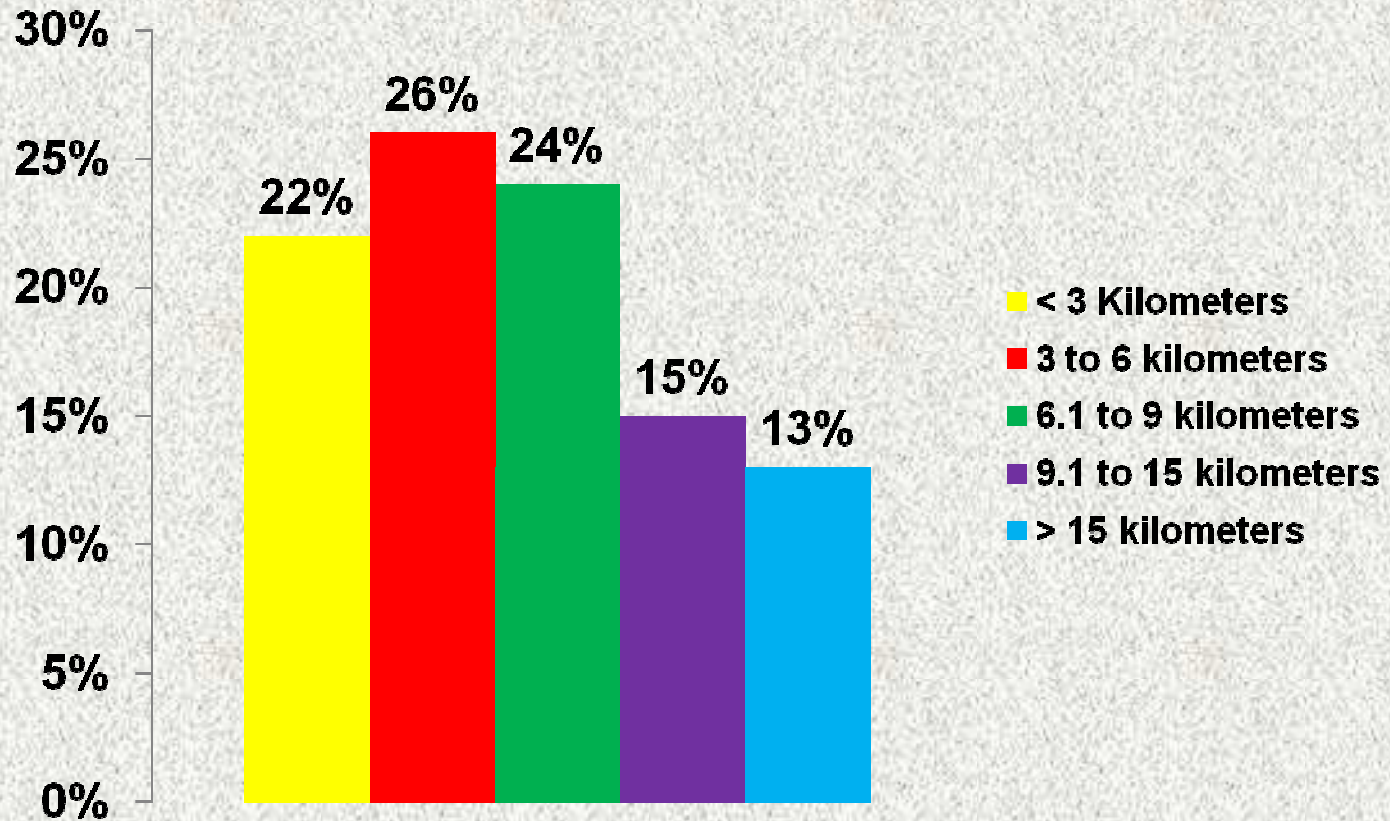


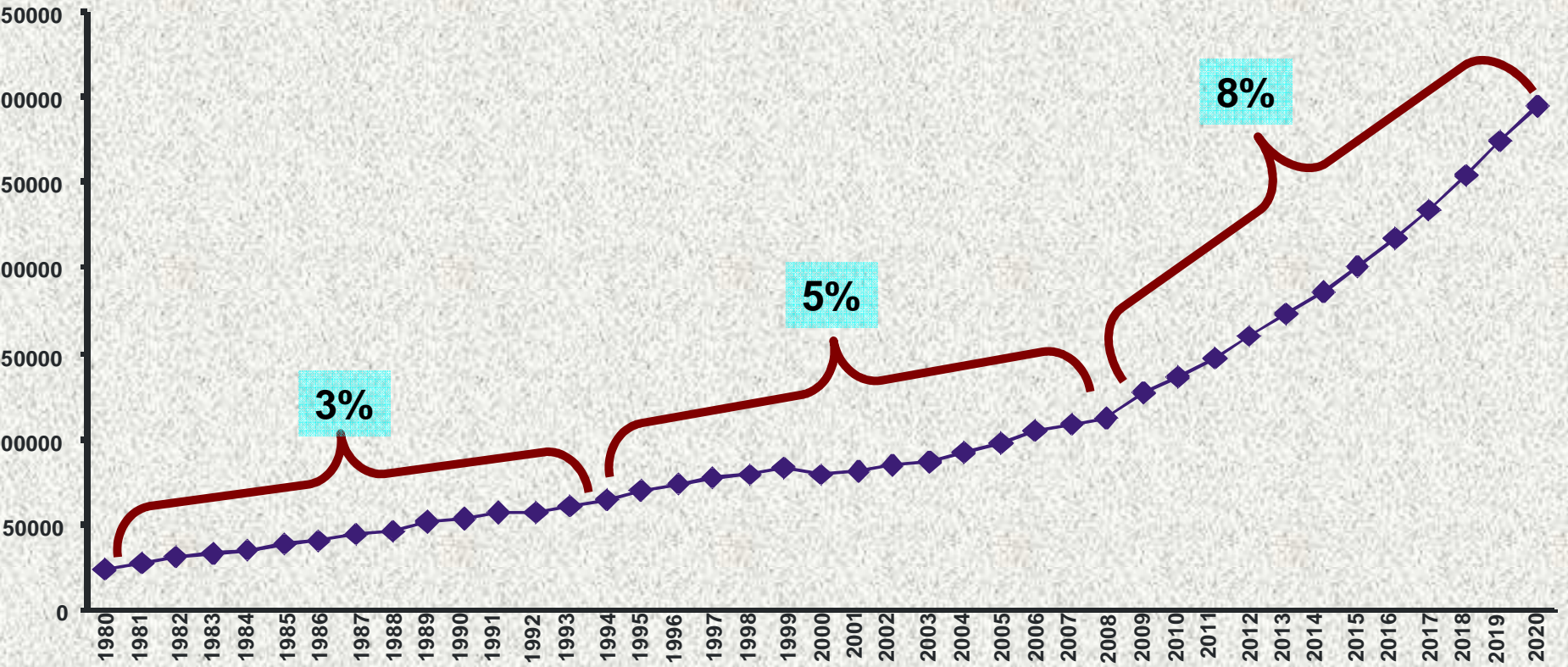
Average Trip Length of Respondents





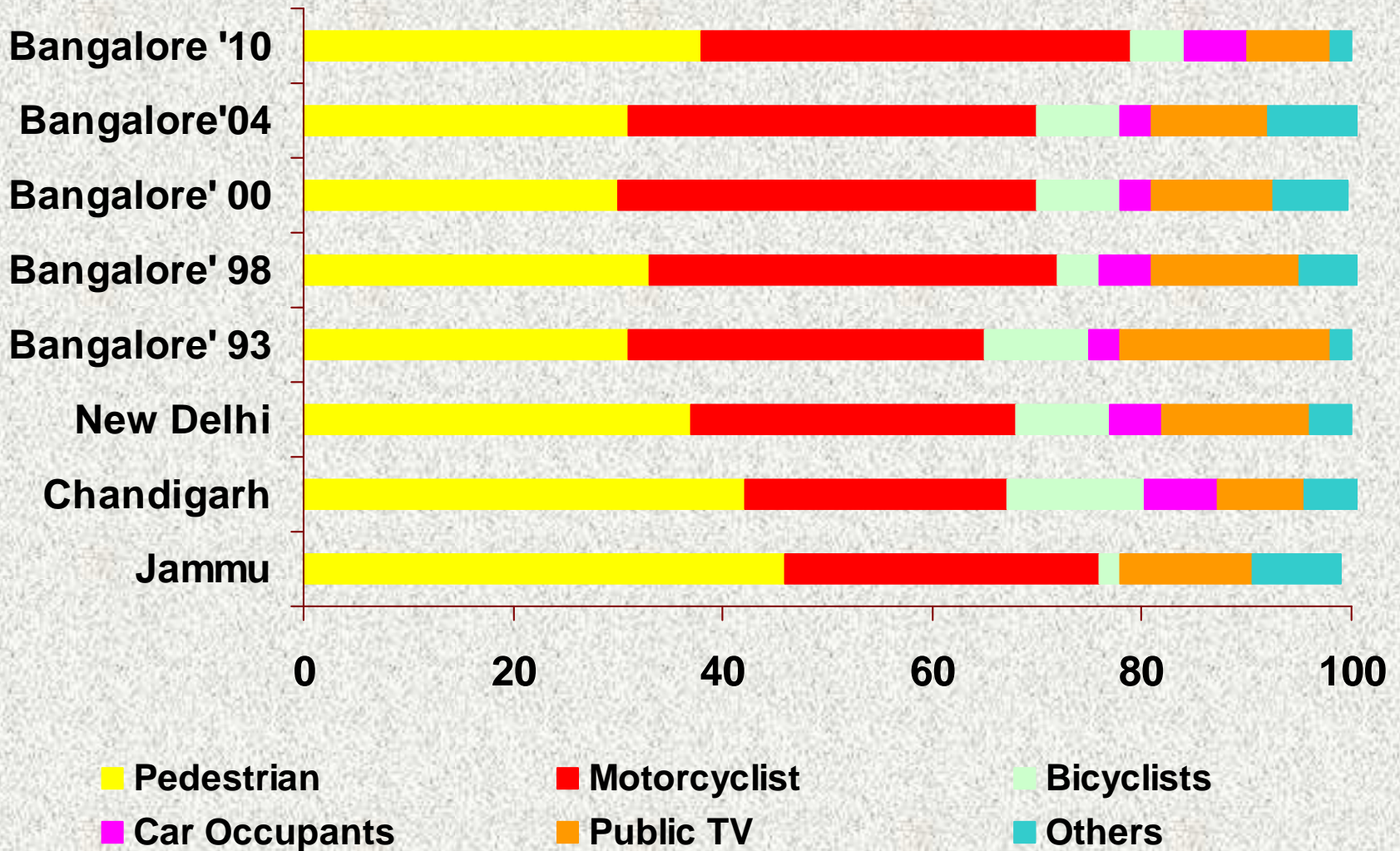
Average Trip Length of Respondents





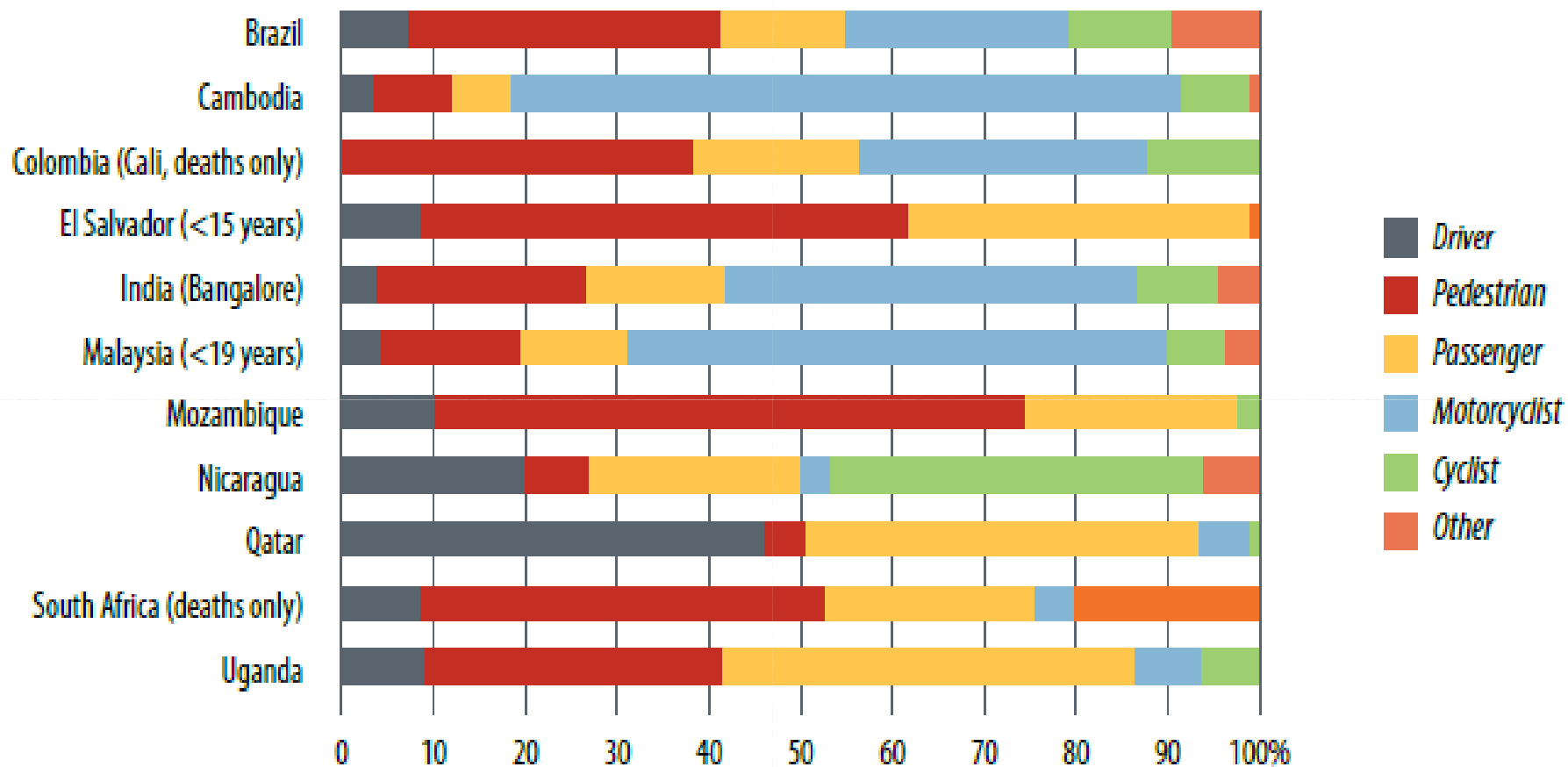


Road user category in Epidemiological studies





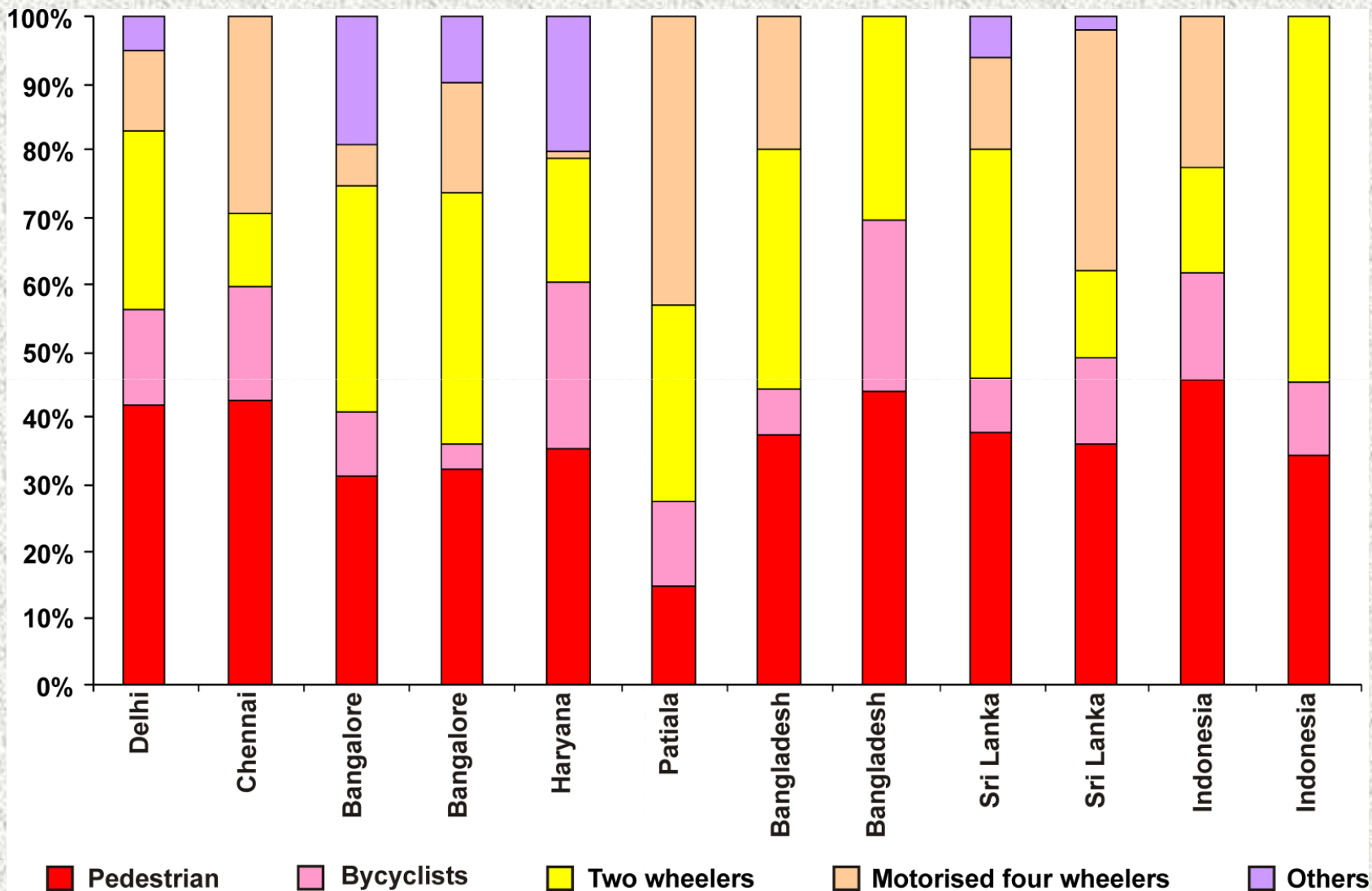
Injuries and fatalities among road users in selected low-income and middle-income countries (<25 years)



WHO 2005

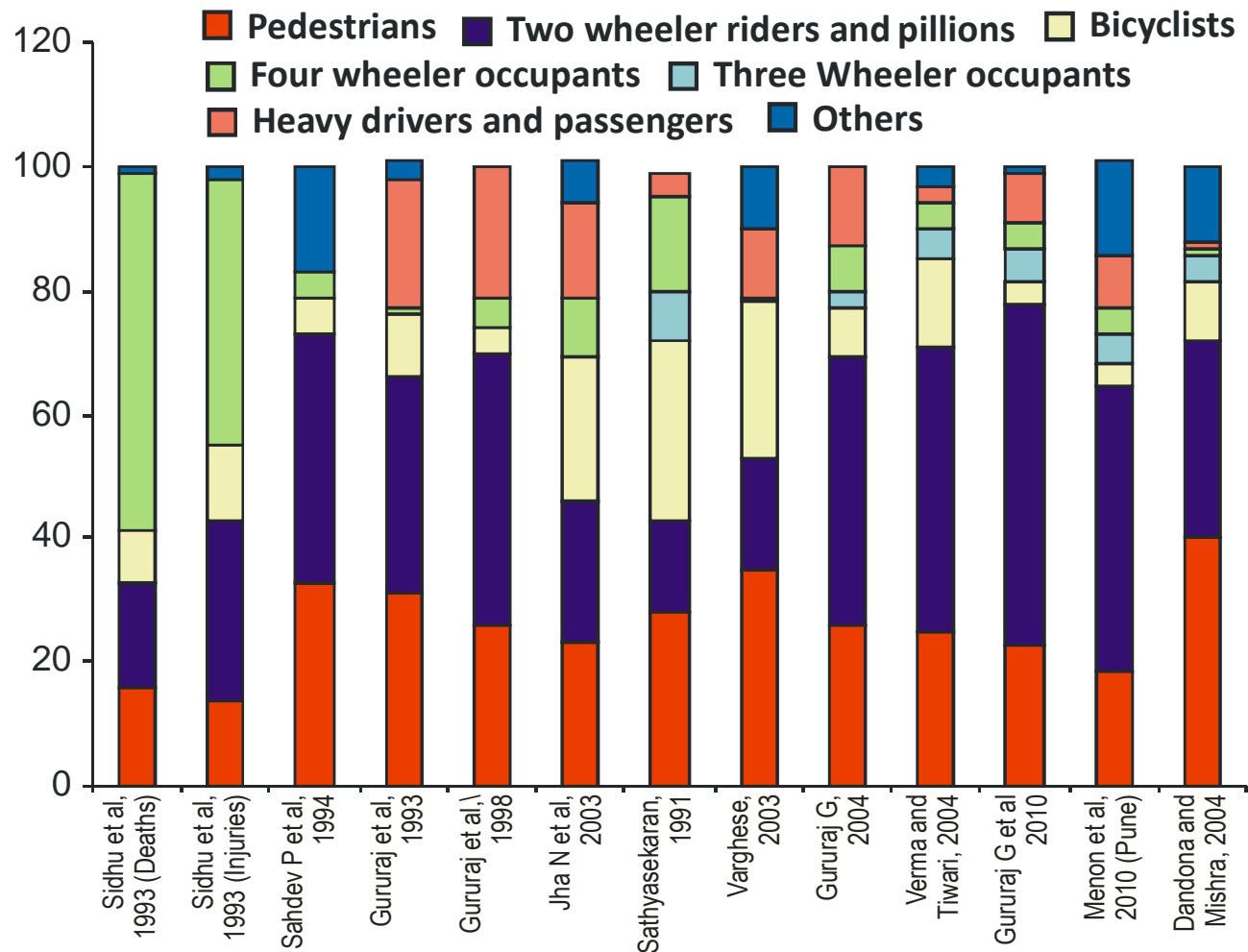


ROAD USERS FATALITIES IN SEAR



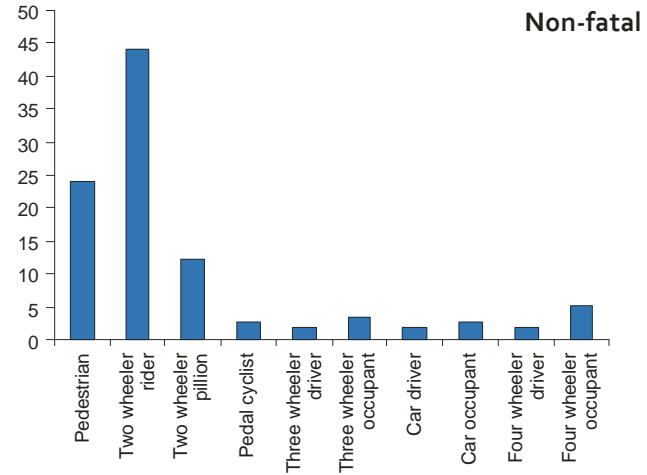
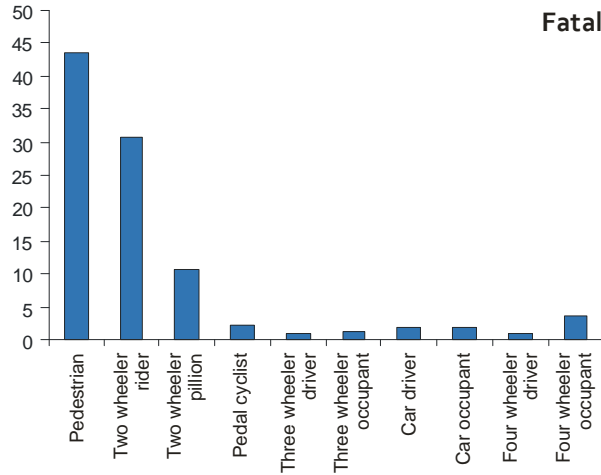


Road user categories killed and injured in India in different studies

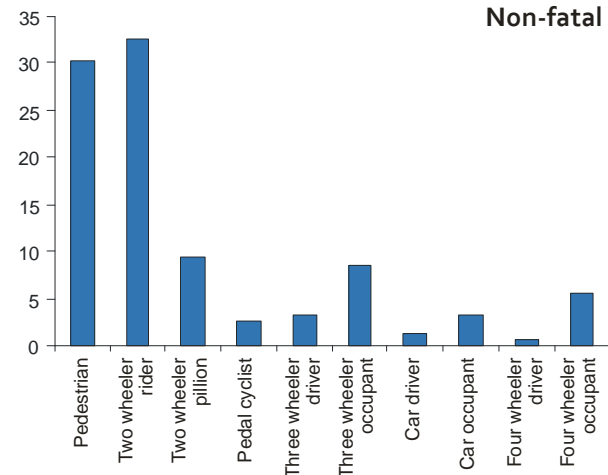
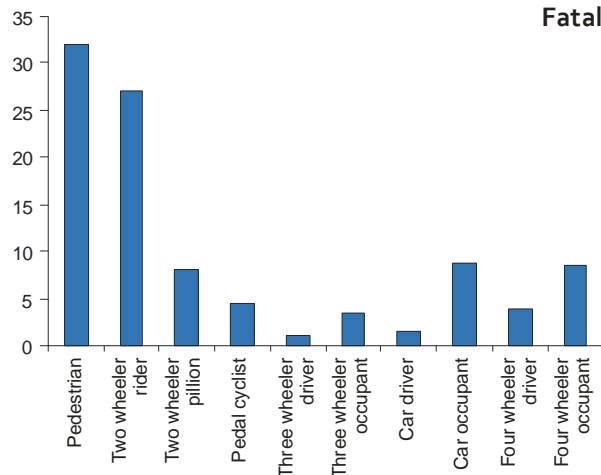


Road user category involved in road crashes (Findings from Bangalore road safety programme

Urban

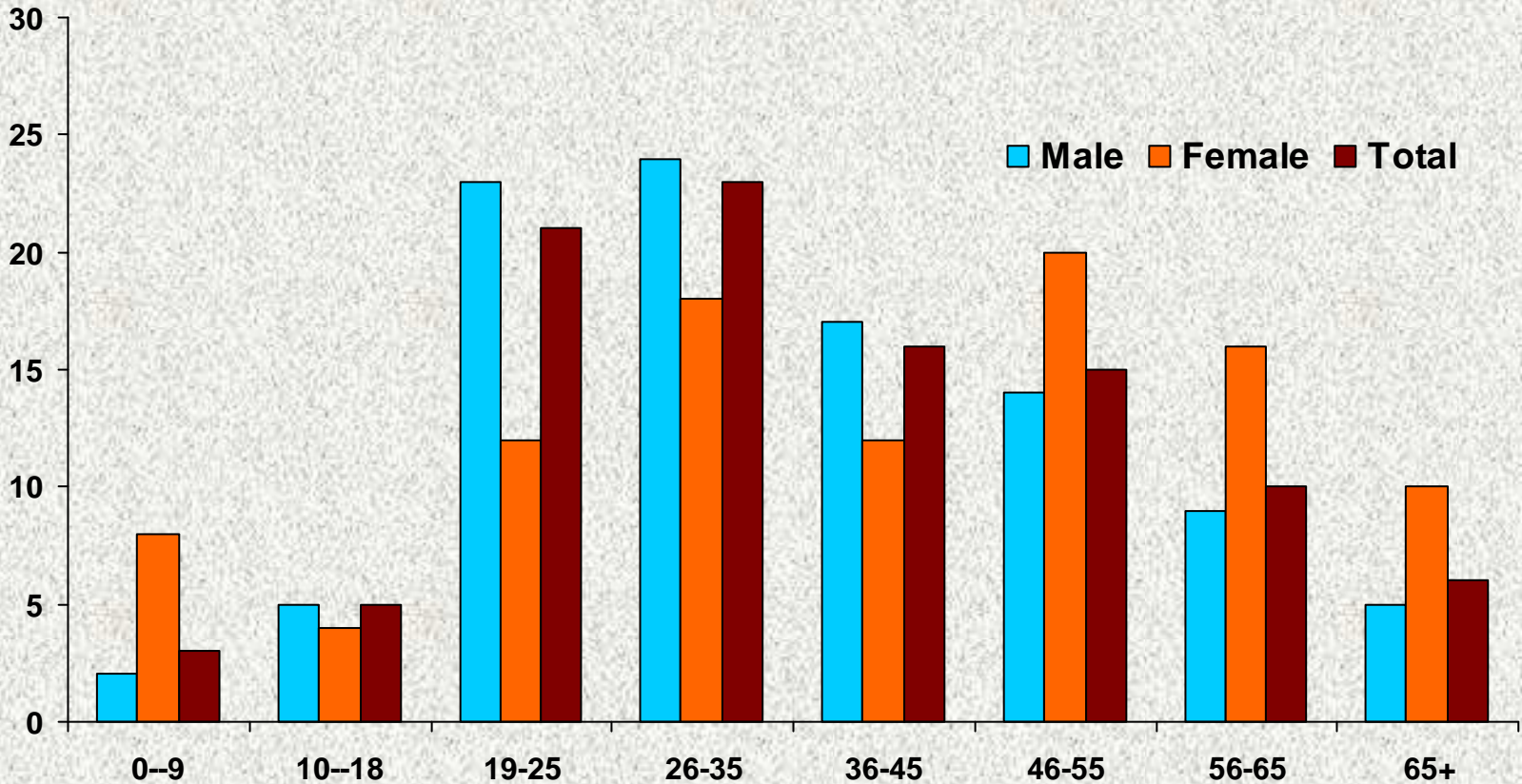


Rural





Age Sex Distribution (%)





- **Age / Sex**
- **Socioeconomic status**
- **Nature of VRUs**
- **Use of protective devices**
- **Alcohol**

- **Severity of crash**
- **Nature of injuries**
- **Outcome of injuries**

**Factors
influencing
outcome**

- **Availability of timely care**
- **Accessibility**
- **Affordability**
- **Rehabilitation services**

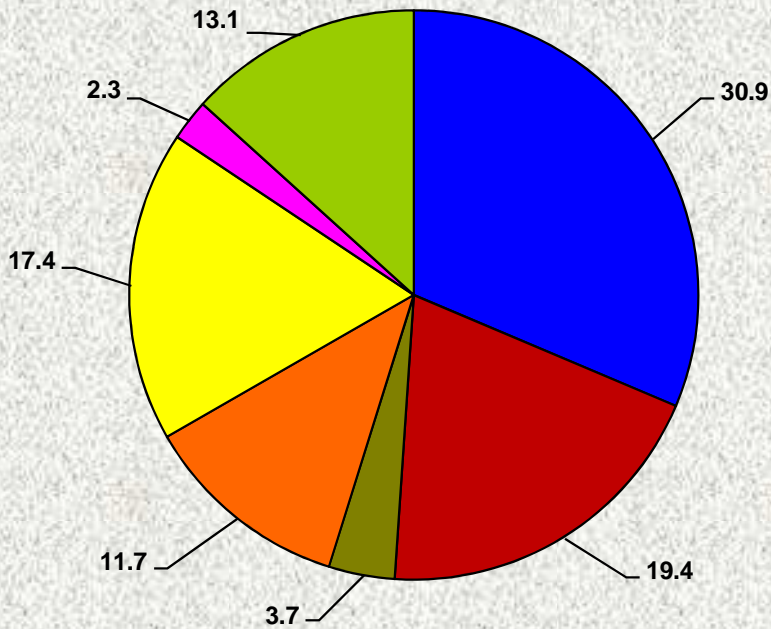
- **Support mechanisms**
- **Compensation mechanisms**
- **Policies and programmes**



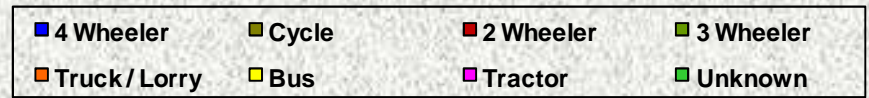
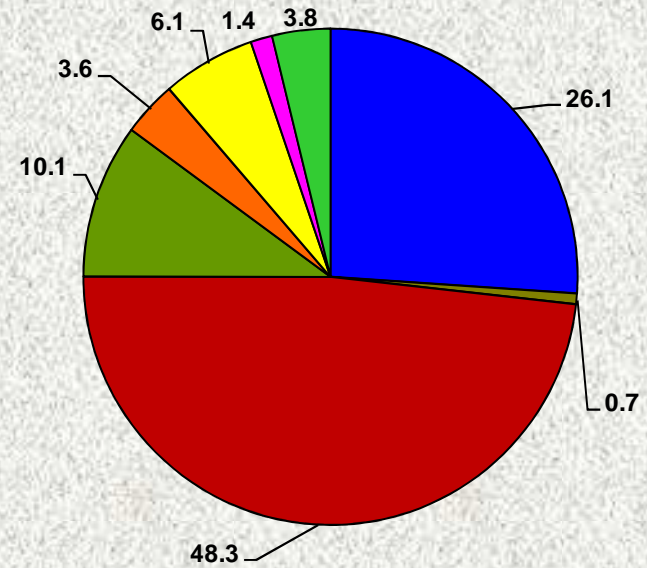
Collision of vehicles with Pedestrians Urban



Fatal



Non Fatal

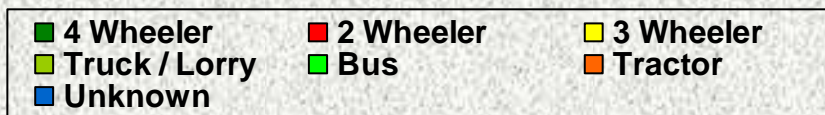
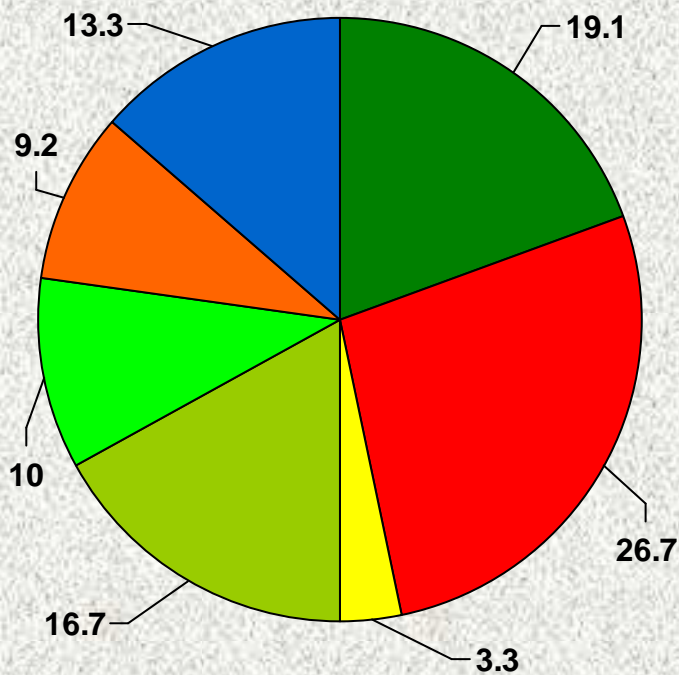




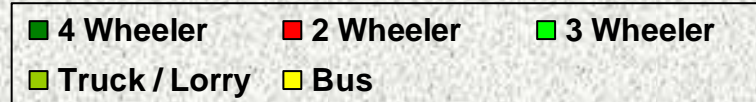
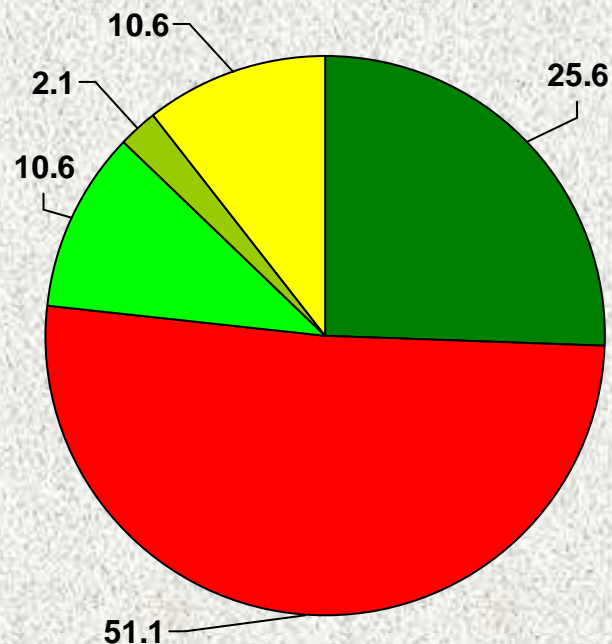
Collision of vehicles with Pedestrians Rural



Fatal

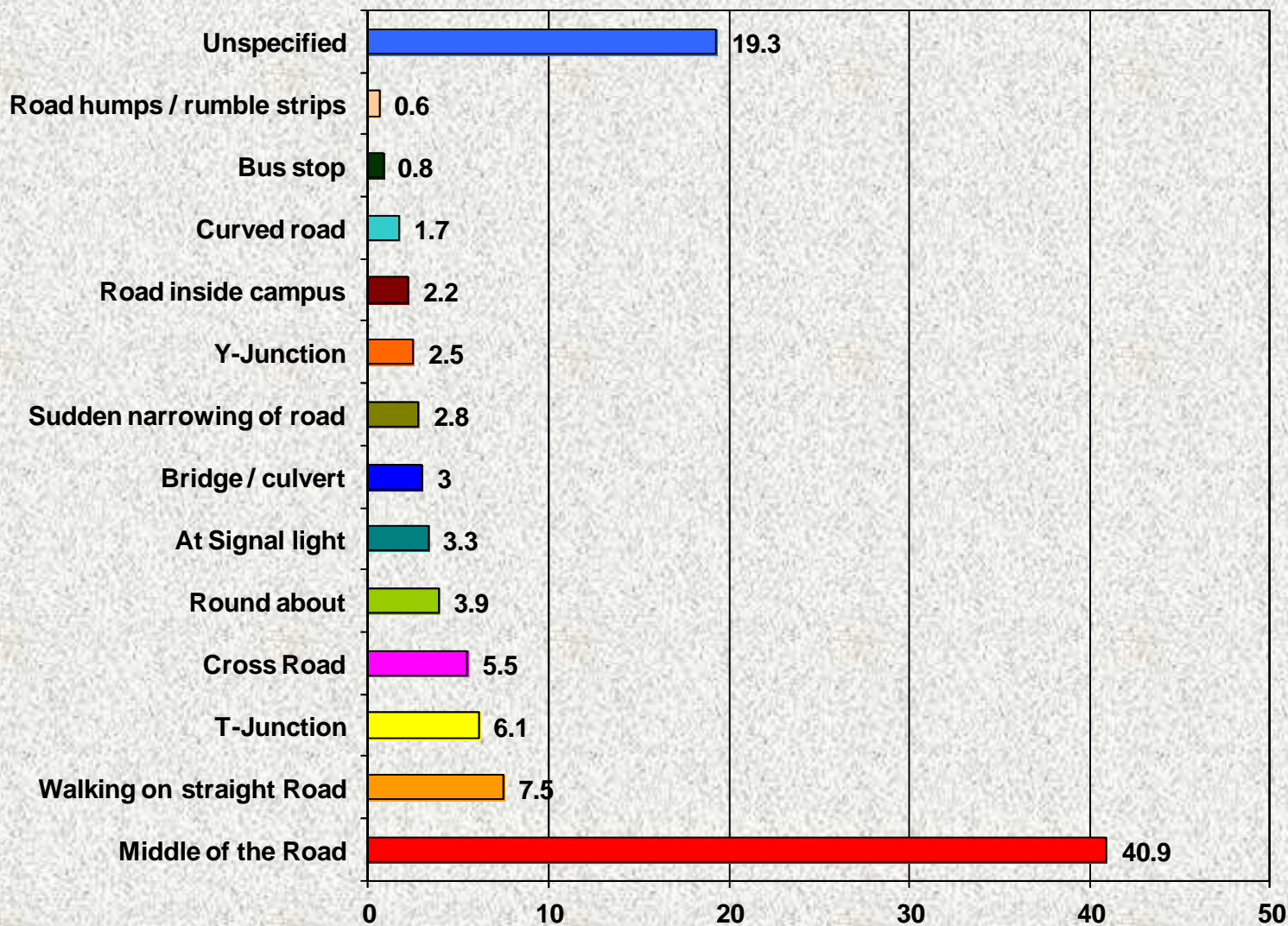


Non Fatal



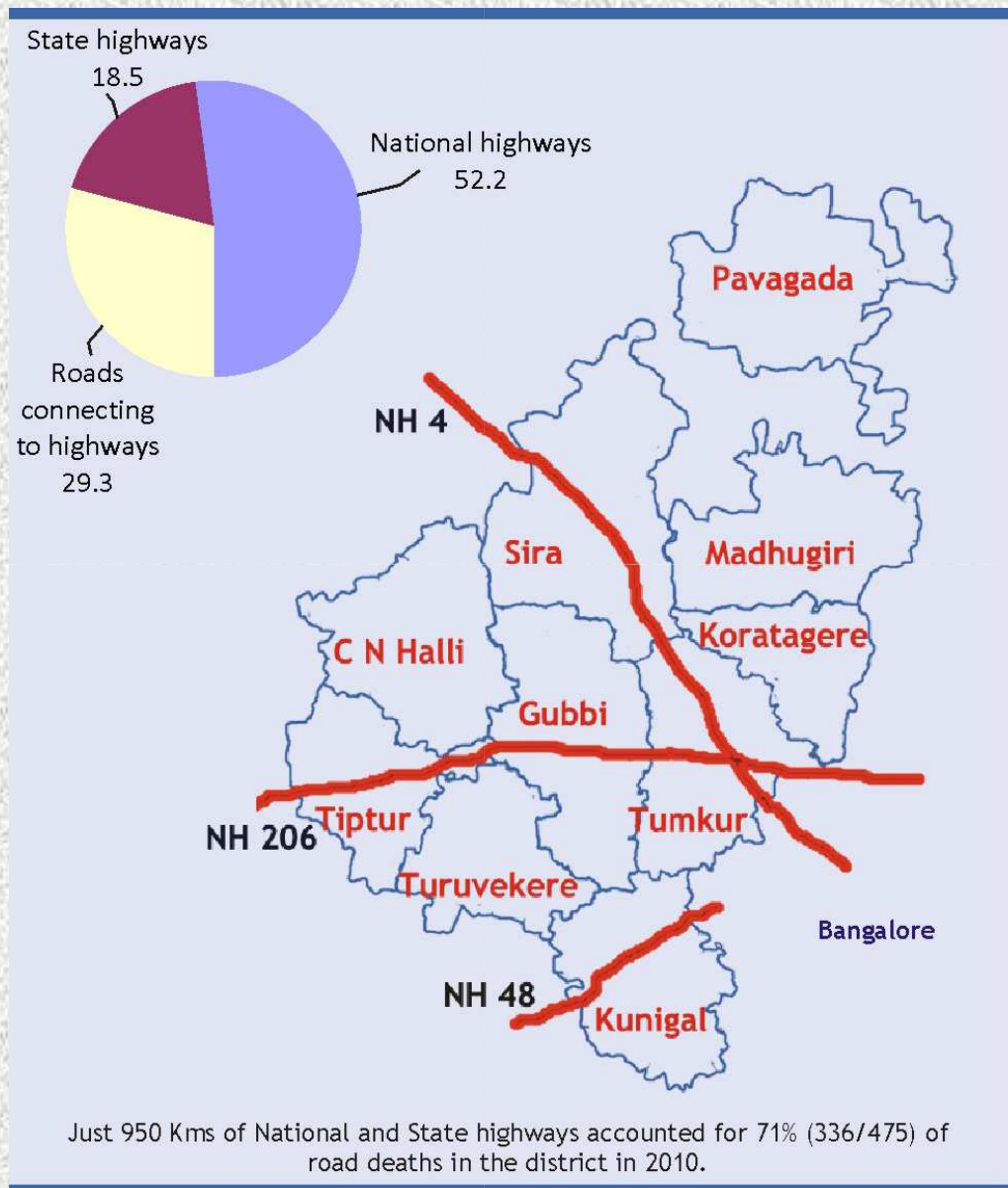


Location of fatal pedestrian crashes,



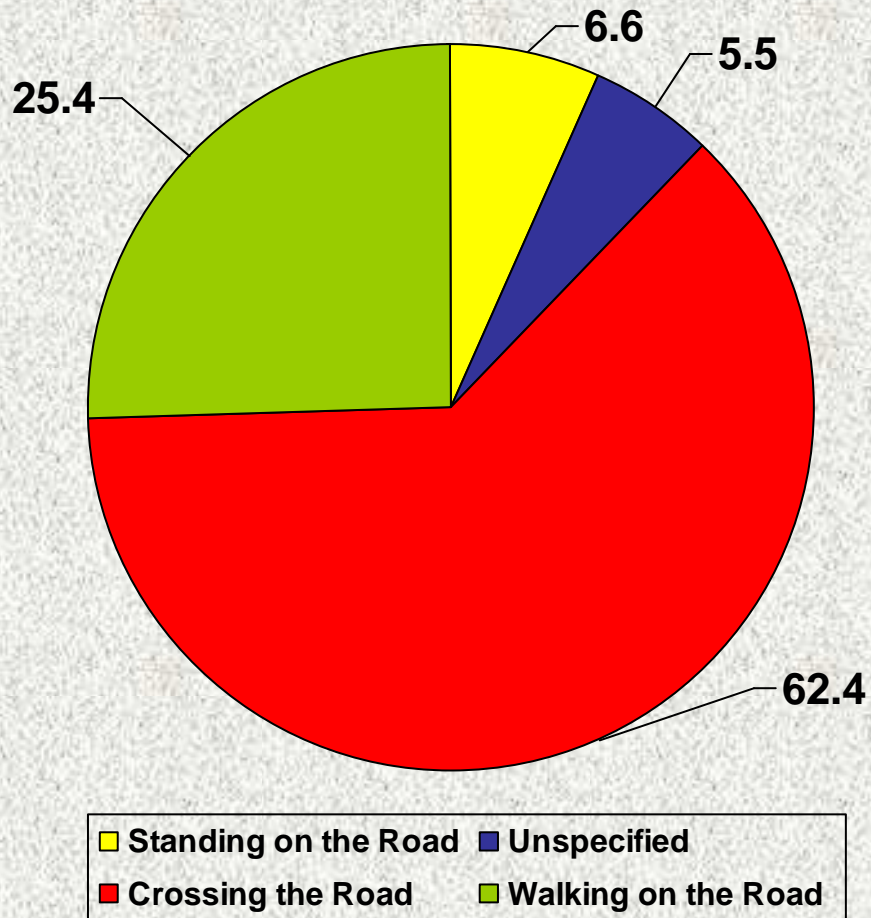


Map showing highways contributing for more fatal crashes





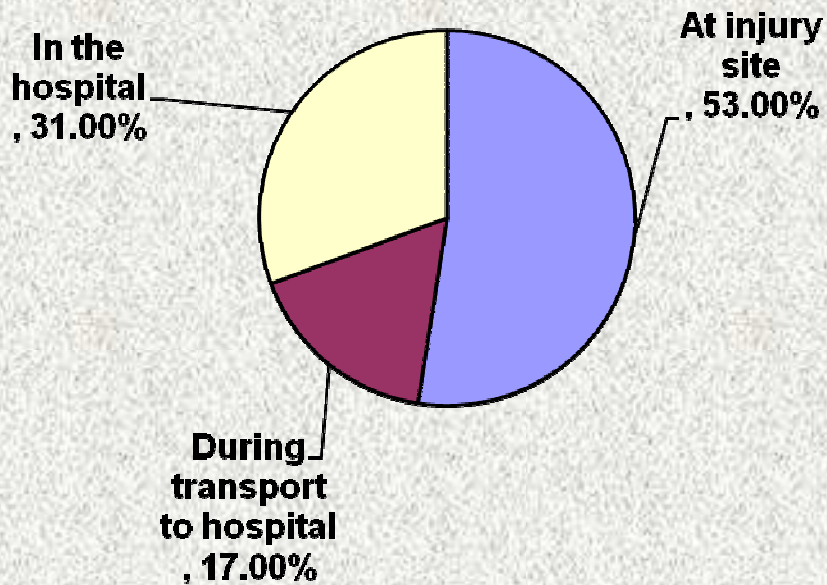
Pedestrian activity at the time of crash



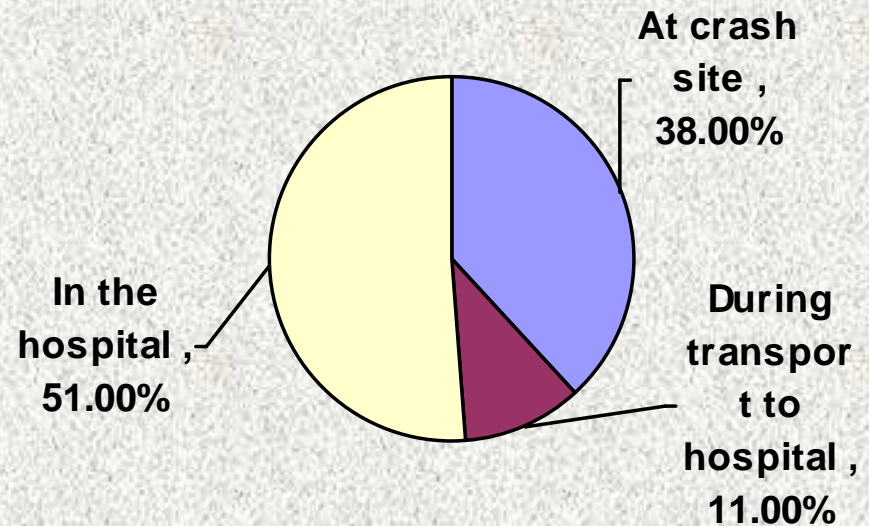


Place of Death

RTI Deaths in Rural areas



RTI Deaths in Bengaluru

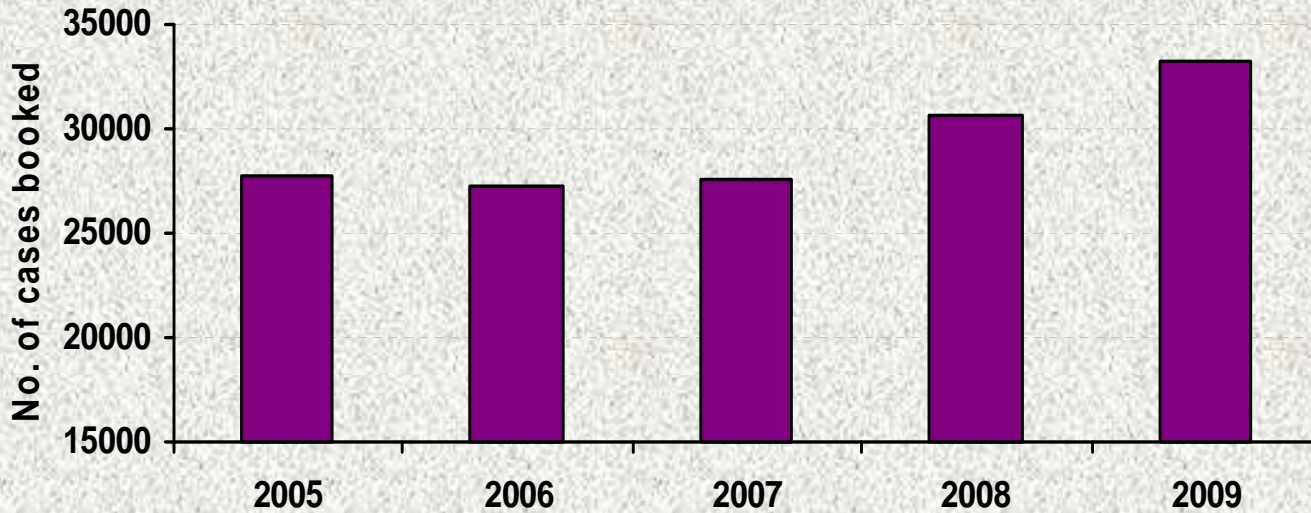




Drink & Drive

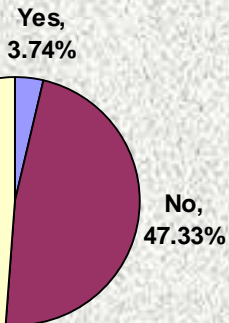


Trend of Drunken Driving cases booked by the Bangalore City Police

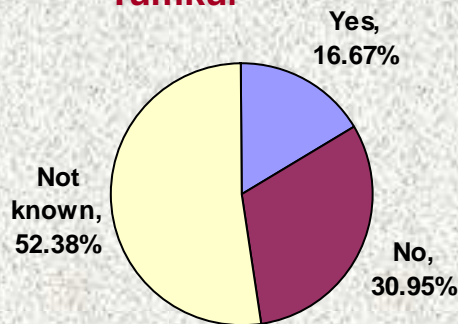


Alcohol use among Fatal RTIs in Bengaluru & Tumkur

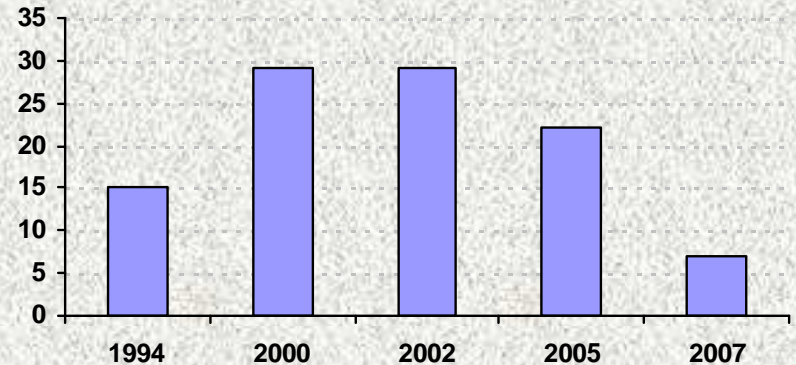
Bangalore



Tumkur

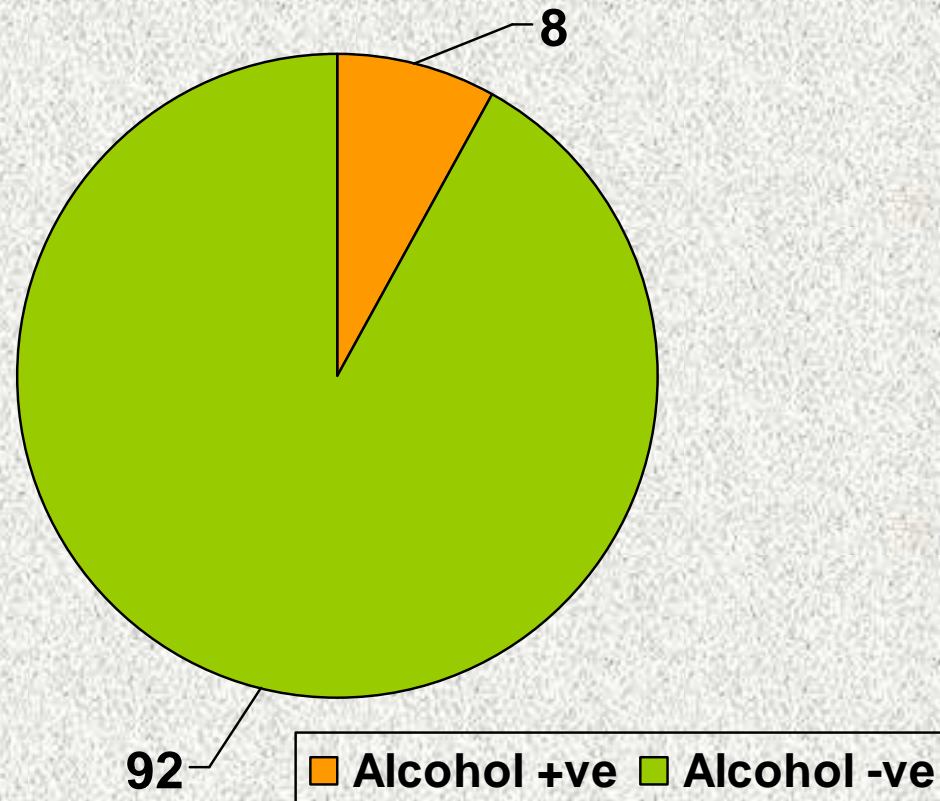


Alcohol from previous studies



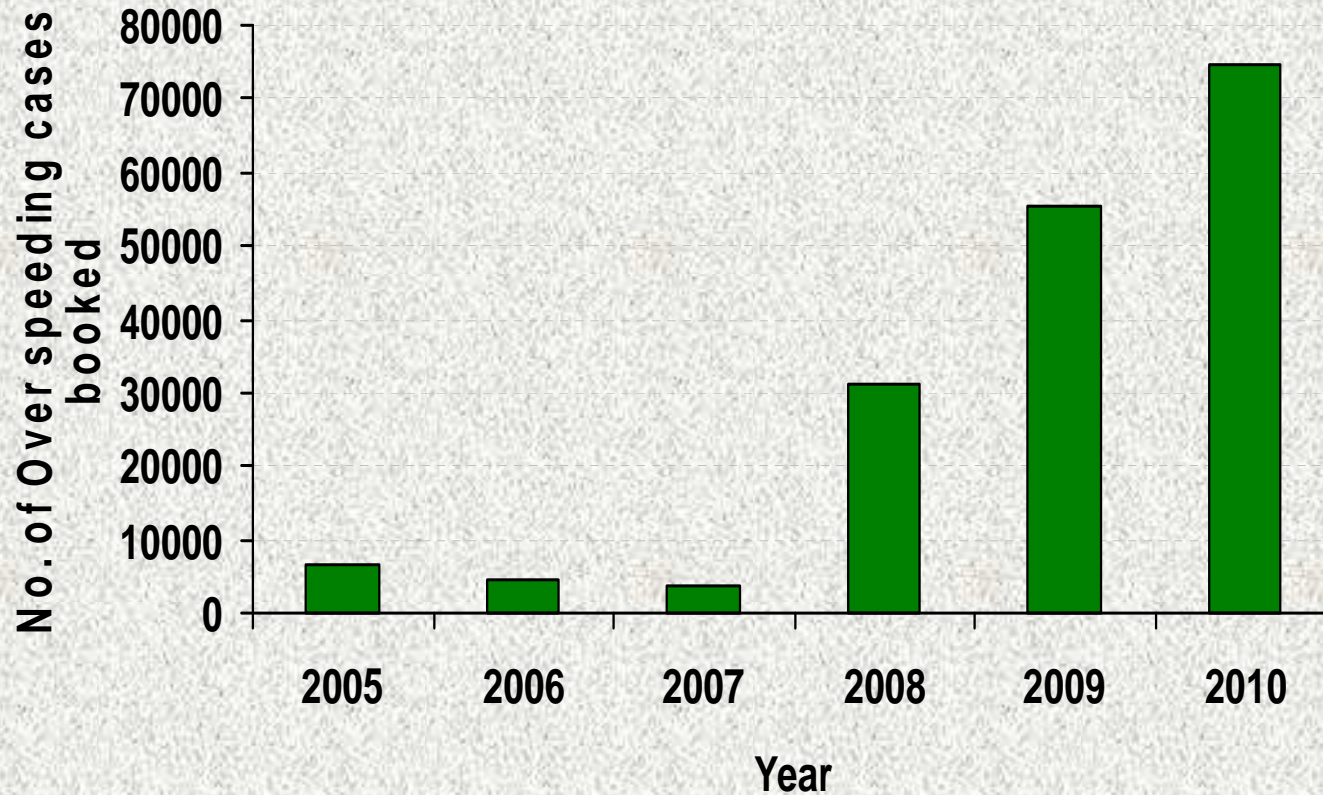


Persons driving under the influence of alcohol: Results from an observational study (%)



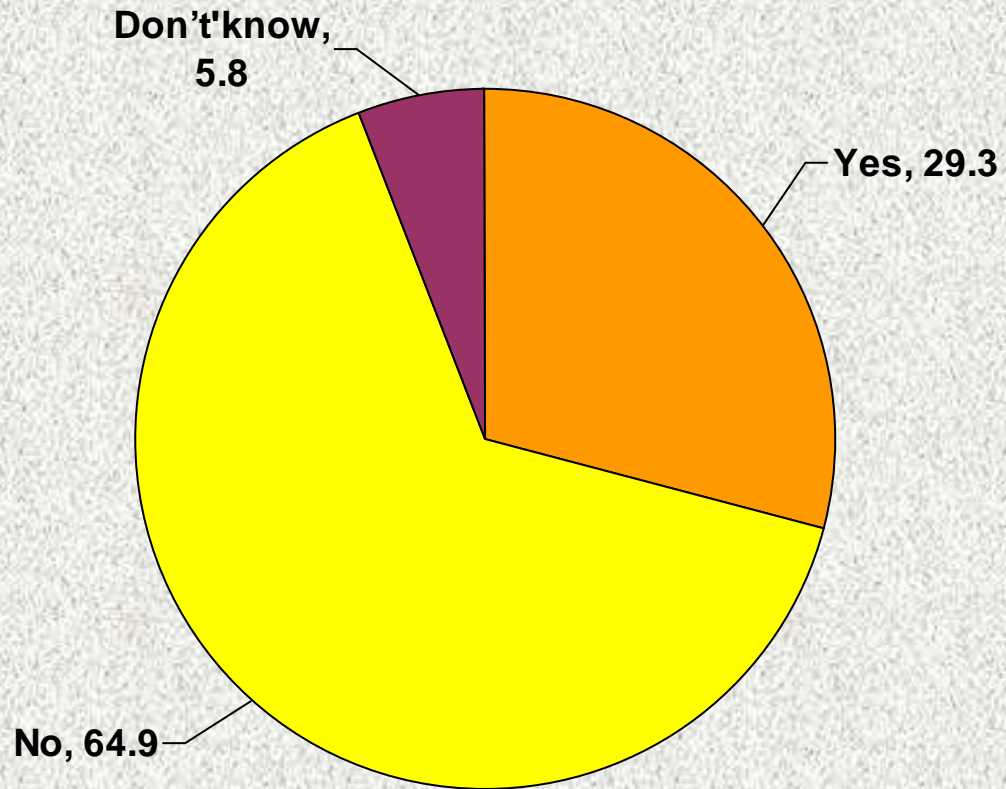


Trend of Over speeding cases booked by the Bangalore City police



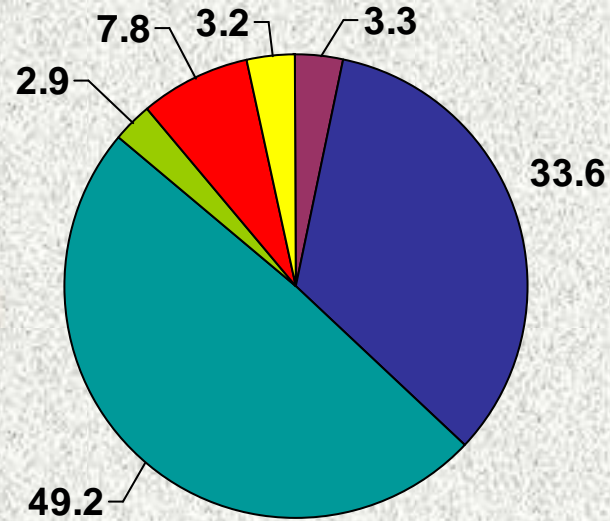


First Aid Given





Place of First Aid

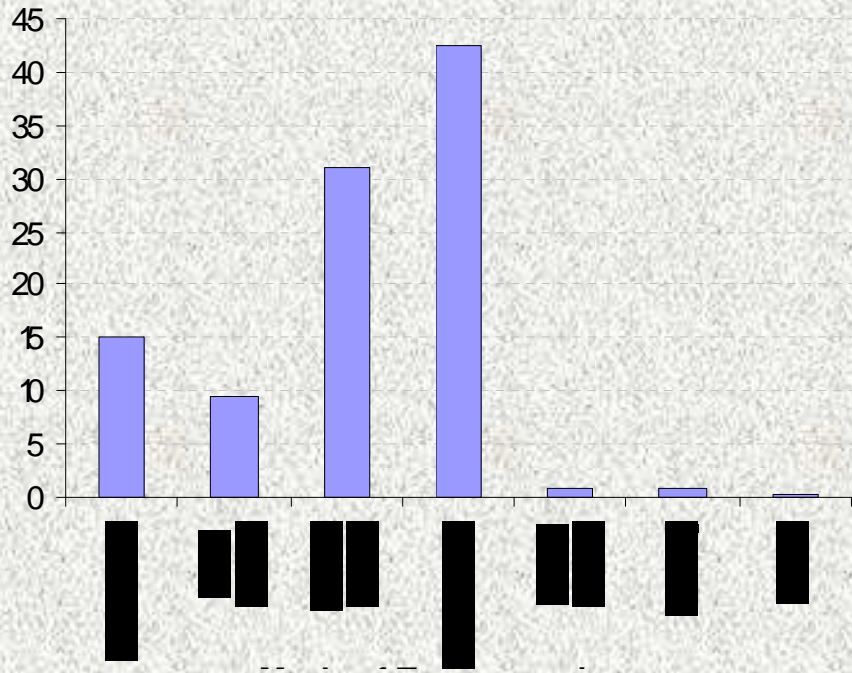




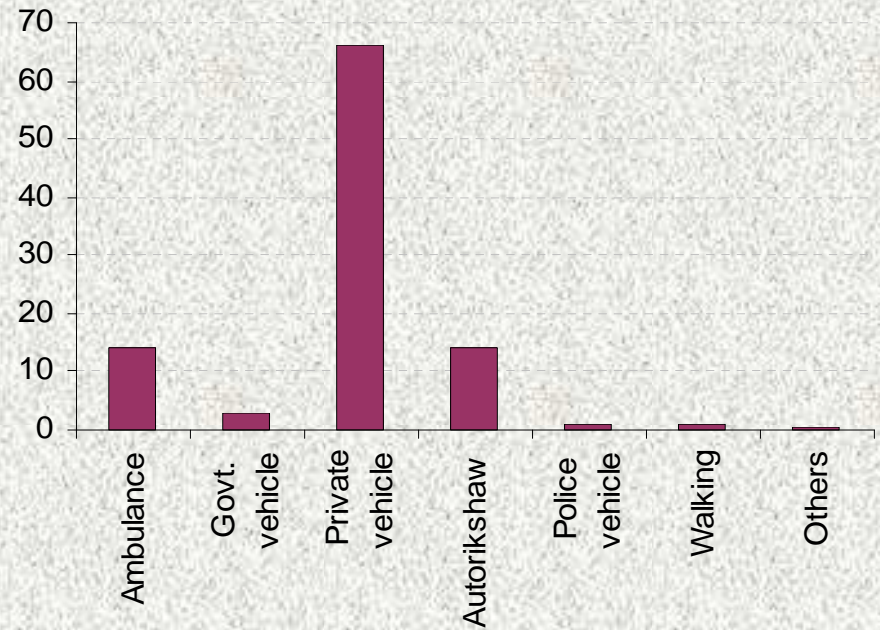
Mode of Transportation (2009)



Urban

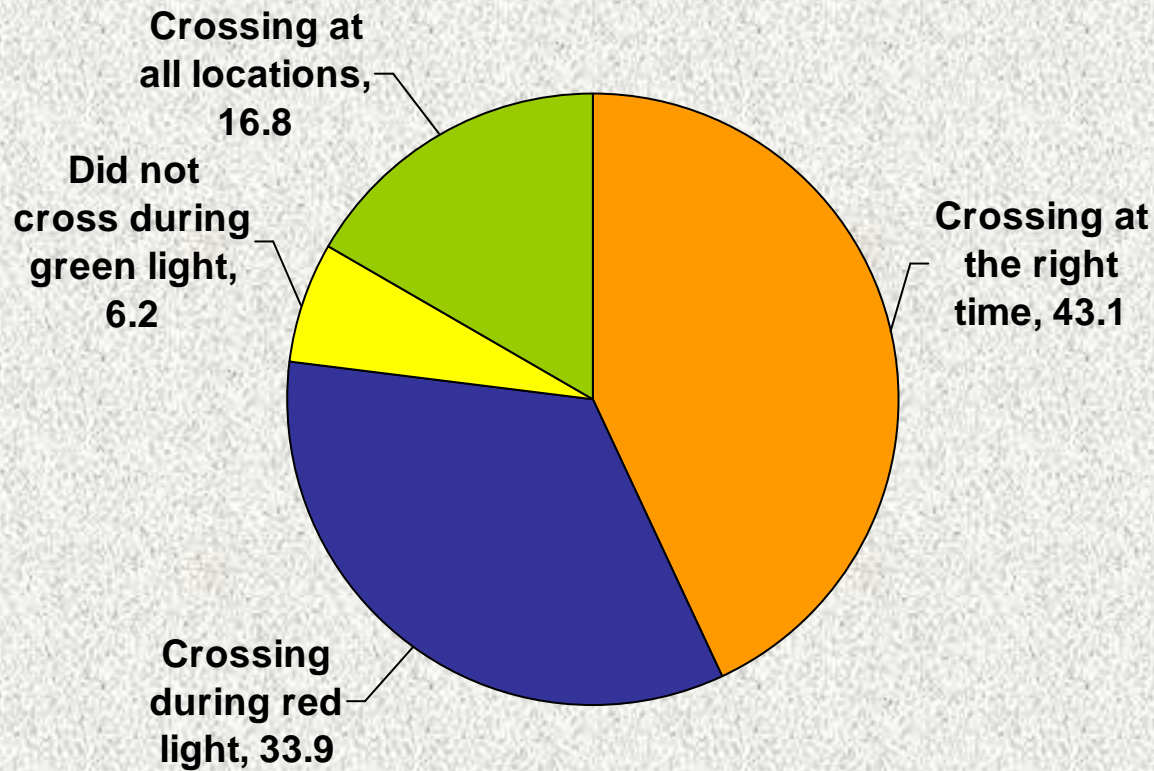


Rural



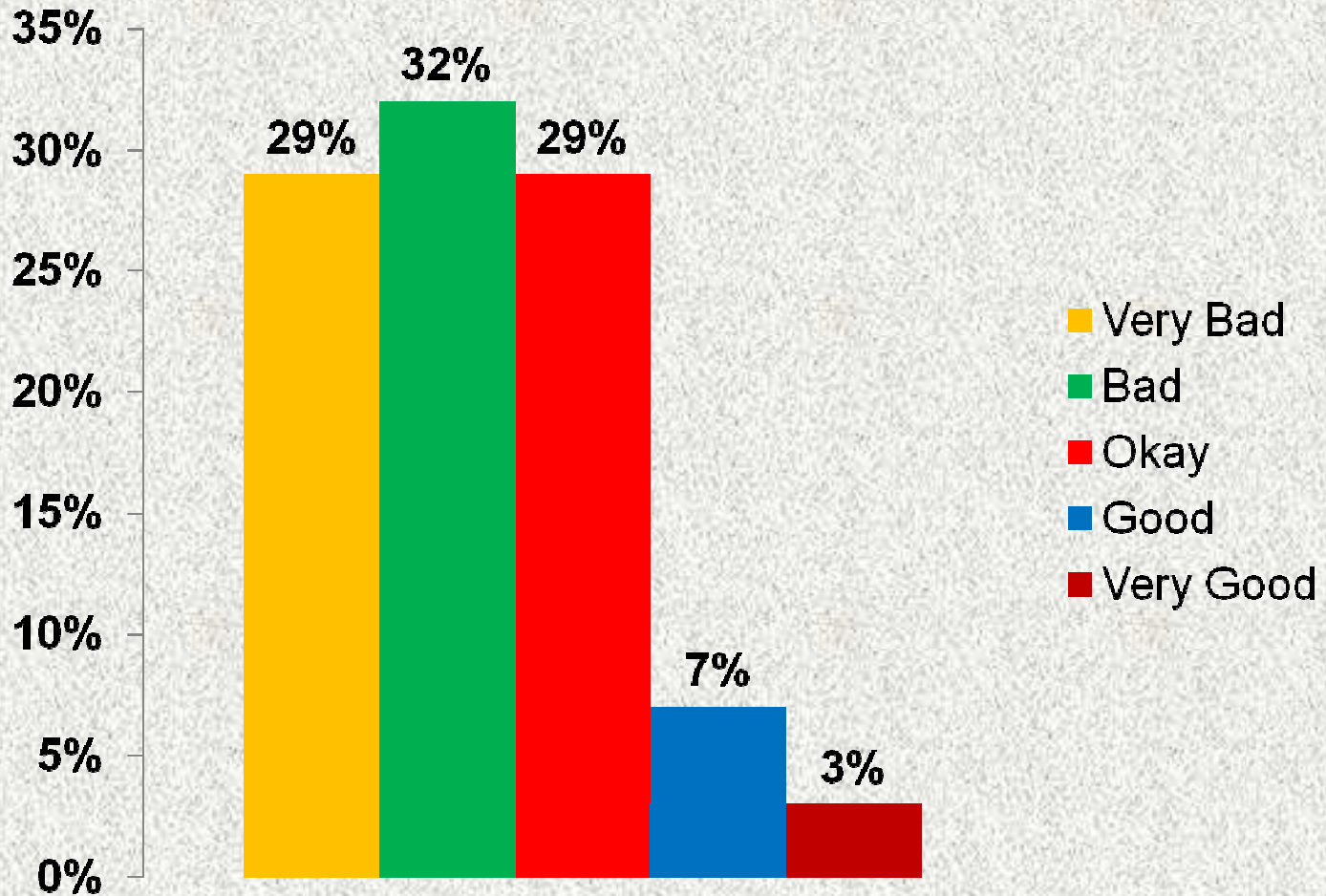


Road crossing behaviour: Results of observational study (%)





Respondents' Ratings of Pedestrians Facilities





Issues and Challenges

- Lack of dedicated road safety institutions
- Lack of integrated transport policies
- Lack of pedestrian friendly policies
- Pedestrian vis-à-vis road safety policies
- Absence of safe designs and standards
- Capacity within policy makers
- ? Crash analysis data – moving beyond surveillance
- ? Other risk factors like alcohol, speed , etc.,
- Budget for promoting walkability
- Pedestrian road behaviours



Towards solutions

- Institutional mechanisms for road safety
- Integrated pedestrian safety policies
- Capacity strengthening programmes
- Improving public transport systems
- Mandatory street design guidelines
- Greater investment in applied research and data
- Targeted pedestrian injury reduction programmes
- ❖ Traffic separation and calming measures
- ❖ Speed management programmes
- ❖ Alcohol control measures
- ❖ Increasing visibility programmes
- ❖ Trauma care programmes







Marking a New Era





Responsibility, Leadership, Coordination - Who?



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**