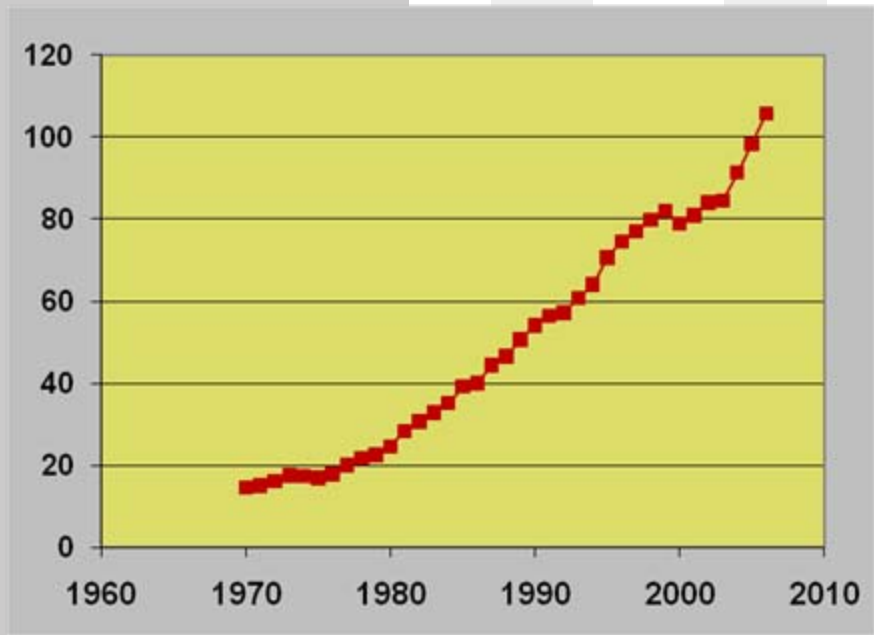


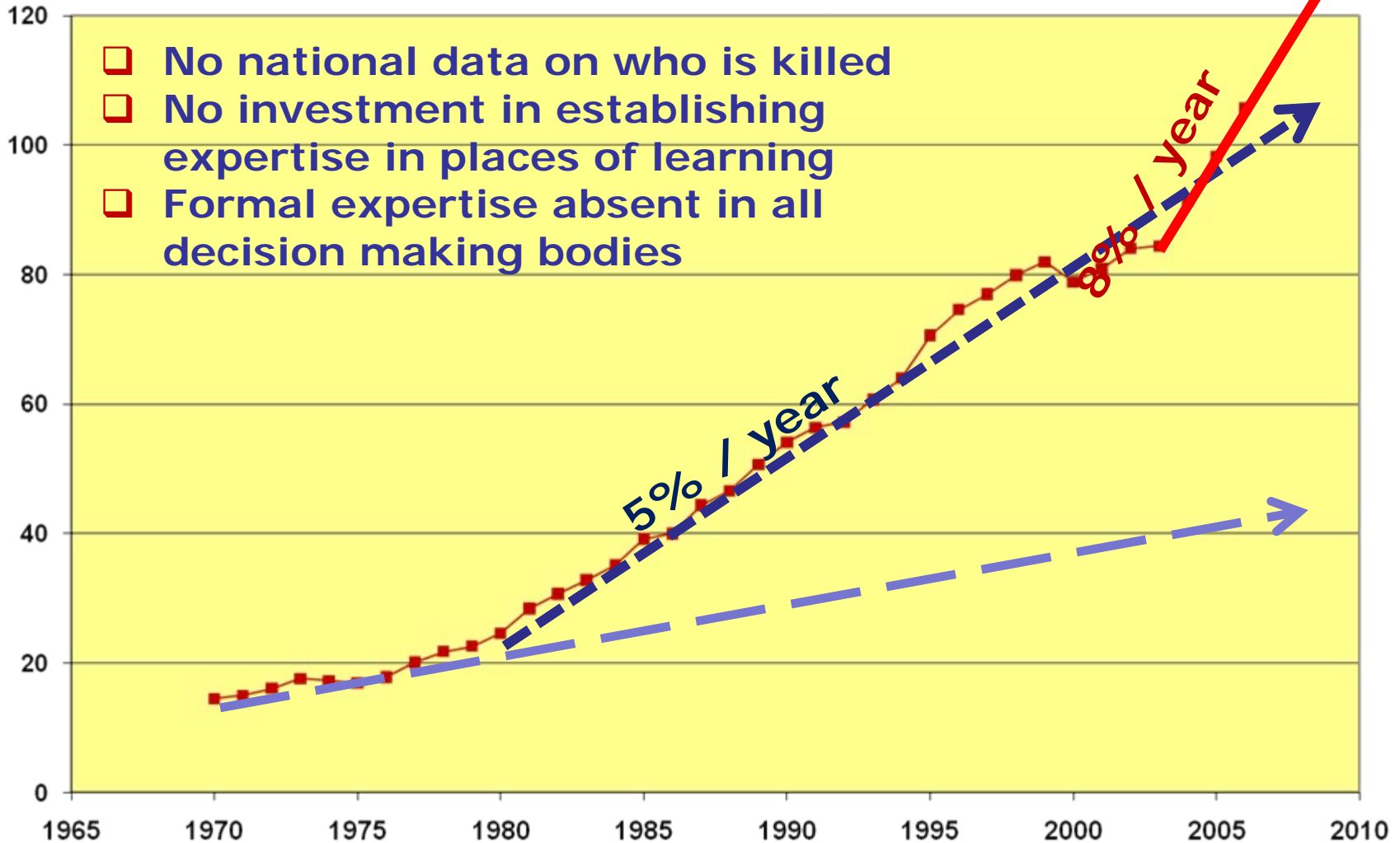
# Perspective on Road Safety in India



Dinesh Mohan



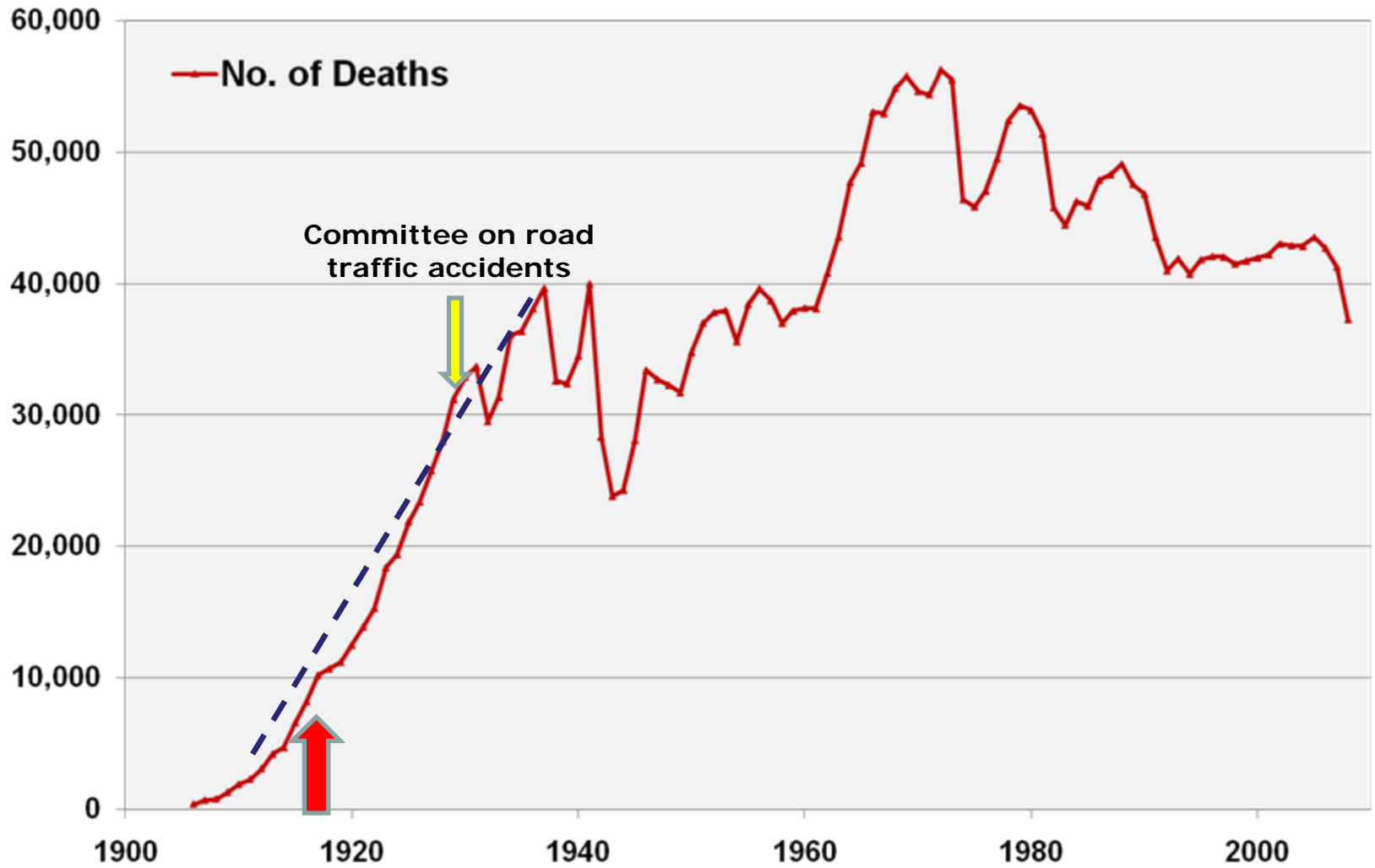
# Persons killed in road traffic crashes in India, thousand



Source: NCRB, 2007

Estimated 1,650,000 hospitalised in 2006

# RTI fatalities USA



## Committee on Traffic Accident Statistics

WASHINGTON • D C • MAY 6, 1930

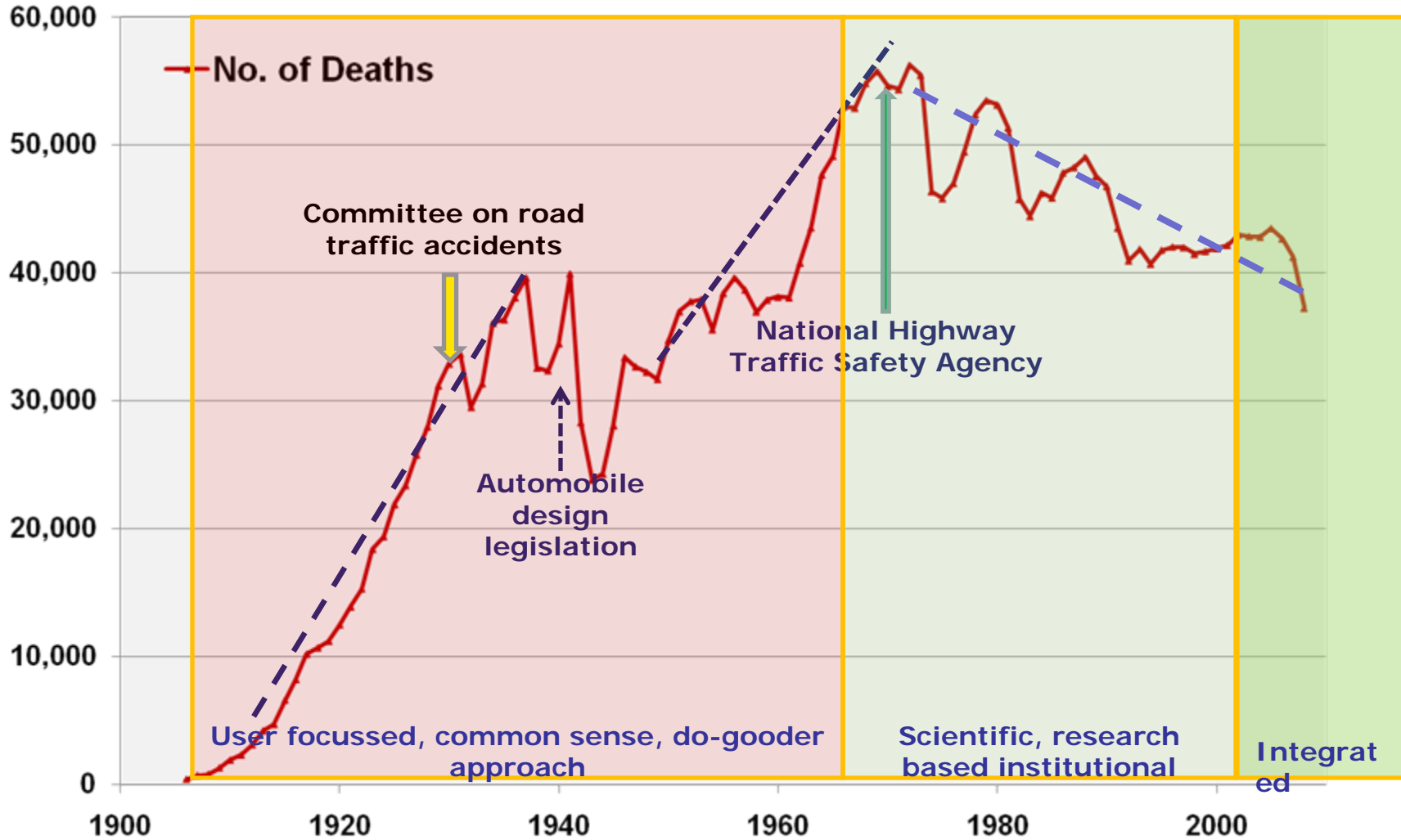
and regrettable increase in the number of street and highway accidents, both fatal and nonfatal, in recent years, and especially in 1929. Attention of the whole nation is sharply focused on this increase, which in 1929 was more than ten per cent, and

6. Whether this recent tendency is due to a more intensive utilization of the average automobile, or to the greater speeds at which now driven, or to a generally more reckless disregard of traffic and safety rules, or to all three factors combined, it is difficult to say. These factors and others doubtless play their

22. The Committee strongly urges that emphasis be given to safety education in the schools. Fatalities to children under 15

28. Accident spot maps or card files should be maintained, to be used primarily to detect points at which accidents occur most frequently, and as a basis for plans to eliminate the conditions

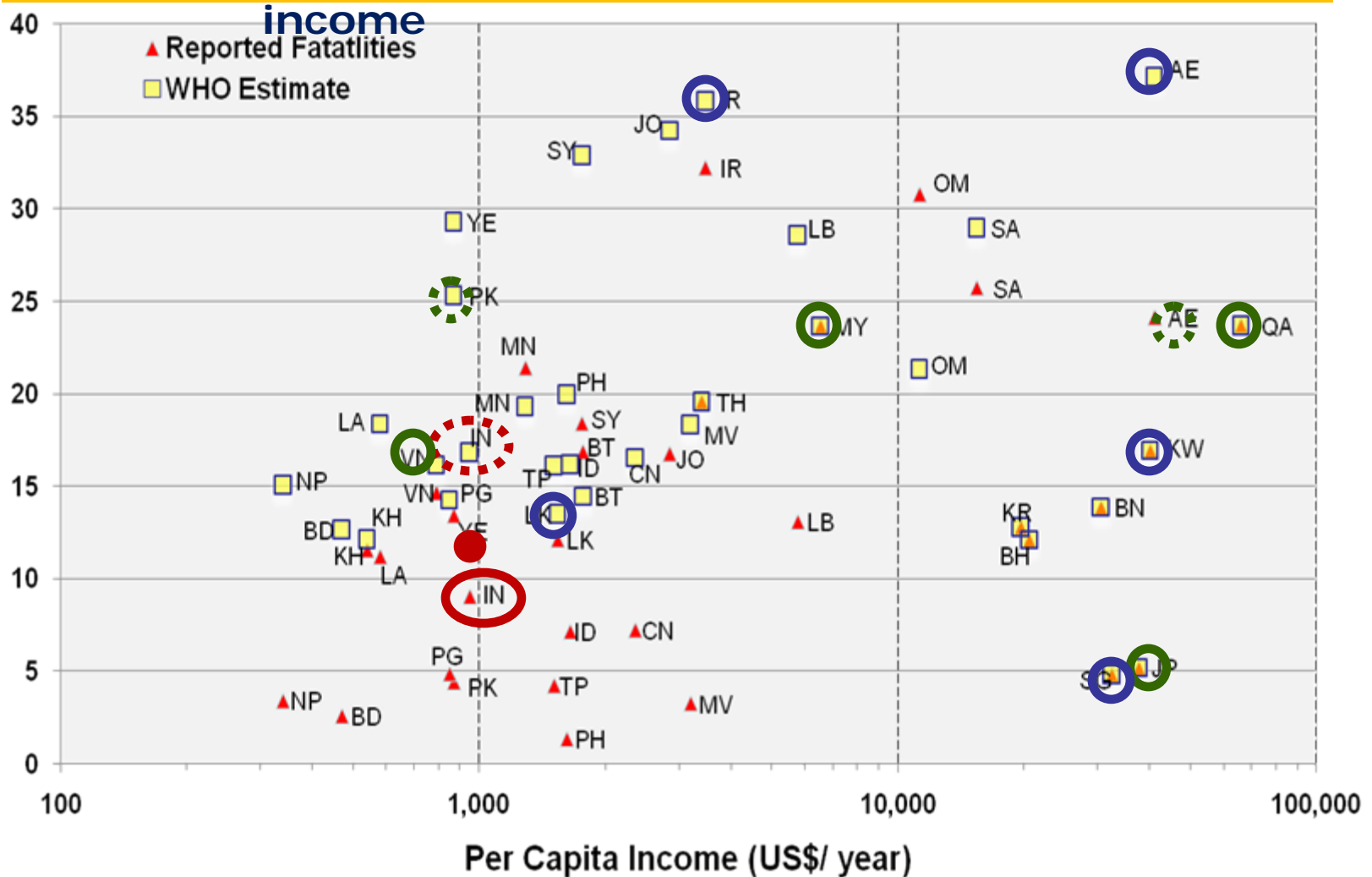
# RTI fatalities USA



# Age distribution of population and traffic fatalities, 2006.

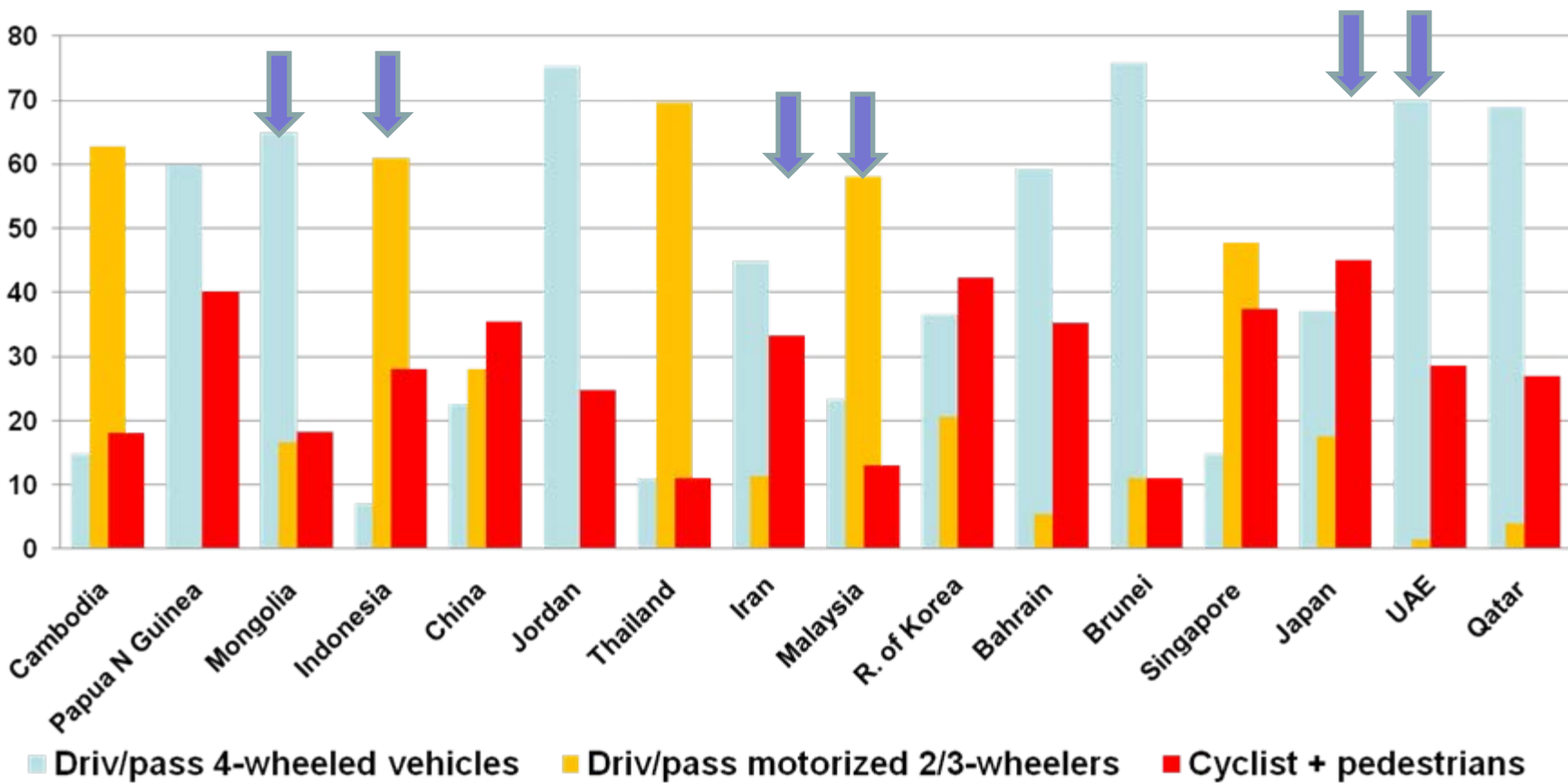
Data collection not necessarily dependent on

High rates possible in rich countries & low in LMIC



# Proportion of RTI fatalities by road user type. Countries are arranged in increasing income form left to right

**RTI modal shares not necessarily income dependent**



# Predictions

Provided that present policies continue into the future, the traffic fatality rate of India, for example, will not begin to decline until **2042** -----

**192,000 fatalities**  
*TRAFFIC FATALITIES AND ECONOMIC GROWTH, Elizabeth Kopits, Maureen Cropper, World Bank Policy Research Working Paper 2005, April 2005*

**GOOD NEWS ONLY IF WE DO OUR OWN RESEARCH AND AND INTRODUCE DESIGN INNOVATIONS**

that incorporates the cyclically varying nature of a society's concerns for safety, predicts an earlier date of **2030** for the

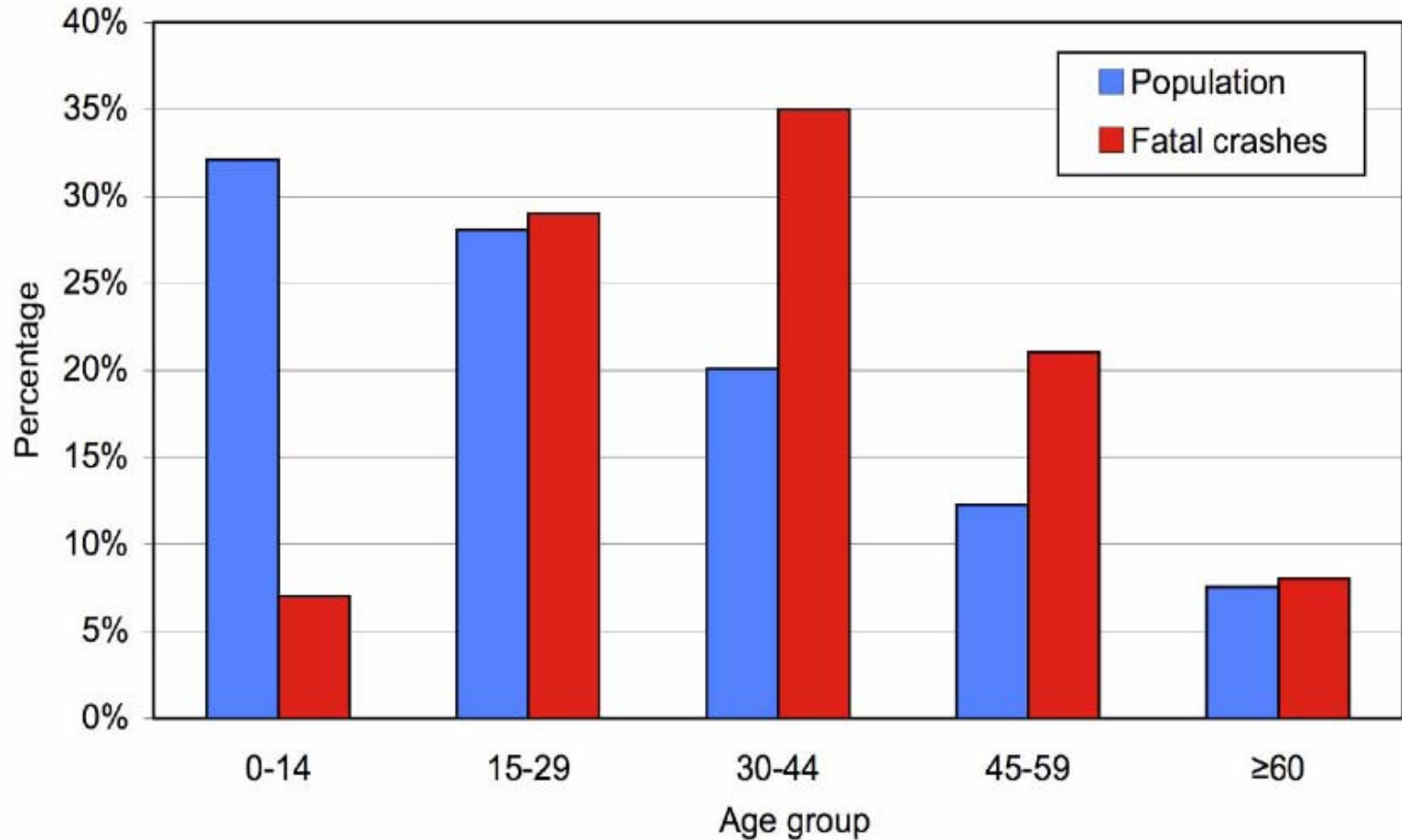
**peak traffic fatalities in India.**  
*Koornstra, M. (2007) Prediction of traffic fatalities and prospects for mobility becoming sustainable-safe, Sadhna - Academy Proceedings in Engineering Sciences, Vol. 32, No. 4, 365-396.*

**At present rates fatalities may peak at 260,000!**



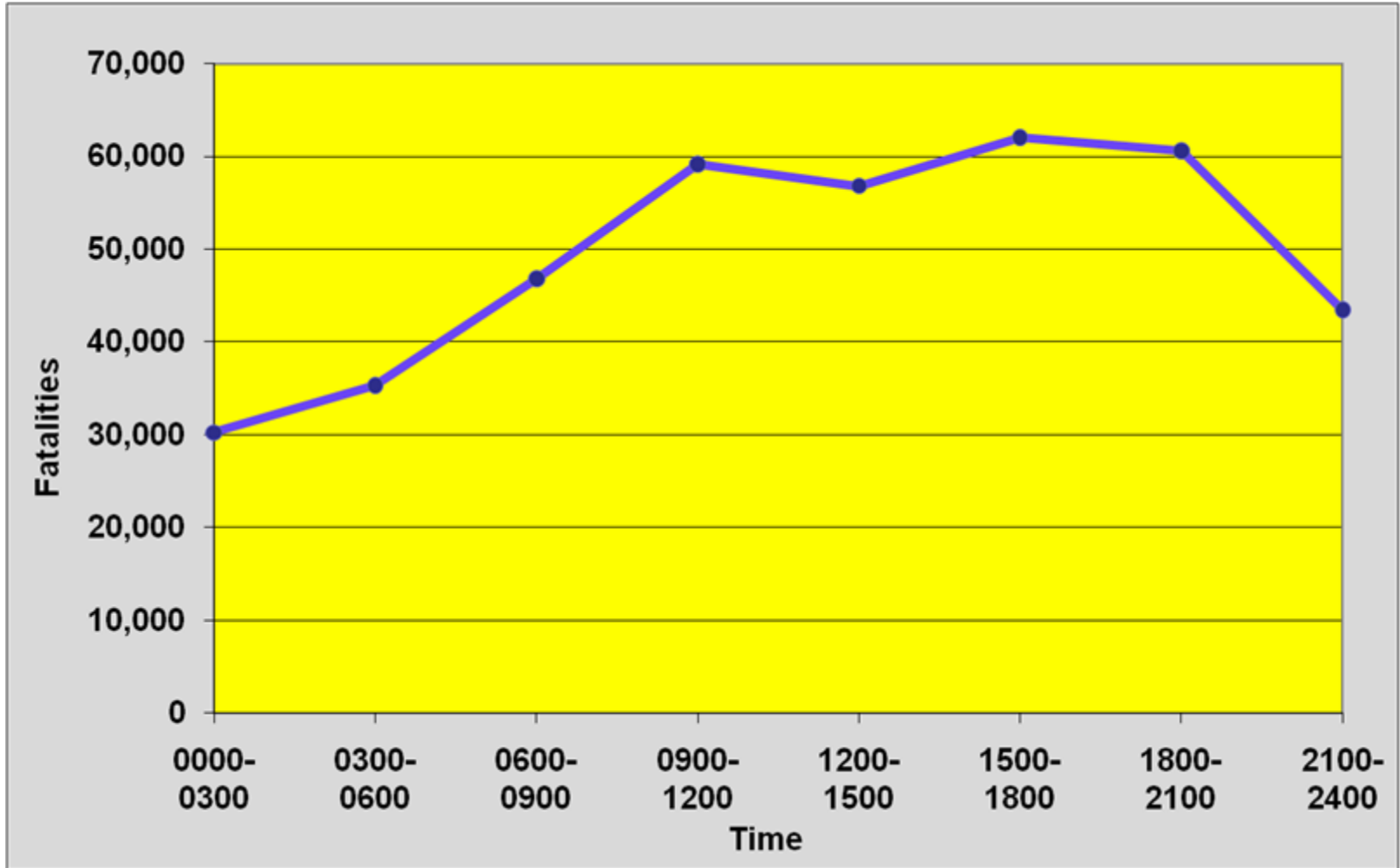


## Age distribution of population and traffic fatalities, 2006.



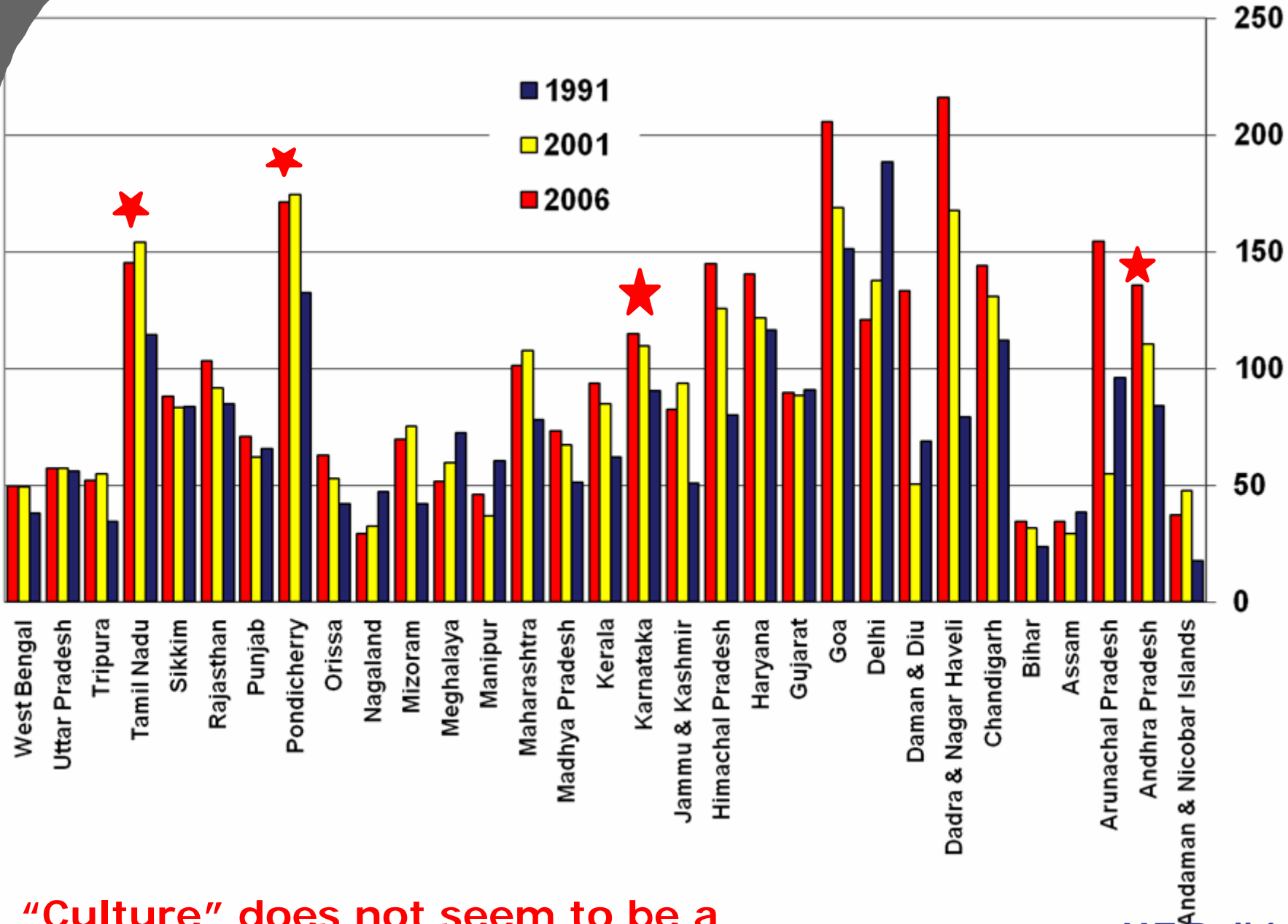
**Children fatalities: 2 per 100,000 persons in India**

## Traffic fatalities by time of day, India 2006.



**High night rates – alcohol, speed, conspicuity**

# Fatalities per million persons – states and UT

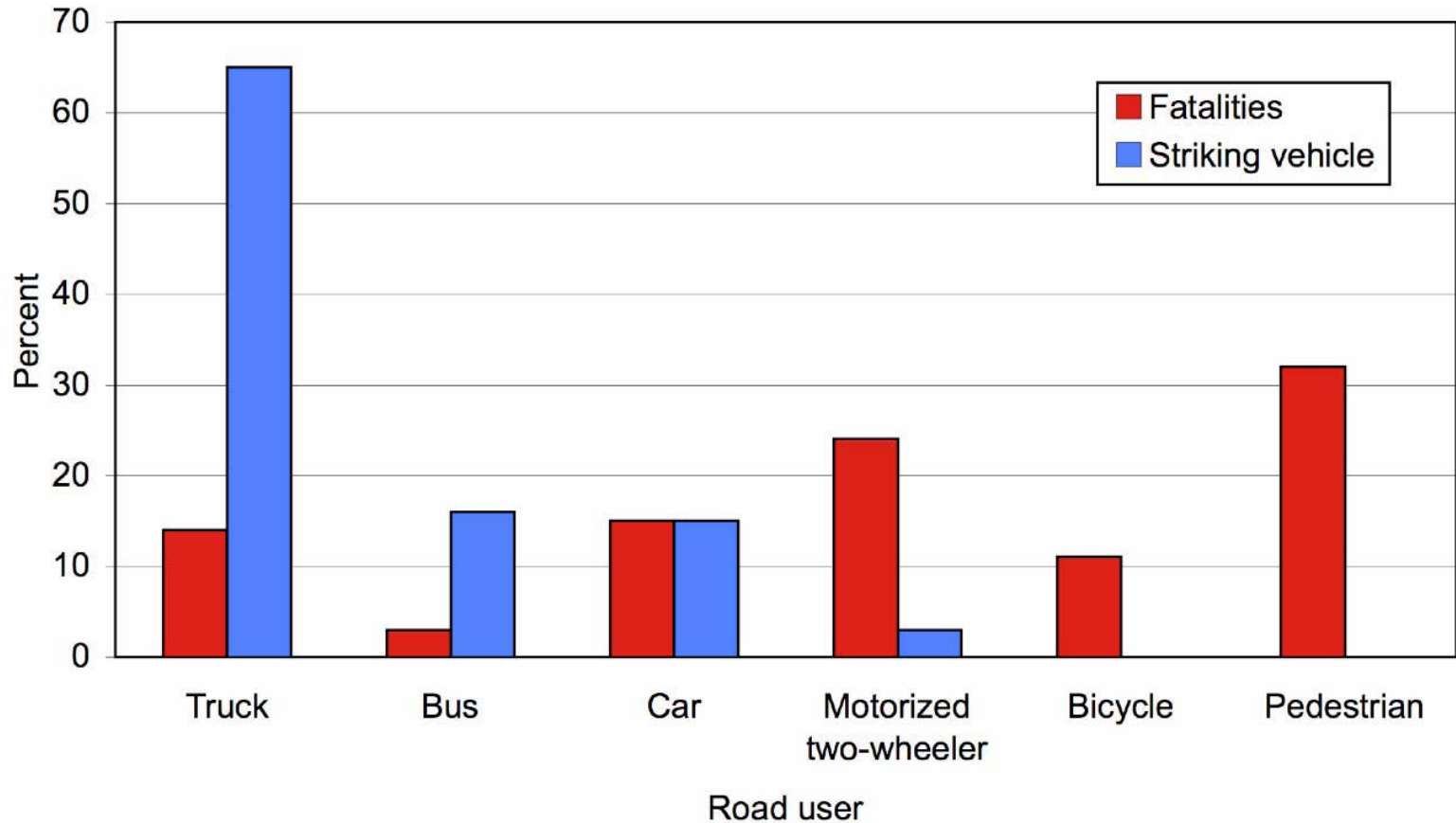


**“Culture” does not seem to be a determining factor**

## Fatality rates in selected countries, 2006.

Country	Vehicles per 100 persons	Fatalities per 100,000 persons
Sweden	51	4.9
Netherlands	48	4.9
United Kingdom	51	5.3
Switzerland	56	5.5
Norway	55	5.6
Denmark	44	6.1
Iceland	72	6.4
Germany	58	6.5
Japan	59	6.6
<b>India</b>	<b>7</b>	<b>9.5</b>

# Traffic fatalities and striking vehicle by road-user type on national highways, 1999



Source: Tiwari, Mohan, and Gupta, 2000

# Highway design?



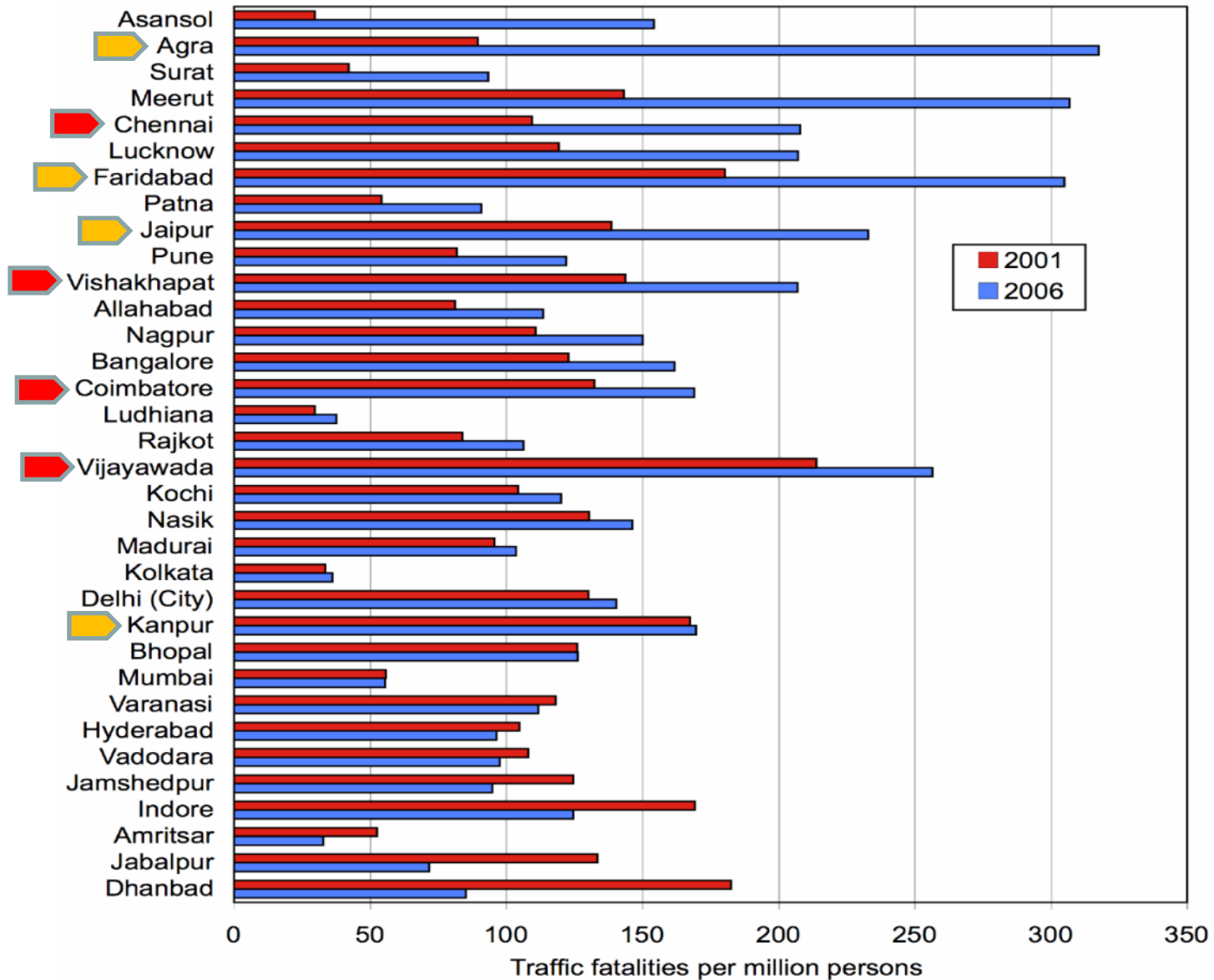
## SUMMARY - HIGHWAYS

- Construction of four-lane divided highways has not reduced fatality rates.
- Pedestrians, bicyclists account for a large proportion of fatalities.
- High incidence of fatal rear-end crashes.
- High incidence of headon crashes on divided highways.

## CONCLUSIONS

- Redesign of intercity roads with separation of slow and fast modes – continuous service roads (?)
- Safe and convenient road crossings at frequent intervals - 1 km (?)
- Wider and solid shoulders
- Truck rear ends more conspicuous
- Speed control, especially in inhabited areas

# Traffic fatality rates in cities with populations of at least one million, 2001 and 2006

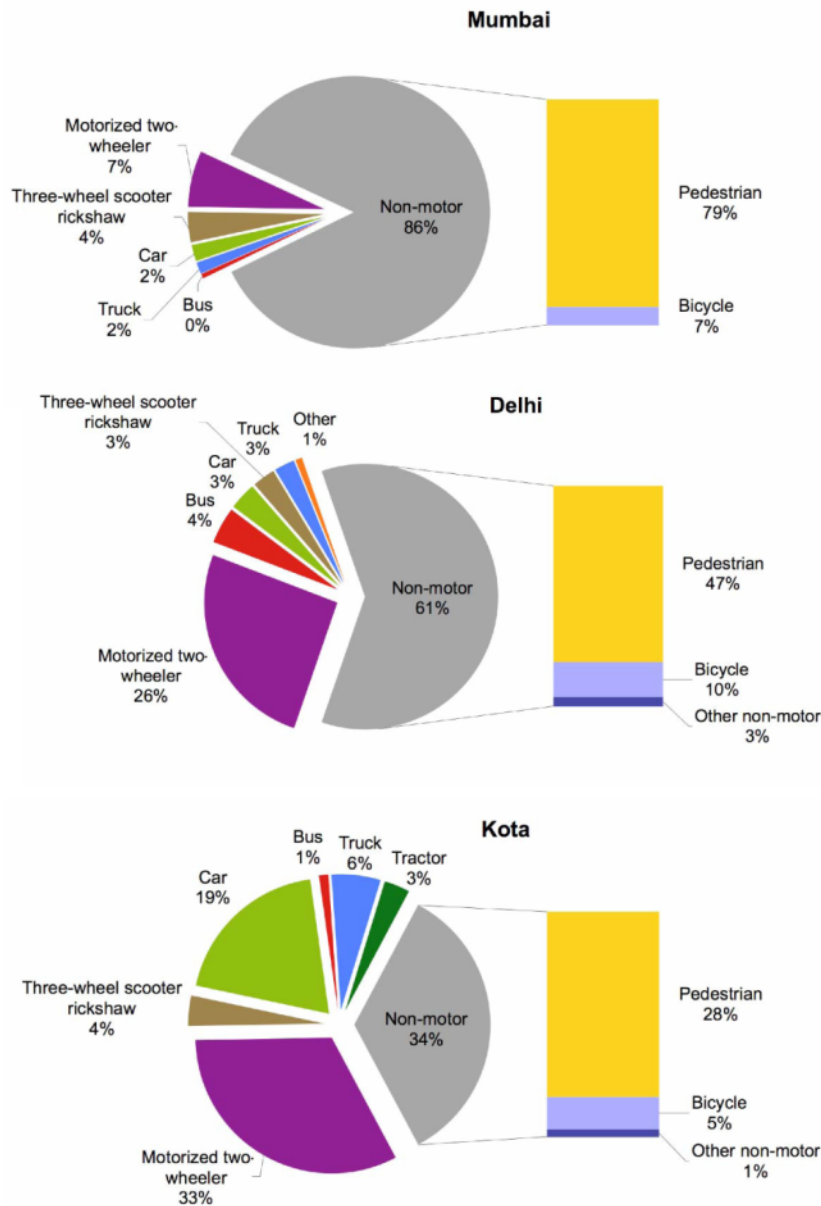


Source: NCRB, 2007

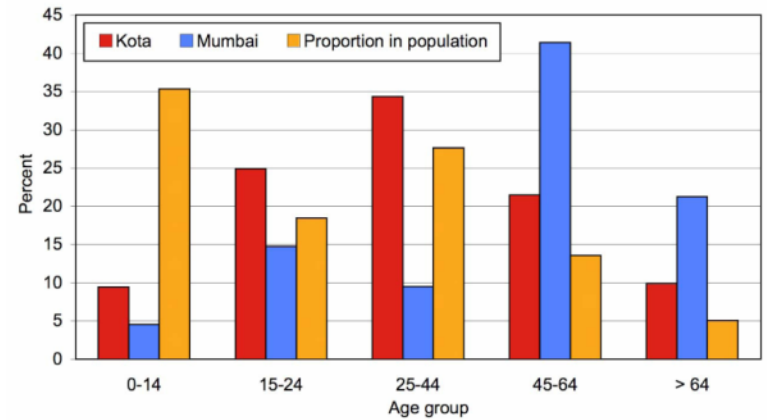
**Increase 2-5 times in 5 years in**



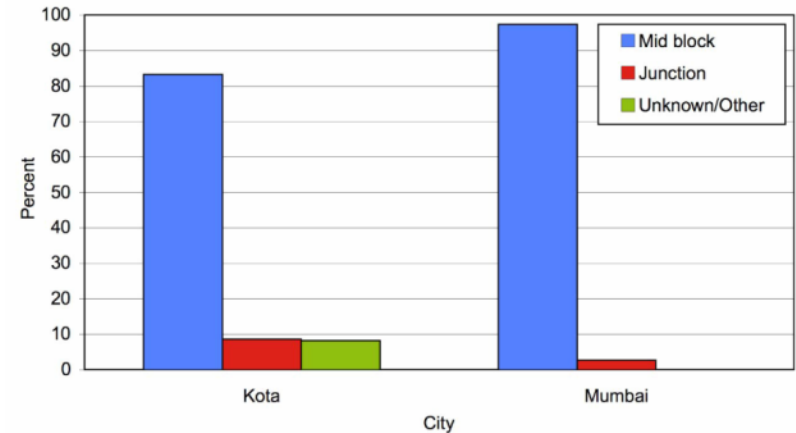
## Fatalities by road user in Delhi (2001-2005), Mumbai (1996-1997), and Kota (2007)



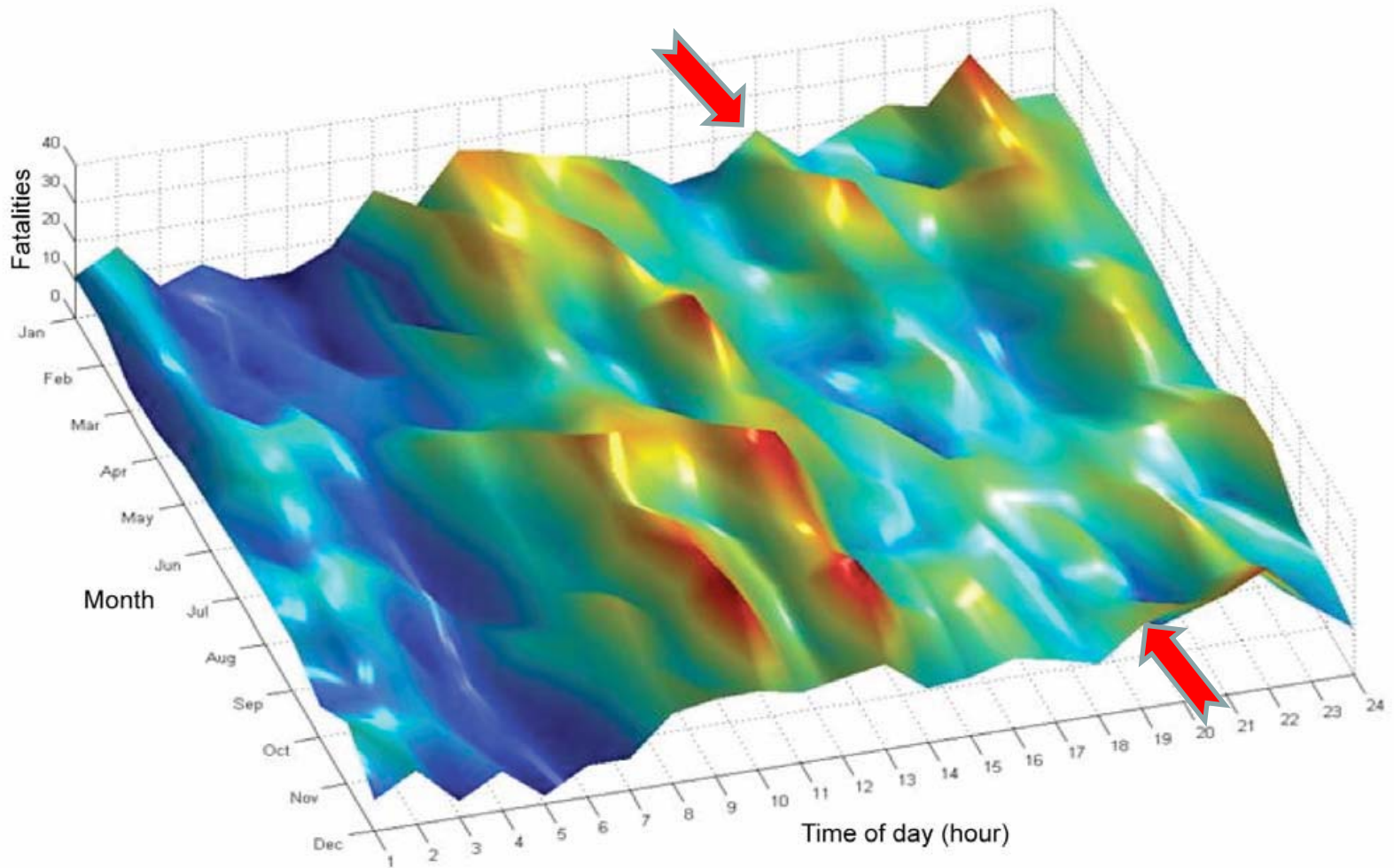
## Traffic fatalities by age group in Kota and Mumbai



## Locations of fatal crashes in Kota (2007) and Mumbai (1996-1997)

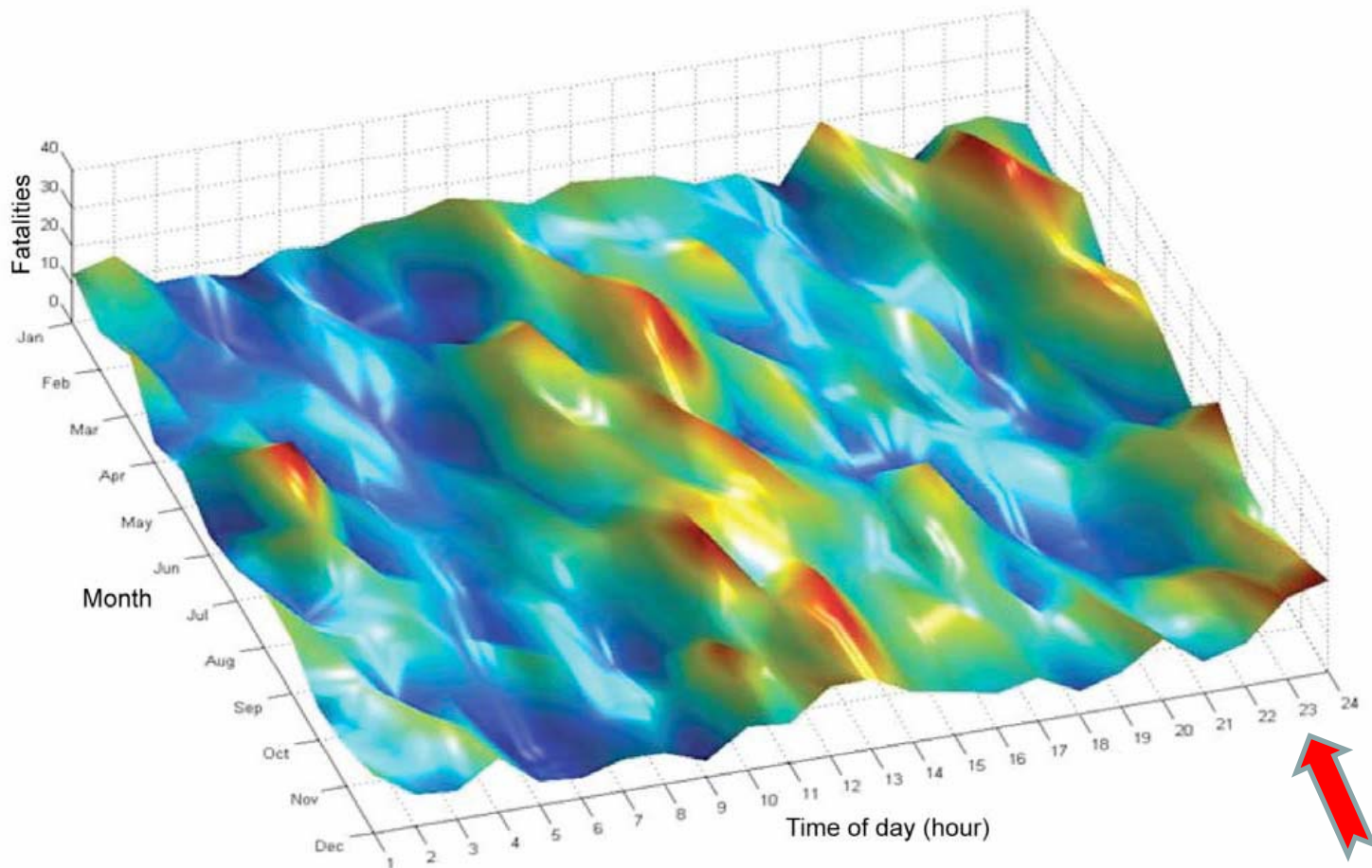


# Fatalities of unprotected road users by month and time of day in Delhi, 2001-2005



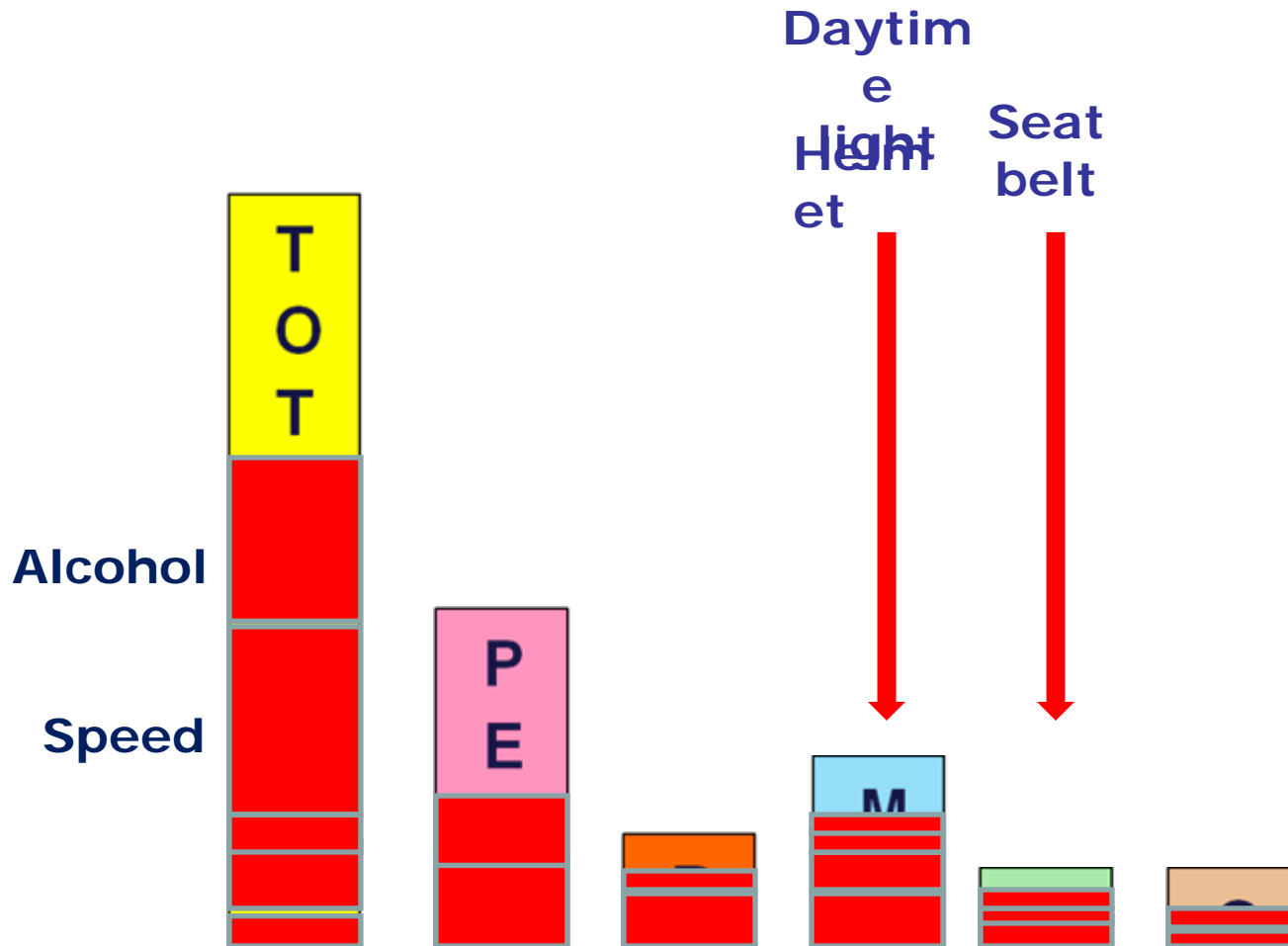
Lighting and visibility

# Fatalities of motorised road users by month and time of day in Delhi, 2001-2005



**Speed & alcohol checking essential**

# A thought exercise on effect of interventions



Speed & alcohol checking essential

# Conclusions

- ❑ ***Pedestrians and other non-motorists in urban areas***
  - ***Separation of traffic on arterial roads and traffic calming in all other areas – clear & continuous pedestrian paths mandatory on all arterial roads***
  - ***Speed control, use of scientifically designed roundabouts instead of traffic lights, no free left turns***
  - ***Pedestrian impact standards for all vehicles***
- ❑ ***Motorcycles and small cars in urban areas***
  - ***Daytime running lights for motorcycles***
  - ***Enforcement of motorcyclist helmet-use laws in all states***
  - ***Mandatory airbags for all cars, may be cost effective***
    - when enforcement measures are lacking***

# Conclusions – contd.

## **❑ Pedestrians, other non-motorists, and slow vehicles on highways**

➤ *Highway designs to be modified to separate slow vehicles and pedestrians – service lanes all along the highway*

➤ *Convenient road crossing facilities at frequent intervals*

➤ *Speed control*

## **❑ Over-involvement of trucks and buses**

➤ *Speed control by use of data loggers and GPS systems*

➤ *Safer vehicle fronts and improved vehicle conspicuity*

➤ *Research to understand the needs of local traffic and to develop standards for breaks in medians (to reduce wrong way driving)*

# Conclusions – systems

- ❑ **India specific solutions essential, otherwise deaths may not reduce before 2030 ( ~ 260,000 fatalities)**
- ❑ ***Random breathalyzer tests at night on all highways and urban areas***
- ❑ ***Only possible when promoted by a National Road Safety Board***
- ❑ ***Revamp data collection procedures***
- ❑ ***All data in public domain***
- ❑ ***Compulsory road safety course in all civil engineering departments***
- ❑ ***Establish at least 4-5 road safety research centres in existing institutions within the current 5 year plan ( ~ Rs 10 crores per centre initially)***