

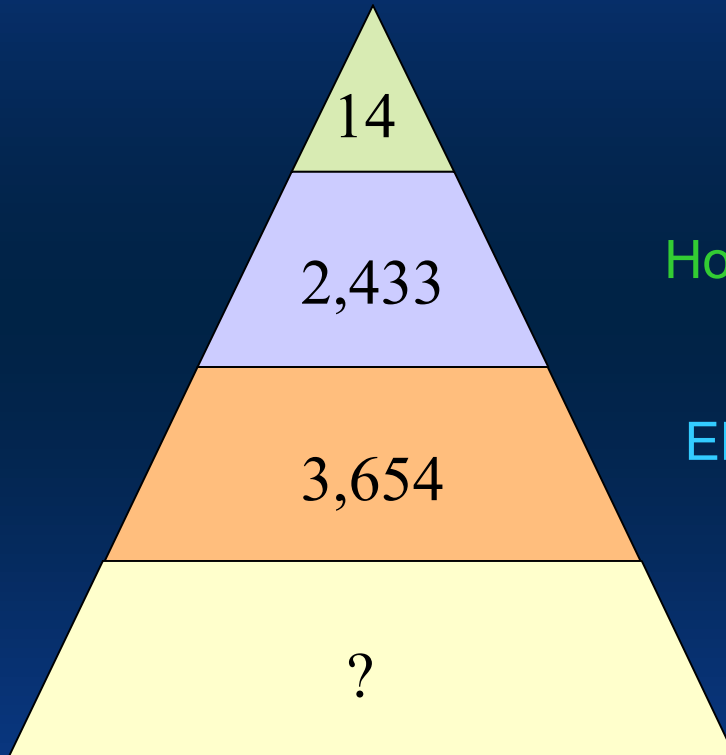


Victorian bicycling and pedestrian (transport) injuries

Erin Cassell & Angela Clapperton
Victorian Injury Surveillance Unit (VISU)
Monash University Accident Research Centre



Bicycling 2006



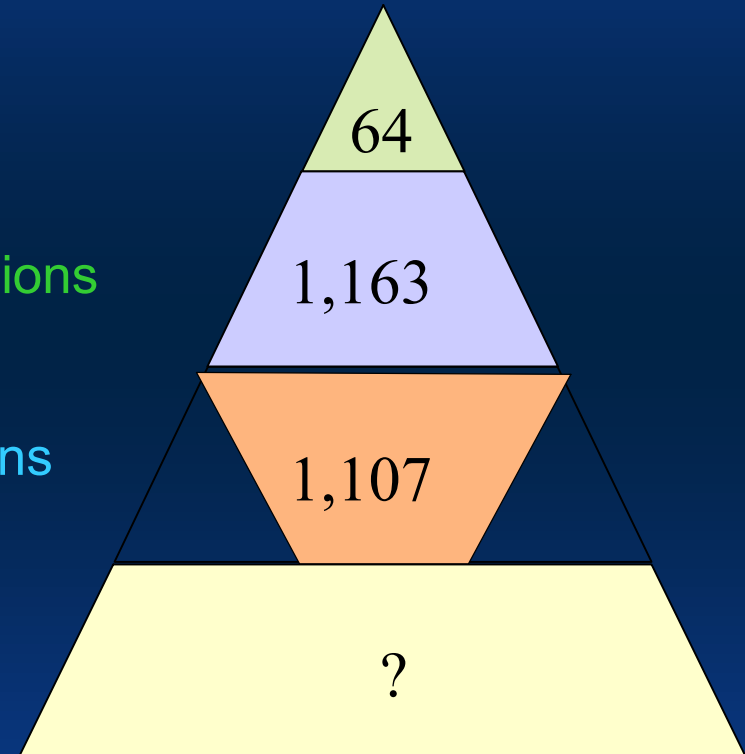
Deaths

Hospital admissions

ED presentations

Other
(GPs etc.)

Pedestrian 2006*



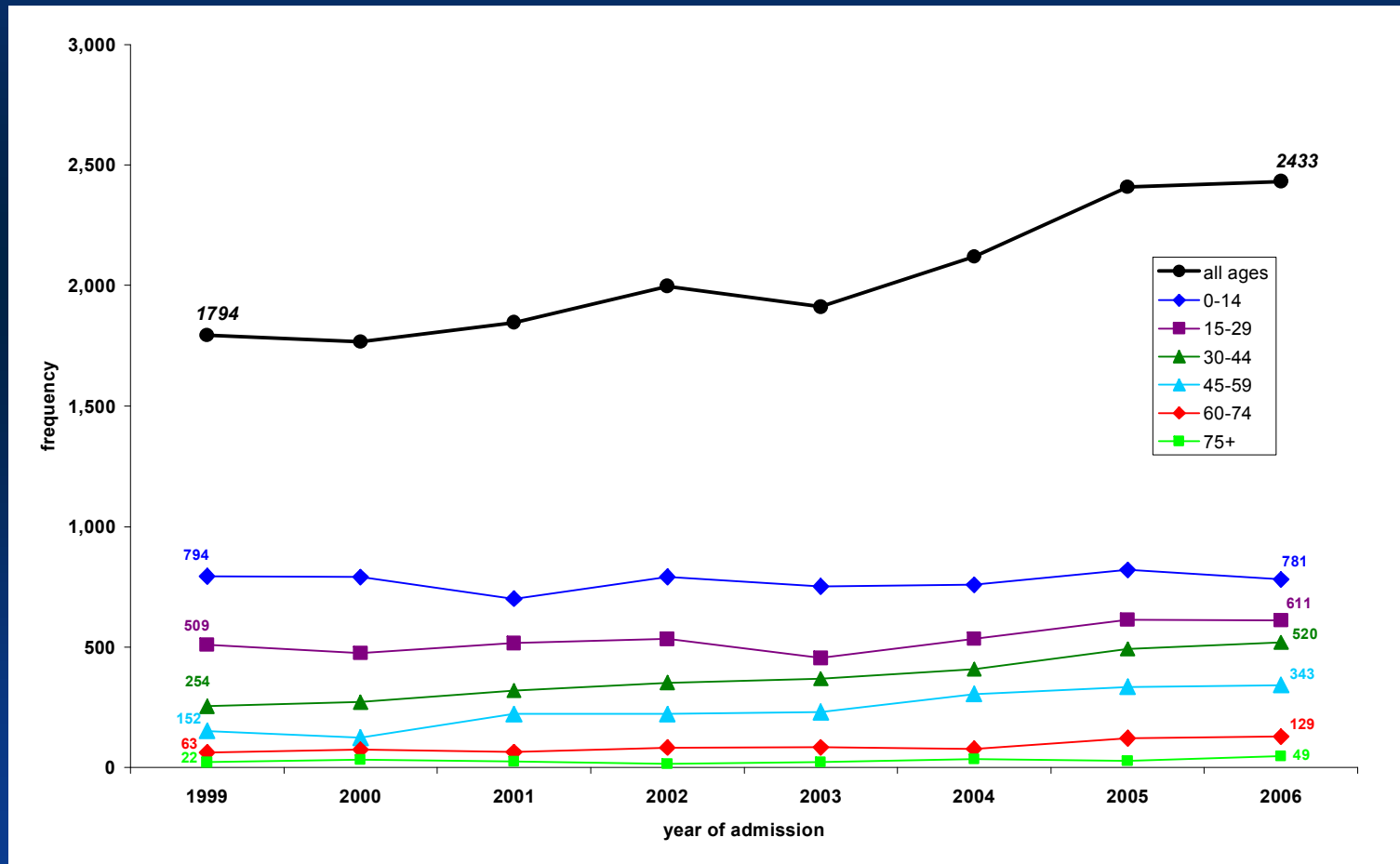
Bicycling injury (hospital-treated cases)

Bicycling injury, Victoria 2006

	Hospital admissions	ED presentations (non-admissions)	All hospital-treated cases
Traffic "on-road"	44% (n=1,068)	60% (n=2,183)	53% (n=3,251)
Non-traffic "off-road"	54% (n=1,319)	34% (n=1,251)	42% (n=2,570)
Other and unspecified	2% (n=46)	6% (n=220)	4% (n=266)
All	100% (n=2,433)	100% (n=3,654)	100% (n=6,087)



Trend in number of hospital admissions for bicycling injury: Victoria, 1999-2006





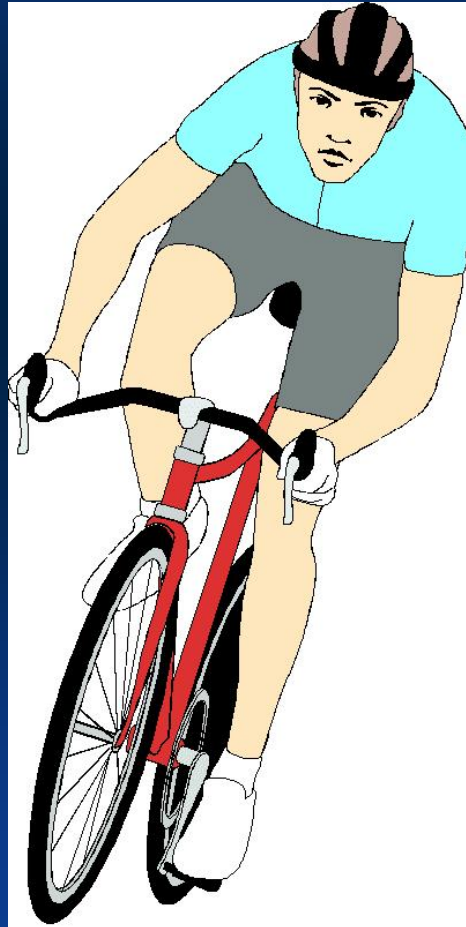
Body site injured, Victoria 2004-6

Trunk, 11%, 6%

Hip & thigh, 5%, 2%

Knee & lower leg, 12%, 11%

Ankle & foot, 2%, 7%



Head & face, 26%, 18%

Neck, 3%, 1%

Shoulder & upper arm, 13%, 13%

Forearm & elbow, 21%, 15%

Wrist & hand, 7%, 17%

Hospital admissions (n=6,962)

ED presentations (n=10,221)

Bicycling injury type, Victoria 2004-6

	Admissions (n=6,962)	ED presentations (n=10,221)
Fracture	52%	24%
Open wound	16%	20%
Dislocation, sprain/strain	5%	20%
Superficial injury	5%	17%
Intracranial injury	8%	2%
Injury to internal organs	3%	<1%
Other and unspecified	11%	16%



Bicycling injury causes, Victoria 2004-6

	Admissions (n=6,962)
Non-collision incident	48%
Collision with car, pick up truck or van	15%
Collision with fixed or stationary object	5%
Collision with other pedal cyclist	3%
Collision with pedestrian or animal	1%
Other and unspecified	28%



Prevention Measures: Bicycling

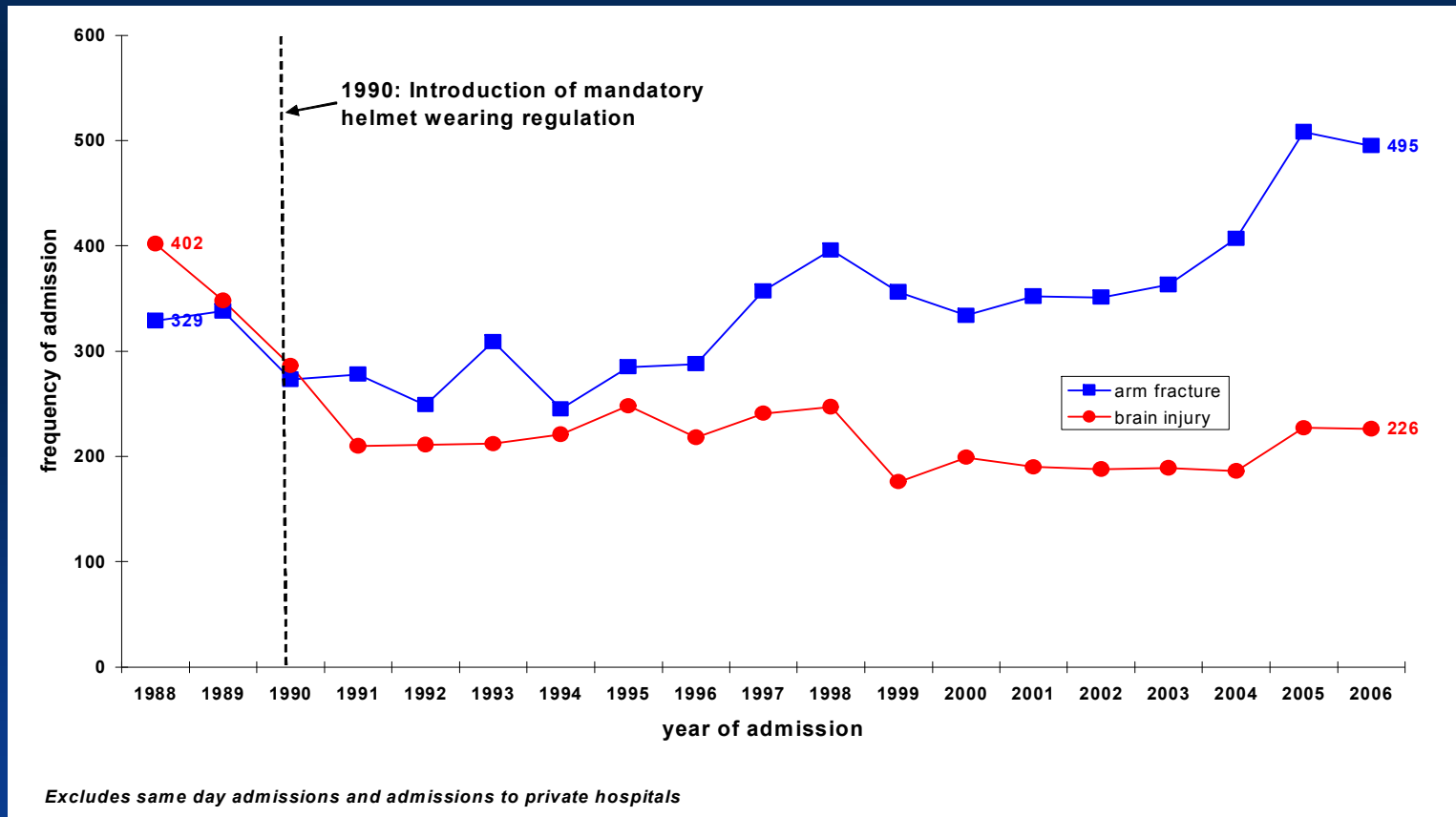
- **Helmet wearing**
 - **Enforcement necessary**
- **Increase visibility**
 - **Fluorescent stickers on bags/coat**
 - **Reflective material, flashing lights (front & rear), 'smart' lights.**



Helmet wearing effectiveness:

Trend in frequency of bicycling-related admissions for brain injury compared with arm fracture

Victoria 1988-2006





Prevention Measures Bicycling

- **Helmet wearing**
 - Including enforcement of compliance
- **Increase visibility**
 - Fluorescent stickers on bags/coat
 - Reflective material, flashing lights (front & rear), 'smart' lights.

Prevention Measures: Bicycling

- **Skills training**
 - Child on and off-road training plus on-going supervision (? effectiveness)
 - Defer bicycling debut to ages 6 or 7
- **Improve bicycling infrastructure**
 - Intersection safety high priority – simplify
 - Traffic calming?, road surface improvement
 - Separation (lanes?, paths, routes, networks)



Prevention Measures: Bicycling

- **Lower vehicle speed limits**

- **Default 50km/h vehicle speed limit in built up areas
→ 30% (NS) reduction in bicycle crashes (NSW)**
- **Lower limit to 30km/h in high-risk areas**

- **Improve bicycle & vehicle design**

- **Retractable handlebars, noseless & gel-filled seats**
- **Motor vehicle frontal design changes (forgiving bumpers, bonnet, windscreens; no/less aggressive bull bars); use of daytime running lights**
- **Regular bicycle maintenance**

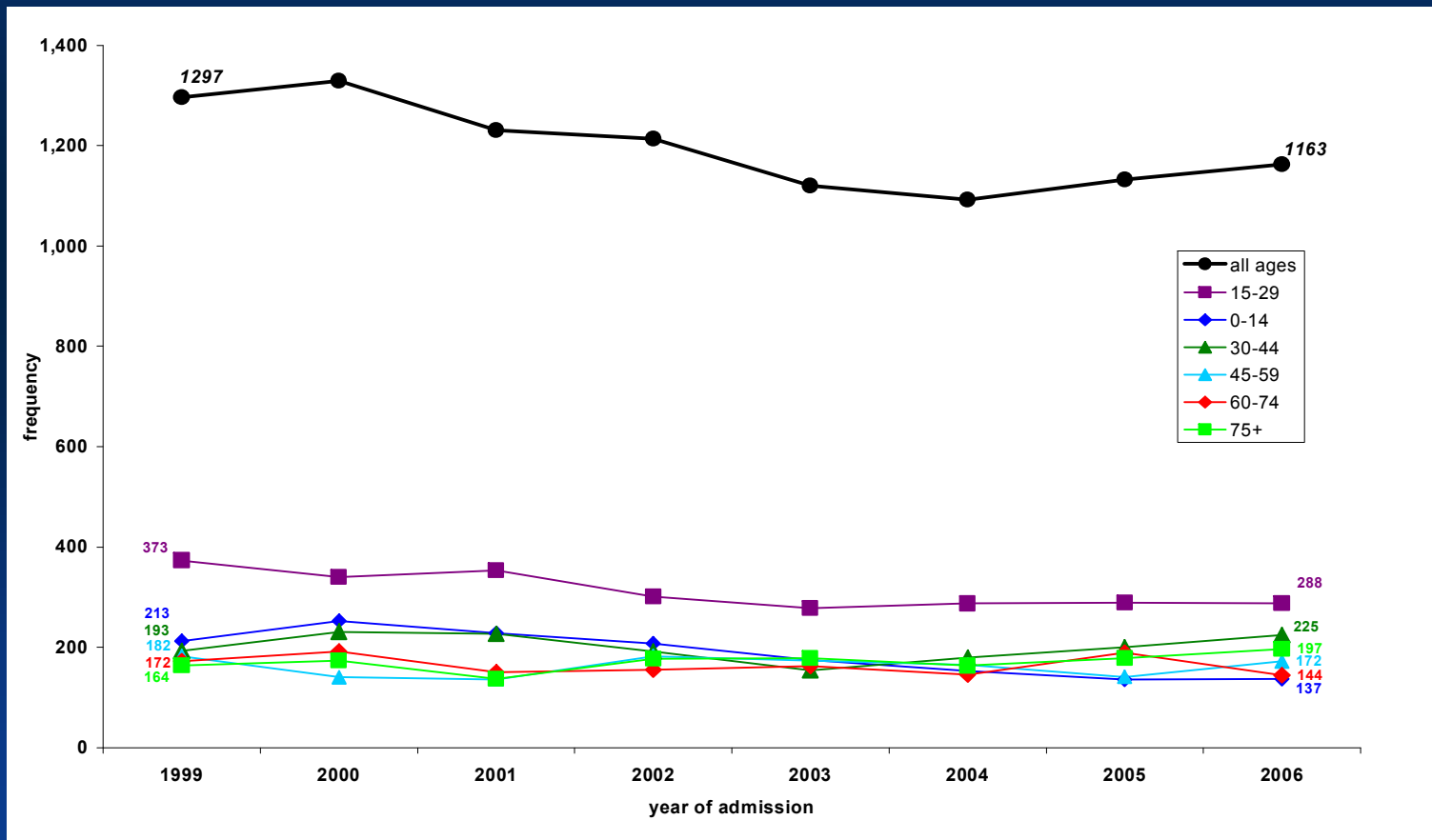
Pedestrian injury (hospital-treated)

Pedestrian injury, Victoria 2006

	Hospital Admissions	ED presentations (non-admissions)	All hospital-treated injury cases
Traffic “on-road”	74% (n=865)	50% (n=559)	63% (n=1,424)
Non-traffic “off-road”	17% (n=203)	43% (n=476)	30% (n=679)
Other and unspecified	8% (n=95)	7% (n=72)	7% (n=167)
All	100% (n=1,163)	100% (n=1,107)	100% (n=2,270)



Trend in number of hospital admissions for pedestrian injury by age group Victoria, 1999-2006



Body site injured, Victoria 2004-6

	Admissions (n=3,387)	ED presentations (n=3,029)
Head, face and neck	32%	14%
Trunk	16%	5%
Upper extremity	16%	20%
Lower extremity (mostly knee & lower leg)	35%	45%
Other & unspecified	2%	16%

Injury type, Victoria 2004-6

	Admissions (n=3,387)	ED presentations (3,029)
Fracture	49%	14%
Open wound	8%	13%
Dislocation, sprain/strain	3%	27%
Superficial injury	10%	19%
Intracranial injury	13%	<1%
Other and unspecified	17%	26%

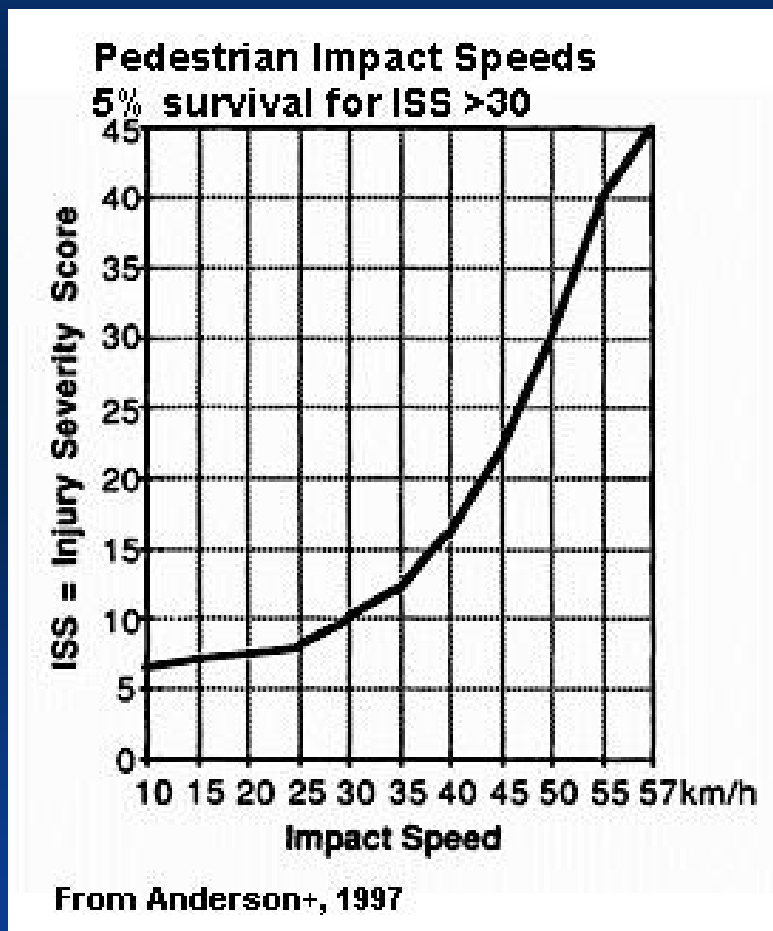
Injury causes, Victoria 2004-6

	Admissions (n=3,387)
Collision with car, pick up truck or van	79%
Collision with bus or truck	3%
Collision with pedal cyclist	3%
Collision with other non-motor vehicle	2%
Collision with 2 or 3 wheeled motor vehicle	2%
Collision with railway train or vehicle	1%
Other and unspecified	10%

Prevention Measures: Pedestrians

- **Improve pedestrian infrastructure**
 - Traffic calming measures
 - Crossings (zebra?), medians, refuges, kerb extensions, raised platforms
- **Lower vehicle speed limits**
 - default 50km in built up areas →25-40% reduction in fatal & serious pedestrian injury crashes (Victoria)
 - Reduce to 30km/h in high risk areas

Risk of pedestrian death as a function of vehicle impact speed



Prevention Measures: Pedestrians

- **Reduce alcohol crashes (13% adult pedestrian crashes - Vic)**
 - Upgrade road lighting, limit parking near hotels, direct pedestrians to safer crossing points (erect barriers/fencing, change hotel entrances)
 - Highly responsive pedestrian lights, good lane marking, refuges, skid resistant pavement, driver warnings
 - Responsible service of alcohol



Prevention Measures: New technologies

- **Intelligent Transport Systems (ITS):**
 - pedestrians & bicyclists neglected in vehicle ITS
 - in-car & pedestrian hand-held detectors appear impractical

- **Signal control detection technologies:**
 - puffin/pussycat crossings (piezo-pads/radar/laser/video sensors)

- **Better information displays at signals:**
 - 'do not start', countdown clock?

- Contact VISU for local data
 - visu.enquire@muarc.monash.edu.au
 - 9905 1805