

Moving Towards A Safer and Healthier Transportation System -- Taiwan's Experience

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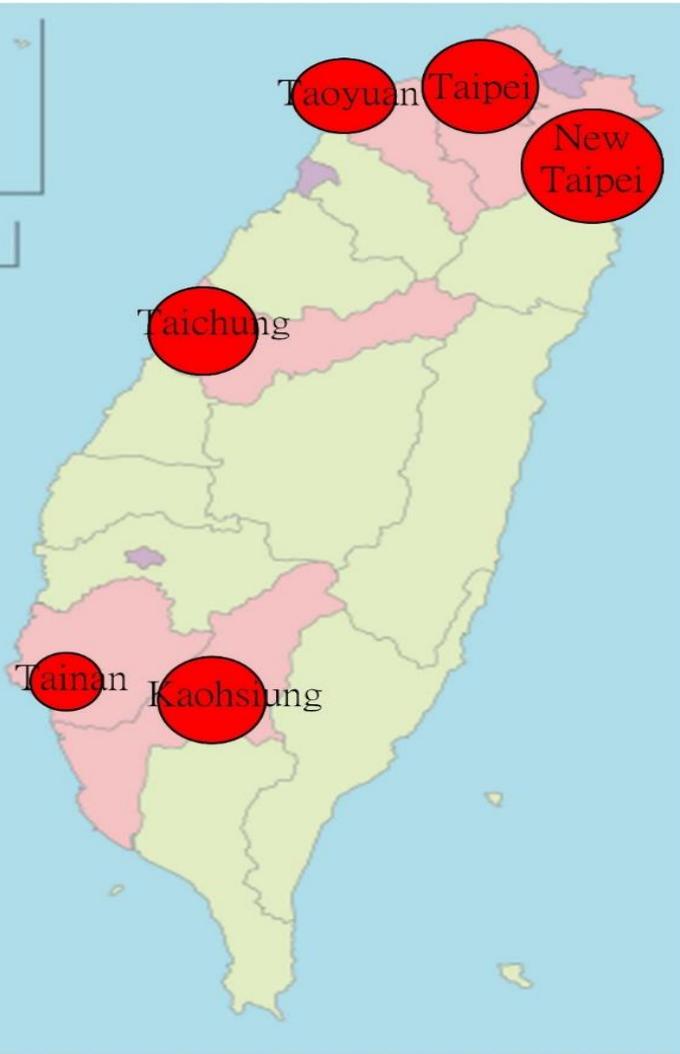
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National Chiao Tung University

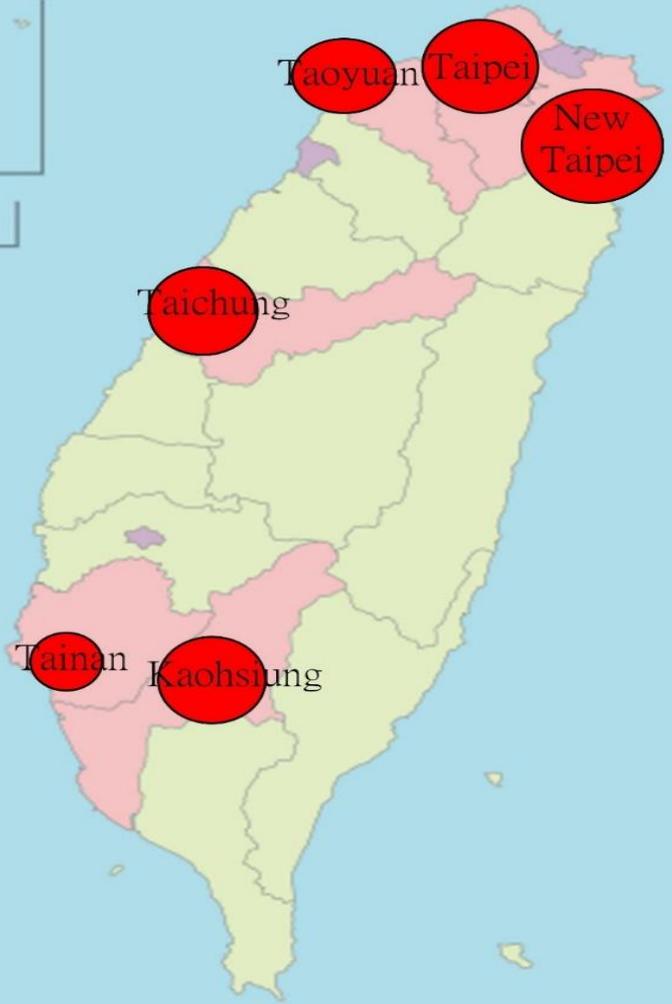
Is it safer to live in a major city ?



	Six Major Cities In Taiwan	Other Counties In Taiwan
Population	69.2 %	30.8%
Number of Traffic Injuries	70.0%	30.0%
Number of Traffic Fatalities	52.0%	48.0%



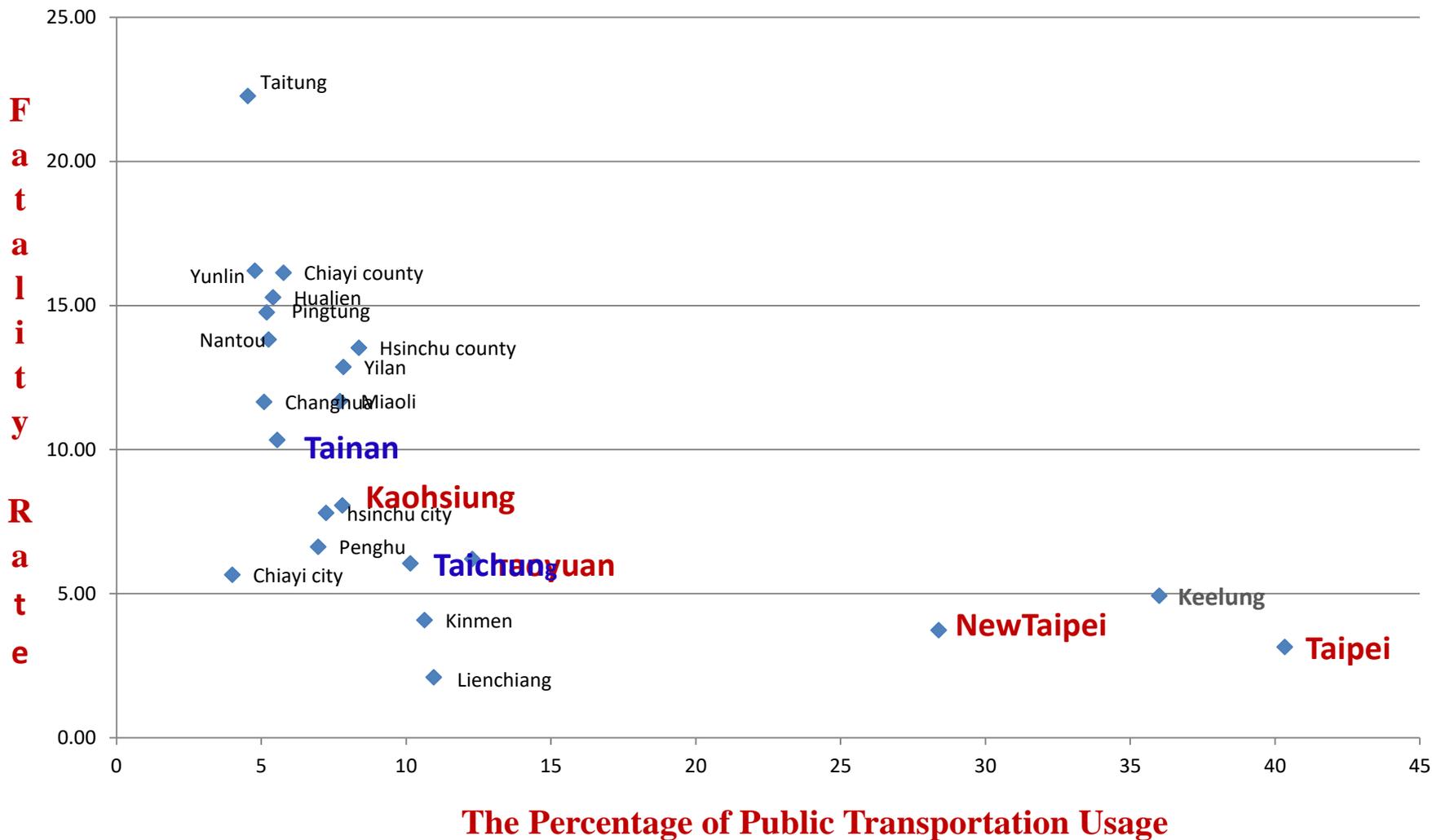
Accident Rates for 6 Major Cities in Taiwan



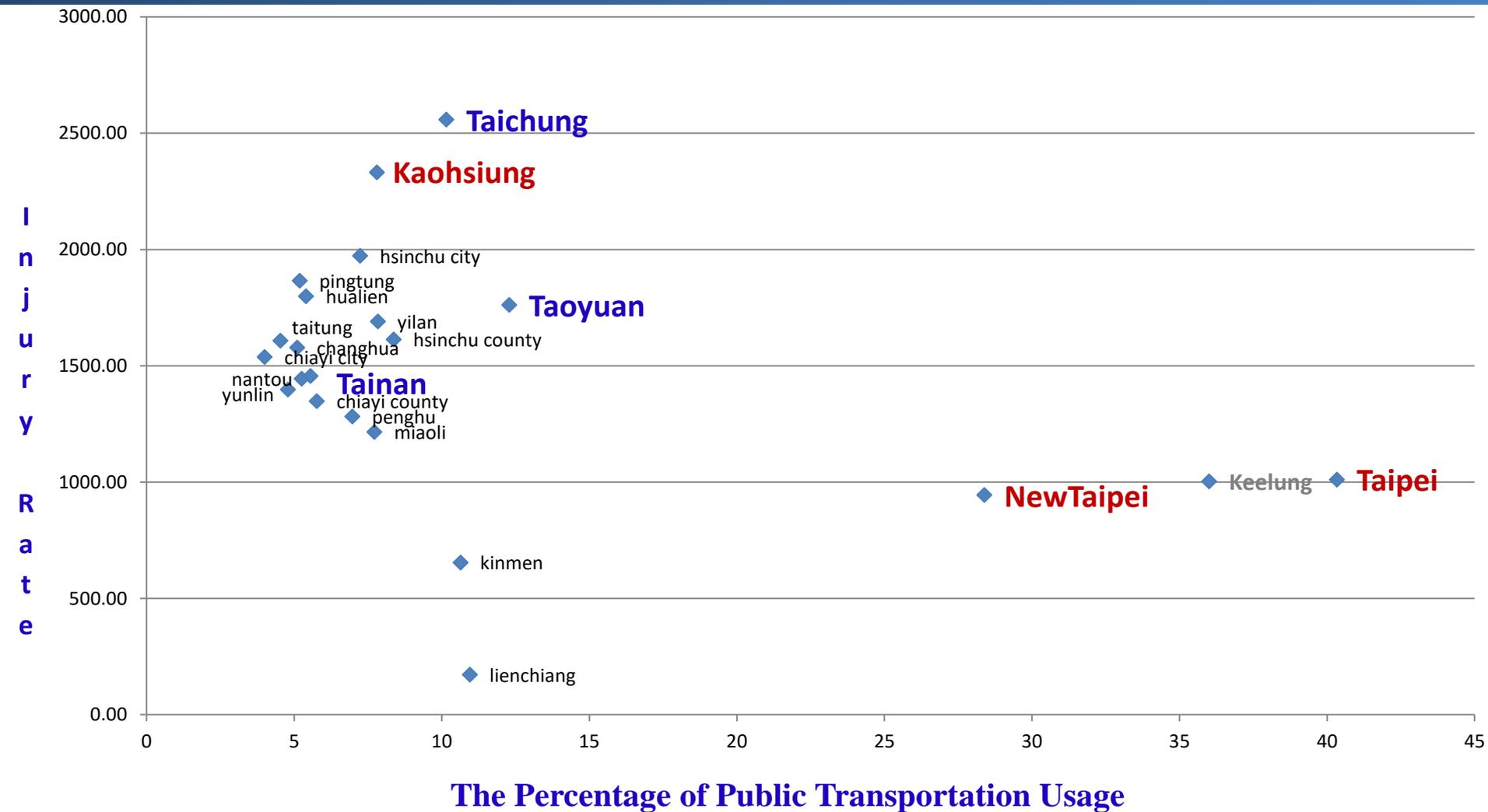
Traffic Fatalities & Injuries per 100,000 Pop.	Population (Million)	MRT	% of Public Transportation Usage
Taipei City (3.15, 1011)	2.685	Yes	40.7
New Taipei City (3.73, 944)	3.985	Yes	29.9
Taoyuan City (6.20, 1761)	2.175	New	13.0
Taichung City (6.05, 2558)	2.780	Under Const.	11.1
Tainan City (10.3, 1456)	1.886	No	5.9
Kaohsiung City (8.07, 2339)	2.778	Yes	7.9



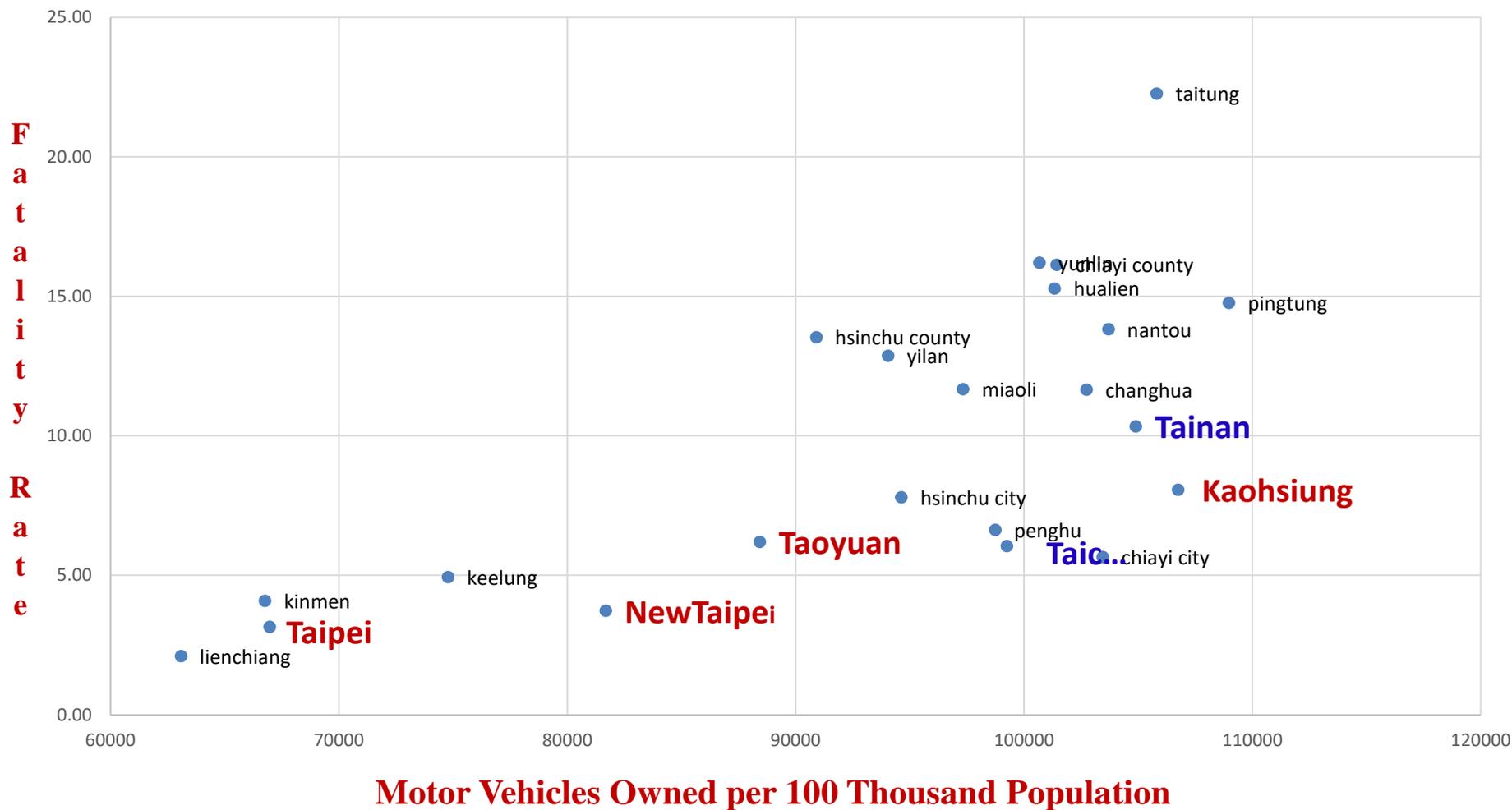
Accident Fatalities per 100 Thousand Population vs. Public Transportation Patronage



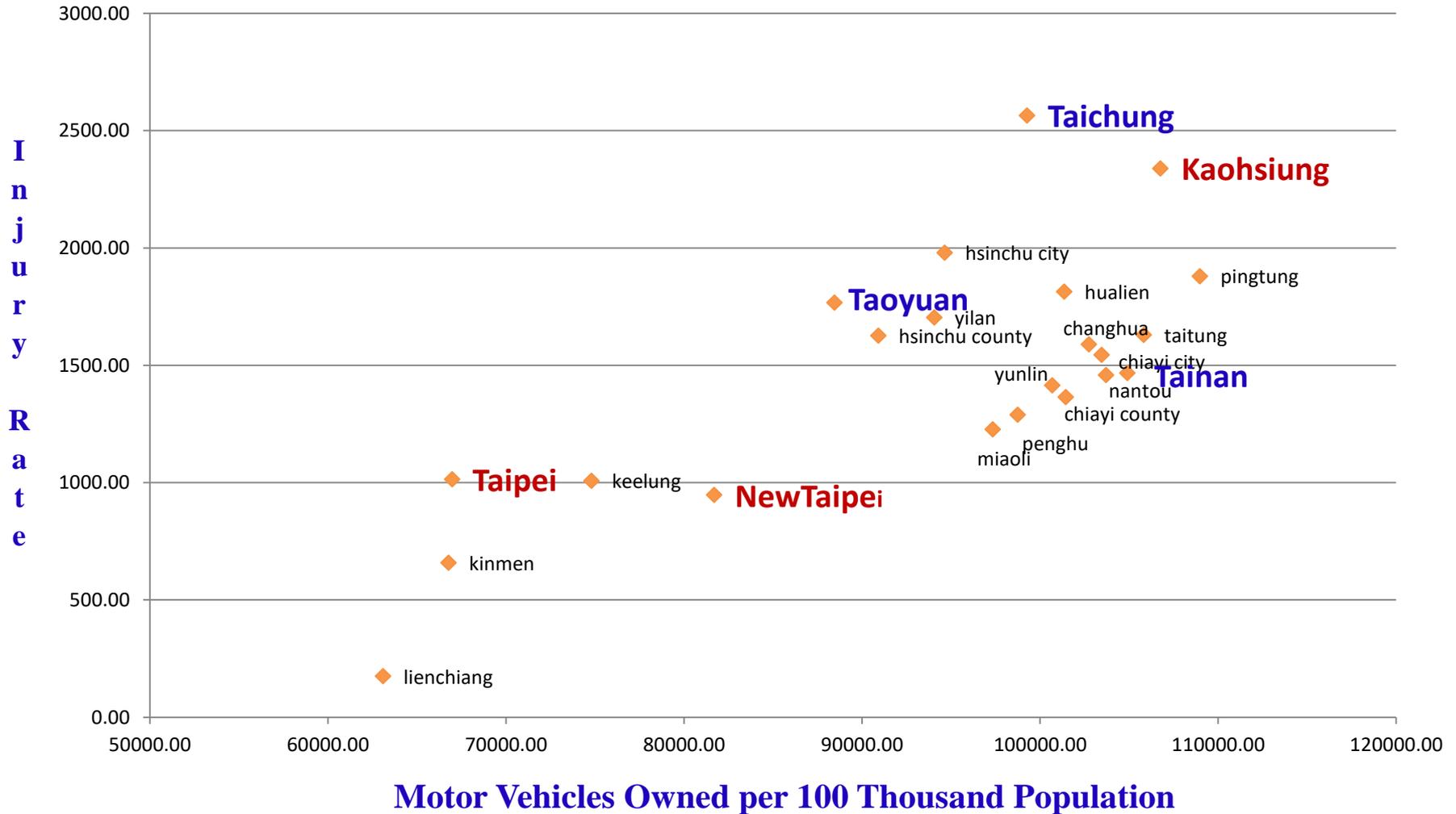
Accident Injuries per 100 Thousand Population vs. Public Transportation Patronage



Accident Fatalities per 100 Thousand Population vs. Motor Vehicle Ownership

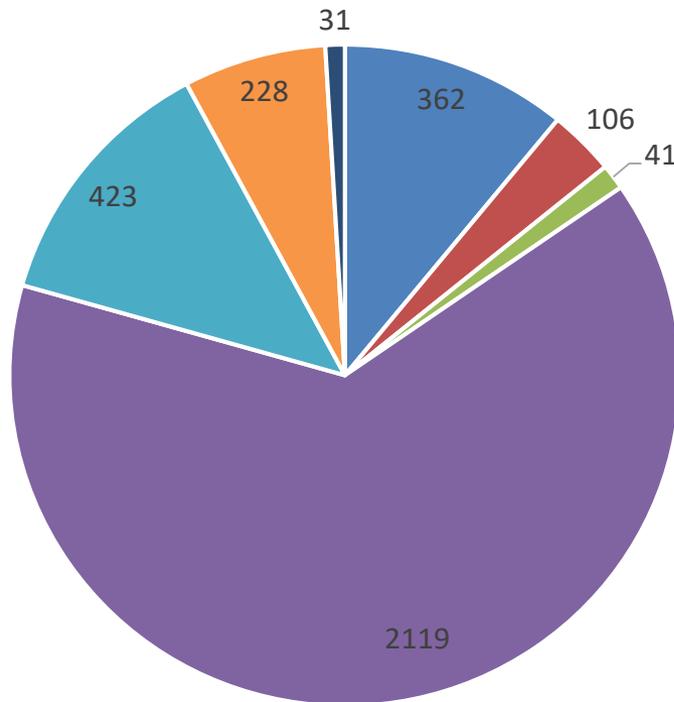


Accident Injuries per 100 Thousand Population vs. Motor Vehicle Ownership

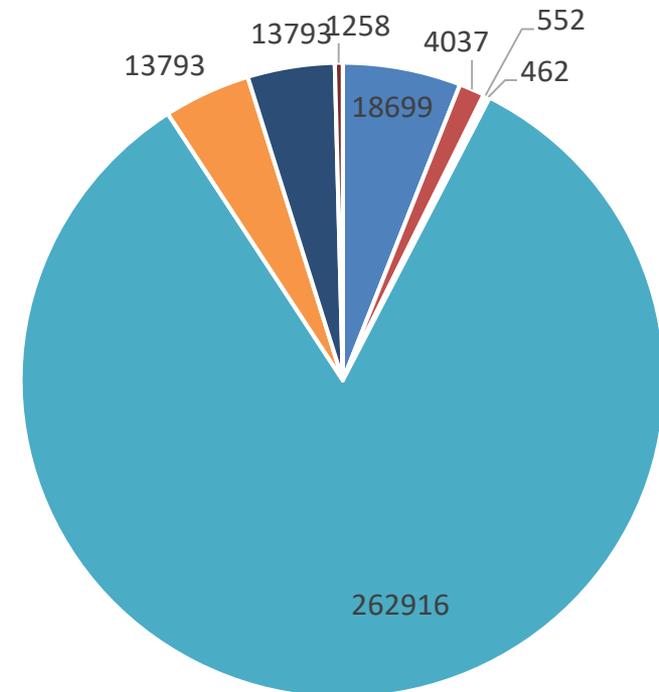


Accident Fatalities and Injuries for Different Transportation Modes

Fatalities



Injuries



Accident Fatalities and Injuries for Different Vehicles (Year 2011)

- Car
- Small truck
- Large Truck
- Motorcycle
- Pedestrian
- Bicyclist
- Other

- Car
- Small truck
- Large truck
- Bus/Coach
- Motorcycle
- Pedestrian
- Bicyclist
- Other



The Mode Use of Travel in Taiwan

	Neighborhood Travel (< 1Km)	Short Distance Travel (1~15Km)	Medium Distance Travel (15~60Km)	Long Distance Travel (>60 Km)
Walk	●			
Bicycle	○			
Motorcycle	●●●●●○	●●●○	○	
Car	●●○	●●●	●●●●●	●●●●
Bus	○	●●	●●	●●○
Mass Rapid Transit		○	○	
Traditional Railway		●	●●	●●●
High Speed Rail				○



Moving Towards A Safer Transportation

- ◆ Moving private vehicle users towards public transportation in Taiwan
 - MRT construction projects in major cities
Taipei, New Taipei, Taoyuan, Taichung and Kaohsiung.
 - LRT construction projects in Taiwan
Kaohsiung and New Taipei
 - Traditional railway improvement
Taiwan Railway Administration (TRA)
 - Bus service improvement projects
 - ✓ Subsidizing new bus purchase
 - ✓ Seamless transportation – time, ticket, information, fare, ... etc.
 - ✓ Employing new technologies for bus operation safety
 - ✓ Promoting road traffic safety management system ISO 39001



Moving Towards A Safer Transportation

◆ Engineering improvement projects

➤ Roadway safety design

- ✓ Motorcycle: priority lane, pavement and marking, motorcycle waiting zones,
- ✓ Pedestrian: sidewalk construction
- ✓ Bicycle: bicycle lane

➤ Traffic engineering and management

- ✓ Traffic signal design: pedestrian signal, motorcycle two-step left turn regulation, pedestrian priority program
- ✓ Traffic regulations: Seat-belt, helmet, BAC regulation, speeding, senior driver licensing

◆ Traffic safety enforcement projects

- Traffic safety campaign: drunk driving, speeding, unlicensing driving, parking violation, ..etc.



Moving Towards A Safer Transportation

◆ Traffic safety education

➤ School education

- ✓ Traffic safety education review program
- ✓ School bus administration program
- ✓ Bicycle and motorcycle riding training and education

➤ Continuing education

- ✓ Roadway traffic safety instructors program
- ✓ Community traffic safety education program

➤ Driver education & Licensing

- ✓ Driving school administration and evaluation program
- ✓ Driver licensing modification
- ✓ Senior driver licensing program



Moving Towards A Healthier Transportation

◆ Green Transportation Promotion

➤ Electric vehicle projects

- ✓ Electric bus and motorcycle
- ✓ Emission inspection programs

➤ Pedestrian and bicycle projects

- ✓ Sidewalk construction and improvement program
- ✓ Bicycle lane and public bicycle (Ubike)
- ✓ Bicycle parking facility

➤ Public transportation projects

- ✓ Electric and low floor bus program
- ✓ Free bus programs in several cities
- ✓ Energy saving education for commercial drivers



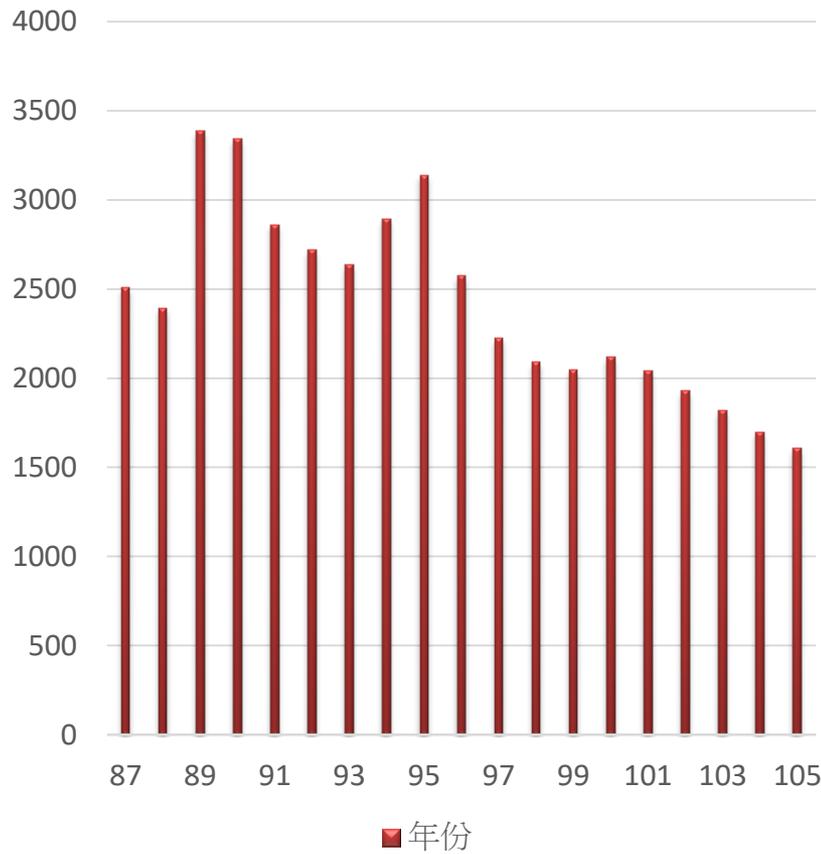
Efforts : Traditional Strategies

	Make it safer and healthier
Walk	<ul style="list-style-type: none"> • Encourage, Promote, Environment & Engineering Improvement • exclusive pedestrian signal, walkway, sidewalk, pedestrian priority
Bicycle	<ul style="list-style-type: none"> • Encourage, Promote, Environment & Engineering Improvement • bicycle lane, Ubike, school education
Motorcycle	<ul style="list-style-type: none"> • Reduce usage, Push toward public transportation • parking charge, Licensing policy + Promote electric motorcycle
Automobile	<ul style="list-style-type: none"> • Reduce usage, Push toward public transportation • parking charge, licensing policy + promote electric automobile
Public Transportation	<ul style="list-style-type: none"> • Encourage, Promote + Development and Construction • Railway project: MRT, light rail system, traditional rail • Bus : exclusive bus lanes, free bus project, feeder bus project, bus transfer station, BRT + electric bus project

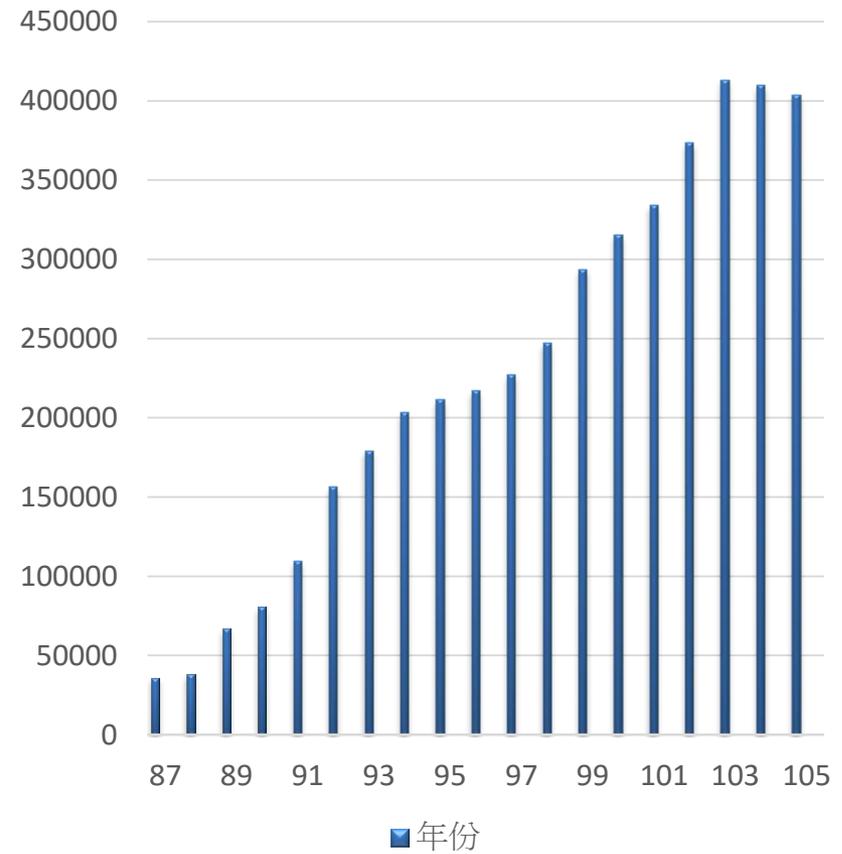


Taiwan's Performance : Accident Fatalities and Injuries 1998-2016

Road Traffic Accident Fatalities

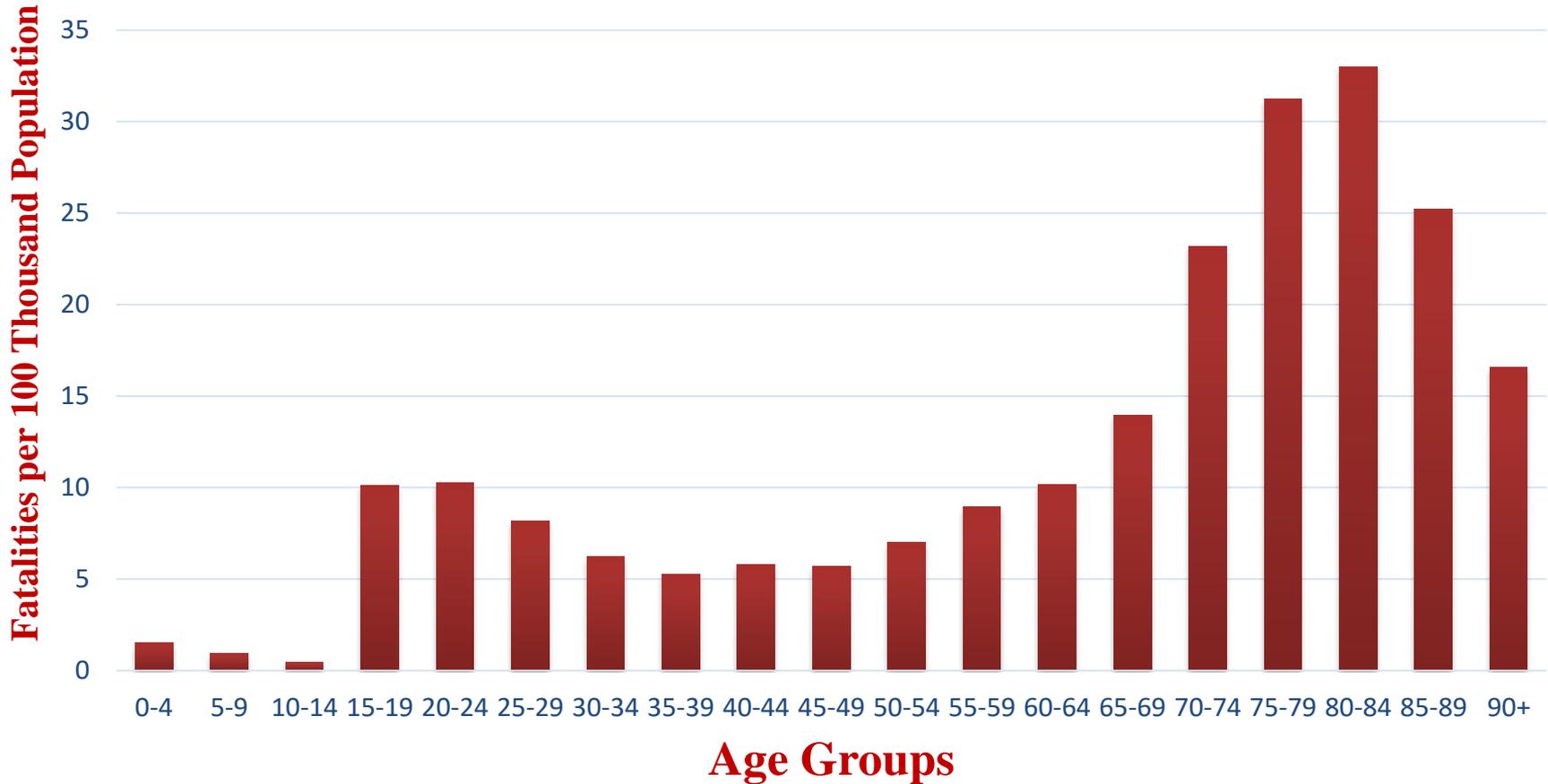


Road Traffic Accident Injuries



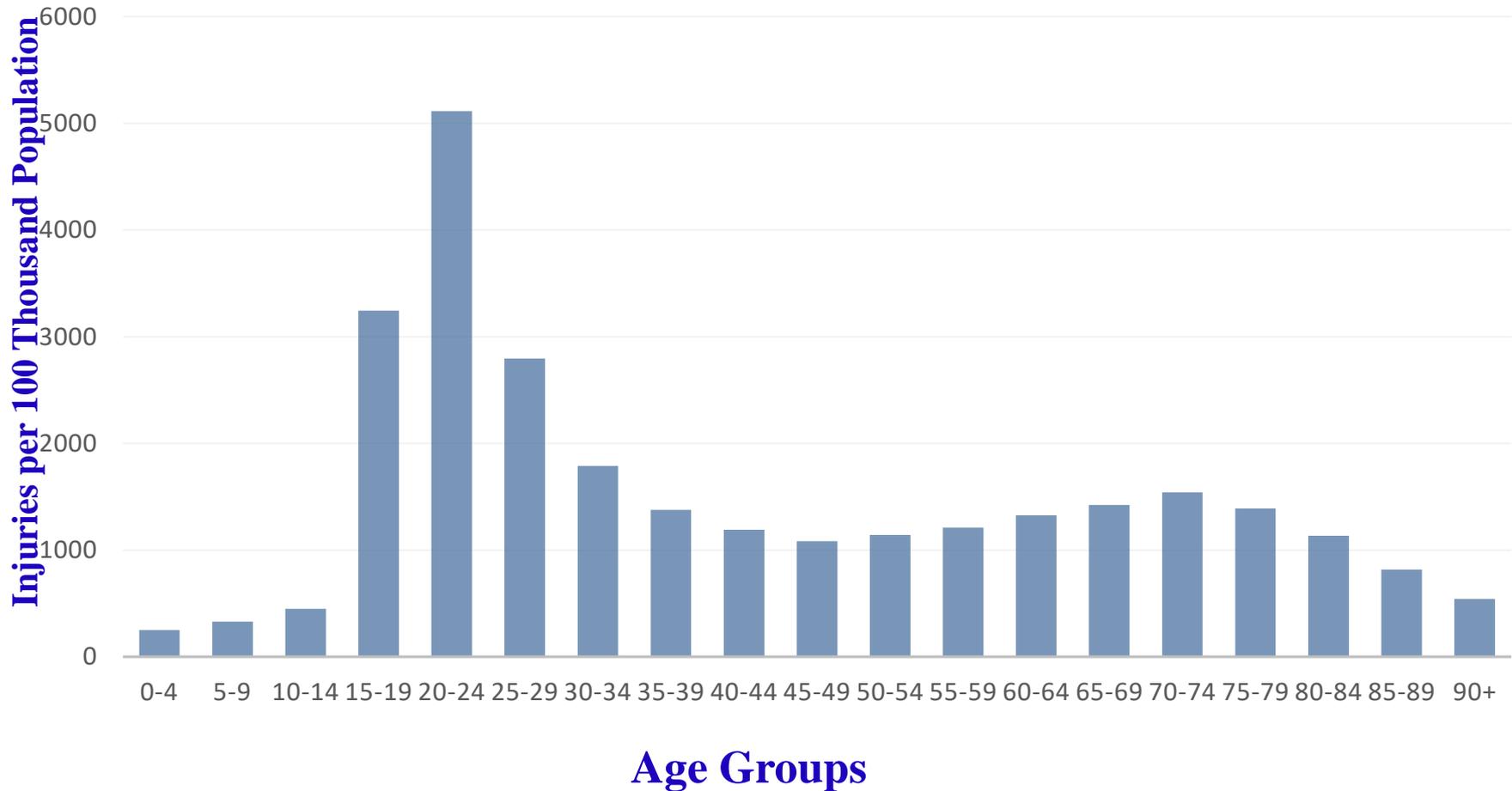
Accident Fatality Rates: Age Groups

Fatalities per 100 Thousand Population in 2016



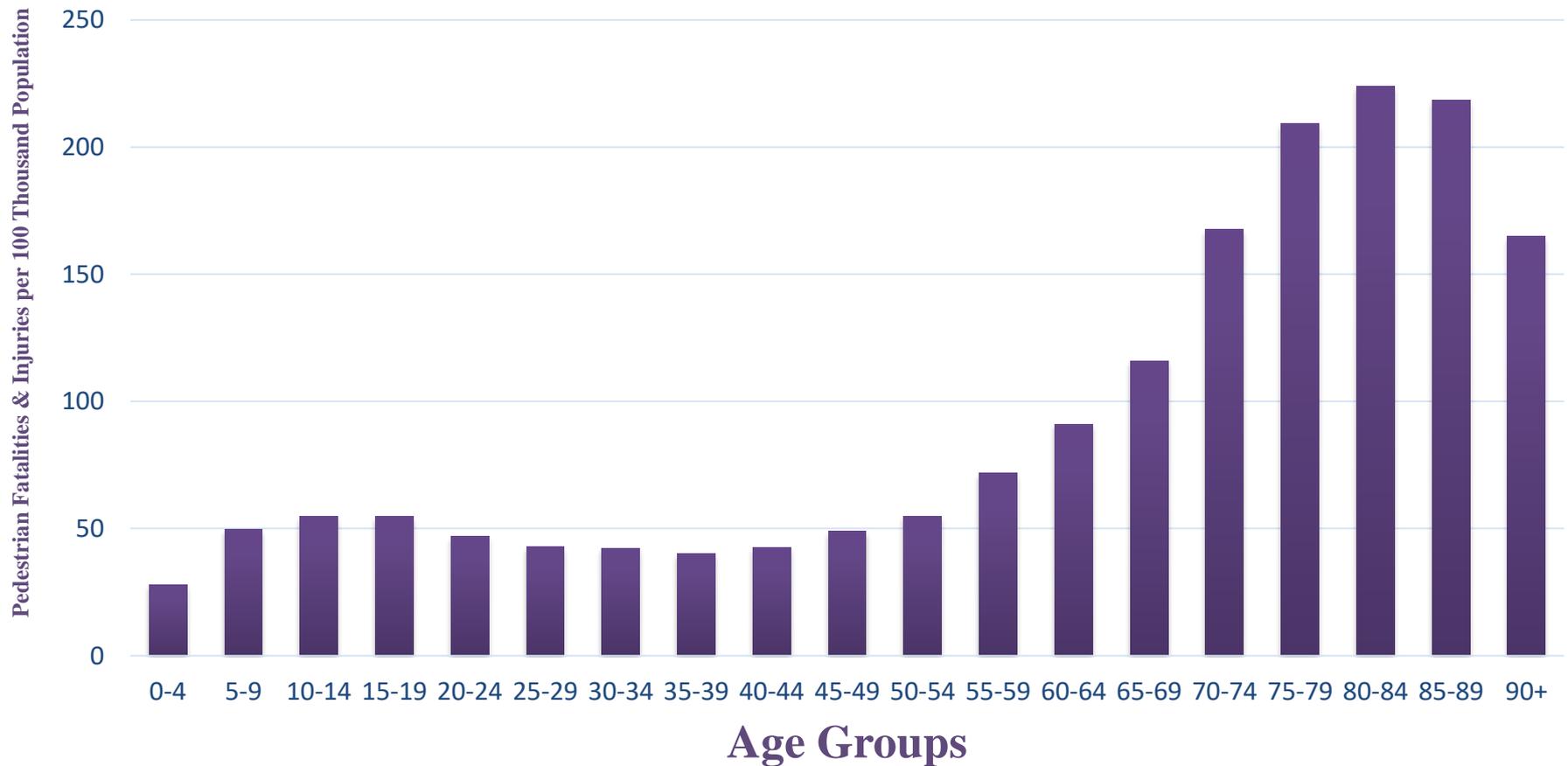
Accident Injury Rates: Age Groups

Injuries per 100 Thousand Population in 2016

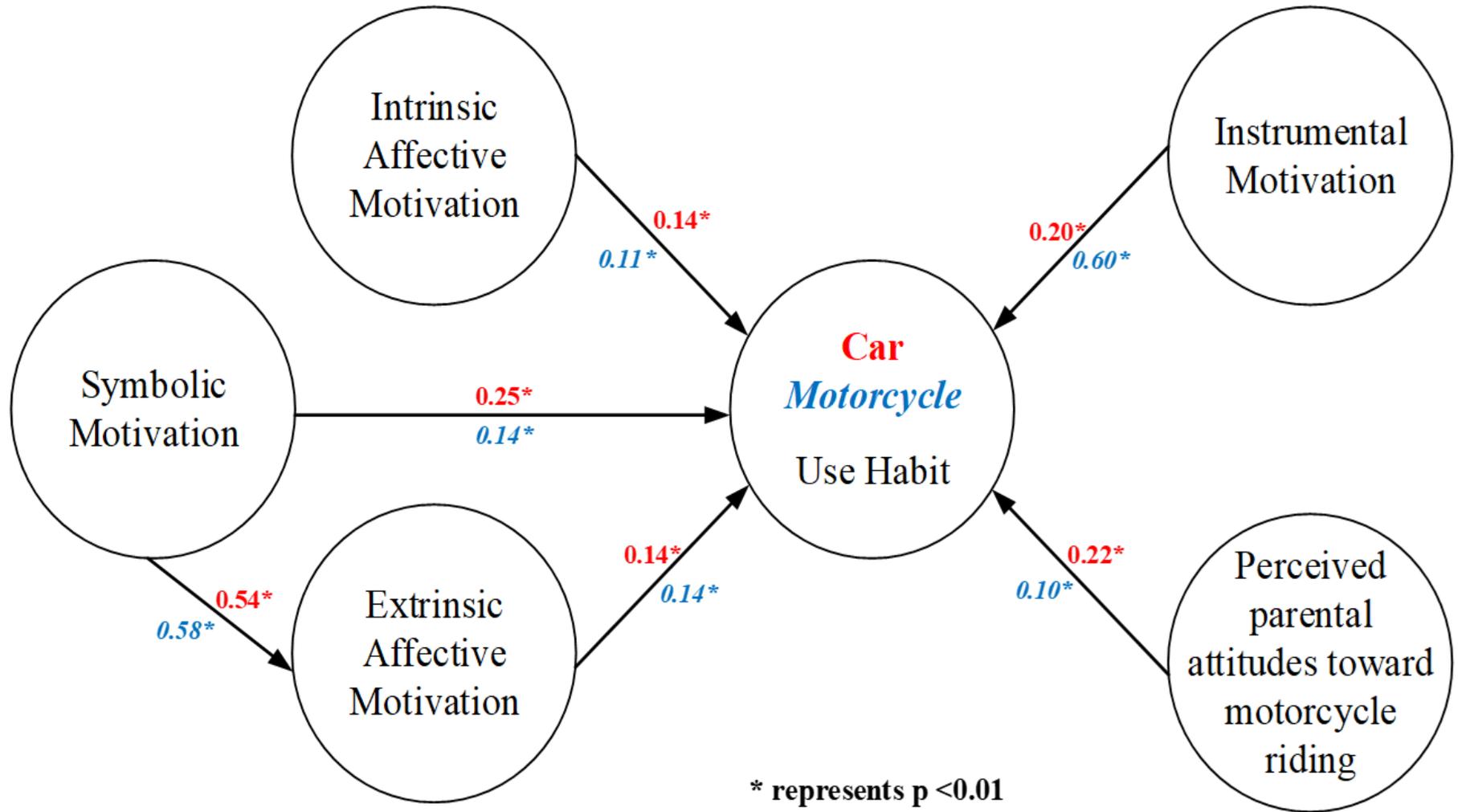


Pedestrian Accident Injury Rates

Fatalities & Injuries per 100 Thousand Population in 2016



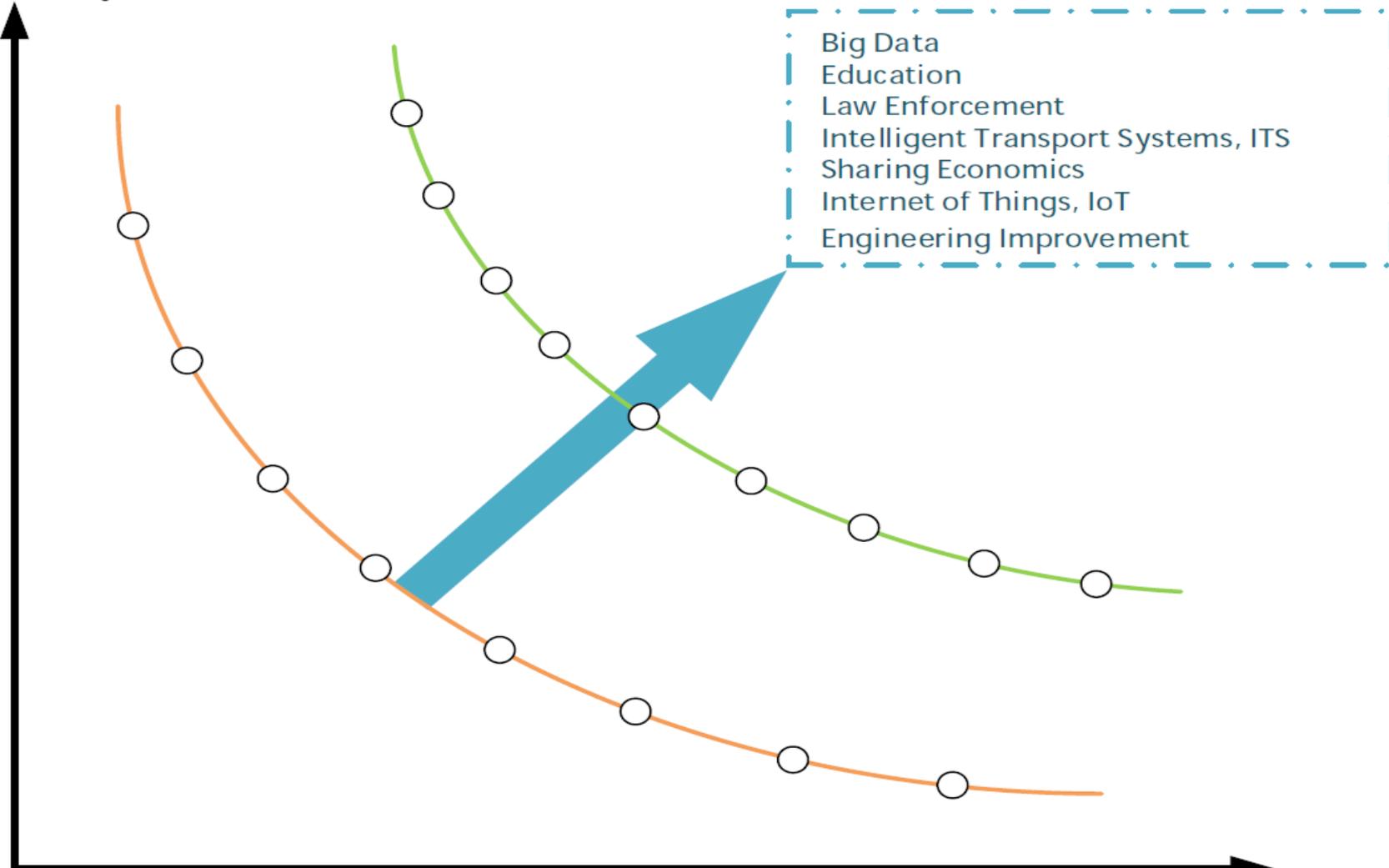
Motivations of Car & Motorcycle Usage



Moving Towards Safer and Healthier Transportation

-- New Innovative Strategies

Capacity & Efficiency



Safety & Health

Further Steps Towards The Safer and Healthier Transportation System

- ◆ **High population density and private vehicle ownership in Taiwan -- 0.59 motorcycle and 0.32 auto per person**
- ◆ **The increase of bicycle and pedestrian traffic accidents**
- ◆ **Increasing traffic injuries and fatalities for elderly people**
- ◆ **Challenges to Move forward A Safer & Healthier Transp.**
 - **Establish a safe and sustainable culture for transportation**
 - **Moving motorcyclists to use public transportation smoothly**
 - **Reduce automobile ownership and usage effectively**
 - **Improving the safety and environment for walking and cycling**
 - **Integrating public transportations efficiently**
 - **Provide safe & healthy transport service for elderly people**
- ◆ **Modern information and communication technologies as well as innovative management are the potential power.**

