

Death rates associated with driving and pedal cycling for all other road users in Great Britain 2005-2013

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Background

Most of the focus when comparing modes of transport is on the person ‘in charge’ of the vehicle (e.g. car drivers vs. cyclists)

Relative risk of different forms of transport, Great Britain: 2013

Casualty rate per billion vehicle miles

	Killed	Killed or seriously injured
Car driver	2	24
Pedestrian	34	463
Pedal cyclist	34	1,036
Motorcycle rider	119	1,853

- Little attention paid to the risk borne by all other road users involved in the same collision (e.g. passengers, occupants in other vehicles, pedestrians)
- Aim of this study: **To examine the death rates for all other road users by age, sex, and travel mode over a 9-year period**

Key outcome: Fatalities per Million Hours Use

Numerator (deaths in fatal crashes involving at least 1 car or pedal cycle*):

- Deaths to persons 'in charge' of vehicle (car driver / pedal cyclist)
- Deaths to all other road users in those crashes (e.g. occupants in other vehicles in a multi-vehicle collision, pedestrians, passengers)
- All deaths

Arranged by age/sex of the car drivers / cyclists **involved** in fatal collision

* A subset of all fatal collisions

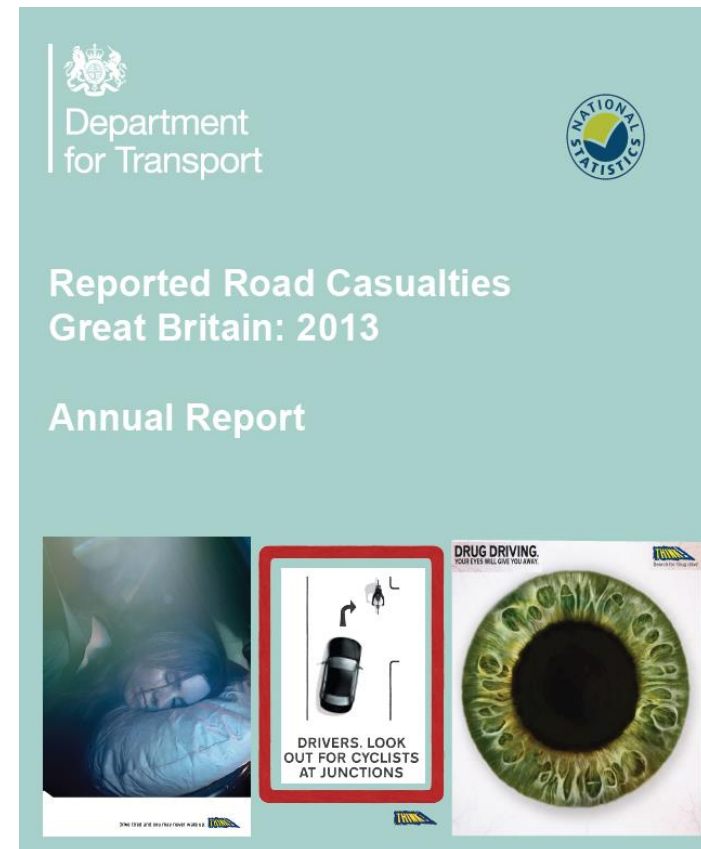
Denominator (travel exposure: amount of time spent travelling on all roads):

Average hours travelled per person per calendar year aggregated to GB population

Arranged by age/sex and by travel mode (car driver / pedal cyclist)

Numerator (STATS19)

- National (GB) database of road crashes, involving 1+ vehicle, reported to and by the police
- Variables recorded for each crash:
 - Details of all vehicles
 - Location
 - Demographics (age, sex)
 - Injury severity (**fatal**; severe; slight)
 - Casualty type: e.g. driver, cyclist, passenger, pedestrian



Denominator (National Travel Survey)

- Time spent travelling for modes of travel via diary
- Unit of analysis is *stage*
- Calculate average time spent travelling per person per week (car driver; cyclist)
- NTS estimates aggregated to calendar year and GB population



- Aggregating data over 3-years due to small number of pedal cyclist deaths on roads (2005-07; 2008-10; 2011-13)
- A secondary aim was to investigate trends
- Present age- and sex-specific F/MHU: lower age limit of 17

Fatal crashes involving ≥ 1 car or pedal cycle in 2013: (N=1296)



(N=1178)



(N=57)

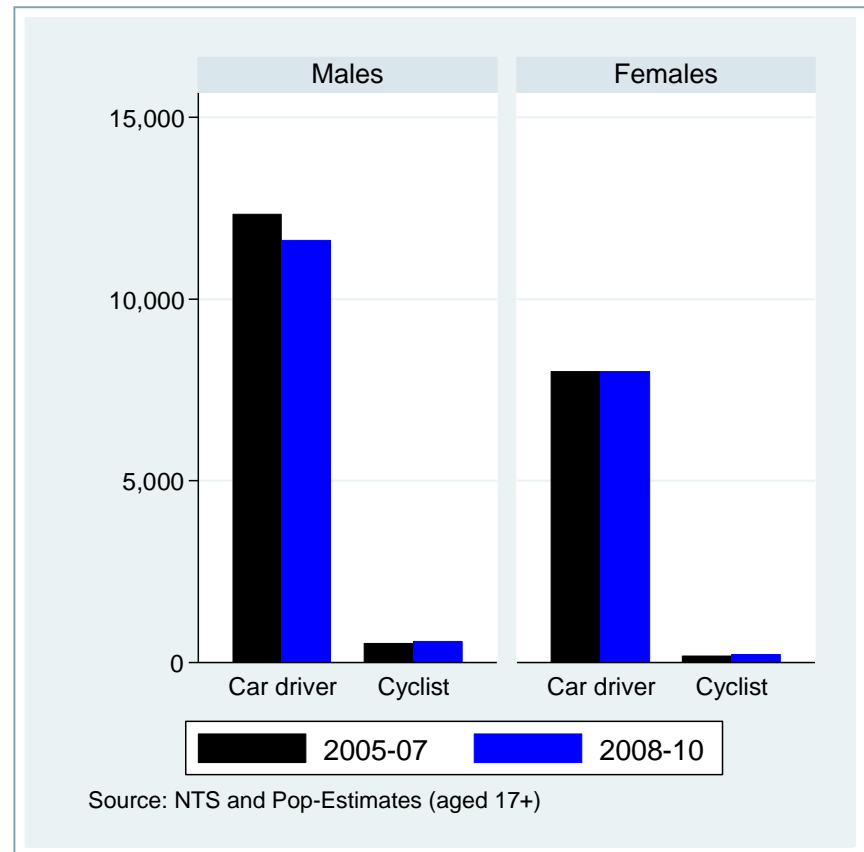
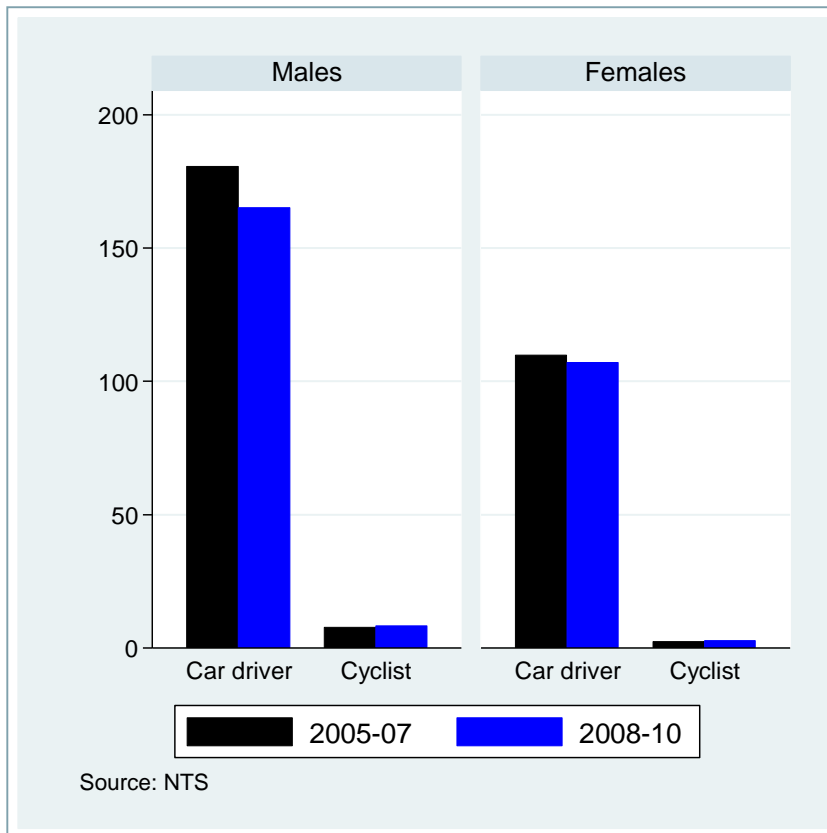


(N=61)

Deaths (n=1268)		Deaths (n=58)		Deaths (n=63)	
	Driver (N=541)		N/A		Driver (N=2)
	Passenger* (N=232)		N/A		Passenger (N=0)
	N/A		(N=50)		(N=59)
	(N=278)*		(N=6)*		(N=0)
	(N=182)*		(N=1)*		(N=2)

* Not 'in charge' of vehicle

Results: Time spent travelling (exposure)



Decline in amount of driving, especially for males

Changes in death rate over time could occur through:

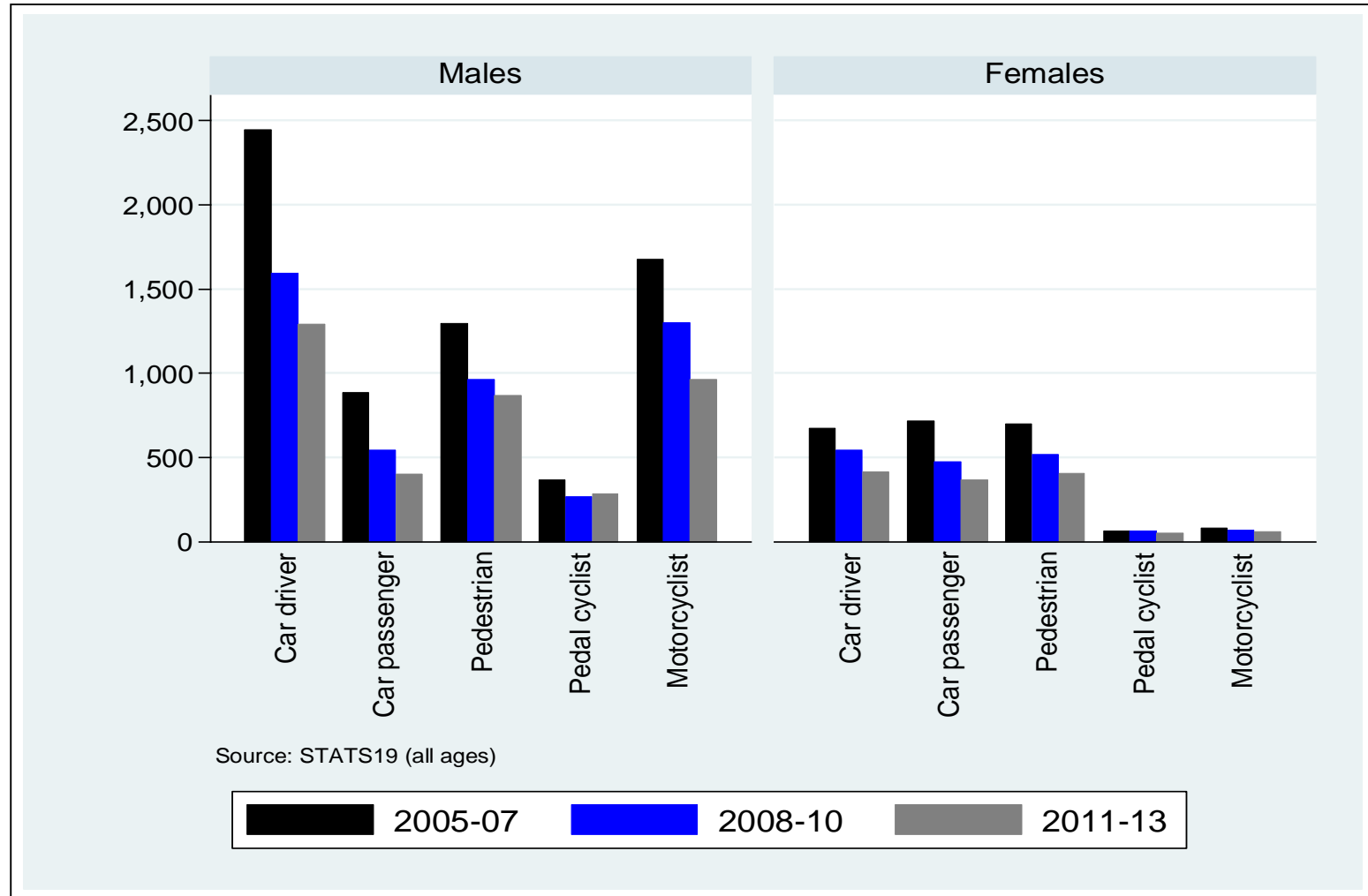
- Changes in **numerator** (road deaths);
- Changes in **denominator** (time spent travelling)

or **both**

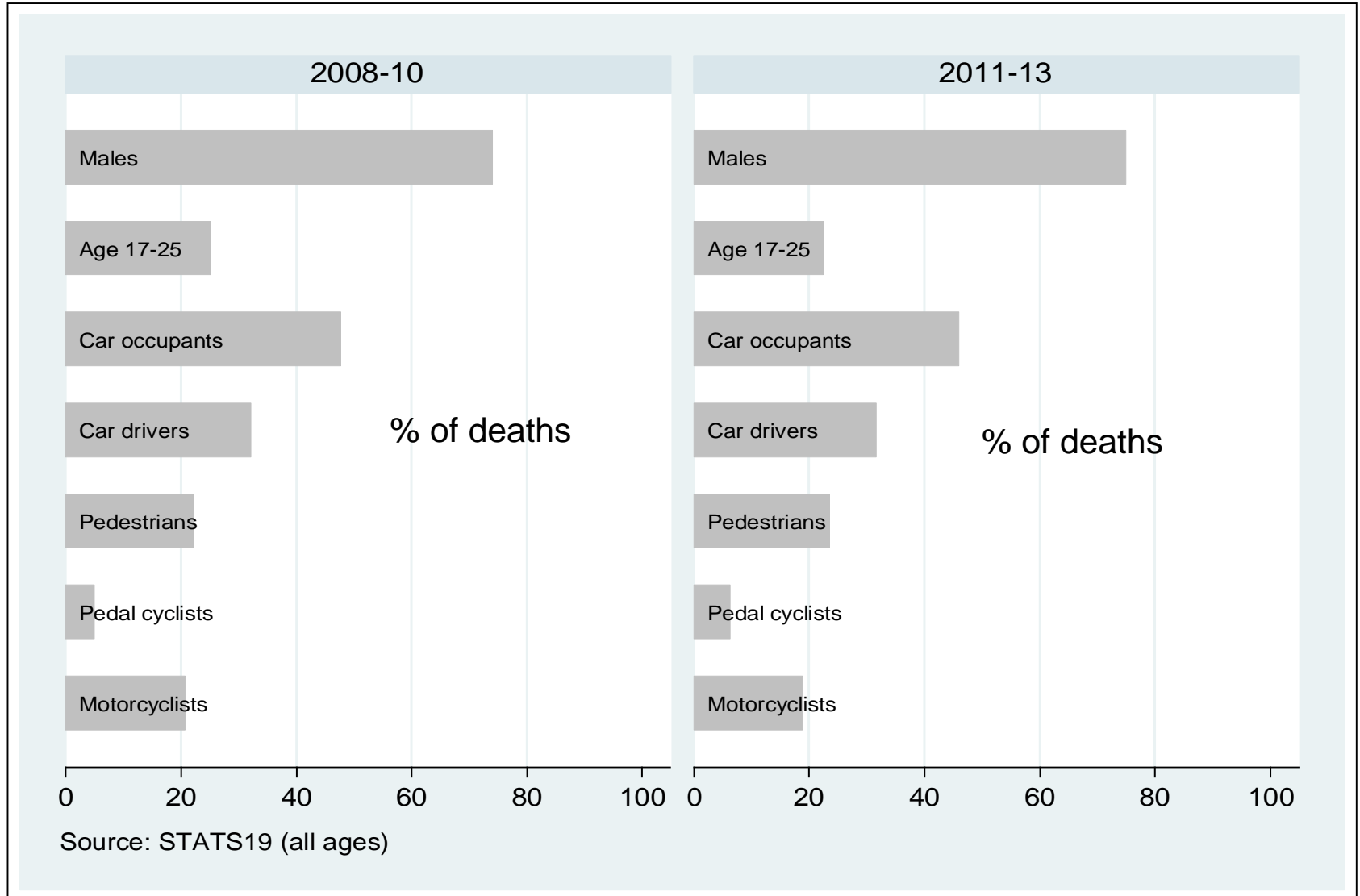
Amount of exposure refer to time travelled in the popⁿ (not just actual drivers or cyclists).

- Changes in the amount of time spent travelling could be because of changes in average time spent travelling; population size; or both.

Falls in absolute number of road fatalities (numerator)



No change over time in who is involved

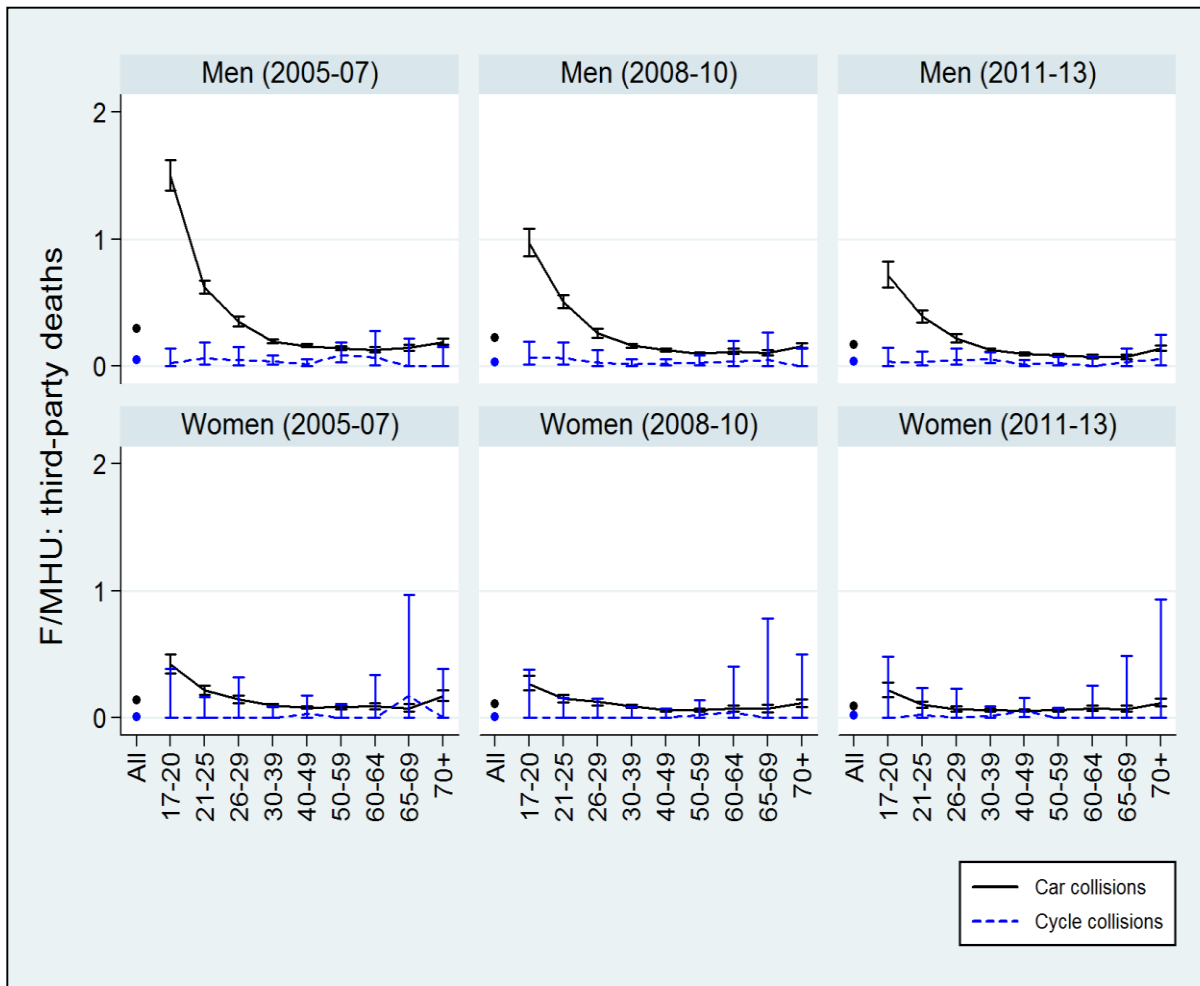


F/MHU for persons 'in charge', by travel mode, age, and sex



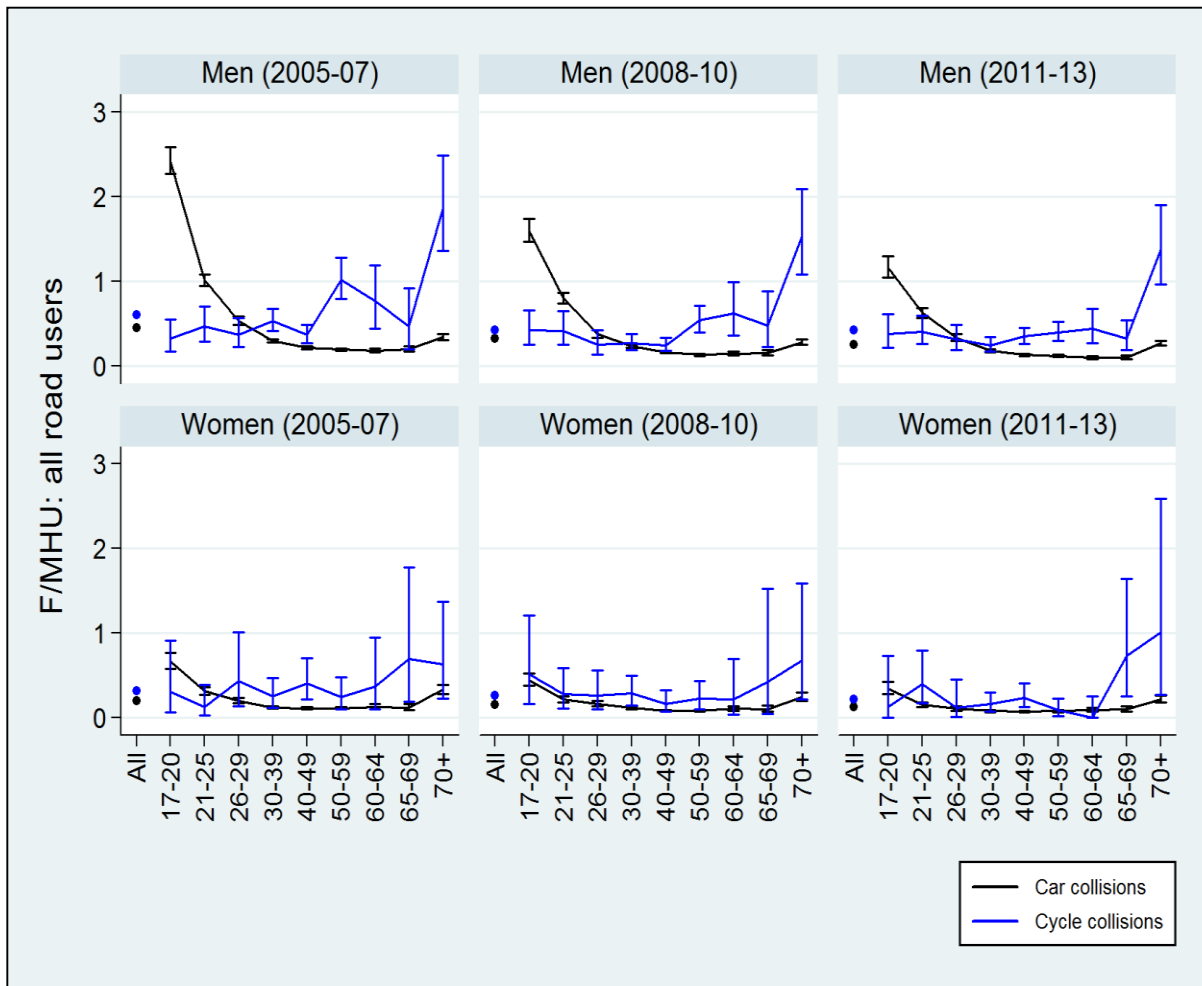
- F/MHU for drivers showed familiar U-shape, highest for youngest and oldest groups
- F/MHU for pedal cyclists increase with age, especially for males
- Higher for male drivers than male cyclists (17-20) then cross-over; this was most pronounced in earlier time-period

F/MHU for all other road users, by travel mode, age, and sex



- F/MHU for car collisions also showed U-shaped pattern with age
- Higher F/MHU for male than for female drivers most apparent at younger ages
- F/MHU for all other road users higher than the equivalent driver age- and sex-specific group
- Low number of deaths to other road users in fatal cycle collisions

F/MHU for all road users, by travel mode, age, and sex



- For males, driving was substantially the riskier for age groups up to 26-29; F/MHU for cycling rose more substantially with age than for driving

Strengths

- Quantifying the magnitude of the increase in the F/MHU for driving vs cycling when the deaths to other road users in car crashes are accounted for
- Integration of two data sources
- All deaths on GB roads are reported in STATS 19, even if no motor vehicle involved
- Time travelled = best measure of exposure for comparing travel modes

Limitations

Cannot (in this study) attribute cause of crash

Confounding factor of road type:



- Difficult to compare driving vs cycling (using these data sources) when they use different roads:
 - Death rates considerably lower on motorways
 - Ideally compare them using roads that drivers and pedal cyclists share

Conclusions

- Comparisons between travel modes ignore the risks faced by other road users: comparison of death rates by mode of travel should take these deaths into account.
- Taking account of deaths to other road users increases death rates considerably more for driving than cycling.
- Although the fatality risks per MHU borne by cyclists are higher than for car drivers, the higher user risks are balanced by reduced risks faced by other road users.

Key message

- **existing comparisons of road traffic death rates across travel modes and by age and sex do not account for the risk faced by other road users**