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Comparing the Drivers Involved in Fatal and Serious Injury Collisions using Geodemographics

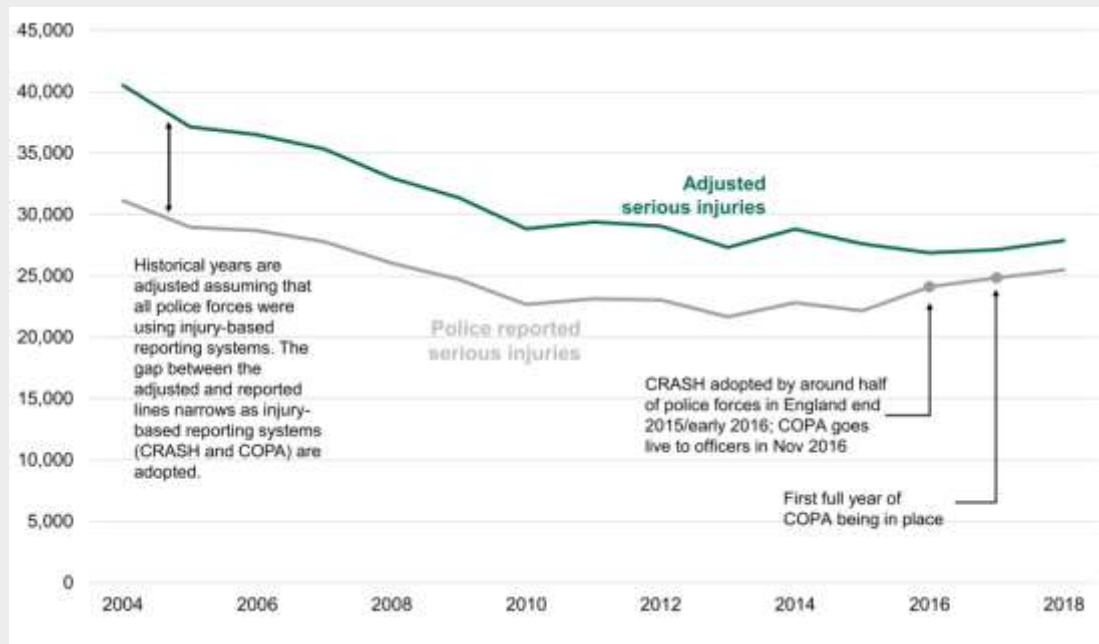
Law Enforcement and Public Health conference
23rd October 2019

James Nunn

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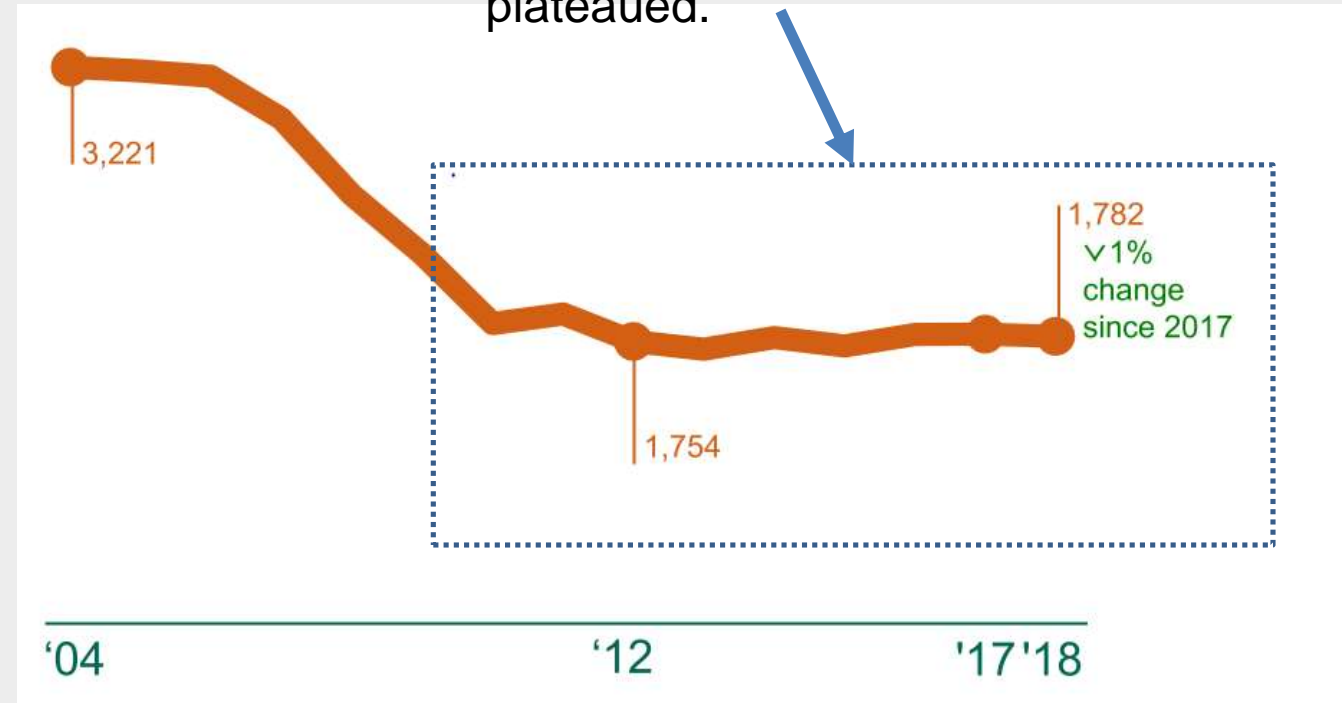
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The societal problem



Serious injuries. Reported road casualties in Great Britain: 2018 annual report, Department for Transport, 2019

There had been steady decline in fatal and seriously injured casualties until 2010. Since then the numbers have plateaued.



Fatalities. Reported road casualties in Great Britain: 2018 annual report, Department for Transport, 2019

Background

- Education interventions and public information are applied to whole populations
- Direct marketing methods using geodemographics to target specific audiences can be effective (Ashby and Longley, 2005; Tapp, Whitten and Housden, 2014; Leventhal, 2016)



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Geodemographics

- Segmentation of the population by combining geographic, census and lifestyle data
- Acorn (CACI Limited, 2014) geodemographic profiles have three levels of granularity
- The coarsest level distributes the population into 6 categories, the mid level uses 18 groups and the finest 62 types
- The 62 types, used in this analysis, run from 1 to 62, the lower the number the more affluent the segment



Geodemographics



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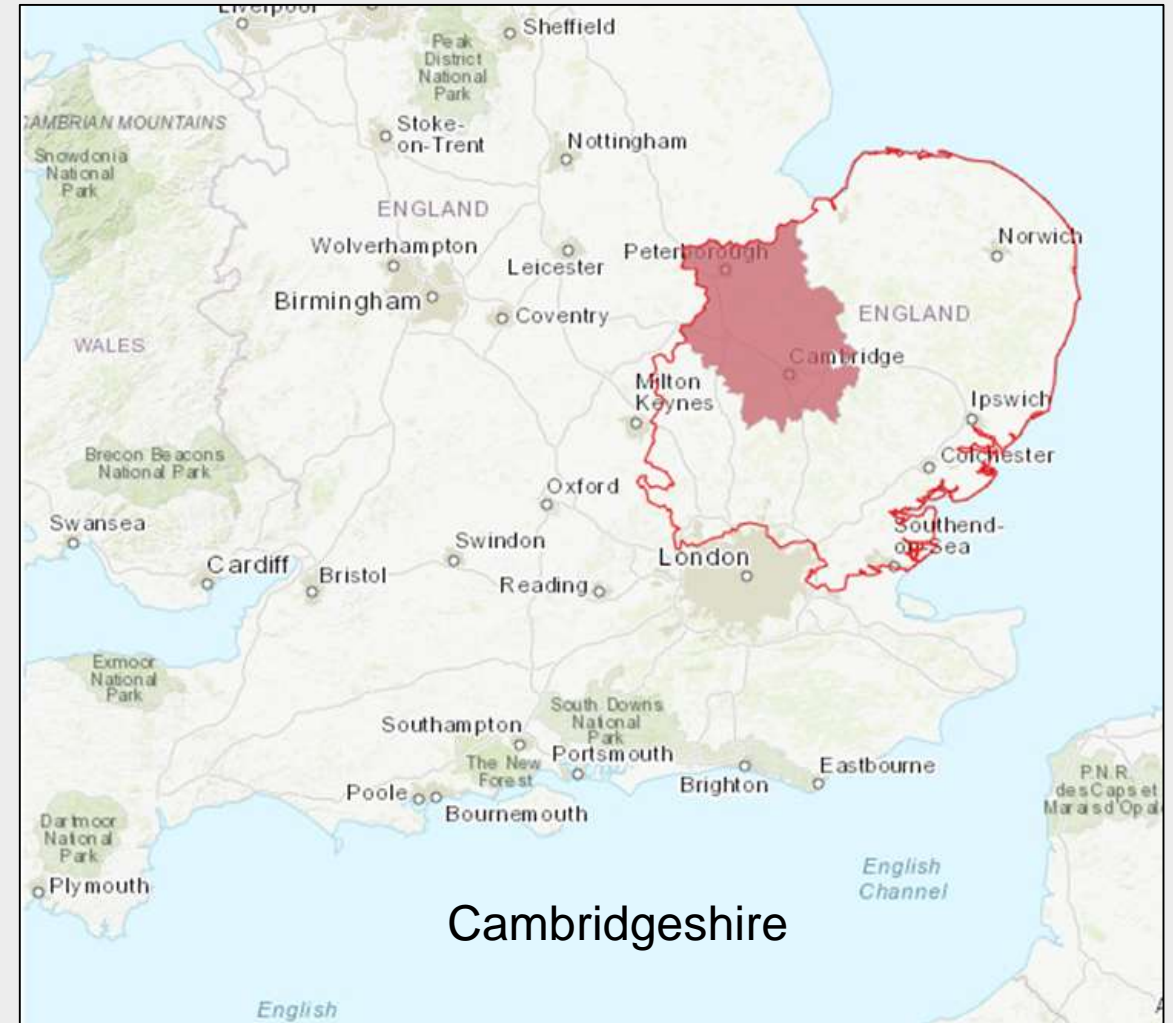
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Aim

- Determine if the geodemographic profile distributions of motor vehicle drivers involved in serious injury (MAIS3+) and fatal collisions are suitable to target interventions for one UK geographic area



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Objectives

1. Geodemographic profiling of the motor vehicle drivers involved in fatal and MAIS3+ collisions.
2. Compare the geodemographic distribution of culpable drivers and non-culpable drivers from fatal collisions and MAIS3+ collisions



Data Origins

- Police collisions data for the county of Cambridgeshire for the period April 2012 to March 2017 linked to hospital trauma patient data to identify collisions resulting in MAIS3+ injuries (AIS 2005) (Nunn *et al*, 2018)
- Motor vehicle drivers only from the MAIS3+ collisions and the motor vehicle drivers from the fatal collisions were culpability scored using the Robertson and Drummer (1994) culpability scoring tool.



Dataset

- Motor vehicle drivers from fatal and MAIS3+ collisions in Cambridgeshire for the period April 2012 to March 2017 who reside in Cambridgeshire and have a valid postcode (n=371, Fatal n=137, MAIS3+ n=234)
- This is 65% of all the drivers involved in the collisions (n=661), the surrounding counties account for a further 24%)
- Examining Cambridgeshire drivers n=370 presented a valid geodemographic profile (Fatal n=137, MAIS3+ n=233)

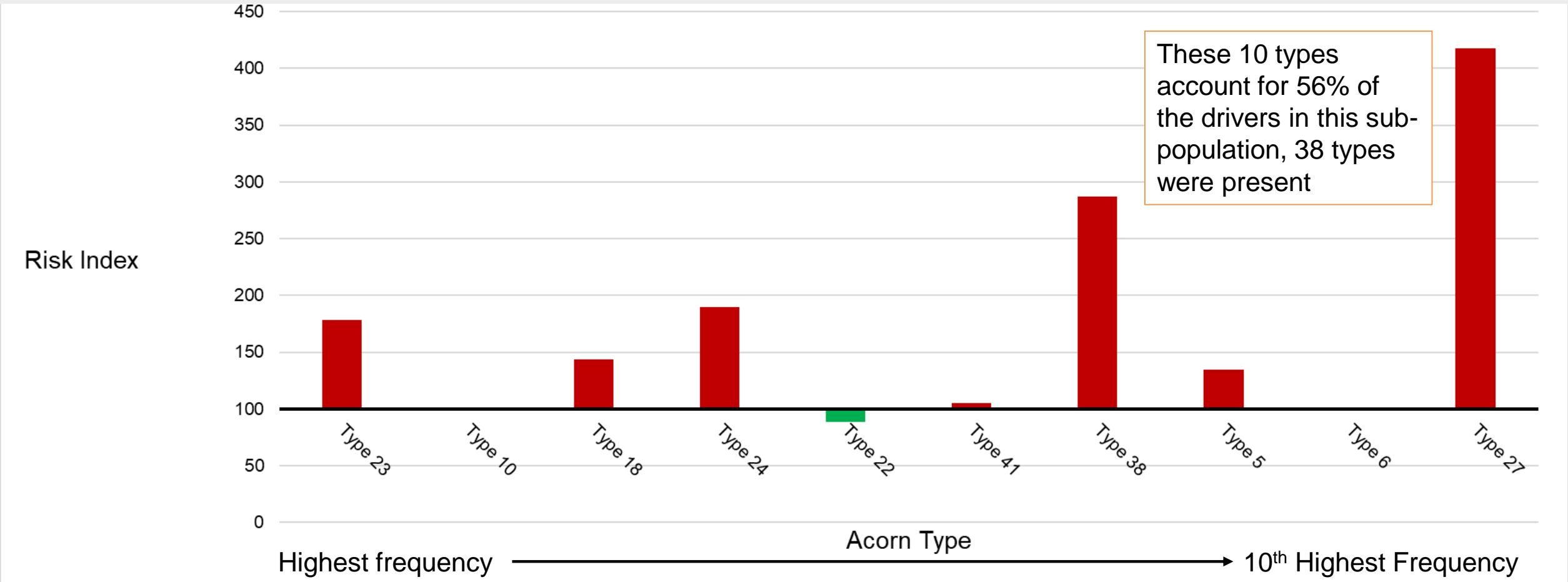


Risk Index

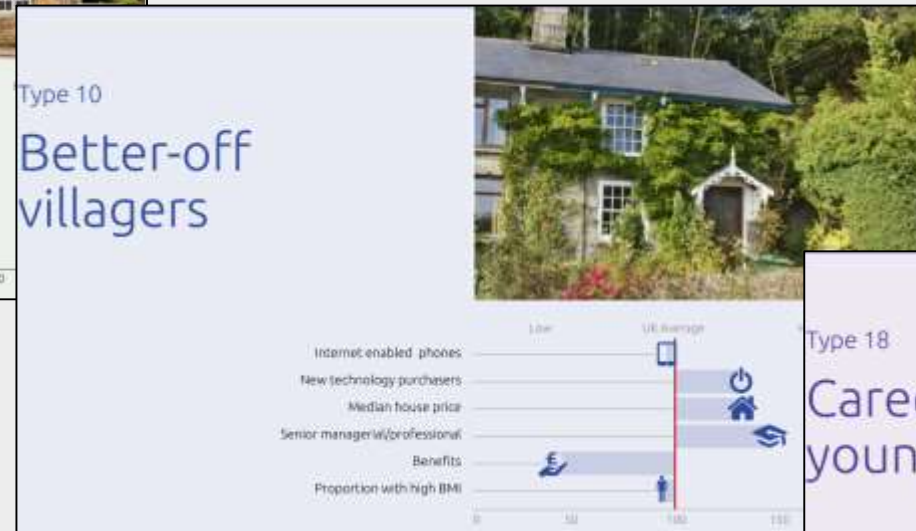
- Risk Index is a way of presenting the frequencies in terms of the background population or a baseline (Anderson, 2005; 2010; Ashby and Longley, 2005; Loo and Anderson, 2016)
- Three stage process to calculate the index
- Acorn type population proportion = $\frac{\text{Acorn type frequency in the population}}{\text{Total Acorn types present in the population}}$
- Expected frequency in the sub-population = Acorn type population proportion \times Sub-population size
- Risk index = $\frac{\text{Actual Acorn type frequency in the sub-population}}{\text{Expected Acorn type frequency in the sub-population}} \times 100$



Risk Index – Acorn Type – MAIS3+ – Culpable and Contributory Drivers



Risk Index – Acorn Type – MAIS3+ – Culpable and Contributory Drivers



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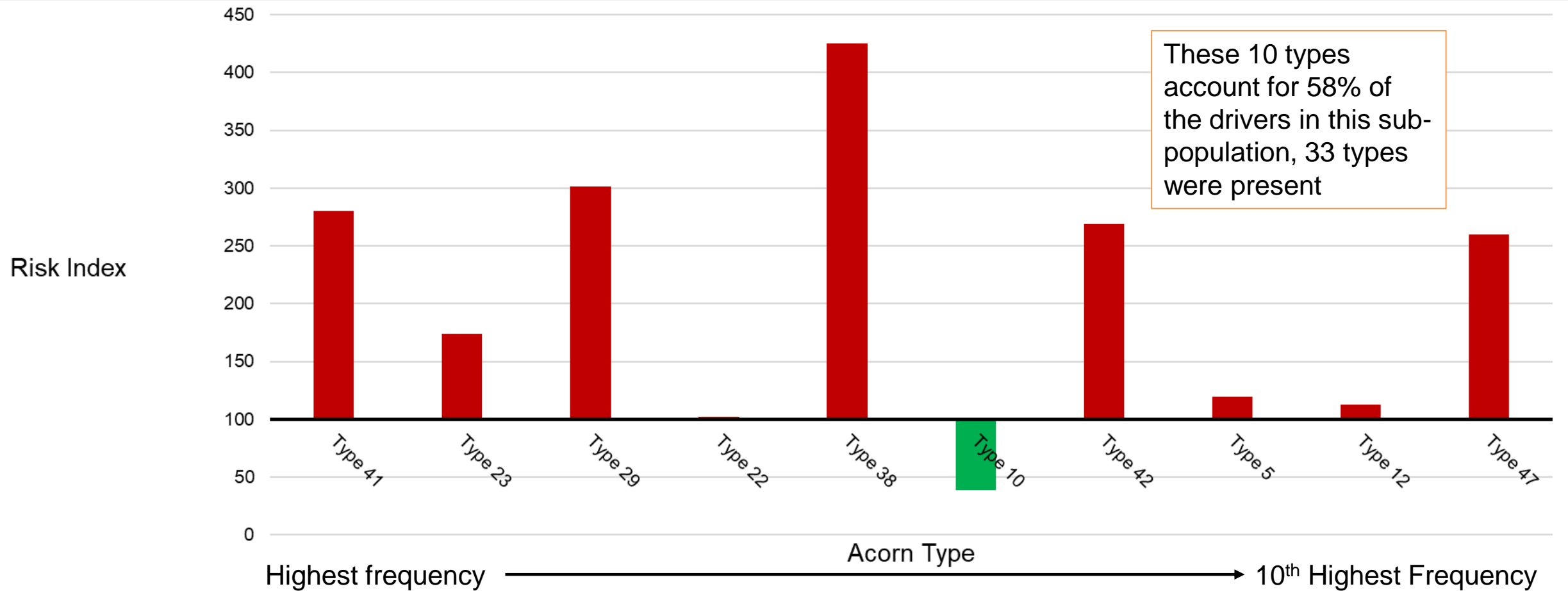


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Risk Index – Acorn Type – Fatal – Culpable and Contributory Drivers



Risk Index – Acorn Type – Fatal – Culpable and Contributory Drivers

Type 41

Labouring
semi-rural
estates



Type 23

Owner occupiers
in small towns
and villages



Type 29

Established
suburbs, older
families



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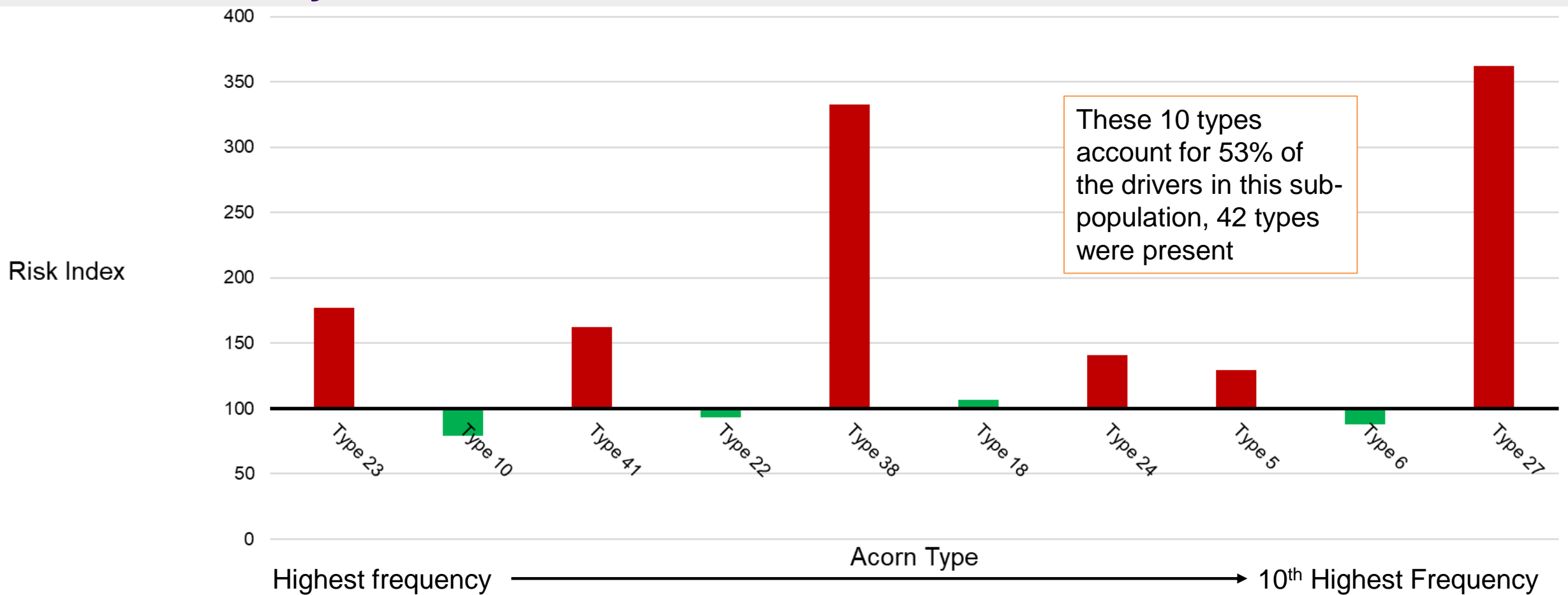


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Risk Index – Acorn Type – Fatal and MAIS3+ – Culpable and Contributory Drivers



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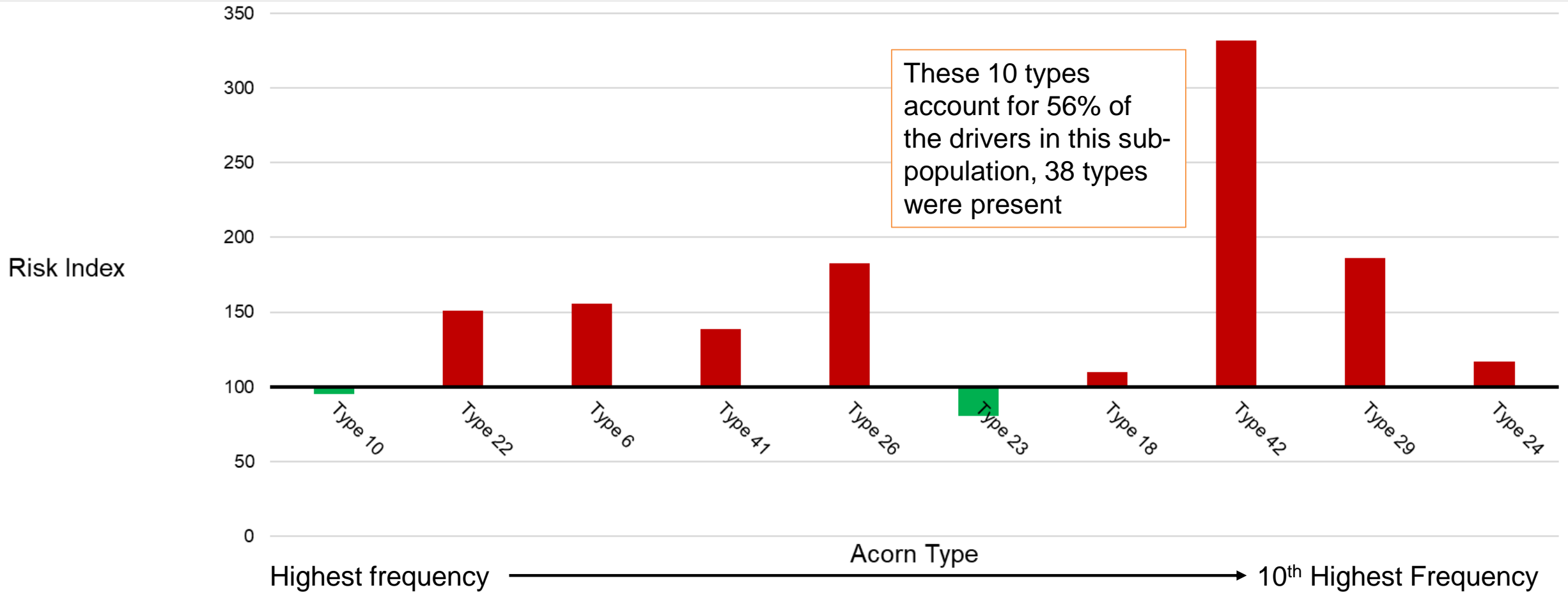


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Risk Index – Acorn Type – Fatal and MAIS3+ – Non-Culpable Drivers



Implementation

Over-represented groups can be targeted with interventions.

Further geospatial analysis can determine clustering of the geodemographic types to allow targeting of interventions focussed on reducing the prevalence of cluster populations in serious injury collisions.



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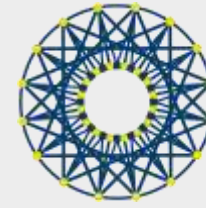
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ROADS POLICING
ACADEMIC NETWORK



Any Questions

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Acknowledgements

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