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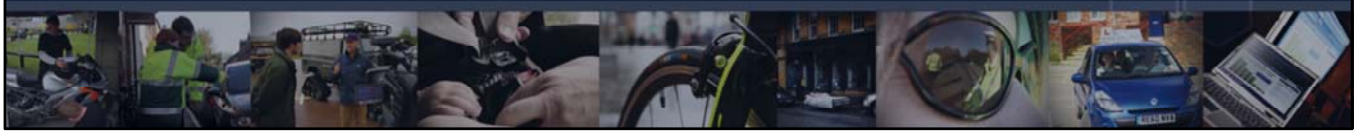
Safety in Numbers for Cyclists in England

Safety First or Numbers First?

Richard Owen



Some of our clients

What is Safety in Numbers (SIN)?

- Wikipedia:

Safety in numbers is the hypothesis that, by being part of a large physical group or mass, an individual is less likely to be the victim of a mishap, accident, attack, or other bad event.

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https://en.wikipedia.org/wiki/Safety_in_numbers

Safety in Numbers for cyclists

- Peter Jacobsen (2003):

'More riders, fewer crashes; fewer riders, more crashes'

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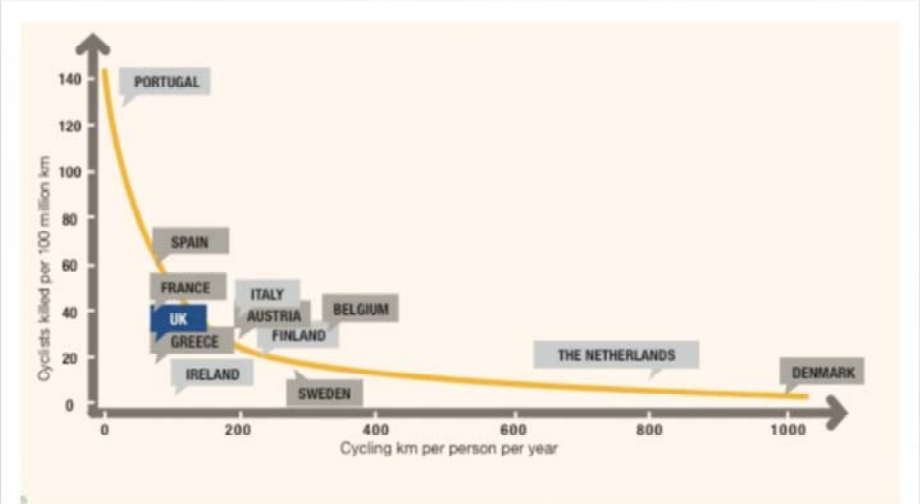
'Safety in numbers: more walkers and bicyclists, safer walking and bicycling', P.L. Jacobsen, Injury Prevention, 2003, Issue 9, pages 205-209

Safety in Numbers for cyclists



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EU countries cycling level and cycling risk in 1998 (Jacobsen 2003)

Why does SIN happen?

- Peter Jacobsen:
  - Adaptation in motorists' behaviour.
- CyclingUK:
  - The drivers are more likely to be cyclists themselves and are therefore more sympathetic;
  - There is greater political will to improve cycling conditions.

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There are more hypothesis about that. We will just mention a few.
(1) Safety in numbers: more walkers and bicyclists, safer walking and bicycling, P.L. Jacobsen, Injury Prevention, 2003, Issue 9, pages 205-209
(2) http://www.cyclinguk.org/campaign/safety-in-numbers

Safety in Numbers for Cyclists in England: Measuring the Effect

- Focus:
  - English Local Authority Districts (LADs) includes cities (n=319)
  - Uses multiple datasets
  - Better (not perfect) metric - risk rate
  - Relationship between cycling risk and cycling level
  - Four categories of LADs based on their level of cycling and the cycling risk (above and below the average)

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Published in…

The Data

- Three datasets:
  - The last 5 years' average adult cyclists' casualties (2010-2014), based on residence, from MAST Online. Residency is calculated by using the postcode of the casualty
  - The Proportion of residents who cycle (any length) for utility purposes at a given frequency in England, 2013 to 2014
  - Population number for each local authority district (LAD), from the GB statistics, for adults (16+)

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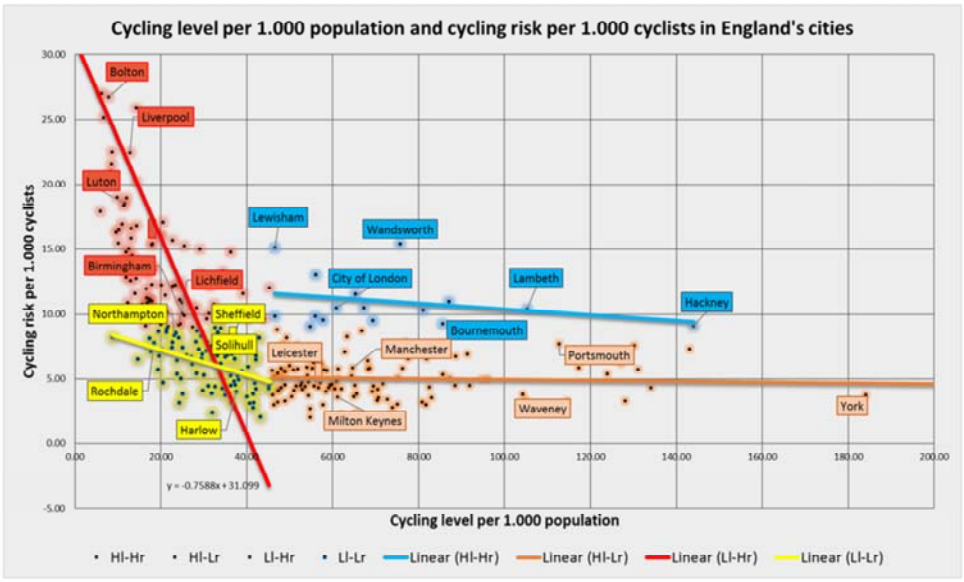
Results



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*Cambridge isn't even on the chart

1. High Risk – High Level	Blue
2. High Risk – Low Level	Red
3. Low Risk – High Level	Orange
4. Low Risk – Low Level	Yellow

What this means

1. There seem to be Safety in Numbers in England
2. The safety effects of increasing cycling seems to be more pronounced for cities with low level of cycling
3. For all ***types of cities*** the effect of increasing cycling is a decrease in risk rate BUT this doesn't mean necessarily that is valid for each city (there are many things to consider when designing a cycling campaign, such as infrastructure, hot spots, cycling purpose, cyclists' profiles)

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Which Came First?

Do more cyclists influence safety rates

or

Do better safety rates encourage more cycling?

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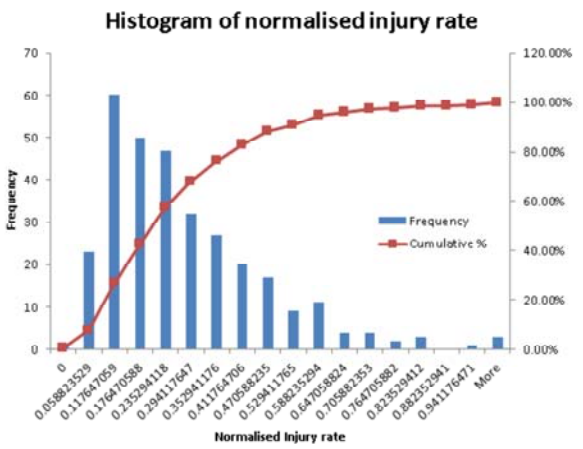
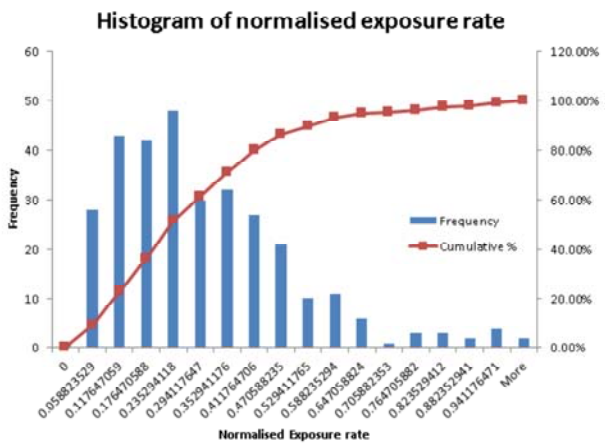
Numbers First or Safety First?





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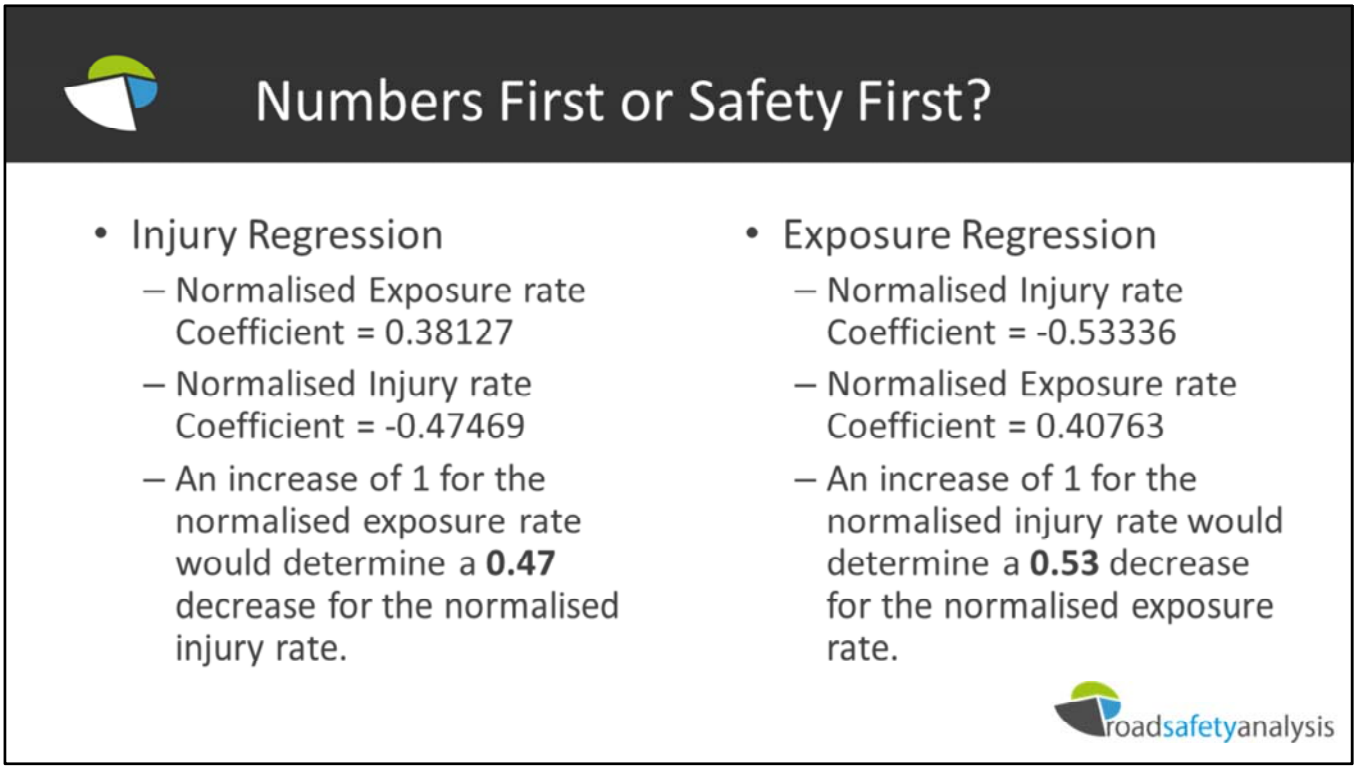
For the next step, simple linear regressions were applied to the whole sample, from both perspectives, for estimating the size of the effect each variable produce on the other, and interpretation of the results was provided.

In the final step of analysis, the sample was split in two subsets, related to their rate of exposure. The first subset represents cities with an exposure rate higher or equal to the average exposure rate (135 cities); the second subset represents cities with an exposure rate lower that the average exposure rate (179 cities). For both subsets, similar simple linear regressions were applied, from both perspectives, and interpretation of the results was provided, as well as a comparison between the two subsets.



Q for George Coefficient = slope? Is it a coincidence that .53 + .47 = 1?

Having very similar effects in direction as well as in size for both regressions, at this level we cannot make assumptions about any differences in the way either variable is shaping the other.

High vs Low Exposure Areas

- High Exposure
  - No significant result (95% confidence interval)
  - Exposure does not influence Injuries
  - Other factors will influence exposure and injury rates
- Low Exposure
  - Both directions show significant results
  - An increase of 1 in the normalised injury rate resulting in a decrease of 0.25 in the normalised exposure rate.
  - An increase of 1 in the normalised exposure rate results in a decrease of 2.02 in the normalised injury rate.
  - Exposure is therefore much more significant

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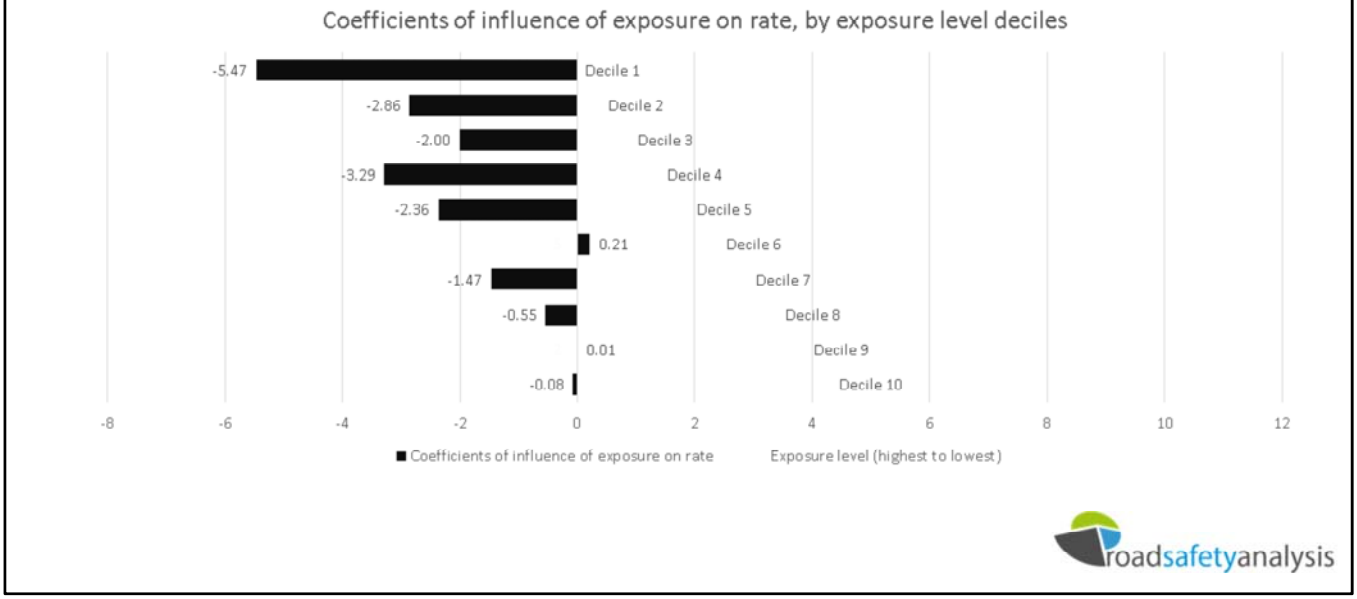
High vs Low Exposure Areas



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High vs Low Exposure Areas

- For areas with low cycling exposure rates SiN exists, it's significant and substantial.
- No SIN effect is seen in areas with higher exposure
- The results seem to indicate that there is rather a saturation point than a tipping point, a level of cycling exposure rate above which SiN effect does not significantly manifest anymore under the existing conditions (infrastructure, culture etc.).
- Beyond this saturation point other possible variables than cycling exposure should probably be investigated in the effort of improving cycling safety.

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Why does SIN stop?

- More powerful and significant effect for cities at the beginning of their cycling journeys
- Presence of 'rare and ultra-rare items' i.e. cyclists
- Inattentional blindness and failure to detect
- Key factor is driver behaviour, not cyclist behaviour

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Thank You

Richard Owen

richard@roadsafetyanalysis.org

www.roadsafetyanalysis.org

+44 01295 731810

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