

GIRO Conference and Exhibition 2012

Juggling uncertainty – the actuary's part to play

19 September 2012

GIRO Conference and Exhibition 2012

The Isles of Wonder:

The Industrialisation of Claims Farming

David Brown and Nigel Carpenter

Disclaimer

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This document supports the research effort of the Actuarial Profession's working party and is not written advice directed at the particular facts and circumstances of any given situation and/or data.

The materials contained in this presentation pack and any oral representation of it by the working party are outside the scope of the TAS.

Third Party Working Party

- Third iteration of the Actuarial Profession's Third Party Working Party, which investigates third party motor claims (injury and property damage)
- Scope this year focussed on private car comprehensive business, with a more granular analysis of geography
- At £8.5bn earned premium for 2011, greater volumes of data than ever before:
 - Data from new contributors representing an extra £2.1bn in earned premium for 2011
 - Significant increase in number of contributors since last year, including new FSA and FSC (Gibraltar) regulated companies
 - Analysis of geography now supported by data at postcode sector level
 - Data collected, processed and analysed in aggregate by Towers Watson

Third Party Working Party

- Initial results presented at June Reserving Seminar and Pricing Seminar:
 - Market statistics and accident year trends, with commentary from the Working Party
 - Analysis of regional experience
- Further potential results to be presented at GIRO:
 - Analysis of individual bodily injury claims data
 - Ancillary analysis from publicly available sources
 - Data questionnaire
 - Implications for the PPO working party results
- Data is provided as at 31 December 2011
 - But the focus of today's hot topic is Geography

Acknowledgements

Working Party:

David Brown (Chair)
John Berry
Simon Black
Nigel Carpenter
Kyveli Charsouli
Matthew Fothergill
Leon Jones
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Tesco Underwriting
The Co-operative Insurance
Zurich

Special thanks:

Towers Watson:
Jennifer Clarke
Alex Craig
James Haybyrne
Adrien de Nazelle

DLG: Oliver Wallace

AXA:
Sylvie Le Delliou
Raj Lakhani
Louise Purchase & team

Admiral: Jamie Long

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3. TV Regions
4. Postcode Districts
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6. A brief history of London and the North West

Data

Market Geographic analysis

- Latest reported claim numbers and **uncapped** incurred claim amounts were provided split by postcode sector
- These data were aggregated and a set of industry statistics produced that shows how key statistics vary by location in the UK
- These statistics are based on latest positions (i.e. on claim information excluding any estimate for IBNR or IBNER claims or amounts) which should be considered when interpreting any results. As such any TPI/TPD ratios are likely to be particularly **understated** for recent accident years
- Results are presented both at postcode sector level in the form of maps, and at RSMB TV region level for aggregated statistics of interest. The TV region lookup used in the analysis has been updated, meaning that there will be some differences, expected to be very minor, compared with last year's analysis
- Data has been checked for consistency but has not been independently audited

Data

Market statistics

- The collection of contributing insurers has changed materially over the years. For example relative to last year's study it includes four new insurers.
- Each year it is common for a number of insurers to make relatively subtle changes to their definitions of claim statistics. In the aggregate, these lead to distortions when comparing the market studies between different years.
- Not all contributors are able to supply data to support every claim statistic in each study. There are generally improvements (but not always) in the availability of data from year to year, and as such, the results of the most recent study will be based upon data from an increased proportion of the contributor companies (and not just new contributors). Again, this introduces a material distortion into any analysis which attempts to compare the results across different studies.
- It is reasonably common for insurers to restate the claims statistics of prior accident years (and prior periods of development), particularly in the case where portfolios (including movements on prior year liabilities) have been acquired or disposed of by the contributor(s) in question. Other reasons for such changes can be changes in the availability of granular data pertaining to (potentially large) segments of portfolios (such as in the case where data is provided by bordereaux rather than being integrated in insurer administration systems) or in some cases changes in the mapping of data to classes.
- For this reason, we would recommend that if the user of the research wishes to understand how trends have evolved over time, then they should focus on looking at trends by accident year within the latest study, rather than attempting to compare the results across studies.
- Likewise we do not consider statistically valid any back engineering of individual contributors' contributions

Data

Police statistics

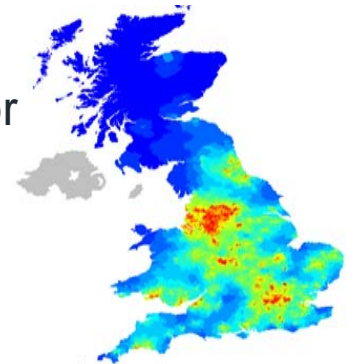
- The Road Traffic Act 1991[^], defines the duty of the public to report a personal injury road accident on a public road involving at least one motor vehicle (unless details such as insurance documents, name, etc. are exchanged between drivers).
- Stats19 is a set of data collected by a Police Officer when a road accident involving an injury or death occurring on a public road is reported (within 30 days of occurrence).
- Non-motor vehicles such as pedal cycles and ridden horses are reported regardless of motor vehicle or pedestrian involvement. Thus, Stats19 road accidents are defined wider than in the Road Traffic Act.
- Casualties per road accident as measured by Stats19 can be viewed as a proxy for the ratio of claimants per injury claim.
- The Department for Transport acknowledged in their 2008 report that a considerable proportion of non-fatal casualties are not reported to the police.
- In addition consistency in time in the data collection can not be guaranteed.

[^]Road Traffic Act 1988, s 170 amended by the Road Traffic Act 1991, Sch 4

Data

Claim Management Companies

- Our CMC data extract is limited to knowing the count and location of CMCs registered office. We do not have information on the turnover or geographical extent of operations of individual CMCs.
- The CMC density maps, by being based upon the count of CMCs, implicitly assume that all CMCs are equal in size, and by virtue of the spatial smoothing algorithm assume that all CMCs operate locally to their registered office.
- As the size and structure of individual CMCs actually varies from sole traders operating locally to national companies operating across the UK, the CMC density charts should be interpreted with caution and indicative of broad trends only.



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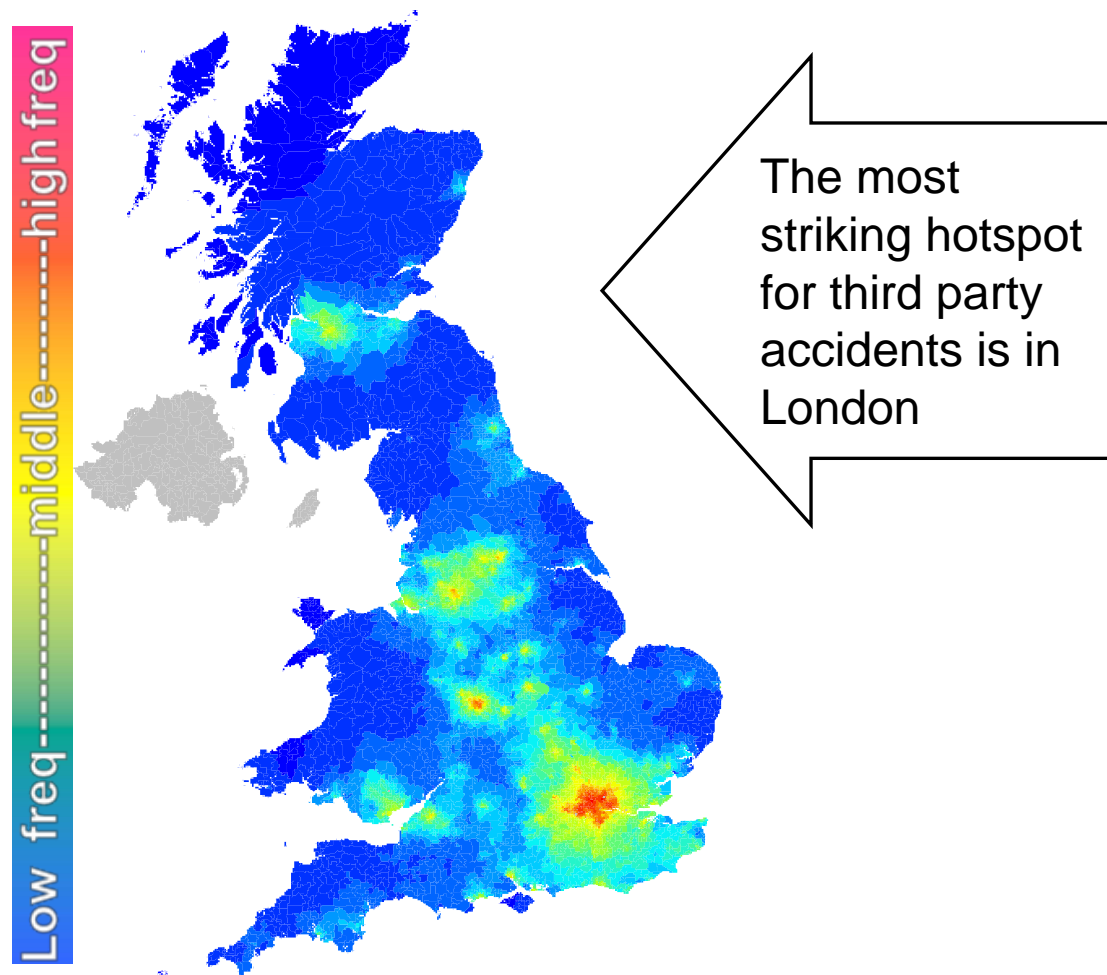
UK Maps

Comparing Market data & CMC data

- CMC hotspots and TPI hotspots are similar
- This also is the case for TPI / TPD (the factor which CMCs are potentially elevating)
- But here, London appears to be anomalous with higher CMC density than its TPI / TPD ratio would suggest (unless there is a lag effect and we will see this in **London 2012** data).

Geographic analysis

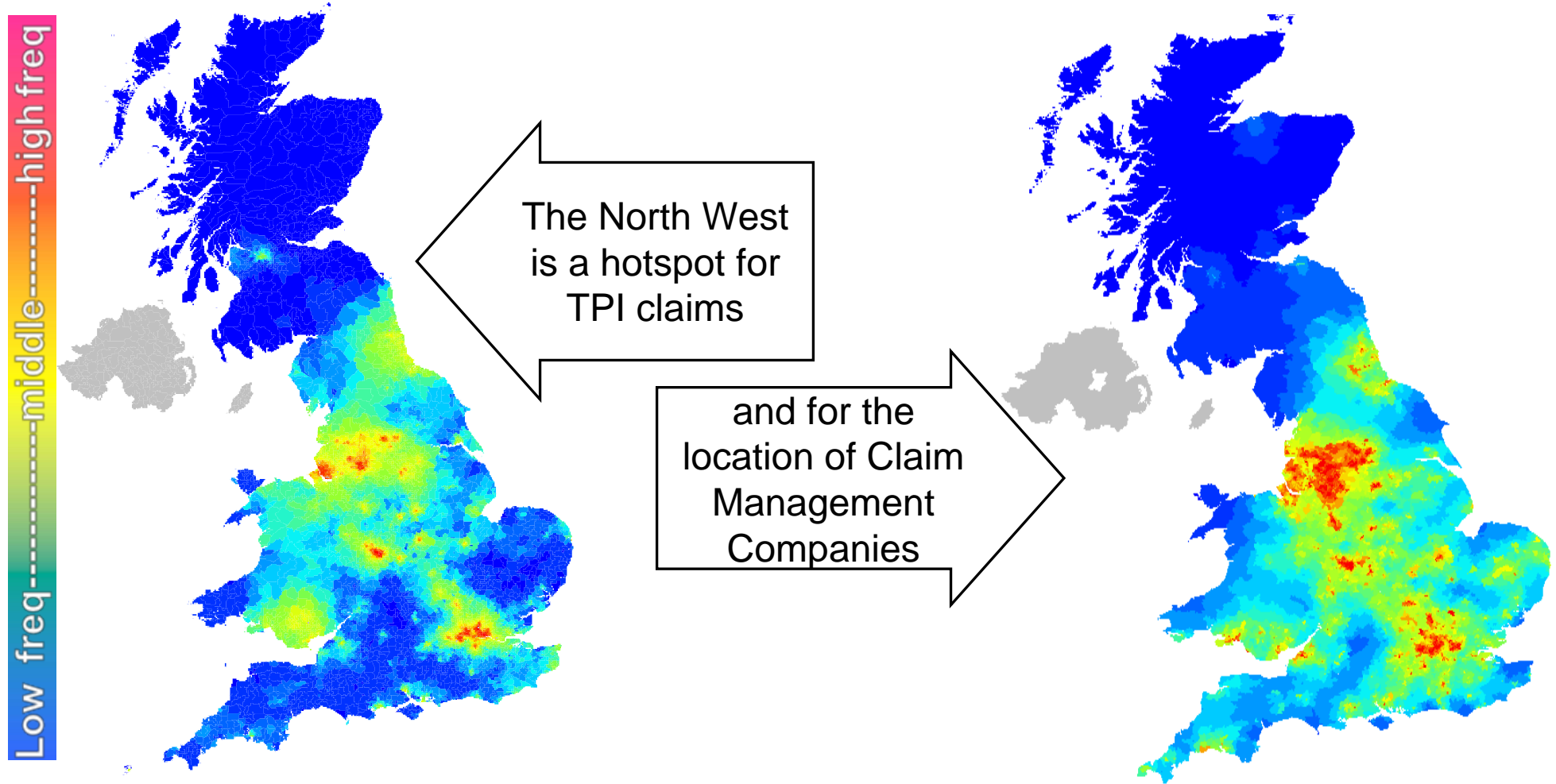
TPD frequency 2011



Geographic analysis

TPI frequency in 2011

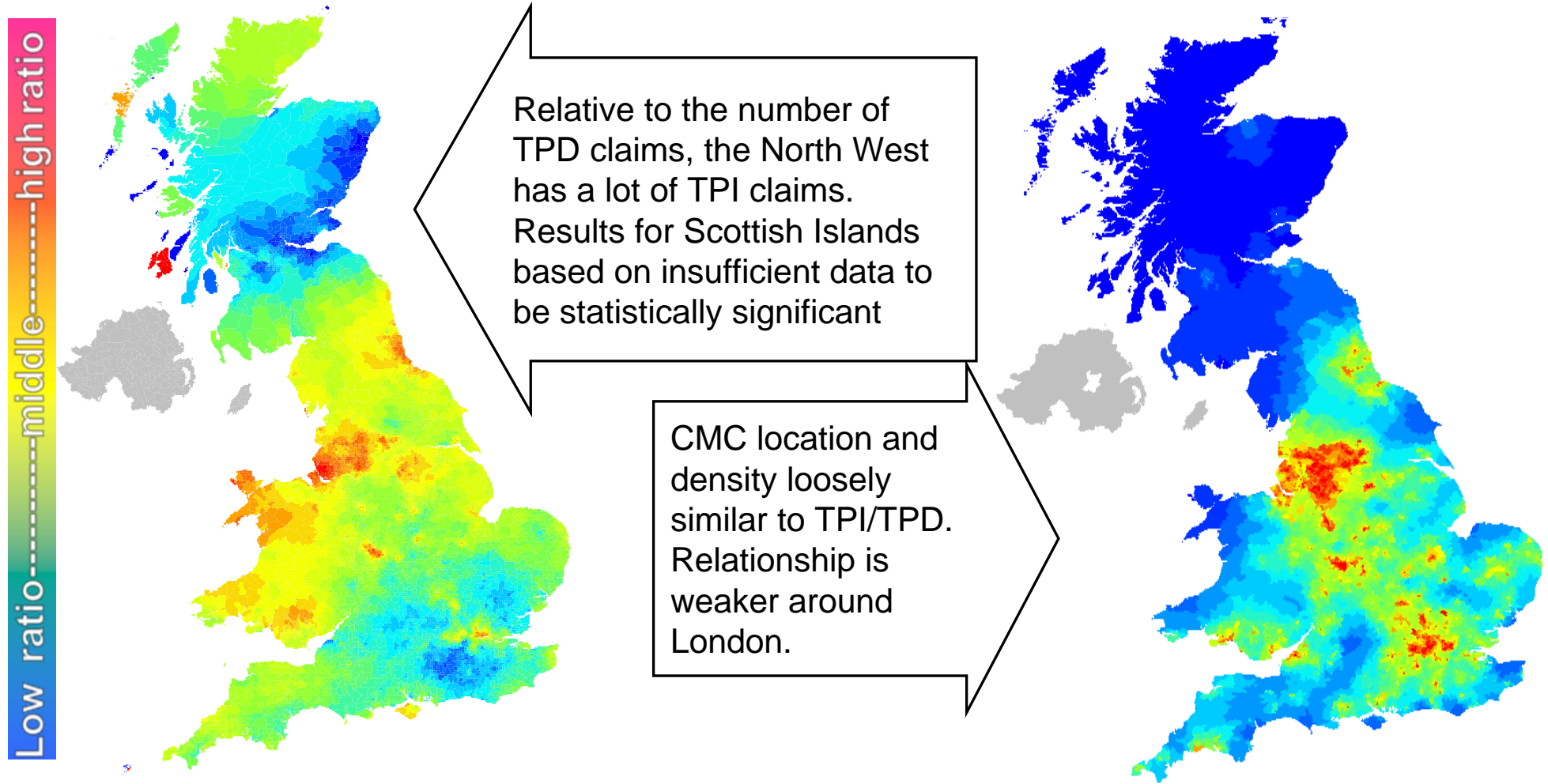
CMC density 2011



Geographic analysis

TPI / TPD ratio in 2011

CMC density 2011



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UK Maps

STATS19 Police “Accident” Data

Similarities to Market Data

- In non rural areas, the TPI / TPD hotspots and Police Casualties per Accident coincide.
- If a TPI / TPD proxy is inferred, the Police data could suggest that the North West has some contributing underlying reasons for higher TPI /TPD (potentially driven by more multicar accidents / passengers per car)

Differences to Market Data

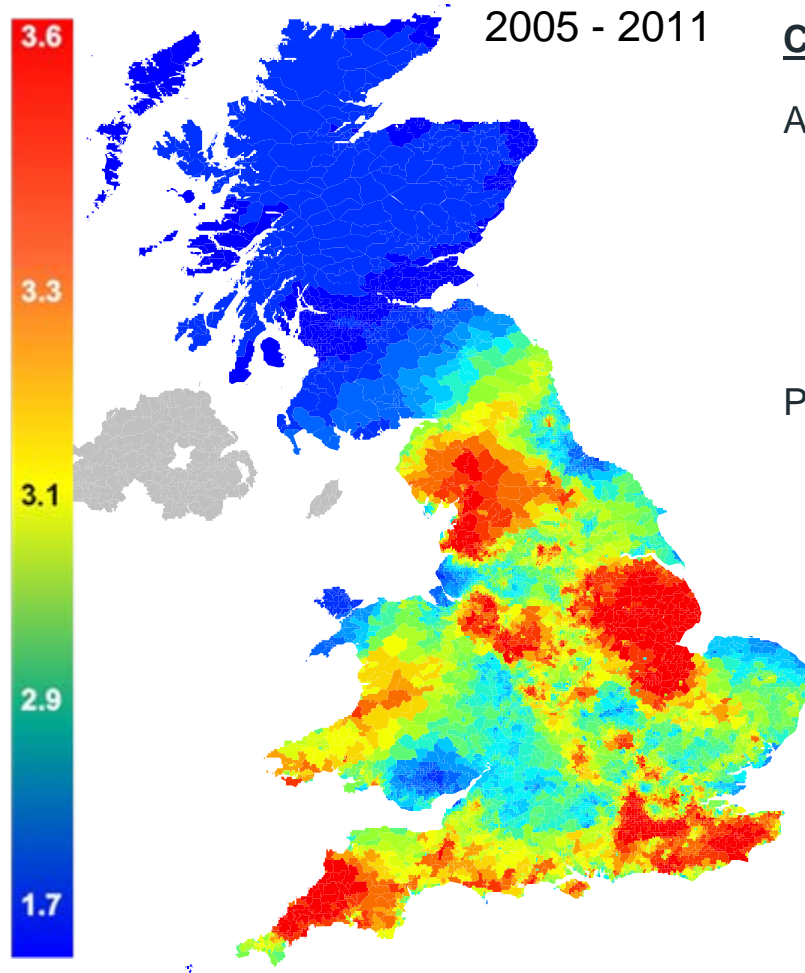
- Police Accident statistics always include bodily injury (including any insured drivers); and they are likely not to be recording minor injuries
- Police injuries are down; market data is up
- Police data is more rural; market data is more urban (& North West)

Geographic analysis

“Accidents” per 1000 popn

STATS19

2005 2006 2007 2008 2009 2010 2011



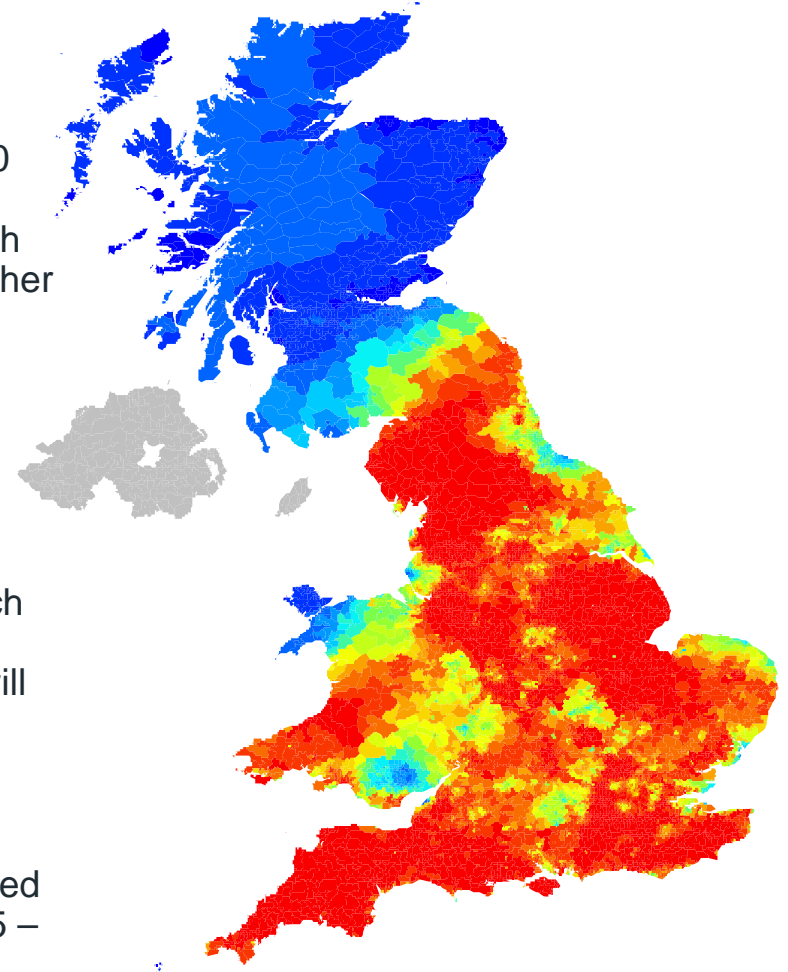
Comment

Accidents involving policy reported injury per 1000 population shows unexpected pattern, with rural areas showing higher ratios.

Presume that this is due to population being an inappropriate denominator.

Tourism hotspots, such as the Lakes, South Coast and Cornwall will have disproportionate levels of traffic to population.

Frequency has reduced significantly over 2005 – 2011.

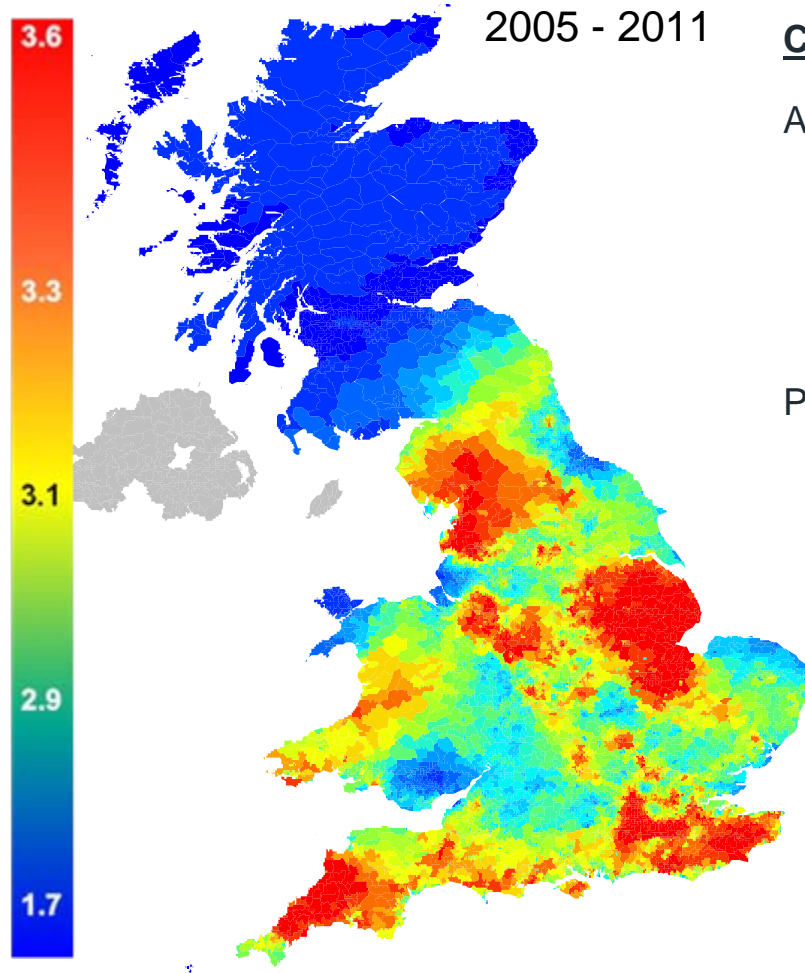


Geographic analysis

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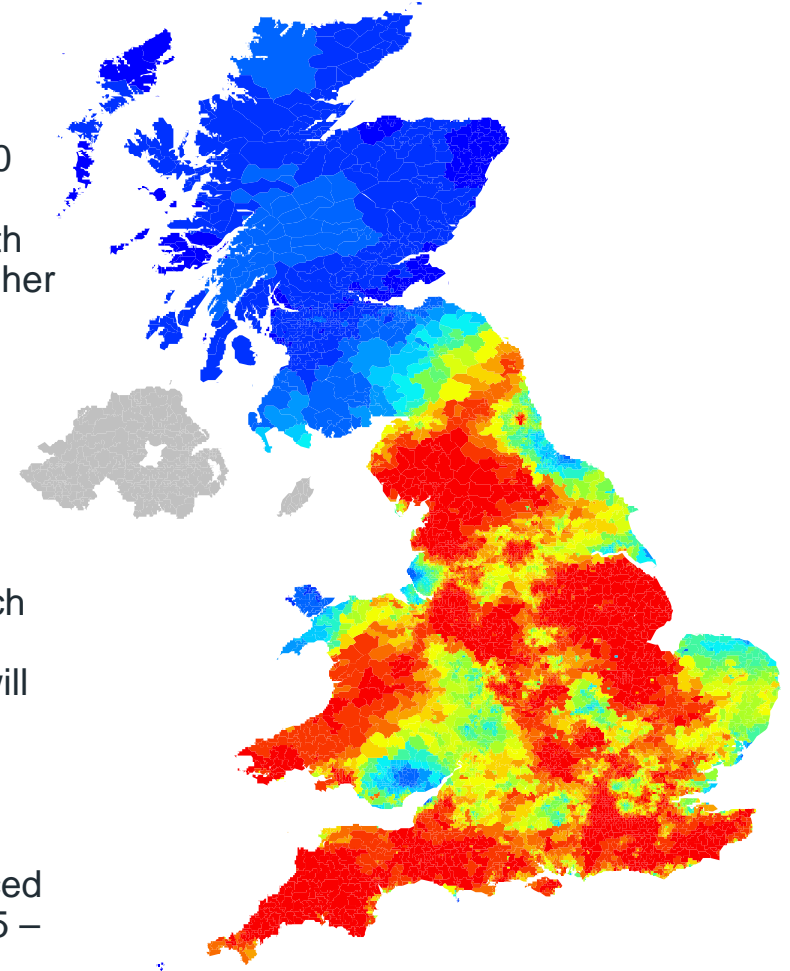
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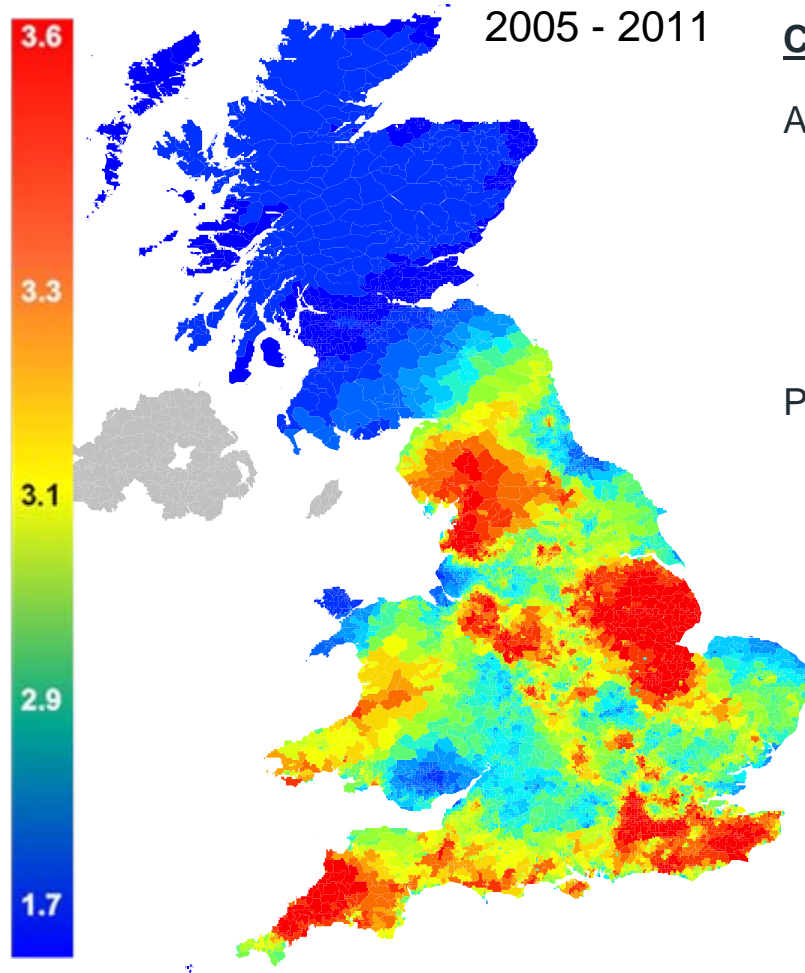


Geographic analysis

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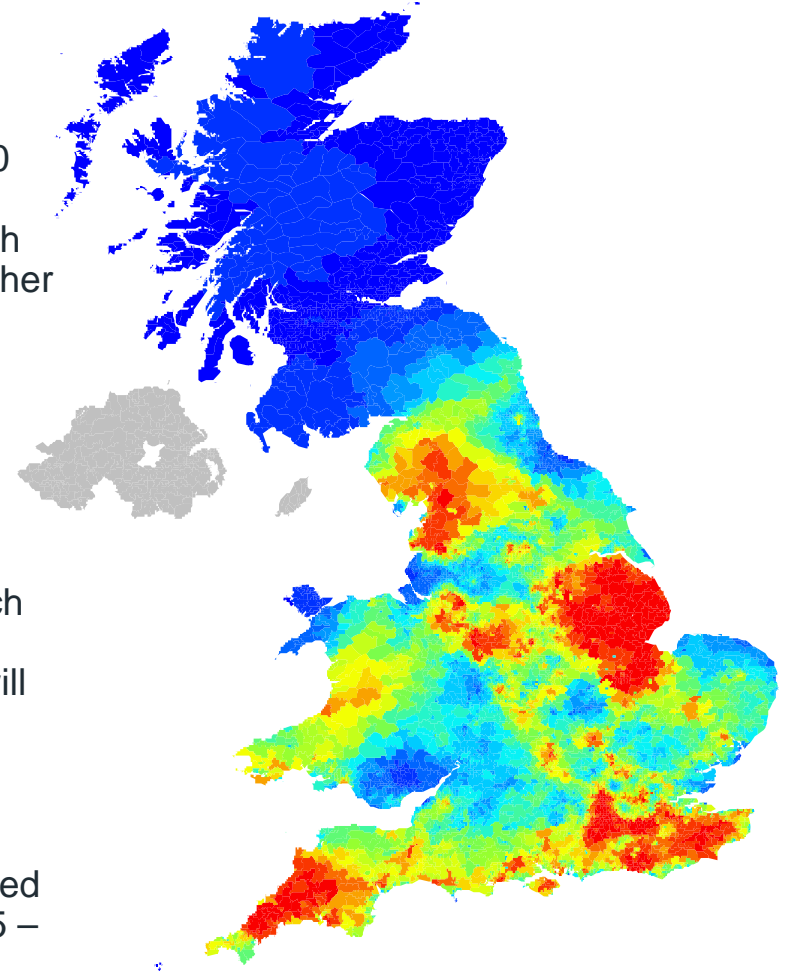
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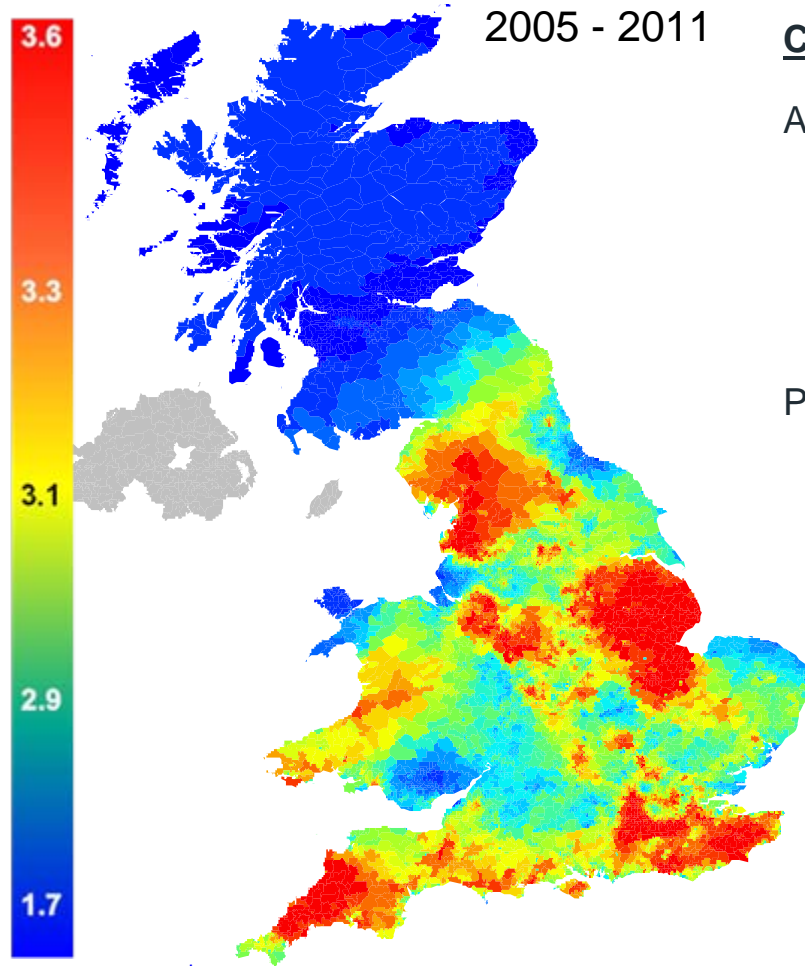


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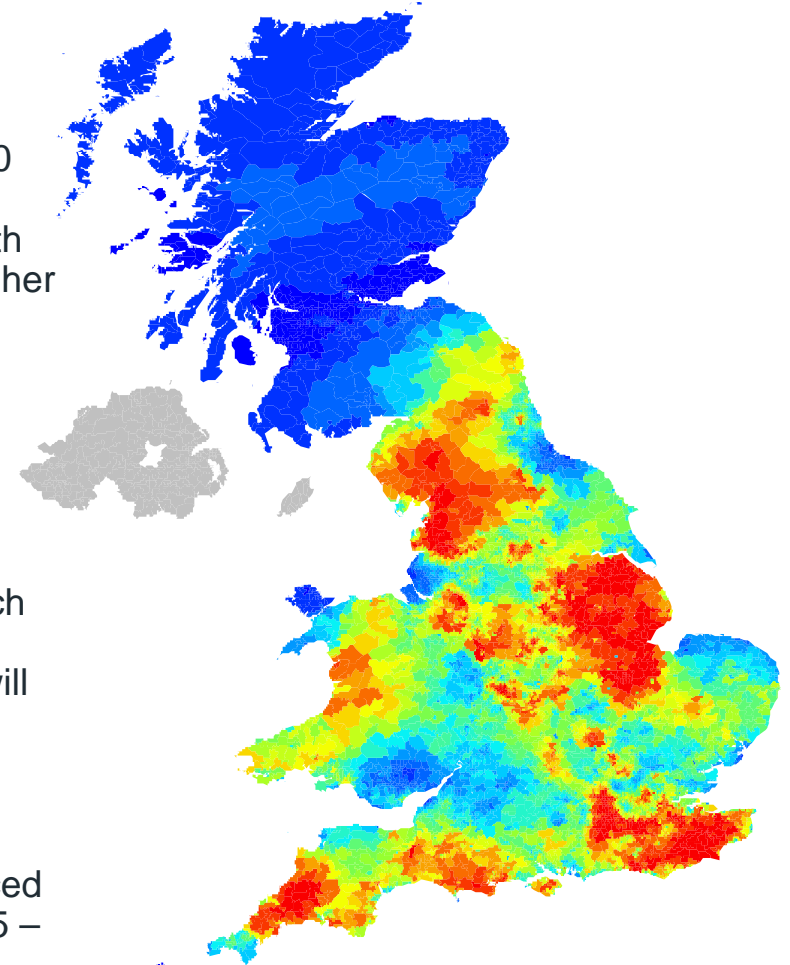
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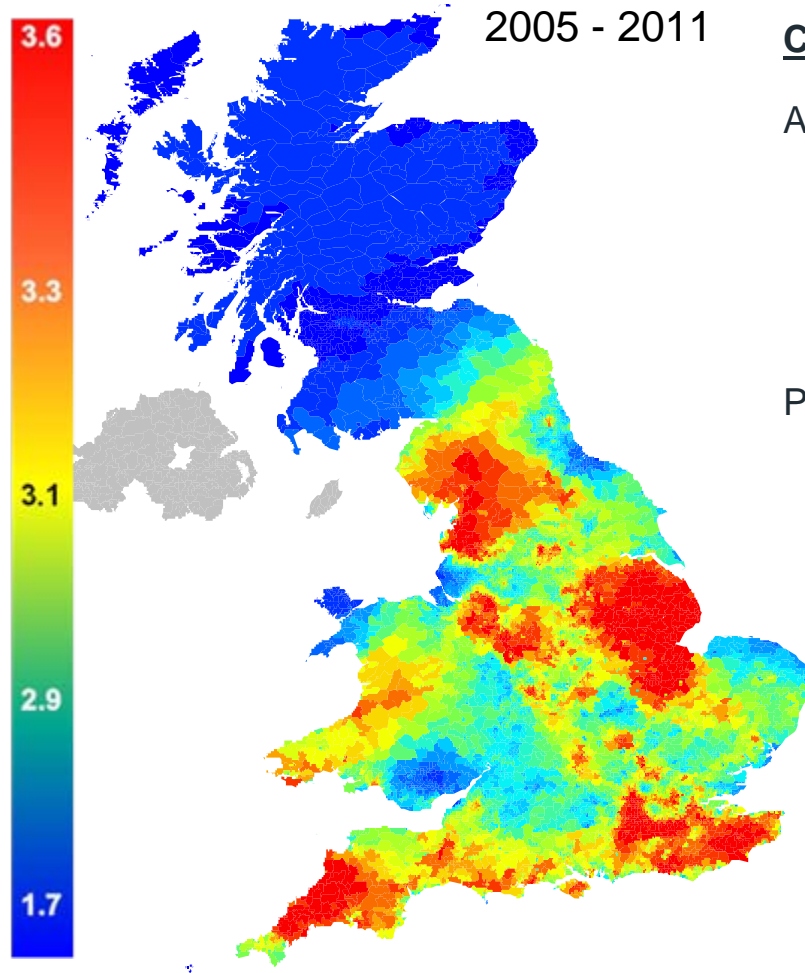


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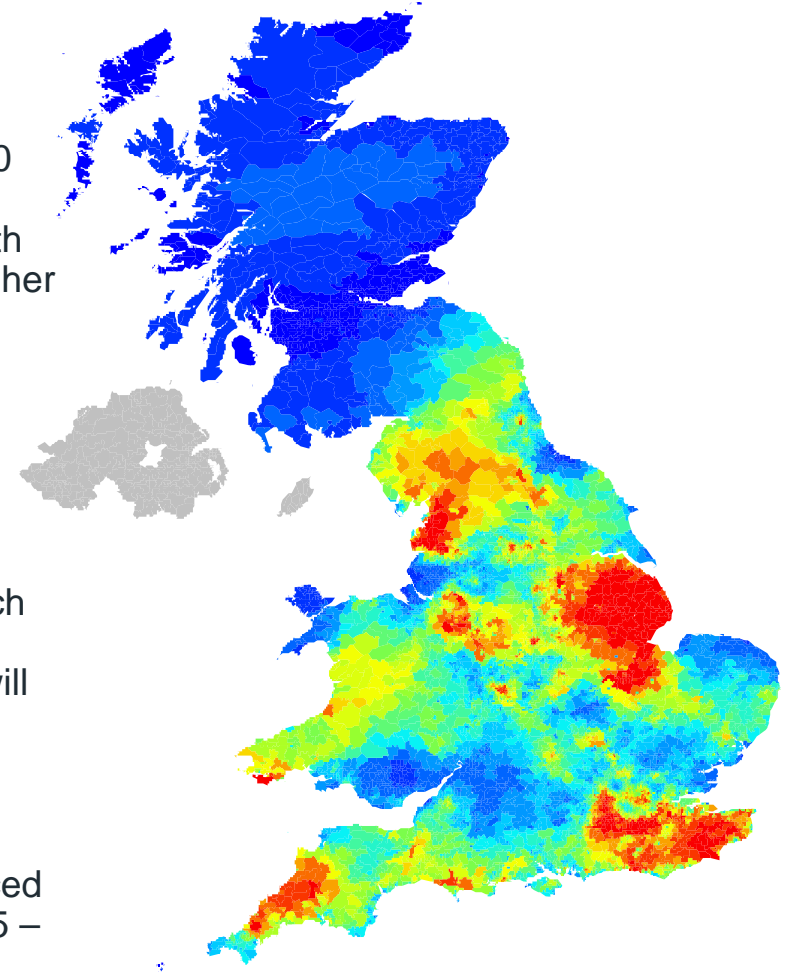
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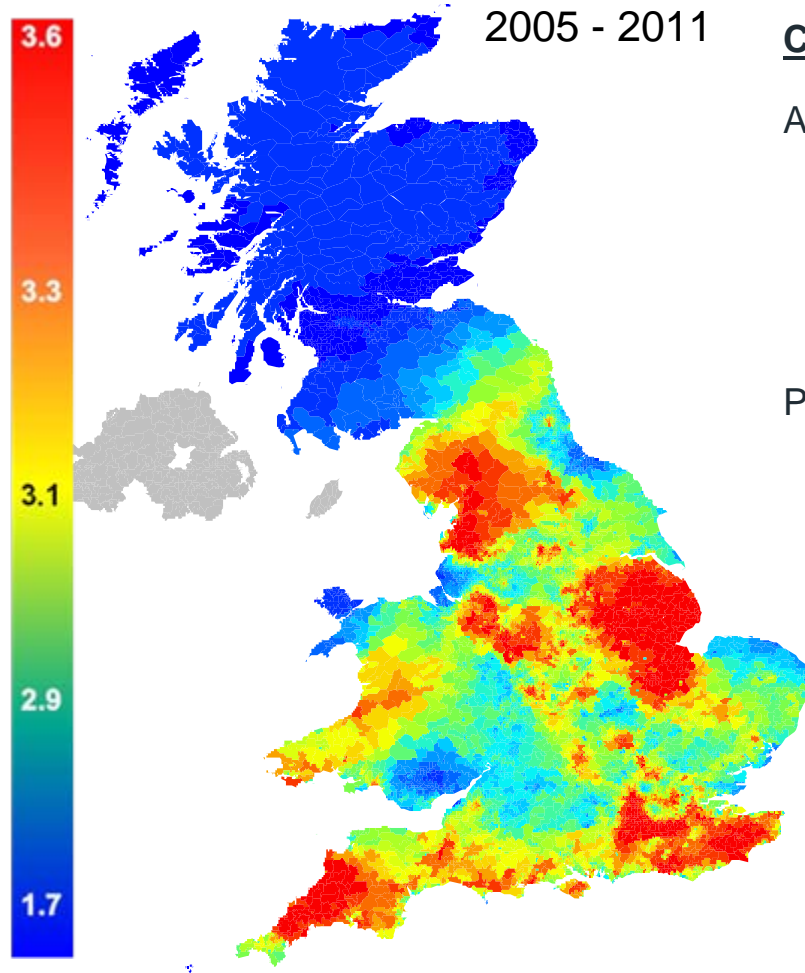


Geographic analysis

“Accidents” per 1000 popn

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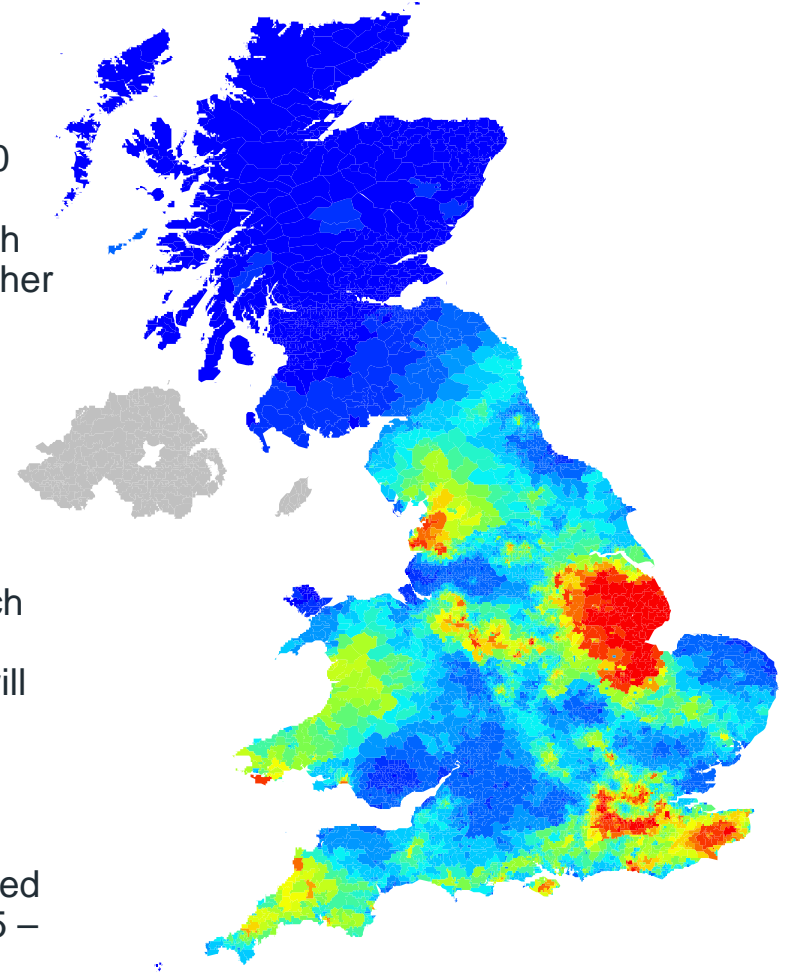
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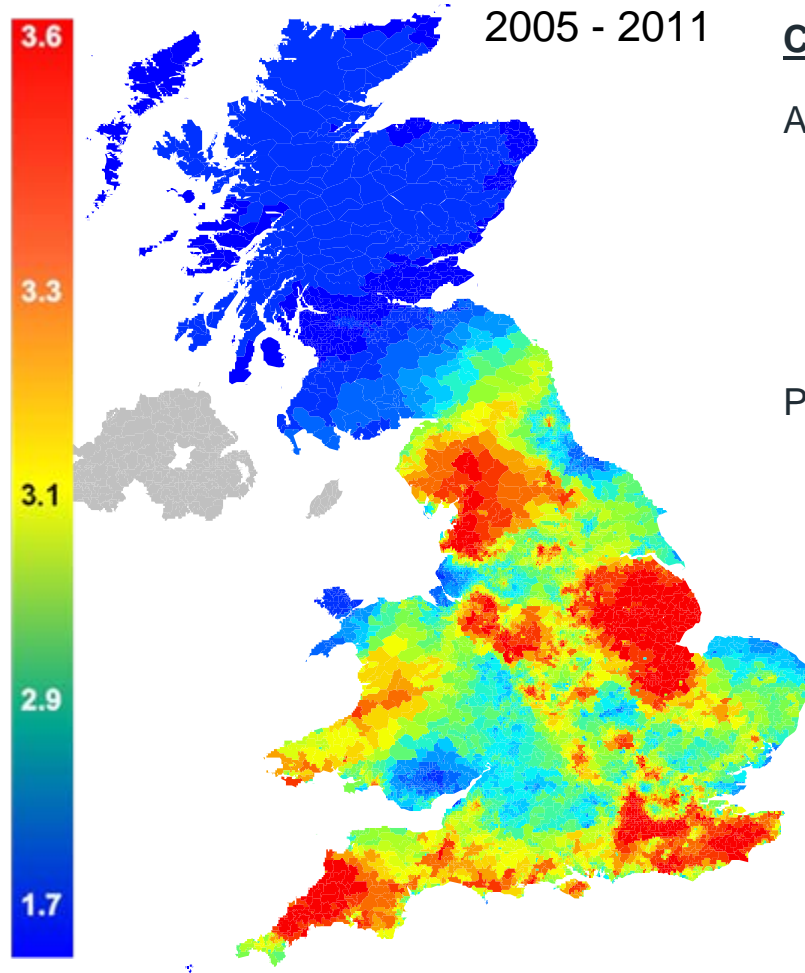


Geographic analysis

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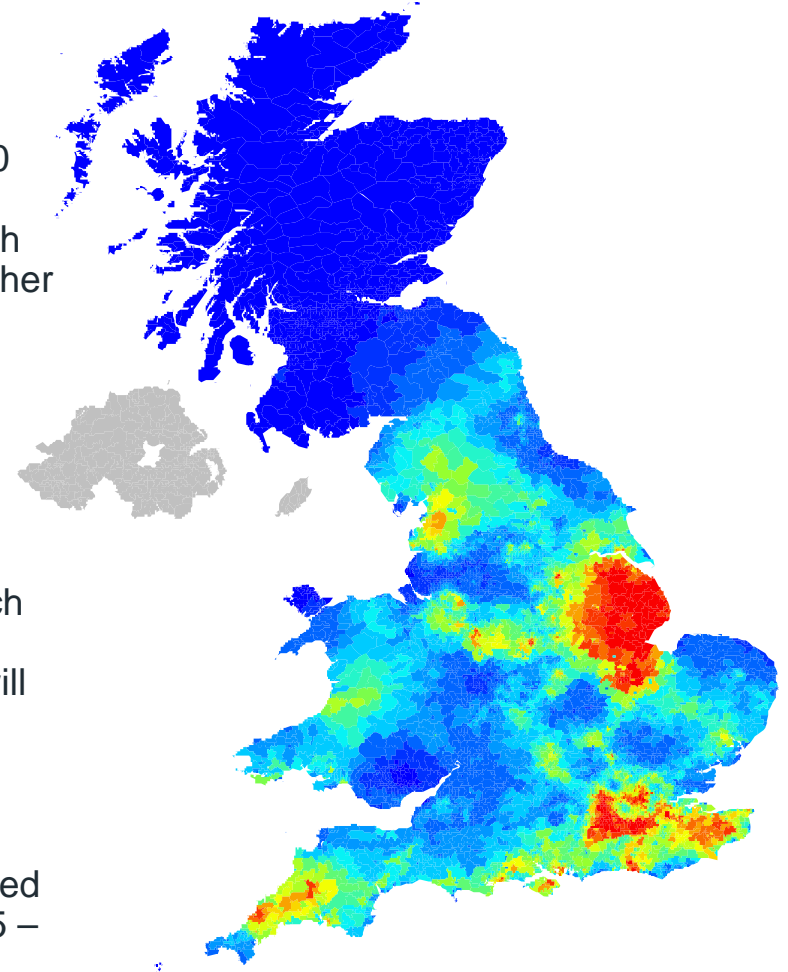
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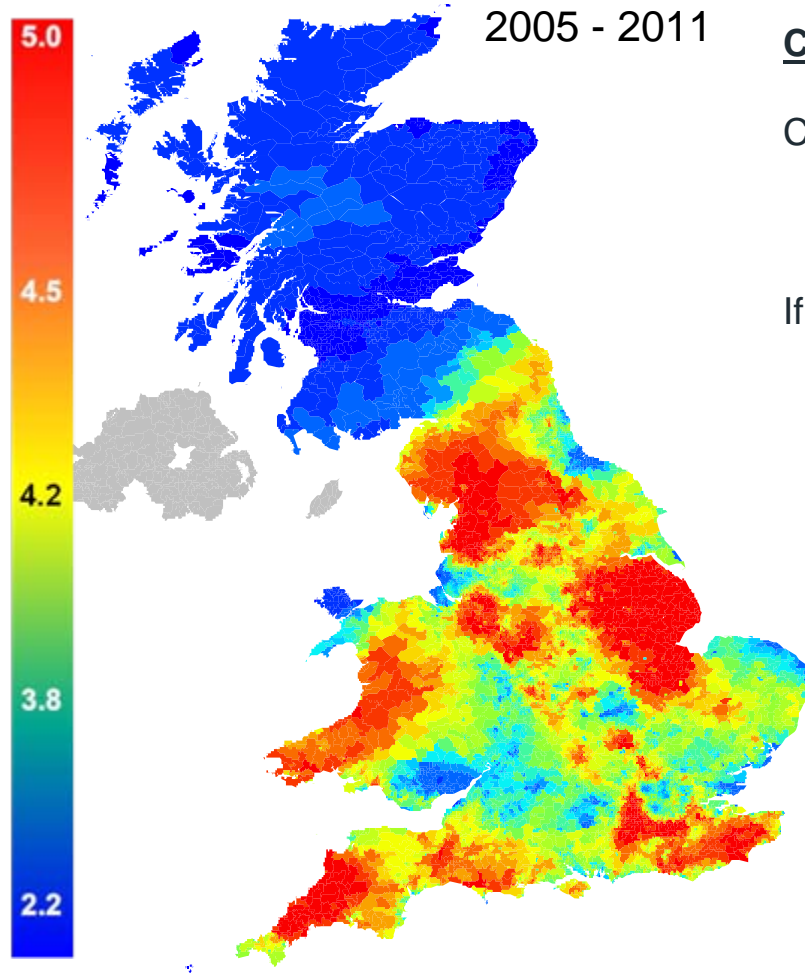


Geographic analysis

Casualties per 1000 popn

STATS19

2005 2006 2007 2008 2009 2010 2011

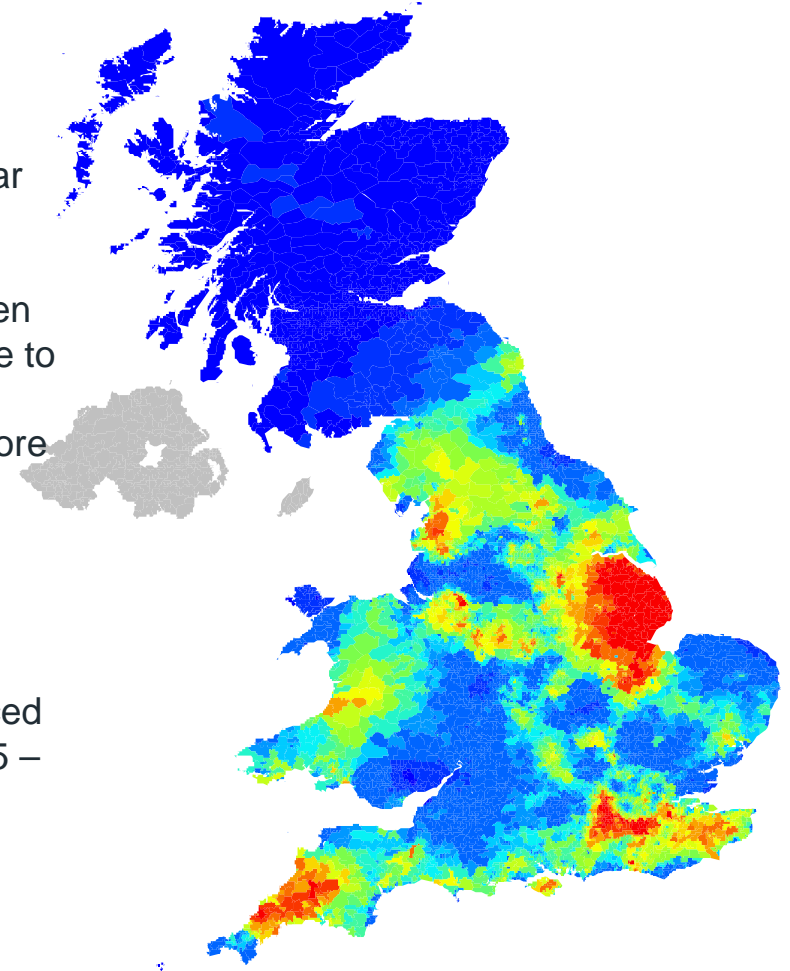


Comment

Casualties per 1000 population shows similar pattern to accidents.

If anything rural effect is even stronger potentially due to more passengers per vehicle giving rise to more casualties.

Frequency has reduced significantly over 2005 – 2011.

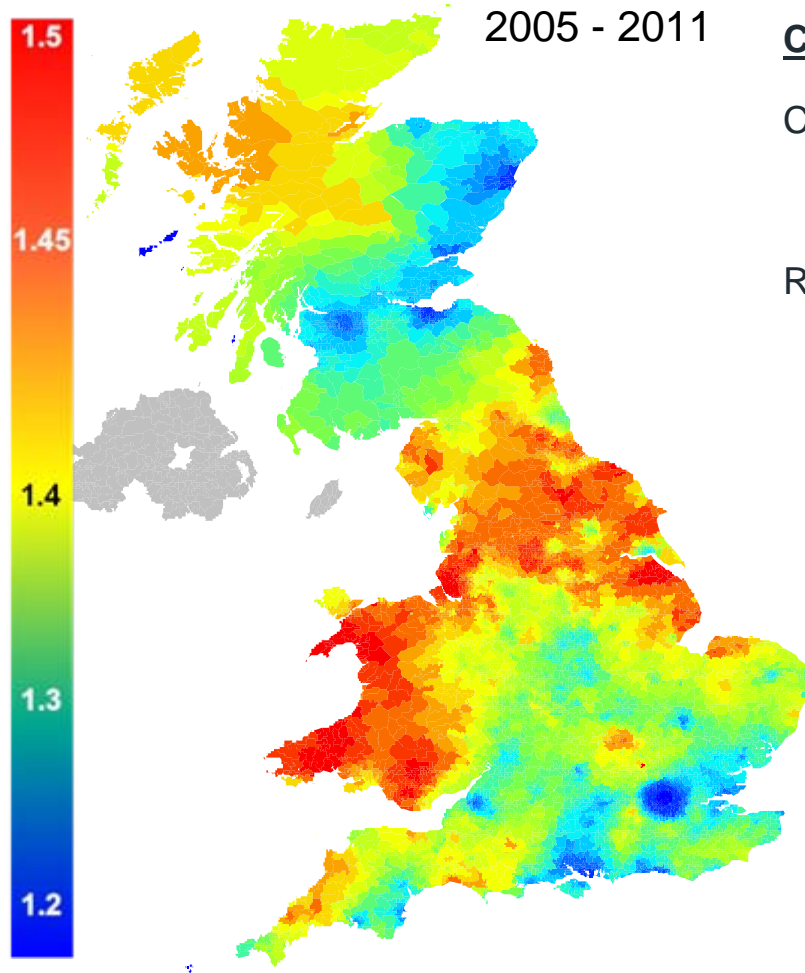


Geographic analysis

Casualties per “Accident”

STATS19

2005 2006 2007 2008 2009 2010 2011



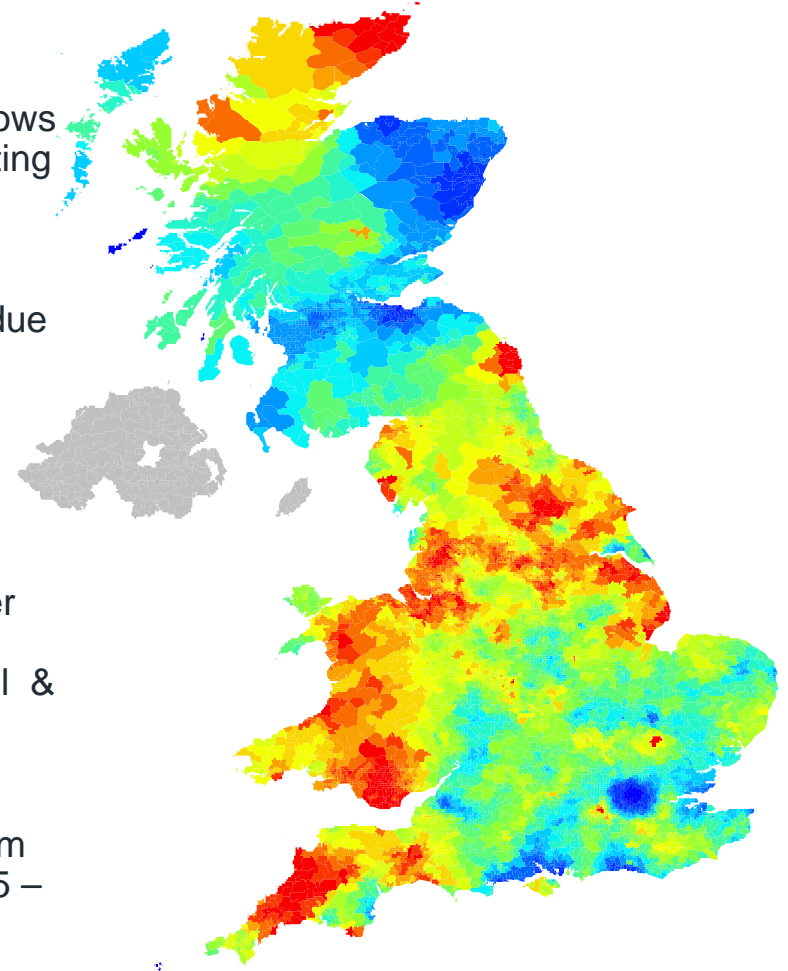
Comment

Casualties per accident shows some stark and interesting contrasts.

Rural areas generally show higher ratios, possibly due to higher speeds and greater vehicle occupancy.

London, Glasgow and Edinburgh show very low ratios but not other large cities such as Birmingham, Liverpool & Manchester

Ratio has reduced from 1.37 to 1.35 over 2005 – 2011.

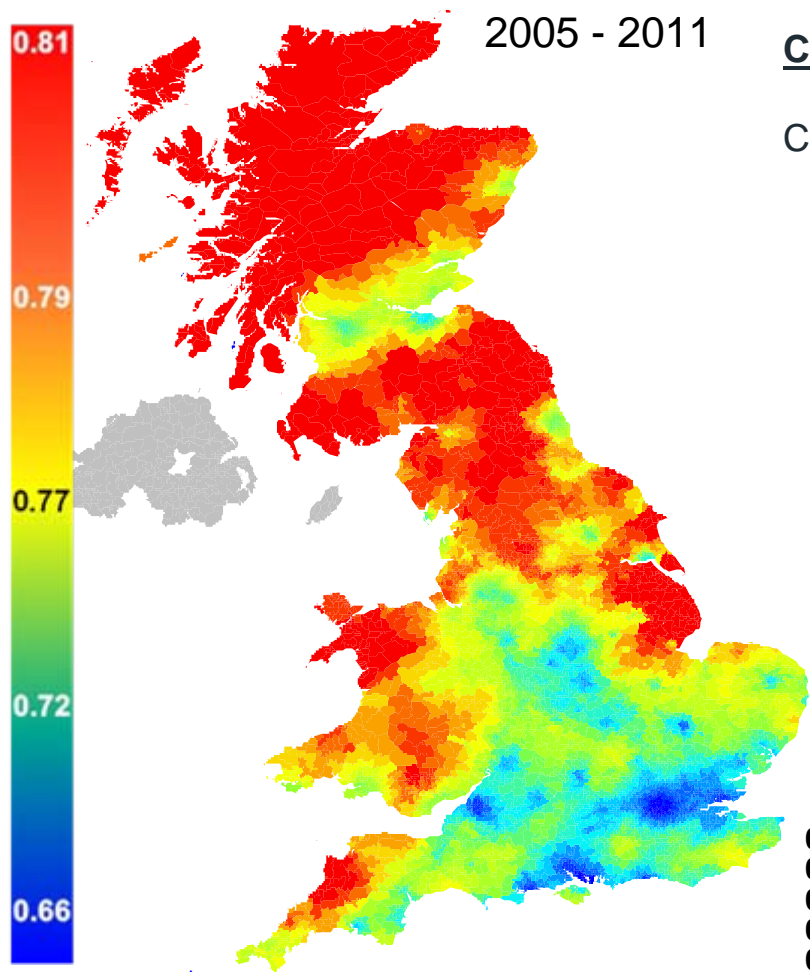


Geographic analysis

Casualties per Vehicle

STATS19

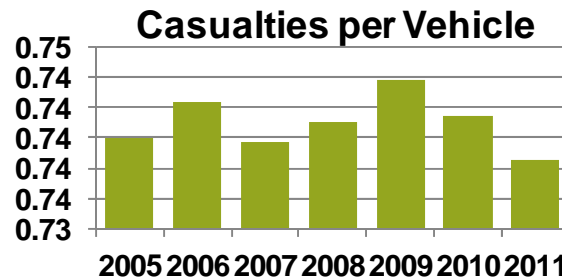
2005 2006 2007 2008 2009 2010 2011



Comment

Casualties per vehicle shows rural urban differentiation seen in earlier charts.

Ratio has remained at 0.74 over 2005 – 2011.

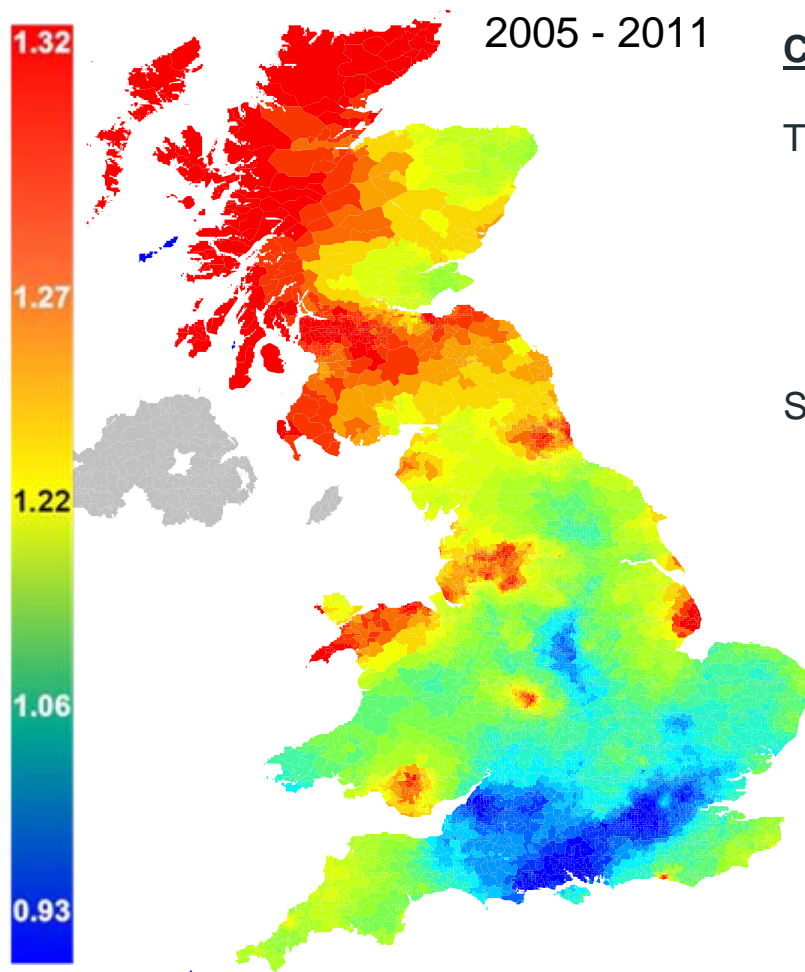


Geographic analysis

Inferred TPI per TPD*

STATS19

2005 2006 2007 2008 2009 2010 2011



Comment

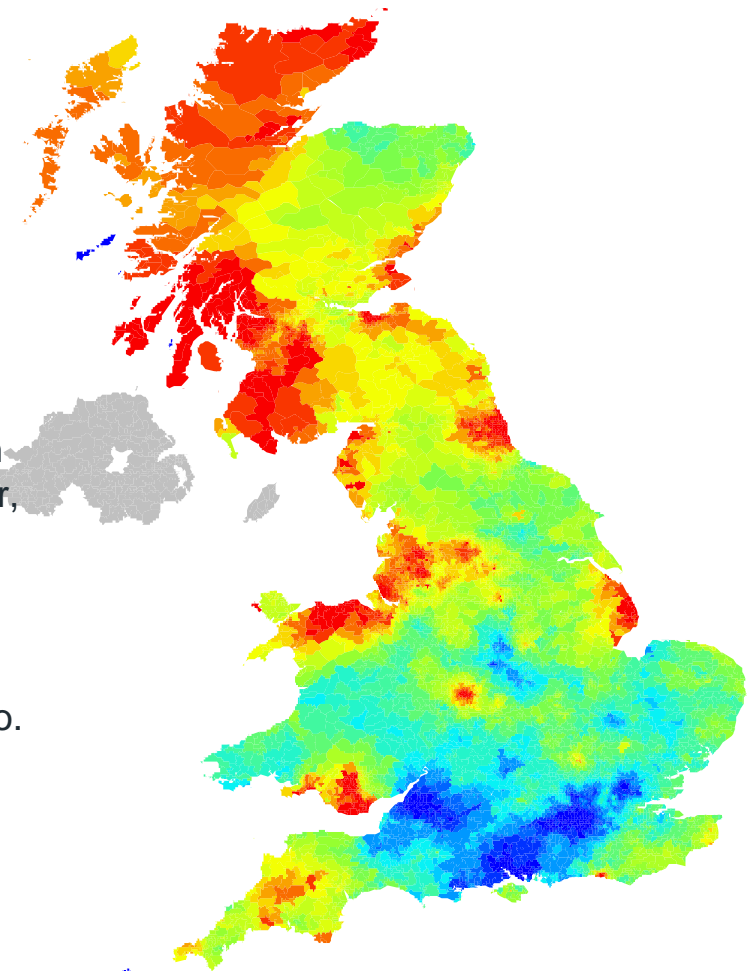
TPI per TPD ratio is high in some rural areas, presumably due to more passengers and higher speeds

Some urban areas shown higher TPI per TPD, such as Liverpool, Manchester, Birmingham and South Wales.

London and South England has lowest ratio.

Overall pattern in stark contrast to Insurer's experience.

* See next slide for details



Inferred TPI per TPD

Technical Explanation

Definition of TPI / TPD ratio

Within the Insurance data, the TPI per TPD ratio measures the ratio of the count of TPI to TPD claims excluding at fault drivers and damage to the at fault vehicle.

For example, 1 accident, 2 vehicles, 3 casualties (2 drivers and 1 passenger)

TPI count = 1 claim or 2 claimants and TPD count = 1 claim or 1 claimant (the at fault driver and vehicle do not contribute to counts)

TPI/TPD ratio = 1 when measured on a claims basis or 2 when measured on a claimant basis.

The STATS19 data records information relating to accident with injury. For an accident with injury we know the number of casualties, number of vehicles involved and the status of the casualties (i.e. whether casualties are drivers, passengers or pedestrians). With this information we can create a pseudo TPI per TPD ratio as follows:

$\text{TPI} = \text{count of all casualties} - \text{count of casualties where casualty is driver in first vehicle}$

$\text{TPD} = \text{count of all vehicles} - \text{count of accidents}$

In the above example, TPI count = 2 (= 3 - 1, as the driver of the first vehicle will not count) and TPD count = 1 (= 2 - 1)

Inferred TPI per TPD

Technical Explanation

Weaknesses in these measures and comparisons

- Can see that this pseudo measure is closest to the insurance TPI/TPD ratio measured on a claimants basis
- STATS19 data will only count TPD where there is a TPI. In insurance figures there will be a small proportion of TPI claims for which there is no TPD claim.
- Whilst direct comparisons are not necessarily sensible, comparison of geographical variation is of interest.

Observations in the STATS19 exhibits

- The main observation in the STATS19 data is that the KPIs / risk is not uniform across the country. There are material variations that can operate at small geographical areas.
- A secondary observation is that the STATS19 geographical variation is often different to that observed in insurance data. London often jumps out as being better than other big cities (see Casualties per accident, Casualties per vehicle and Inferred TPI per TPD) and this is generally not the case in insurance data
- Finally the STATS19 statistics suggest that there may be some underlying reasons why Liverpool / Manchester have higher TPI experience.

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TV Regions

Comparing Market Data & CMC data

Geographic analysis

Postcodes: a quick recap














KT17 1HB

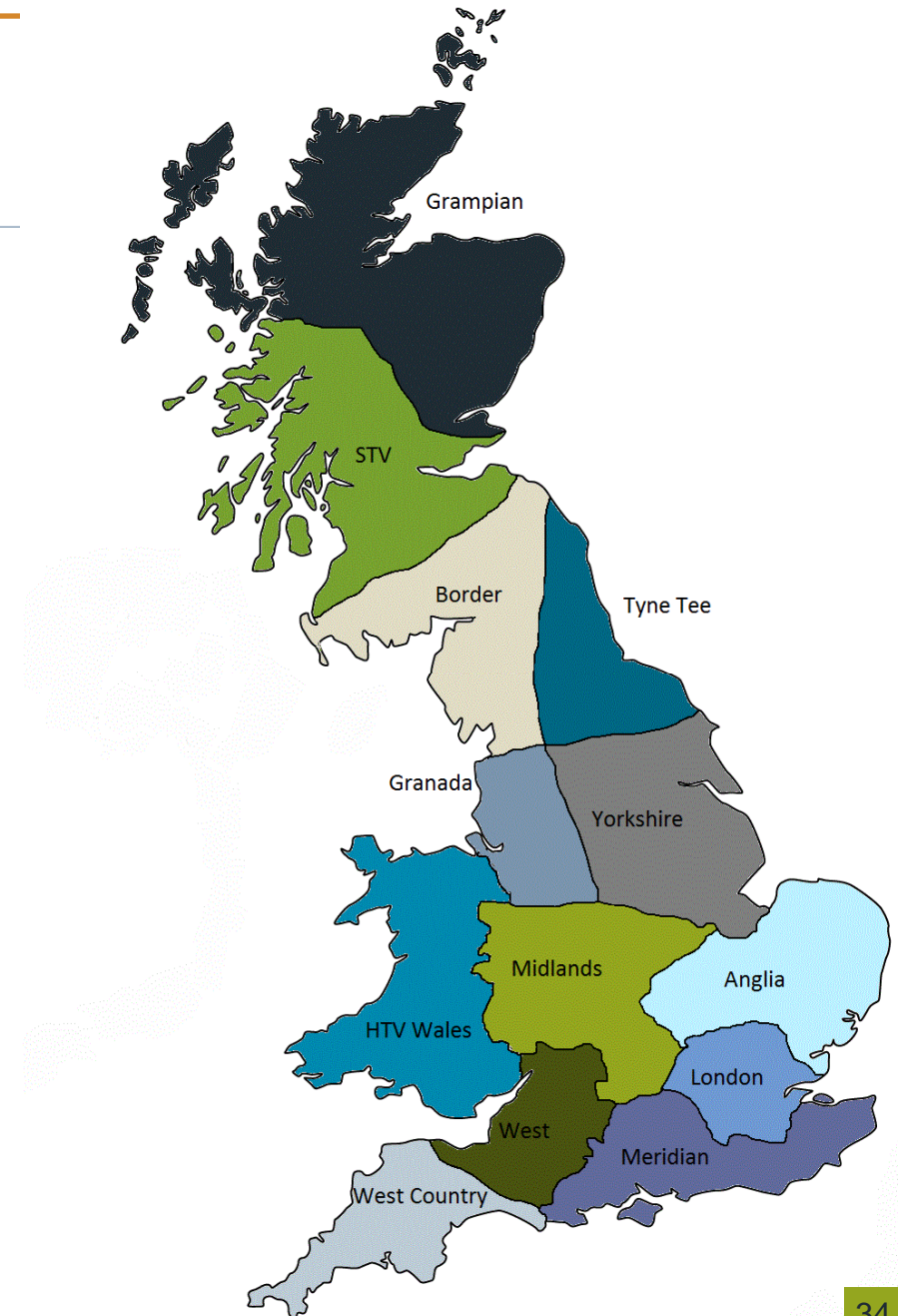
- Postcode Area = KT
 - Postcode District = KT17
 - Postcode Sector = KT17 1
 - Postcode Unit = KT17 1HB
-
- RSMB TV region = London



Geographic analysis

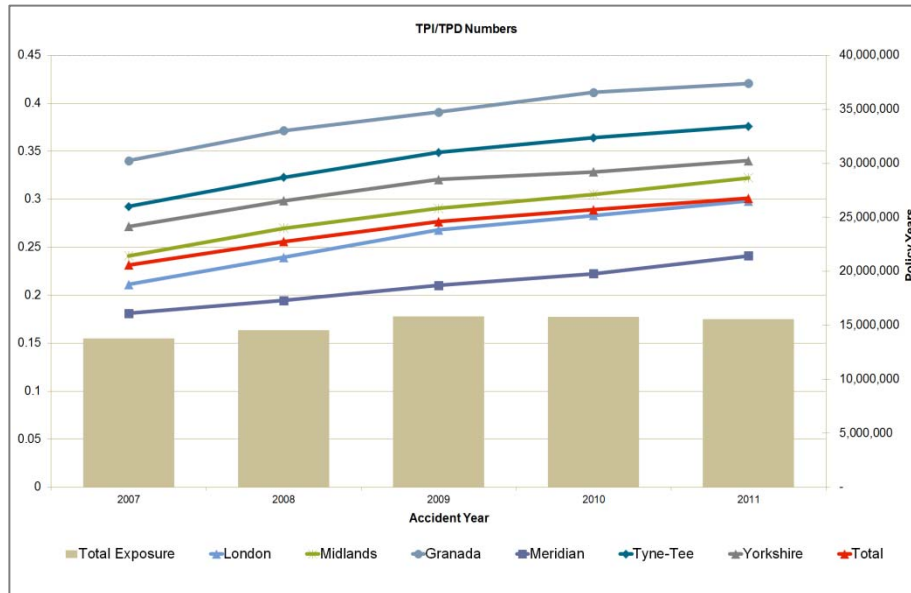
Key to RSMB TV Regions

Colour	TV Region	% of Total 2011 Exposure
	Grampian	2%
	STV	6%
	Border	1%
	Tyne Tee	5%
	Granada	11%
	Yorkshire	10%
	HTV Wales	5%
	Midlands	15%
	Anglia	9%
	London	18%
	HTV West	4%
	Meridian	11%
	West Country	3%



Geographic analysis

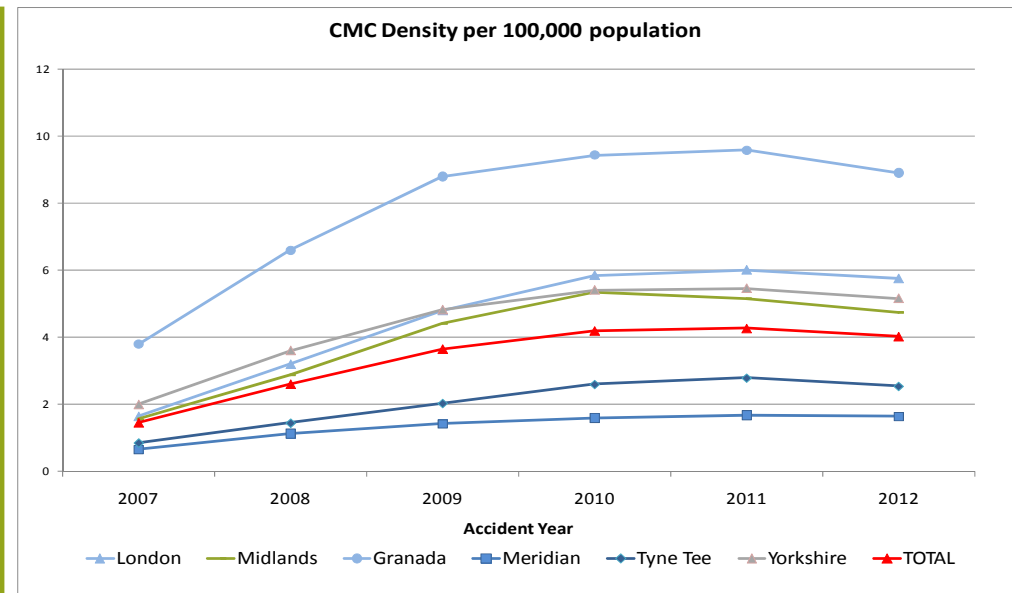
TPI to TPD Ratio



- The North West continues to display the highest TPI / TPD ratio
- London has deteriorated and now equals the national average
- The rate of worsening does itself vary geographically (the lines are not parallel)

2011 is particularly subject to further IBNR development

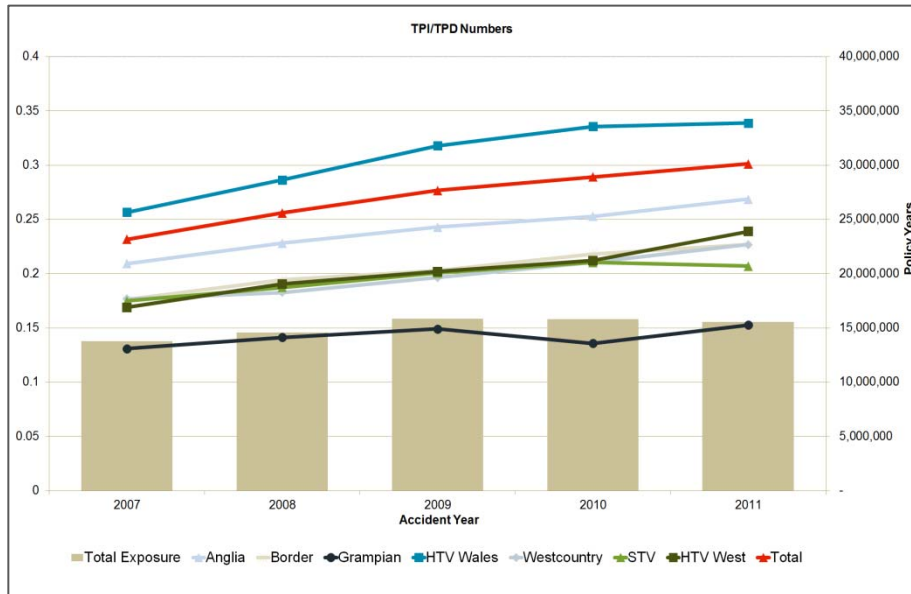
CMC density



- The North West also shows the highest CMC density
- London now shows the second highest density of CMCs, but is lagging in TPI/TPD
- The North East has relatively low CMCs, but high TPI/TPD
- All regions showing similar decrease in CMCs in 2012 (but national turnover is up)

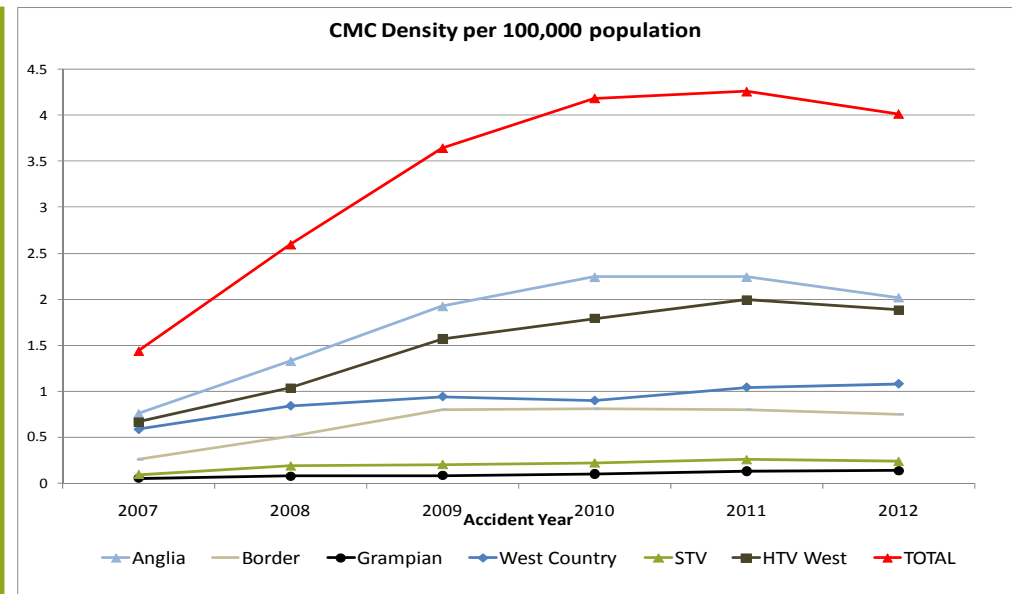
Geographic analysis

TPI to TPD Ratio



- Across the UK, ratios lie between 15% and 43%
- Scotland in particular exhibits favourable trends

CMC density



- Scotland and North England show the lowest density of CMCs
- Reducing numbers of CMCs also seen in 2012 for Anglia and HTV West areas (but overall national turnover is up)

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Postcode Districts

Comparing Market Data & CMC data

- The picture for postcode districts is different to that of towns as a whole or regions as a whole
- 11 of the top 20 TPI / TPD postcode districts are in Birmingham; 3 are in Manchester; 4 in Bradford; 1 in London and only 1 in Liverpool
- Each of the top 20 postcodes districts for TPI / TPD are also in the top 10% for CMC density

Geographic analysis

Best and worst postcode districts - methodology

- Data from all contributors were pooled and split by postcode district and accident year
- Key statistics were then calculated, including frequencies and severities for TPI and TPD claims using incurred amounts and reported claim numbers including nils
- The best and worst postcode districts for 2009 - 2011 were then determined for each key statistic, subject to the districts having an exposure of greater than 1500 earned vehicle years in that period

Geographic analysis

Best and worst postcode districts for TPI frequency

Best	
Postcode District	Nearest town/city
KW16	Kirkwall
KW17	Kirkwall
IV26	Inverness
KW15	Kirkwall
ZE2	Shetland
NE70	Newcastle
IV15	Inverness
EH31	Edinburgh
HS2	Hebrides
EH37	Edinburgh
IV19	Inverness
HS1	Hebrides
IV27	Inverness
AB33	Aberdeen
DG7	Dumfries
PH16	Perth
KA27	Kilmarnock
AB45	Aberdeen
AB55	Aberdeen
EH35	Edinburgh

Worst		CMC Density
Postcode District	Nearest town/city	Percentile Rank
B8	Birmingham	98.8%
B12	Birmingham	99.3%
B10	Birmingham	98.4%
B9	Birmingham	99.6%
B6	Birmingham	96.9%
B19	Birmingham	94.5%
M13	Manchester	98.8%
BD3	Bradford	99.6%
M12	Manchester	99.7%
BD8	Bradford	99.1%
B21	Birmingham	92.5%
BD9	Bradford	97.2%
B66	Birmingham	98.7%
M8	Manchester	99.4%
B11	Birmingham	98.7%
BD5	Bradford	96.5%
N17	London – North	91.0%
B18	Birmingham	99.3%
B20	Birmingham	97.7%
L7	Liverpool	93.0%

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Postcode Areas (Towns)

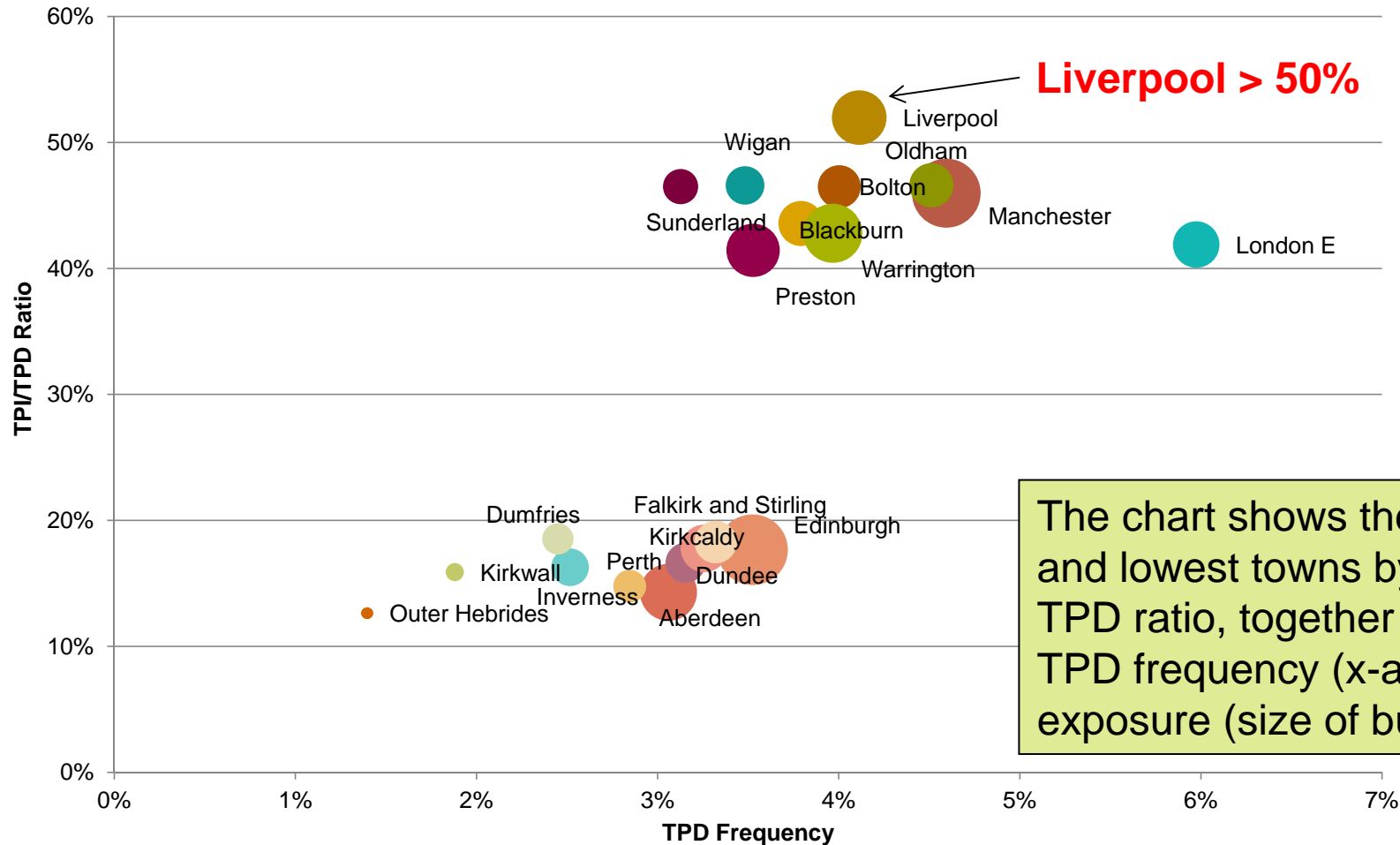
Market Data

- All towns show increases in TPD up to 2008 and the recession; but reductions thereafter
- The rise in TPI/TPD is universal in England & Wales; but stable in Scotland
- Experience seen in small towns are volatile from year to year

Geographic analysis

TPI to TPD Ratio – 2011 Accident Year

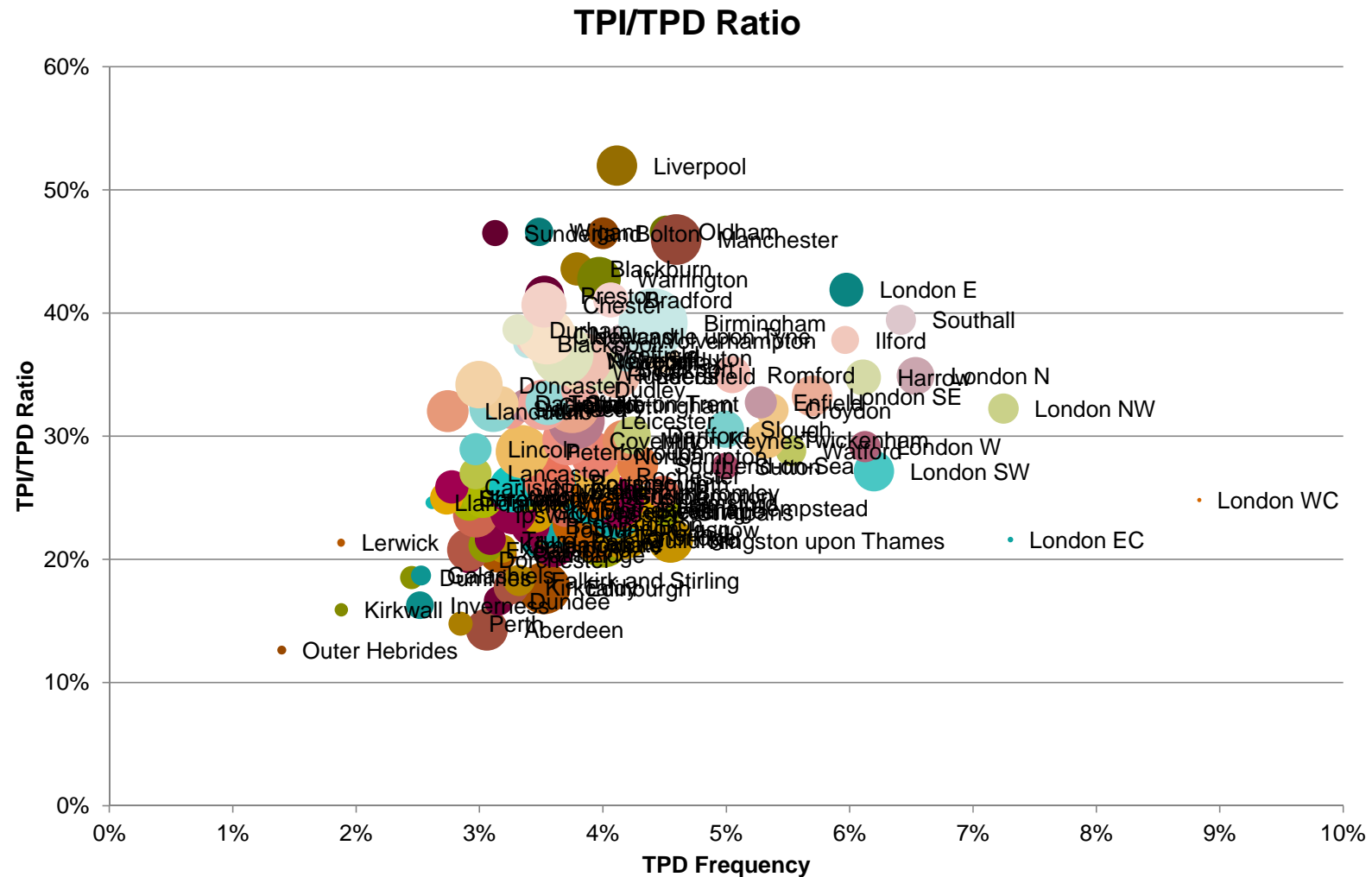
Top 10 & Bottom 10 TPI/TPD Ratio



The chart shows the highest and lowest towns by TPI / TPD ratio, together with their TPD frequency (x-axis) and exposure (size of bubble)

2011 is particularly subject to further IBNR development

Bubble Chart – All – 2011 Accident Year



2011 is particularly subject to further IBNR development

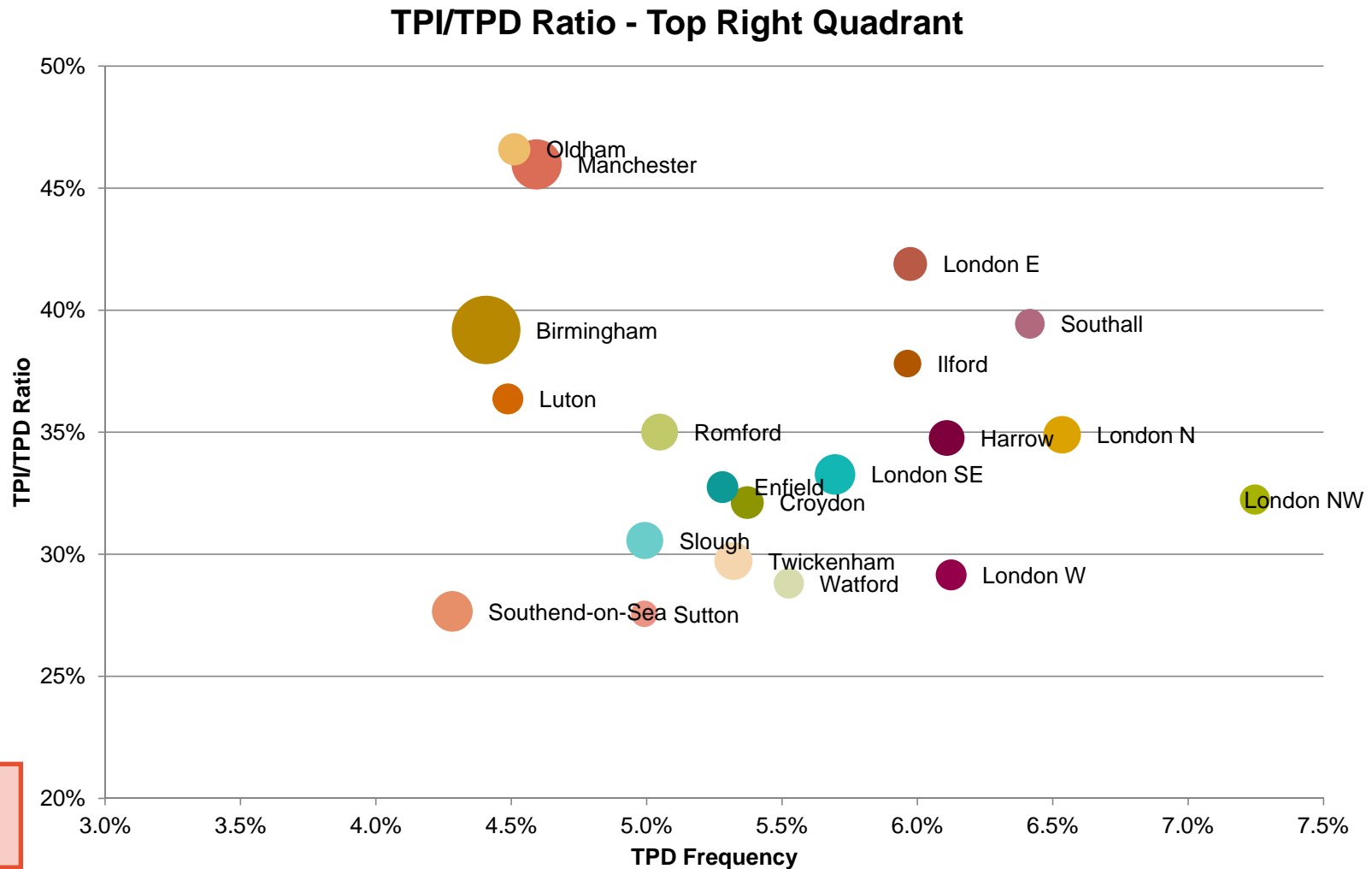
Geographic analysis

Bubble Chart - Quadrants

- The previous chart has been divided into quadrants to give a more detailed view as to where each area lies
- The quadrants are divided where the TPD frequency is 4.25% and the TPI/TPD ratio is 27.5%

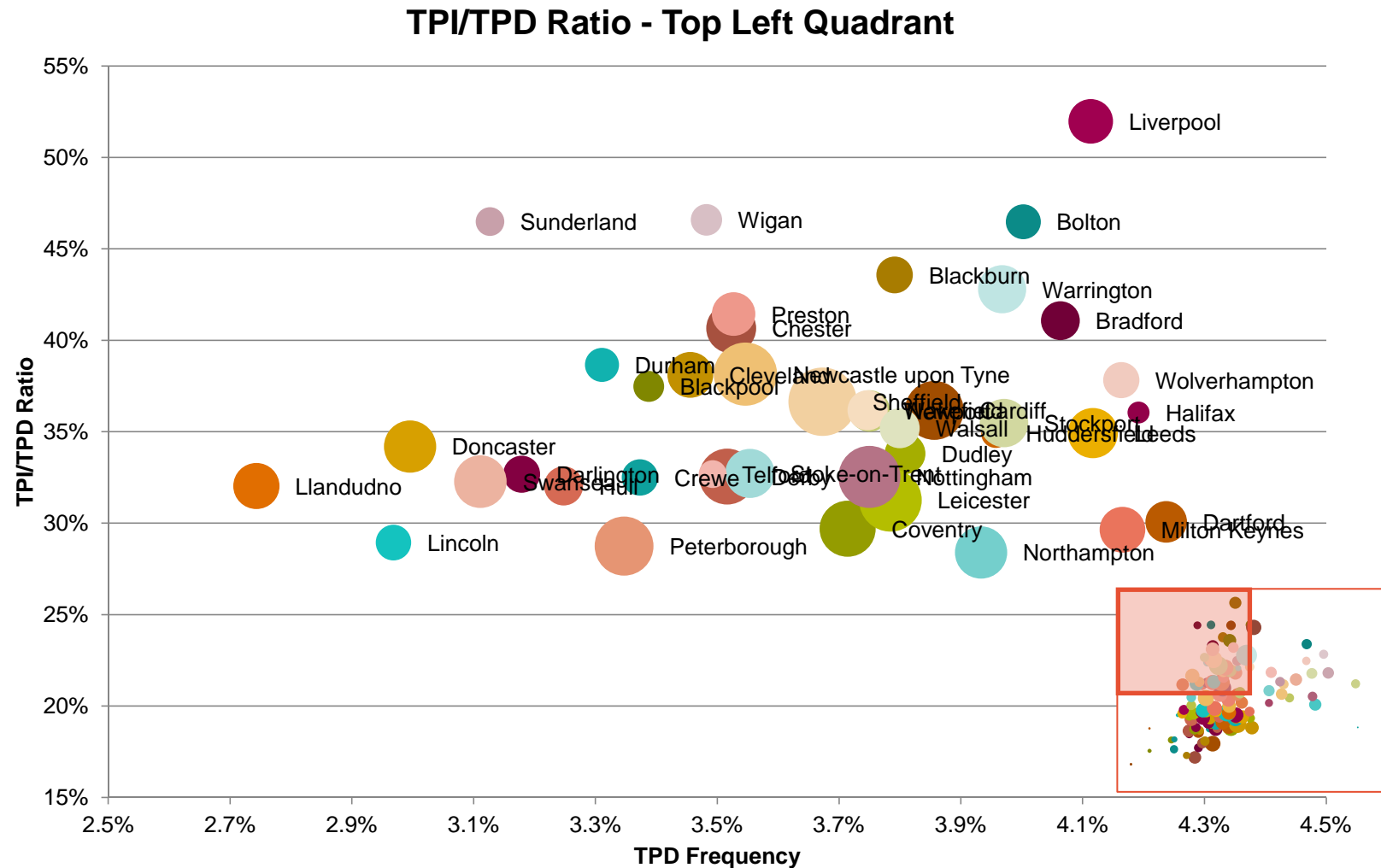
Geographic analysis

Bubble Chart (Top Right Quadrant, 2011 Accident Year)



Geographic analysis

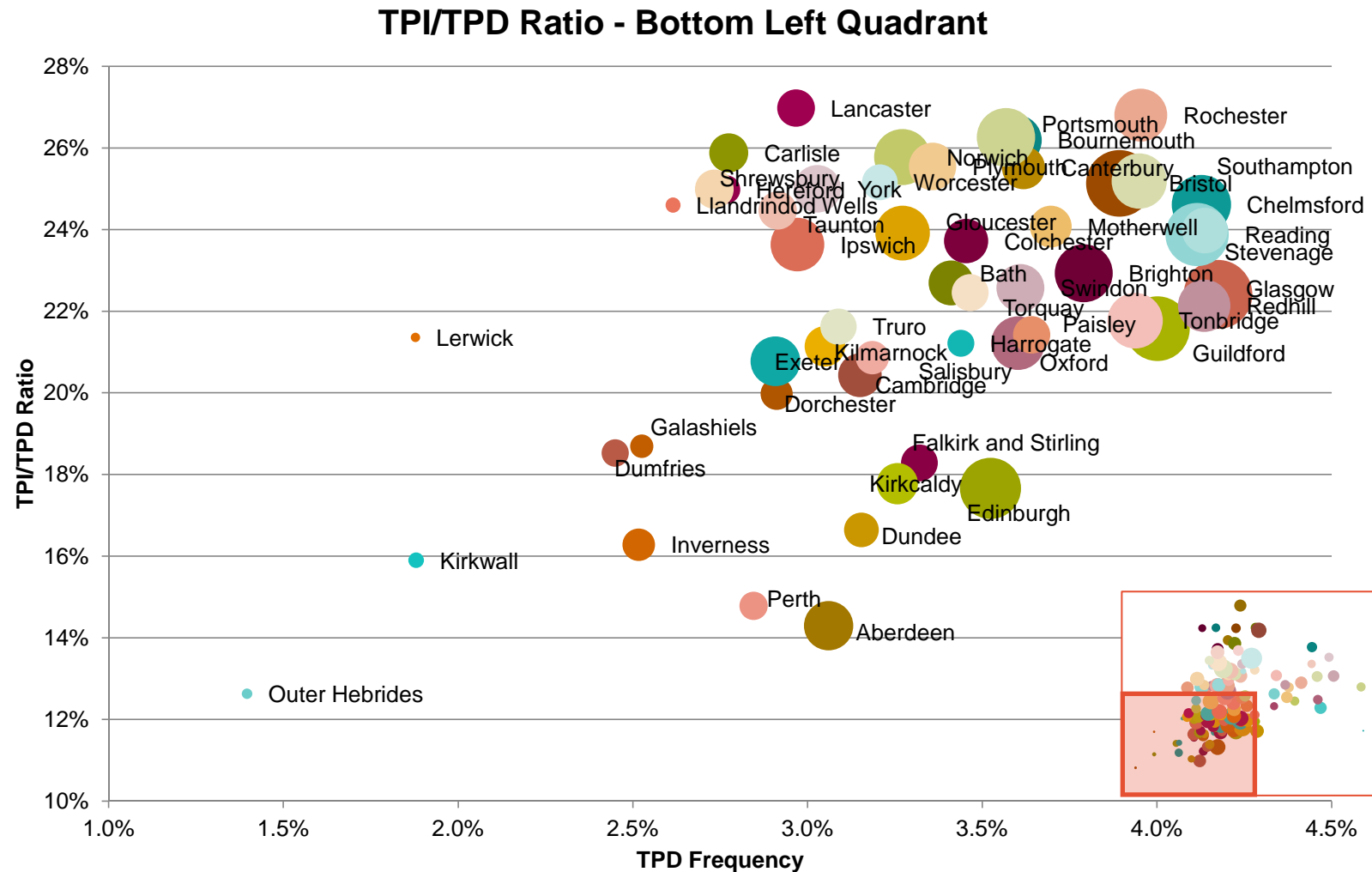
Bubble Chart (Top Left Quadrant, 2011 Accident Year)



2011 is particularly subject to further IBNR development

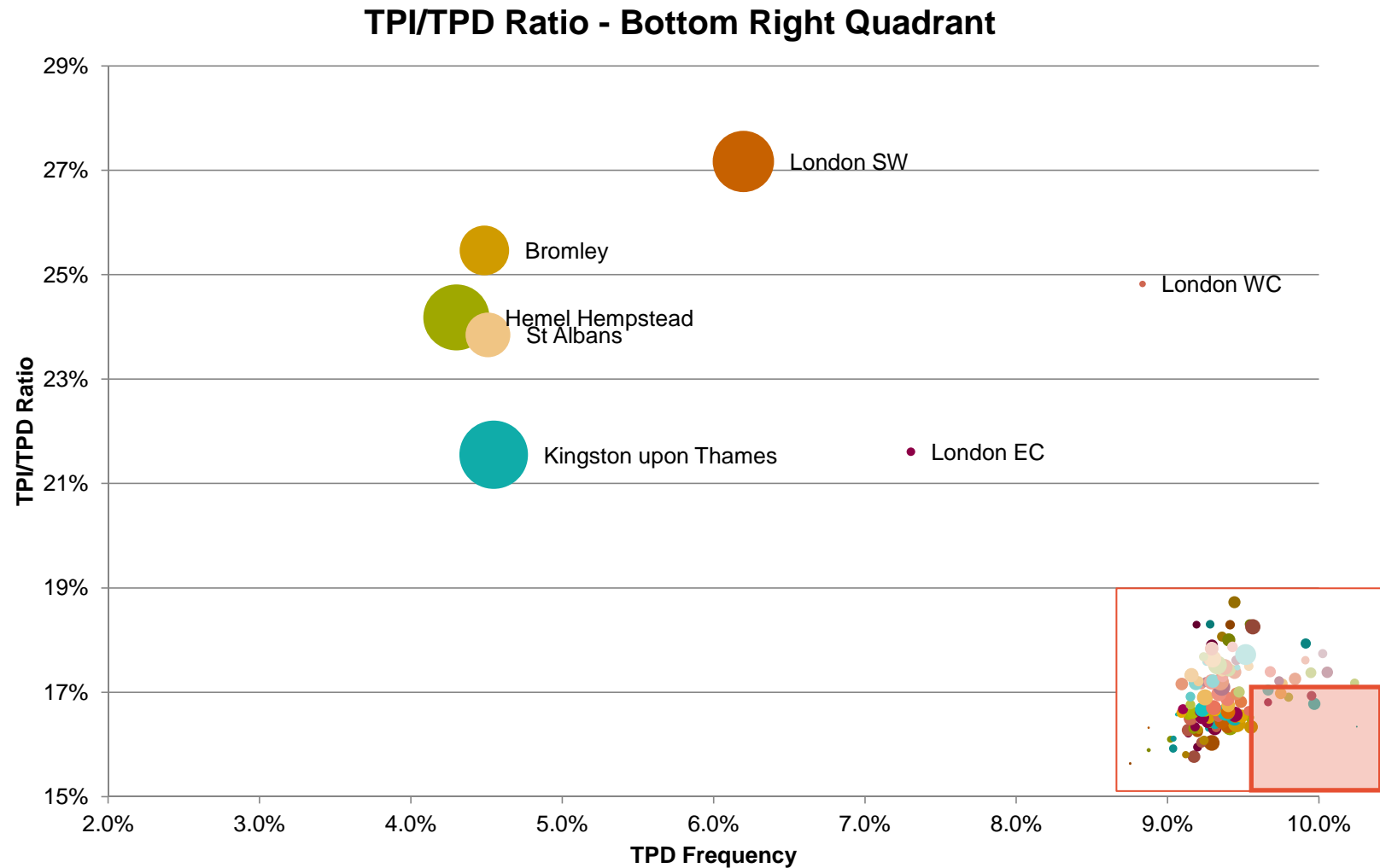
Geographic analysis

Bubble Chart (Bottom Left Quadrant, 2011 Accident Year)



Geographic analysis

Bubble Chart (Bottom Right Quadrant, 2011 Accident Year)



2011 is particularly subject to further IBNR development

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1. Data
2. UK Maps
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 - b. Police statistics
3. TV Regions
4. Postcode Districts
5. Towns
 - a. Market data
 - b. Comparing Market and CMC data
6. A brief history of London and the North West

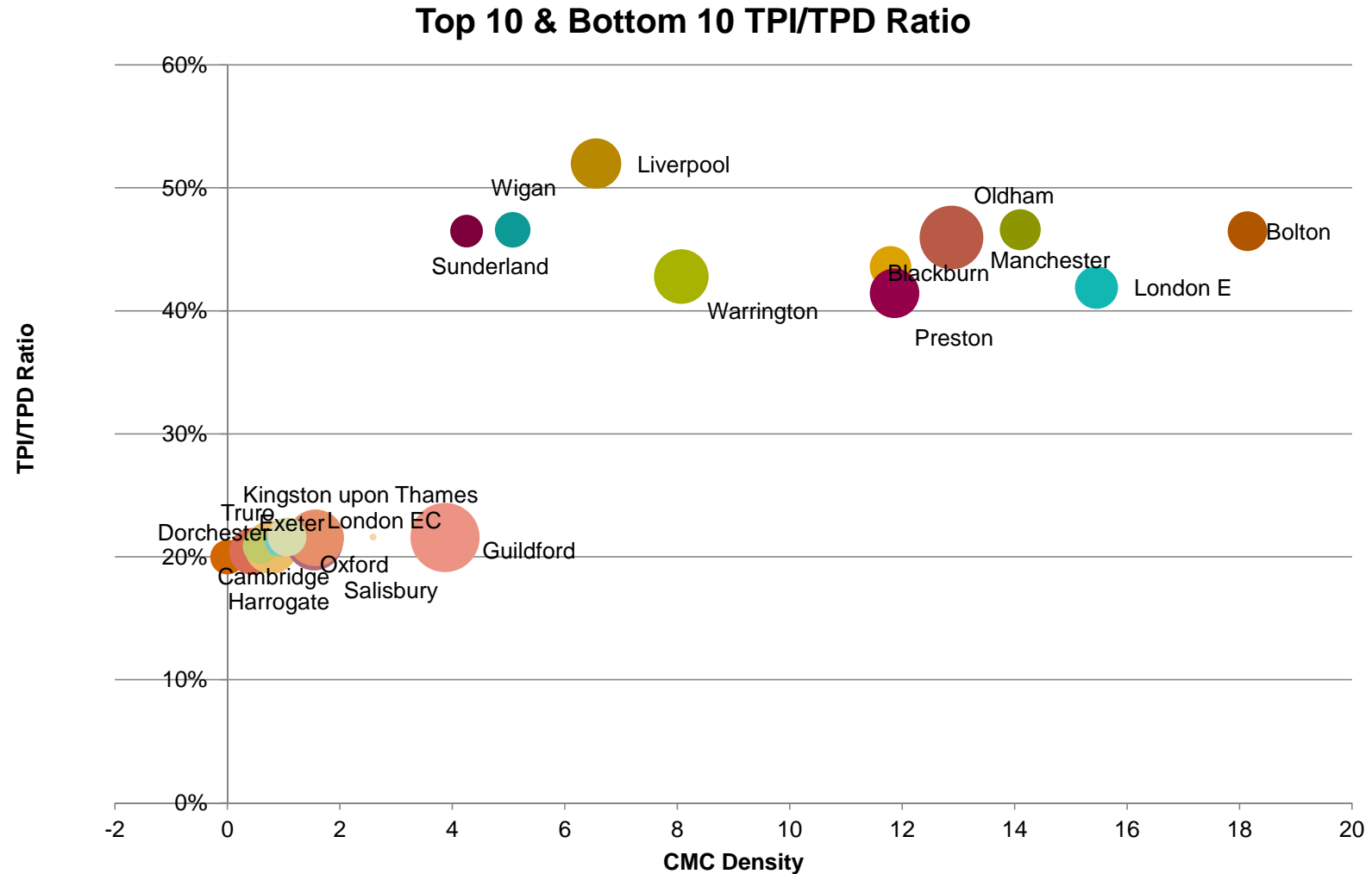
Postcode Areas (Towns)

Comparing Market & CMCs

- At the postcode area level, there is clear differentiation between areas with both high CMC density & high TPI/TPD and those areas with both low CMC density & low TPI/TPD
- However if CMC density drives TPI / TPD, it appears to saturate and be subject to the law of diminishing returns. Areas such as Bolton and East London have materially higher CMC densities than Liverpool, but similar (lower) TPI / TPD. It should be noted the geographical CMC statistics do not capture turnover – and this could be materially higher in some areas than in others
- We have not tracked the development over time to assess any lag effects (where CMC density may grow in advance of rises in TPI / TPD)

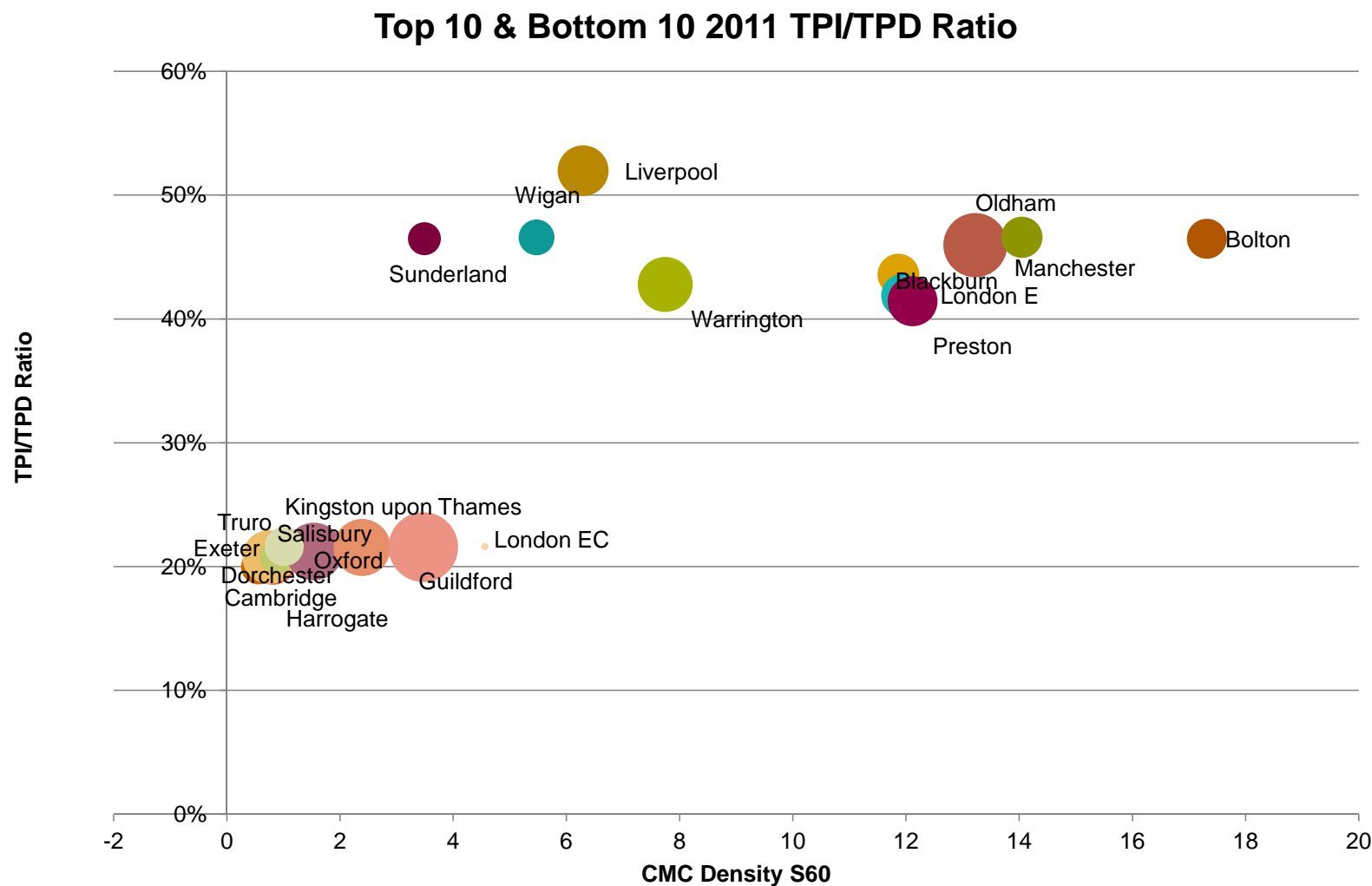
Geographic analysis

TPI to TPD Ratio – CMC Density – 2011 Accident Year



Geographic analysis

TPI to TPD Ratio – CMC Density S60 – 2011 Accident Year



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A brief history of London & the North West

- In the North West there is a much clearer correlation between CMC density and TPI / TPD than in London
- London has seen very marked growth in CMCs, but only modest growth in areas where TPI / TPD exceeds $2/3$. It remains to be seen if this rate of growth will accelerate in 2012.
- The North West has also seen a rapid spreading of hotspots in CMCs which TPI / TPD ($> 2/3$) hotspots are yet to reflect. As for London, there is scope that the rate of growth will accelerate
- There is a limitation on any geographical CMC data in that it measures numbers of CMCs, not their turnover.

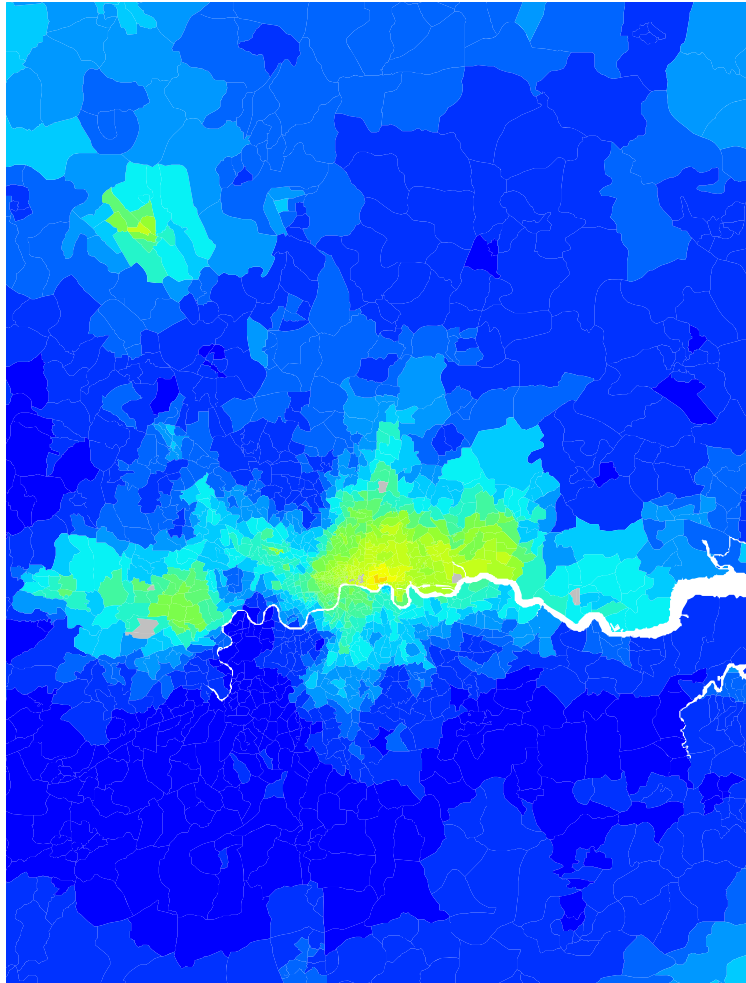
Geographic analysis

Maps of UK experience – key towns / cities

- The following slides show the ratio of TPI to TPD claim numbers across each accident year from 2007 to 2011, for several major UK towns and cities
- The scale of each map is consistent, allowing experience to be compared across different cities
- The lower bound for the highest TPI/TPD banding level (the darkest shade of red) is 65%

Geographic analysis

TPI to TPD Numbers Ratio



PI / PD comment

2007 – Little difference in experience. Benign outside the centre.

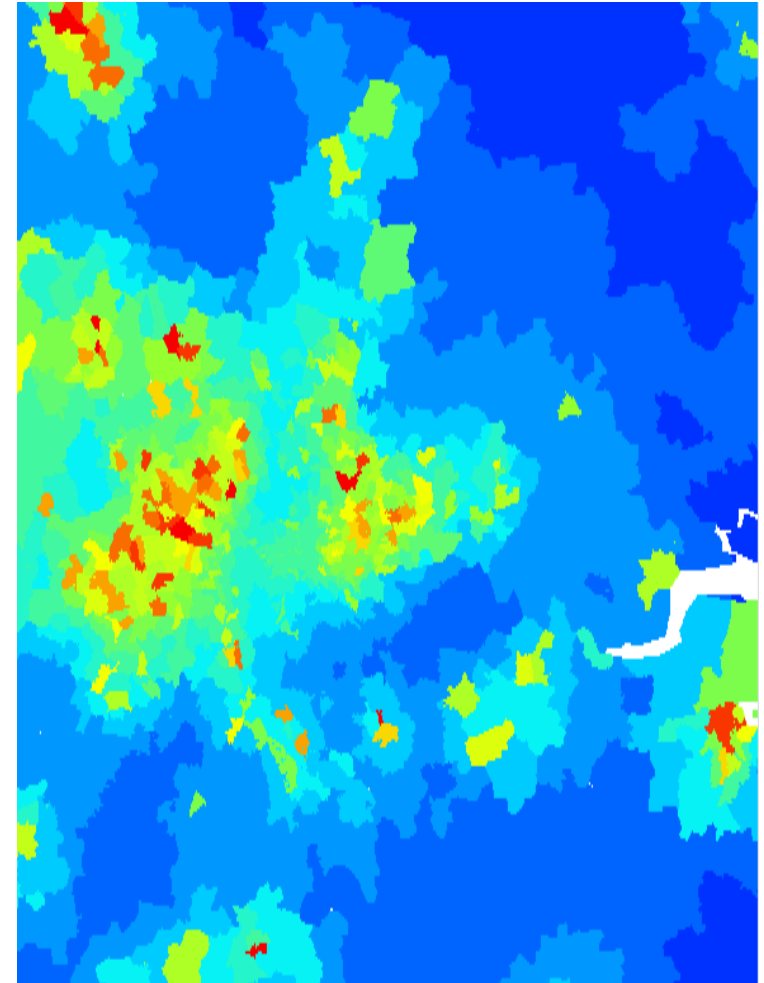
CMC density comment

2007 - Limited variation with small pockets of activity.

2011 – Significant increase in density across much wider area; exceeds growth of TPI to TPD ratio.

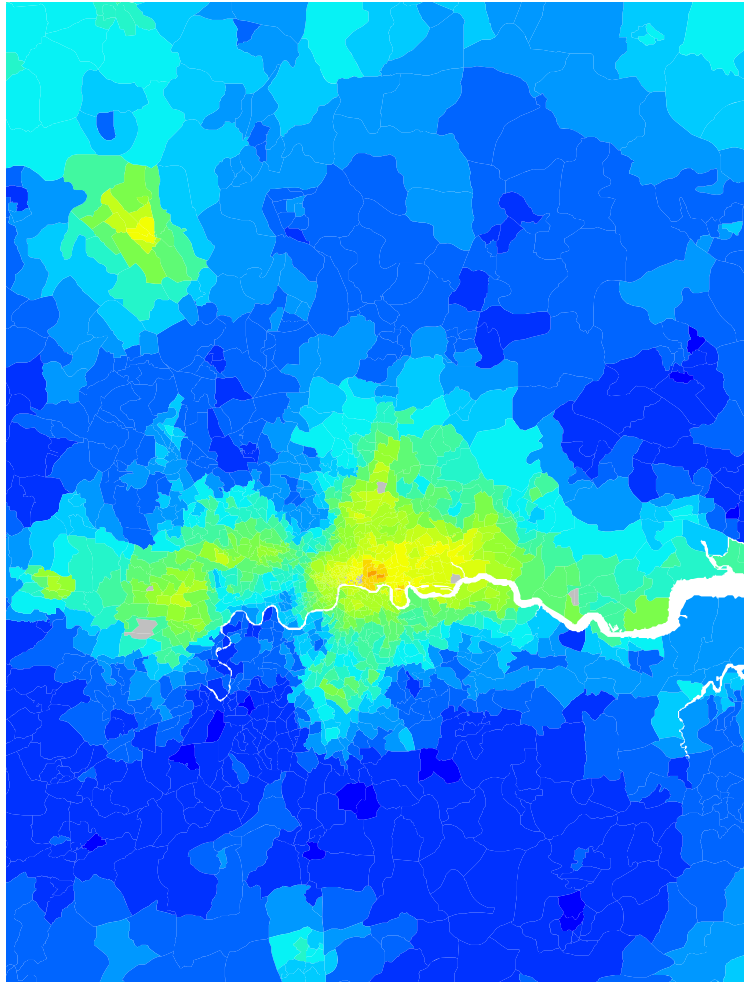
2007 - London

CMC density



Geographic analysis

TPI to TPD Numbers Ratio



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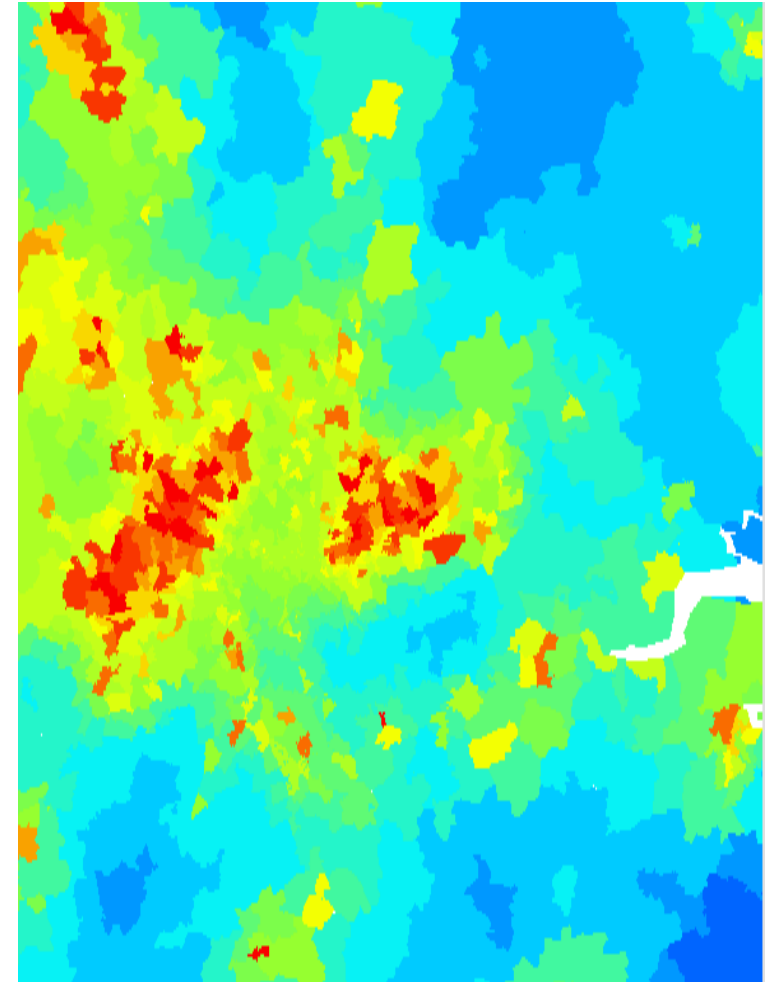
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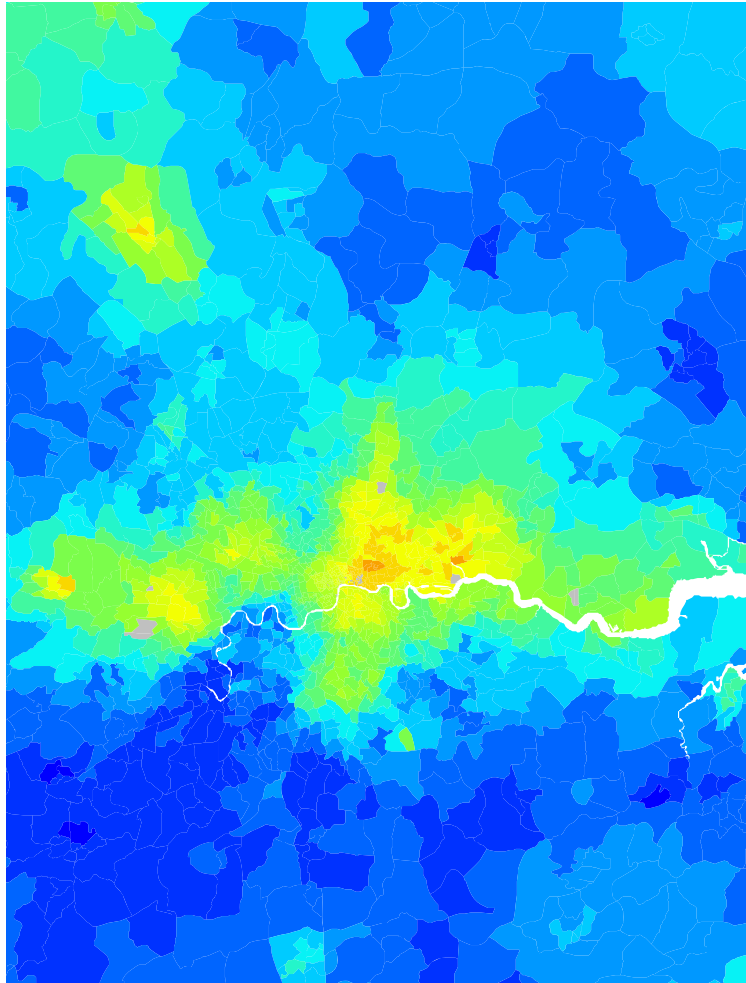
2008 - London

CMC density



Geographic analysis

TPI to TPD Numbers Ratio



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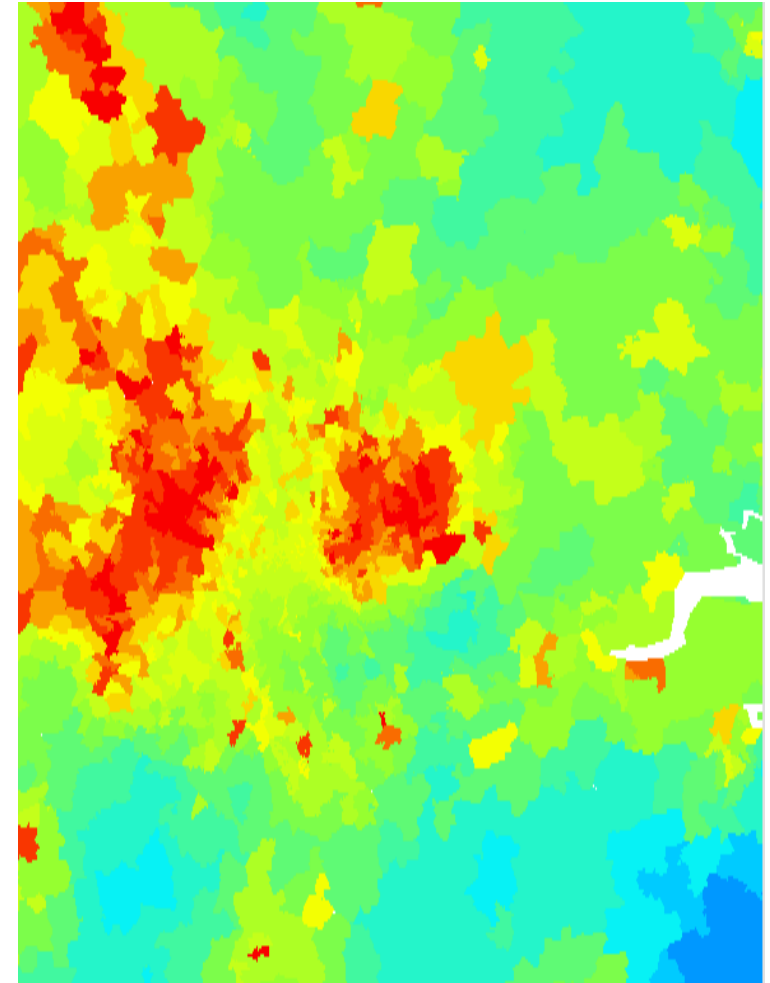
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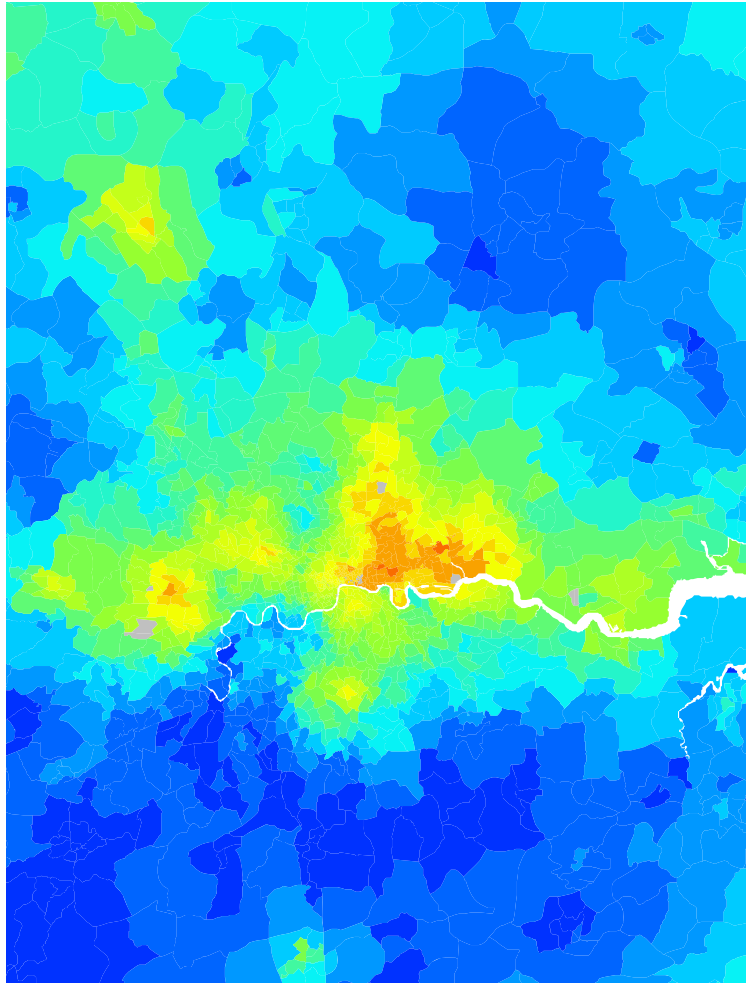
2009 - London

CMC density



Geographic analysis

TPI to TPD Numbers Ratio



TPI / TPD comment

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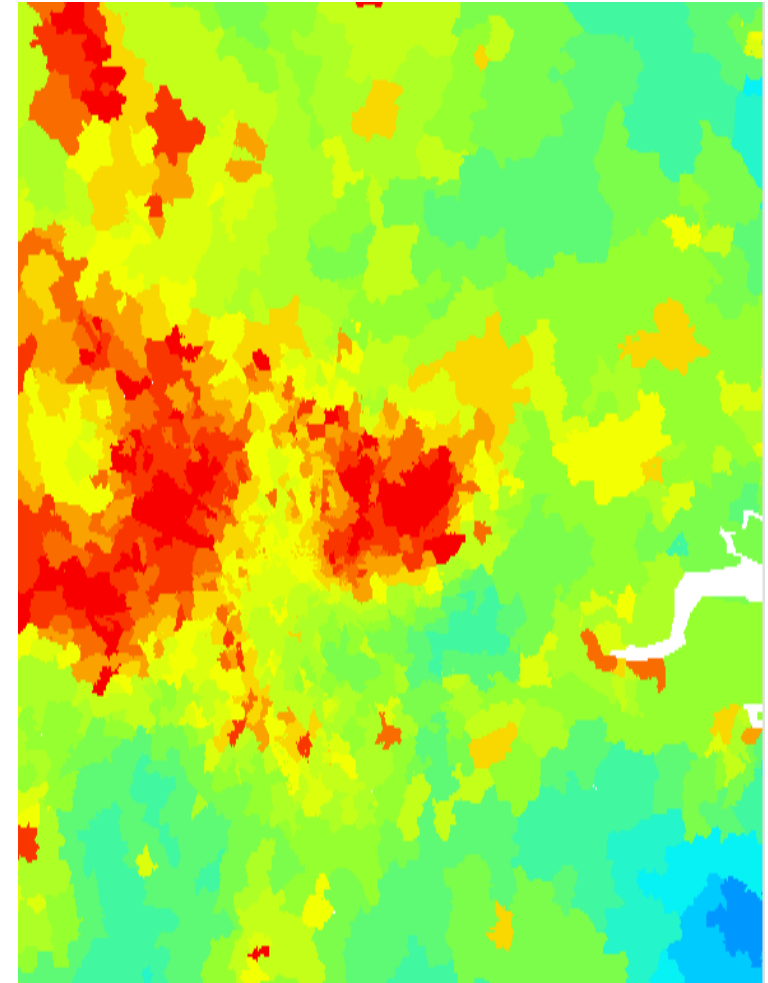
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2010 - London

CMC density

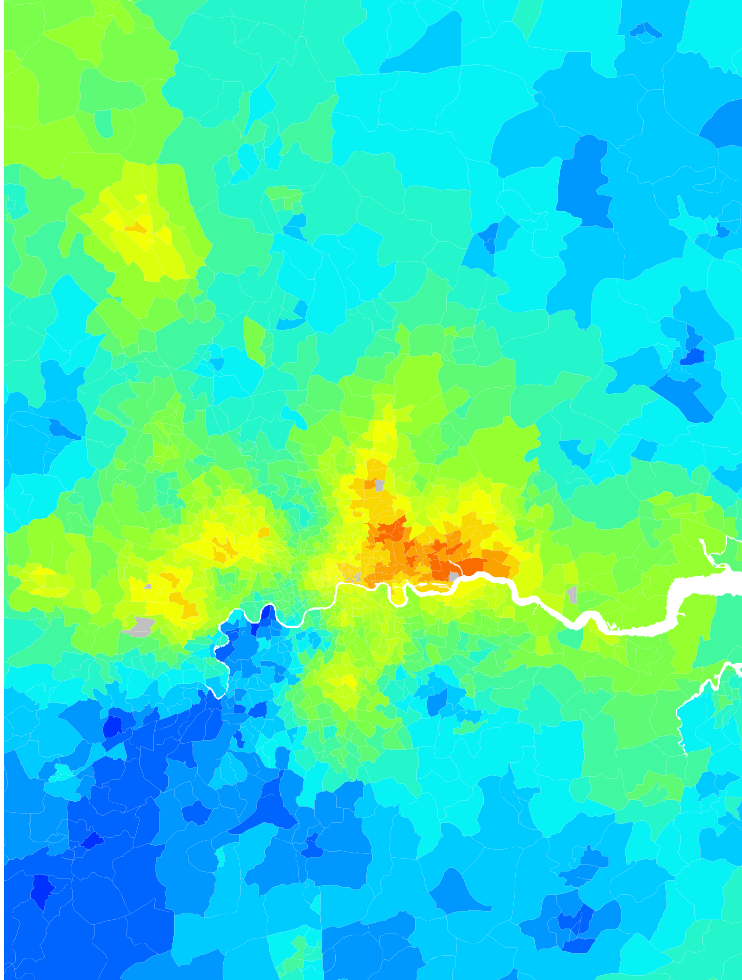


Geographic analysis

TPI to TPD Numbers Ratio

2011 - London

CMC density



TPI / TPD comment

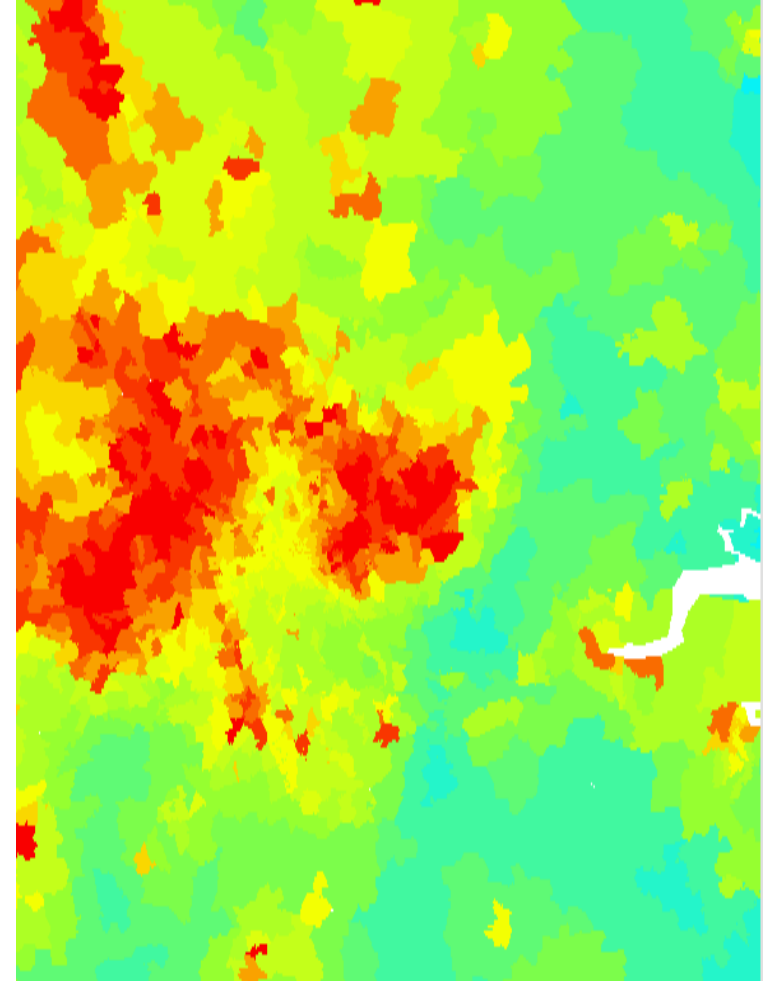
2007 – Little difference in experience. Benign outside the centre.

2011 – the adverse areas have started to spread out

CMC density comment

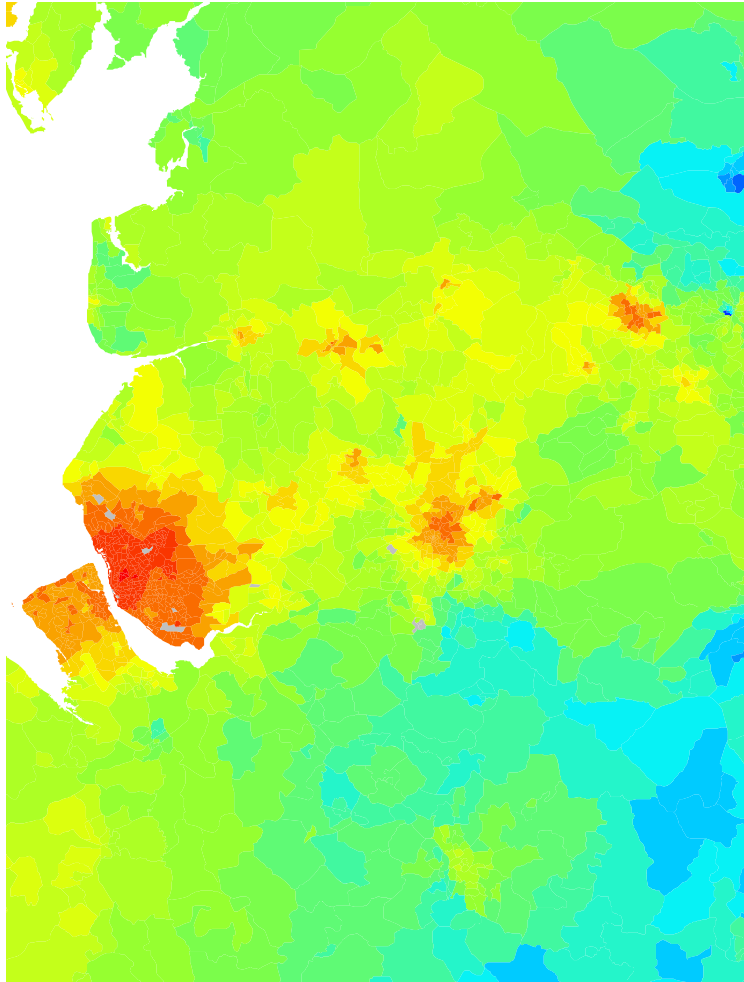
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Geographic analysis

TPI to TPD Numbers Ratio



TPI / TPD comment

2007 – High ratios localised to city centres including both Liverpool and Manchester

2011 – High ratios extend across region

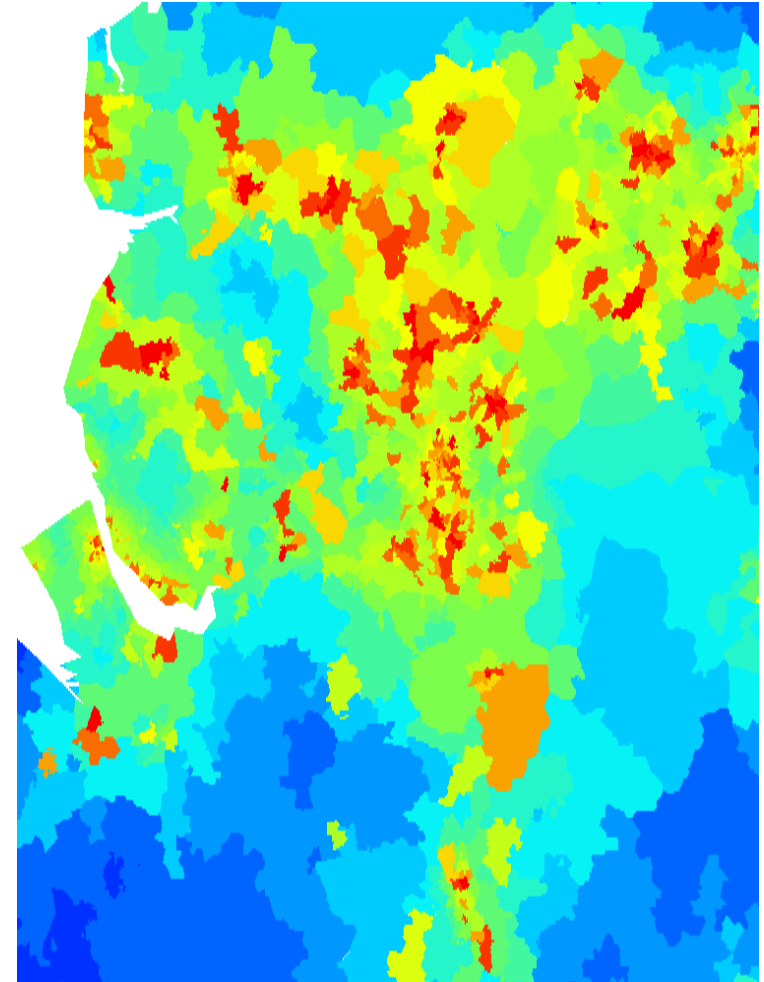
CMC density comment

2007 – High densities show different distribution to TPI / TPD ratio

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2007 – North West

CMC density

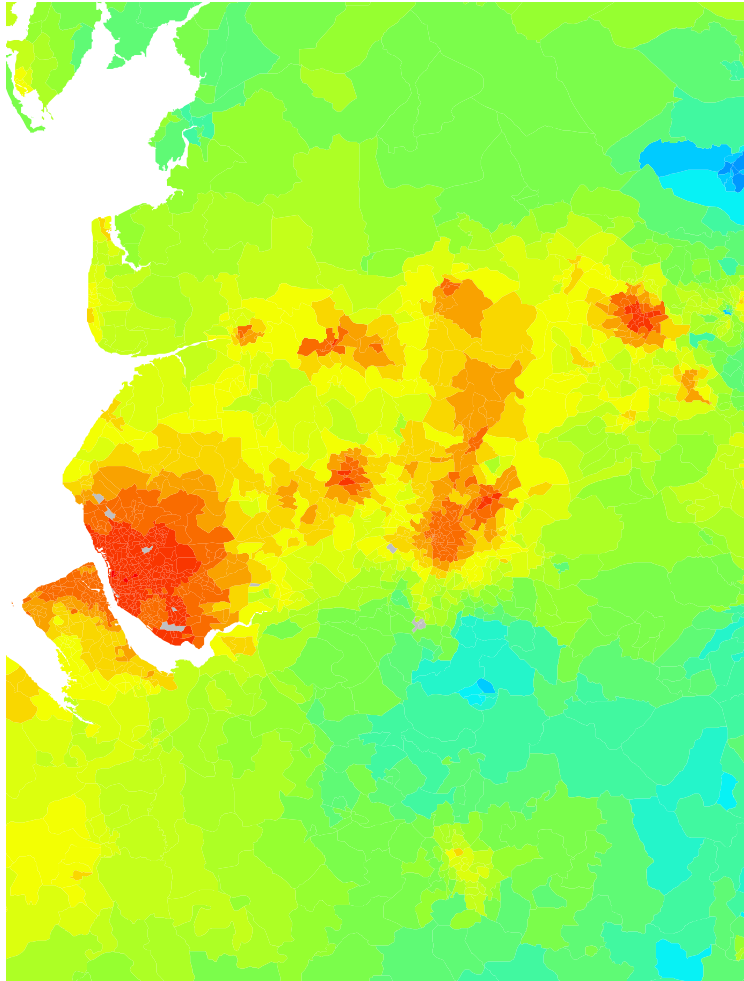


Geographic analysis

TPI to TPD Numbers Ratio

2008 – North West

CMC density



TPI / TPD comment

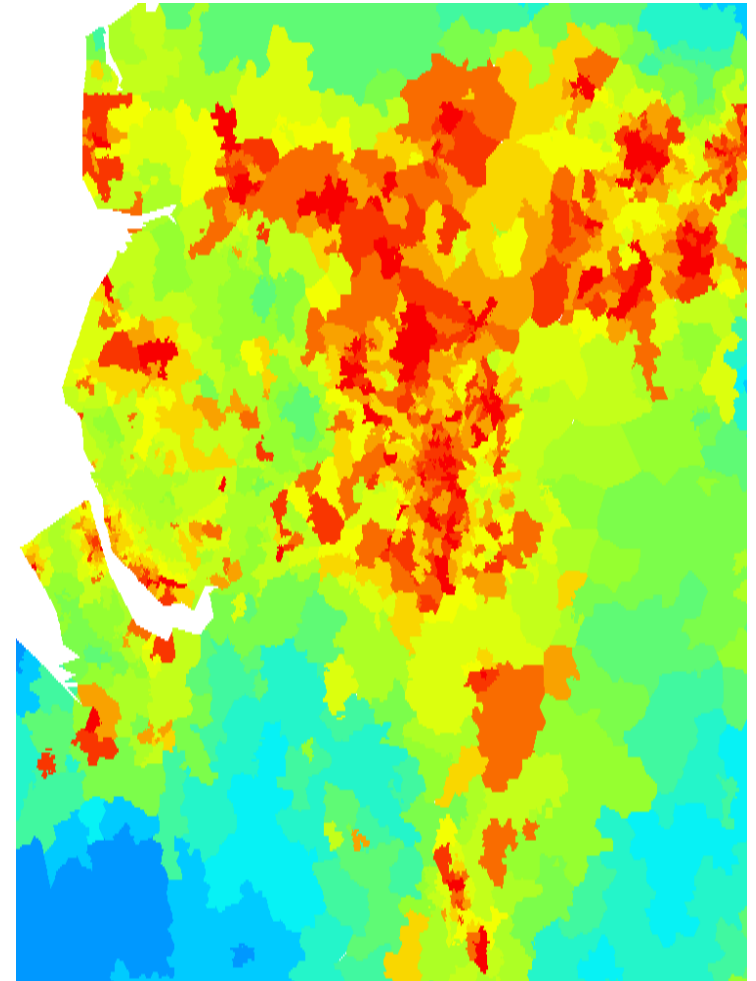
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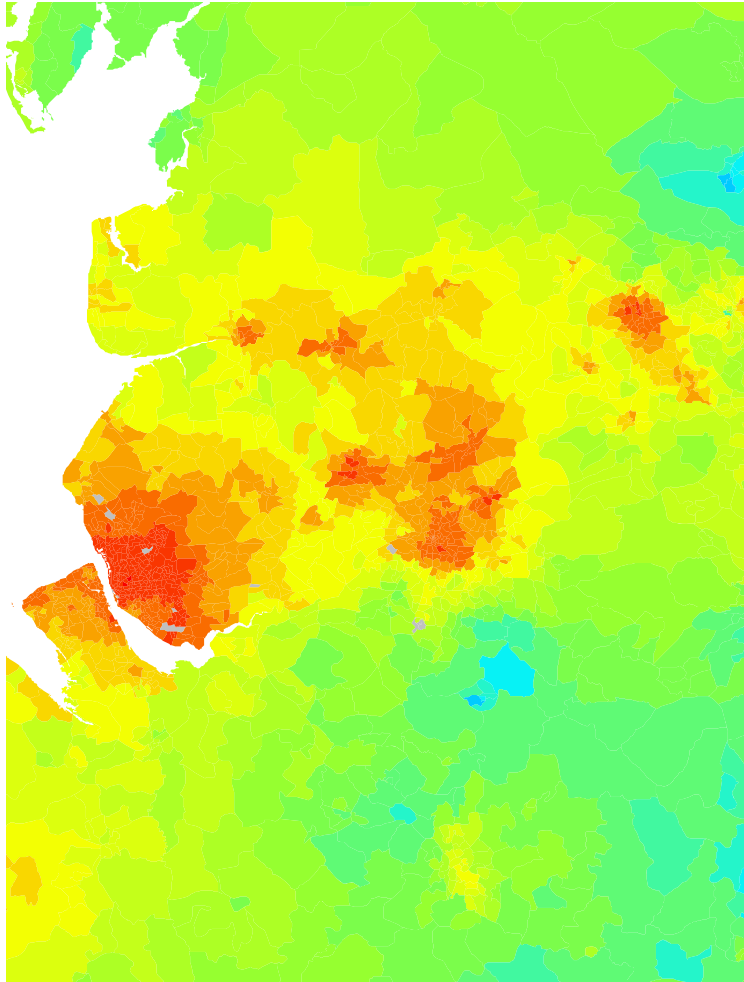
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Geographic analysis

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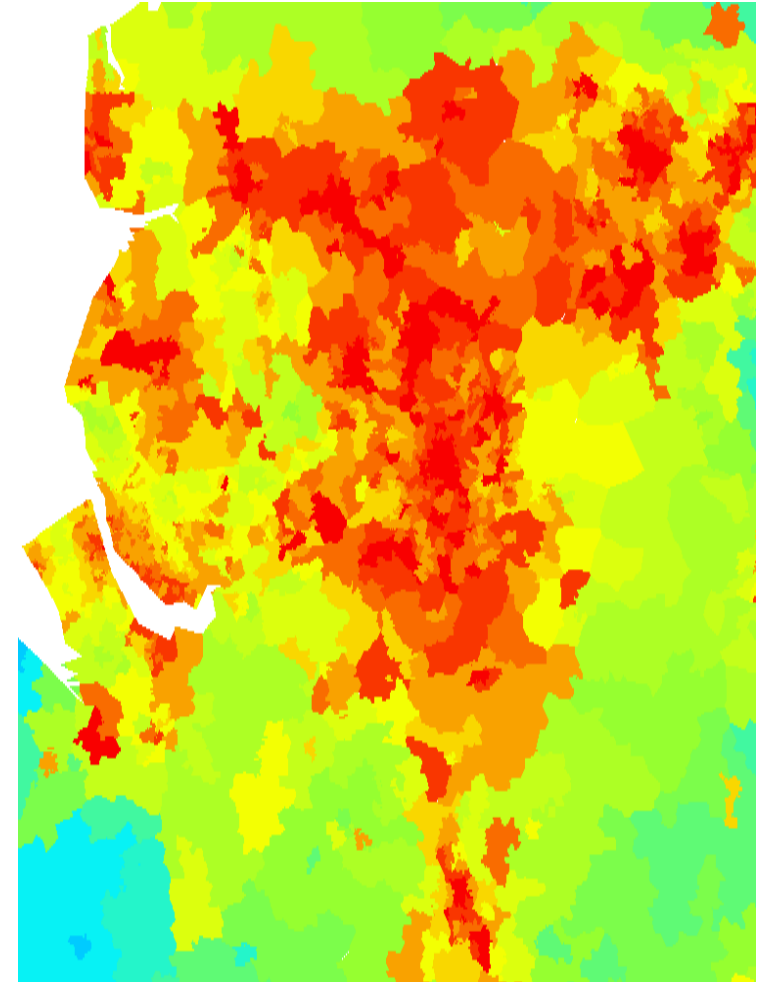
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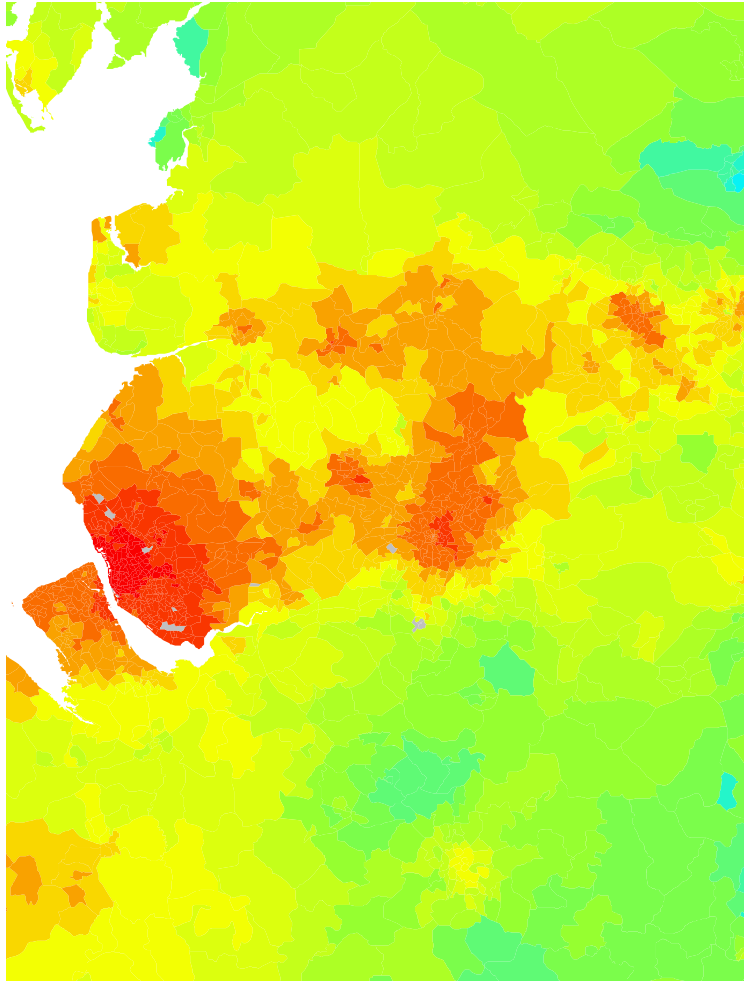
2009 – North West

CMC density



Geographic analysis

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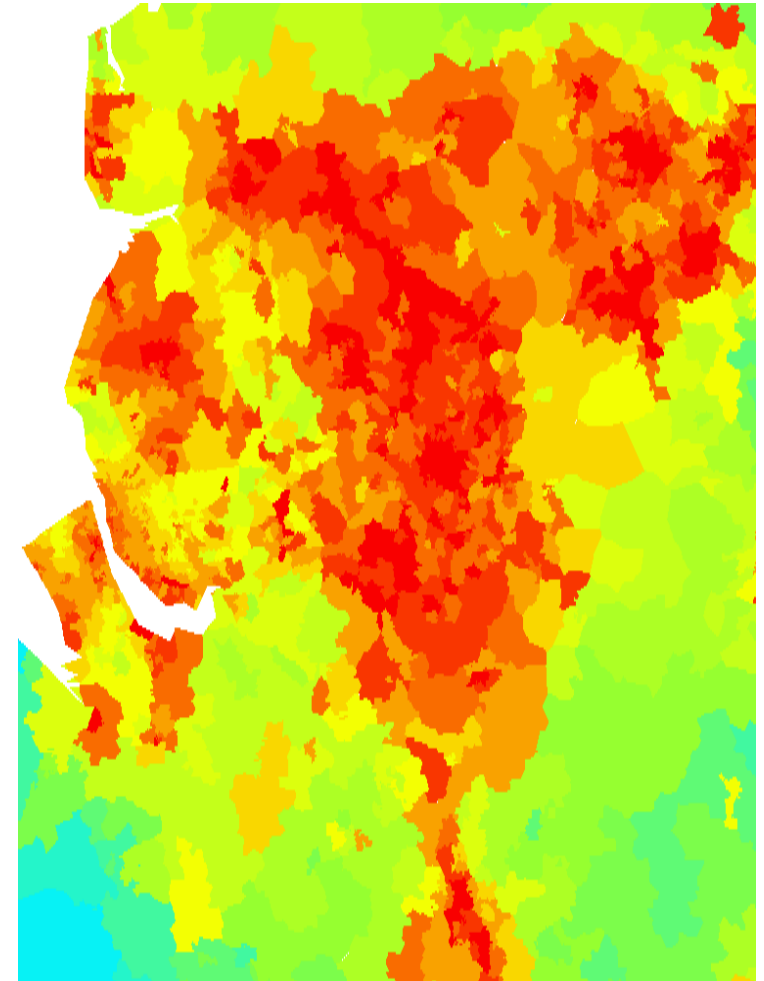
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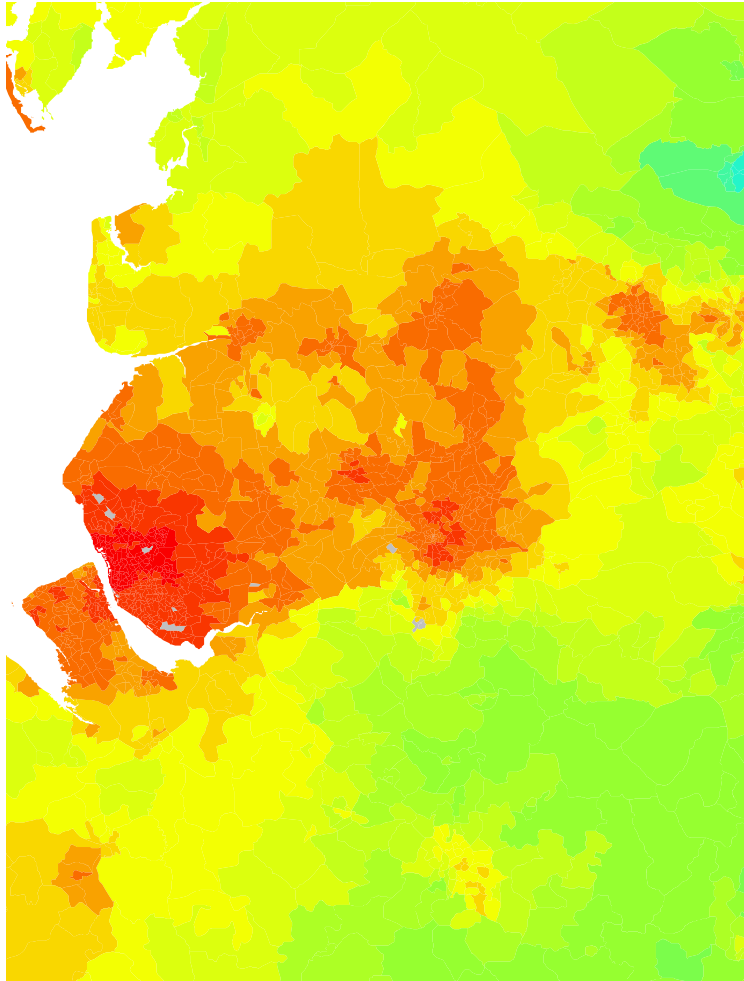
2010 – North West

CMC density



Geographic analysis

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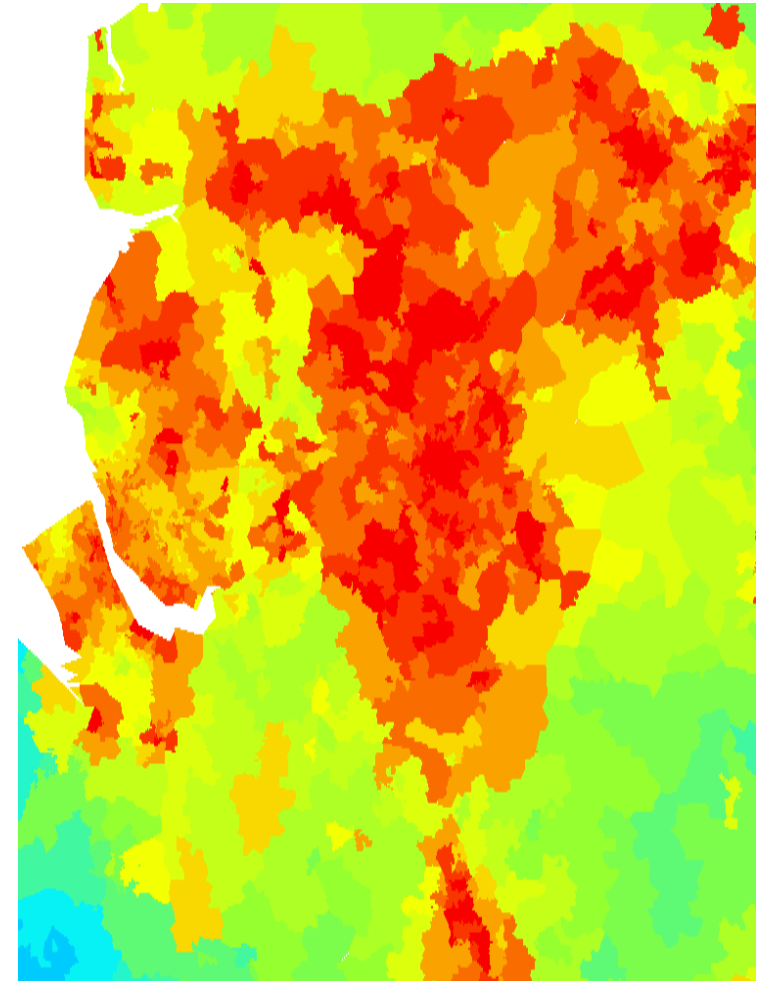
CMC density comment

2007 – High densities show different distribution to TPI / TPD ratio

2011 – Significant increase in density across much wider area; exceeds growth of TPI to TPD ratio.

2011 – North West

CMC density



Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenter.

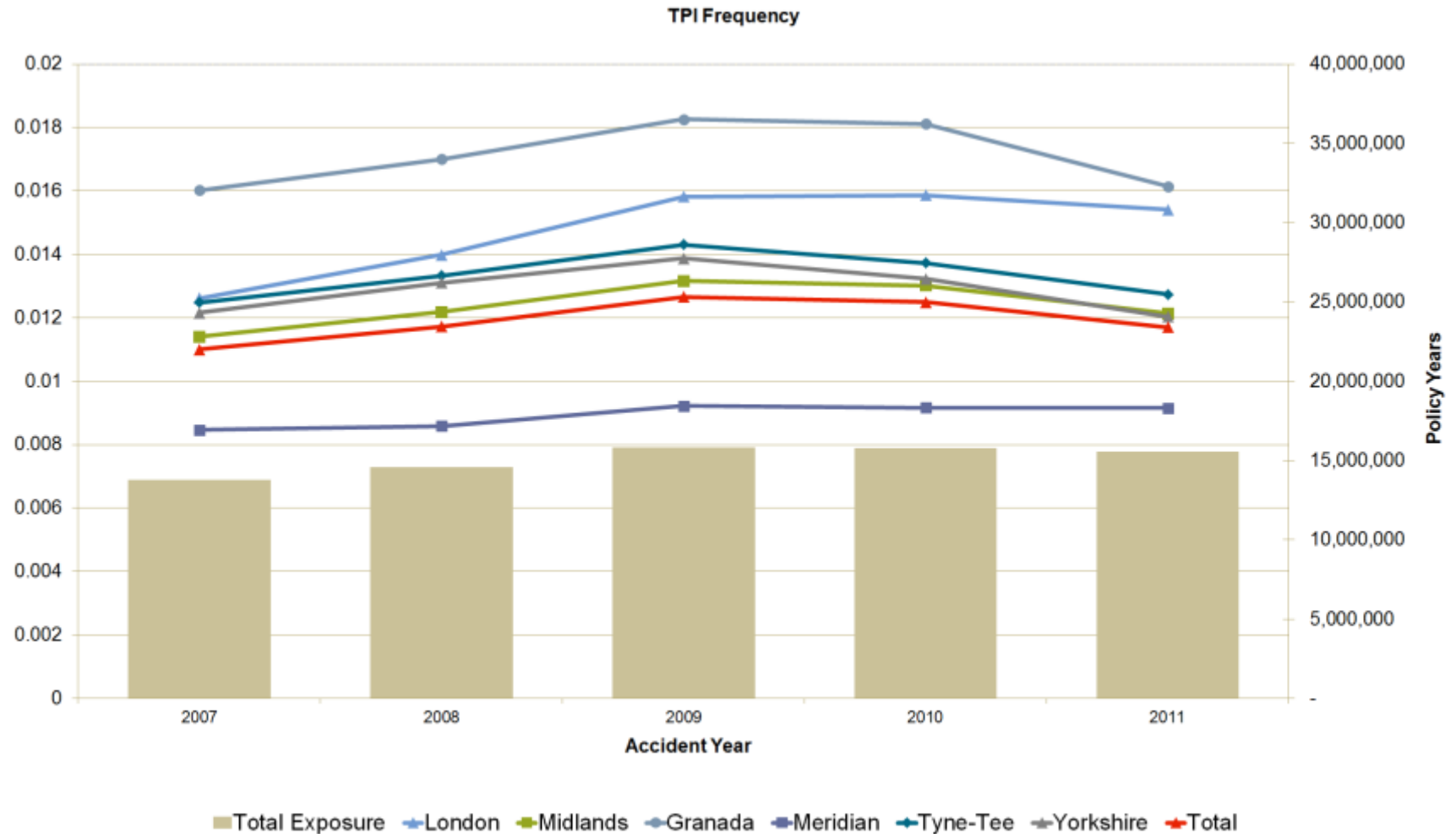


Appendix

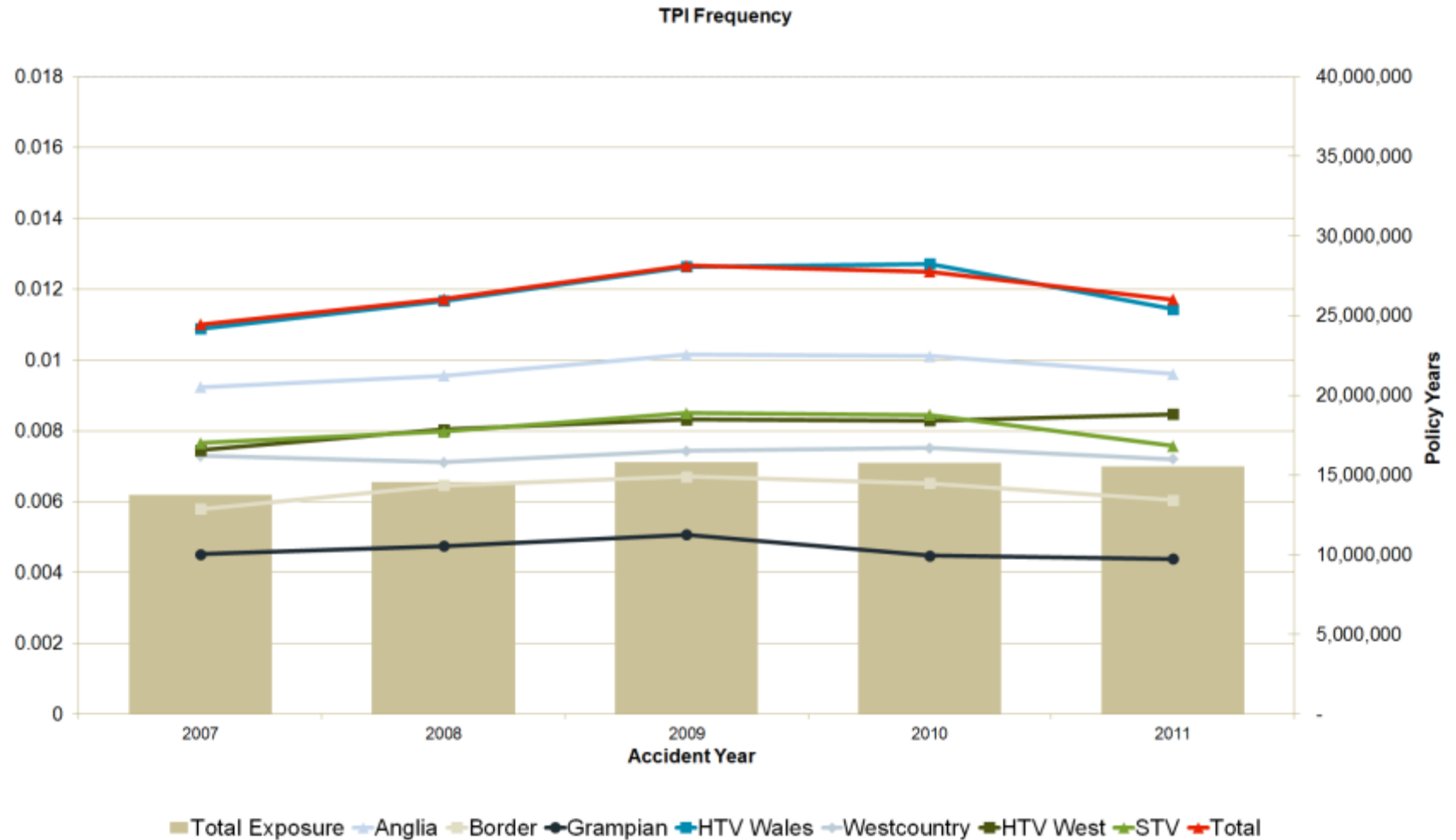
Notes to exhibits

- The following graphs are shown on three bases:
 - Standard basis – these show the unadjusted statistic by TV region and accident year
 - Rescaled basis – these show the statistic by TV region and accident year, relative to its value in 2007 (for example, 1.5 represents a 50% higher statistic than its value in 2007).
 - Difference basis – these show the statistic by TV region and accident year minus its value in 2007 (e.g. 0.001 represents a statistic 0.001 higher than its value in 2007)

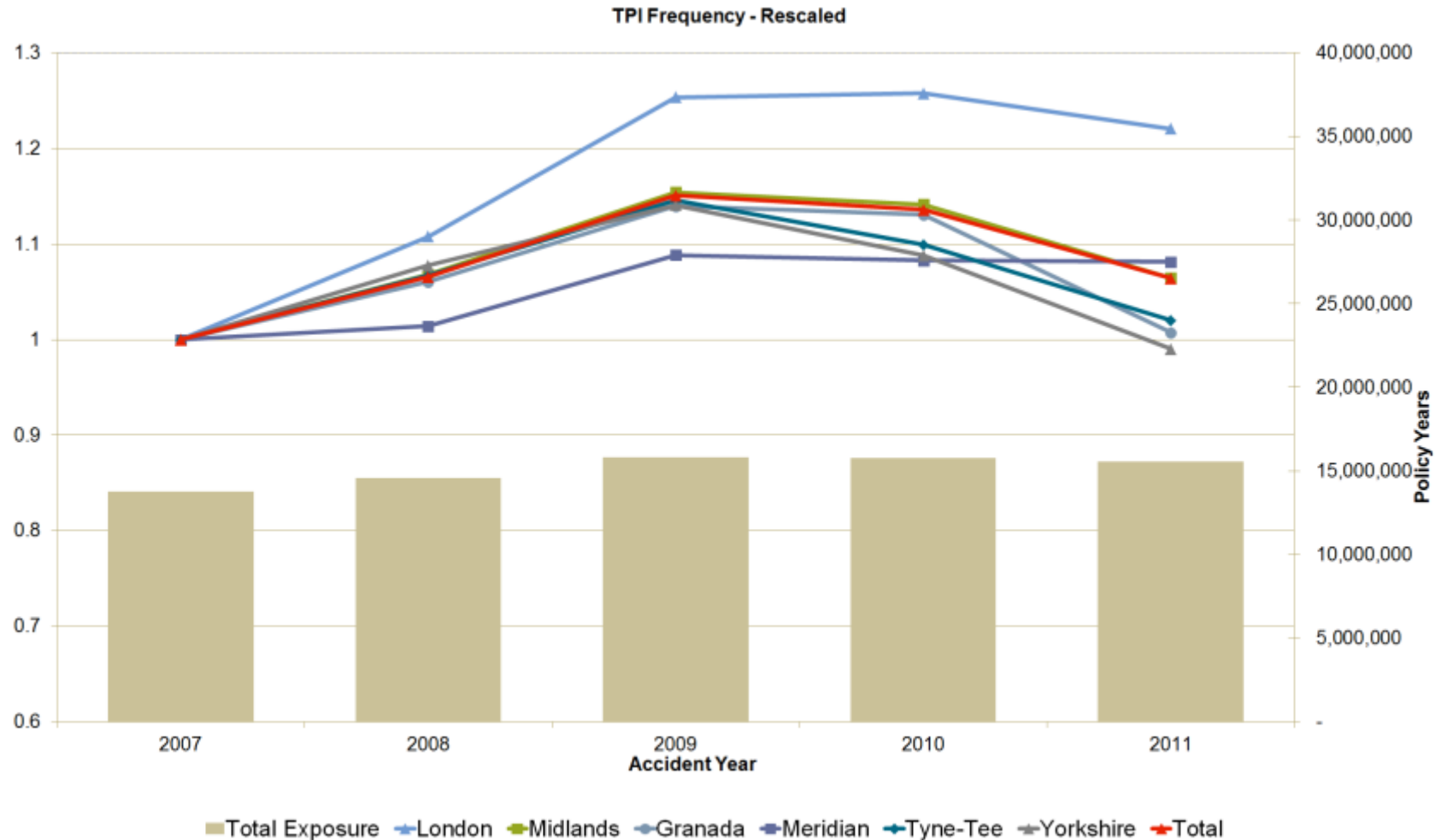
TPI Frequency



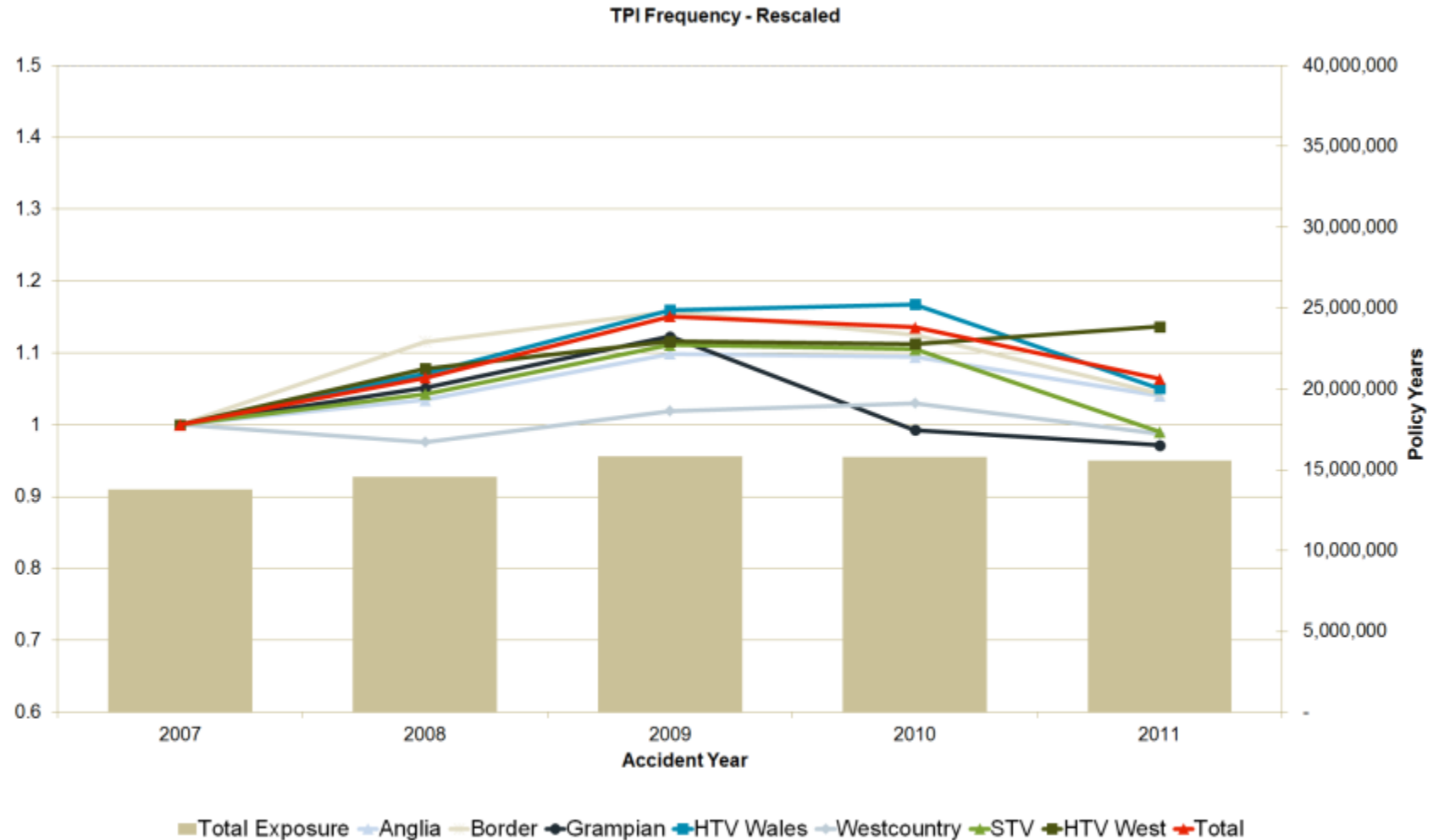
TPI Frequency



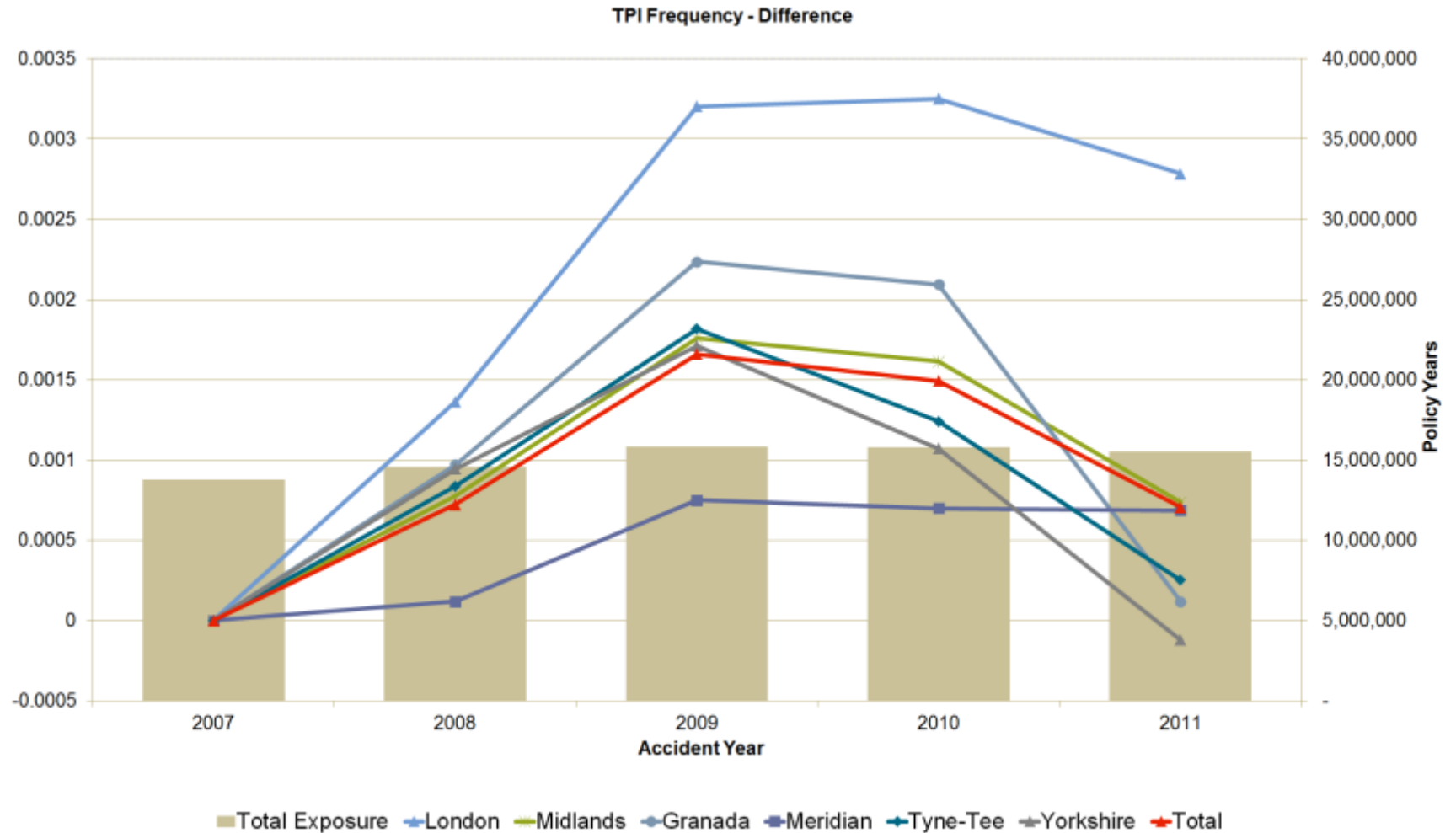
TPI Frequency Rescaled



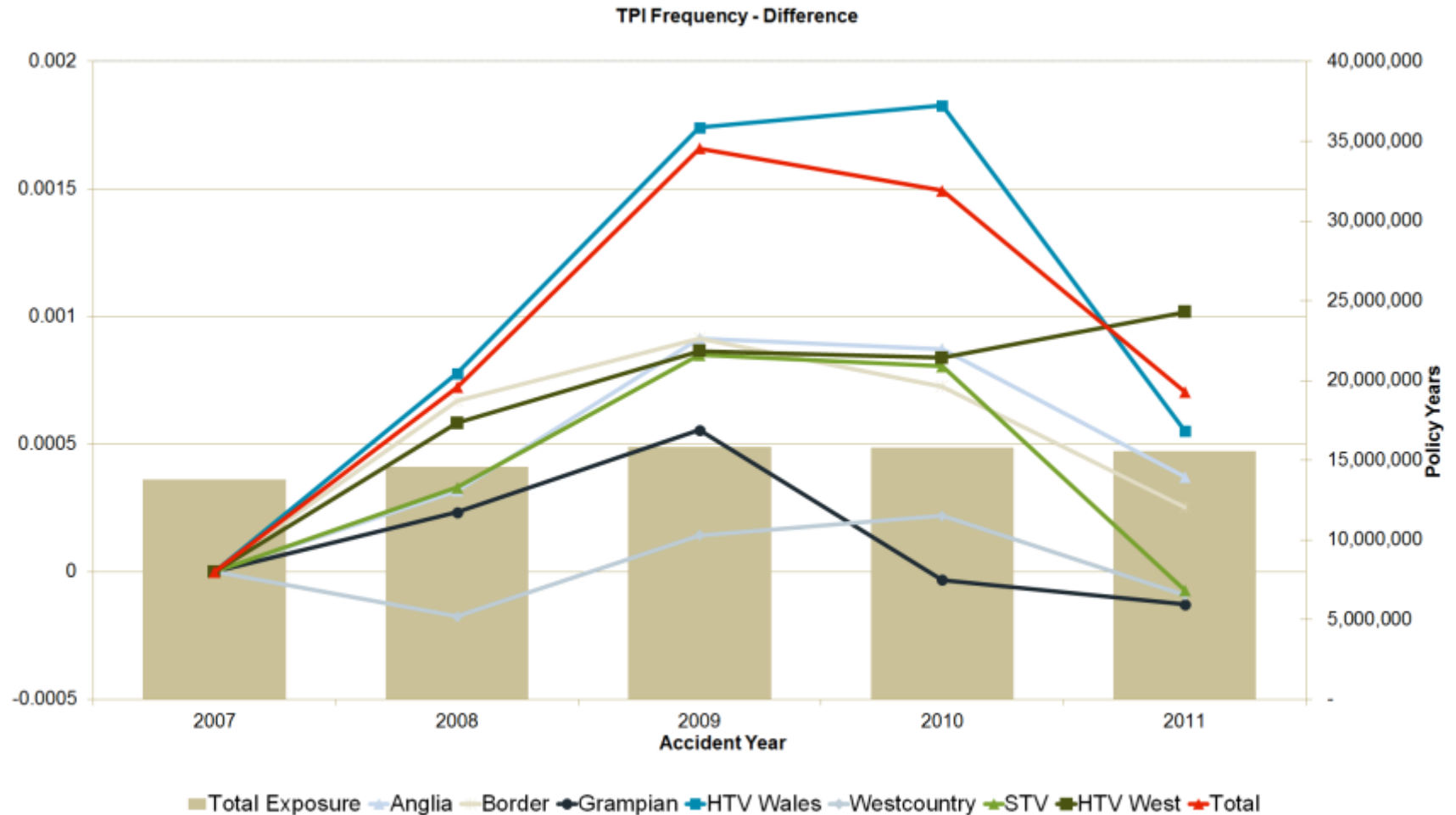
TPI Frequency Rescaled



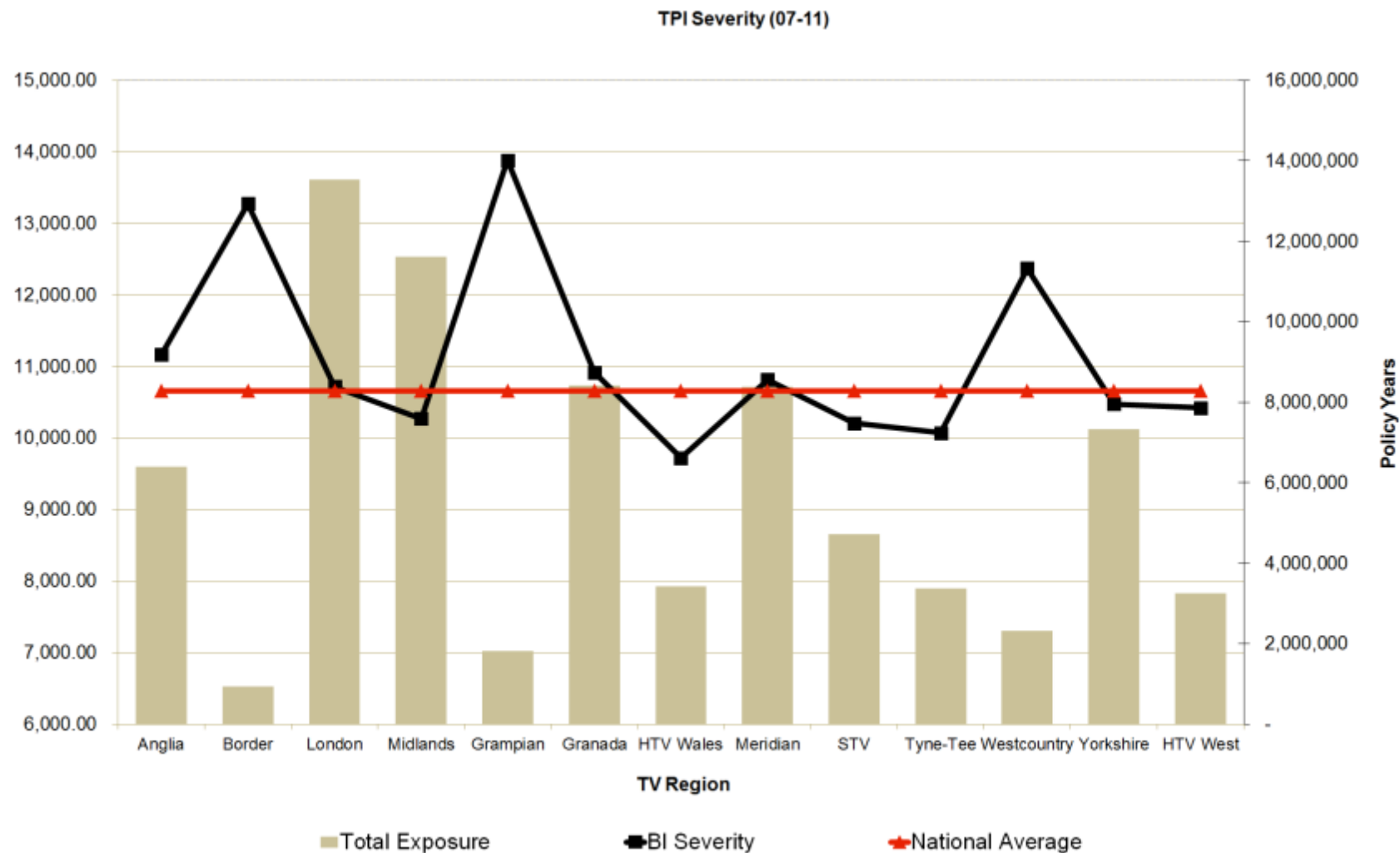
TPI Frequency Difference



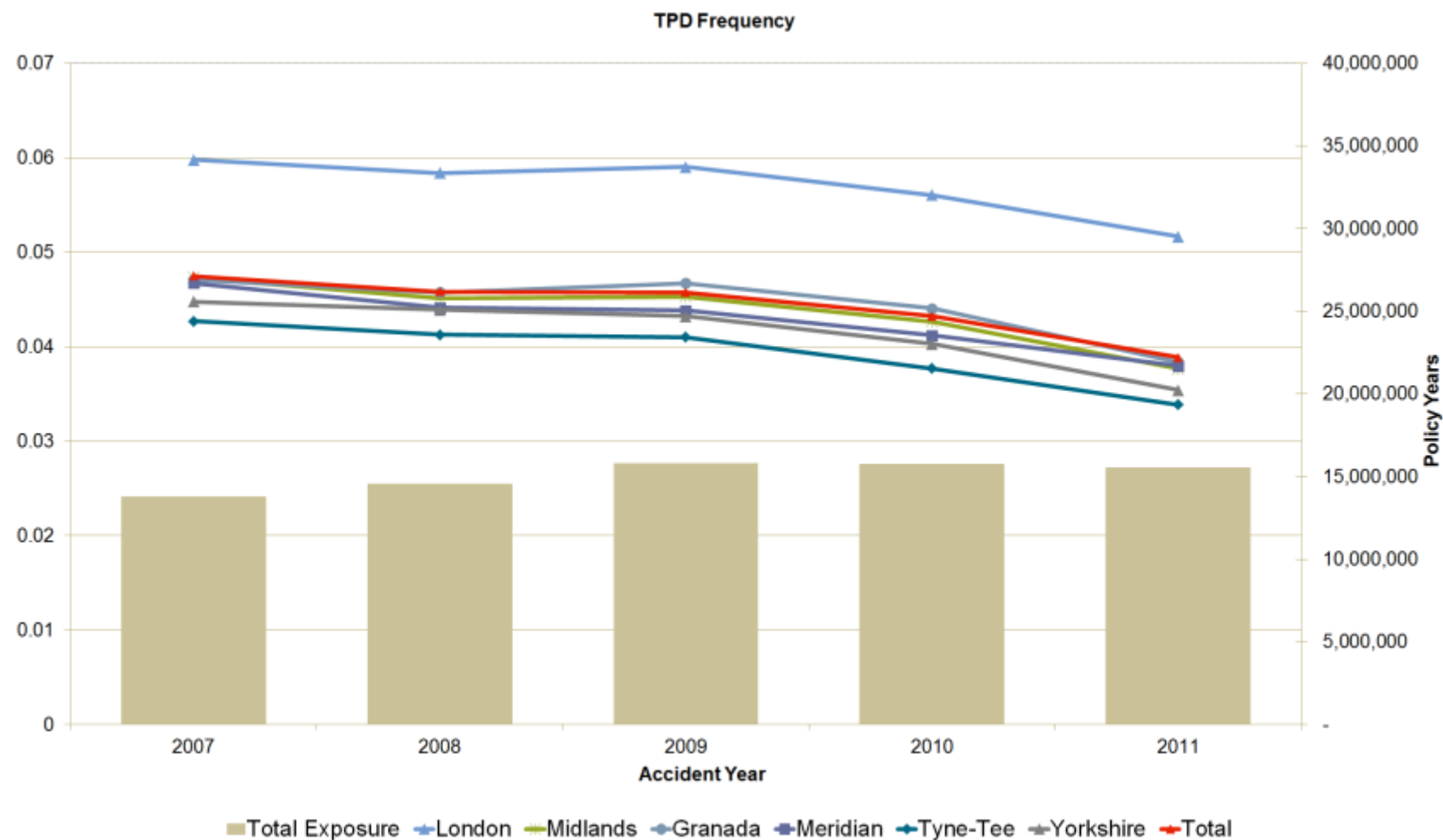
TPI Frequency Difference



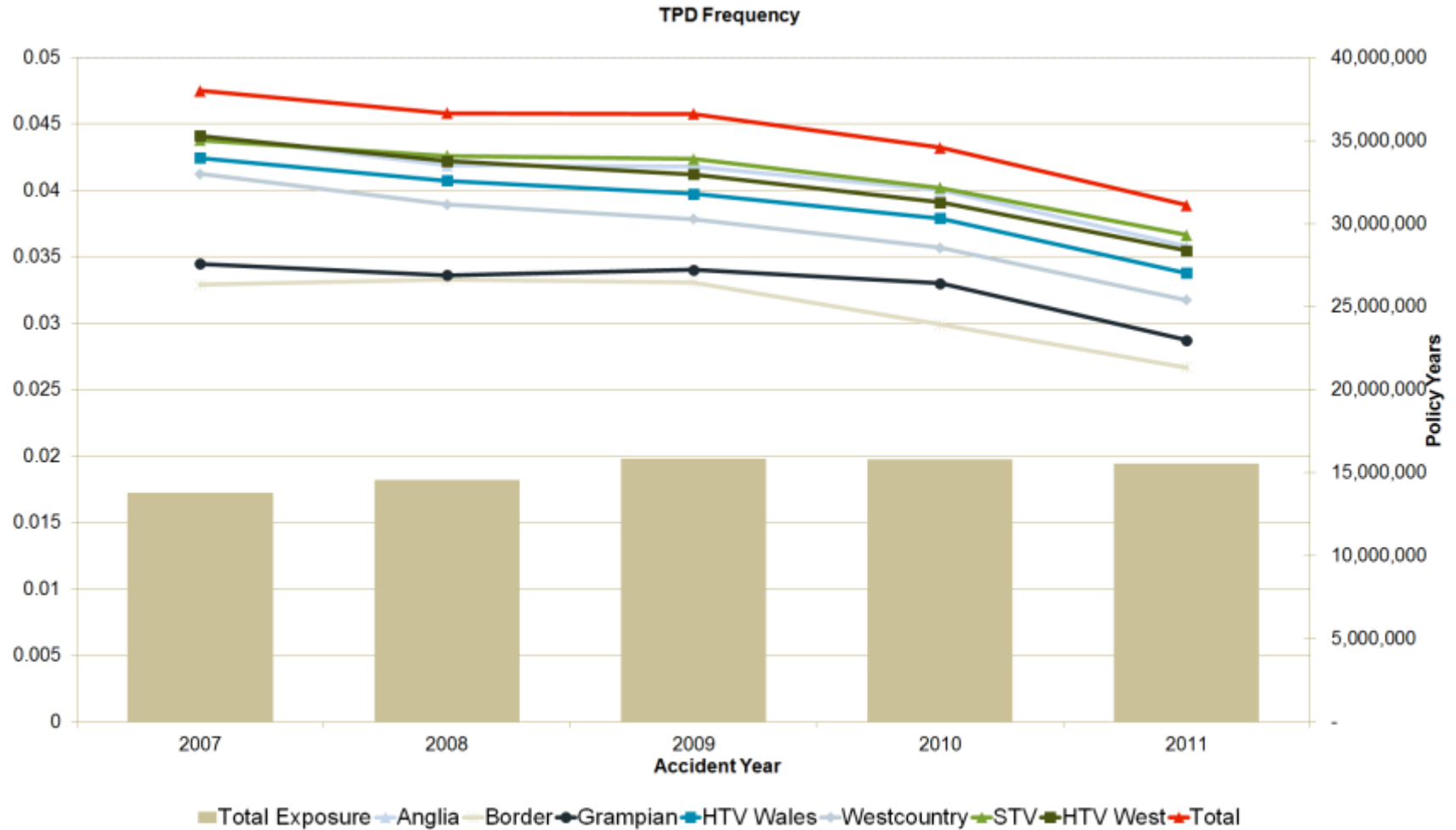
TPI Severity 2007 – 2011



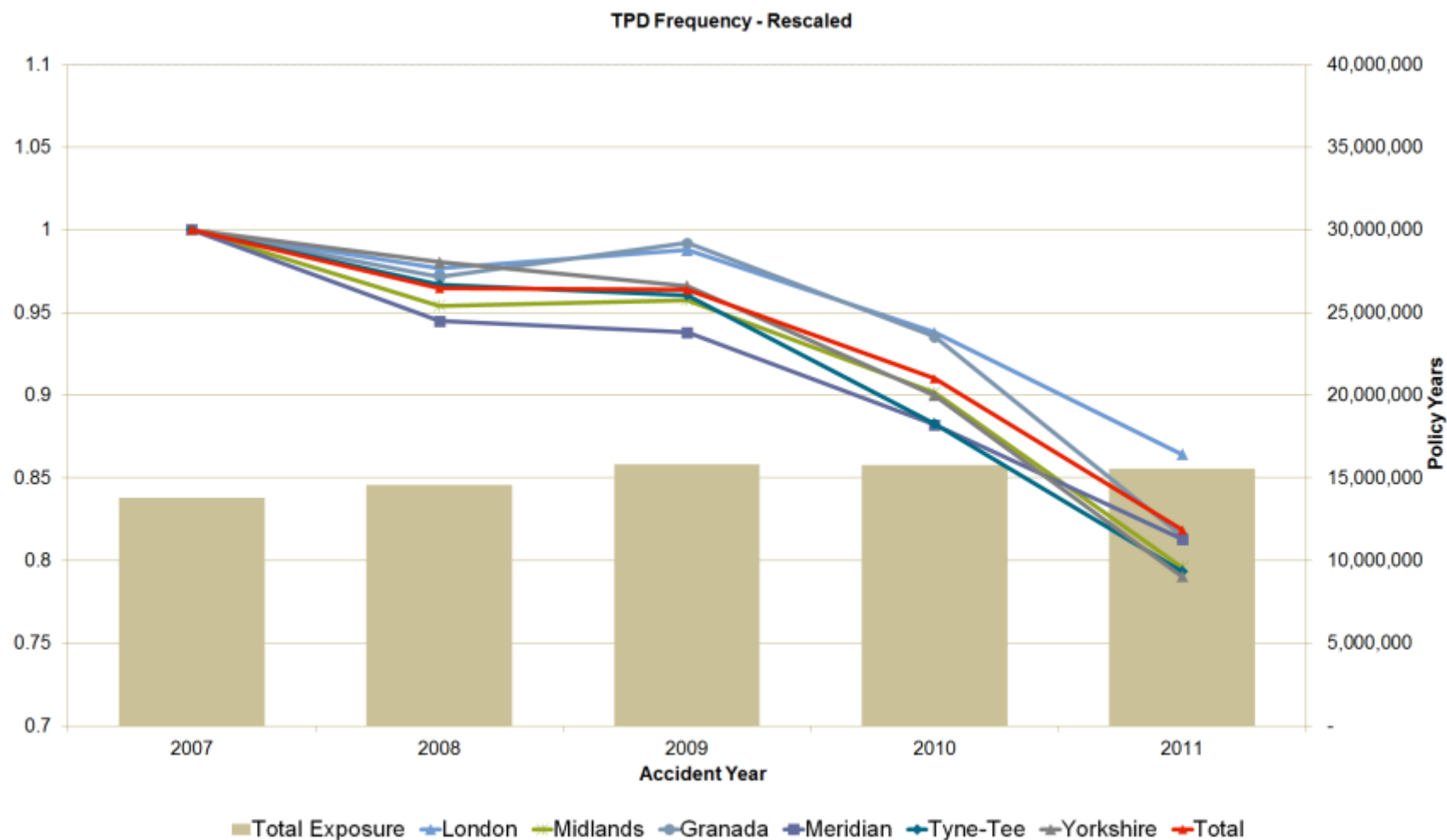
TPD Frequency



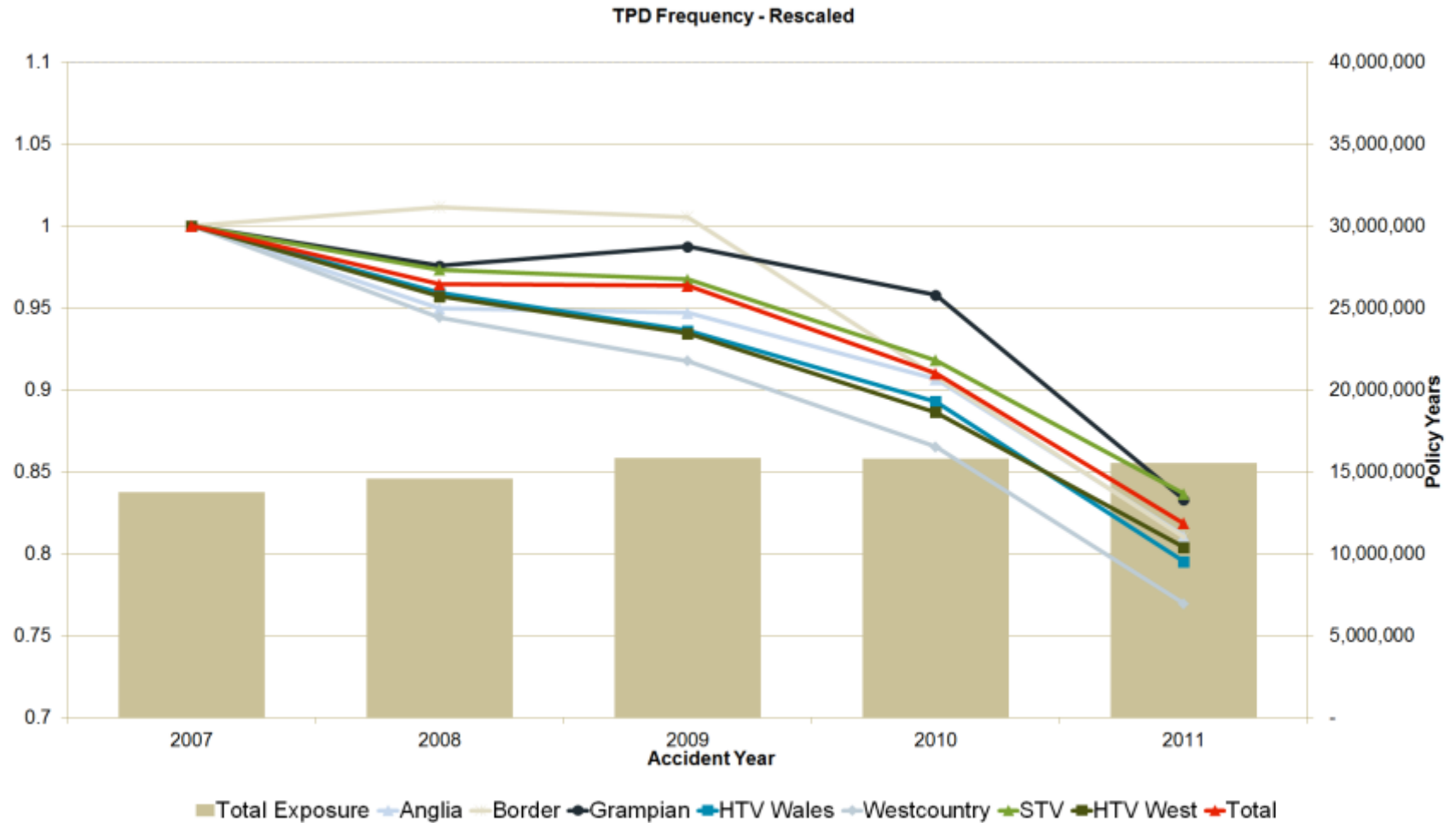
TPD Frequency



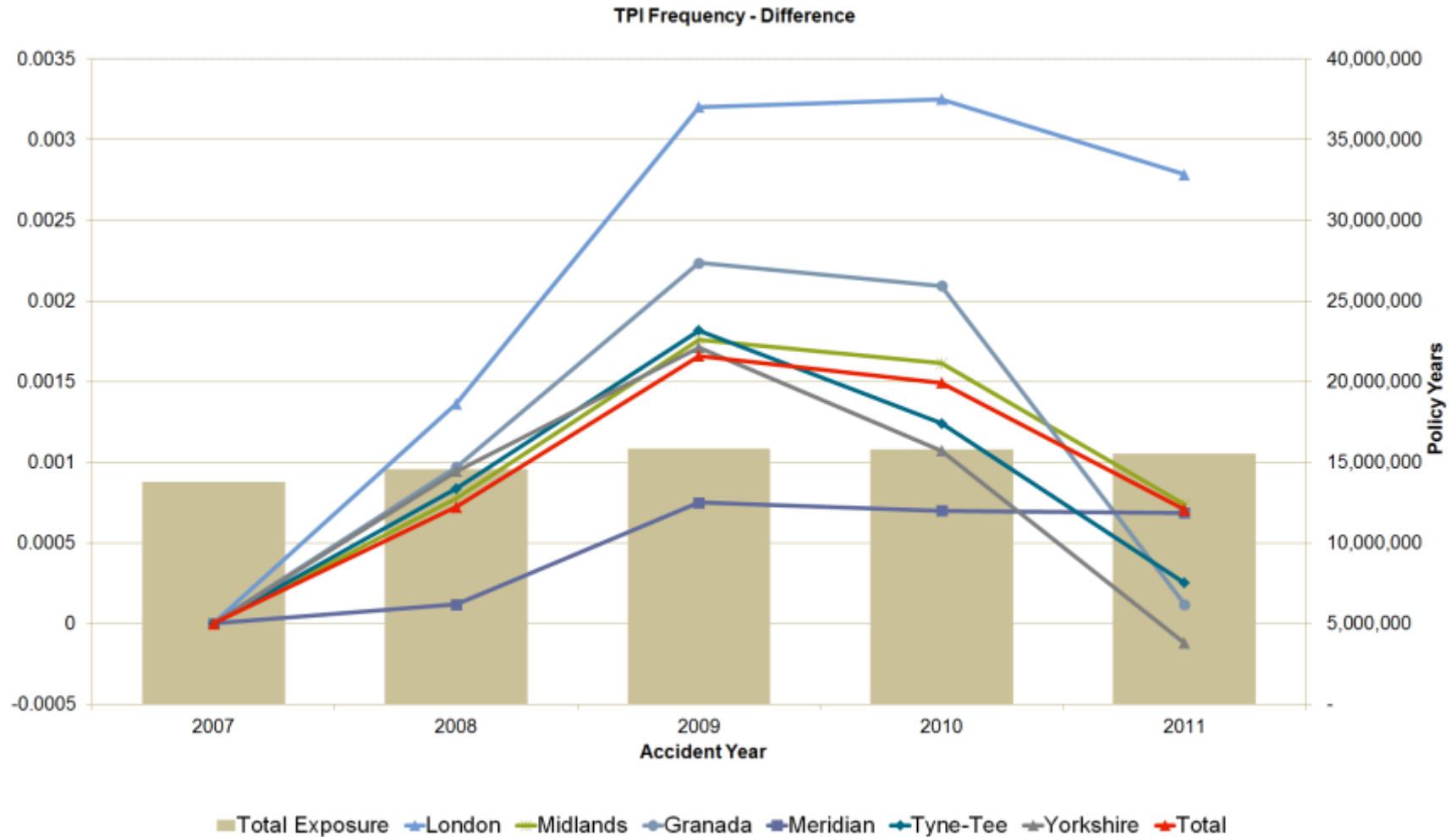
TPD Frequency Rescaled



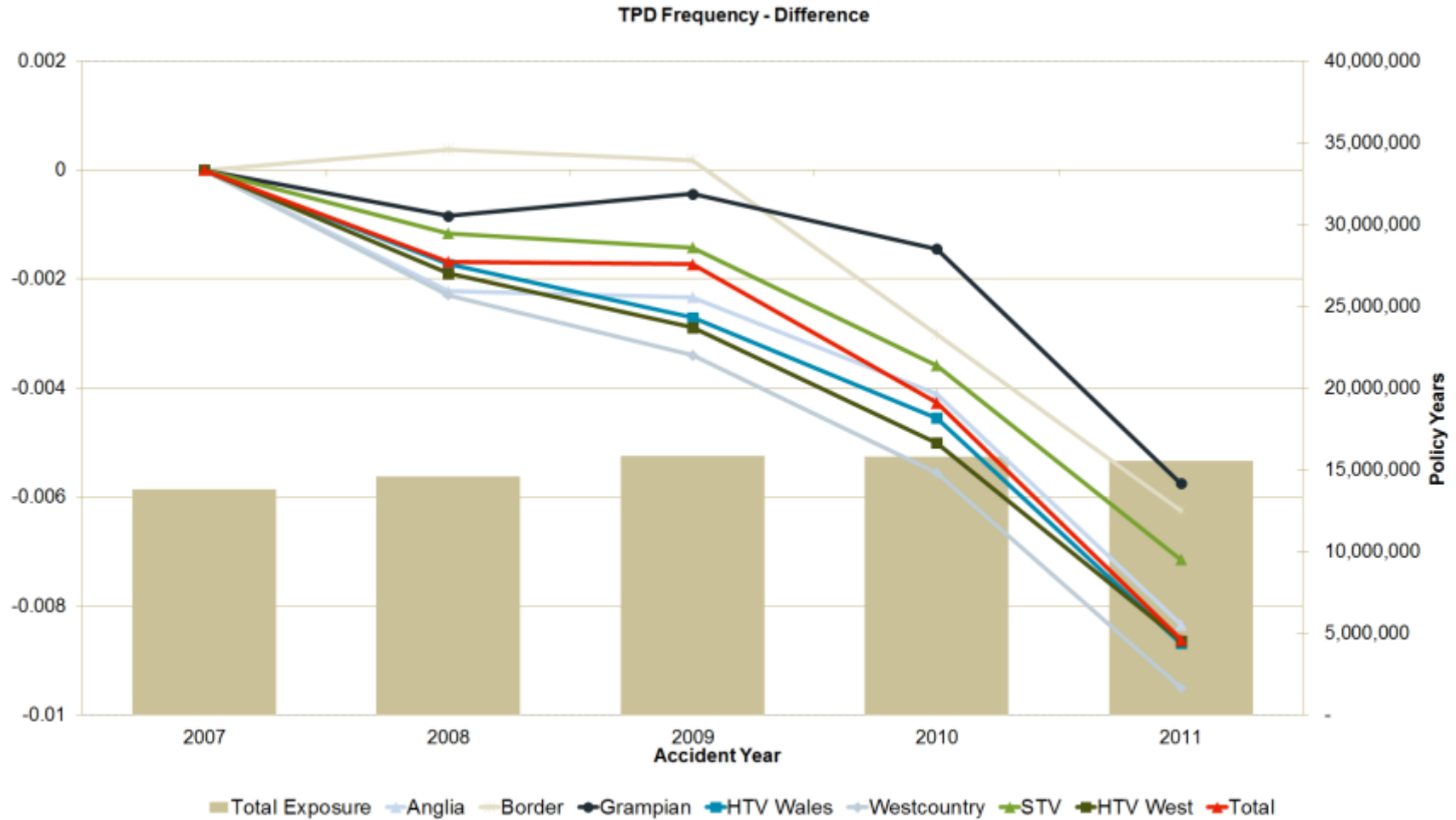
TPD Frequency Rescaled



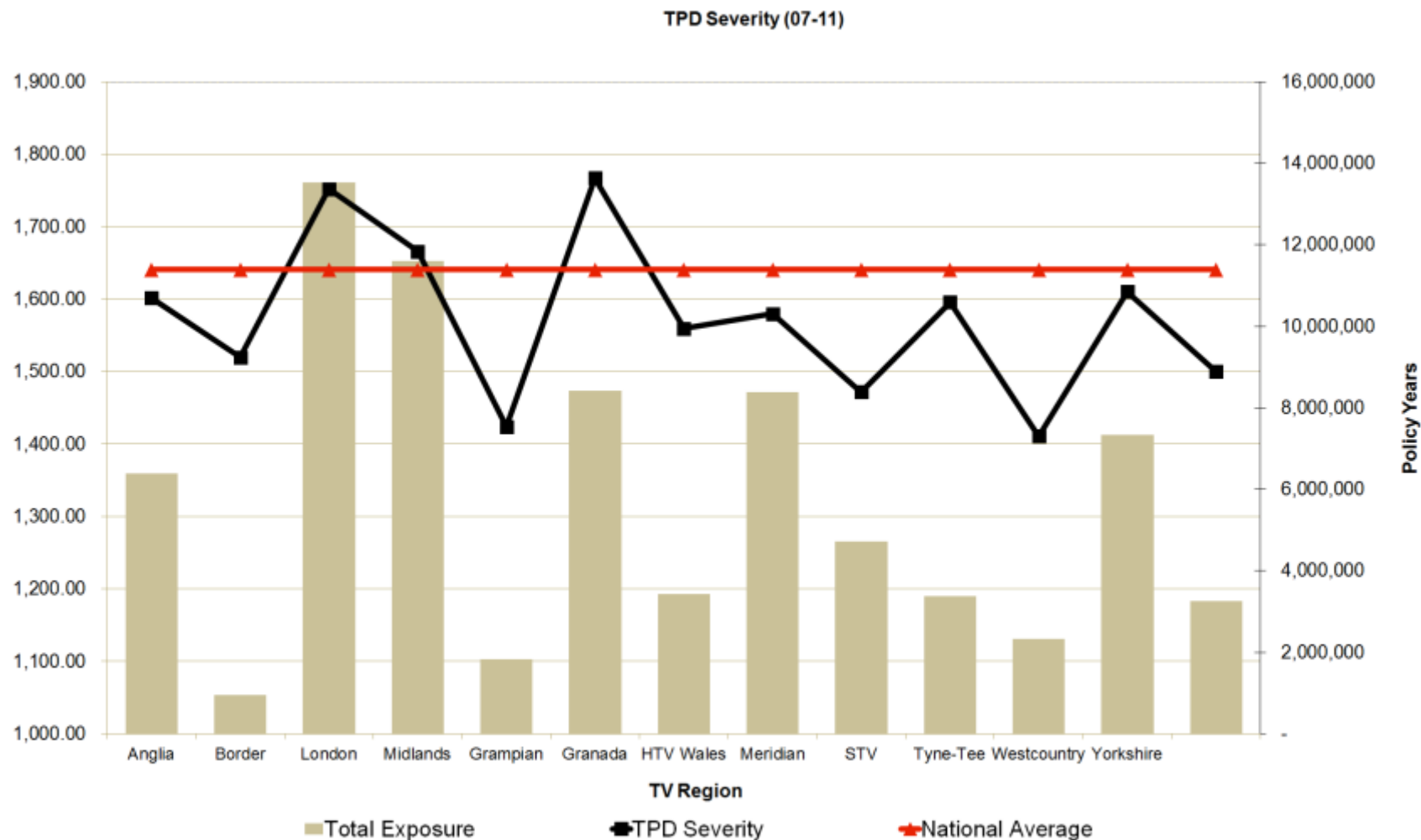
TPD Frequency Difference



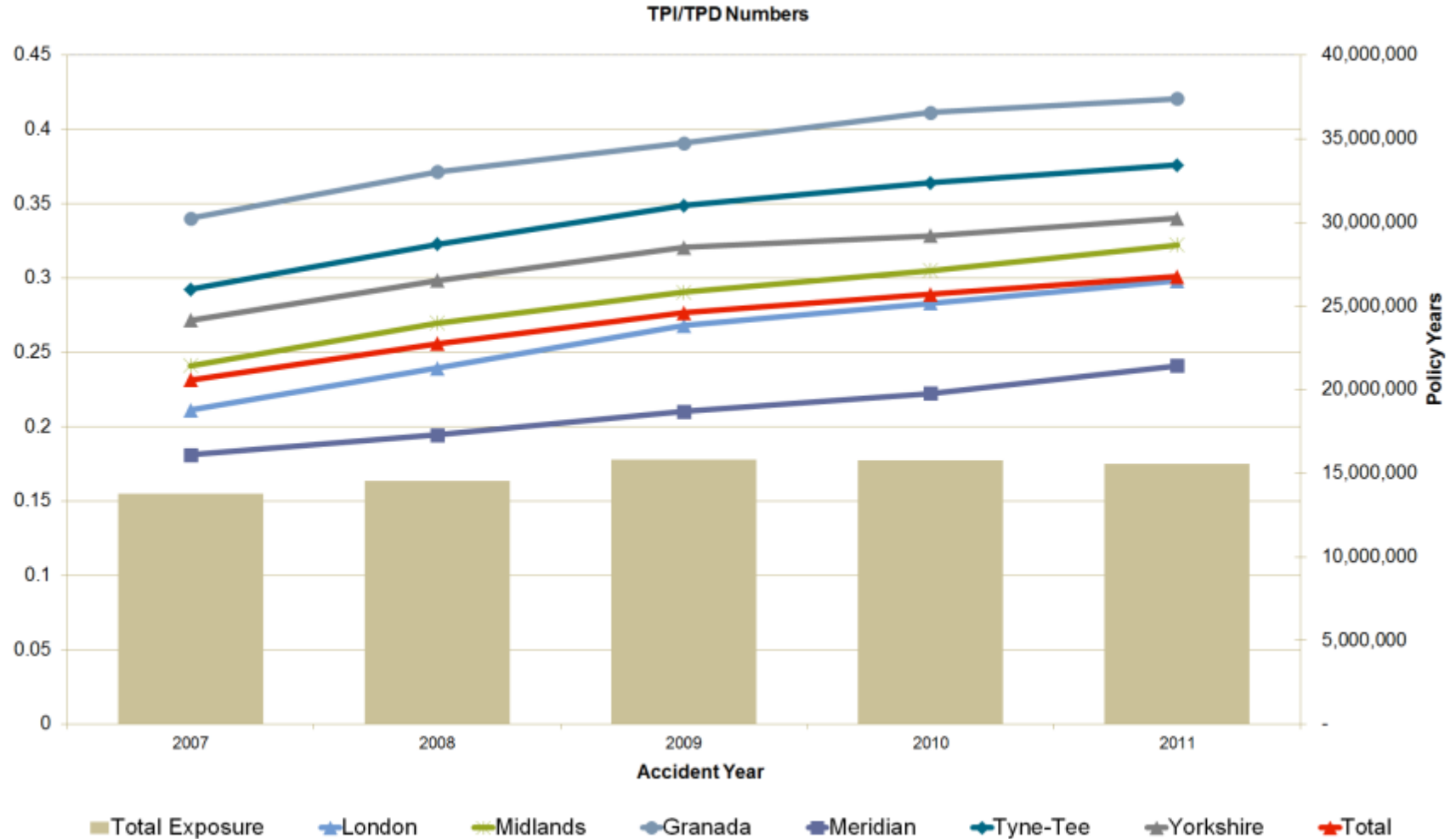
TPD Frequency Difference



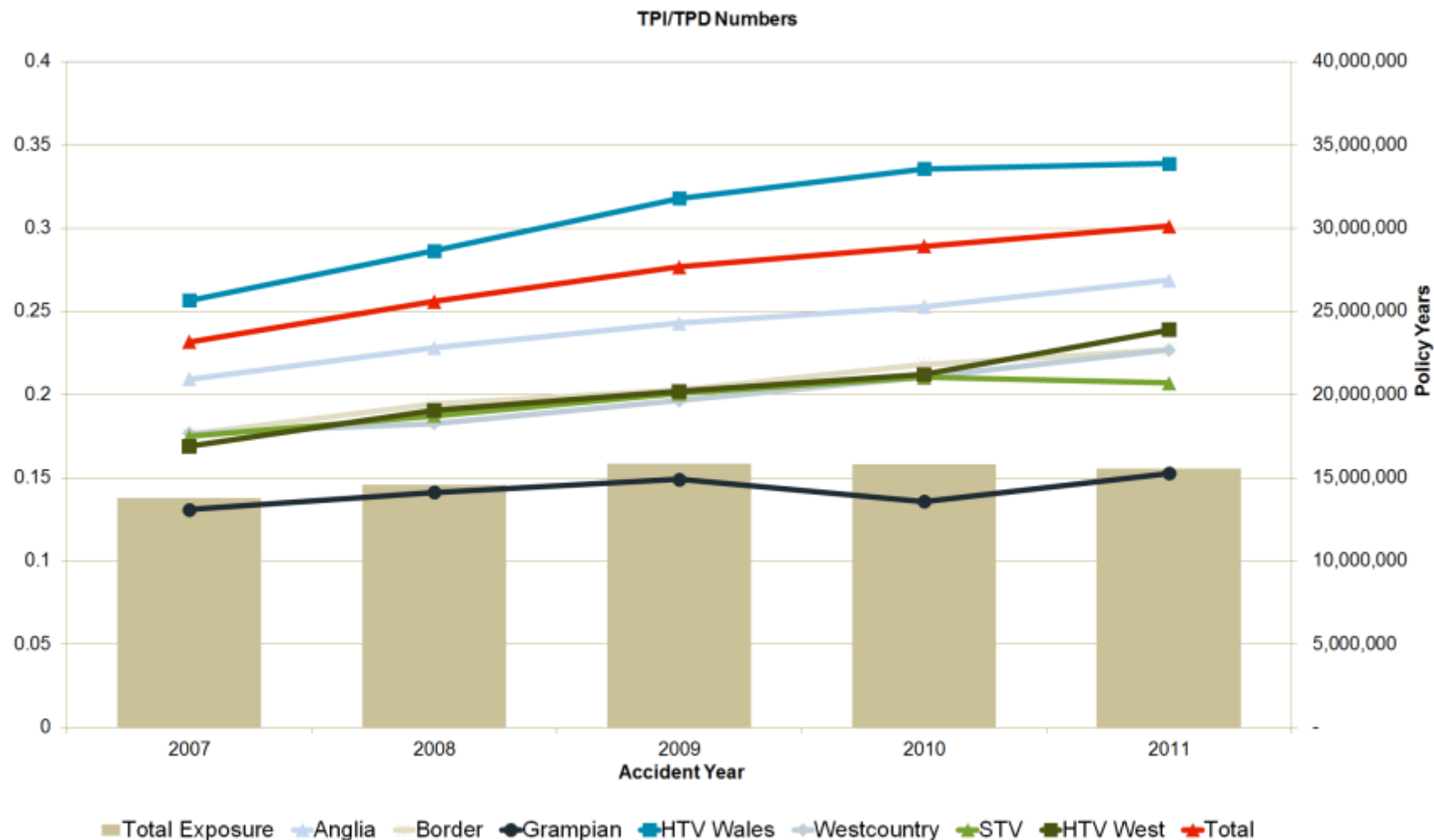
TPD Severity 2007 - 2011



TPI to TPD Ratio



TPI to TPD Ratio

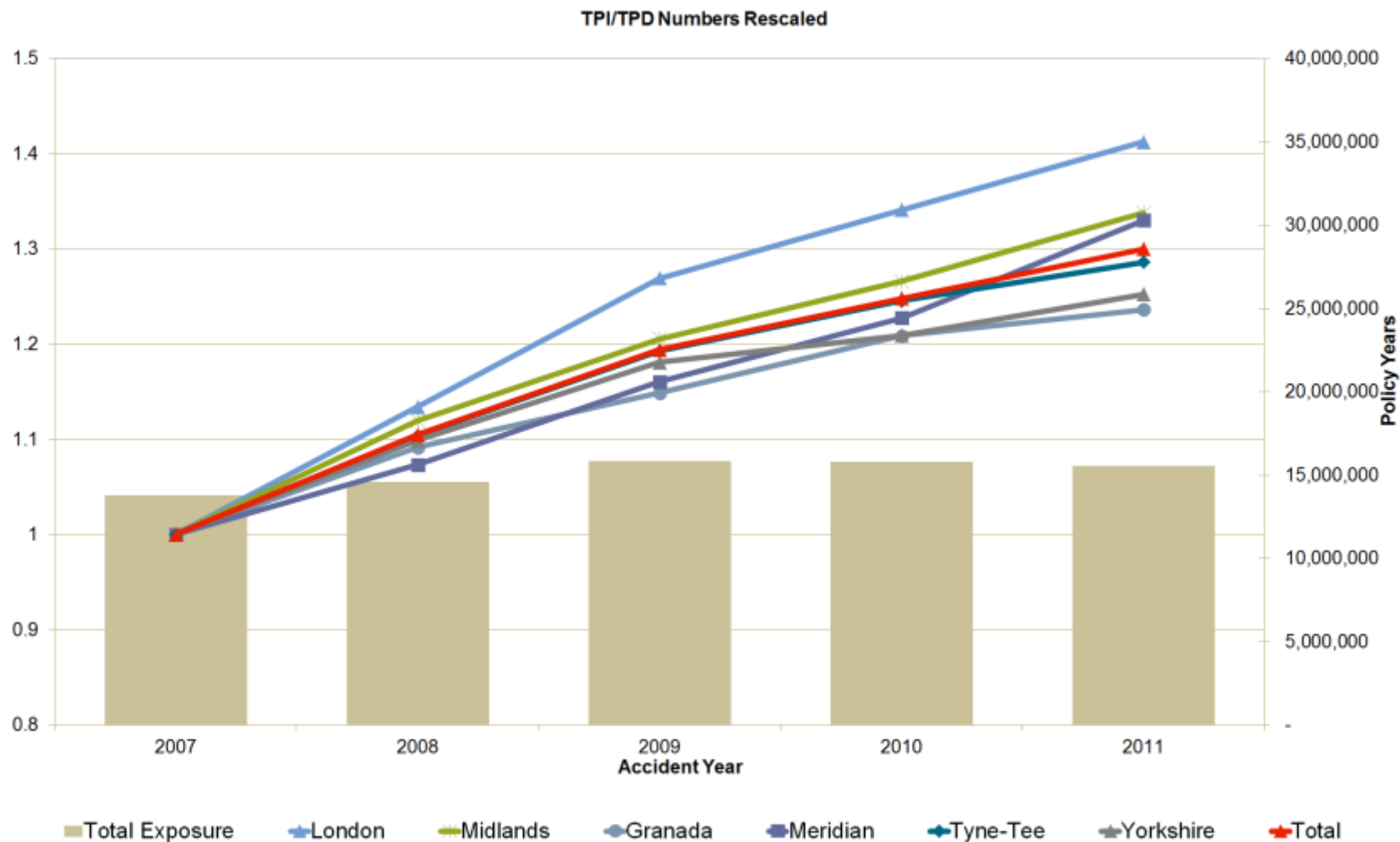


Worst US states for BI/TPD ratio

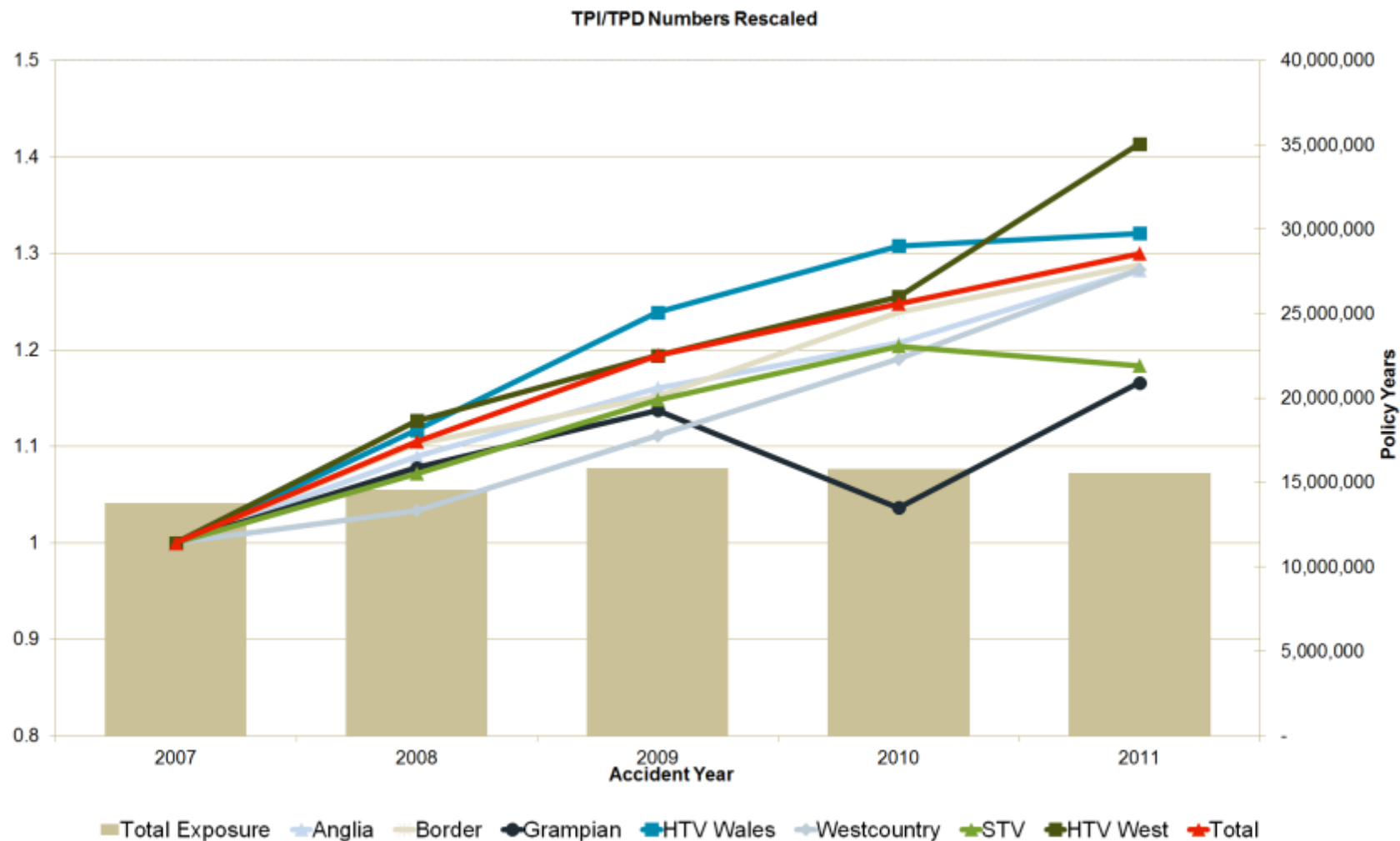
State	BI/TPD Ratio
Louisiana	38.8%
Nevada	37.7%
Rhoda Island	37.3%
Oregon	35.9%
South Carolina	34.3%
Washington	32.0%

- Data taken from ISS's Private Passenger Fast Track Data reports
- Data is as at end of Q4 2011

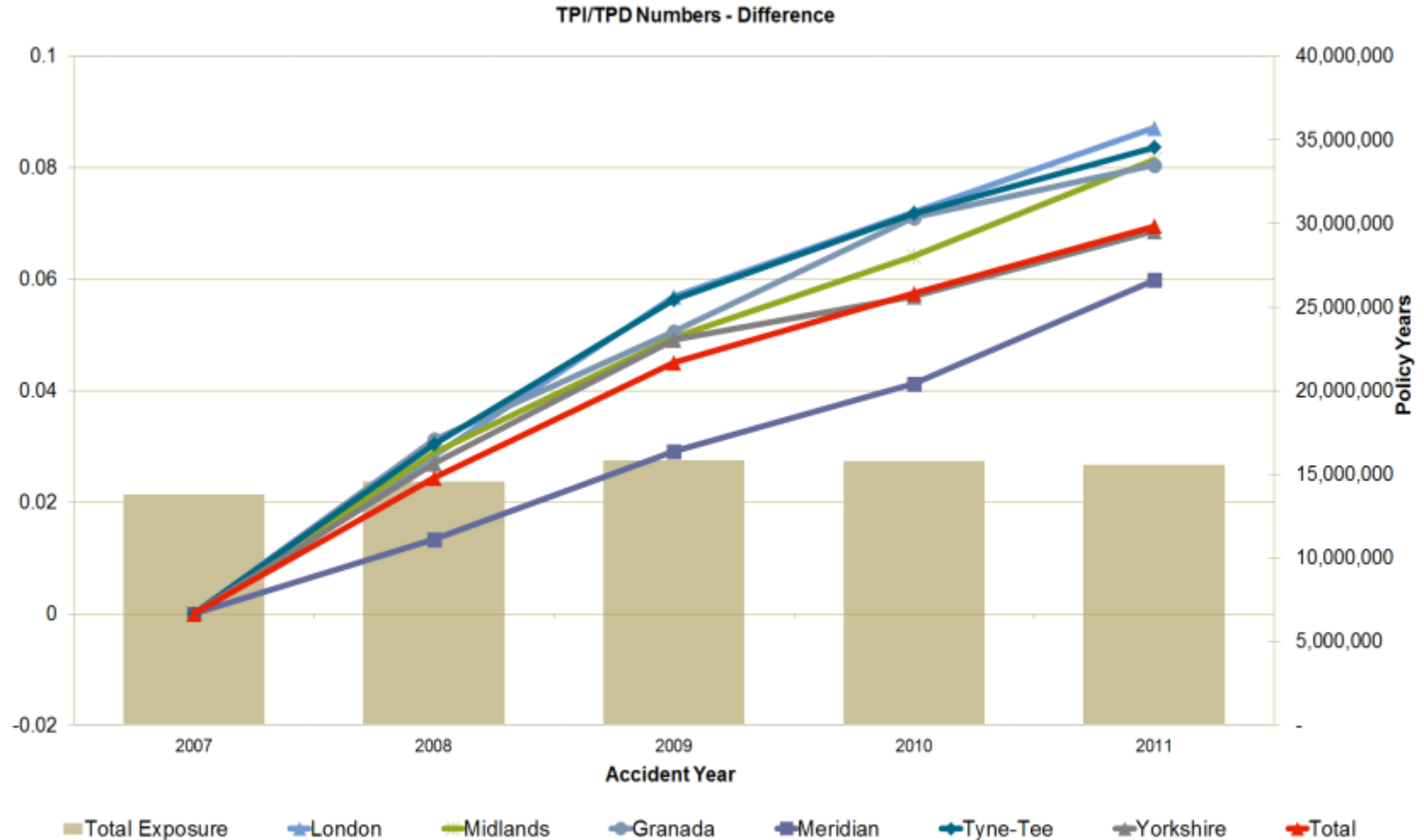
TPI to TPD Ratio Rescaled



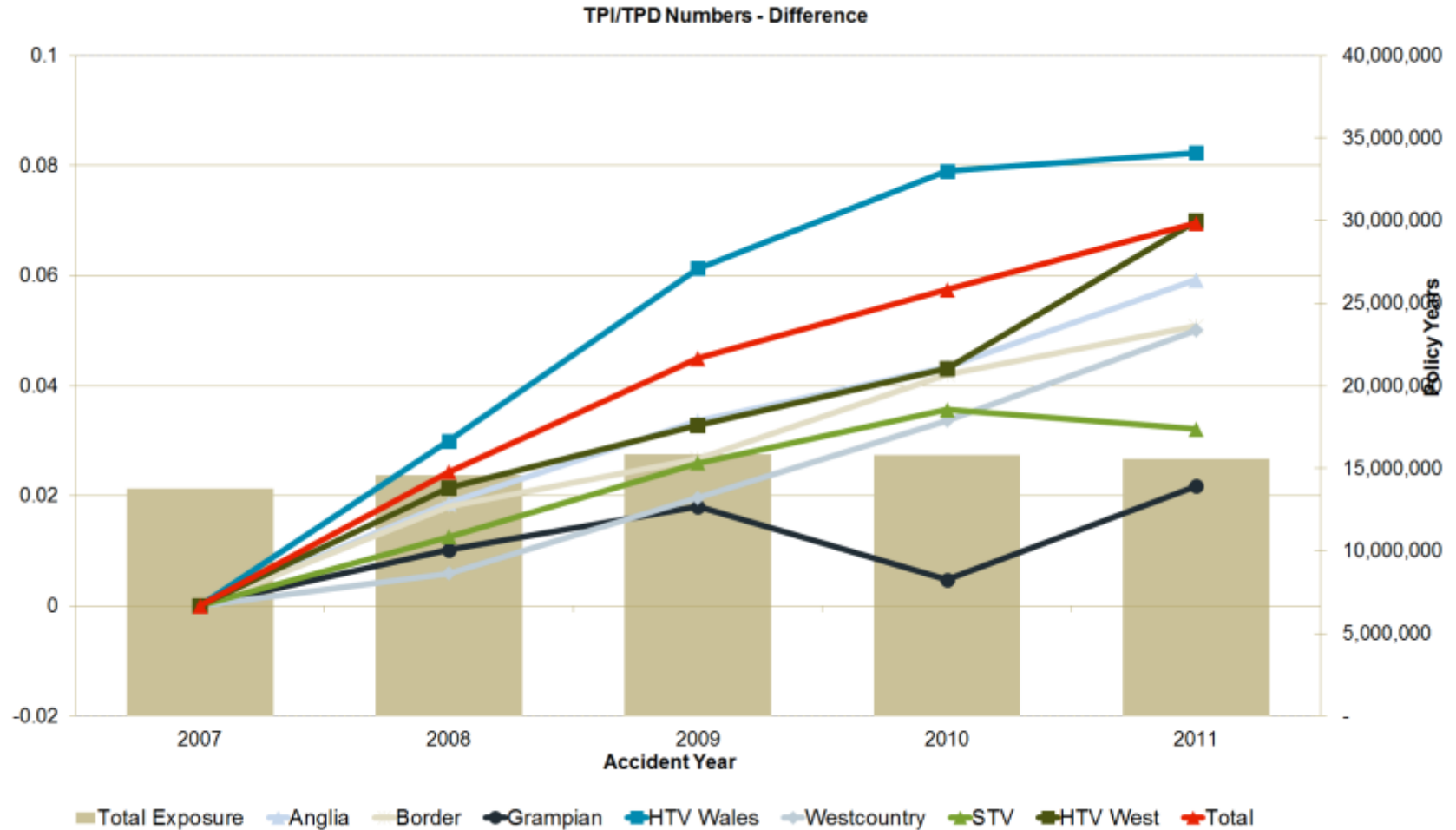
TPI to TPD Ratio Rescaled



TPI to TPD Ratio Difference



TPI to TPD Ratio Difference



Geographic analysis

Best and worst postcode districts - methodology

- Data from all contributors were pooled and split by postcode district and accident year
- Key statistics were then calculated, including frequencies and severities for TPI and TPD claims using incurred amounts and reported claim numbers including nils
- The best and worst postcode districts for 2009 - 2011 were then determined for each key statistic, subject to the districts having an exposure of greater than 1500 earned vehicle years in that period

Geographic analysis

Best and worst postcode districts for TPI frequency

Best	
Postcode District	Nearest town/city
KW16	Kirkwall
KW17	Kirkwall
IV26	Inverness
KW15	Kirkwall
ZE2	Shetland
NE70	Newcastle
IV15	Inverness
EH31	Edinburgh
HS2	Hebrides
EH37	Edinburgh
IV19	Inverness
HS1	Hebrides
IV27	Inverness
AB33	Aberdeen
DG7	Dumfries
PH16	Perth
KA27	Kilmarnock
AB45	Aberdeen
AB55	Aberdeen
EH35	Edinburgh

Worst	
Postcode District	Nearest town/city
B8	Birmingham
B12	Birmingham
B10	Birmingham
B9	Birmingham
B6	Birmingham
B19	Birmingham
M13	Manchester
BD3	Bradford
M12	Manchester
BD8	Bradford
B21	Birmingham
BD9	Bradford
B66	Birmingham
M8	Manchester
B11	Birmingham
BD5	Bradford
N17	London - North
B18	Birmingham
B20	Birmingham
L7	Liverpool

Geographic analysis

Best and worst postcode districts for TPD frequency

Best	
Postcode District	Nearest town/city
KW17	Kirkwall
ZE2	Shetland
HS2	Hebrides
KW15	Kirkwall
HS1	Hebrides
KW12	Kirkwall
IV27	Inverness
AB38	Aberdeen
KW16	Kirkwall
EH31	Edinburgh
KW1	Kirkwall
TD12	Galashiels
LL46	Llandudno
IV19	Inverness
IV25	Inverness
KW14	Kirkwall
IV6	Inverness
IV26	Inverness
LL53	Llandudno
DG7	Dumfries

Worst	
Postcode District	Nearest town/city
B12	Birmingham
B10	Birmingham
B19	Birmingham
B8	Birmingham
B9	Birmingham
SW1X	London - South West
NW11	London - North West
B6	Birmingham
B21	Birmingham
NW10	London - North West
M12	Manchester
BD3	Bradford
B18	Birmingham
BD8	Bradford
N17	London - North
W1H	London - West
M13	Manchester
N15	London - North
B66	Birmingham
BD9	Bradford

Geographic analysis

Best and worst postcode districts for TPI / TPD ratio

Best	
Postcode District	Nearest town/city
KW16	Kirkwall
EH37	Edinburgh
IV15	Inverness
KY9	Kirkcaldy
IV26	Inverness
PH16	Perth
AB14	Aberdeen
AB33	Aberdeen
PA37	Paisley
AB13	Aberdeen
NE70	Newcastle
PL16	Plymouth
FK16	Falkirk
TA22	Taunton
KW17	Kirkwall
AB32	Aberdeen
AB45	Aberdeen
EH40	Edinburgh
AB22	Aberdeen
AB55	Aberdeen

Worst	
Postcode District	Nearest town/city
B8	Birmingham
L4	Liverpool
L32	Liverpool
M13	Manchester
B9	Birmingham
L21	Liverpool
L6	Liverpool
B6	Birmingham
L36	Liverpool
BD3	Bradford
B10	Birmingham
BD8	Bradford
M12	Manchester
L20	Liverpool
L9	Liverpool
M8	Manchester
L24	Liverpool
L30	Liverpool
L11	Liverpool
B19	Birmingham

Geographic analysis

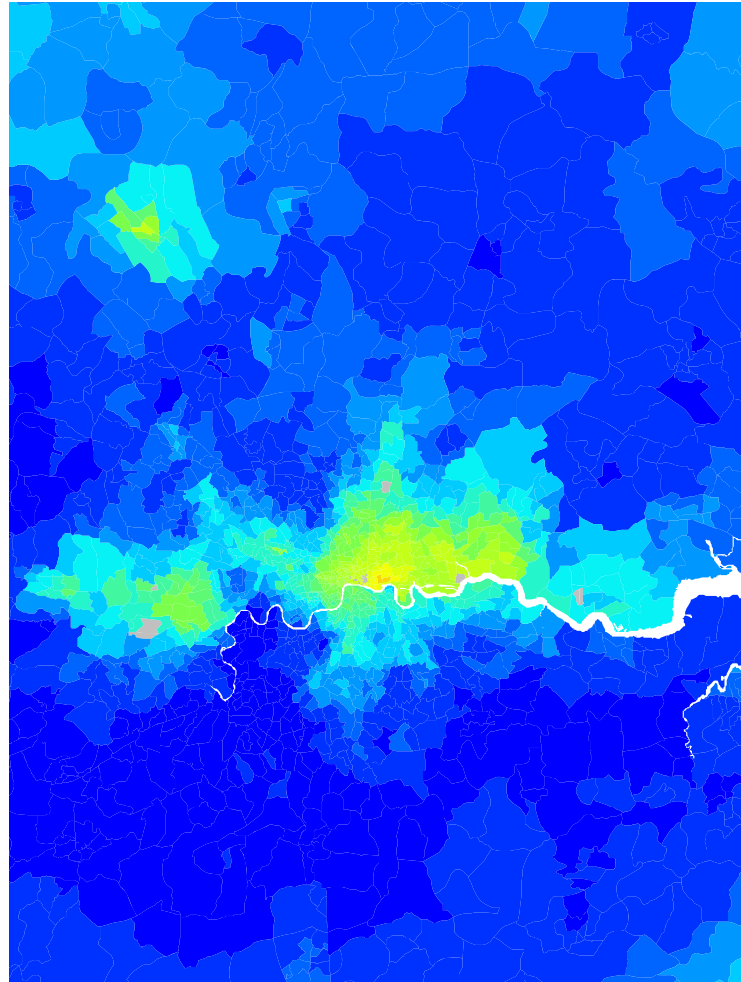
Maps of UK experience – key towns / cities

- The following slides show the ratio of TPI to TPD claim numbers across each accident year from 2007 to 2011, for several major UK towns and cities
- The scale of each map is consistent, allowing experience to be compared across different cities
- The lower bound for the highest banding level (the darkest shade of red) is 65%

Geographic analysis

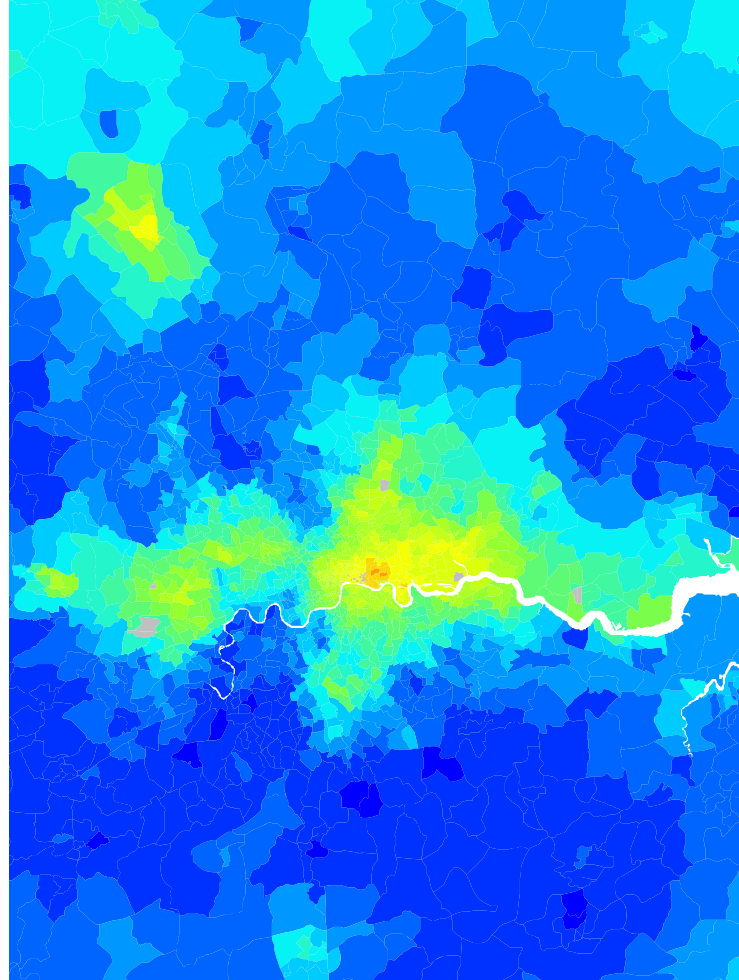
TPI to TPD Numbers Ratio 2007 - London

- London exhibited broadly flat levels of TPI / TPD claim numbers in 2007, with experience outside the centre particularly benign



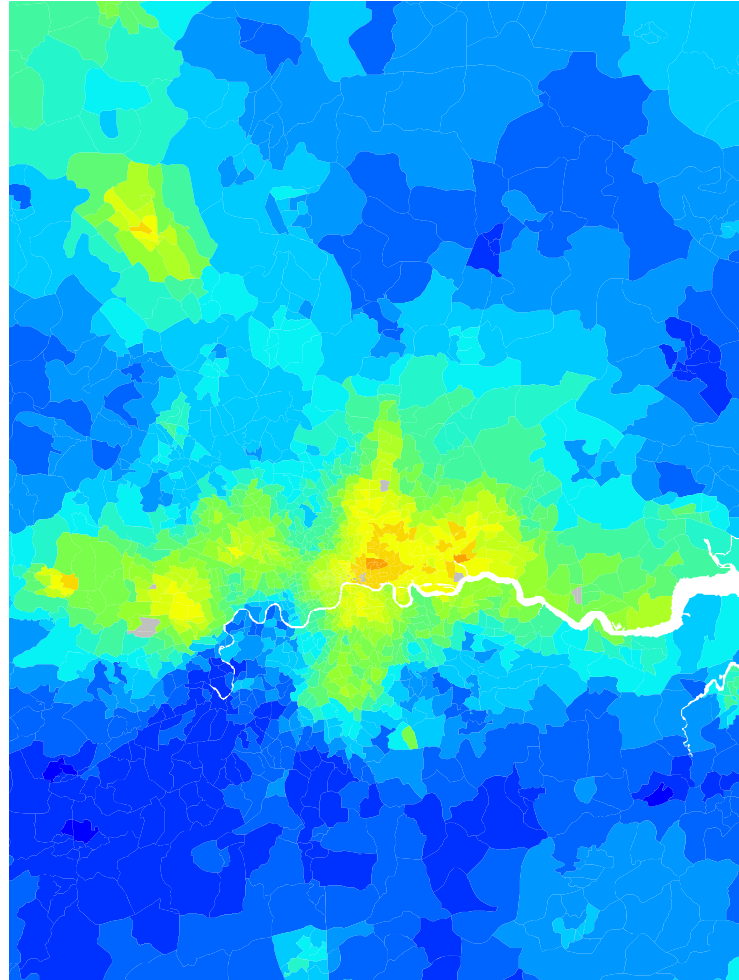
Geographic analysis

TPI to TPD Numbers Ratio 2008 - London



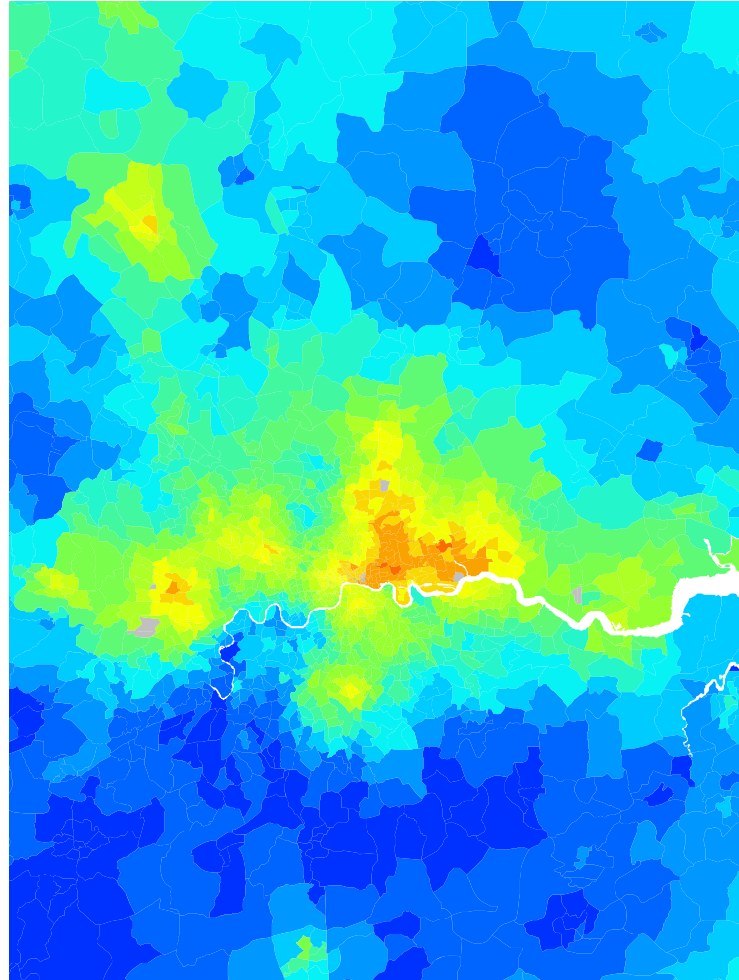
Geographic analysis

TPI to TPD Numbers Ratio 2009 - London



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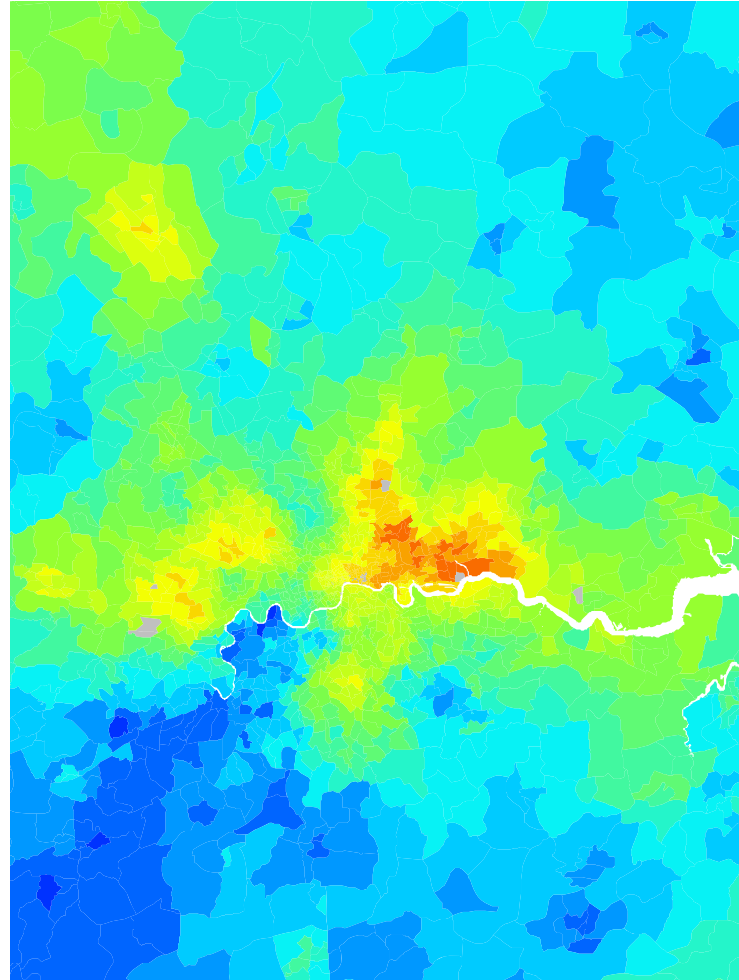
TPI to TPD Numbers Ratio 2010 - London



Geographic analysis

TPI to TPD Numbers Ratio 2011 - London

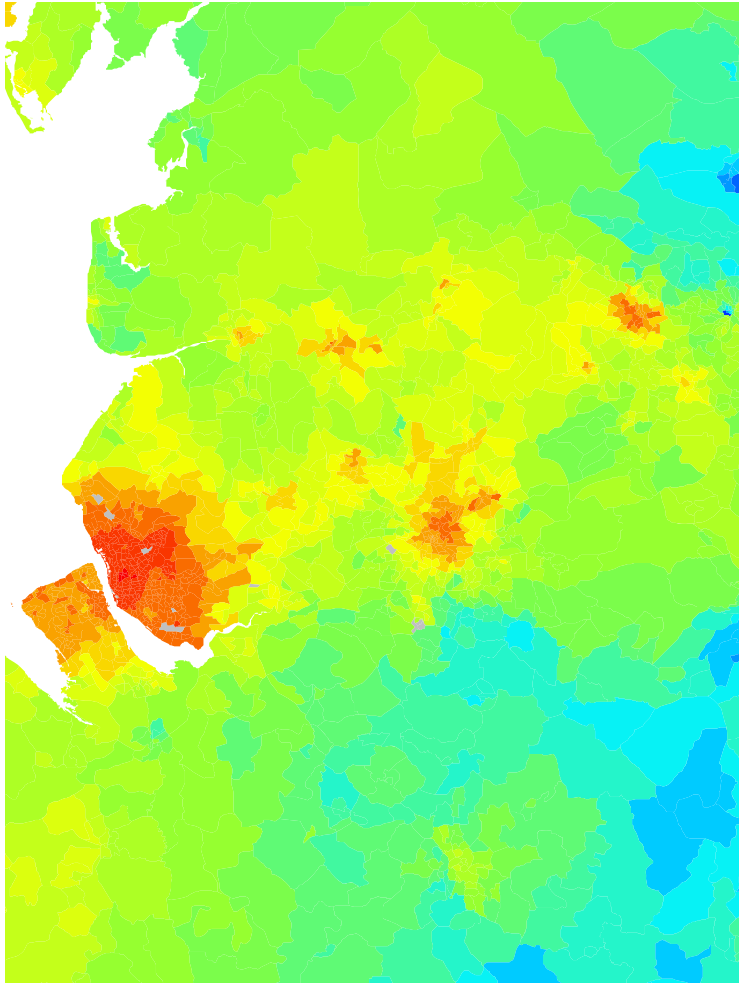
- London has since deteriorated, with evidence of “hot spots” emerging in the east and further west of the city
- Note that more recent years are subject to IBNR



2011 is particularly subject to further IBNR development

Geographic analysis

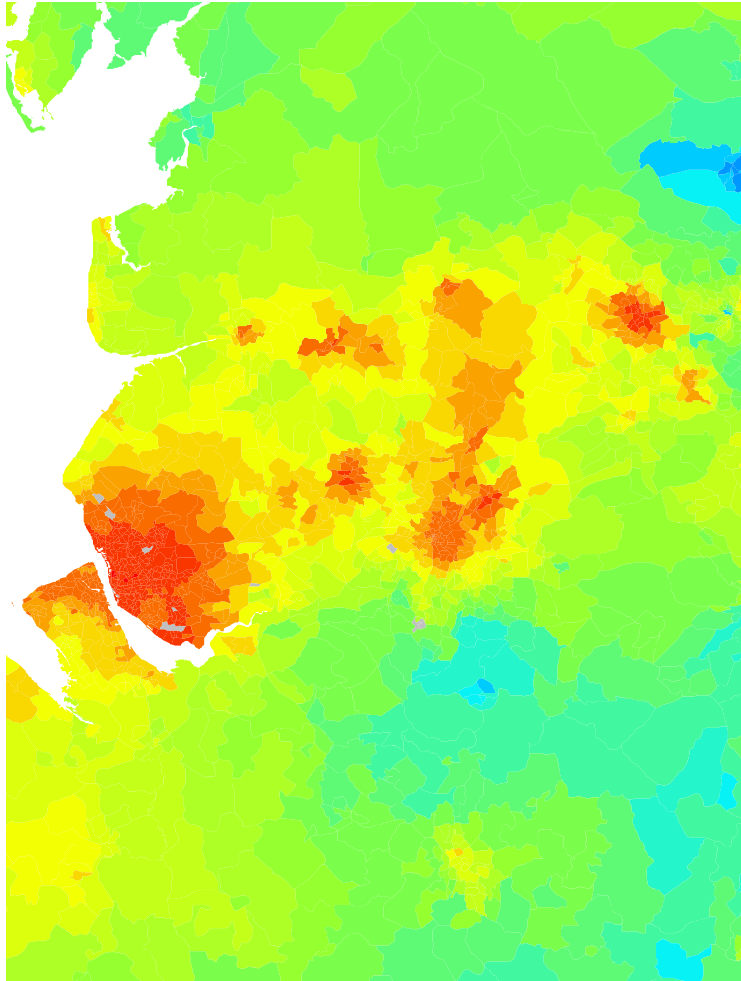
TPI to TPD Numbers Ratio 2007 - North West



- Such “hot spots” were already present back in 2007 in the North West
- Both Liverpool and Manchester were displaying high ratios back in 2007
- Experience localised to a degree to the city centres

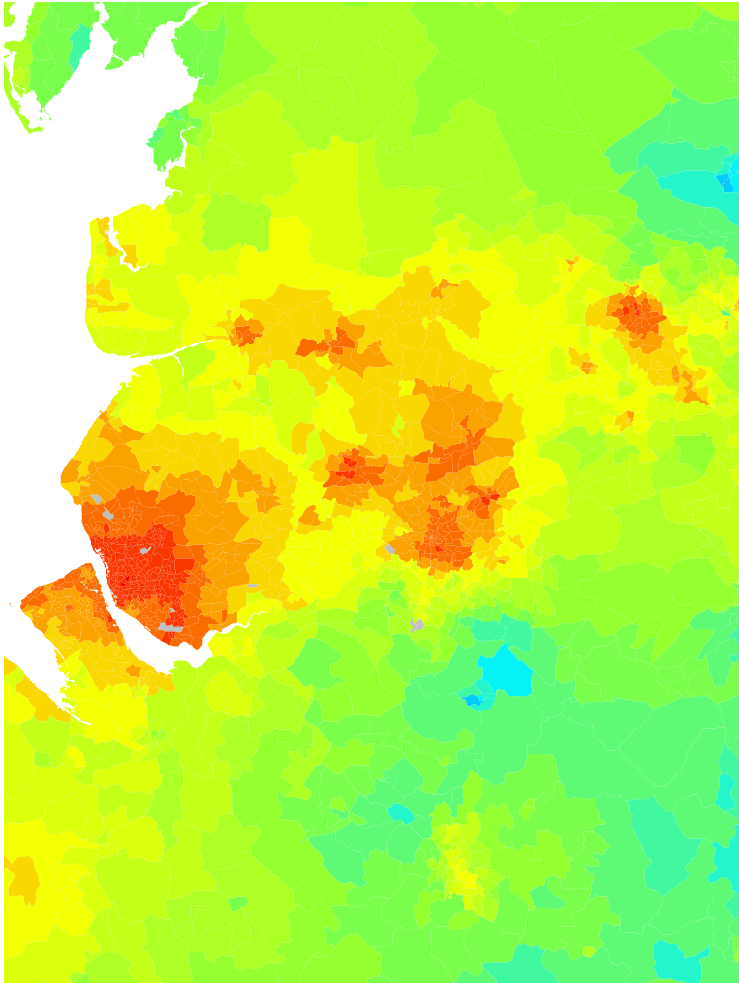
Geographic analysis

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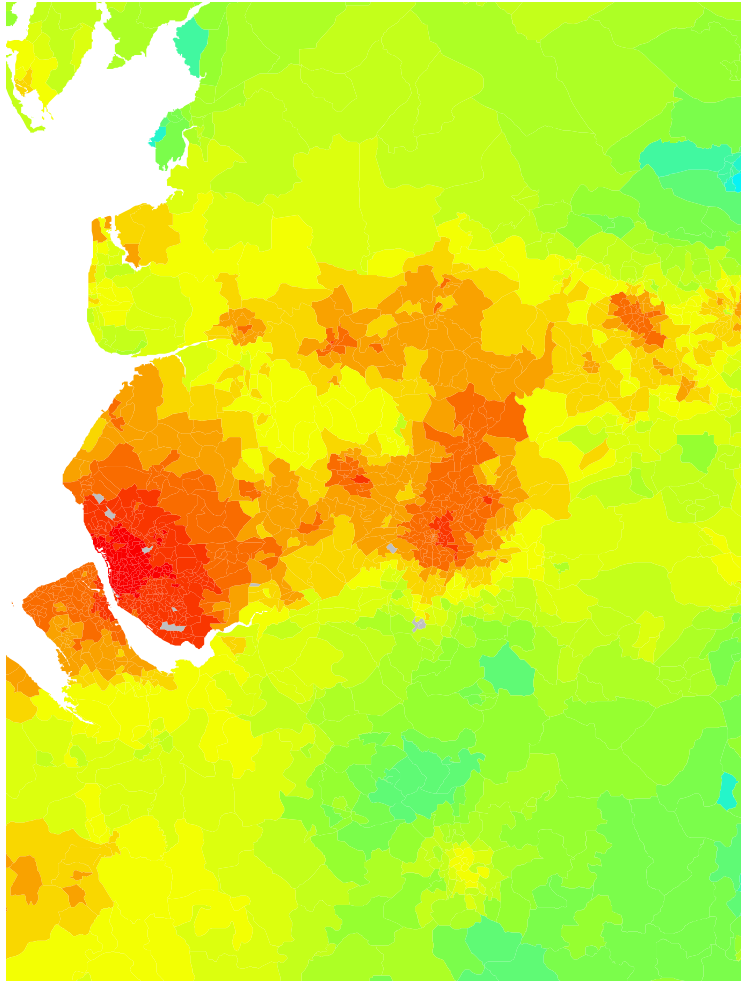
Geographic analysis

TPI to TPD Numbers Ratio 2009 - North West



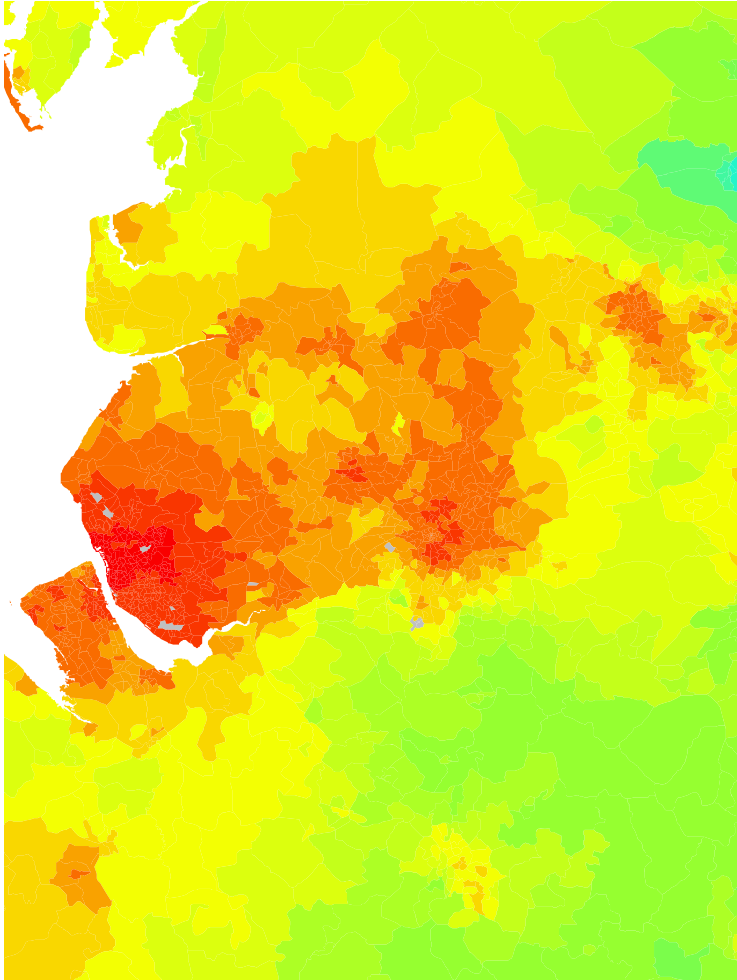
Geographic analysis

TPI to TPD Numbers Ratio 2010 - North West



Geographic analysis

TPI to TPD Numbers Ratio 2011 - North West



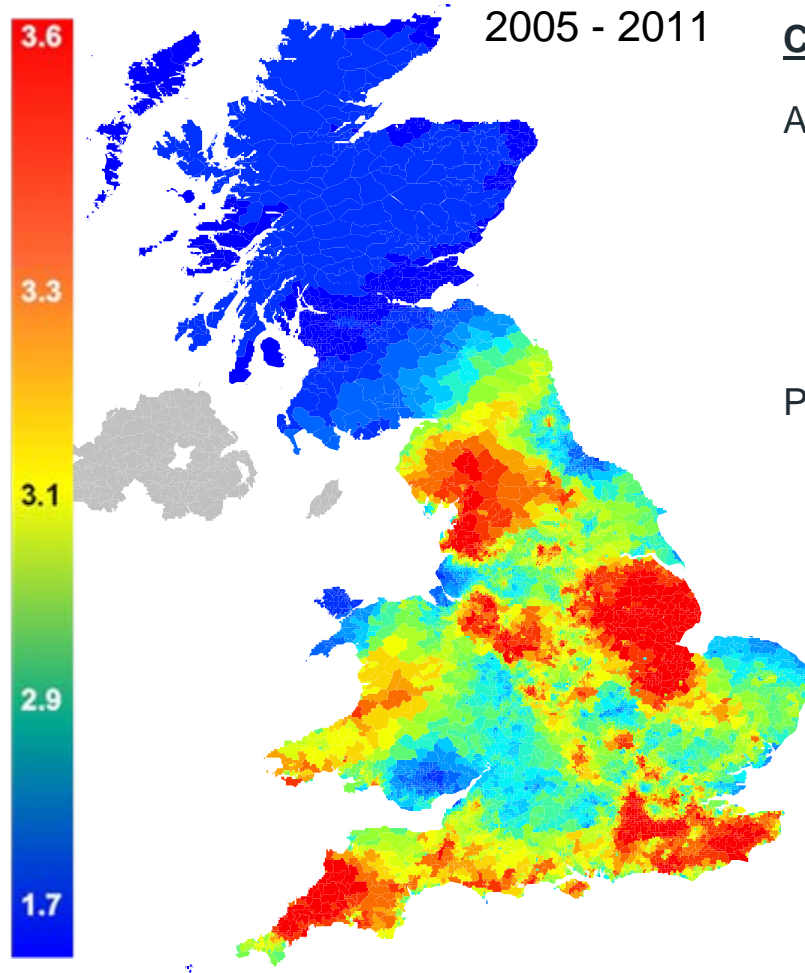
- The North West region has seen a significant increase over the past 5 years
- No longer restricted to city centres

Geographic analysis

“Accidents” per 1000 popn

STATS19

2005 2006 2007 2008 2009 2010 2011



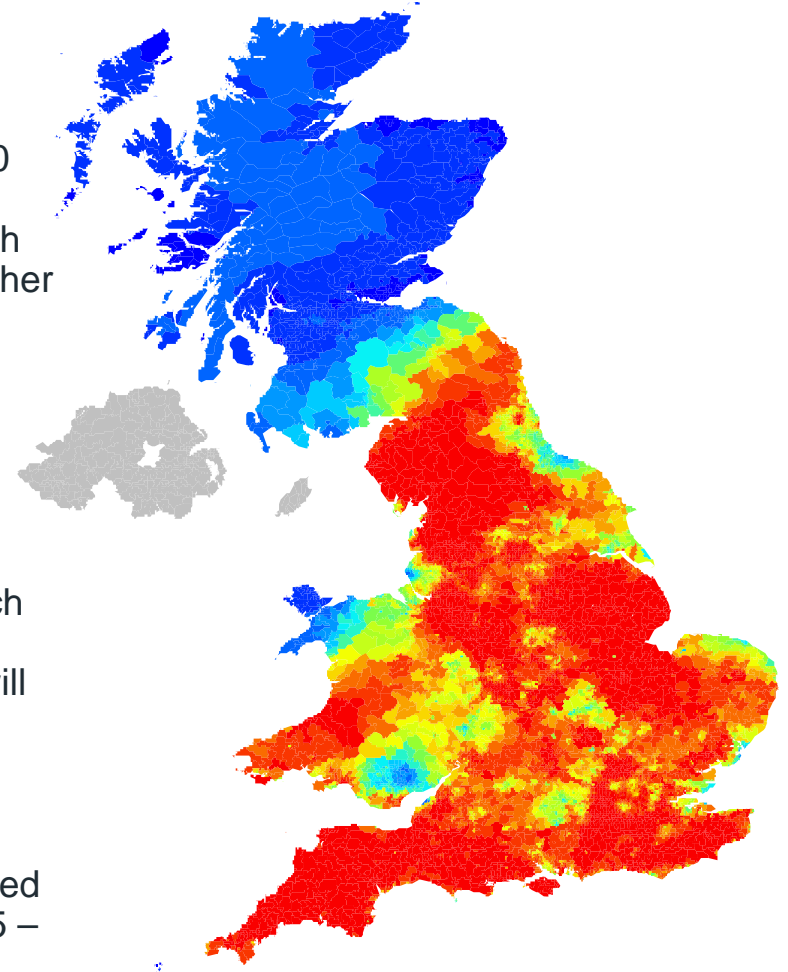
Comment

Accidents involving policy reported injury per 1000 population shows unexpected pattern, with rural areas showing higher ratios.

Presume that this is due to population being an inappropriate denominator.

Tourism hotspots, such as the Lakes, South Coast and Cornwall will have disproportionate levels of traffic to population.

Frequency has reduced significantly over 2005 – 2011.

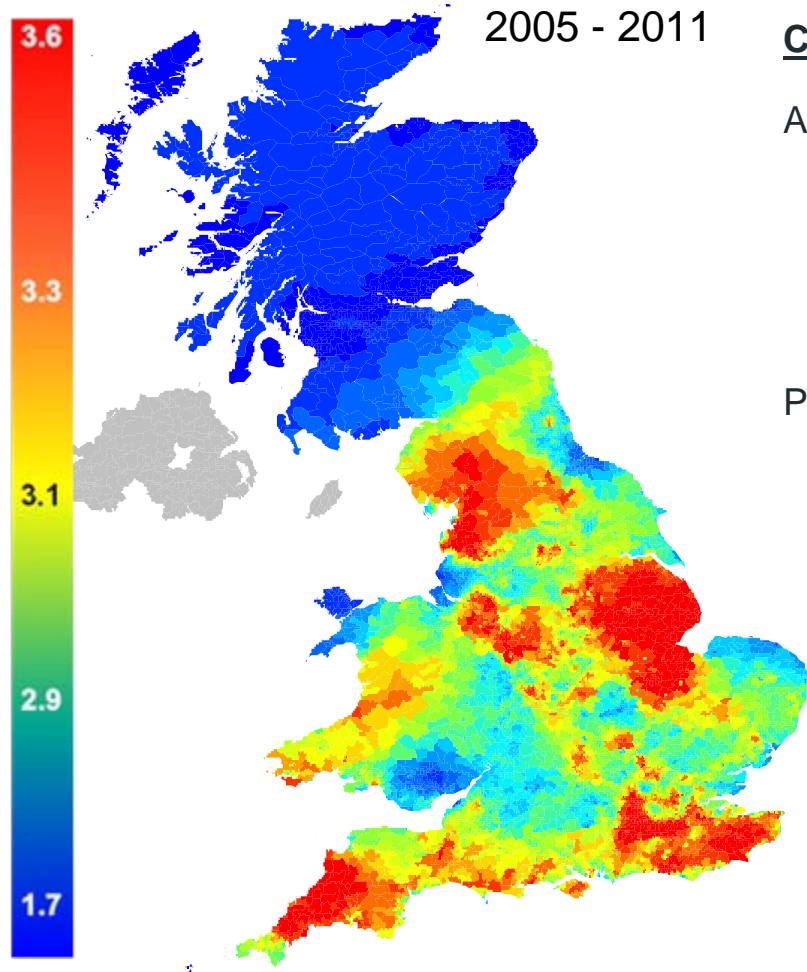


Geographic analysis

“Accidents” per 1000 popn

STATS19

2005 **2006** 2007 2008 2009 2010 2011



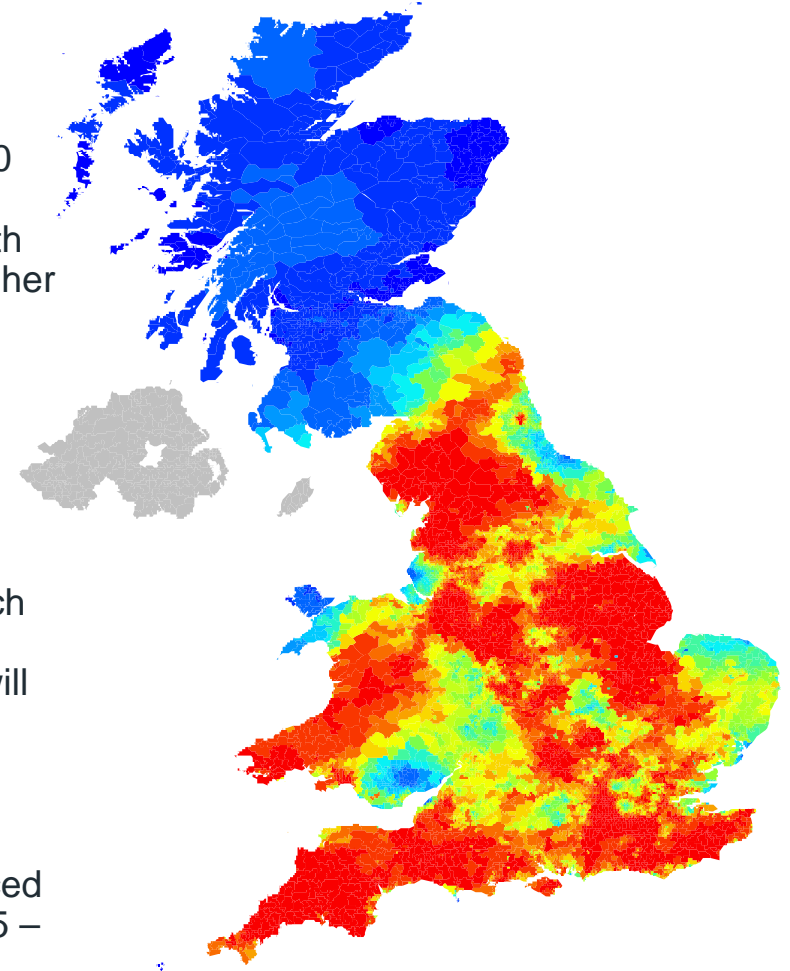
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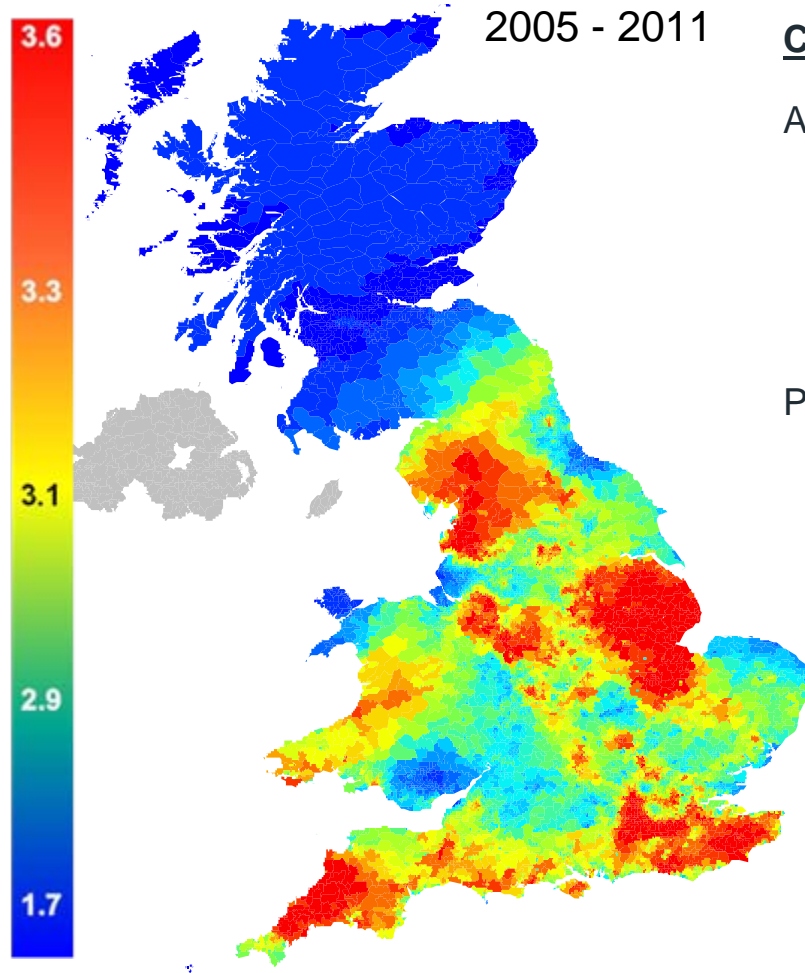


Geographic analysis

“Accidents” per 1000 popn

STATS19

2005 2006 2007 2008 2009 2010 2011



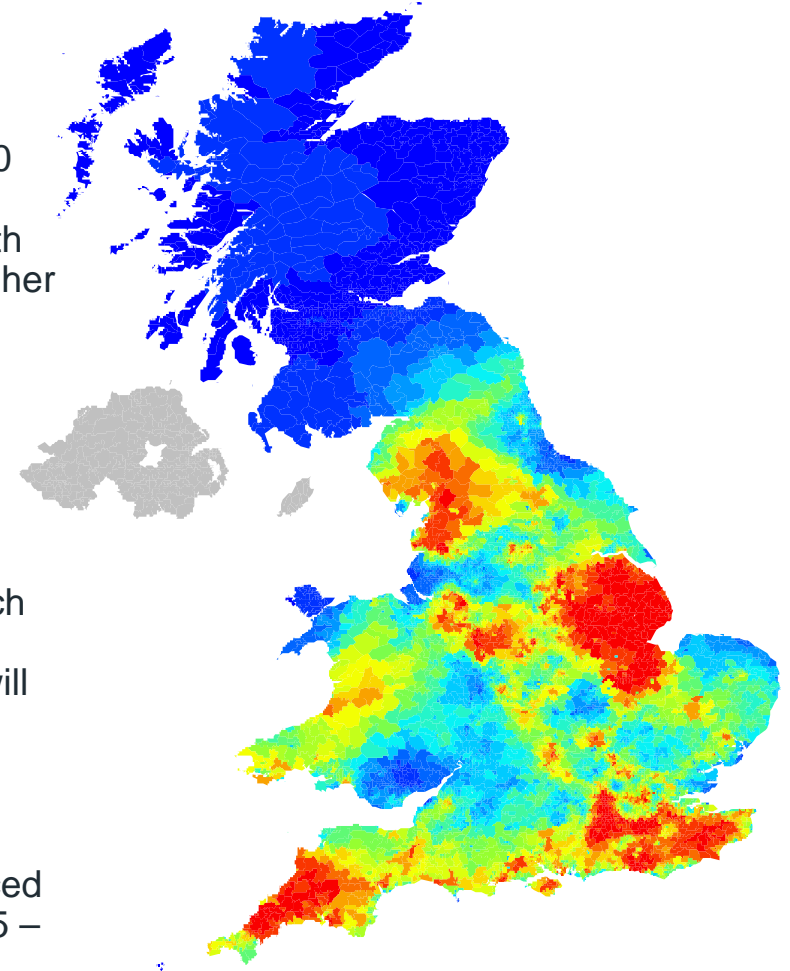
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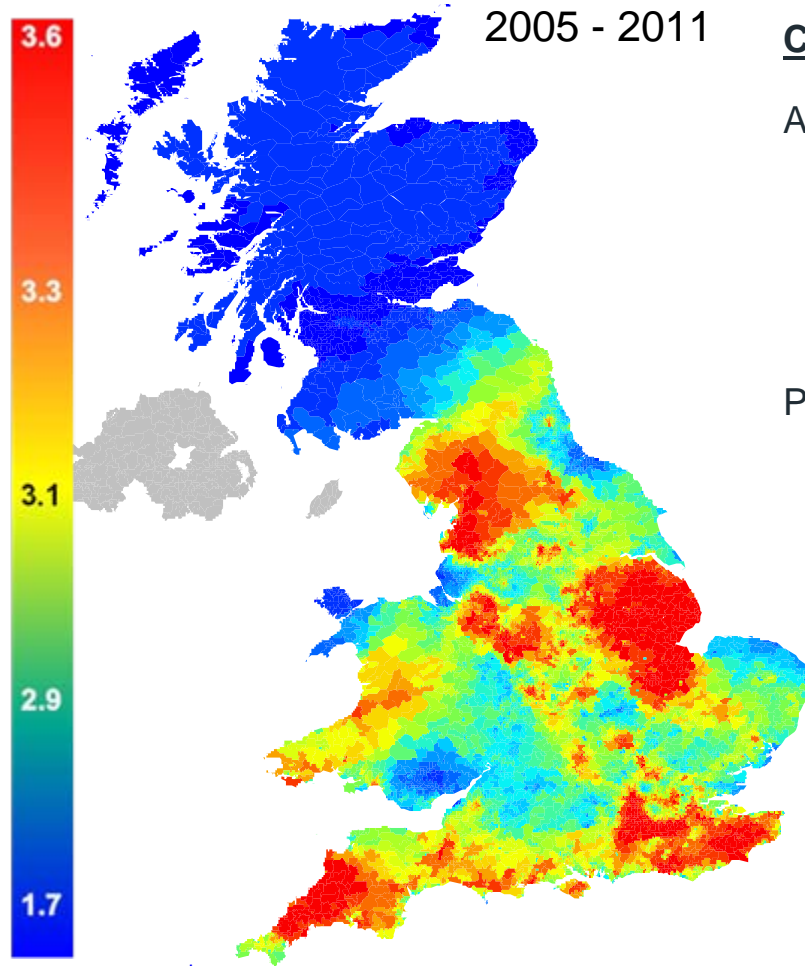


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STATS19

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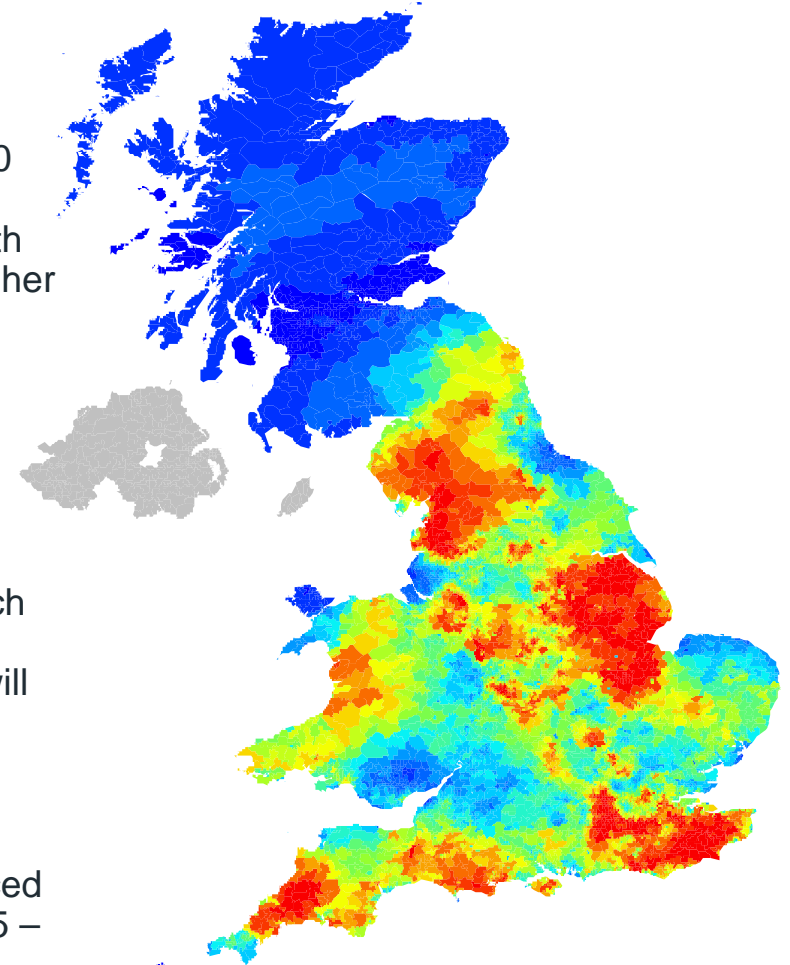
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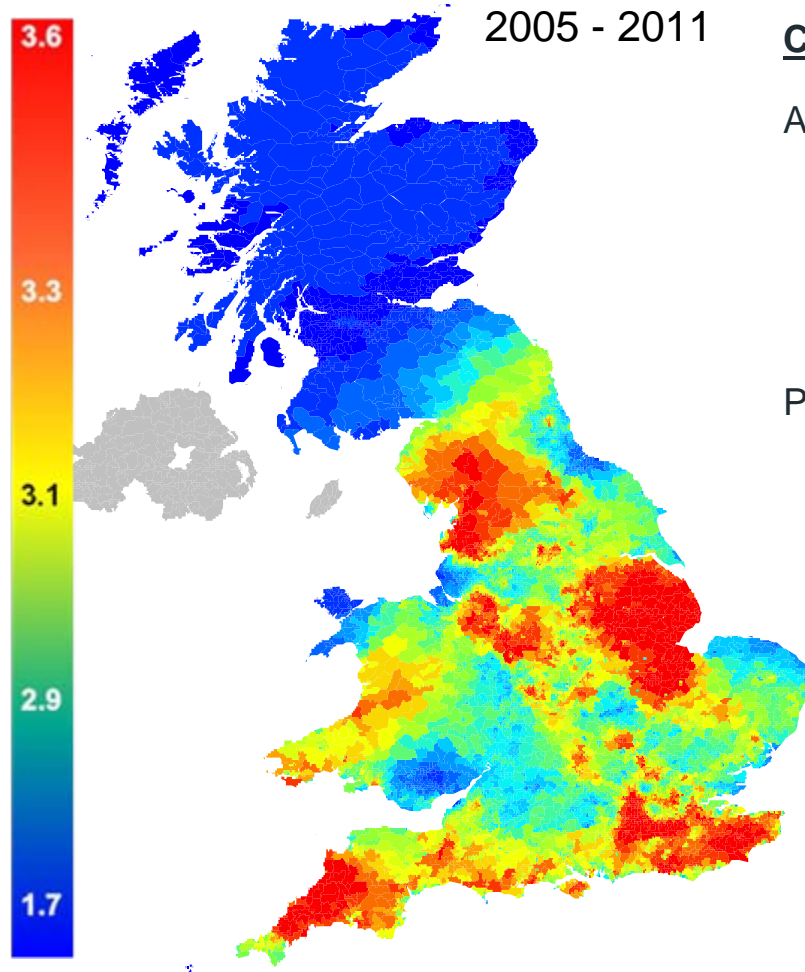


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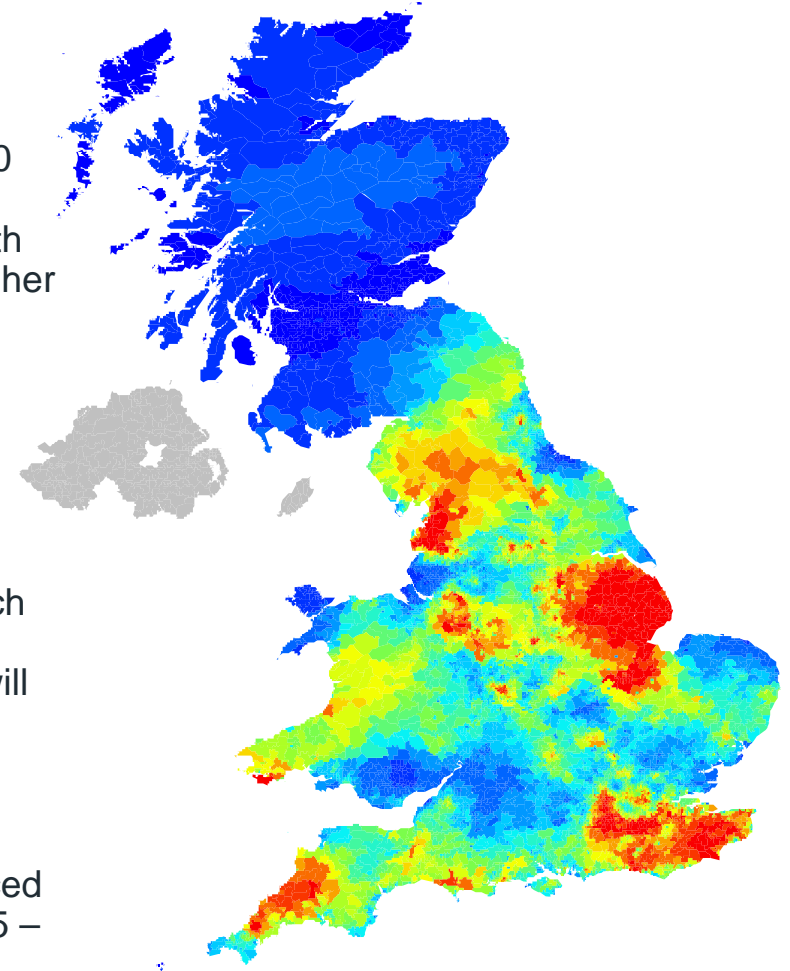
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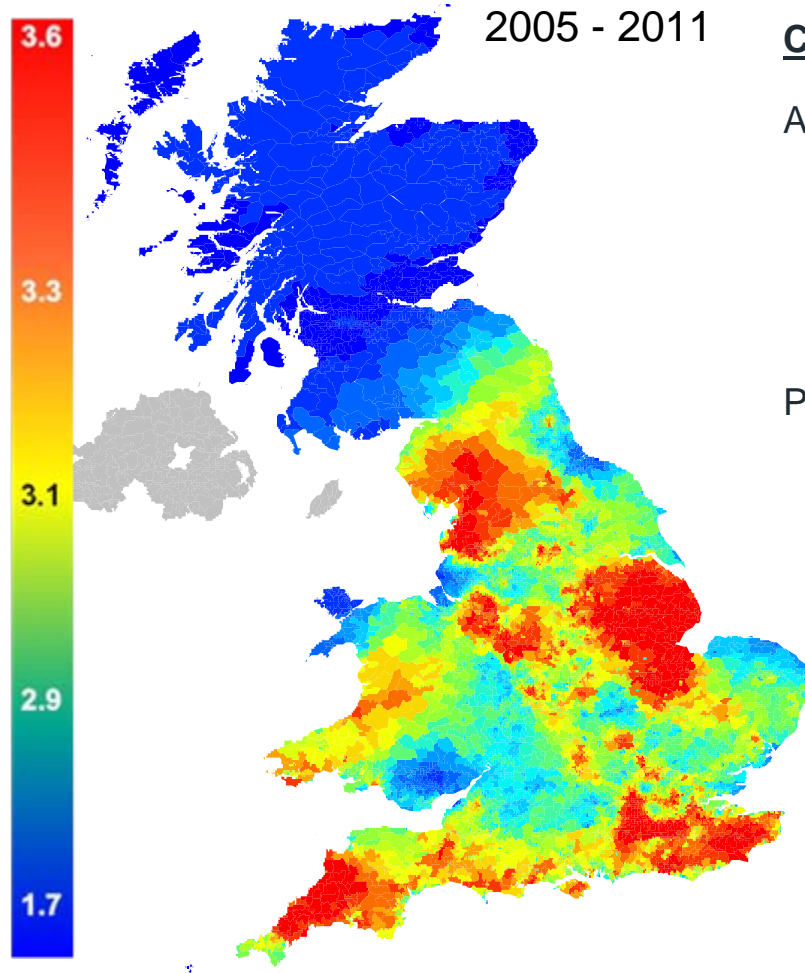


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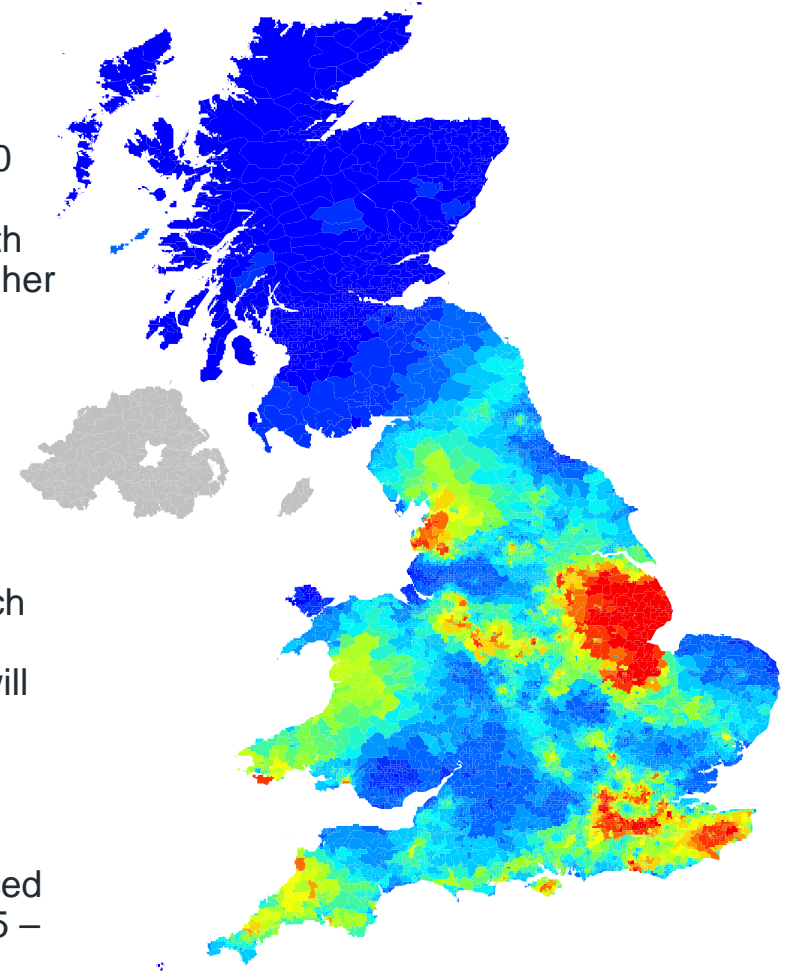
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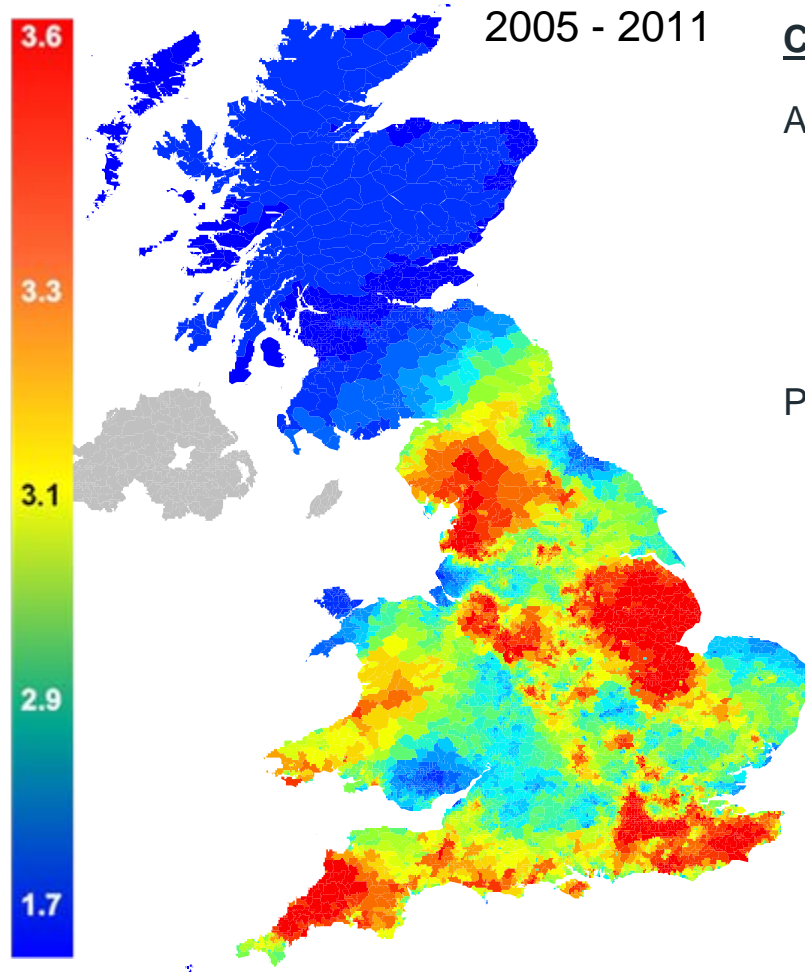


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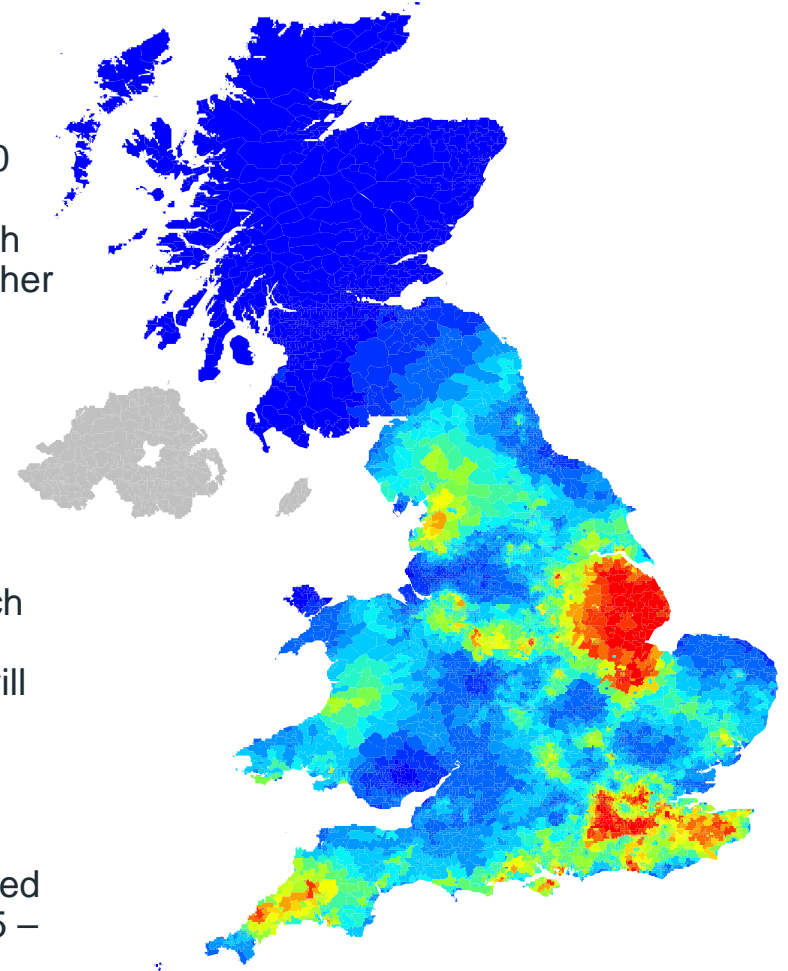
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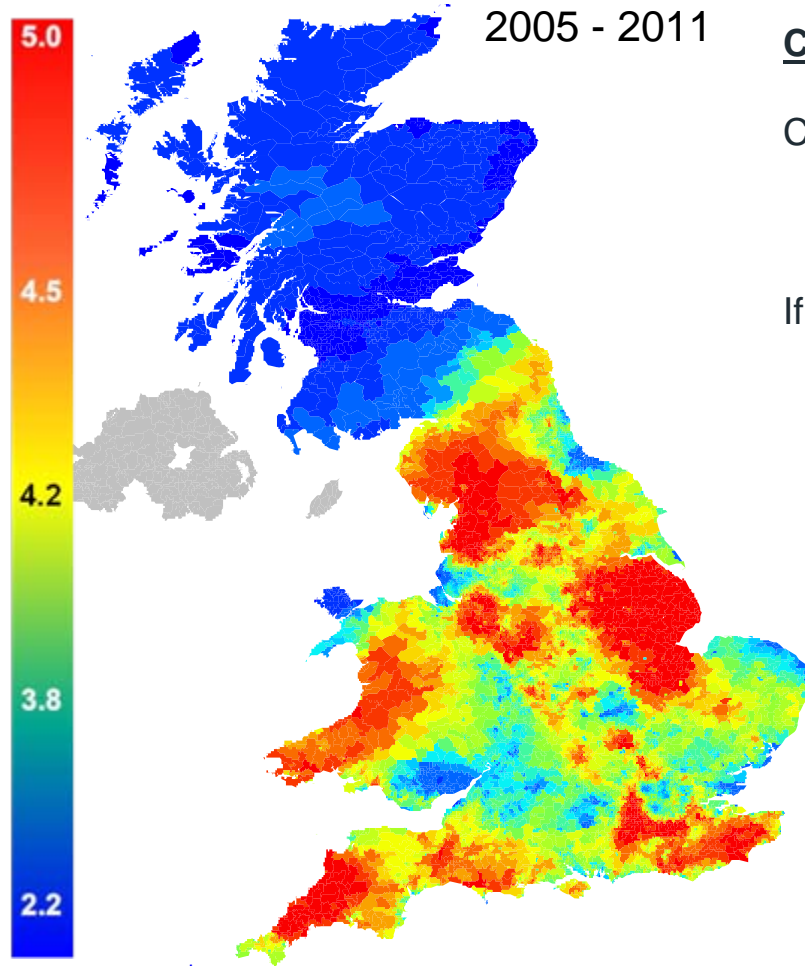


Geographic analysis

Casualties per 1000 popn

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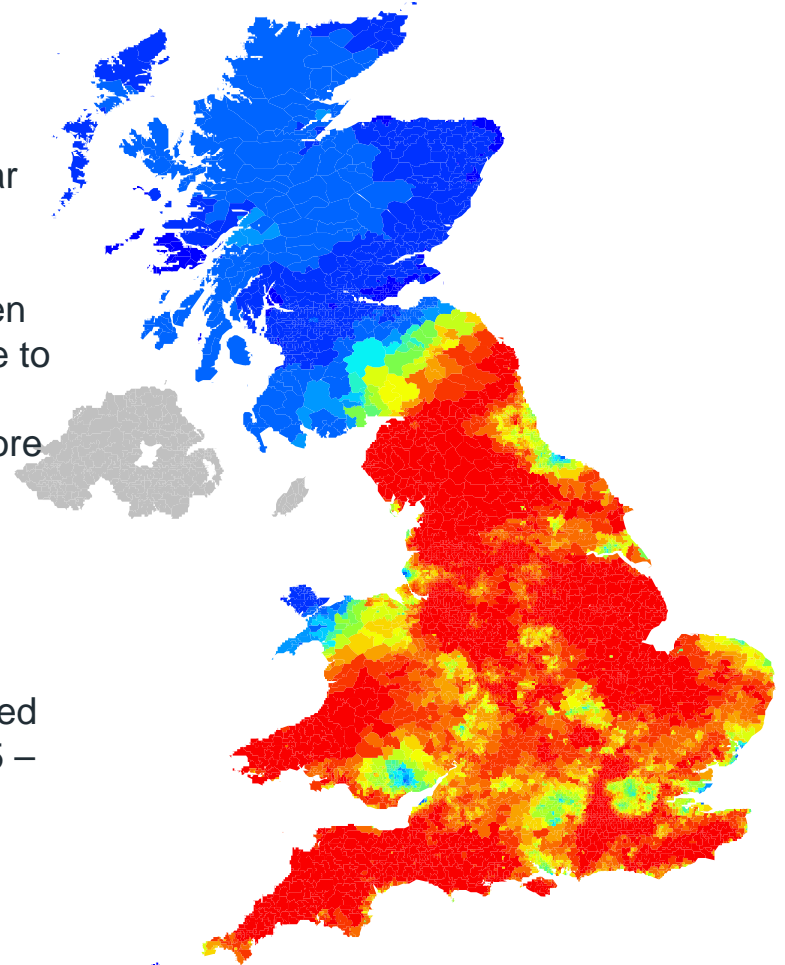


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Casualties per 1000 population shows similar pattern to accidents.

If anything rural effect is even stronger potentially due to more passengers per vehicle giving rise to more casualties.

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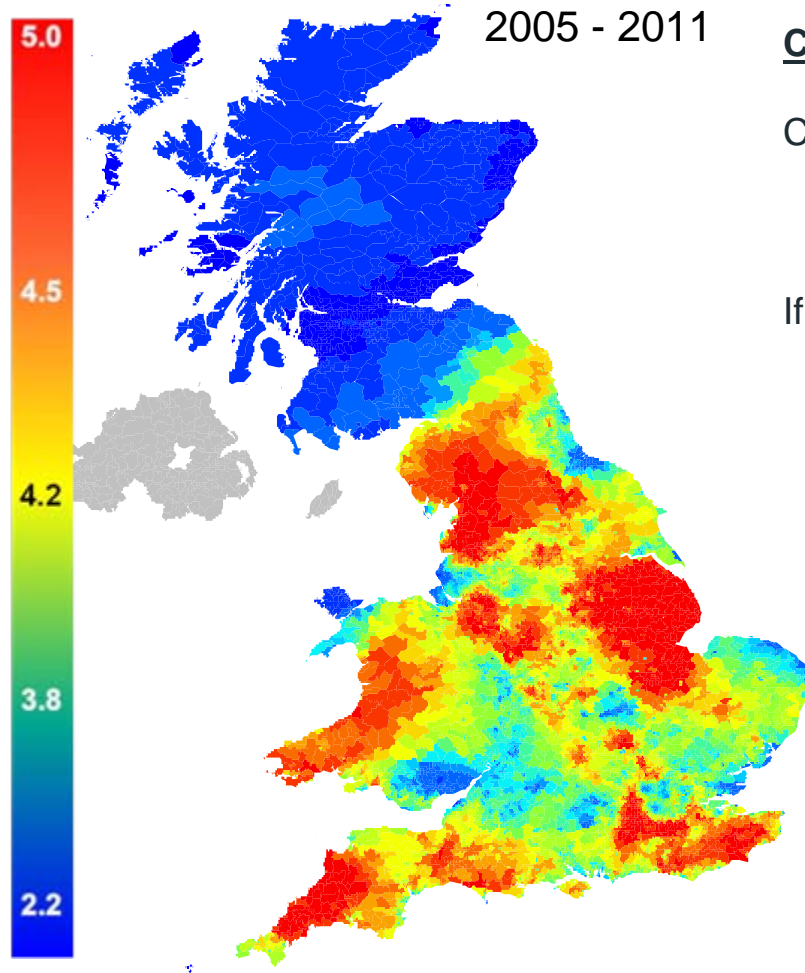


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Casualties per 1000 popn

STATS19

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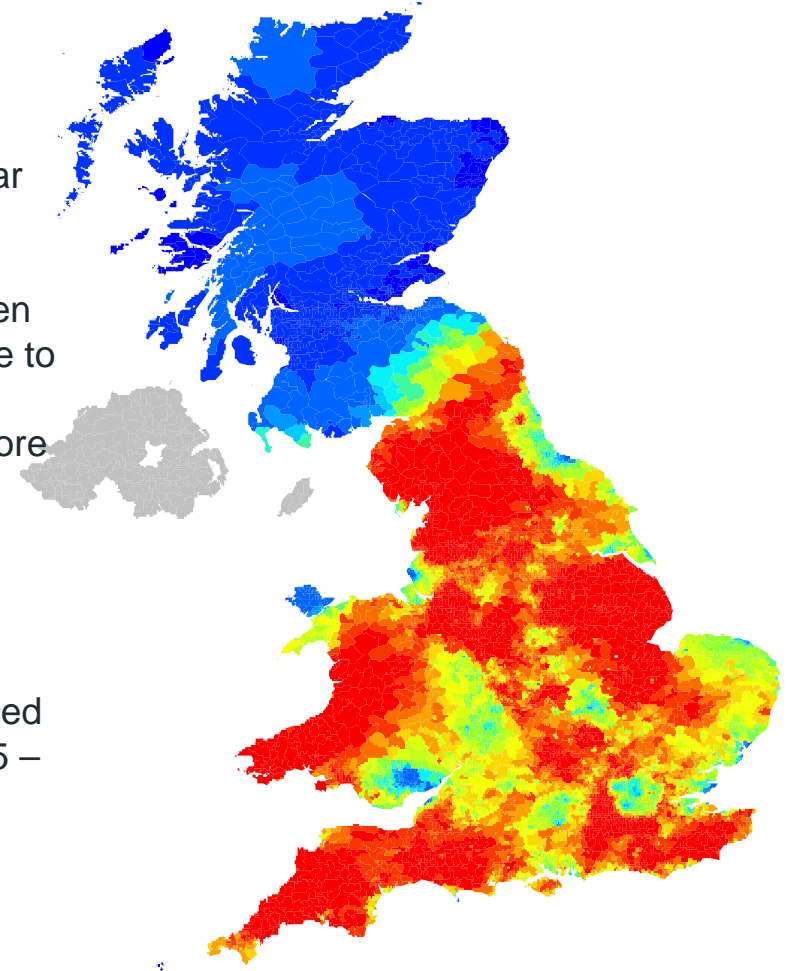


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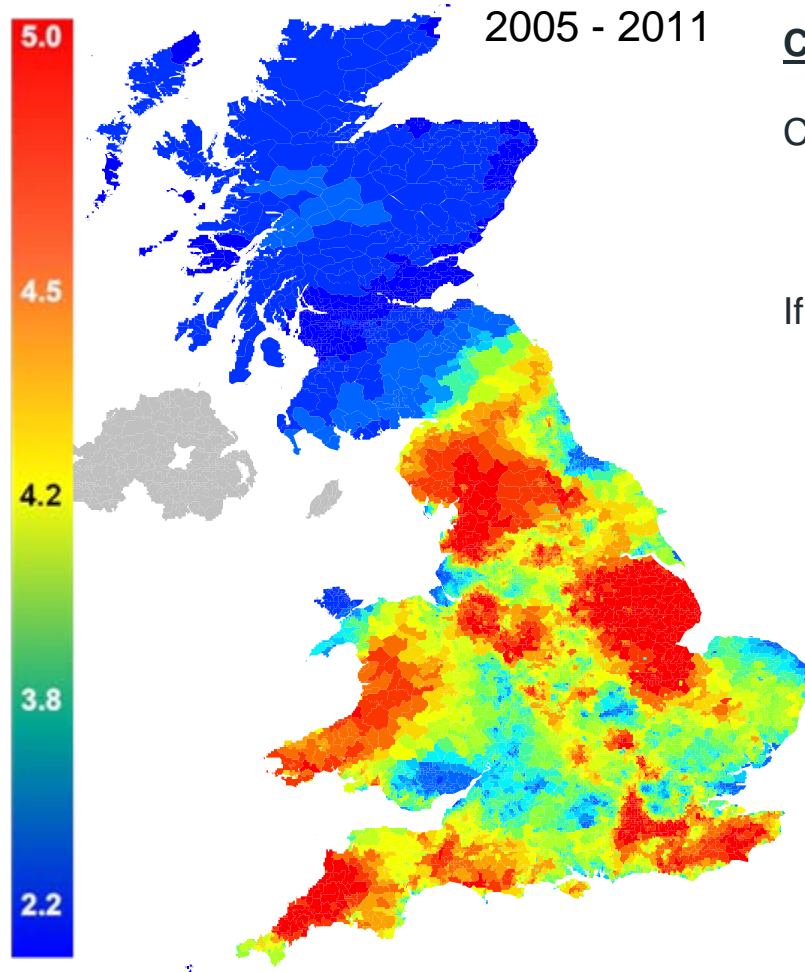


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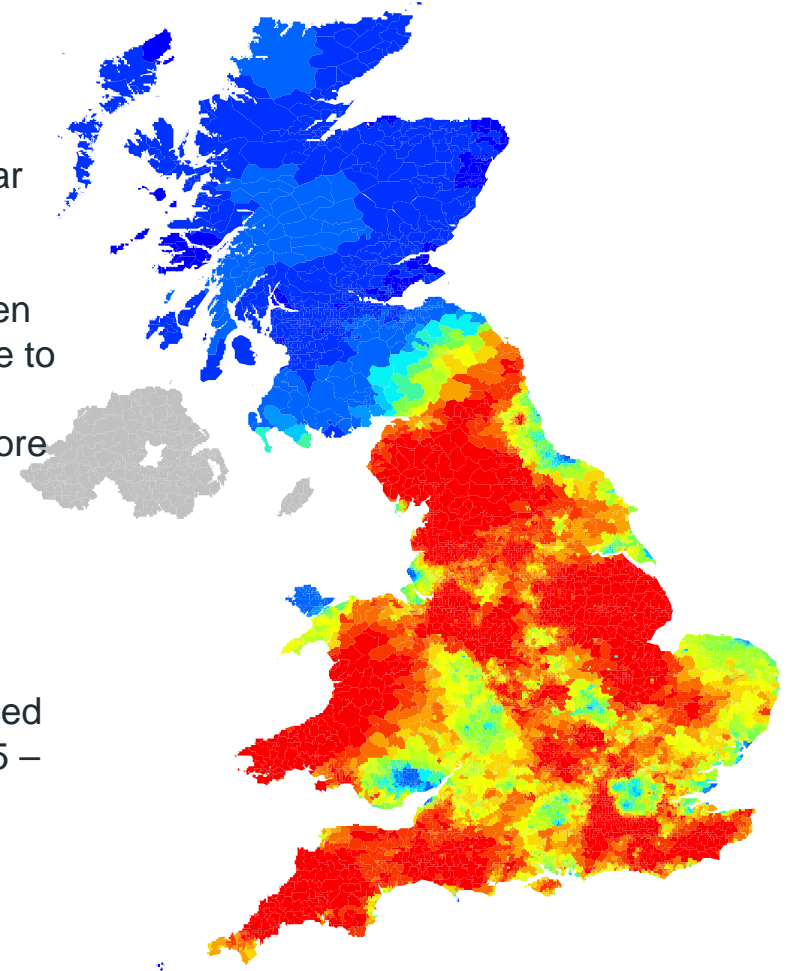


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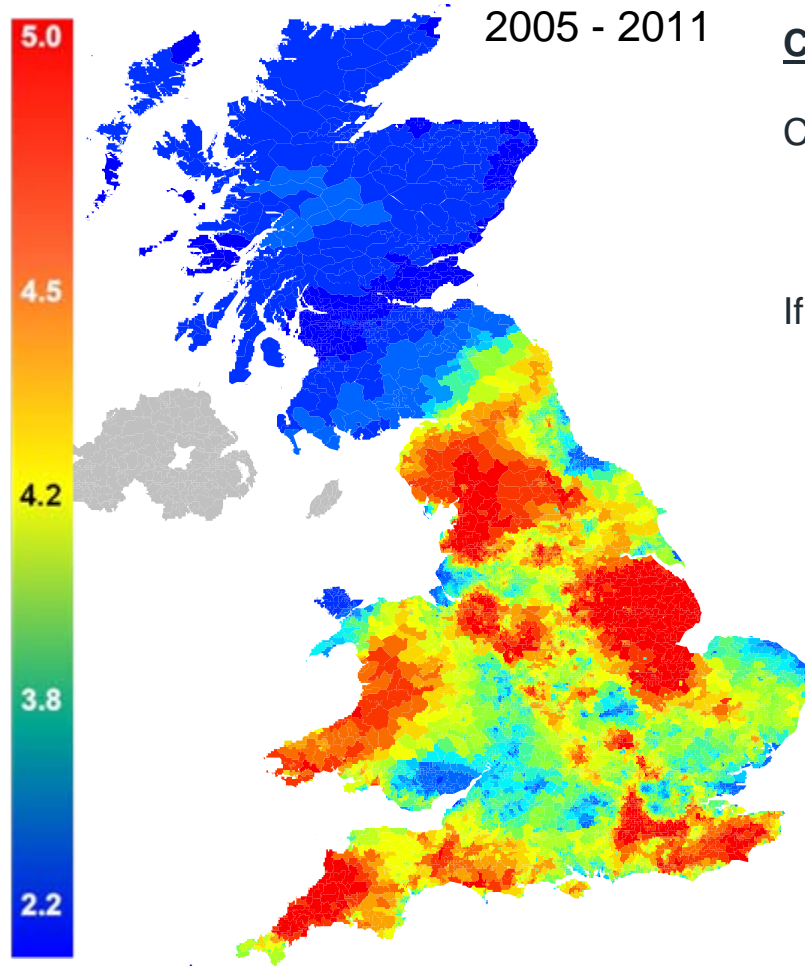


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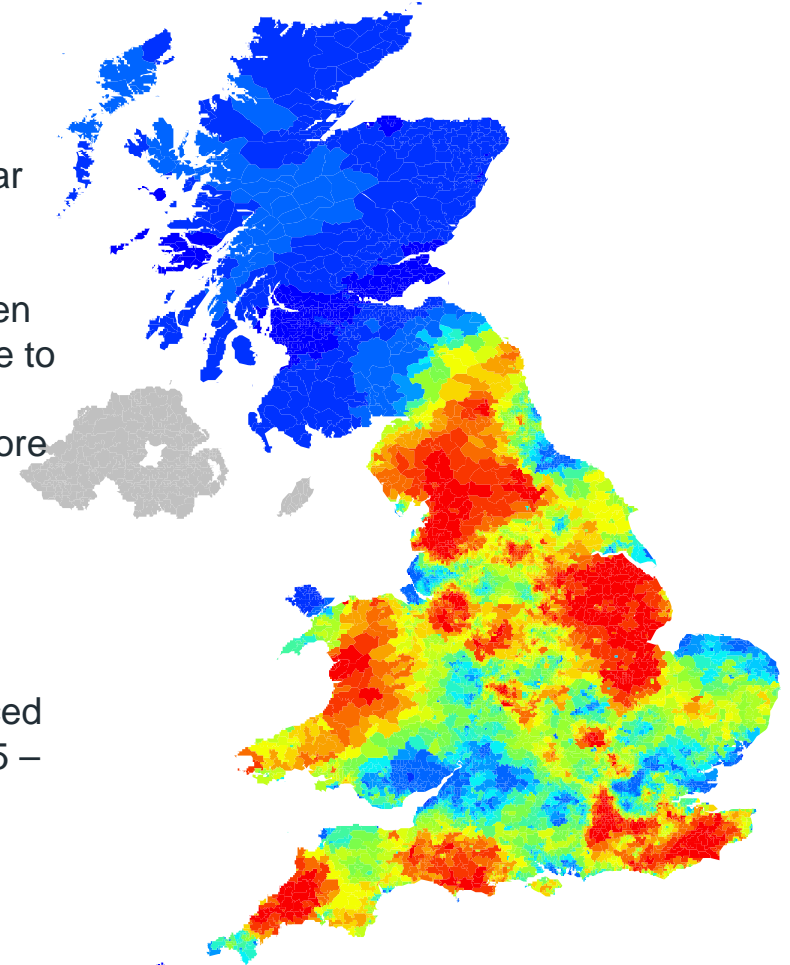


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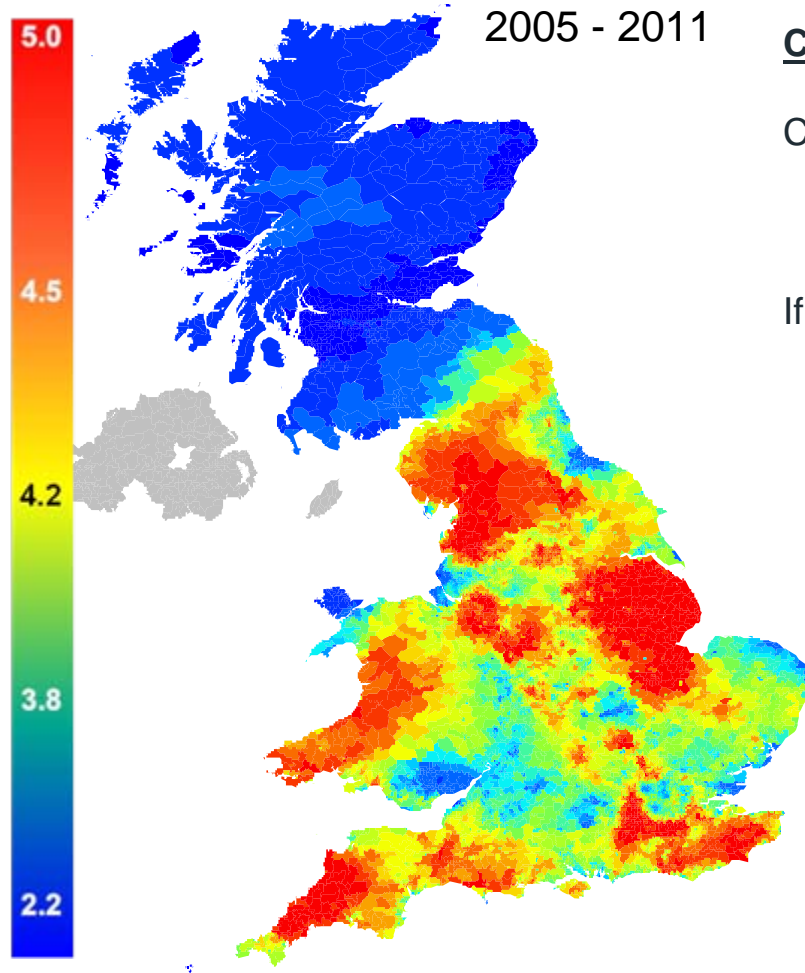


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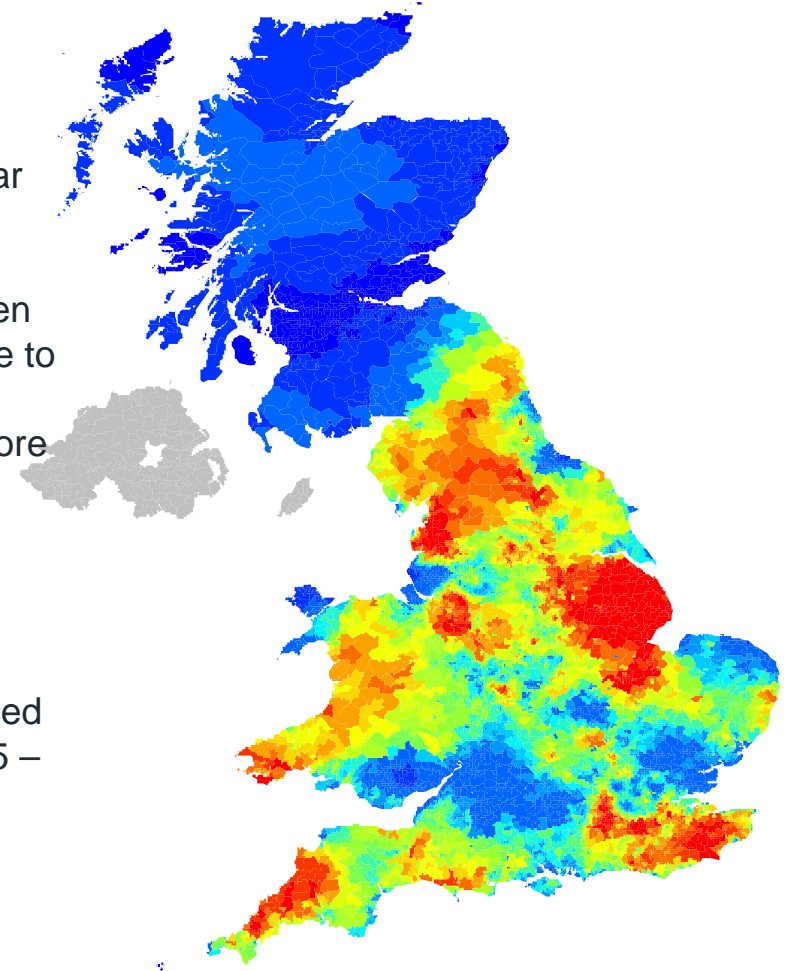


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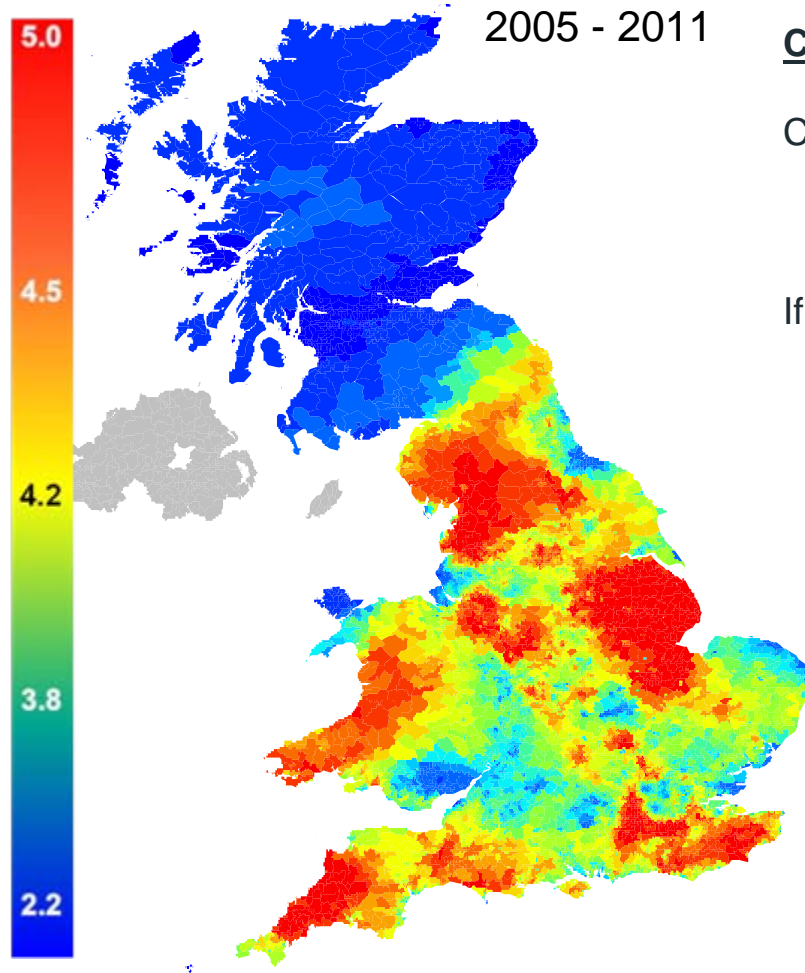


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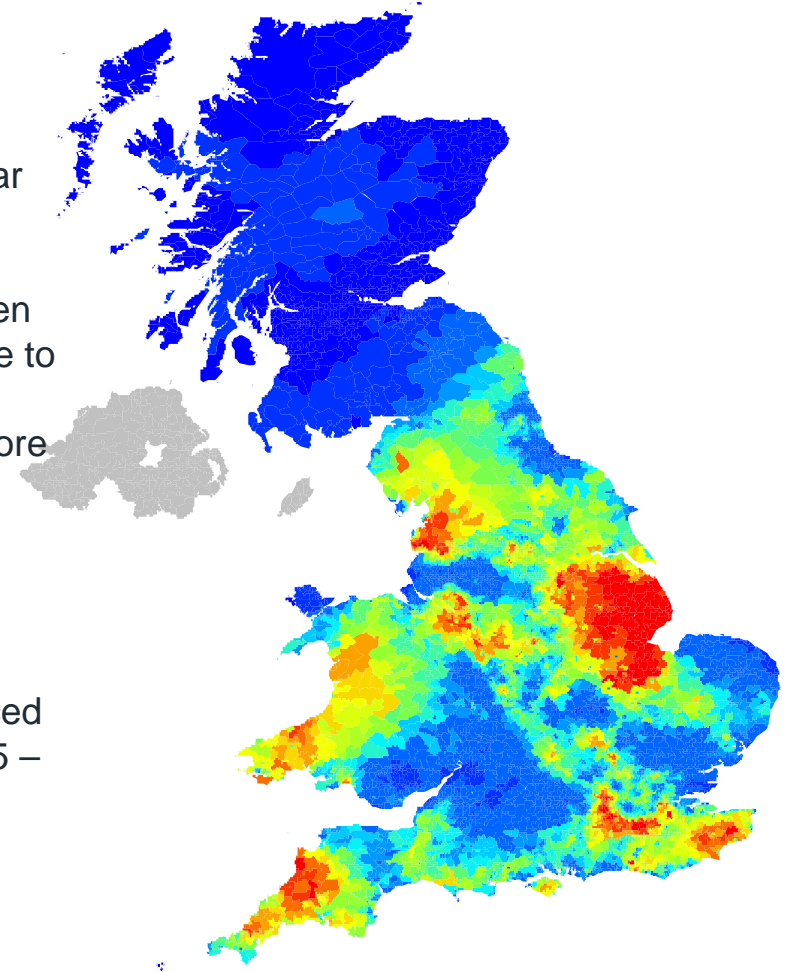


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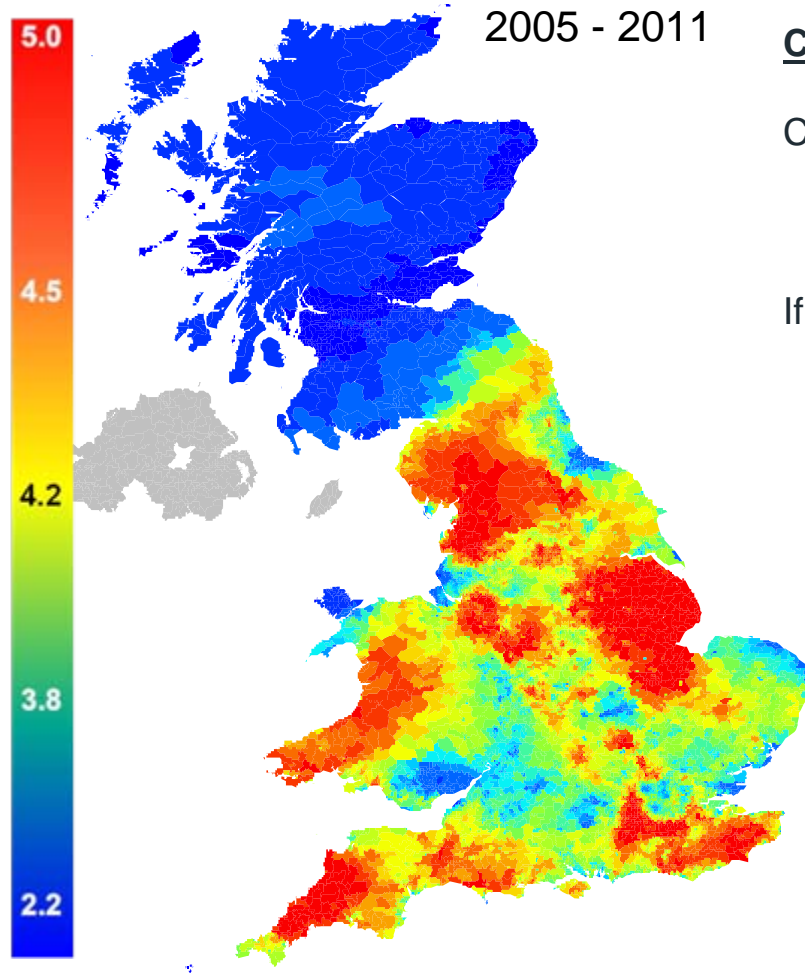


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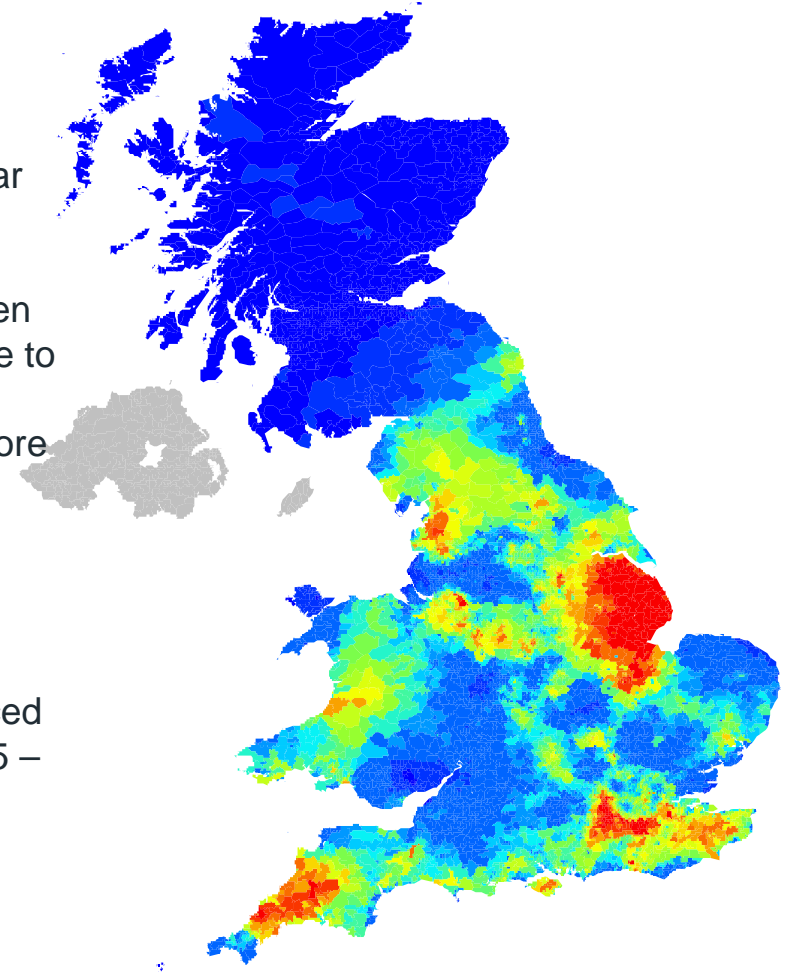


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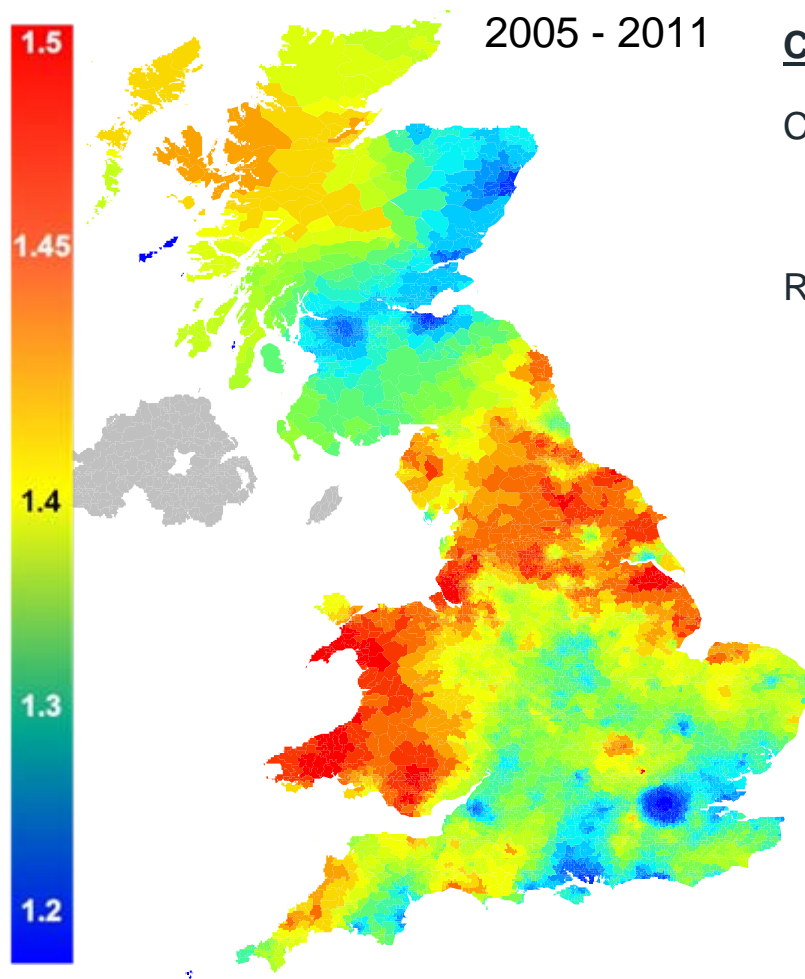


Geographic analysis

Casualties per “Accident”

STATS19

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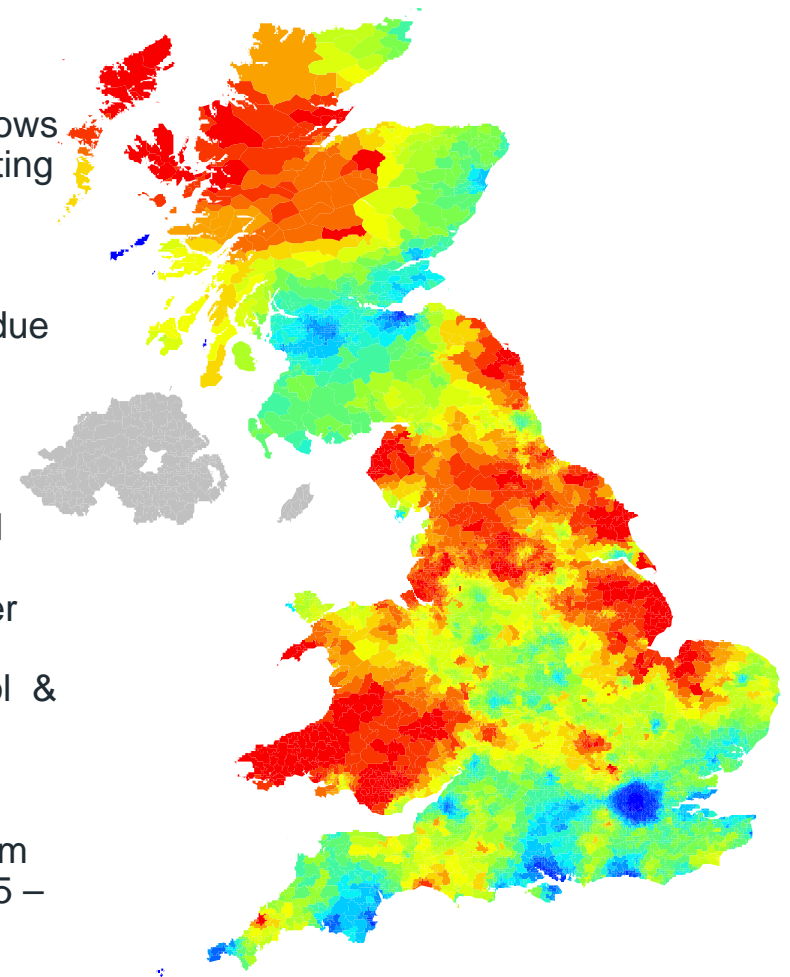
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Casualties per accident shows some stark and interesting contrasts.

Rural areas generally show higher ratios, possibly due to higher speeds and greater vehicle occupancy.

London, Glasgow and Edinburgh show very low ratios but not other large cities such as Birmingham, Liverpool & Manchester

Ratio has reduced from 1.37 to 1.35 over 2005 – 2011.

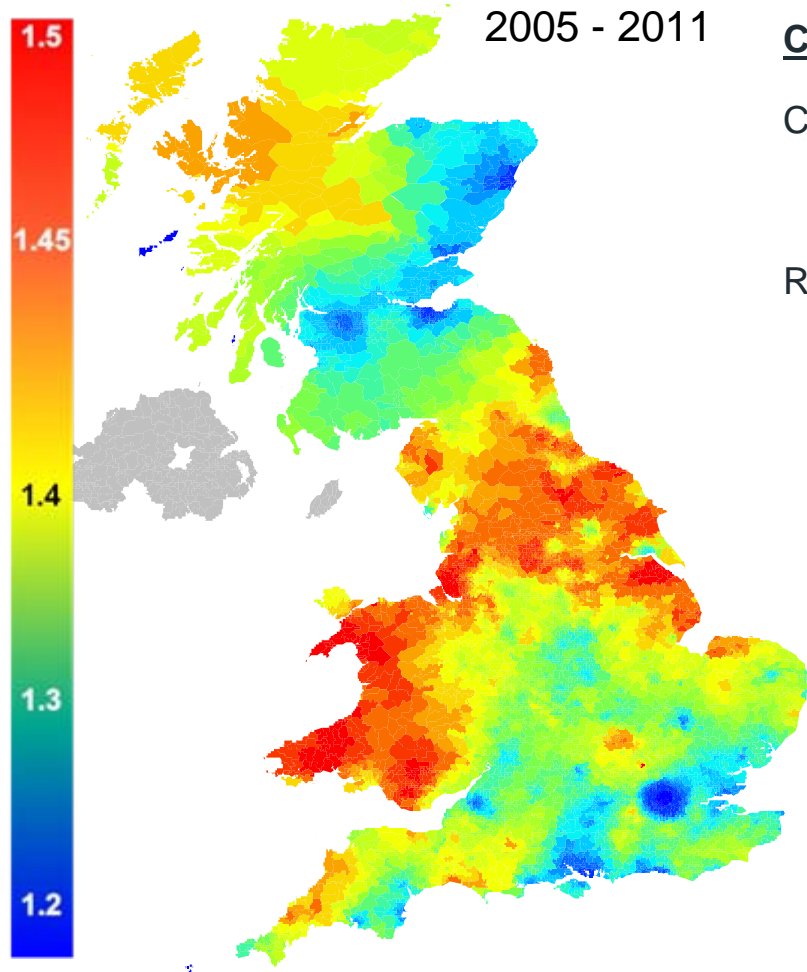


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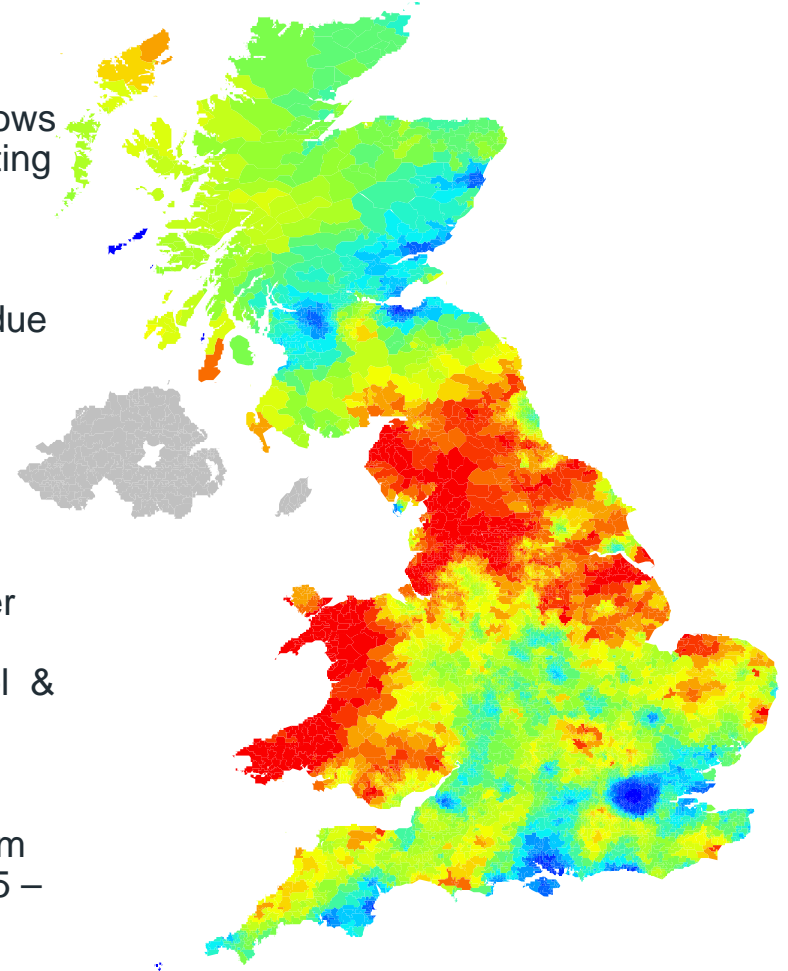
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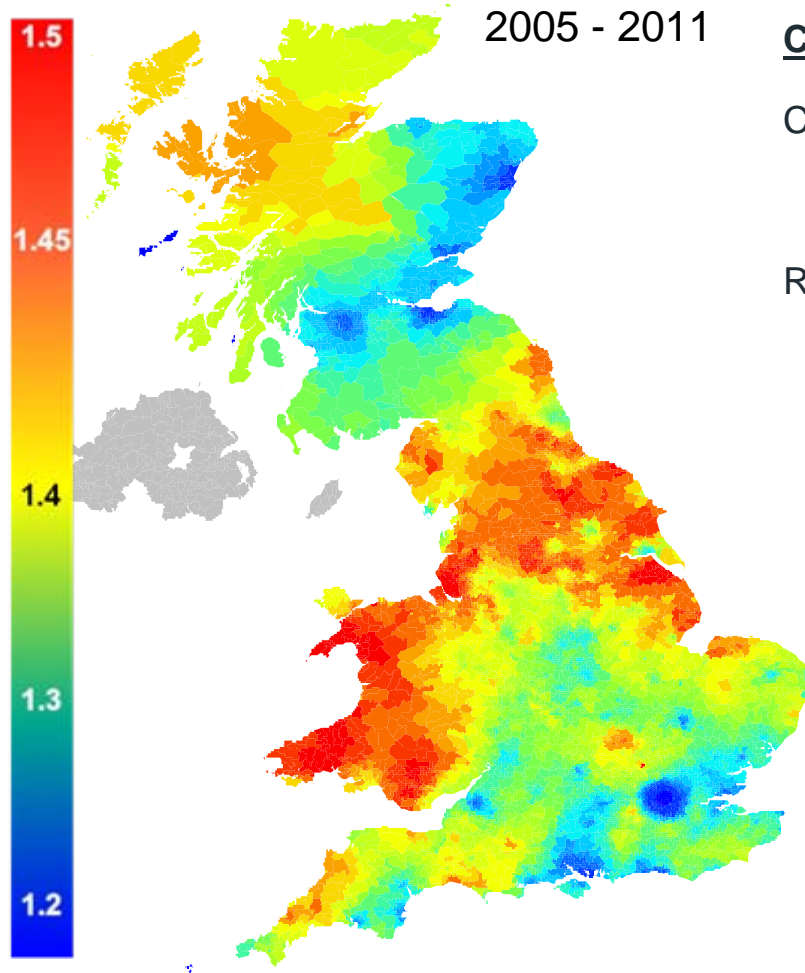


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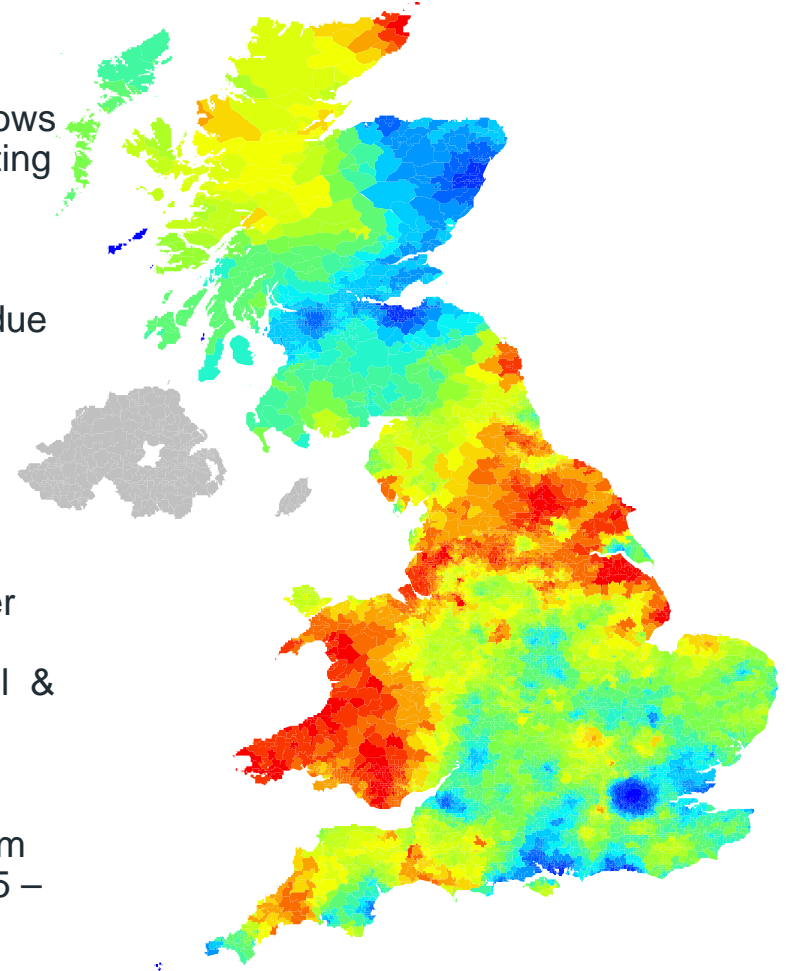
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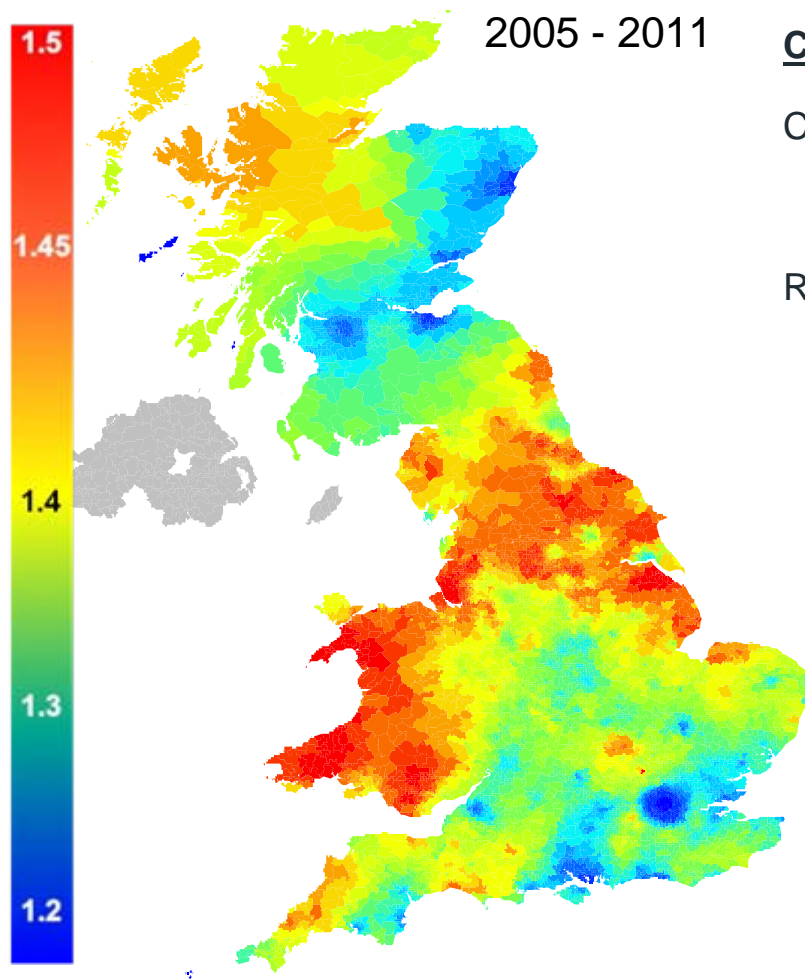


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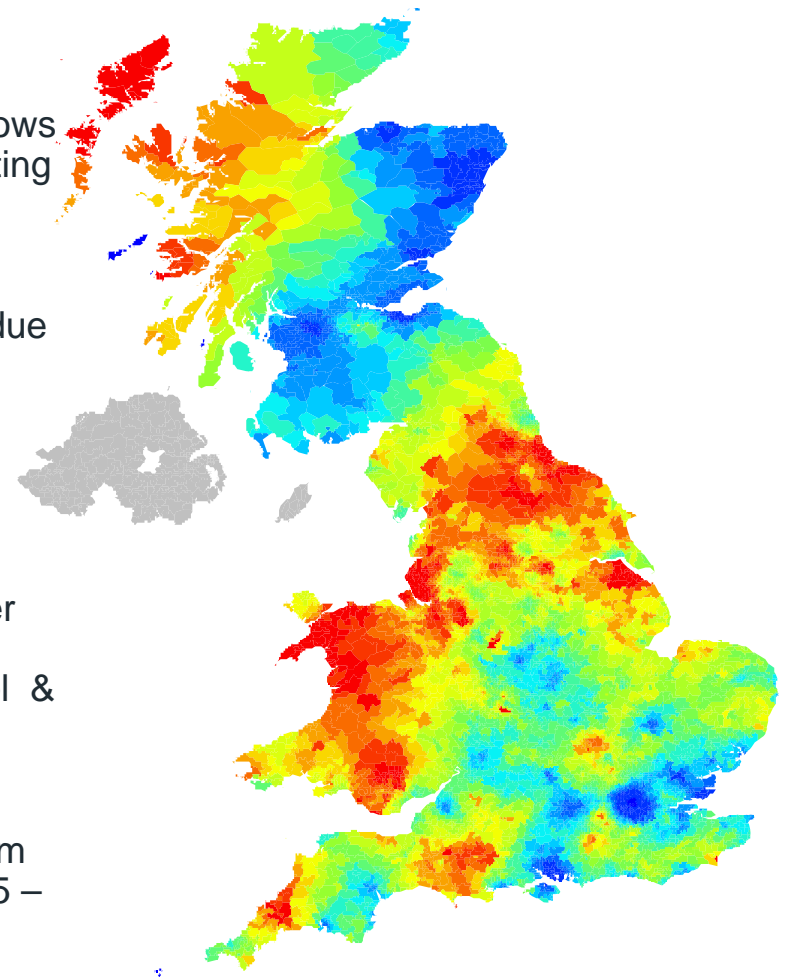
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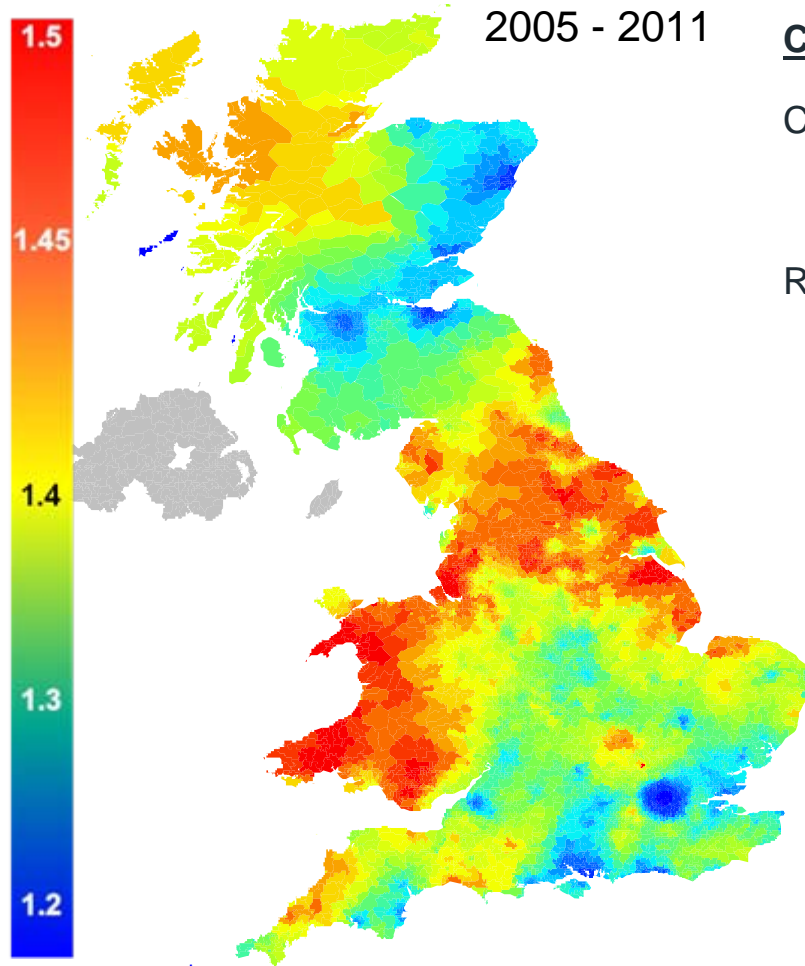


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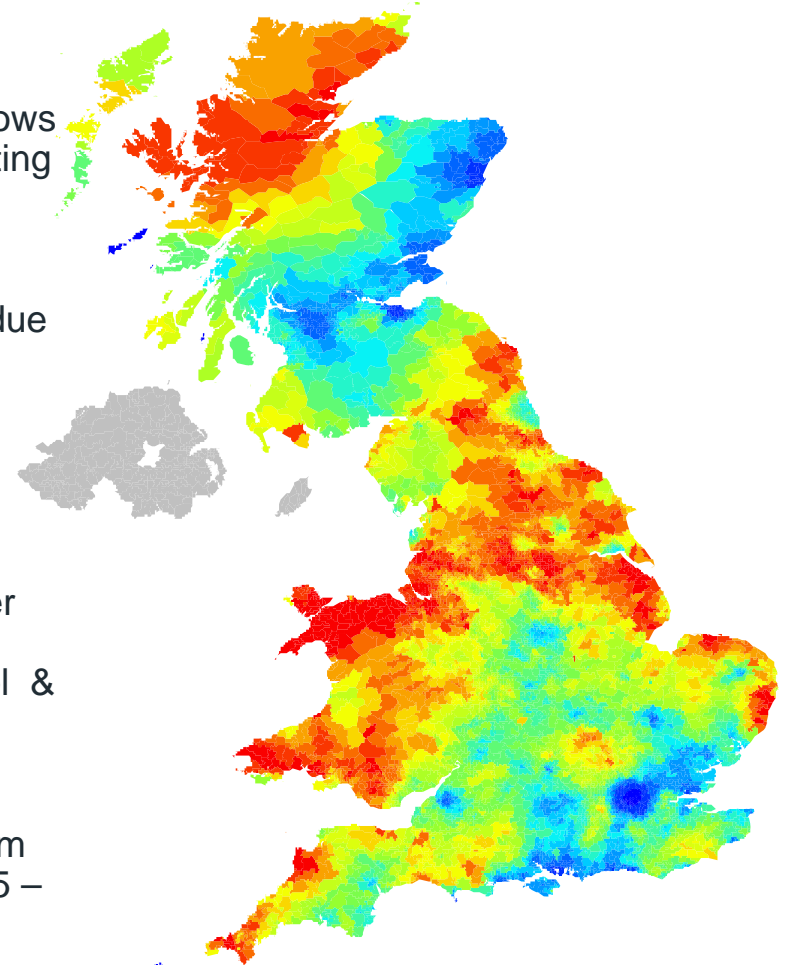
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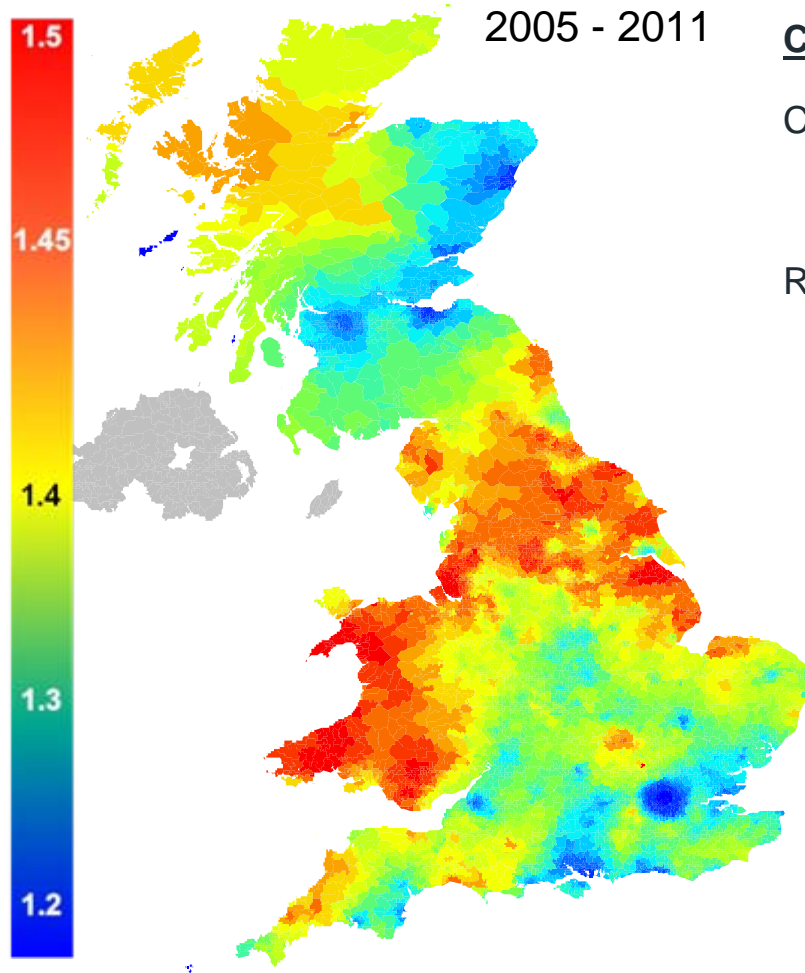


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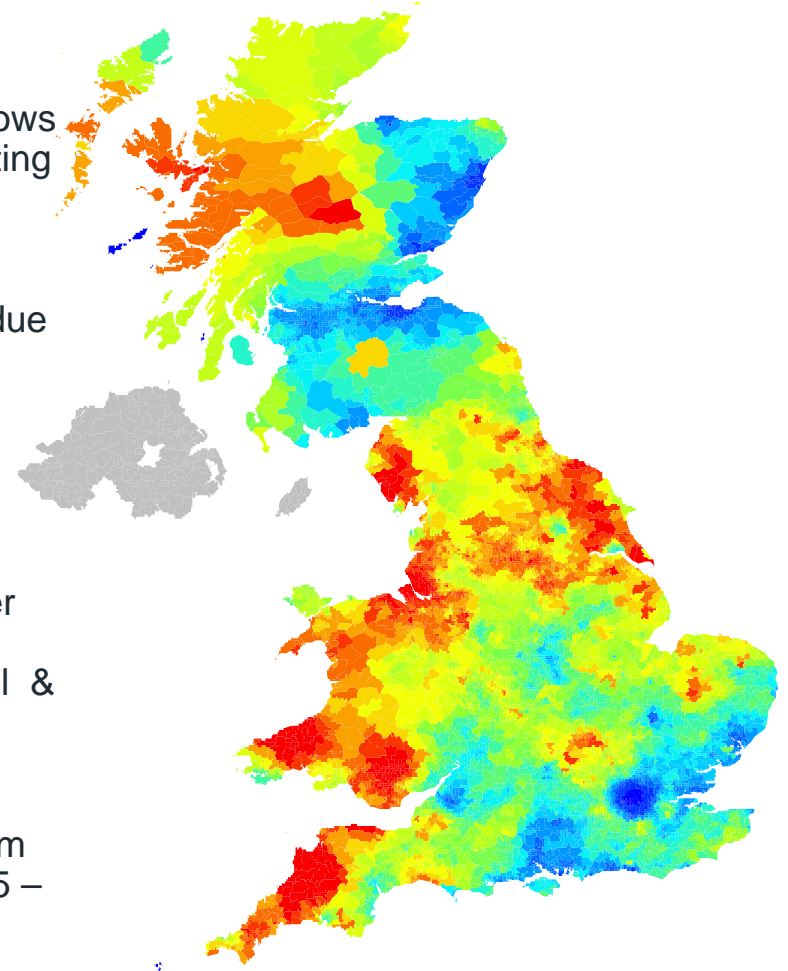
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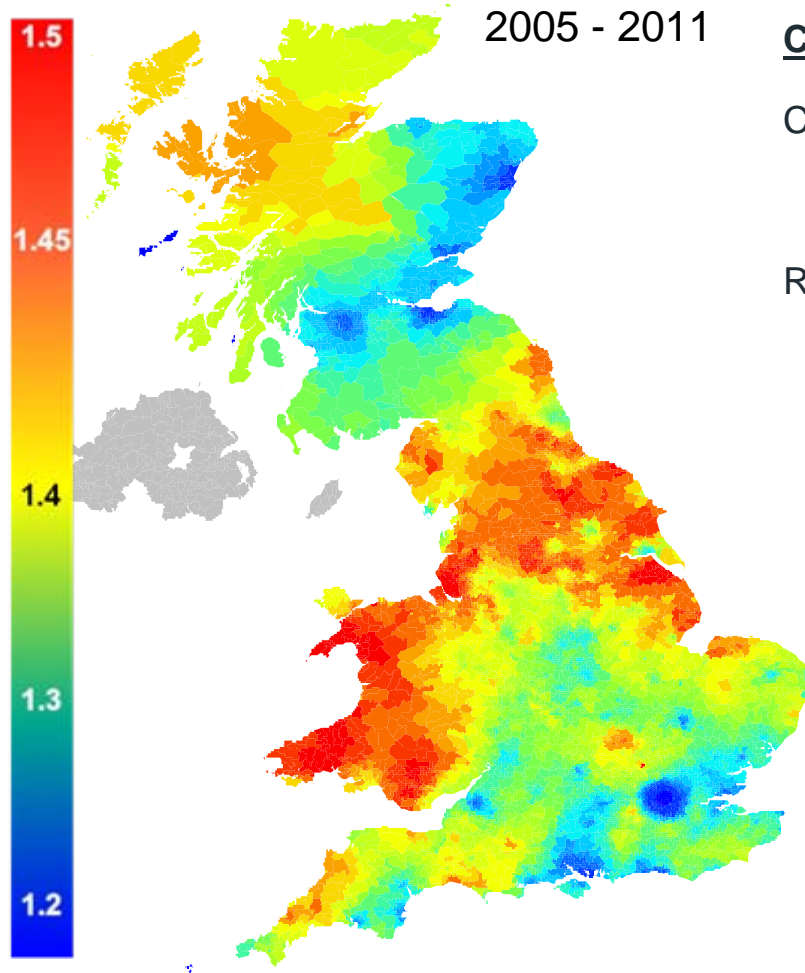


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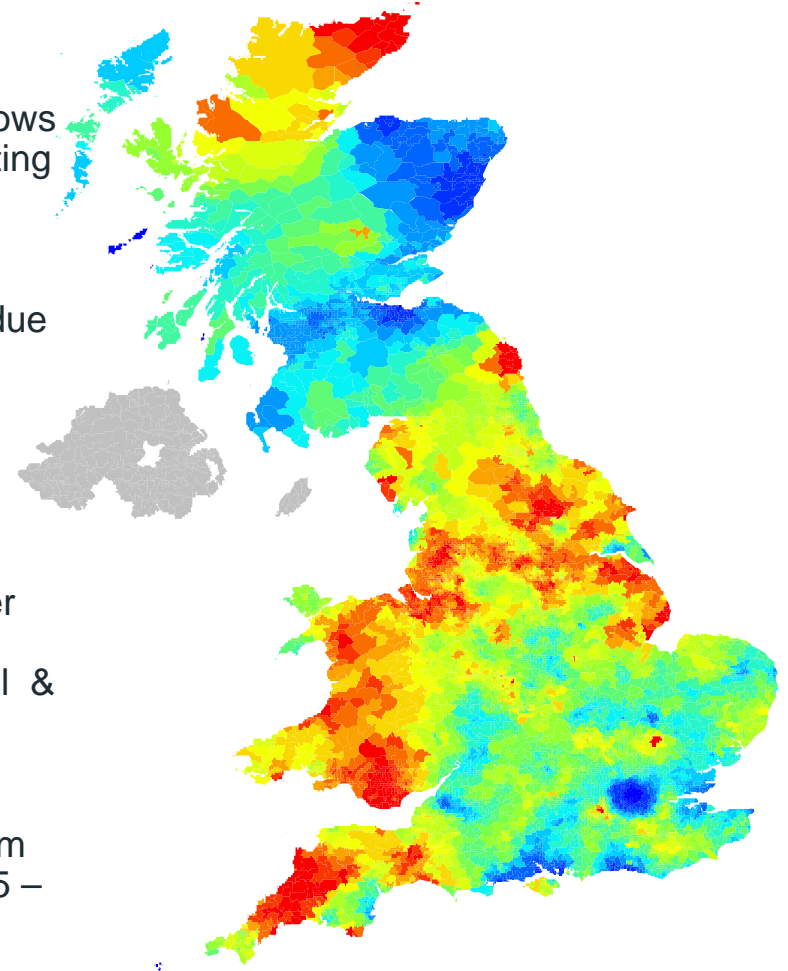
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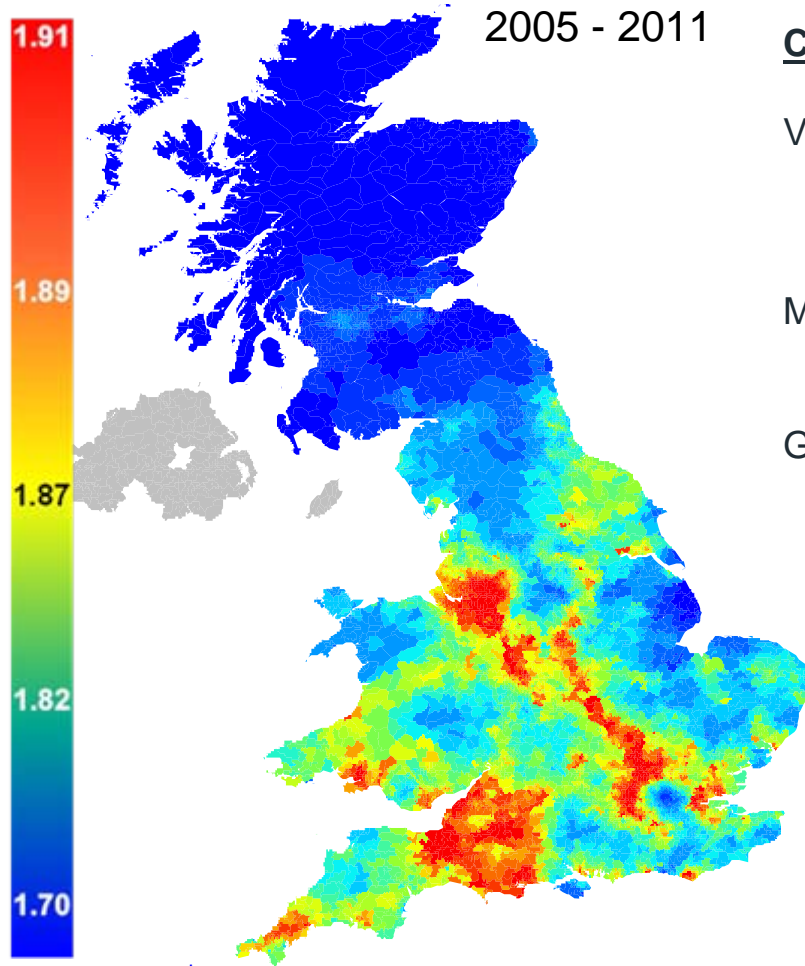


Geographic analysis

Vehicles per Accident

STATS19

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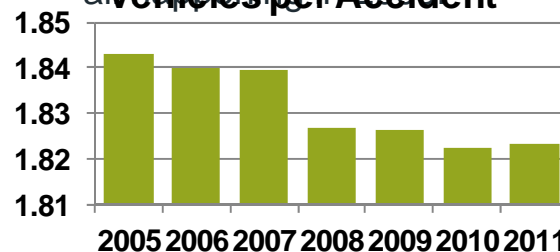
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Vehicles per accident appears to follow major road network?

M25 and M1 effect can clearly be seen.

Greater London appears as an island of better experience.

Ratio has reduced from 1.84 to 1.82 over 2005 – 2011, with the decrease all vehicles in 2008

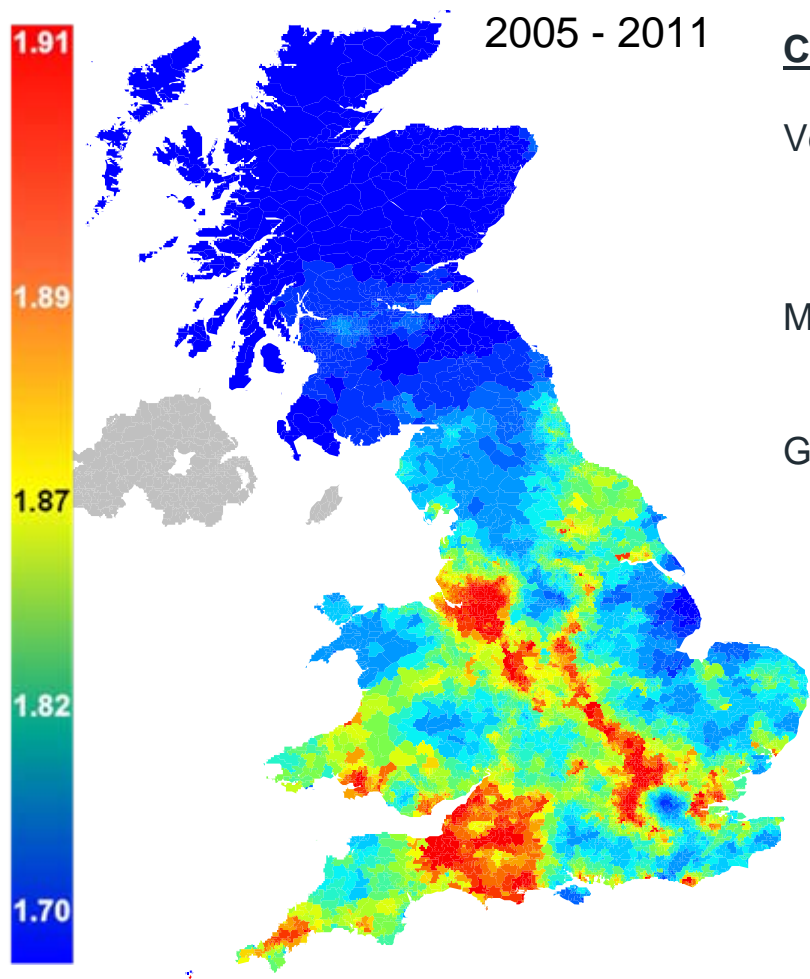


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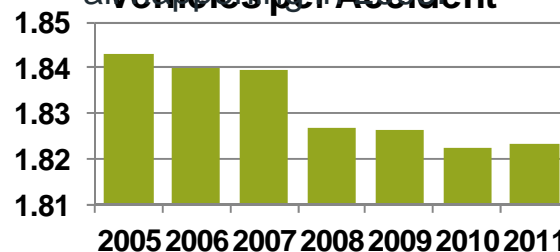
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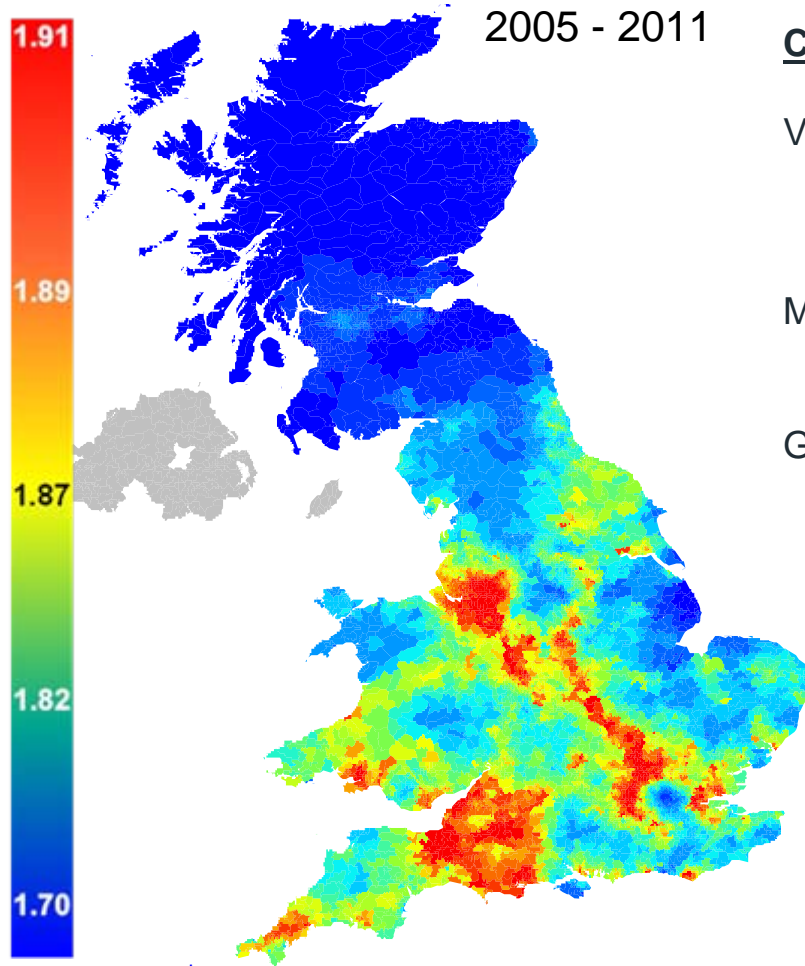


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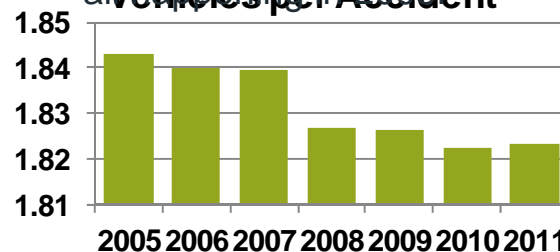
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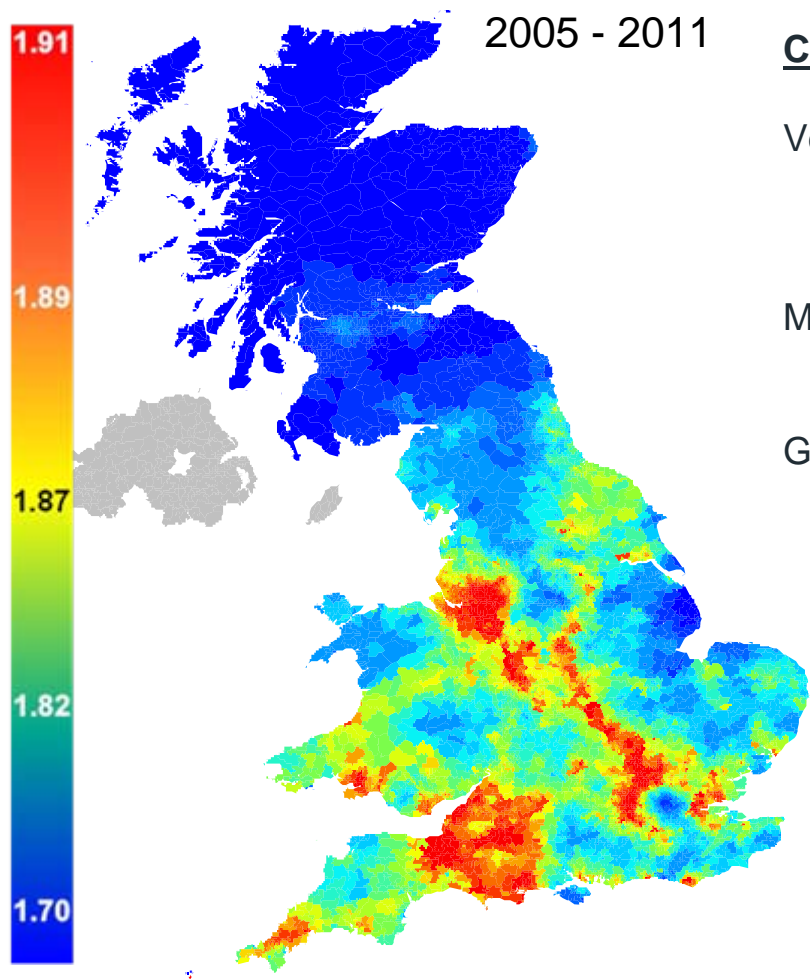


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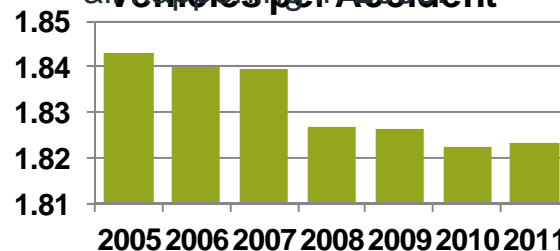
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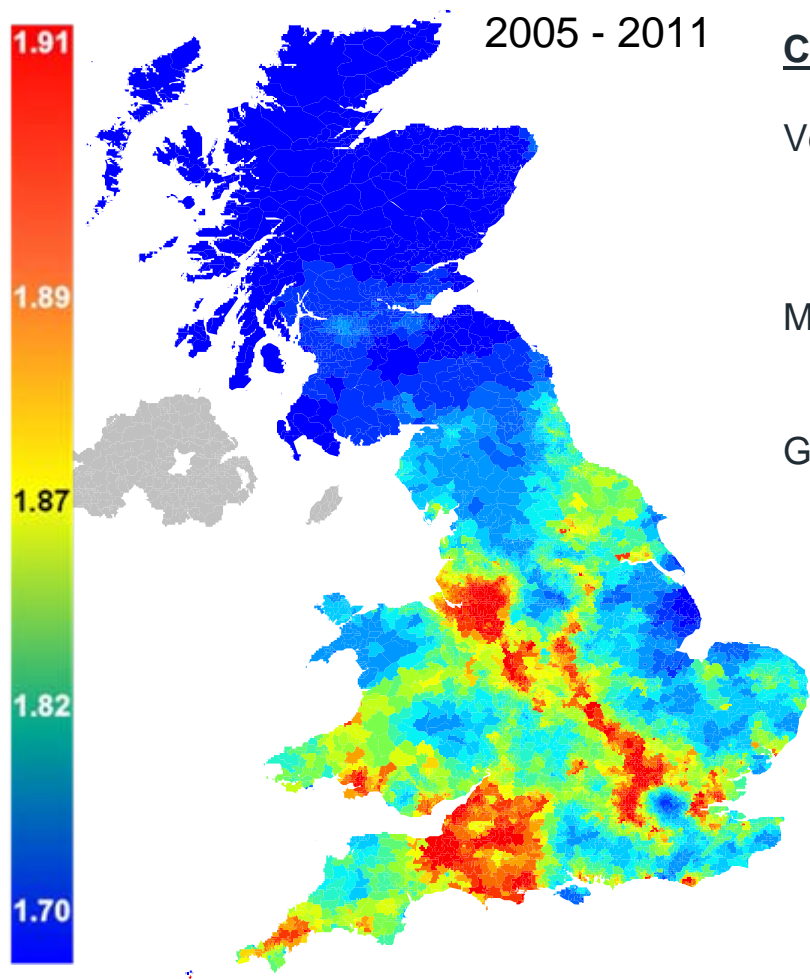


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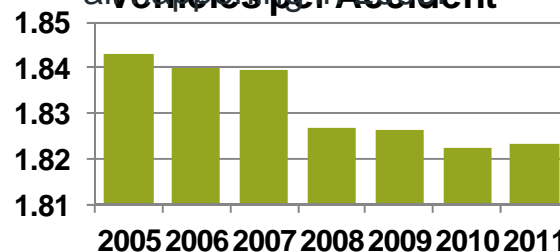
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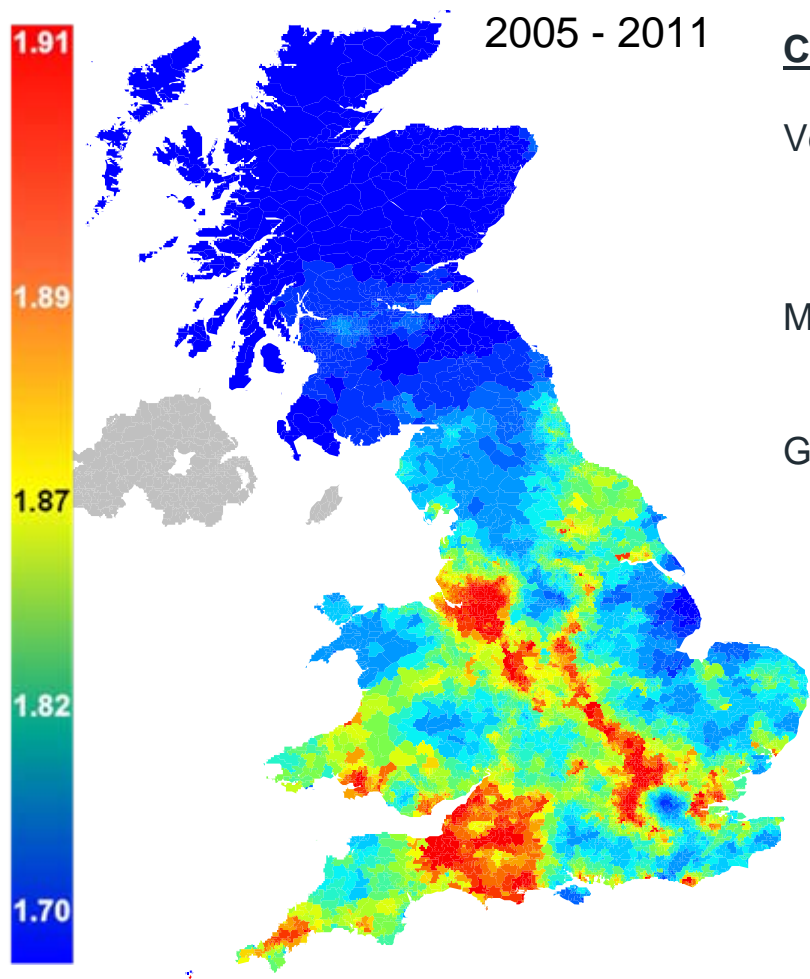


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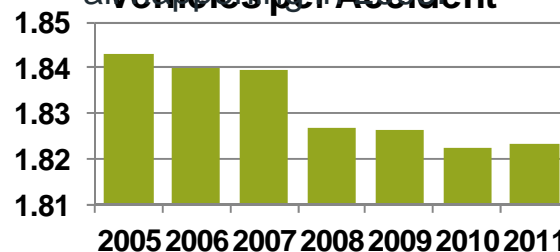
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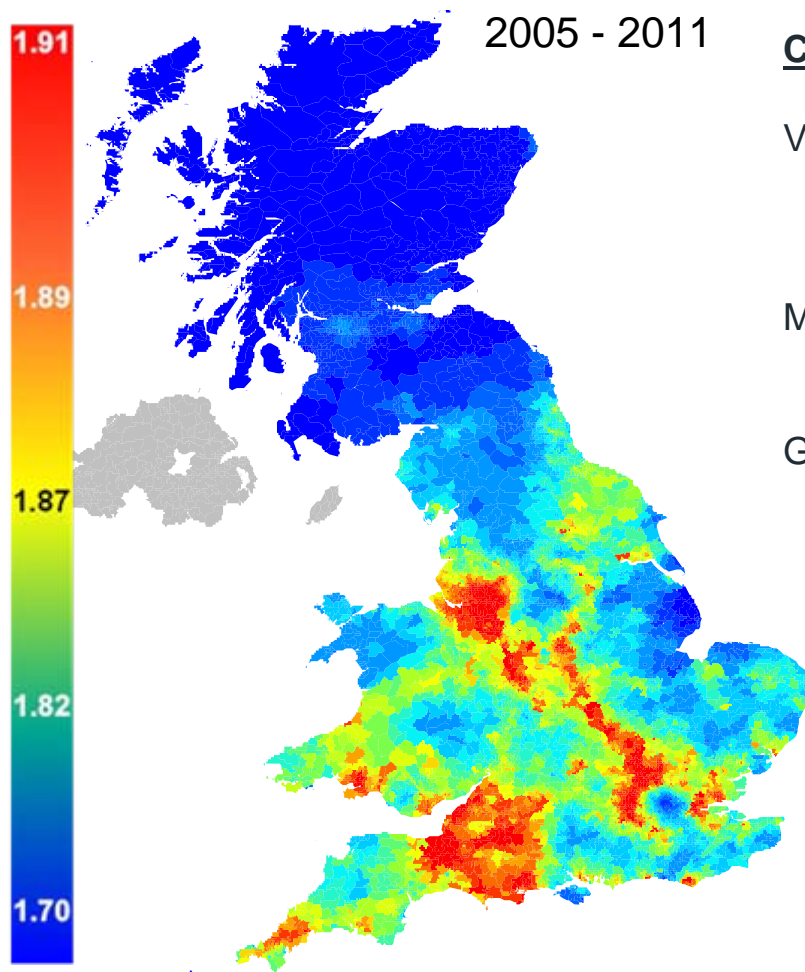


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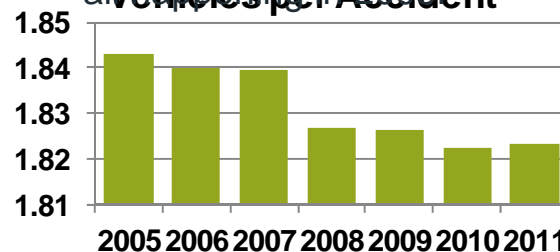
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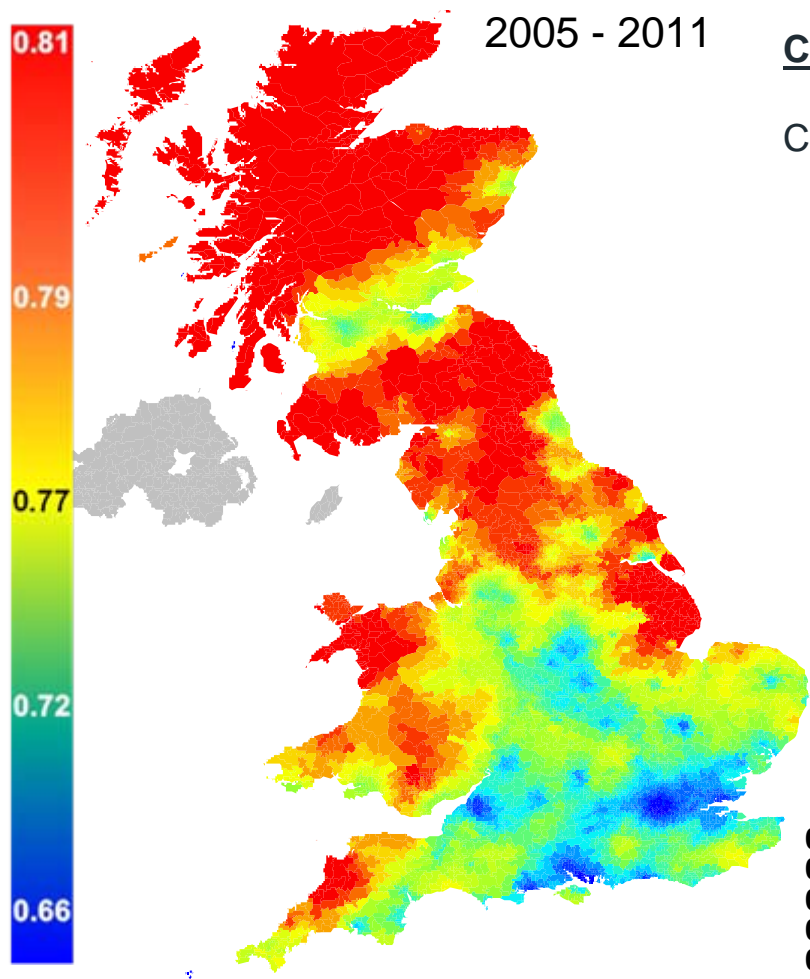


Geographic analysis

Casualties per Vehicle

STATS19

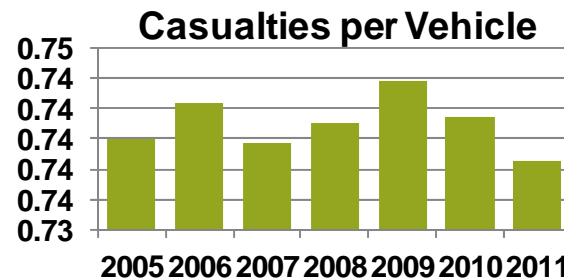
2005 2006 2007 2008 2009 2010 2011



Comment

Casualties per vehicle shows rural urban differentiation seen in earlier charts.

Ratio has remained at 0.74 over 2005 – 2011.

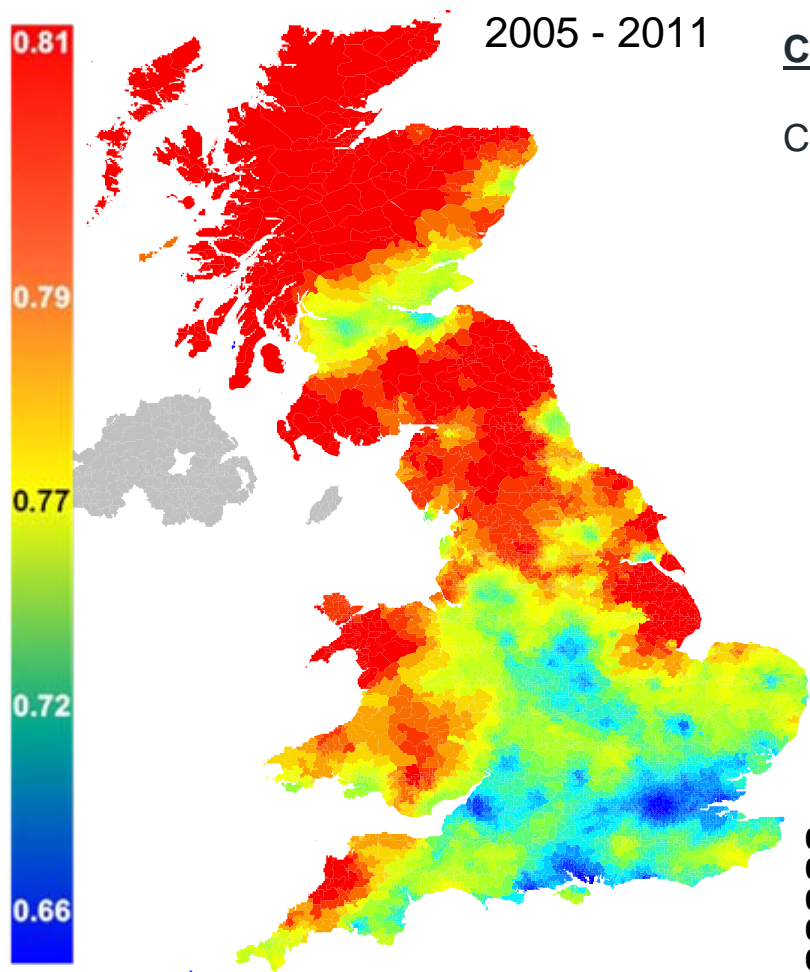


Geographic analysis

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STATS19

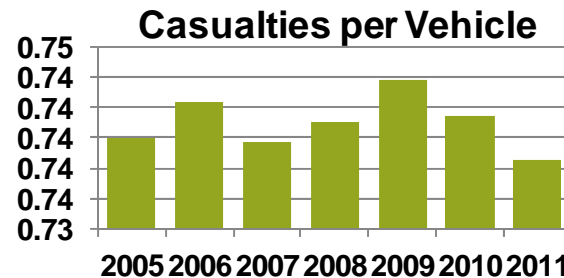
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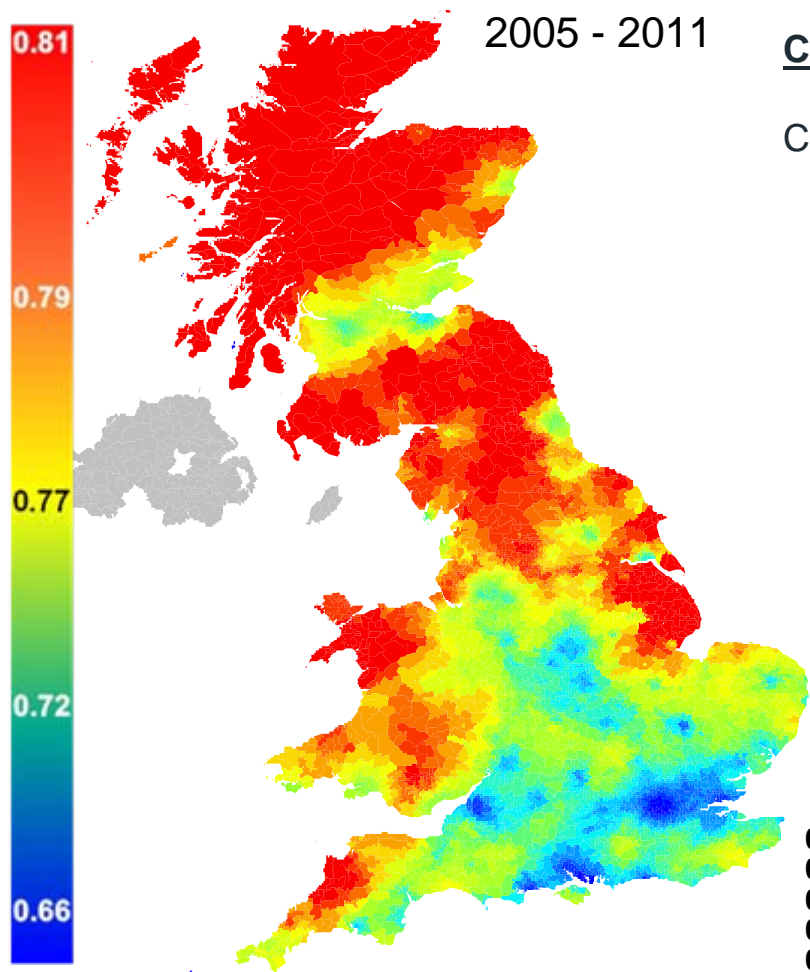


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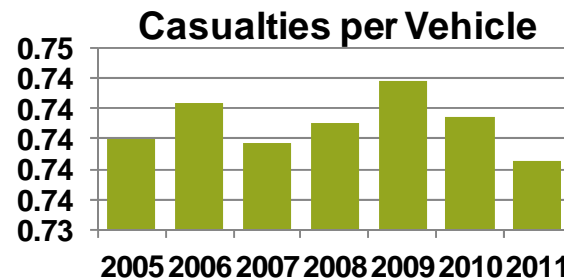
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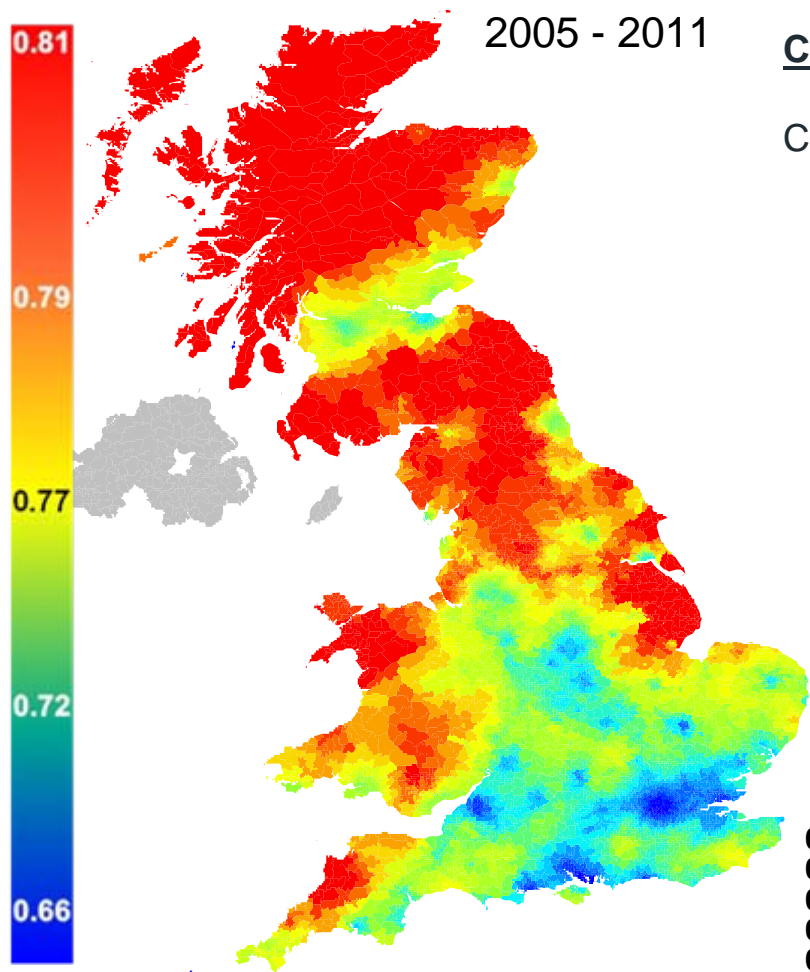


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Casualties per Vehicle

STATS19

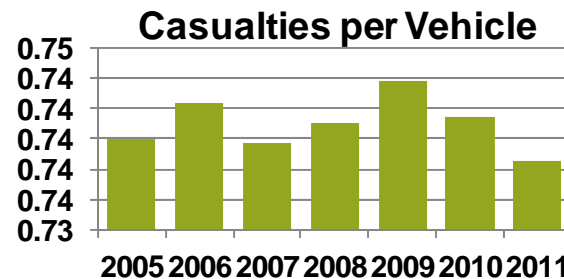
2005 2006 2007 2008 2009 2010 2011



Comment

Casualties per vehicle shows rural urban differentiation seen in earlier charts.

Ratio has remained at 0.74 over 2005 – 2011.

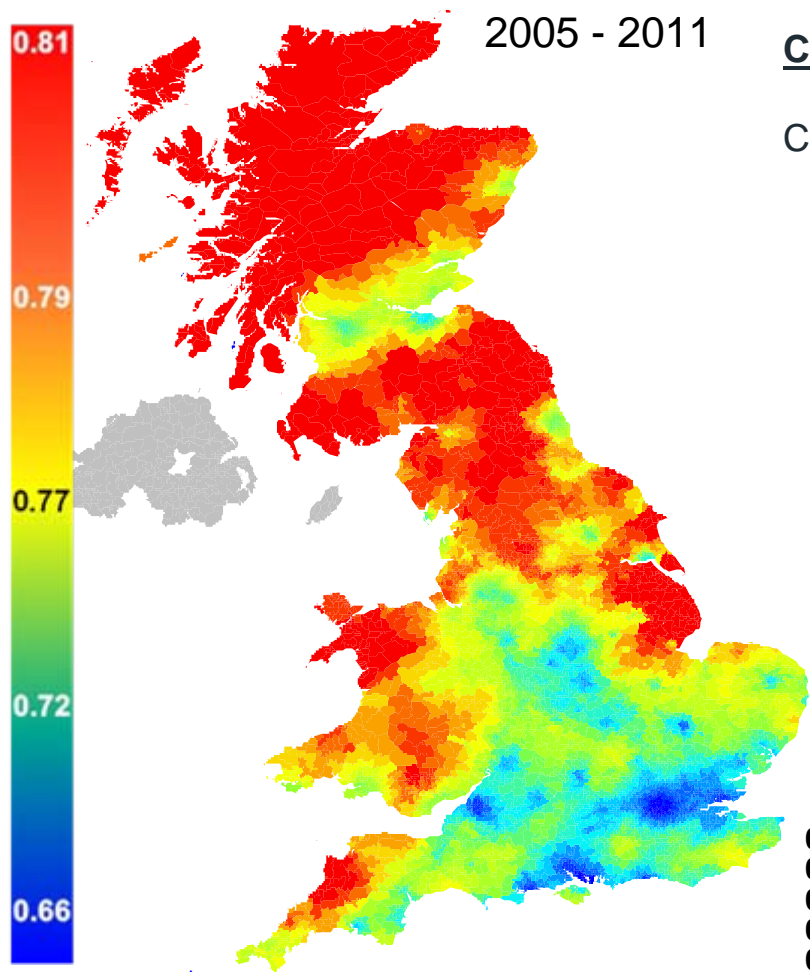


Geographic analysis

Casualties per Vehicle

STATS19

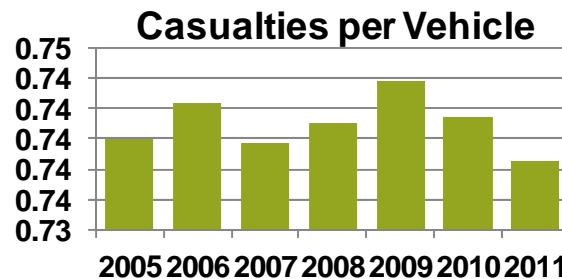
2005 2006 2007 2008 2009 2010 2011



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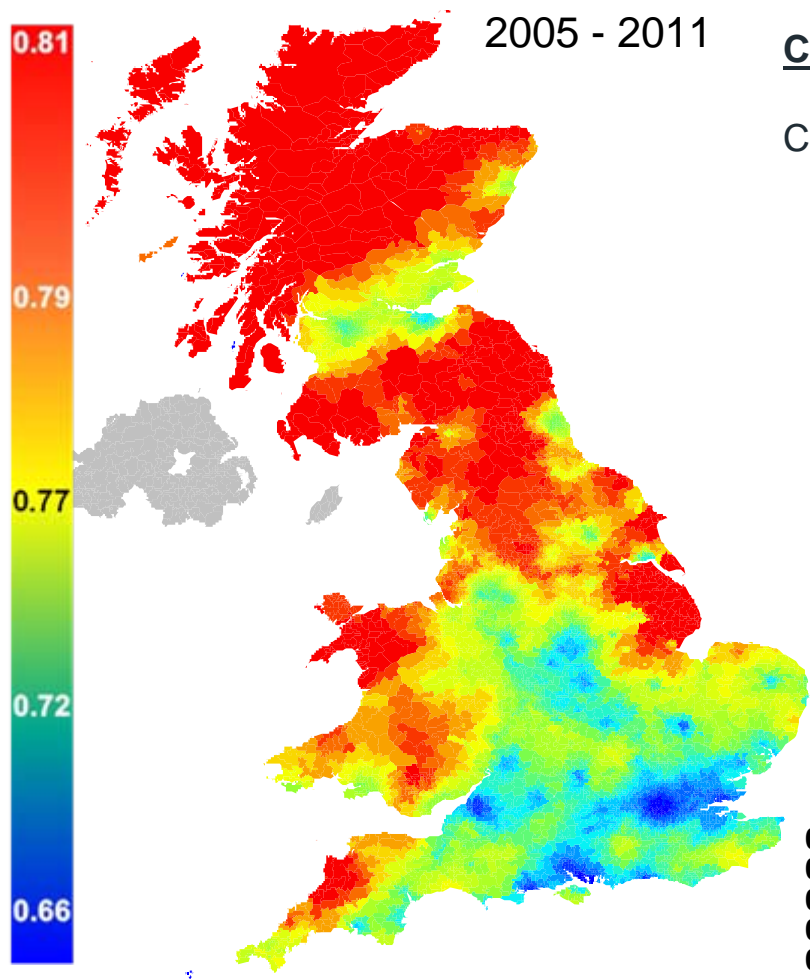


Geographic analysis

Casualties per Vehicle

STATS19

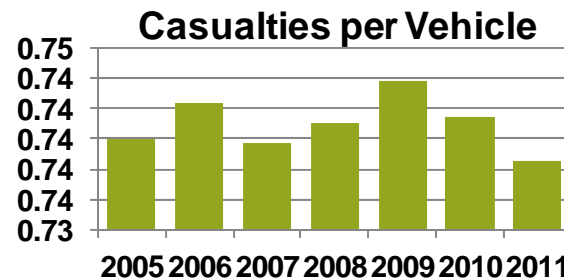
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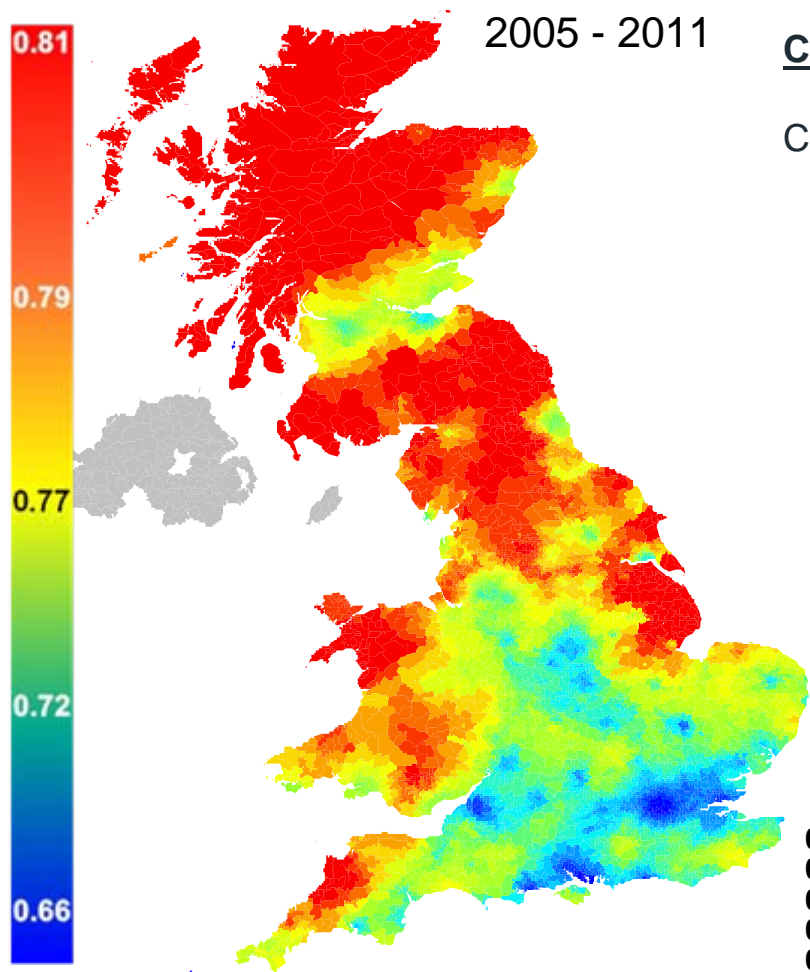


Geographic analysis

Casualties per Vehicle

STATS19

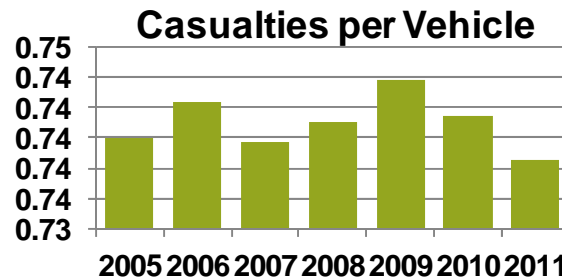
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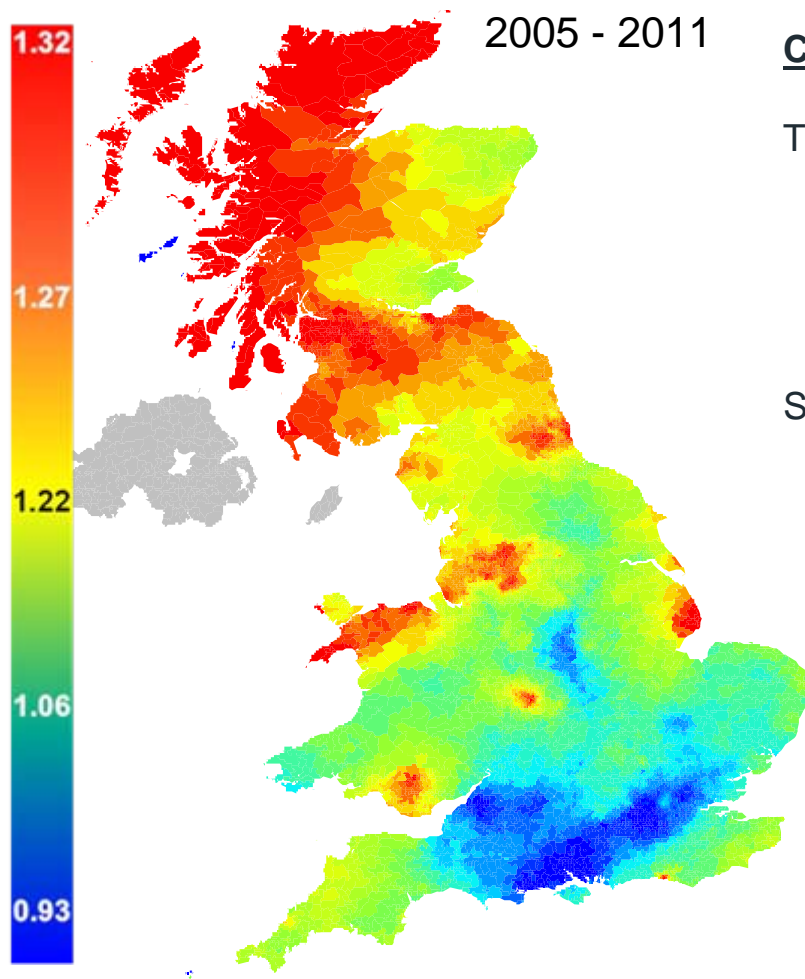


Geographic analysis

Inferred TPBI per TPPD

STATS19

2005 2006 2007 2008 2009 2010 2011



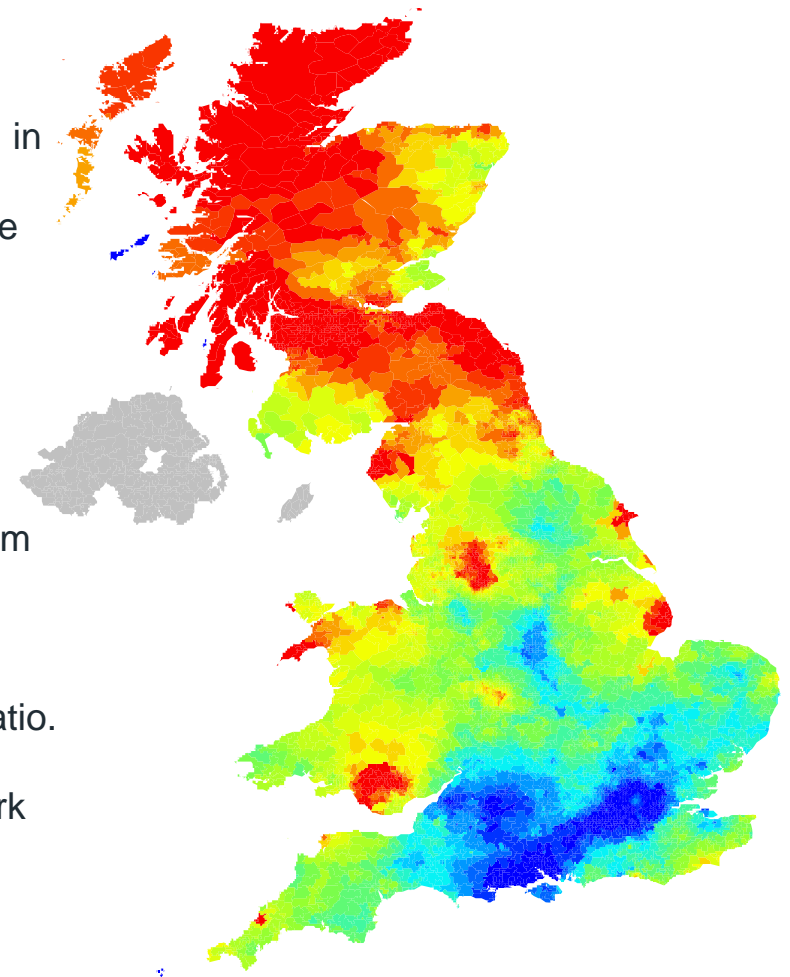
Comment

TPBI per TPPD ratio is high in some rural areas, presumably due to more passengers and higher speeds

Some urban areas shown higher TPBI per TPPD, such as Liverpool, Manchester, Birmingham and South Wales.

London and South England has lowest ratio.

Overall pattern in stark contrast to Insurer's experience.

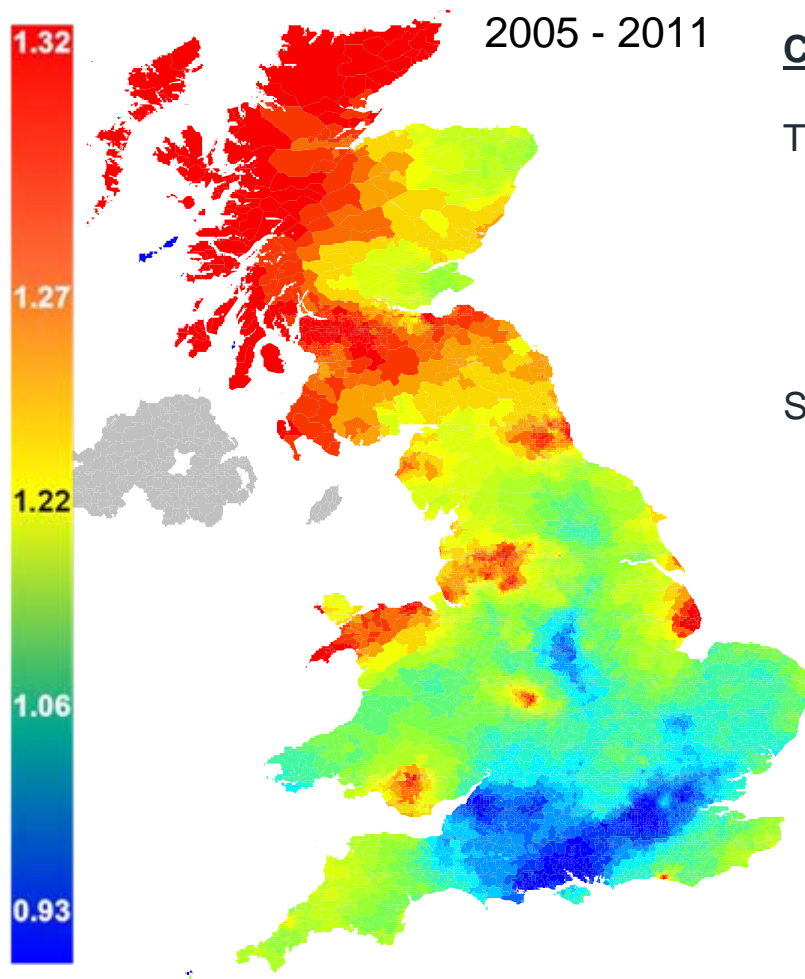


Geographic analysis

Inferred TPBI per TPPD

STATS19

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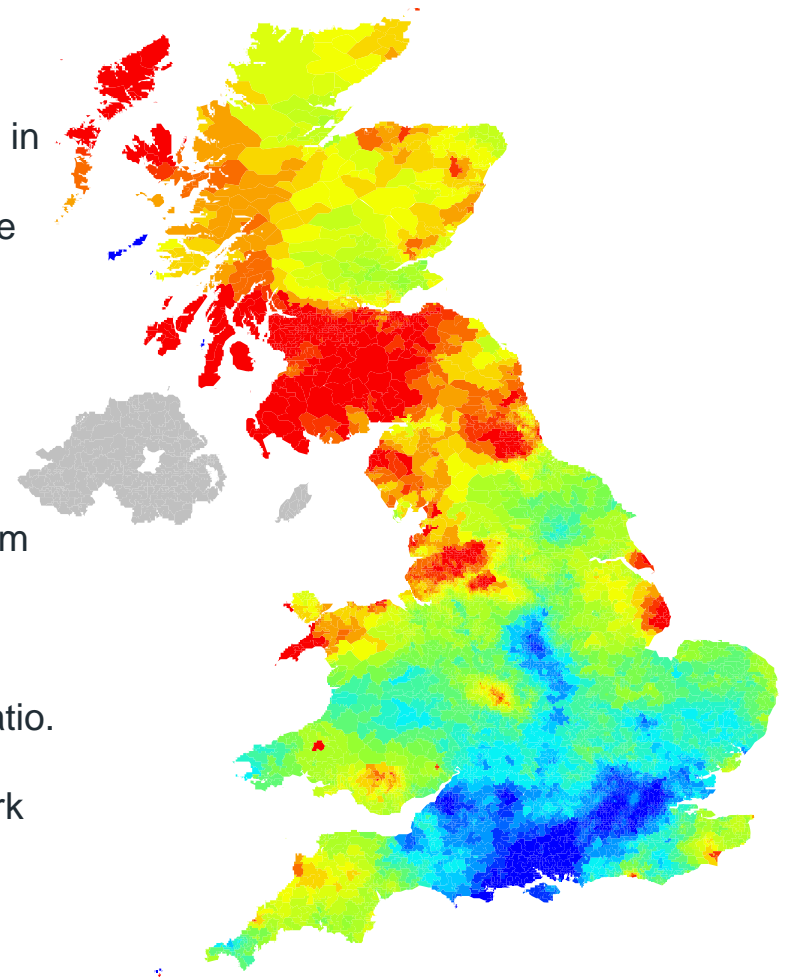
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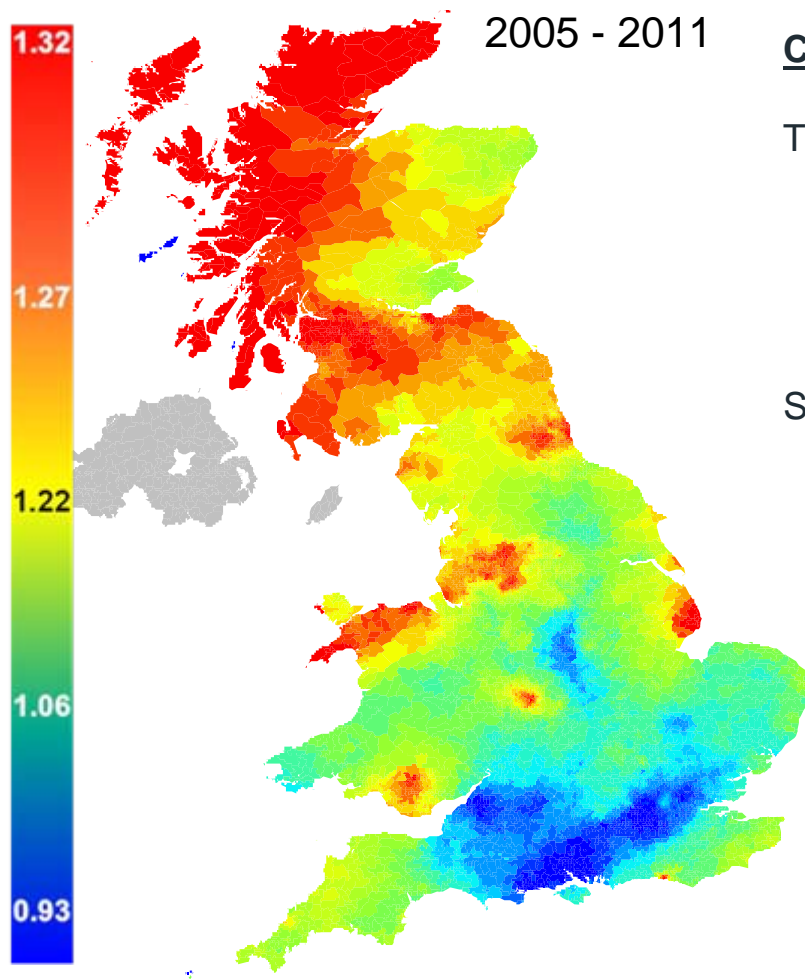


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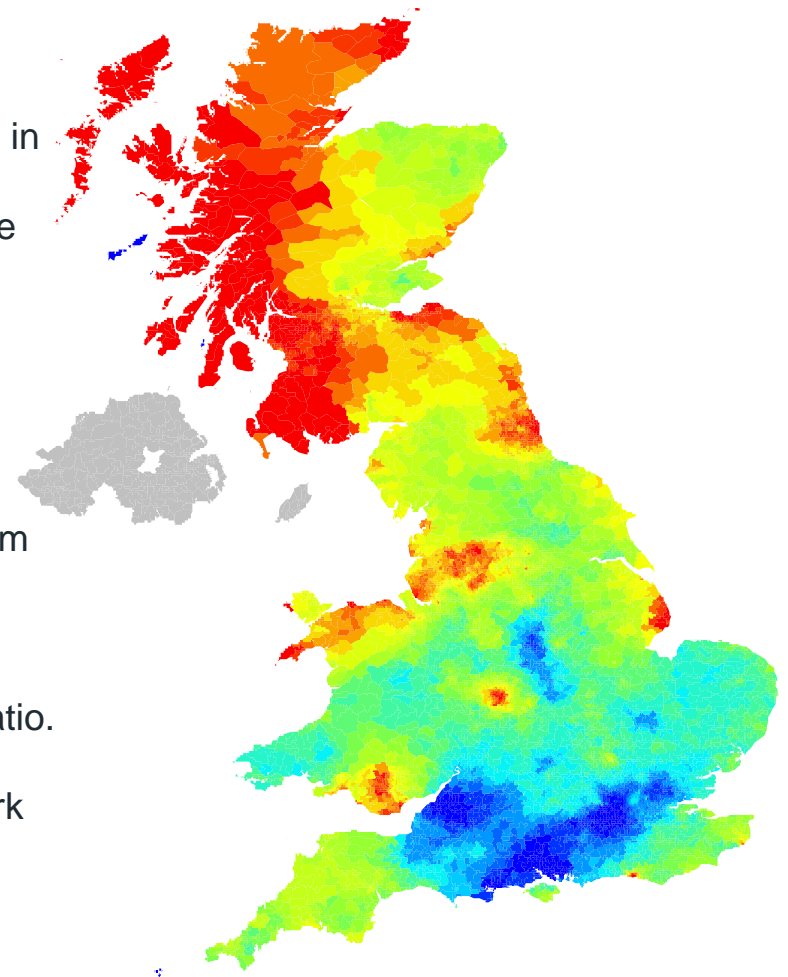
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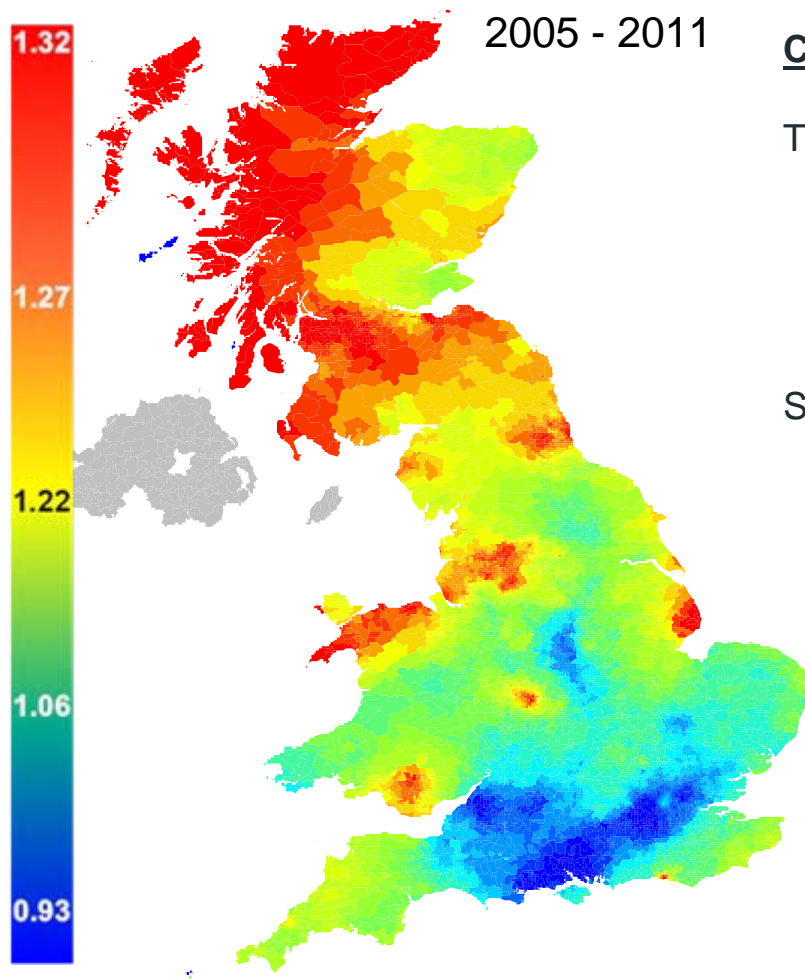


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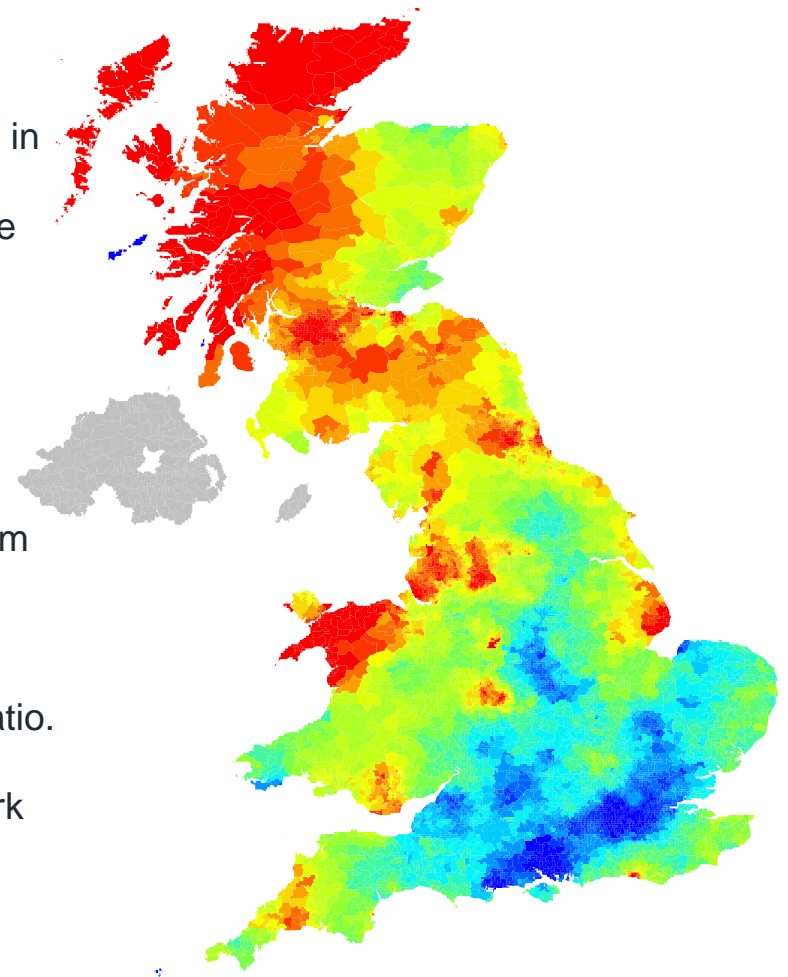
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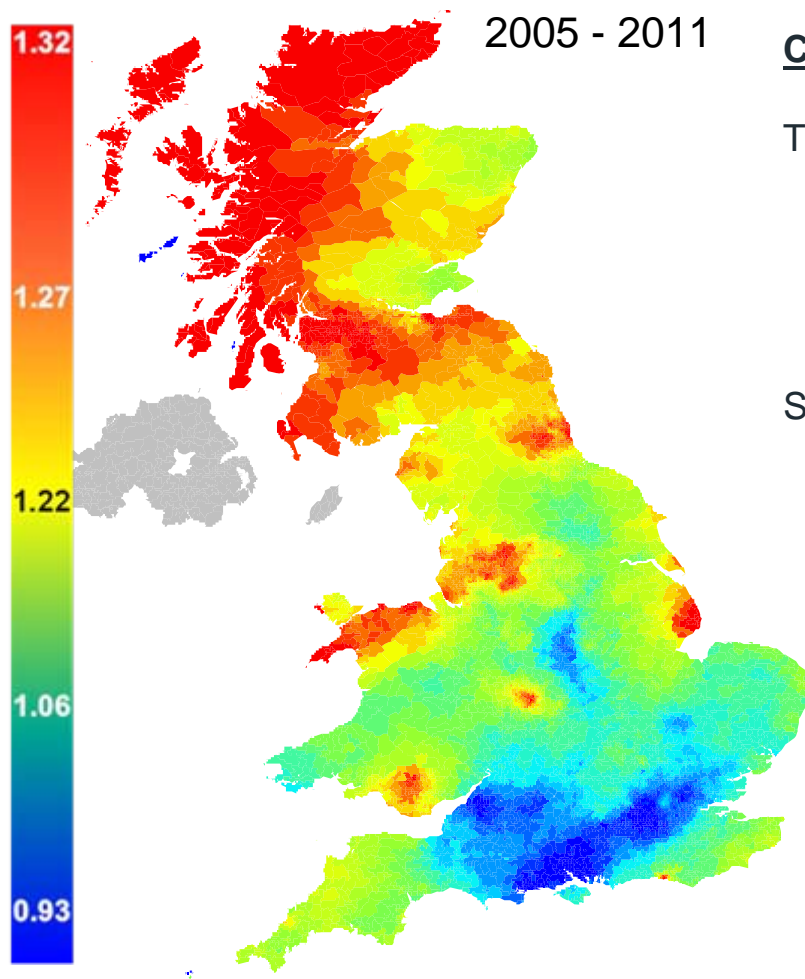


Geographic analysis

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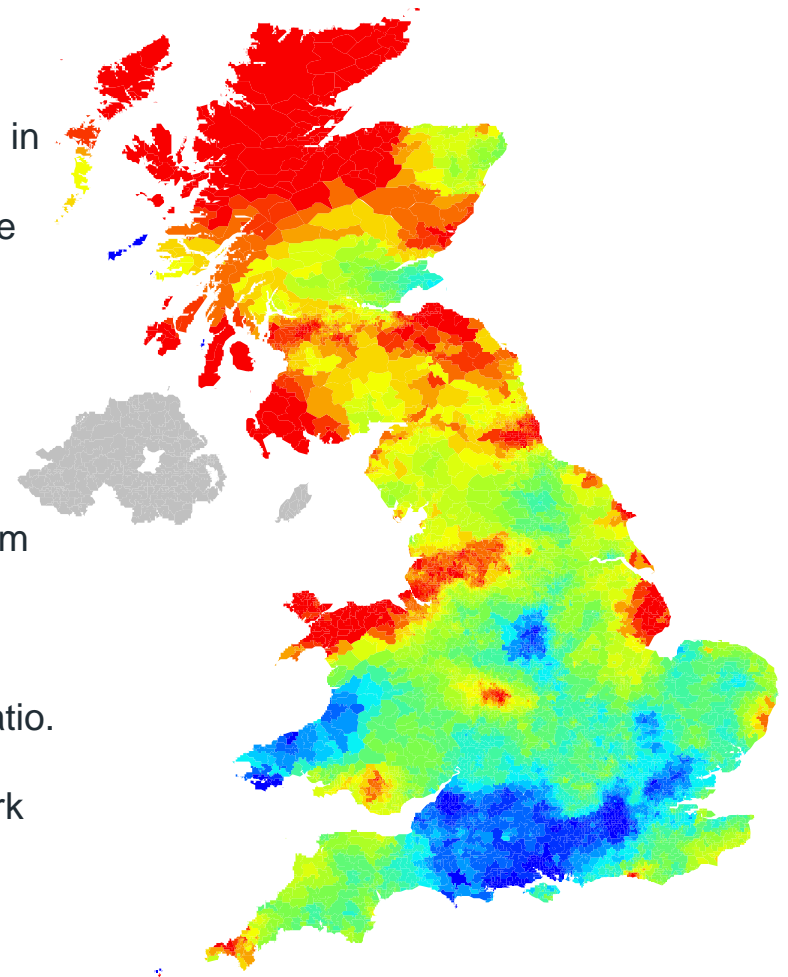
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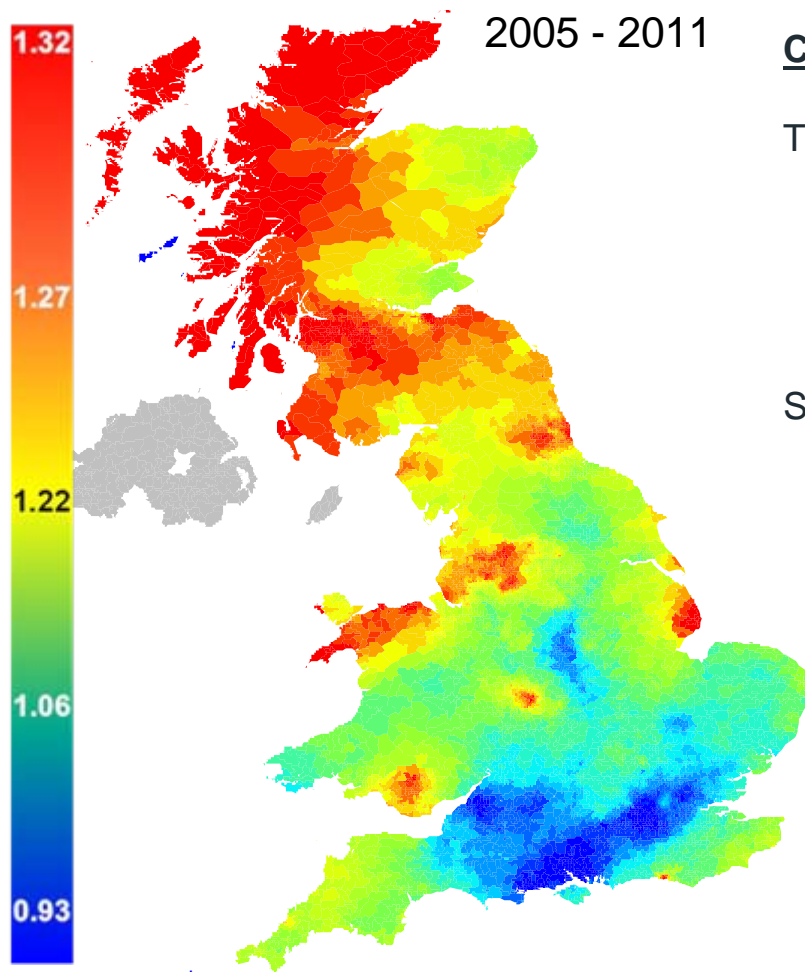


Geographic analysis

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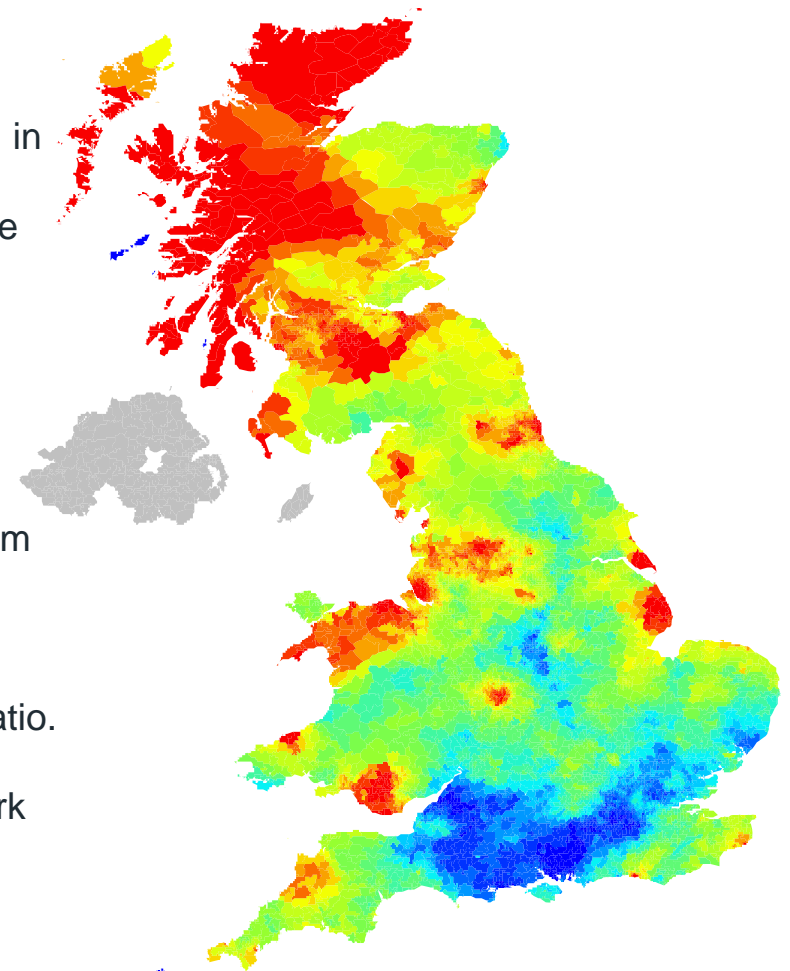
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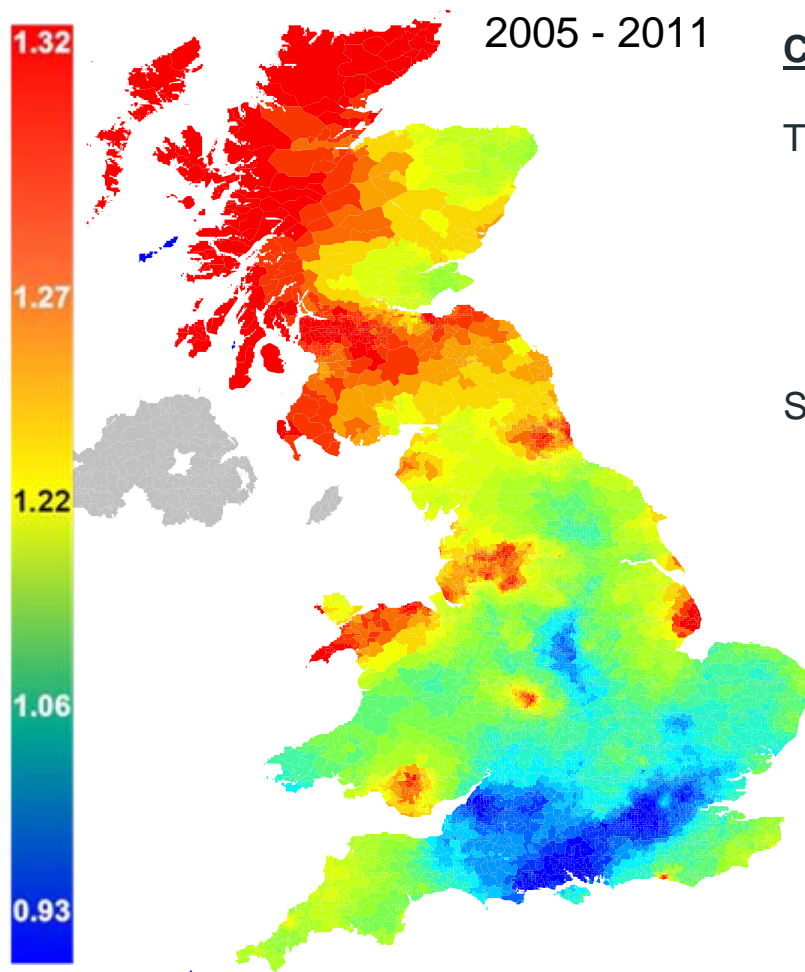


Geographic analysis

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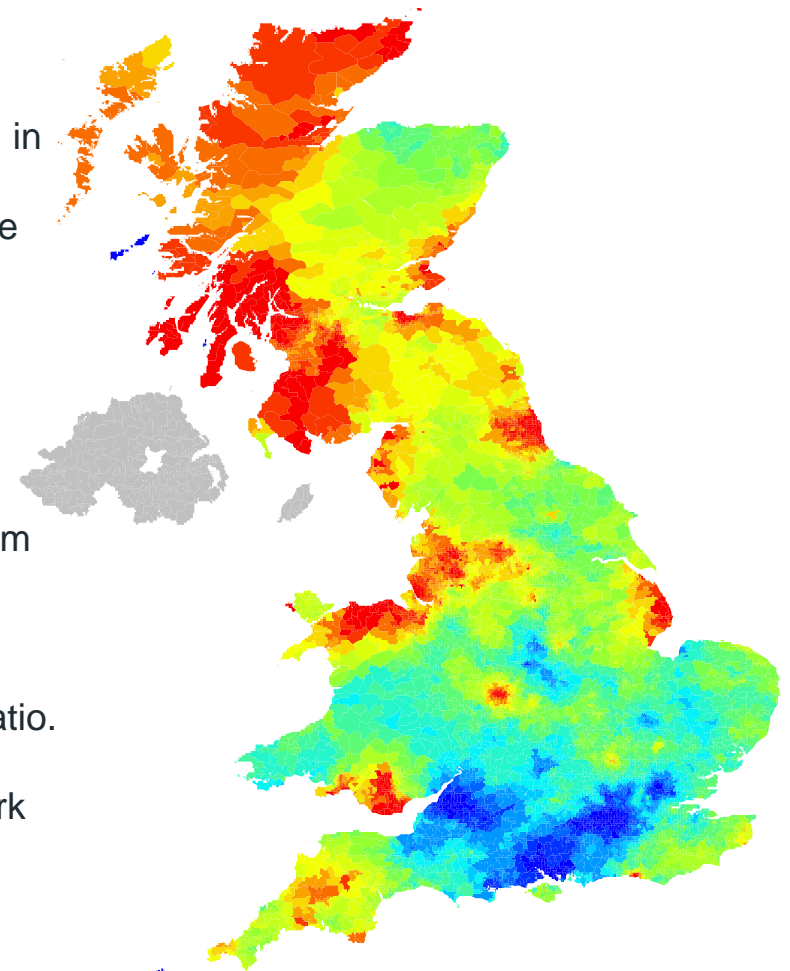
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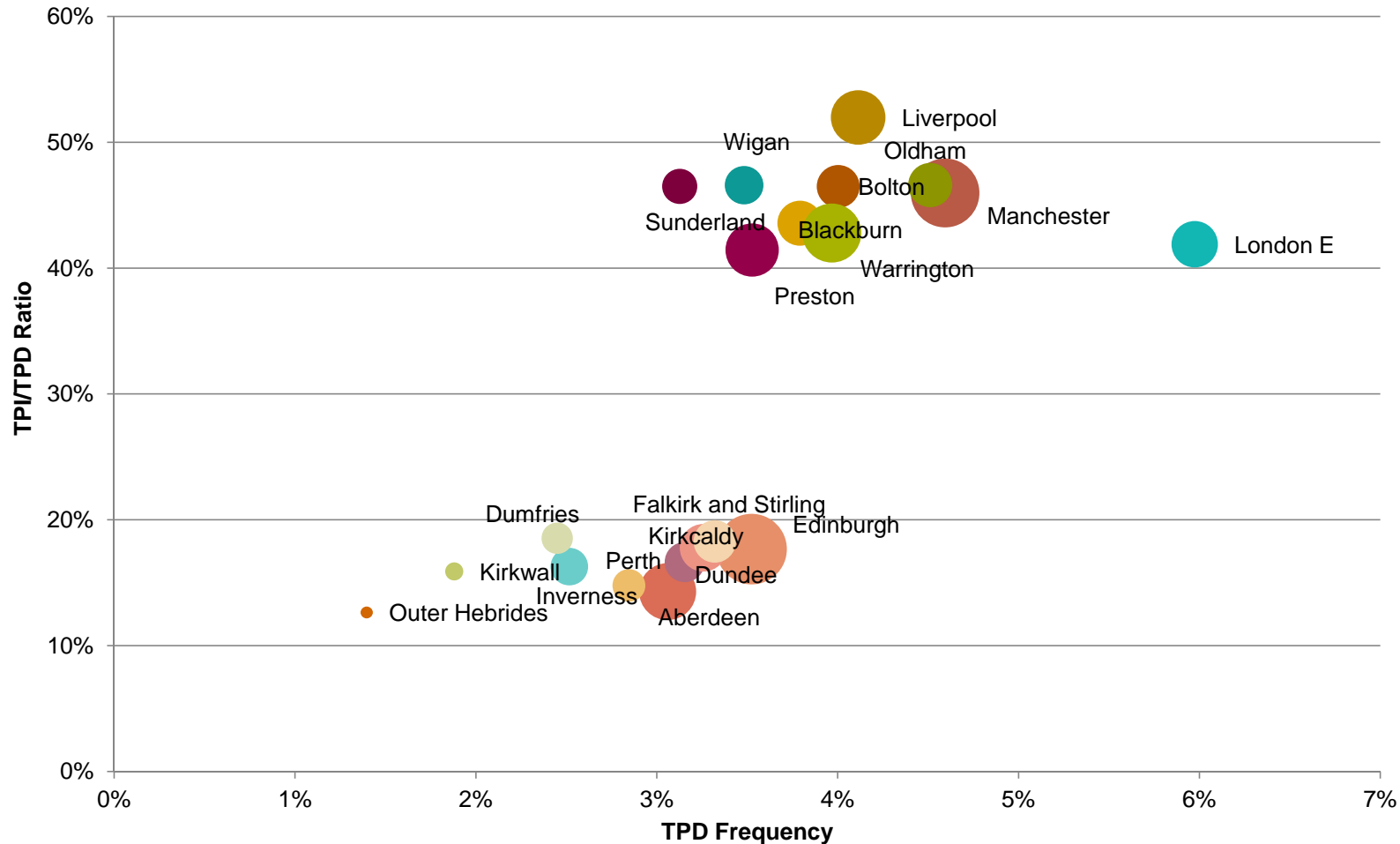
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Geographic analysis

TPI to TPD Ratio – 2011 Accident Year

Top 10 & Bottom 10 TPI/TPD Ratio

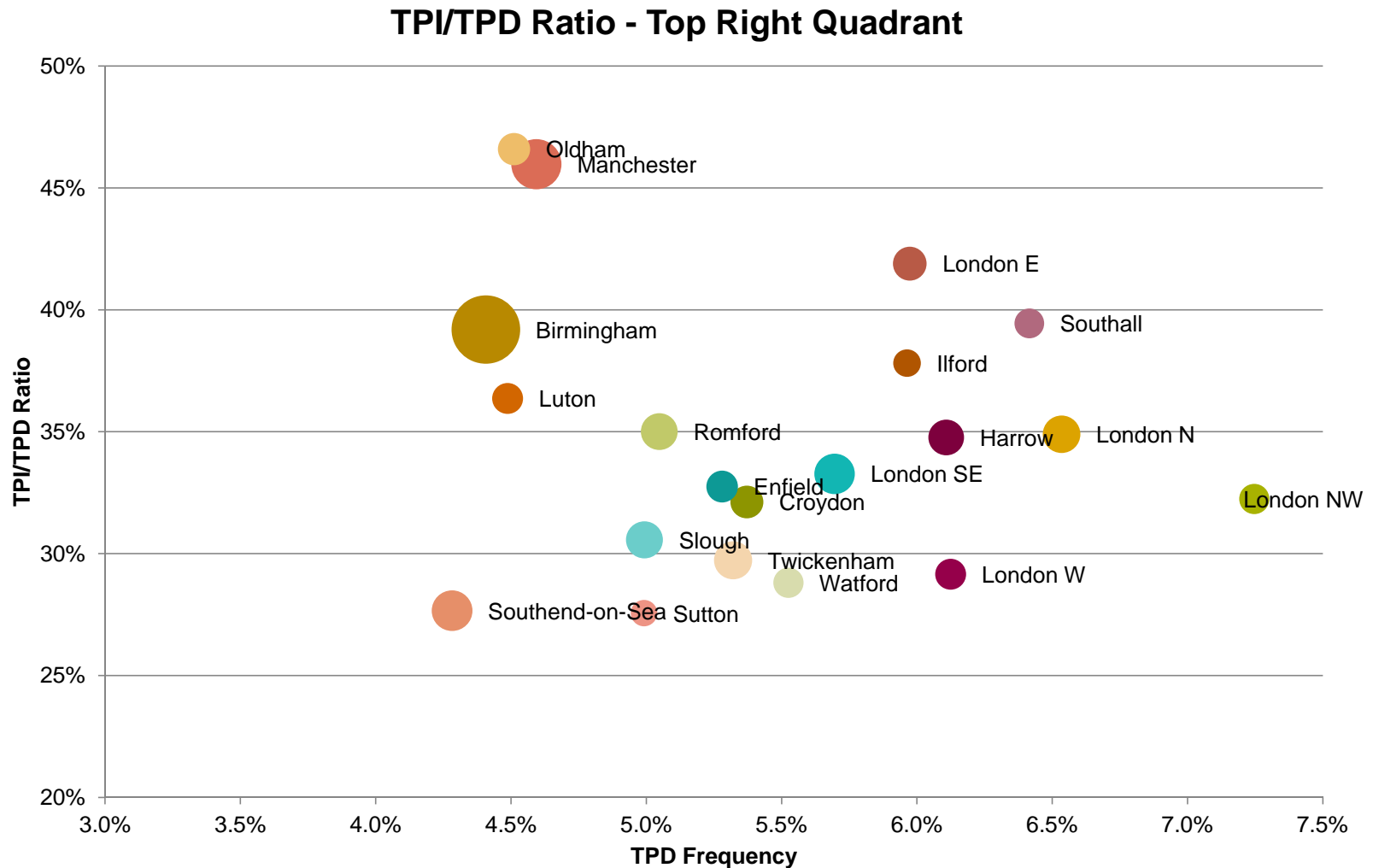


Bubble Chart – All – 2011 Accident Year



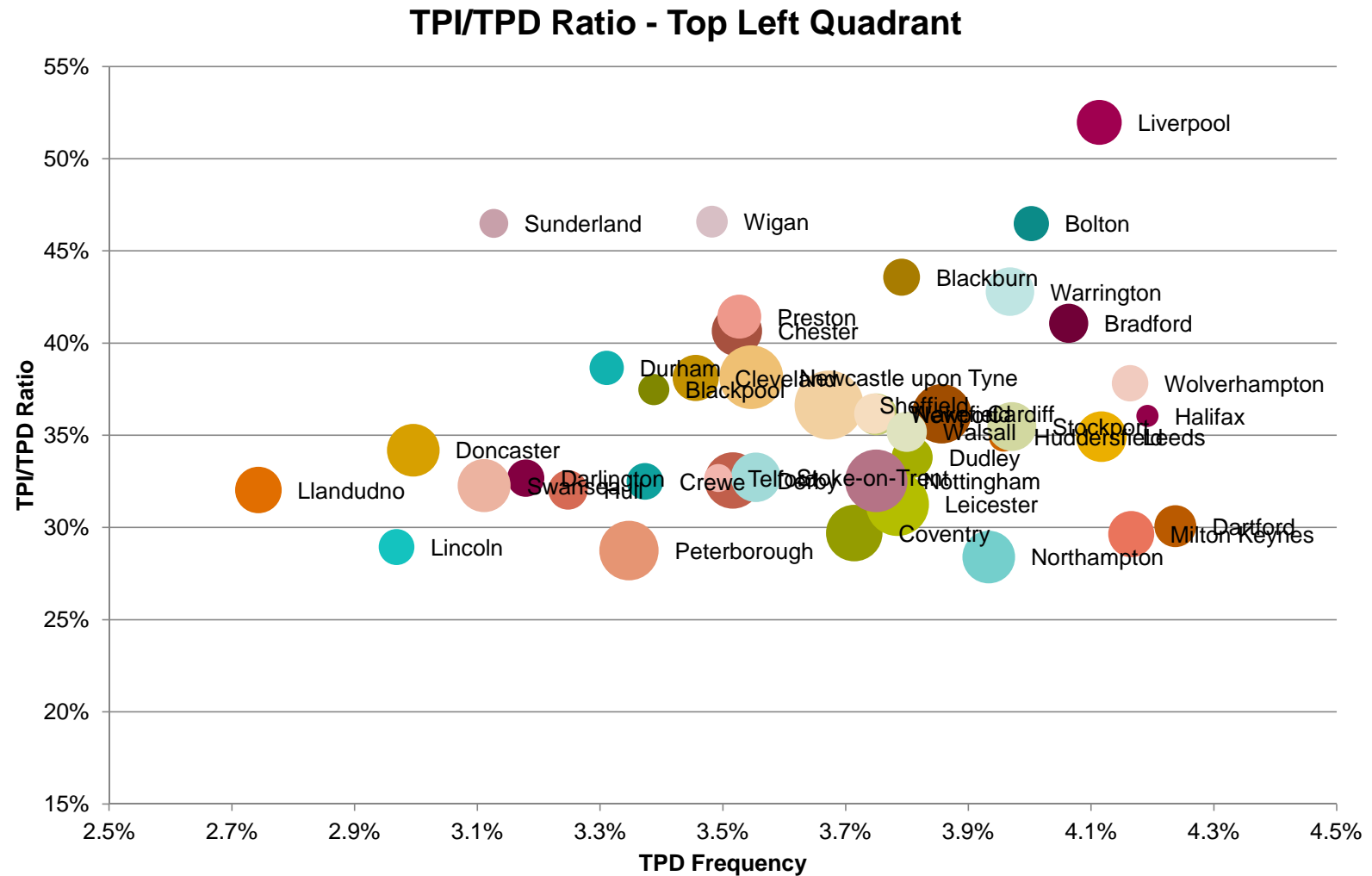
Geographic analysis

Bubble Chart (Top Right Quadrant, 2011 Accident Year)



Geographic analysis

Bubble Chart (Top Left Quadrant, 2011 Accident Year)



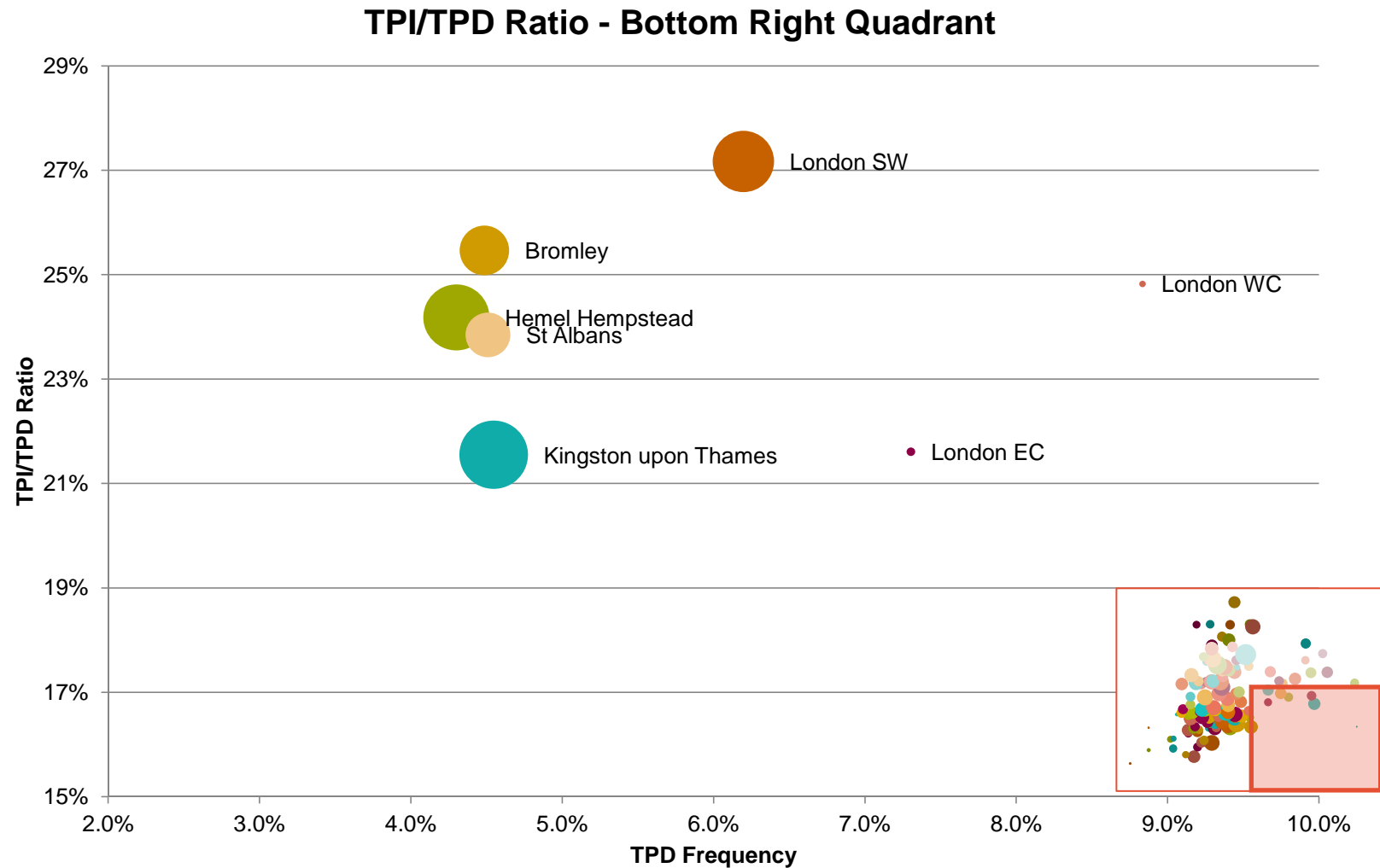
Bubble Chart (Bottom Left Quadrant, 2011 Accident Year)

The scatter plot displays the relationship between TPD Frequency (X-axis) and TPI/TPD Ratio (Y-axis) for various UK airports. The X-axis ranges from 1.0% to 4.5% TPD Frequency, and the Y-axis ranges from 10% to 28% TPI/TPD Ratio. The data points are labeled with airport names, and their size and color represent different categories. The plot shows a positive correlation, with most airports clustered between 2.5% and 4.5% TPD Frequency and 14% to 28% TPI/TPD Ratio. Airports like Lancaster, Portsmouth, and Rochester are among the highest in both metrics, while Outer Hebrides is the lowest in both.

Airport	TPD Frequency (%)	TPI/TPD Ratio (%)
Outer Hebrides	1.4	12.5
Kirkwall	1.9	16.0
Lerwick	2.1	21.5
Dumfries	2.4	18.5
Inverness	2.5	16.3
Galashiels	2.5	18.8
Perth	2.8	14.8
Aberdeen	3.0	14.2
Exeter	2.9	20.8
Dorchester	2.9	19.8
Kilmarnock	3.1	20.5
Truro	3.1	21.5
Salisbury	3.2	20.2
Cambridge	3.2	20.5
Falkirk and Stirling	3.3	18.5
Kirkcaldy	3.3	17.5
Dundee	3.2	16.5
Edinburgh	3.5	17.5
Salisbury	3.4	21.2
Oxford	3.6	20.5
Harrogate	3.6	21.5
Torquay	3.6	22.0
Bath	3.6	22.5
Colchester	3.7	23.5
Swindon	3.7	22.5
Paisley	3.8	21.5
Brighton	3.9	22.5
Tonbridge	4.0	21.5
Guildford	4.0	21.0
Reading	4.1	23.5
Stevenage	4.1	23.0
Chelmsford	4.2	24.5
Southampton	4.2	25.5
Bristol	4.1	24.5
Motherwell	3.8	24.0
Canterbury	3.8	25.5
Bournemouth	3.9	26.0
Portsmouth	3.7	26.5
Rochester	4.1	26.5
Lancaster	2.9	27.0
Carlisle	2.8	25.5
Shrewsbury	2.7	25.0
Hereford	2.8	24.5
Llandrindod Wells	2.7	24.5
York	2.9	24.5
Worcester	3.2	25.0
Norwich	3.4	25.5
Plymouth	3.5	25.5

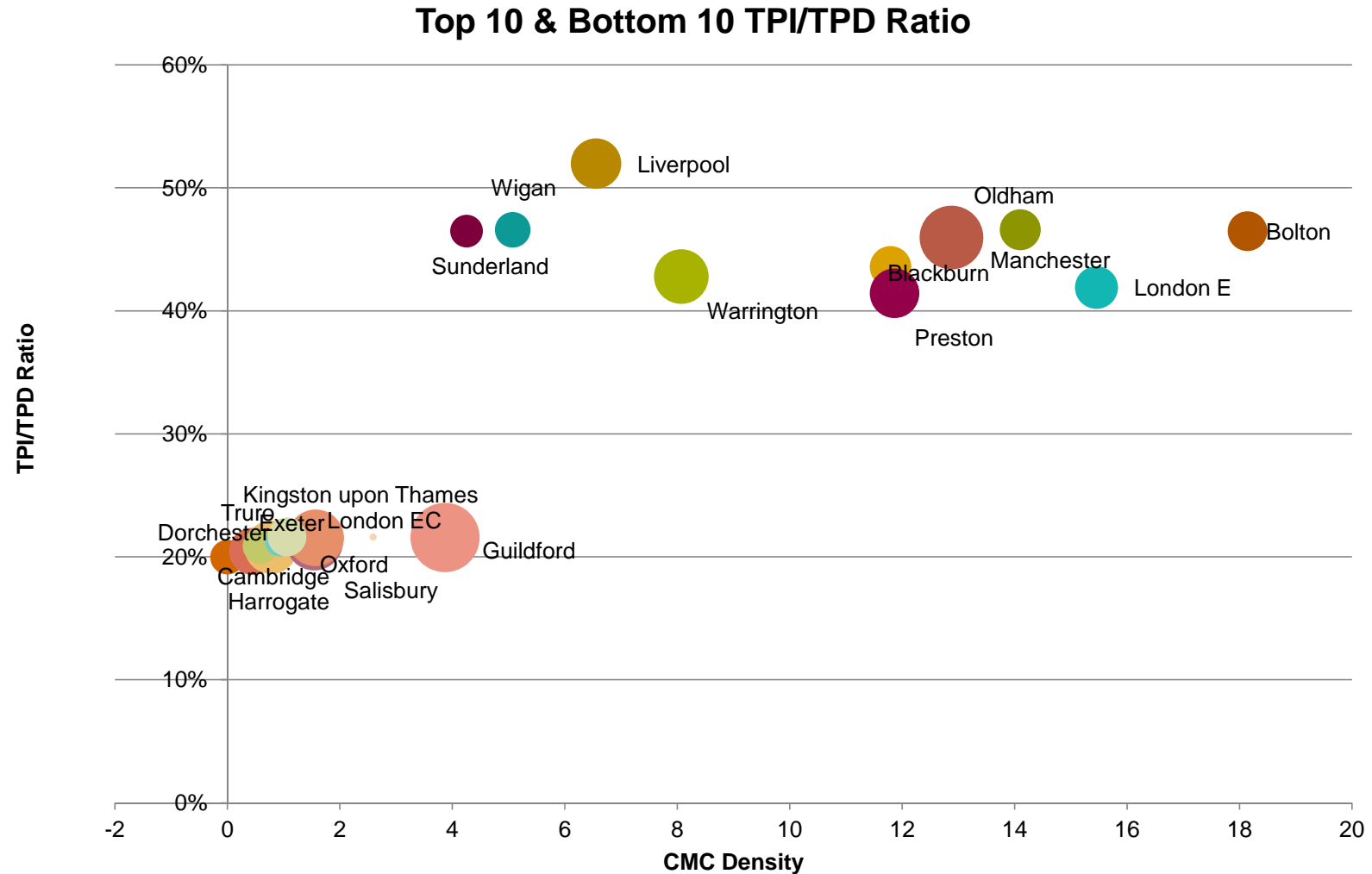
Geographic analysis

Bubble Chart (Bottom Right Quadrant, 2011 Accident Year)



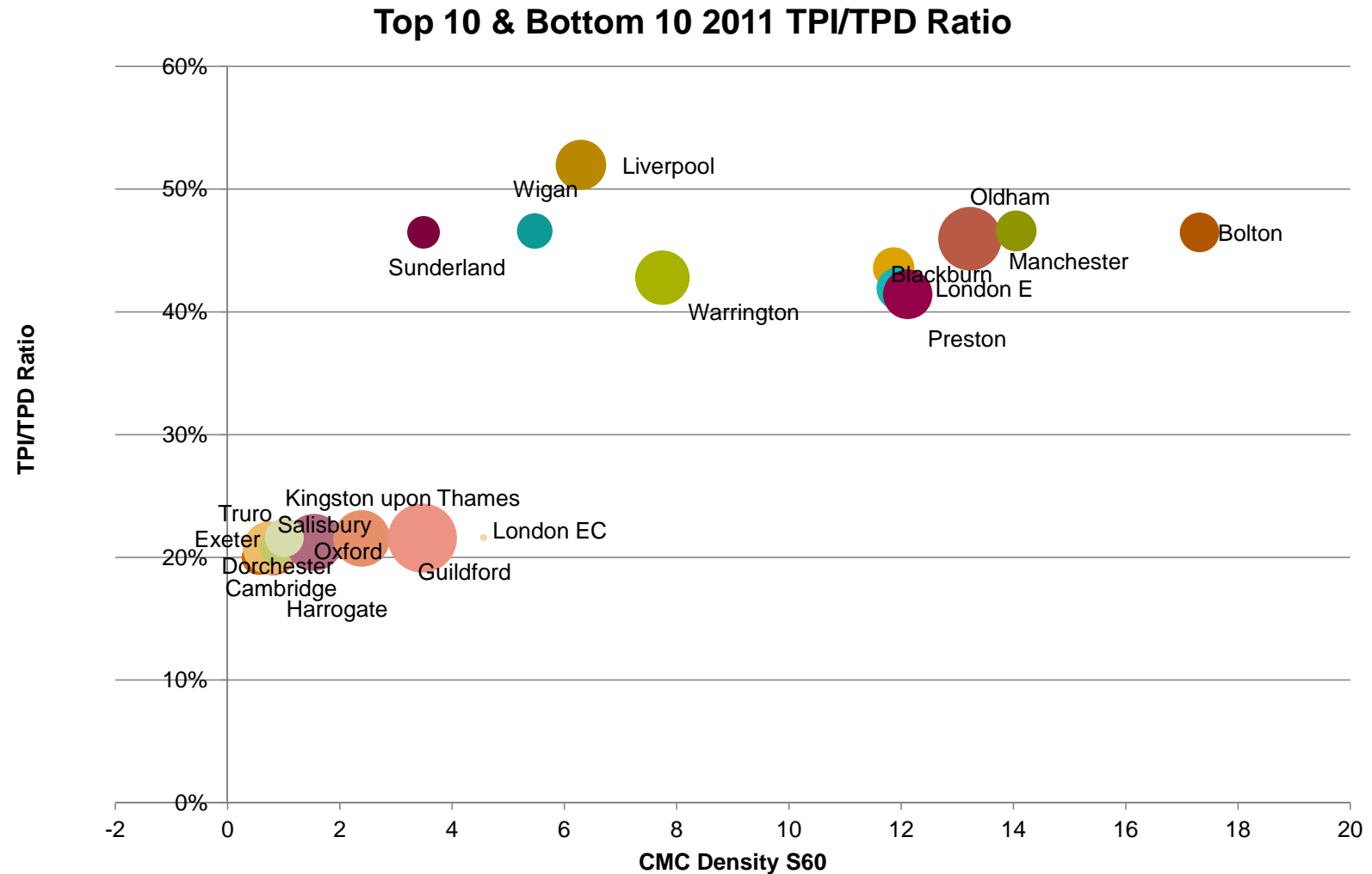
Geographic analysis

TPI to TPD Ratio – CMC Density – 2011 Accident Year



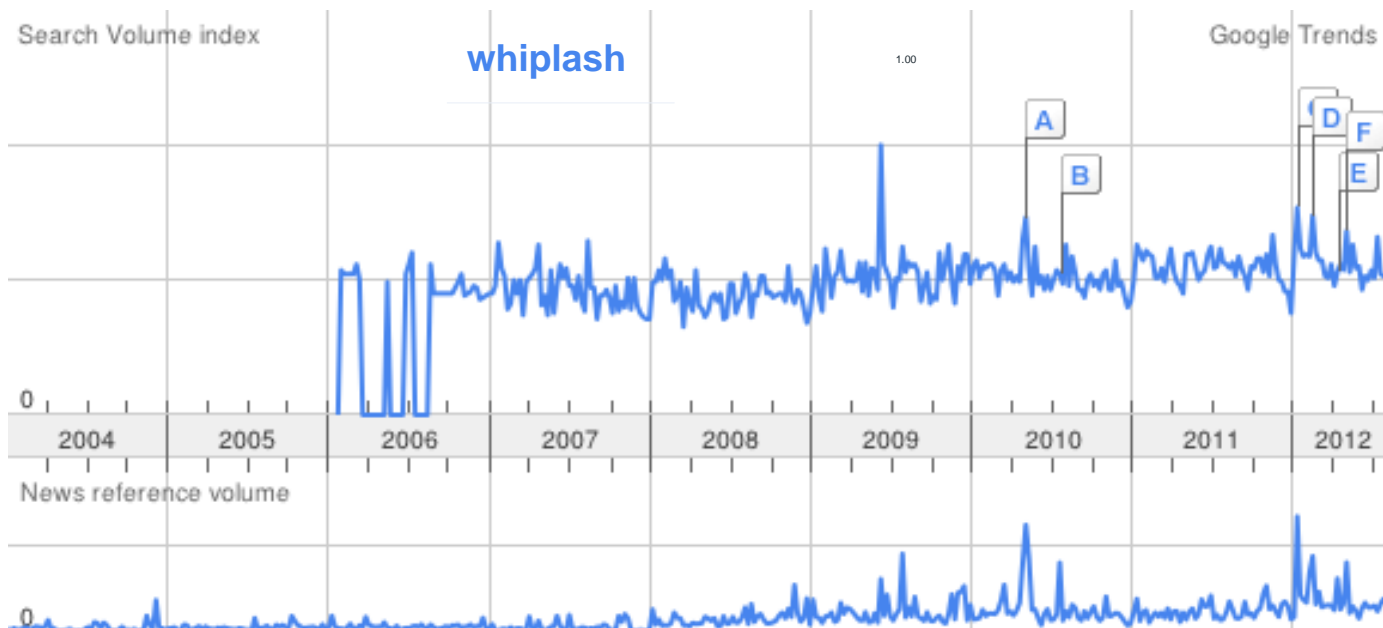
Geographic analysis

TPI to TPD Ratio – CMC Density S60 – 2011 Accident Year



Google Trends

- Google Trends can be used to look at trends in search volume (as a proportion of total Google searches).
- This graph shows UK searches for the term “whiplash” have experienced a modest increase over the period 2007-2012.



Google Trends

- Google Trends also ranks cities by the relative search propensity.
- The table shows the top six UK cities for each year for the proportion of searches for the term “whiplash”.*

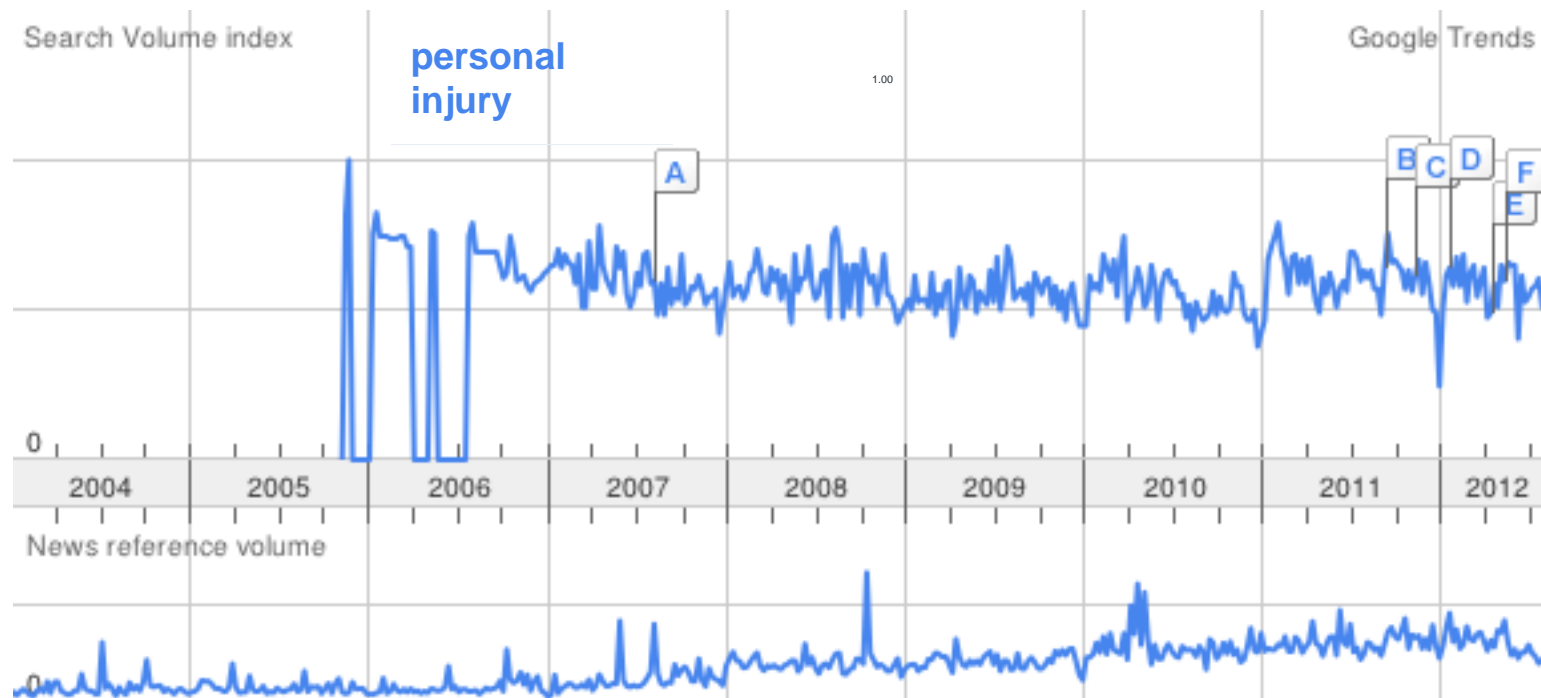
2007	2008	2009	2010	2011	2012
Watford	Thames Ditton	Watford	Hertford	Cardiff	Cardiff
Thames Ditton	Manchester	Thames Ditton	Thames Ditton	Liverpool	Liverpool
Sheffield	Reading	Edinburgh	Sheffield	Belfast	Manchester
Manchester	Sheffield	Manchester	Edinburgh	Preston	Belfast
Birmingham	Birmingham	Sheffield	Manchester	Manchester	Birmingham
Milton Keynes	Edinburgh	Birmingham	Bletchley	Newcastle	Sheffield

- Manchester, Sheffield and Birmingham regularly appear amongst the top six.
- 2011 saw a marked shift, with Cardiff, Liverpool and Belfast appearing in the top four for the first time.

* Data obtained on 22/8/12. Google sampling methodology means this is subject to slight changes on other days.

Google Trends

- Similarly, we can review searches for the term “personal injury”



Google Trends

- The table shows the top six UK cities for each year for the proportion of searches for the term “personal injury”.*

2007	2008	2009	2010	2011	2012
Manchester	Bletchley	Bletchley	Bletchley	Burnley	Manchester
London	Manchester	Manchester	Manchester	Liverpool	Liverpool
Birmingham	Birmingham	Birmingham	Sheffield	Manchester	Leeds
Sheffield	London	Brentford	Brentford	Leeds	Sheffield
Brentford	Poplar	Sheffield	Birmingham	Cardiff	Cardiff
Milton Keynes	Brentford	Edinburgh	Edinburgh	Newcastle	Bristol

- Manchester, Sheffield and Birmingham regularly appear amongst the top six.
- 2011 saw a marked shift, with Cardiff, Liverpool and Leeds appearing in the top five for the first time.

* Data obtained on 22/8/12. Google sampling methodology means this is subject to slight changes on other days.