

Mapping vulnerability to fuel price increases in England

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The (t)ERES project (2014-2016)



RESEARCH INSIGHT CAR RELATED ECONOMIC STRESS IS THERE A TRANSPORT EQUIVALENT OF FUEL POVERTY?



'Car-owning households who need to spend a disproportionately high share of their income to get where they need to go, with negative consequences in terms of restricted activity spaces and/or spending cuts in other essential areas'

≈ 'forced car ownership', 'transport poverty'...

(t)ERES studies



Indicators

- 1. A material deprivation-based indicator of CRES
- 2. A 'low-income high-costs' indicator of CRES

1. EU-SILC 2005-2014 (UK)

Data

- 2. Living Costs and Food Survey (LCFS) 2006-2014 (UK)
- 3. A spatial index of vulnerability to fuel price increases
- Anonymised MOT tests with keeper and derived results data , income data and accessibility statistics (England LSOA)

Motivations



- 1. Fuel price concerns
- 2. Great data in UK, but little policy/research interest
- 3. Contribution to debates in transport & urban studies

Motor fuel and oil prices, UK 1990-2017





Source: DBEIS, 2017

The 'Oil vulnerability' debate



Dodson et al. (e.g. Dodson & Sipe, 2007)

Australian city = "regressive city" – 2 urban structural effects:

- 1. "low socioeconomic status and high car dependence are strongly colocated" (Dodson & Sipe, 2007, p.57)
- 2. socioeconomically less advantaged households are spatially codistributed with less efficient motor vehicle technologies (Li et al., 2013)

BUT "the socio-spatial structure of Australian cities differs from many overseas jurisdictions, particularly (...) Europe (...) given different socio-spatial and transport geographies" (Dodson & Sipe, 2007, p.58)

The 'suburbanization of disadvantage' debate



Australia/US:

- shifting location of social disadvantage from inner cities to suburbs
- result of: neoliberal economic policies, income polarization
 + urban renewal, gentrification
- mediated by housing market processes

(Randolph & Tice, 2014)

➢ Is the UK following suit?

The 'suburbanization of disadvantage' debate



File:People at risk of poverty or social exclusion, by degree of urbanisation, 2013 (1) (%)



(*) The size of the bubbles reflects the share of each degree of urbanisation in national population.

(*) Rural areas: estimate.

(3) Rural areas: not available

(*) Towns and suburbs: not available

Source: Eurostat (online data codes: ilc_peps13 and ilc_lvho01)

Source: http://ec.europa.eu/eurostat/statistics-explained/index.php/Quality_of_life_by_degree_of_urbanisation

3 spatial components of vulnerability to fuel price increases - England

Spatial resolution is LSOA

1. Exposure:

Legend

(auintiles)

0% - 2.7%

2.7% - 3.4%

3.4% - 4.0%

4.0% - 4.6%

4.6% - 15.3%

Cost burden ratio = per household expenditure on fuel / median income

Legend Cost burden ratio Median income (£) (auintiles) 9.168 - 24.172 24 172 - 29 389 29.389 - 34.829 34 829 - 42 369 369 . 178 50

(Anonymised MOT tests and results)

2. Sensitivity

Median household income

3. Adaptive capacity

UNIVERSITY OF LEEDS

Travel time to 8 key services by public transport / walking Legend PT/walk time to services (min.) (auintiles) 45 - 80 113 - 142 143 - 964

(Experian Median Income data)

(UK Government Accessibility Statistics)



see Chatterton et al., 2017)

Accessibility by public transport

Journey time to nearest service by PT & or walk

employment

Primary school

Secondary school

Further education

Doctor (GP)

Food shop

Hospital

Sum of journey time to reach all 8 services Adaptive capacity: Total travel time to 8 destinations by Public transport & or walking



DfT LSOA accessibility statistics 2011

A spatial index of vulnerability to fuel price increases - England, 2011



Standardise each component variable (z-scores)

vulnerability to fuel price increases (VFP)

VFP = f(Exposure , Sensitivity , Adaptive Capacity) VFP = cost burden – income + travel time

A spatial index of vulnerability to fuel price increases - England, 2011





Correlation with IMD rank: r=-0.22

English city regions, 2011



London



10

-10

-8

-6

-4

-2 0 2 Vulnerability 4 6 8

West Midlands



Greater Manchester





Sheffield CR







Dodson et al. (e.g. Dodson & Sipe, 2007)

Australian city = "regressive city" – 2 urban structural effects:

1. "Iow socioeconomic status and high car dependence are strongly co-located" (Dodson & Sipe, 2007, p.57)

2. "socioeconomically less advantaged households are spatially co-distributed with less efficient motor vehicle technologies" (Dodson et al., 2013, p.10)

BUT "the socio-spatial structure of Australian cities differs from many overseas jurisdictions, particularly (...) Europe (...) given different socio-spatial and transport geographies" (Dodson & Sipe, 2007, p.58)



		Car dependence		
		Low	Medium	High
Income	Low	4,112	4,029	2,417
	Medium	3,158	3,578	3,821
	High	3,118	3,119	4,320



r = +0.10





		Car dependence		
		Low	Medium	High
Income	Low	4,112	4,029	2,417
	Medium	3,158	3,578	3,821
	High	3,118	3,119	4,320



r = +0.10 (England) r = +0.22 (excluding London)





West Midlands





r = +0.23

Greater Manchester





r = +0.22

r = +0.23

Sheffield CR



West Yorkshire





r = +0.22

Regressive city or regressive *country*?





Regressive city or regressive *country*?





Regressive city or regressive *country*?





Regressive transport funding?



London gets 24 times as much spent on infrastructure per resident than northeleast England



New transport figures reveal London gets £1,500 per head more than the North – but North West powerhouse 'catching-up'

Of course London gets more transport funding than the north. It's addicted to it
By loon Elledge



Greater Leeds is thought to be the largest city in Europe without some form of metro network. Image: Reptonix/Wikimedia Commons.

Here's why London gets so much of Britain's transport funding



It's all the fault of these fellas. Image: HBO.

Fuel economy & income: a regressive spatial distribution?



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Fuel economy & income: a regressive spatial distribution?





Correlation litres per km / vulnerability index: r = -042

Legend

Fuel economy (liters per 100km) (quintiles) 6.514248 - 6.928230



Legendi Expendie Bendel Bendel Bendel Comment Comme

Fuel economy & income: a regressive spatial distribution?



		Fuel economy (litres per km)		
		High	Medium	Low
Income	Low	5,406	3,912	1,240
	Medium	3,863	3,988	2,706
	High	1,289	2,657	6,611



r = +0.60



Conclusions



- Regressive spatial patterns?
 - > at city-region level: not the same as Australia (yet?)
 - ➤ in England VFP ≠ known patterns of deprivation
 - ...but: capital/global city vs. other city regions
 - vehicle efficiency not part of the problem (yet?)



- 1. Housing + Transport affordability analysis (DfT proposal)
- 2. 'Double Energy Vulnerability': Transport vs. Fuel poverty analysis
- 3. Vulnerability to fuel prices vs. cuts to public transport subsidies since 2010
- 4. Transport & fuel poverty vs. spatial patterns in wellbeing / anxiety



Thank you for your attention!

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https://teresproject.wordpress.com/ @TranspPoverty



<u>www.demand.ac.uk</u> @DEMAND_CENTRE



www.MOTproject.net



Read more:

Mattioli, G., Philips, I., Anable, J., Chatterton, T. (2017) Developing an index of vulnerability to motor fuel price increases in England, 49th University Transport Studies Group Conference, Dublin, 4-6 January 2017. Available from: <u>http://eprints.uwe.ac.uk/30778</u>

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