



# How have inequalities in LE and DFLE changed for local areas in England and Wales between 1991 and 2001?

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"Inequalities in health by socio-economic status: Is it a universal fact?"

InHALE -

Inequalities in Healthy Active Life Expectancy: the role of time, place, person and methods

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# Content

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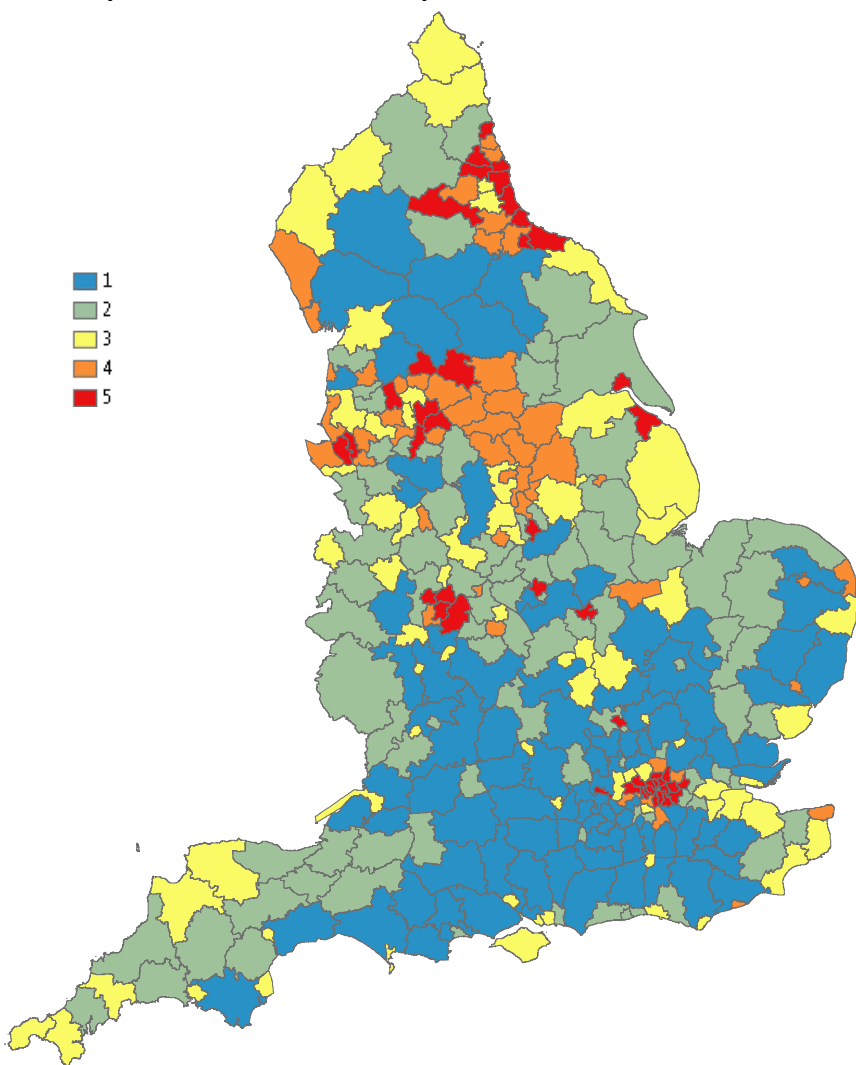
# Research questions

- How have life expectancy (LE) and disability free life expectancy (DFLE) in England and Wales changed between 1991 and 2001?
- Are the patterns of change the same for LE and DFLE?
- How have inequalities in LE and DFLE changed over time?

# Background

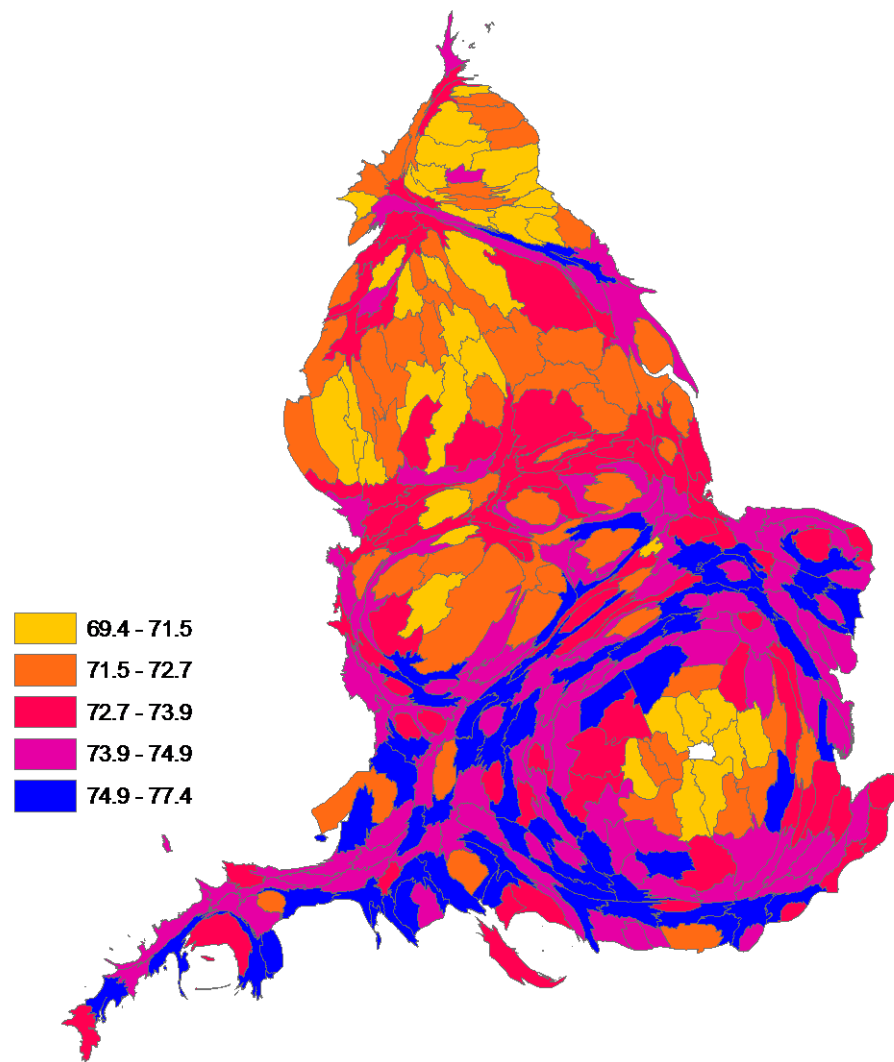
- UK has a long history in health related inequality and significant differences persist in the health of the population both socially and geographically
- The UK has **one of the highest degrees of spatial inequality** in mortality among European countries
- Mortality inequality for the under 75s in Great Britain has been **increasing over the past 40 years**

**Deprivation**  
**-Carstairs Deprivation Index 2001**  
Population based quintiles



**Area based map**

**Life expectancy at birth for men 1991**



**Population based map**

# Data

## Cross sectional

- LE: Office of National statistics (ONS) **vital statistic** data (death) and population mid year estimates 1991 and 2001
- DFLE: self reported limiting long term illness and population counts from **census** 1991 and census 2001

# Methods

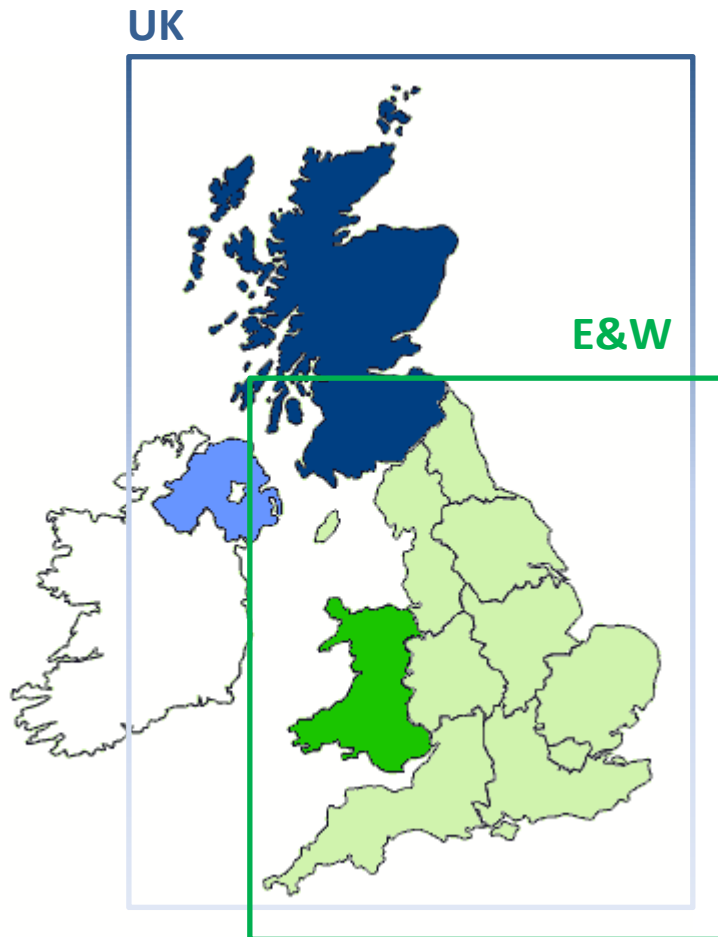
- Abridged life tables to calculate life expectancies (LE) for 5 year age groups (0,1-4, 5-9,.., 85+) for local authorities in E&W for 1991 and 2001
- Sullivan method to calculate disability free life expectancy (DFLE) for local authorities in E&W for 1991 and 2001

# Data preparation

- Geography: boundary changes LA level between 1991 and 2001
- Different age bands for LLTI in 1991 and 2001
- LLTI Question change between 1991 and 2001



# Geography



- England and Wales (E&W) 376 (374) local authorities
- England 354 districts, unitary authorities and London boroughs
- Wales is divided into 22 unitary authority areas

# Analysis and Results

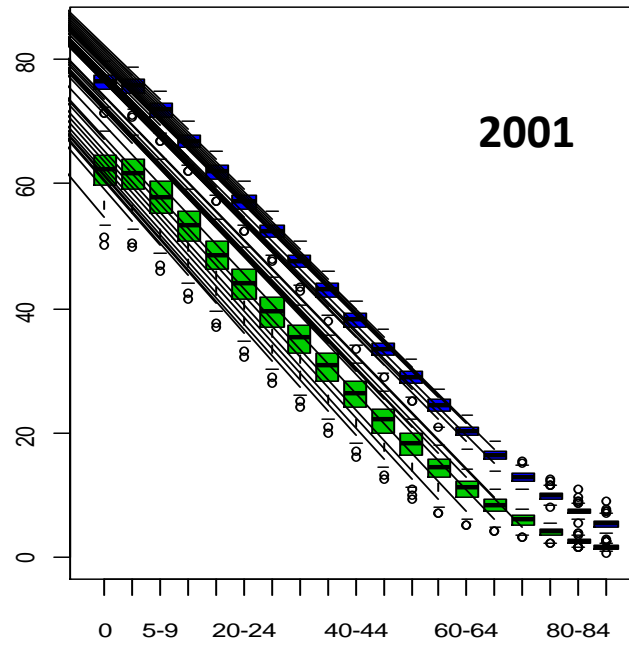
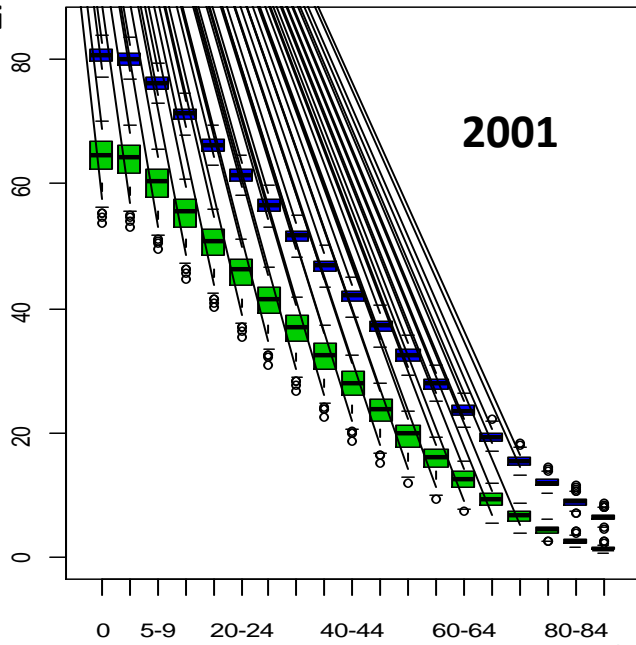
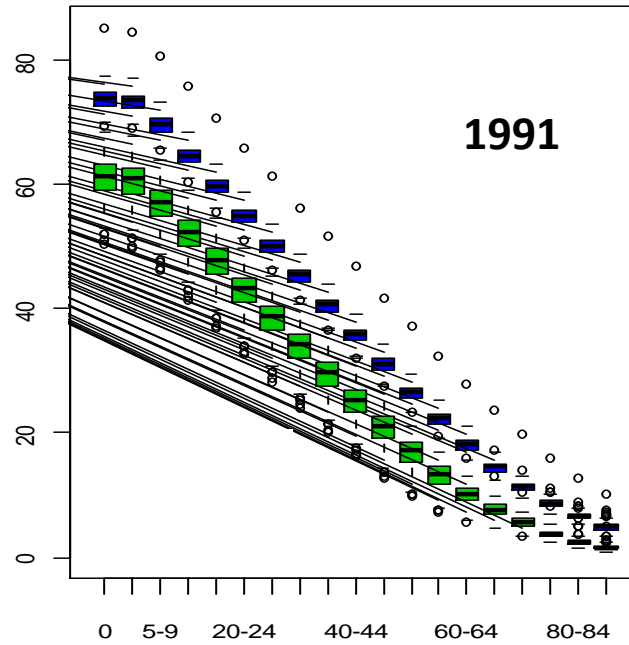
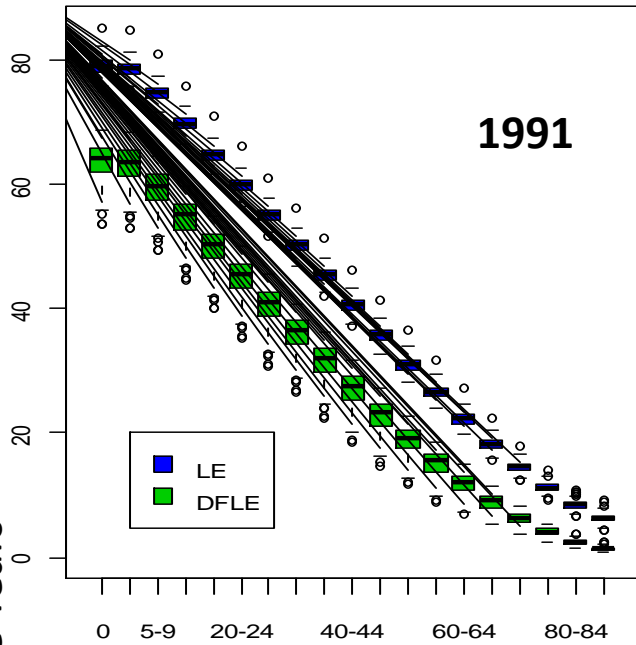
LE and DFLE at Birth, age 50 , age 65 and age 85+

- Changes and Dispersion
- Relationship between LE, DFLE and deprivation

# WOMEN

# MEN

LE and DFLE across local areas in England and Wales for the years 1991 and 2001 women and men for five year age groups



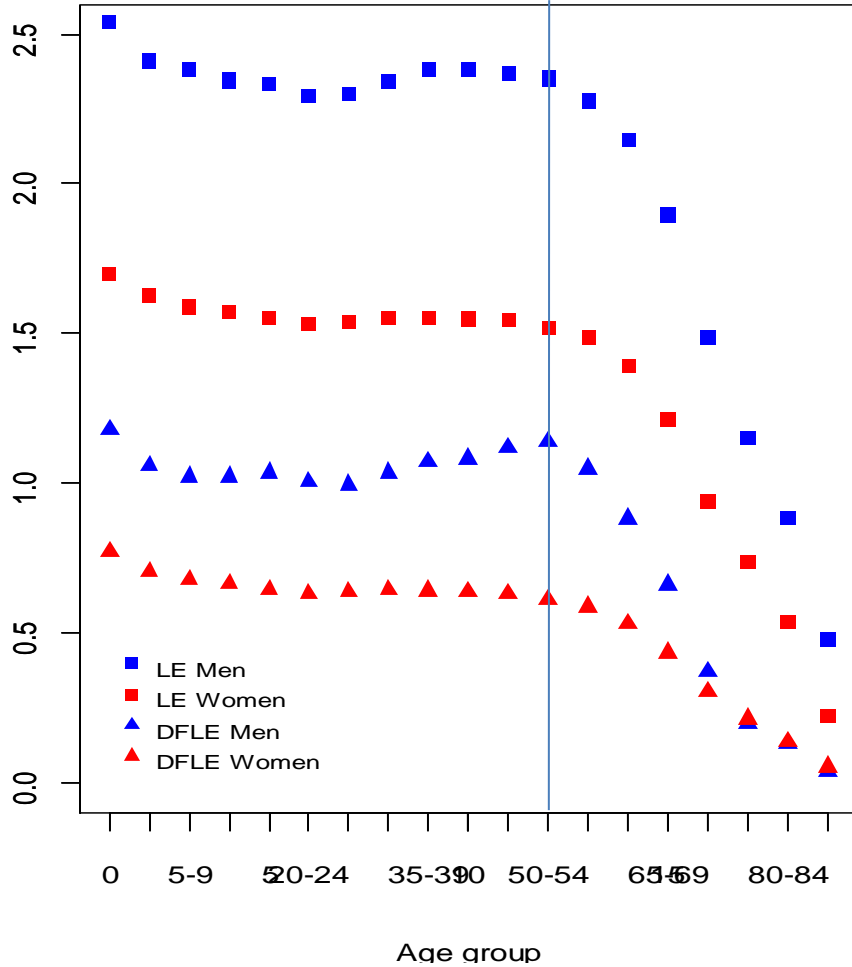
Age groups

# Changes and dispersions in LE and DFLE for England and Wales (1991 and 2001)

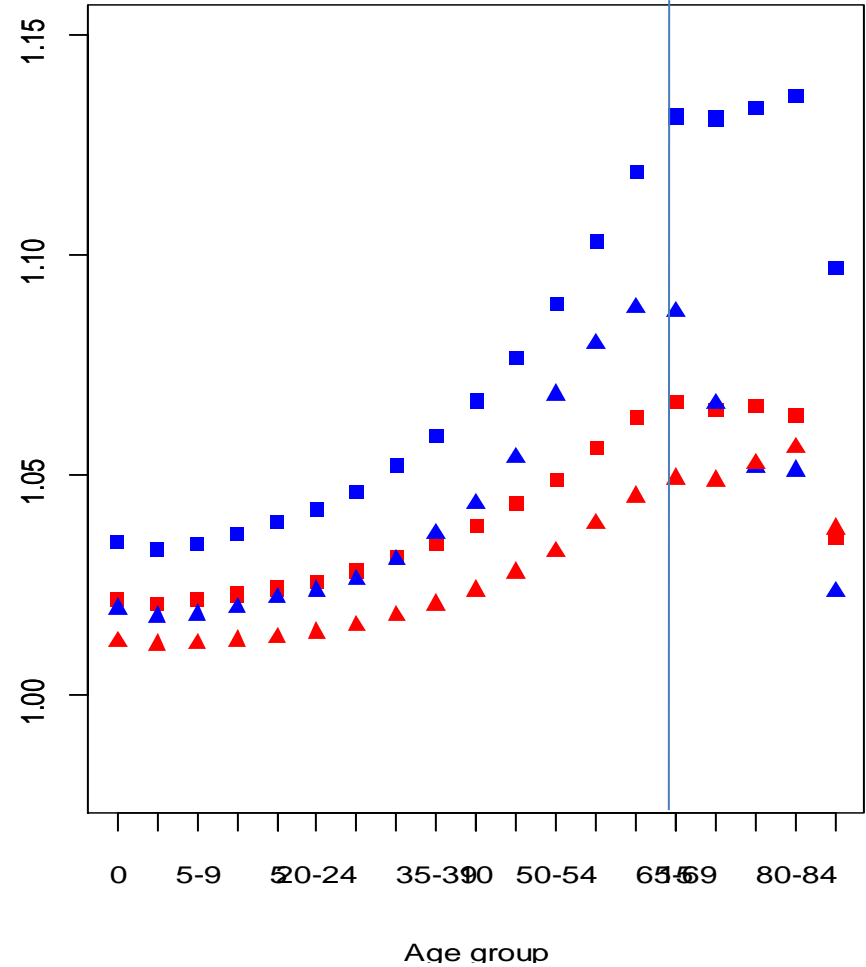
Men									Disability free life expectancy							
Life expectancy									1991				2001			
	Birth	50	65	85	Birth	50	65	85	Birth	50	65	85	Birth	50	65	85
MEAN	73.6	26.5	14.5	4.9	76.2	28.8	16.4	5.4	60.8	16.7	7.6	1.6	62.0	17.9	8.3	1.6
SD	1.6	1.3	1.0	0.7	1.6	1.3	1.0	0.6	3.1	2.2	1.1	0.3	3.4	2.5	1.3	0.3
90-10 range	3.7	3.2	2.1	1.6	4.2	3.4	2.6	1.5	8.0	5.7	2.7	0.7	9.1	6.6	3.6	0.8
IQ range	2.1	1.7	1.3	0.8	2.2	1.9	1.3	0.8	4.3	3.2	1.5	0.4	4.9	3.5	1.9	0.4
MEAN			% change		3.3	8.2	11.6	8.8			% change		1.9	6.4	8.0	2.3
SD			between		1.3	-1.1	0.7	-9.4			between		10.4	12.2	19.6	-5.8
90-10 range			1991 and		11.6	7.3	17.9	-8.5			1991 and		12.8	14.3	26.4	10.9
IQ range			2001		4.3	6.5	2.7	3.6			2001		12.0	8.6	21.5	3.3

Women									Disability free life expectancy							
Life expectancy									1991				2001			
	Birth	50	65	85	Birth	50	65	85	Birth	50	65	65	Birth	50	65	85
MEAN	78.9	31.0	18.2	6.2	80.6	32.5	19.4	6.5	63.6	18.8	8.8	1.4	64.4	19.4	9.3	1.4
SD	1.2	1.1	0.9	0.6	1.3	1.2	0.9	0.6	3.0	2.3	1.3	0.3	3.1	2.3	1.3	0.3
90-10 range	3.0	2.8	2.2	1.6	3.3	3.0	2.4	1.5	7.9	6.0	3.3	0.7	8.1	6.1	3.5	0.8
IQ range	1.7	1.5	1.2	0.8	1.8	1.7	1.3	0.8	4.1	3.1	1.9	0.4	4.3	3.4	1.9	0.4
MEAN			% change		2.1	4.7	6.2	3.5			% change		1.2	3.1	4.7	3.6
SD			between		3.7	3.4	5.1	-2.4			between		3.9	3.4	5.3	6.4
90-10 range			1991 and		7.5	6.2	6.8	-3.0			1991 and		3.4	1.3	6.0	9.0
IQ range			2001		5.1	12.3	7.0	-2.0			2001		6.8	8.5	3.0	8.8

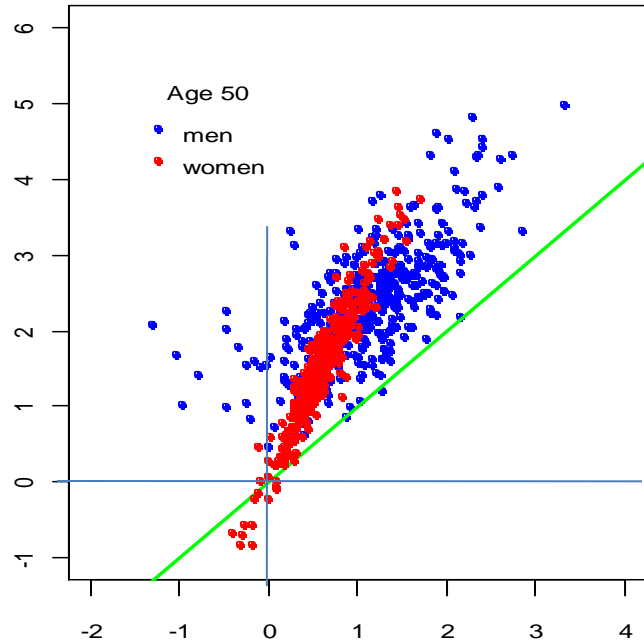
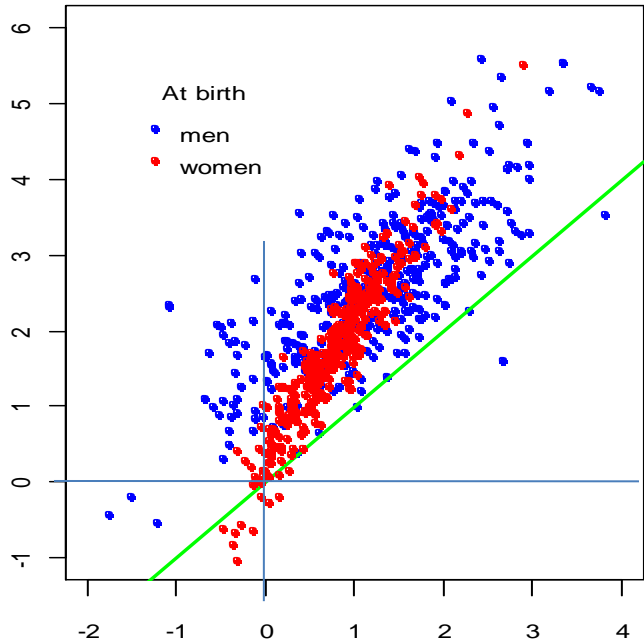
**Absolute change in mean LE and DLFE  
Between 1991 and 2001**



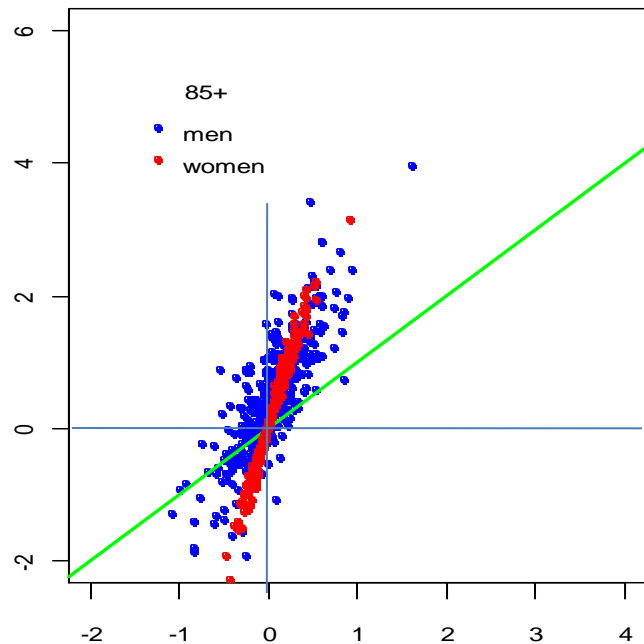
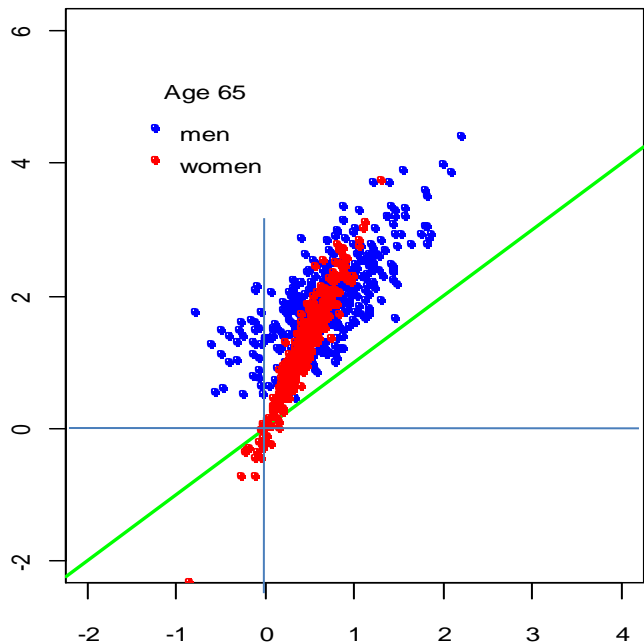
**Relative change in mean LE and DLFE  
Between 1991 and 2001**



**Difference in LE between 1991 and 2001 (LE 2001-LE 1991)**



**Differences in LE between 1991 and 2001 versus differences in DFLE for the same time for 4 ages (at birth, age 50, 65 and 85+) and men and women**



**Difference in DFLE between 1991 and 2001 (DFLE 2001-DFLE 1991)**

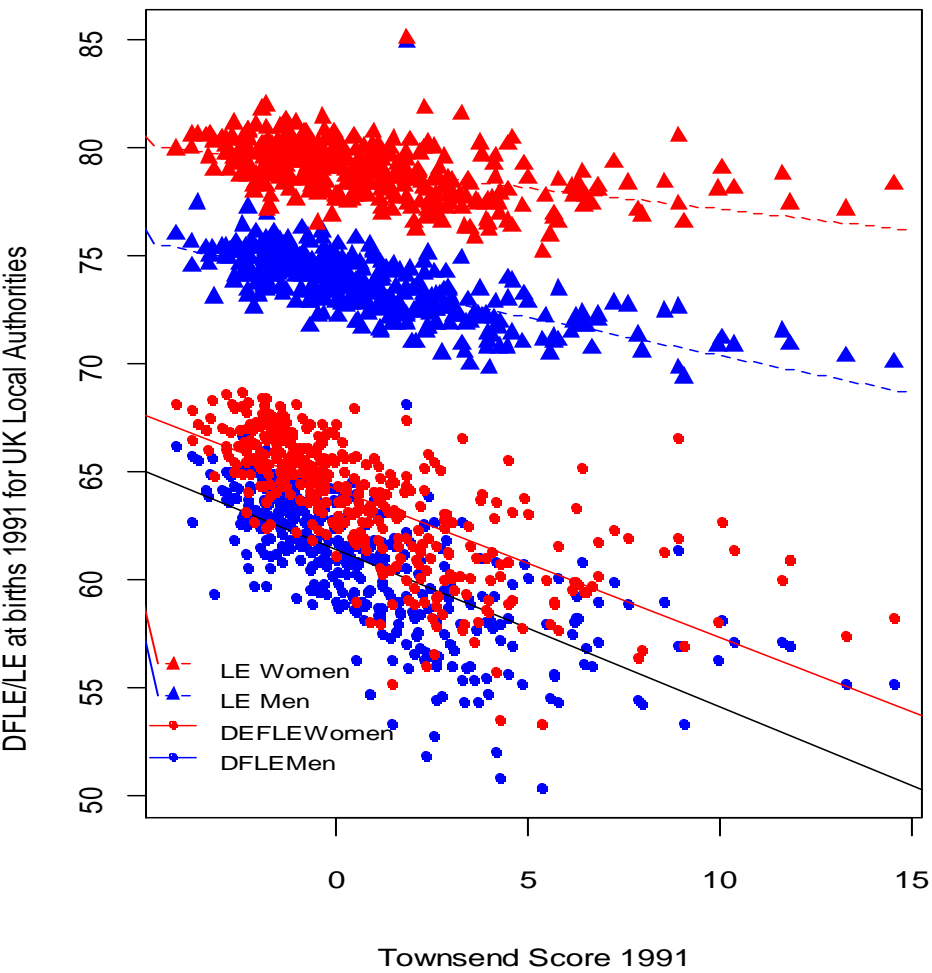
**The relationship between  
LE and DFLE and deprivation in  
England and Wales**

# Deprivation index as socioeconomic indicators

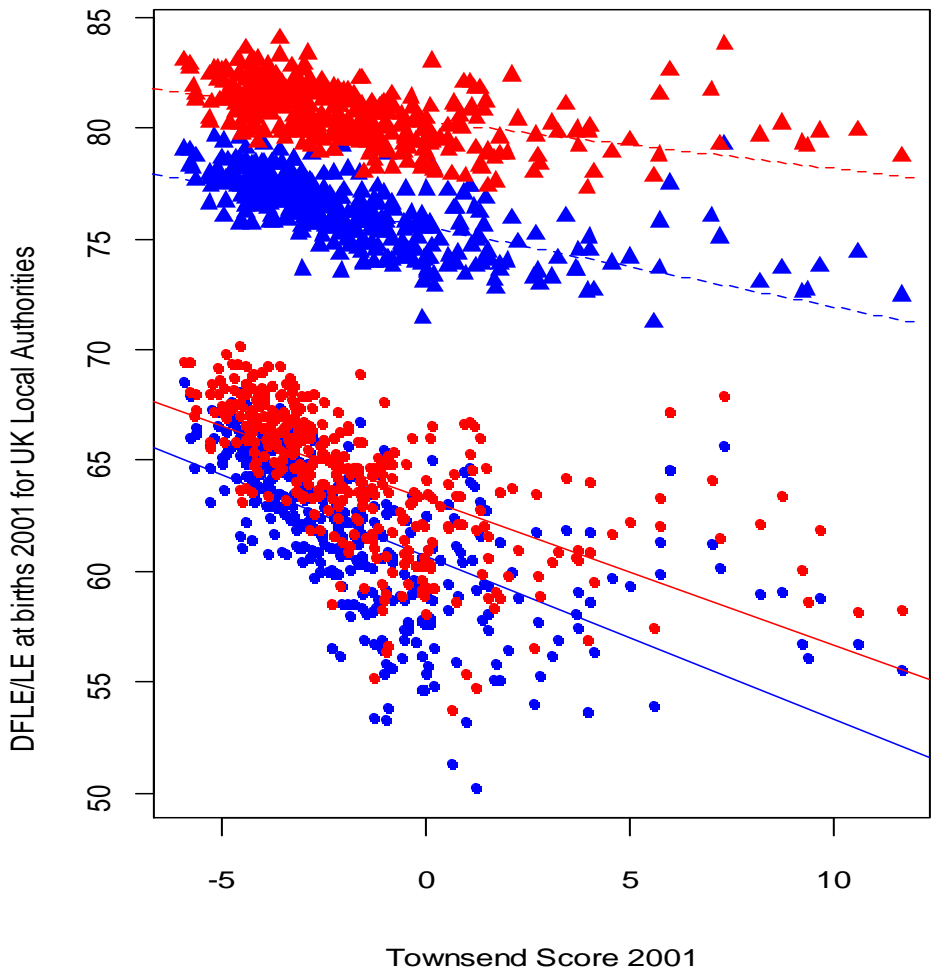
- Townsend score (Townsend *et al.* 1988)
  - i. % households with no car
  - ii. % households not owner occupied
  - iii. % persons unemployed
  - iv. % households overcrowded



# LE and DFLE at birth- Townsend deprivation index 1991 and 2001



Least deprived                      Most deprived



Least deprived                      Most deprived

# The relationship between DFLE and LE and the Townsend deprivation index for men and women at various ages in 1991 and 2001

Year	Gender	Age	Variable	r <sup>2</sup>	Slope	Year	Gender	Age	Variable	r <sup>2</sup>	Slope
1991	Men	at Birth	DFLE	0.49	-0.73	2001	Men	at Birth	DFLE	0.60	-0.81
			LE	0.46	-0.36				LE	0.59	-0.37
		Age 50	DFLE	0.41	-0.47			Age 50	DFLE	0.38	-0.53
			LE	0.39	-0.28				LE	0.43	-0.30
		Age 65	DFLE	0.32	-0.20			Age 65	DFLE	0.28	-0.25
			LE	0.22	-0.15				LE	0.26	-0.17
		Age 85+	DFLE	0.01	-0.01			Age 85+	DFLE	0.01	-0.01
			LE	0.00	0.01				LE	0.01	0.02
	Women	at Birth	DFLE	0.48	-0.69		Women	at Birth	DFLE	0.61	-0.73
			LE	0.23	-0.20				LE	0.39	-0.24
		Age 50	DFLE	0.47	-0.51			Age 50	DFLE	0.38	-0.49
			LE	0.22	-0.18				LE	0.22	-0.19
		Age 65	DFLE	0.35	-0.25			Age 65	DFLE	0.26	-0.23
			LE	0.13	-0.11				LE	0.12	-0.11
		Age 85+	DFLE	0.01	-0.01			Age 85+	DFLE	0.00	0.00
			LE	0.01	0.02				LE	0.02	0.03

## ***Conclusions and outlook***

- How have life expectancy (LE) and disability free life expectancy (DFLE) in England and Wales changed between 1991 and 2001?



**Mean LE and mean DFLE both increased between 1991 and 2001 across age groups and gender in England and Wales**

**In single local areas decrease in LE and DFLE, especially in the oldest ages (85+)**

**For E&W increase is larger in LE compared to DFLE – expansion of morbidity**

## ***Conclusion and outlook***

- Are the patterns of change the same for LE and DFLE?

Yes and no

- Across E&W, mean LE and DFLE increase in absolute numbers for younger ages, until about 50
- Relative change increases with age until about age 65.
- On local area level, the change in LE and DFLE seem to be closer linked in women compared to men-  
further investigation needed

## ***Conclusions and outlook***

- How have inequalities in LE and DFLE changed over time?

Inequalities might have increased across England and Wales in both LE and DFLE

for most ages except LE 85+ both men and women

Ranges in DFLE increased more than LE for men

Ranges in LE increased more than DFLE for women

Deprivation explains more of the variation of DFLE and LE at birth in 2001 compared to 1991 for both men and women

# Outlook

- Analyse healthy life expectancy in 2001
- Social factors that explain the variation in HLE and DFLE between local authorities (in England and Wales) - meta regression analysis
- Update data with Census 2011 data
  - up to date information
  - time series DFLE 1991, 2001, 2011
  - change over time in HLE 2001 and 2011

# Acknowledgments

- Thanks to...
  - .....ethpop.org team, University of Leeds
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**Thanks!**