



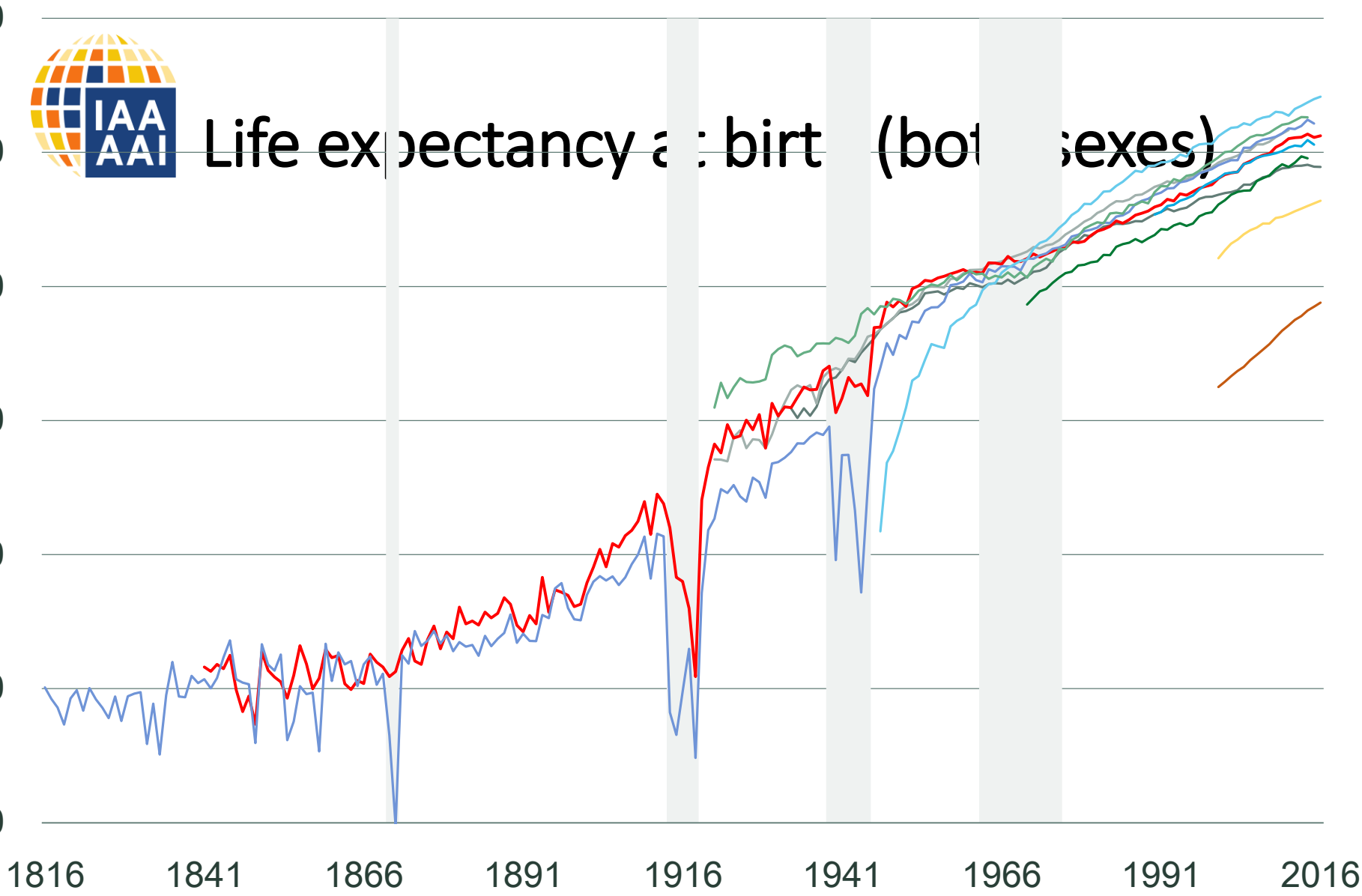
Declining mortality improvements – the UK Story

Aisling Kennedy

Swiss Re



Life expectancy at birth (both sexes)



- US (79)
- CA (82)
- E&W* (81)
- FR (82)
- DE (81)
- JP (84)
- TW (80)
- AU (83)
- CN (76)
- IN (69)

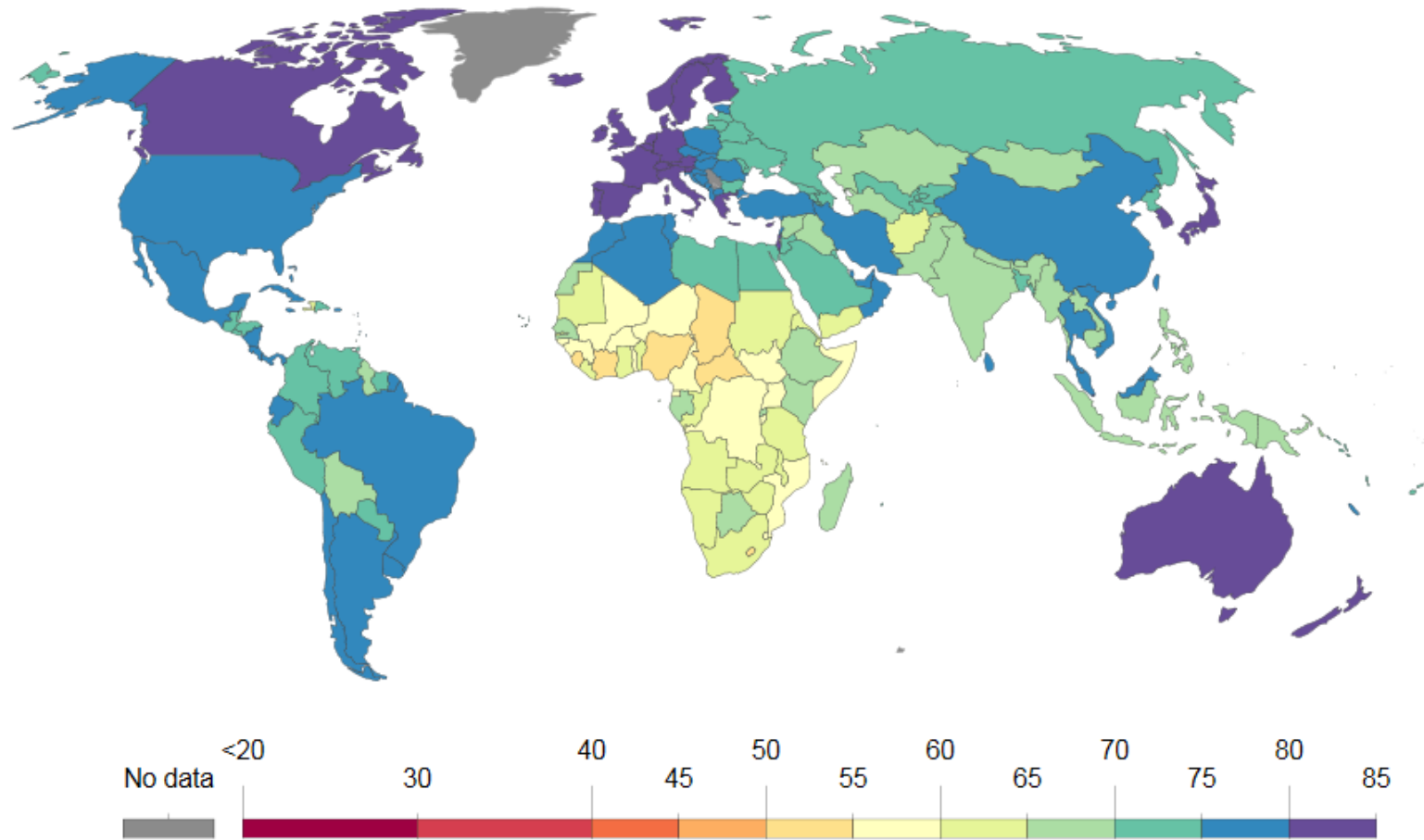
England & Wales

Swiss Re Institute, Sigma No 6/2018





Life expectancy at birth (both sexes)



OurWorldinData.org

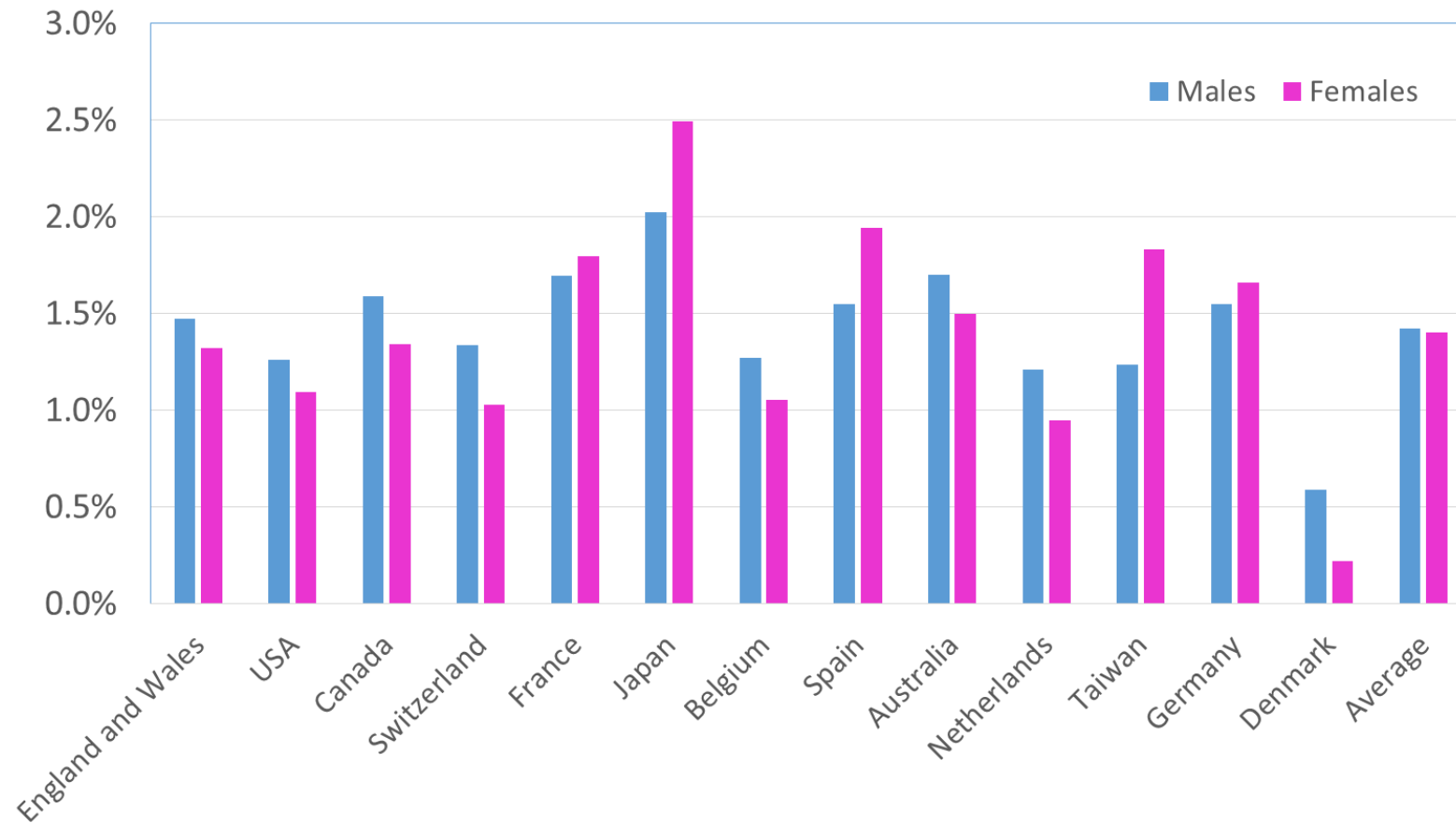
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Long run mortality improvements

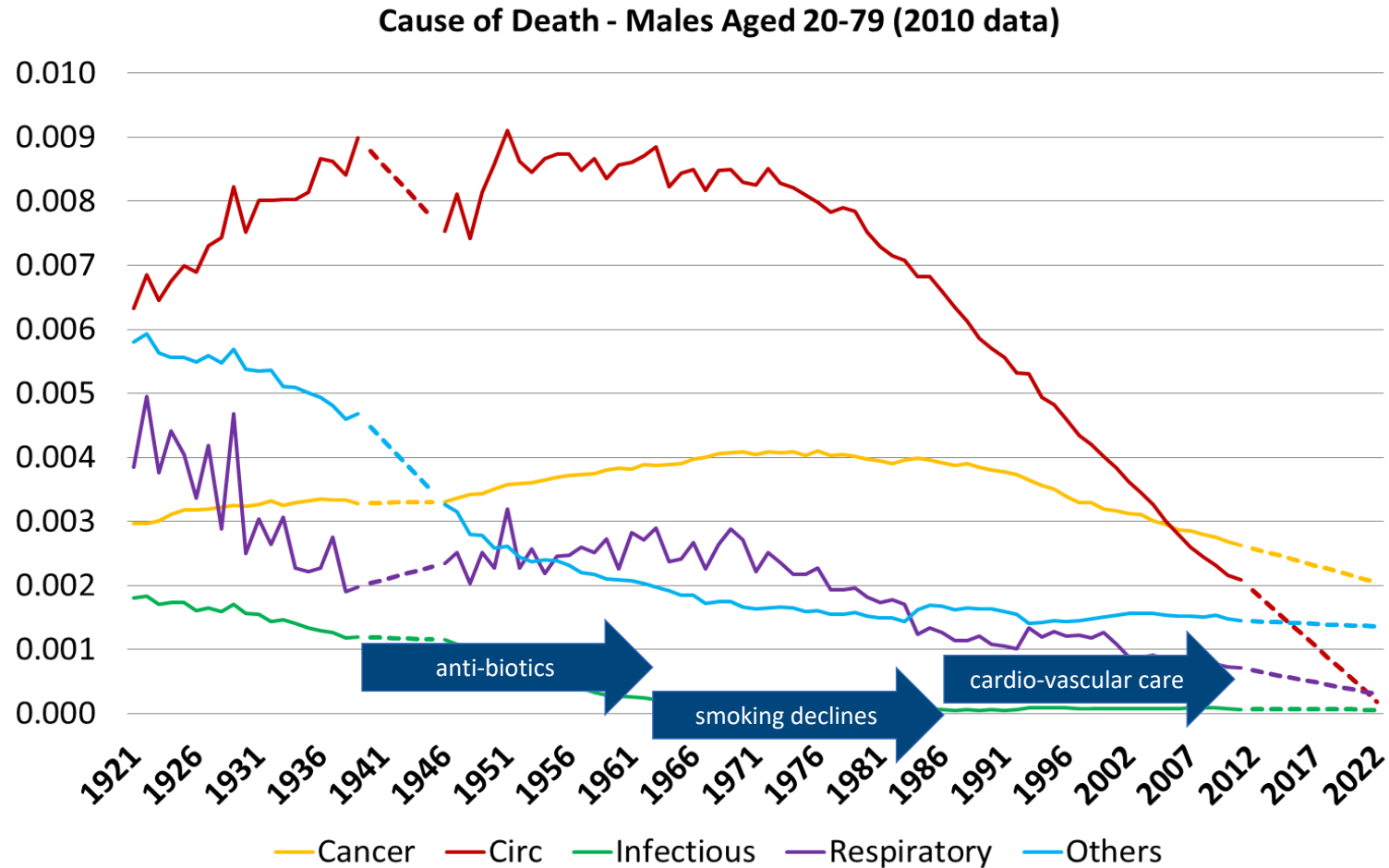
Average improvements - ages 30-90 - 1965 to present



Human Mortality Database, Swiss Re calculation



Long run mortality improvements

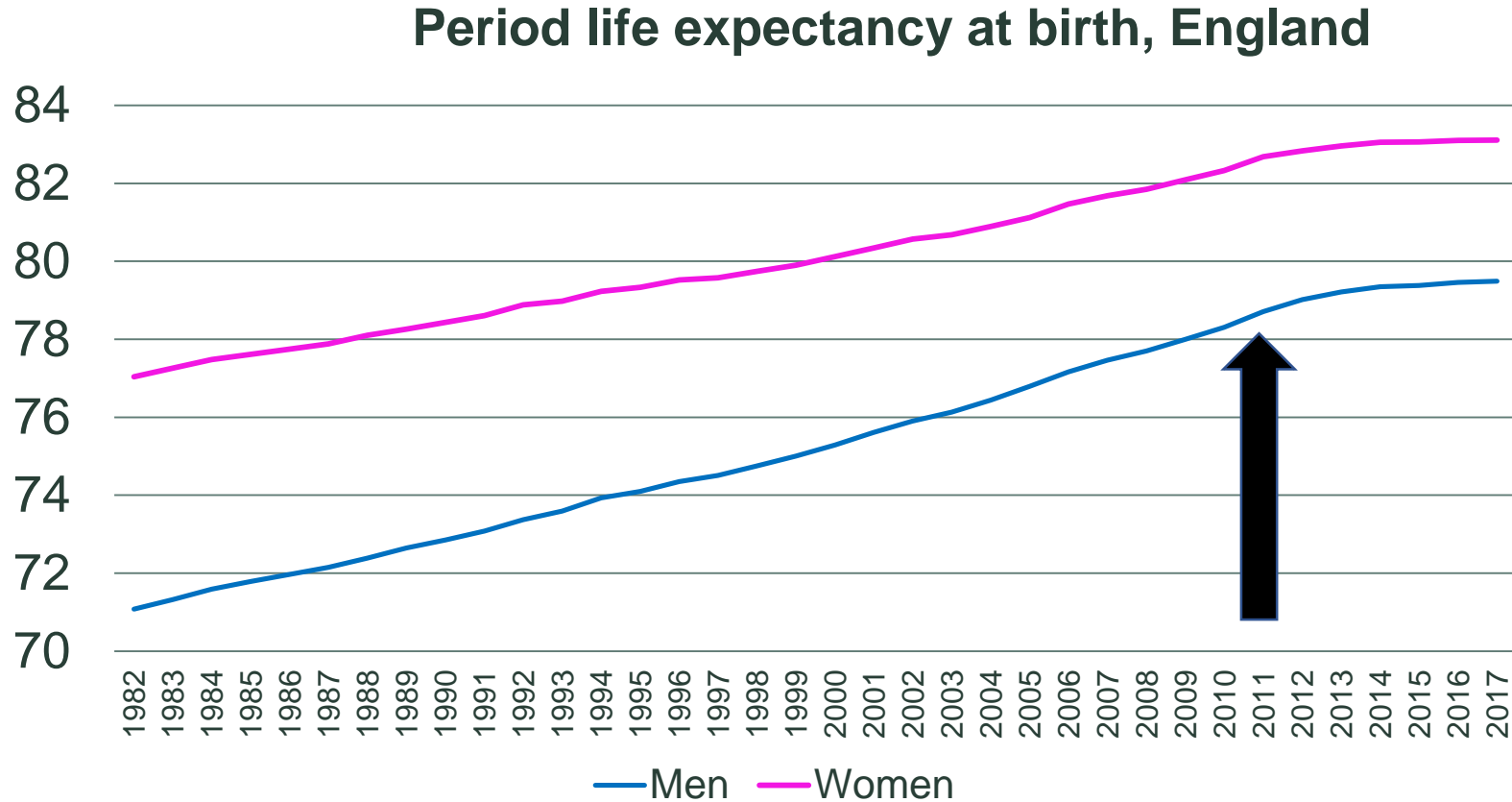


- Solid lines are observed data (up to 2010)
- Dotted lines are linear extrapolations of trends
- Recent improvements have diverged from trend

Office for National Statistics (ONS) data, Swiss Re calculation



Improvements slow down...stall...

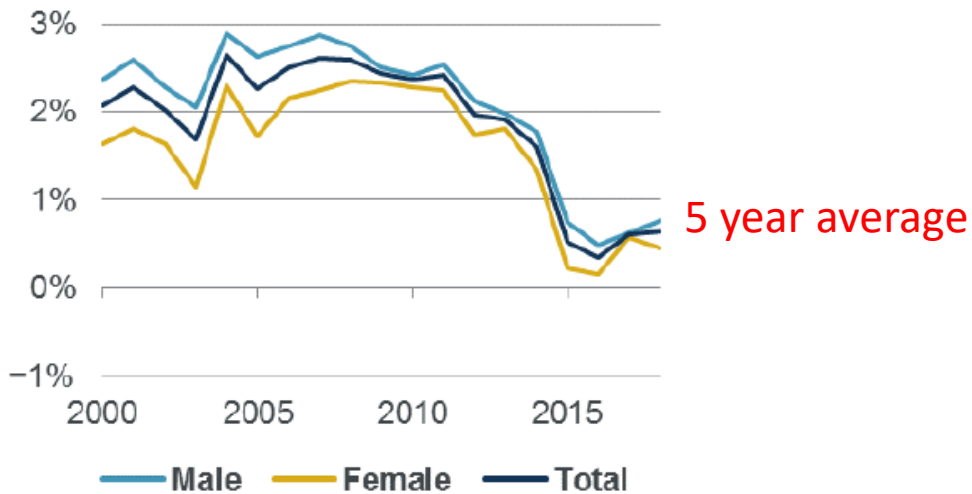
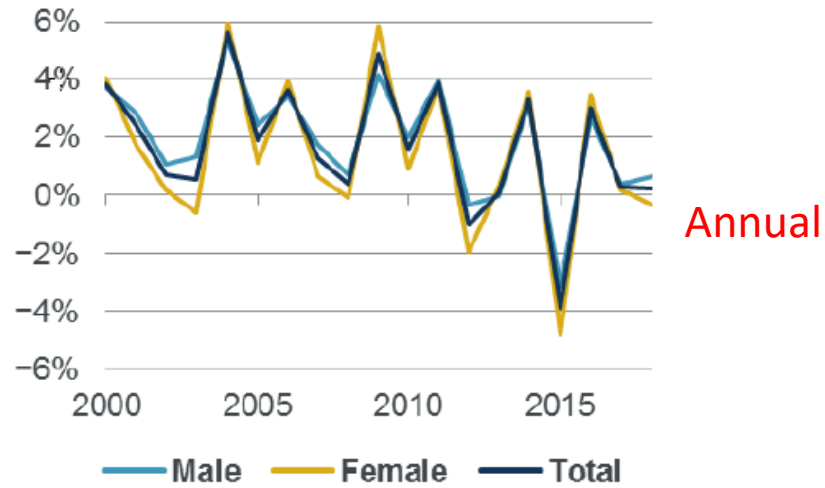


ONS, rolling three year average

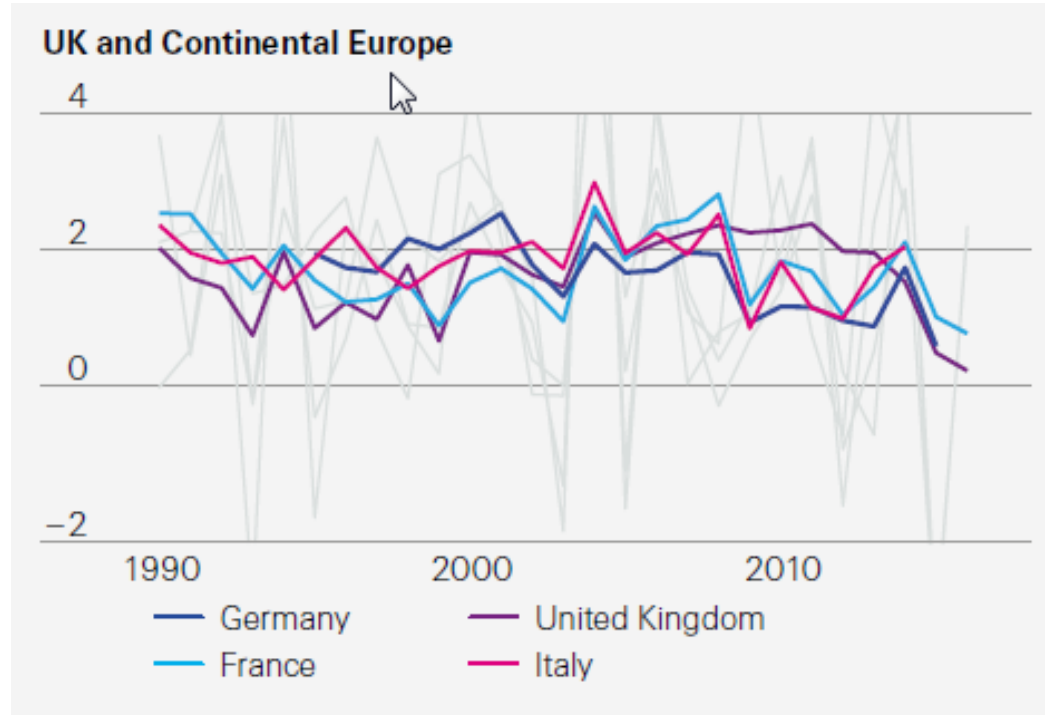


Latest improvements

England & Wales



CMI Working Paper 119



Coloured lines show 5 year average, gray lines show annual rates

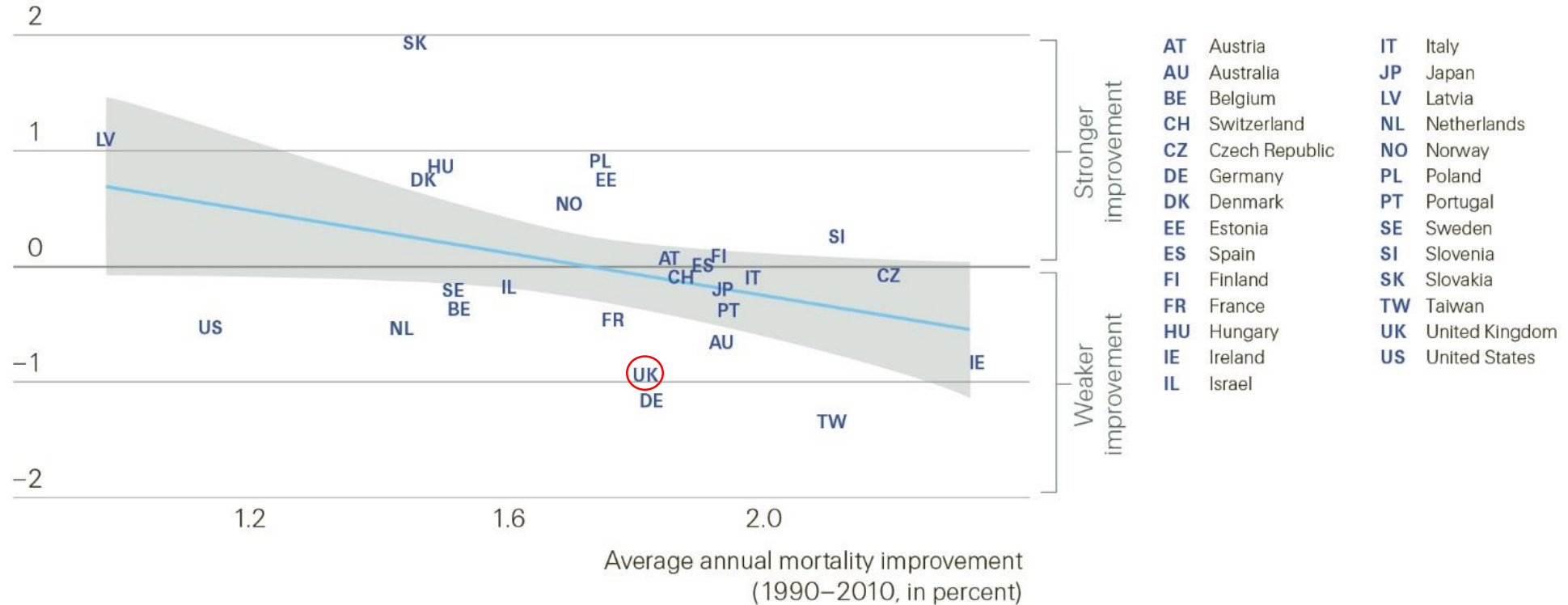
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Change in improvement rates since 2010

Recent deviation from 1990–2010 average improvement
(2011 – latest observation, average, in percentage point)



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Historic & projected improvement rates by cohort

Chart 4A: Mortality improvements (male)

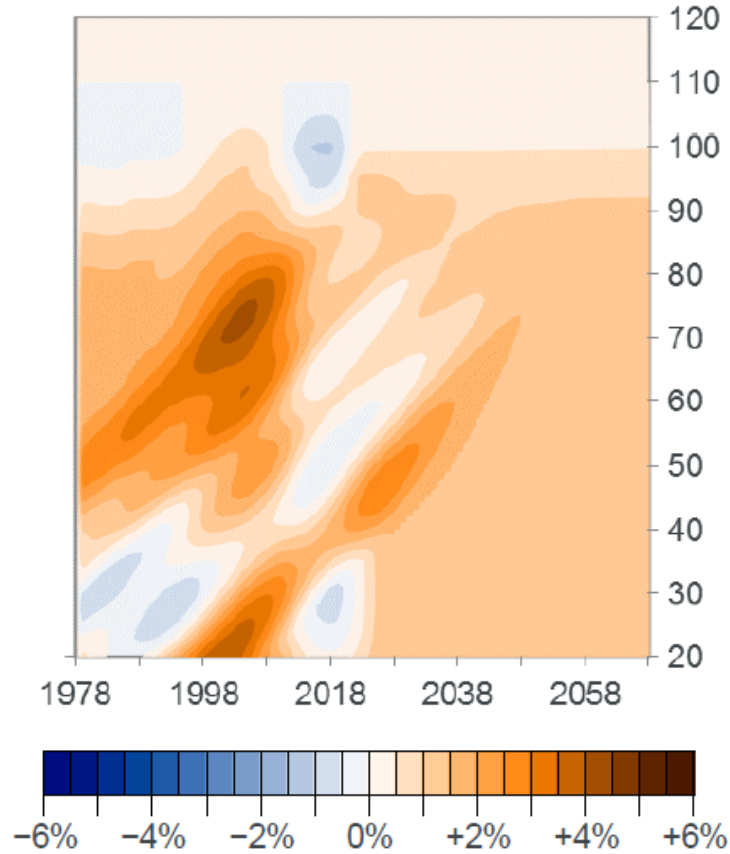
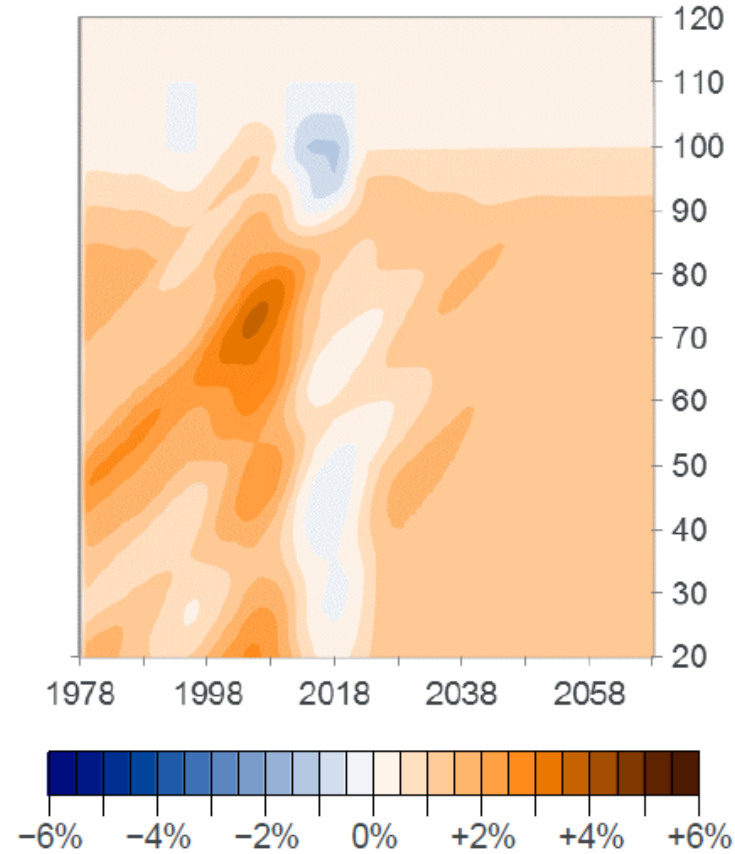


Chart 4B: Mortality improvements (female)



CMI 2018
Core Model,
based on an
illustrative
long term rate
of 1.5% p.a.

CMI Working Paper 119



Impact of reducing improvement rates

Table 5.1: Life expectancies from CMI_2018 and earlier versions (male)

Age	25	35	45	55	65	75	85	95
CMI_2015	65.286	54.206	43.284	32.923	22.963	13.996	7.014	3.006
CMI_2016	64.082	53.312	42.553	32.317	22.633	13.893	6.879	2.812
CMI_2017	63.883	53.107	42.313	32.103	22.454	13.769	6.817	2.780
CMI_2018	63.210	52.420	41.602	31.471	21.921	13.391	6.612	2.677

Table 5.2: Life expectancies from CMI_2018 and earlier versions (female)

Age	25	35	45	55	65	75	85	95
CMI_2015	68.157	57.092	46.186	35.607	25.354	15.784	7.926	3.430
CMI_2016	66.645	55.843	45.178	34.854	24.851	15.560	7.733	3.168
CMI_2017	66.512	55.707	45.038	34.712	24.709	15.447	7.672	3.139
CMI_2018	65.935	55.111	44.431	34.144	24.200	15.060	7.456	3.035



Improvements within deciles of IMD (Index of Multiple Deprivation)*

Chart 4C: Five-year average mortality improvements, males

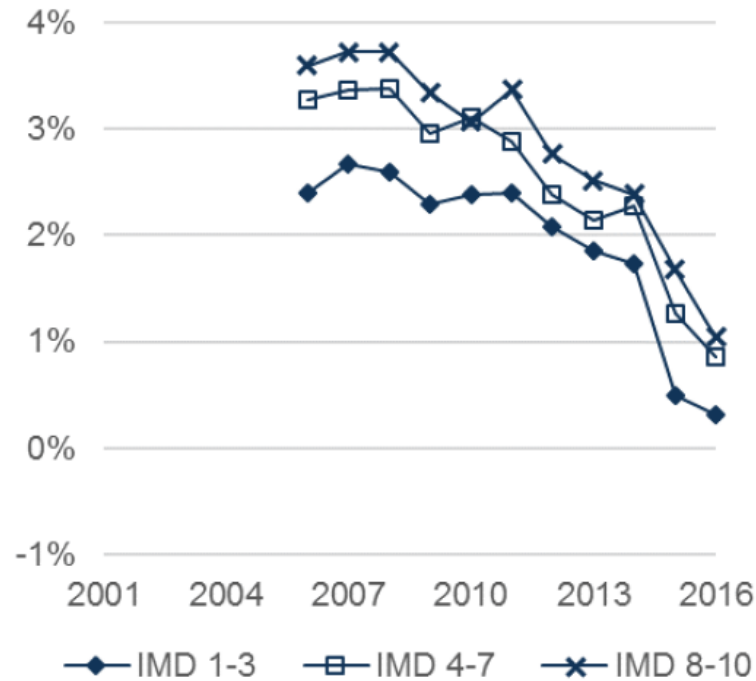
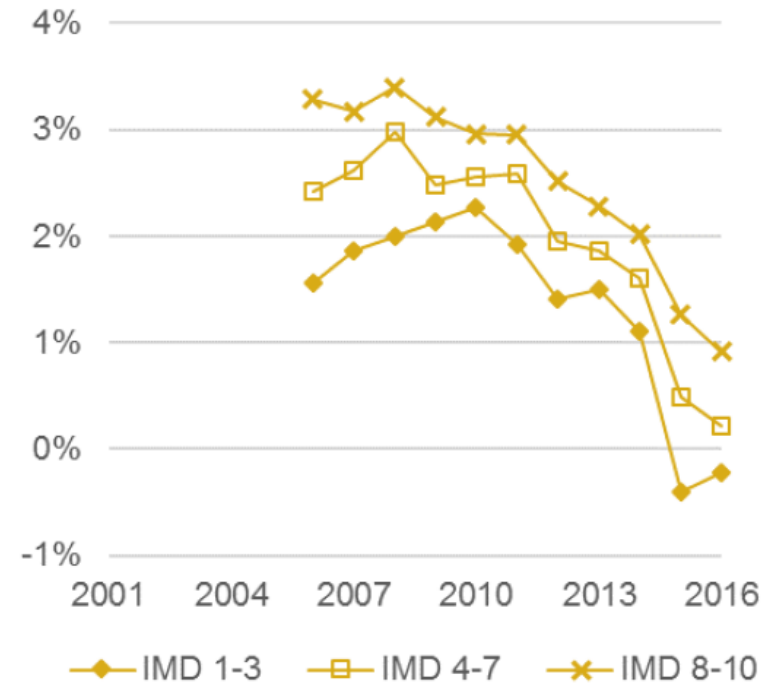


Chart 4D: Five-year average mortality improvements, females

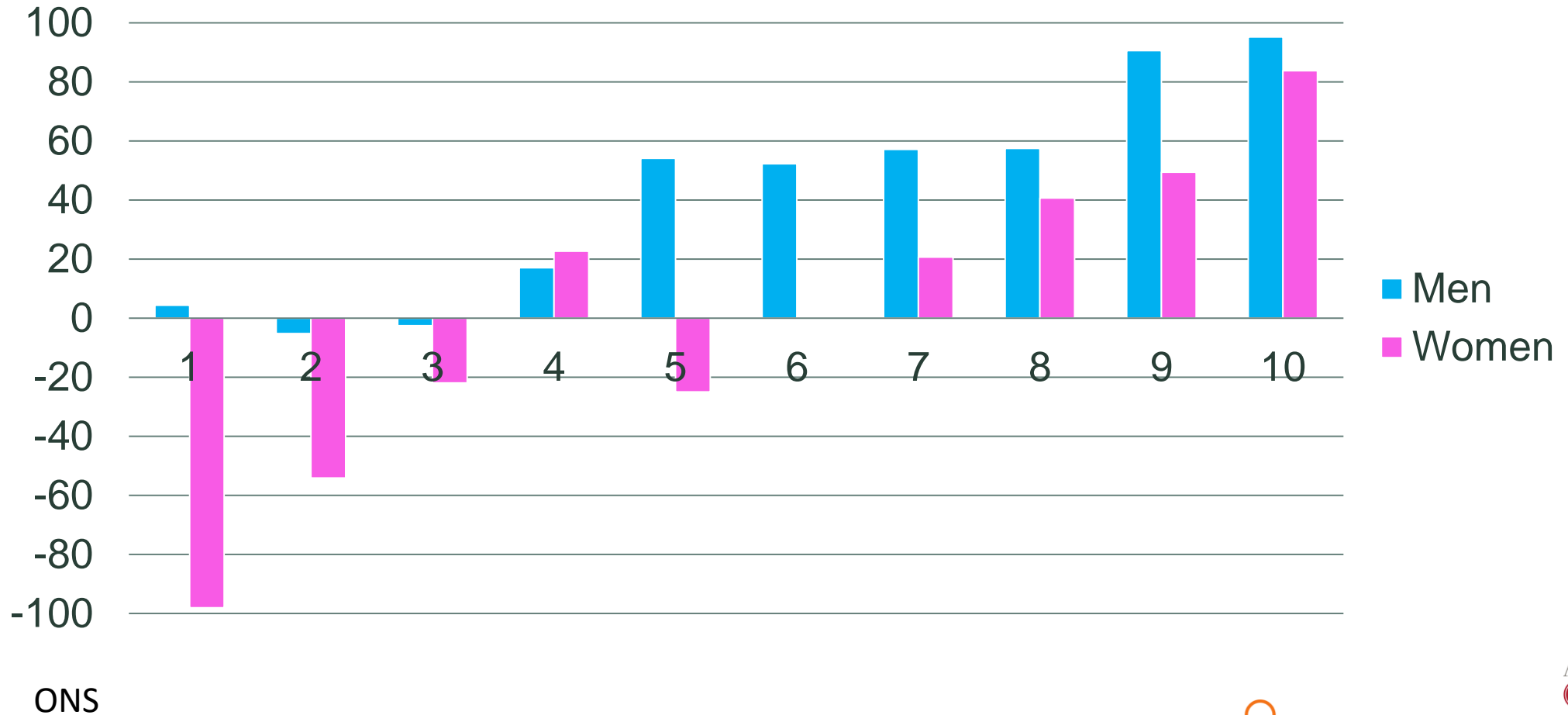


CMI Working Paper 115

*https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/464430/English_Index_of_Multiple_Deprivation_2015_-_Guidance.pdf



Change in life expectancy in days between 2012-2014 and 2015-2017: by IMD decile, England





Pensioner experience is better than population

Table 4.1: Comparison of mortality improvements between the SAPS dataset and the England & Wales (E&W) general population (males, ages 65-100)

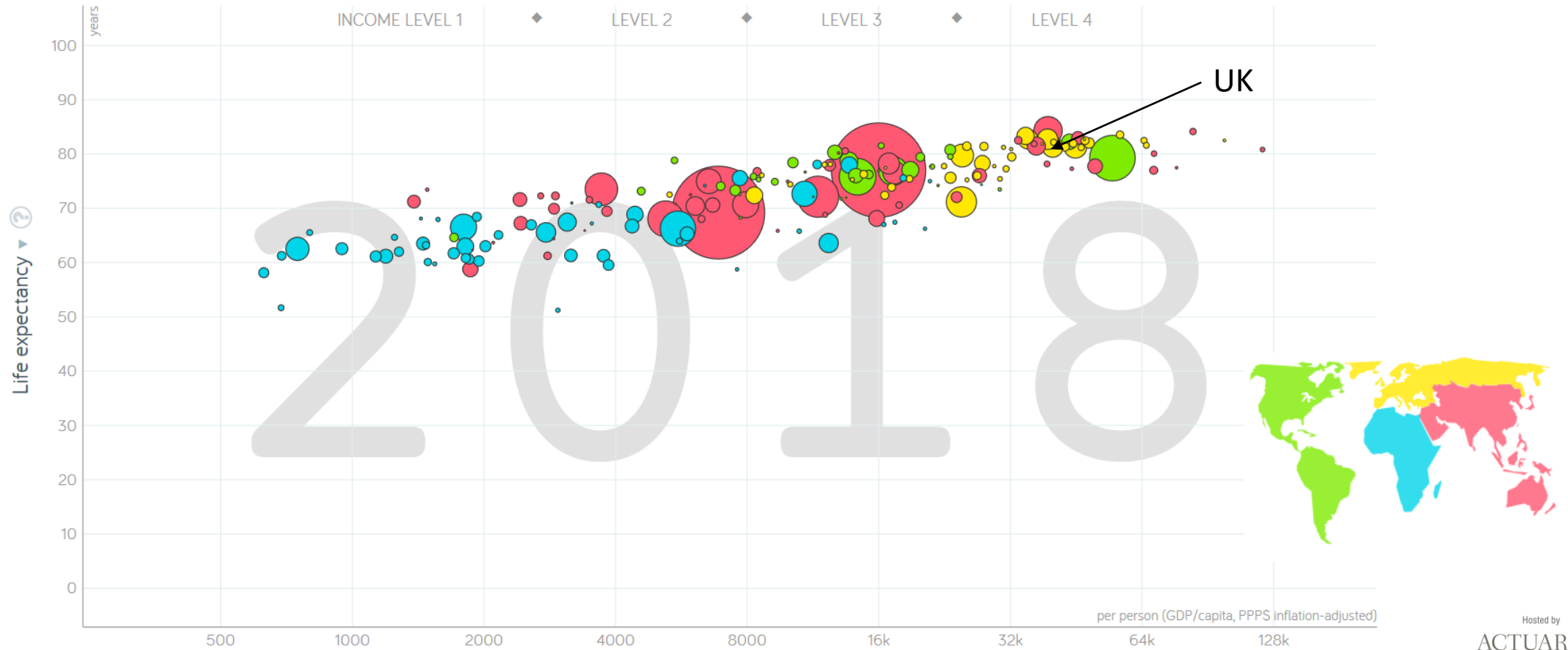
Year	E&W	SAPS (Lives)	SAPS (Amounts)	Difference (Lives)	Difference (Amounts)
2008-11	+2.8% ($\pm 0.2\%$)	+3.7% ($\pm 0.4\%$)	+3.5% ($\pm 0.7\%$)	+1.0% ($\pm 0.4\%$)	+0.8% ($\pm 0.7\%$)
2012-16	+0.6% ($\pm 0.1\%$)	+1.9% ($\pm 0.5\%$)	+2.8% ($\pm 0.9\%$)	+1.3% ($\pm 0.5\%$)	+2.1% ($\pm 0.9\%$)
2008-16	+1.6% ($\pm 0.1\%$)	+2.7% ($\pm 0.3\%$)	+3.1% ($\pm 0.4\%$)	+1.2% ($\pm 0.3\%$)	+1.5% ($\pm 0.4\%$)

Table 4.2: Comparison of mortality improvements between the SAPS dataset and the England & Wales (E&W) general population (females, ages 65-100)

Year	E&W	SAPS (Lives)	SAPS (Amounts)	Difference (Lives)	Difference (Amounts)
2008-11	+2.8% ($\pm 0.1\%$)	+3.2% ($\pm 0.4\%$)	+3.8% ($\pm 0.6\%$)	+0.4% ($\pm 0.4\%$)	+1.0% ($\pm 0.6\%$)
2012-16	+0.1% ($\pm 0.1\%$)	+1.7% ($\pm 0.5\%$)	+2.7% ($\pm 1.0\%$)	+1.5% ($\pm 0.5\%$)	+2.5% ($\pm 1.0\%$)
2008-16	+1.3% ($\pm 0.1\%$)	+2.3% ($\pm 0.3\%$)	+3.2% ($\pm 0.5\%$)	+1.0% ($\pm 0.3\%$)	+1.8% ($\pm 0.5\%$)



International life expectancy by income level



Gapminder

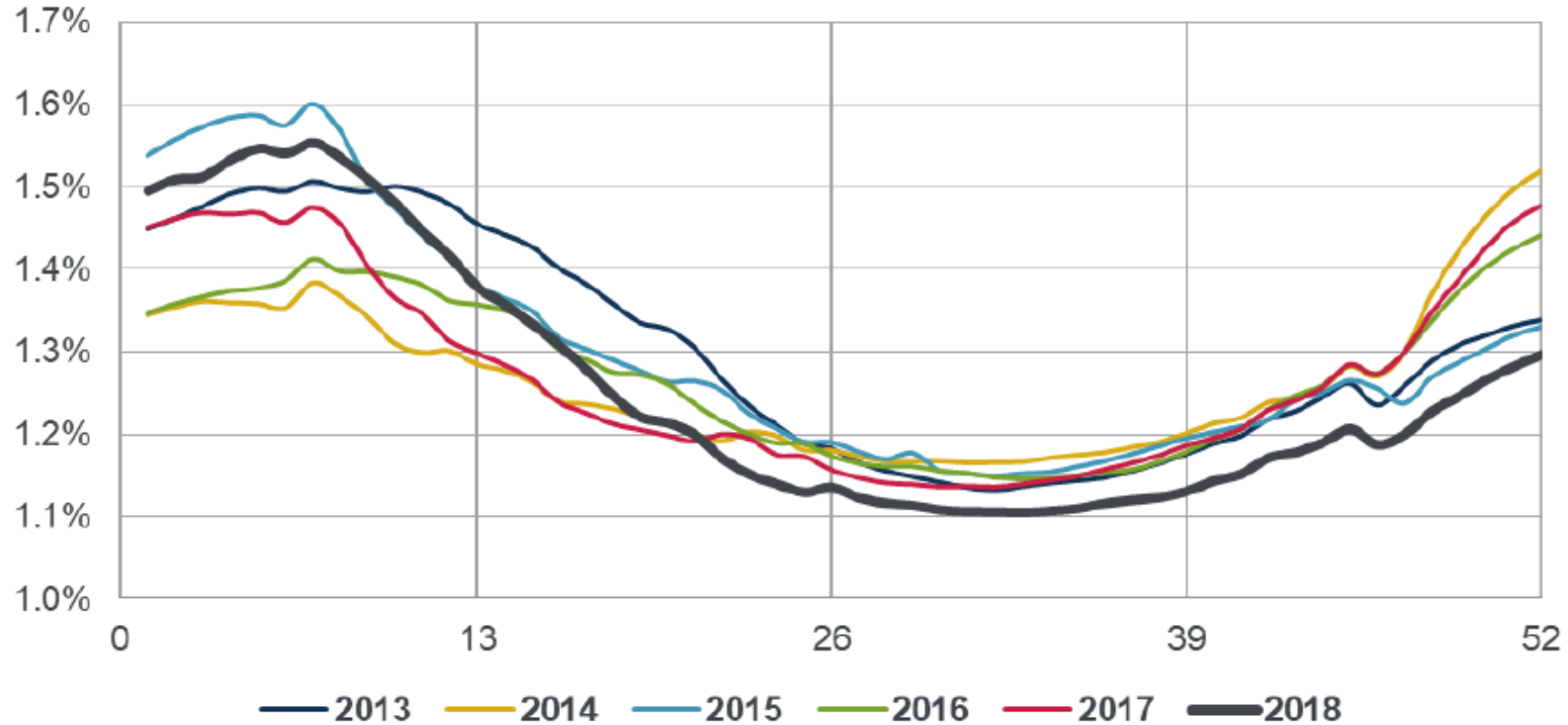
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Seasonality

Quarterly centred average SMRs (standardised mortality ratios) by week number

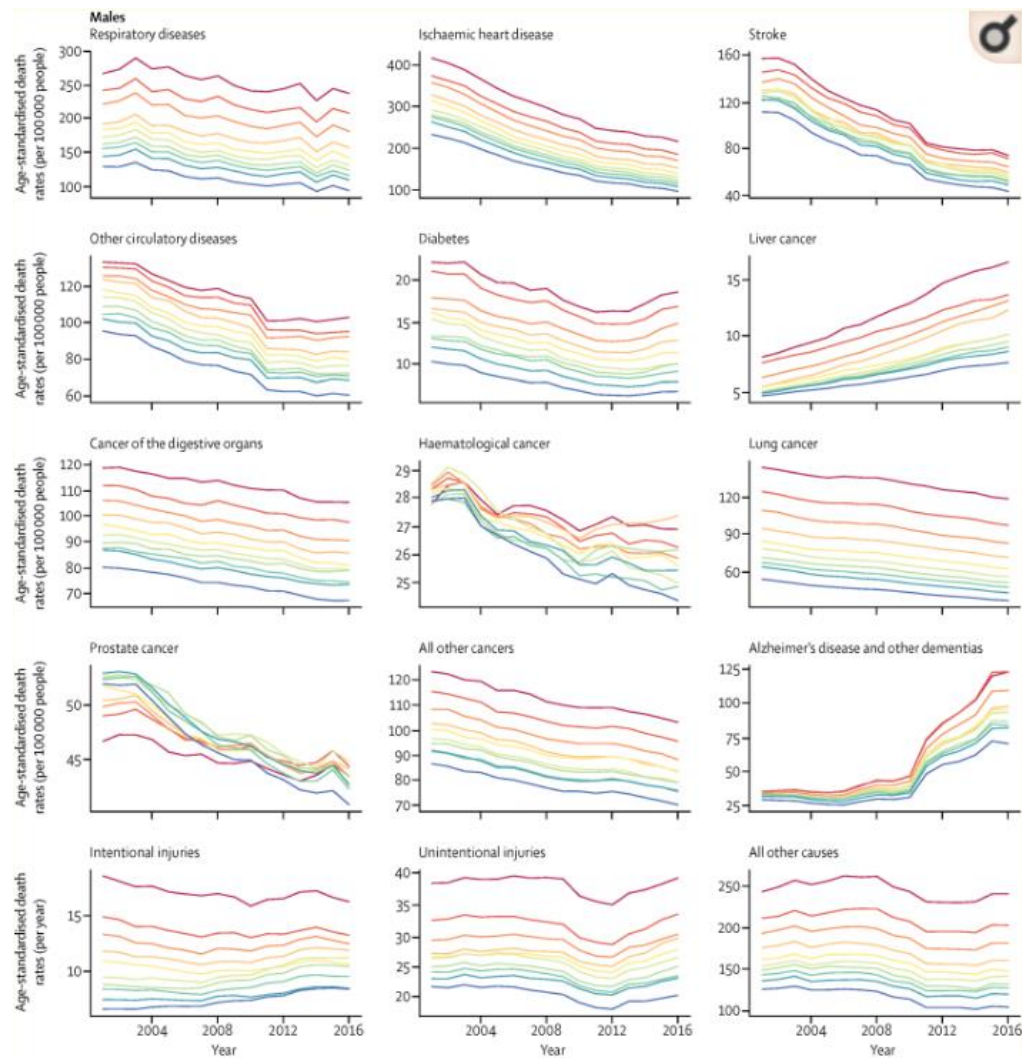




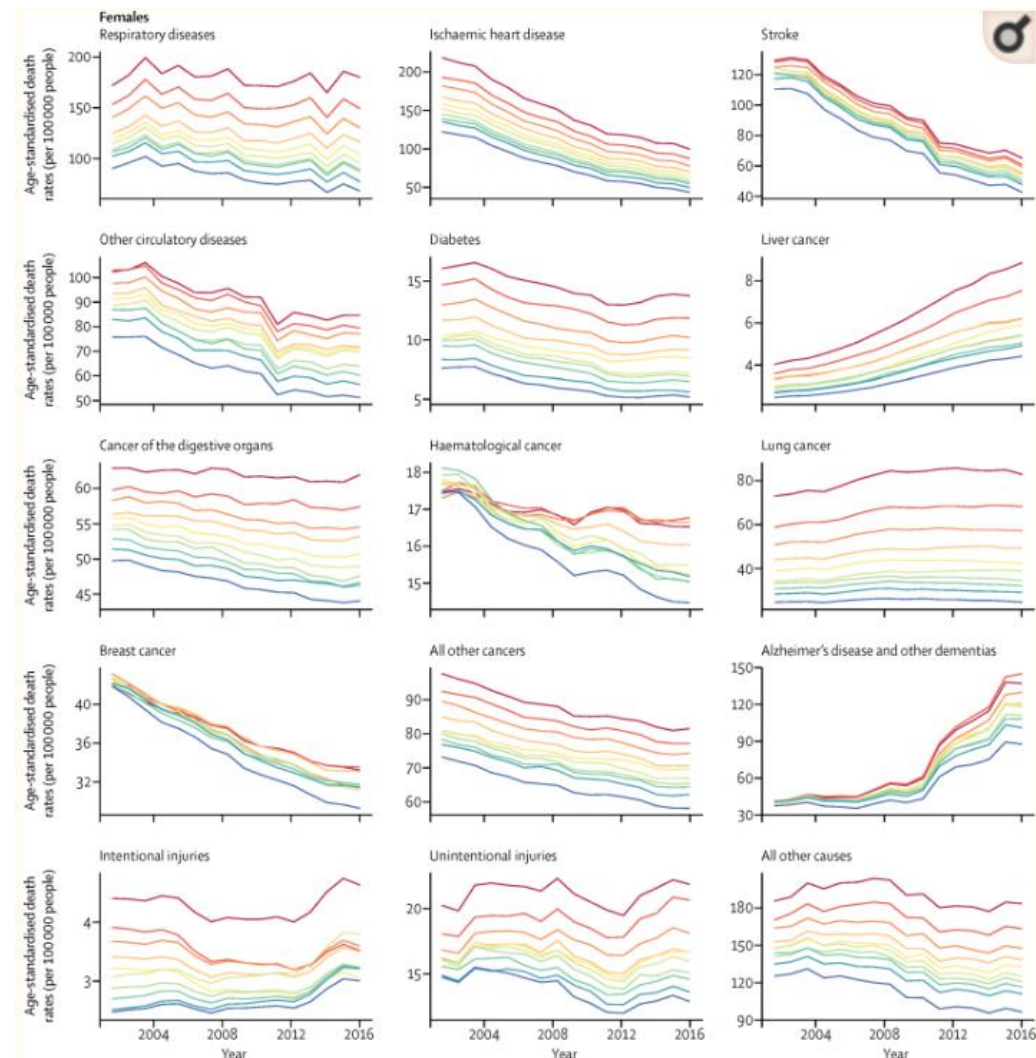
Age-standardised mortality rates by cause of death & IMD

Lancet Public Health, Dec 2018, Bennett et al, doi: 10.1016/S2468-2667(18)30214-7

Men



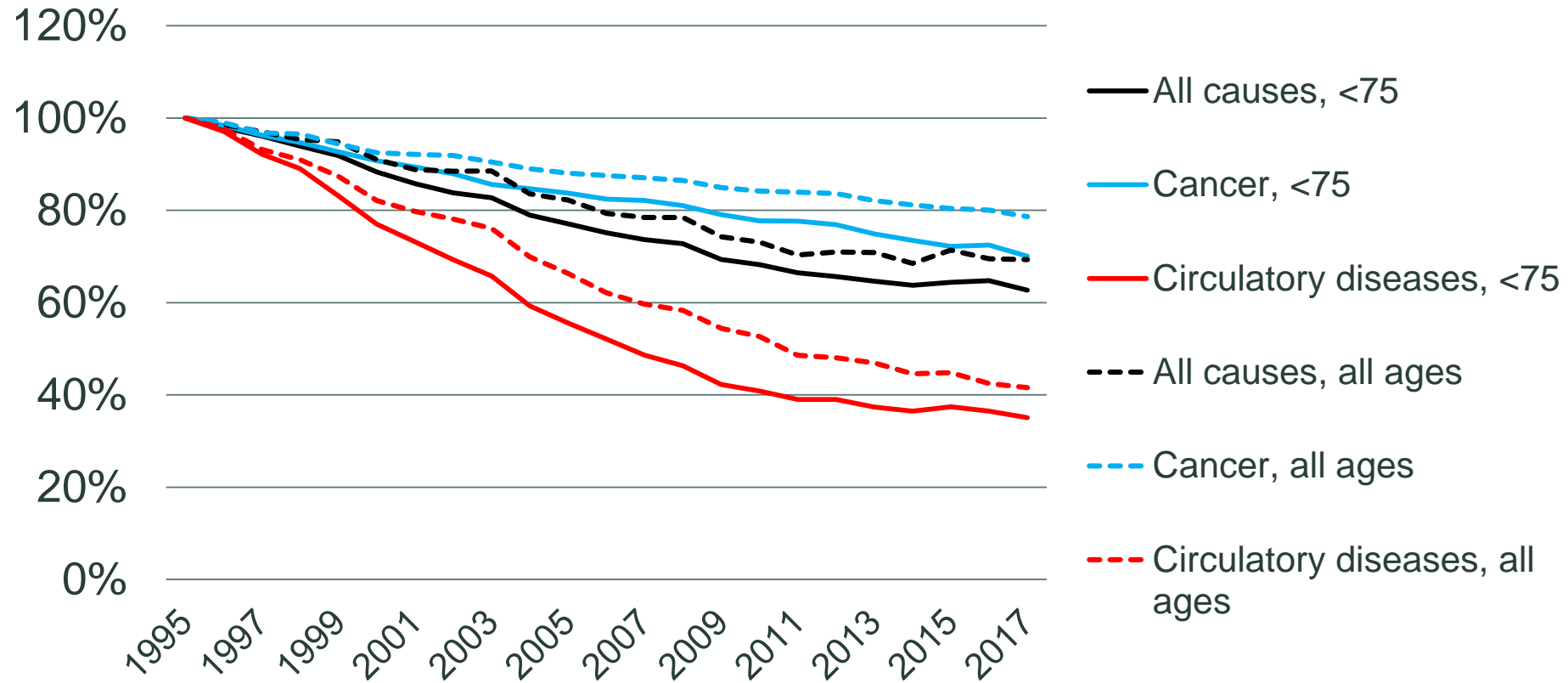
Women





Latest data by cause

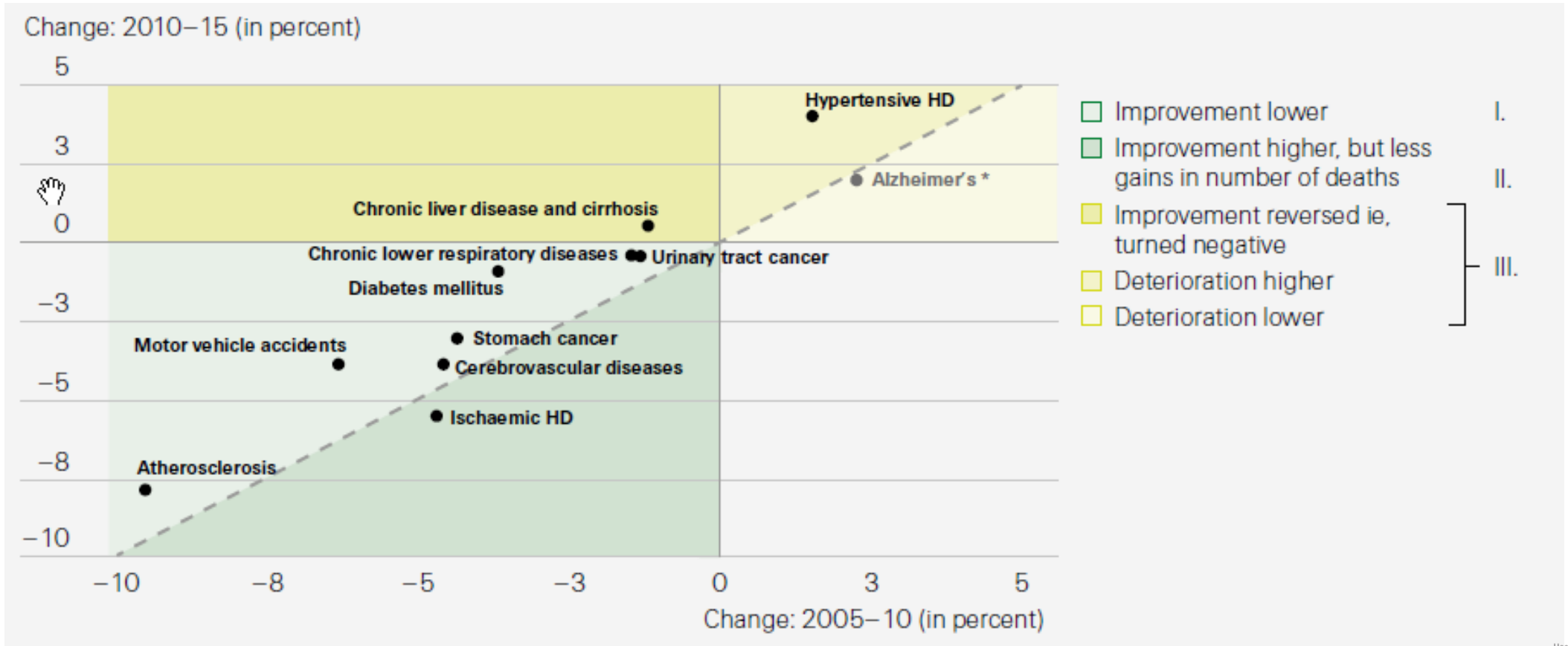
Trend in age-standardised mortality rates by cause



ONS, 28 March 2019



Leading causes of the slow down, internationally (annual change in mortality rates)



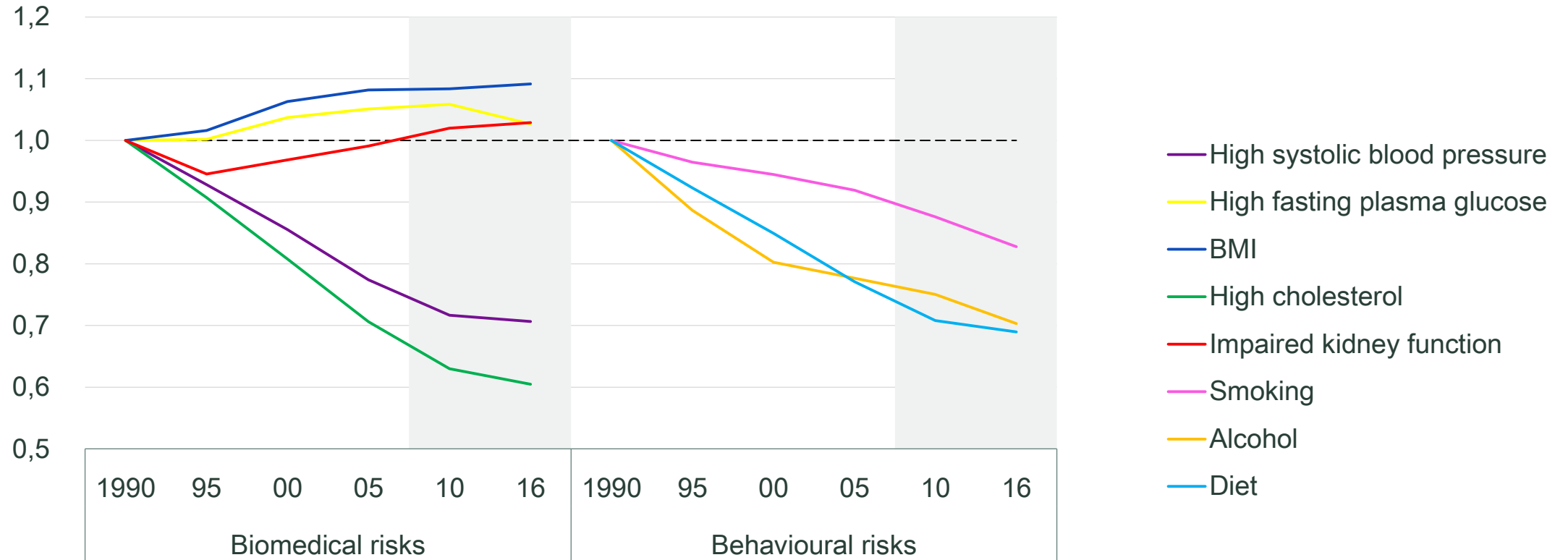
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Changes in shares of total deaths linked to major risk factors (high-income countries, indexed: 1990=100)

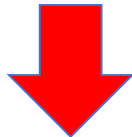
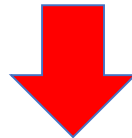
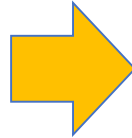


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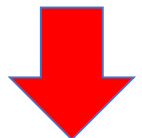


Where are the drivers taking us?

- Cardiovascular
 - enormous reductions in risk observed – limited future upside
- Cancer
 - improvements in screening, diagnostics and earlier intervention
 - long term better treatments
- Lifestyle
 - obesity increasing, abuse of substances increasing.
- Environmental
 - Depends on trends in global warming
- Behavioural
 - better information, potential for adverse selection



- Technology
 - advances in screening, treatment
- Economics
 - what is society's appetite to fund an ageing population?
- Genetics
 - huge advances in understanding genetic drivers
- Anti-microbial resistance
 - the elephant in the room!
 - If this develops we lose a lot of treatment options.



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Thank you very much for your attention

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