Multimorbidity.
A policy and research funder view.

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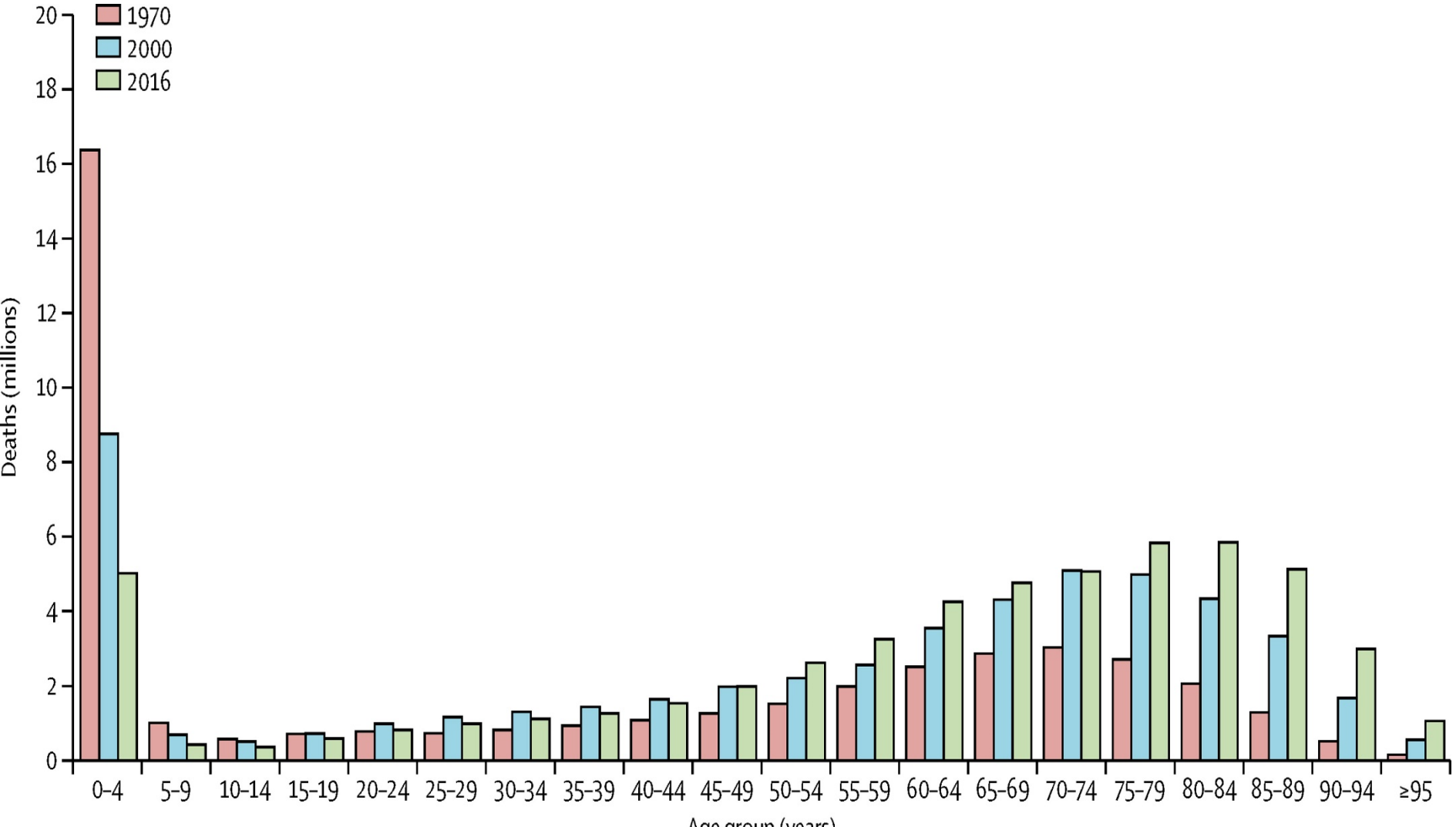
Mutimorbidity

- Is often an unhelpful word, because it can imply a random assortment of conditions, making it difficult to tackle.
- It is actually clusters of disease.
- Clusters, once identified, can be addressed both scientifically and in policy and service delivery.
- Two generalised drivers of multimorbidity everywhere: poverty and age.
- Some major risk factors for specific clusters are known- include smoking, diabetes, obesity, HIV.
- Some obvious, and predictable, trends.

Globally, two major drivers of multimorbidity are falling: extreme poverty and untreated HIV.

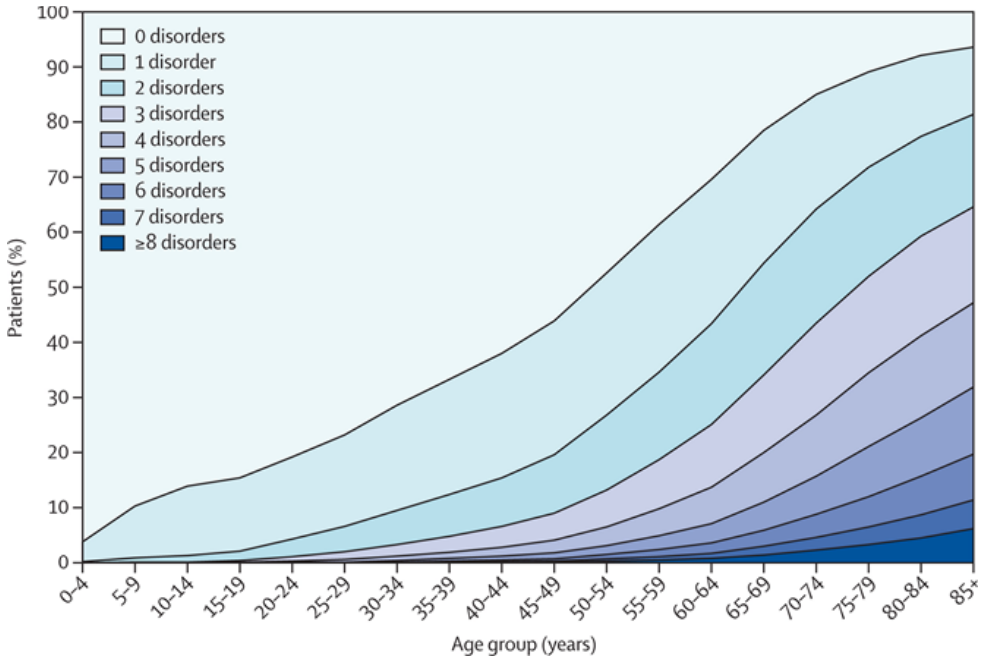
(*Global Burden of Disease Study (GBD), Lancet 2017*)



Scientific and clinical structures are optimised for single diseases. We have to change this (back).

- Clinics
- Medical training
- National guidelines

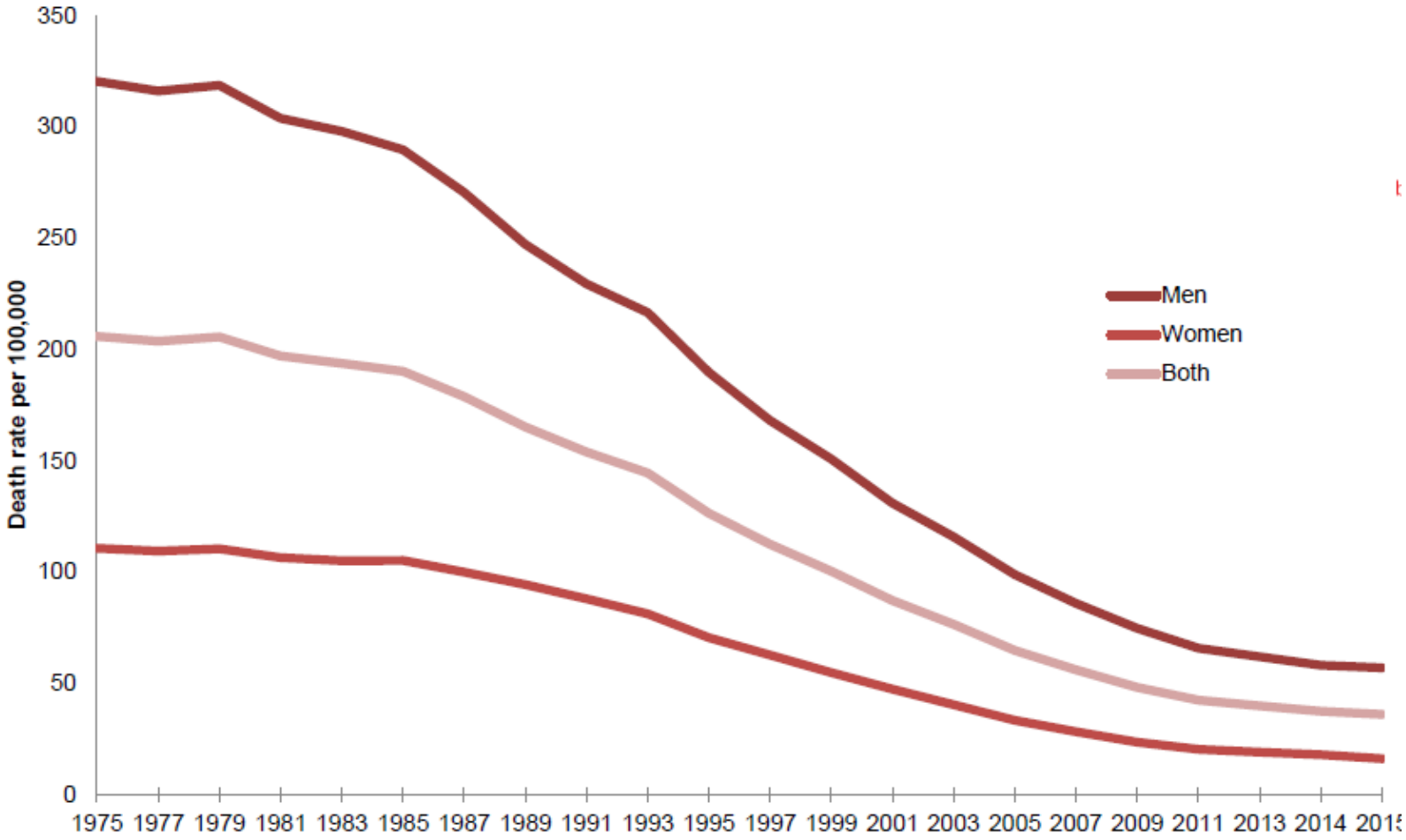
- Grant panels
- Academic departments
- Peer review in journals



Barnett et al 2012

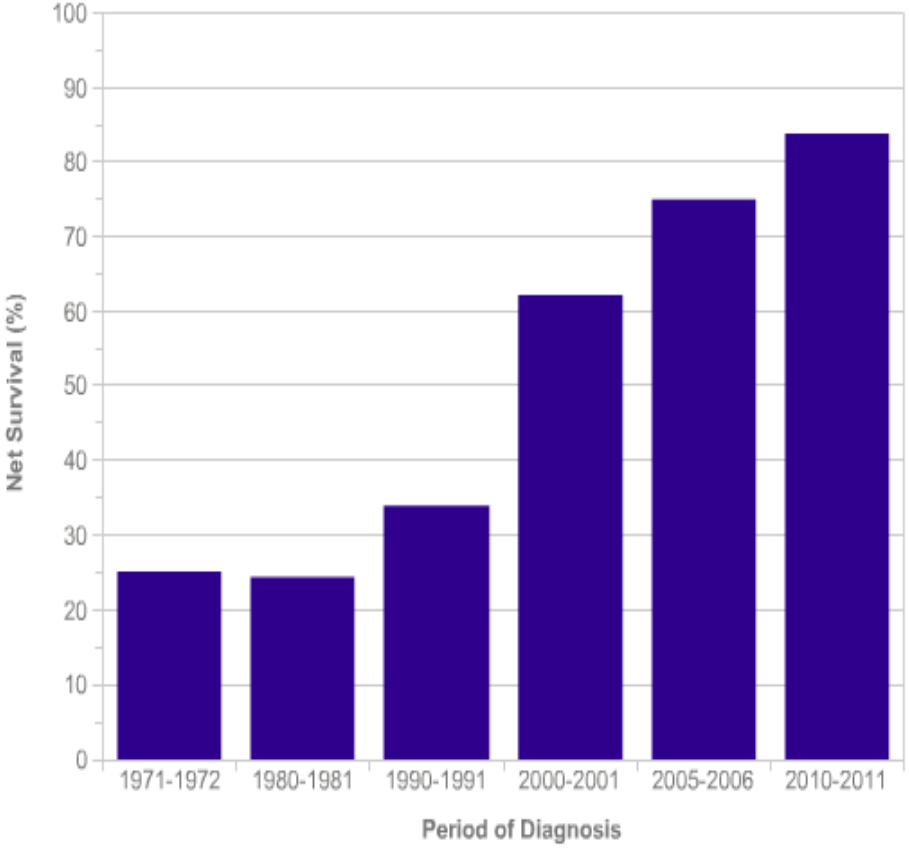
Under 75 year old age-standardised coronary heart disease mortality, UK 1975-2015: 206 to 36/100k.

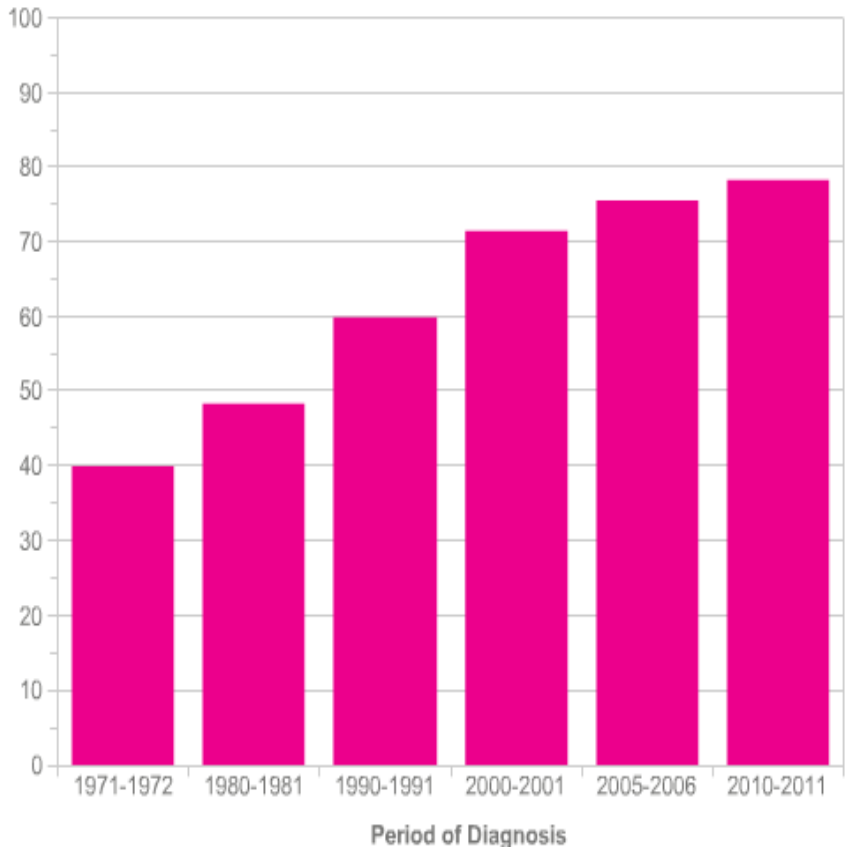
(BHF 2017)



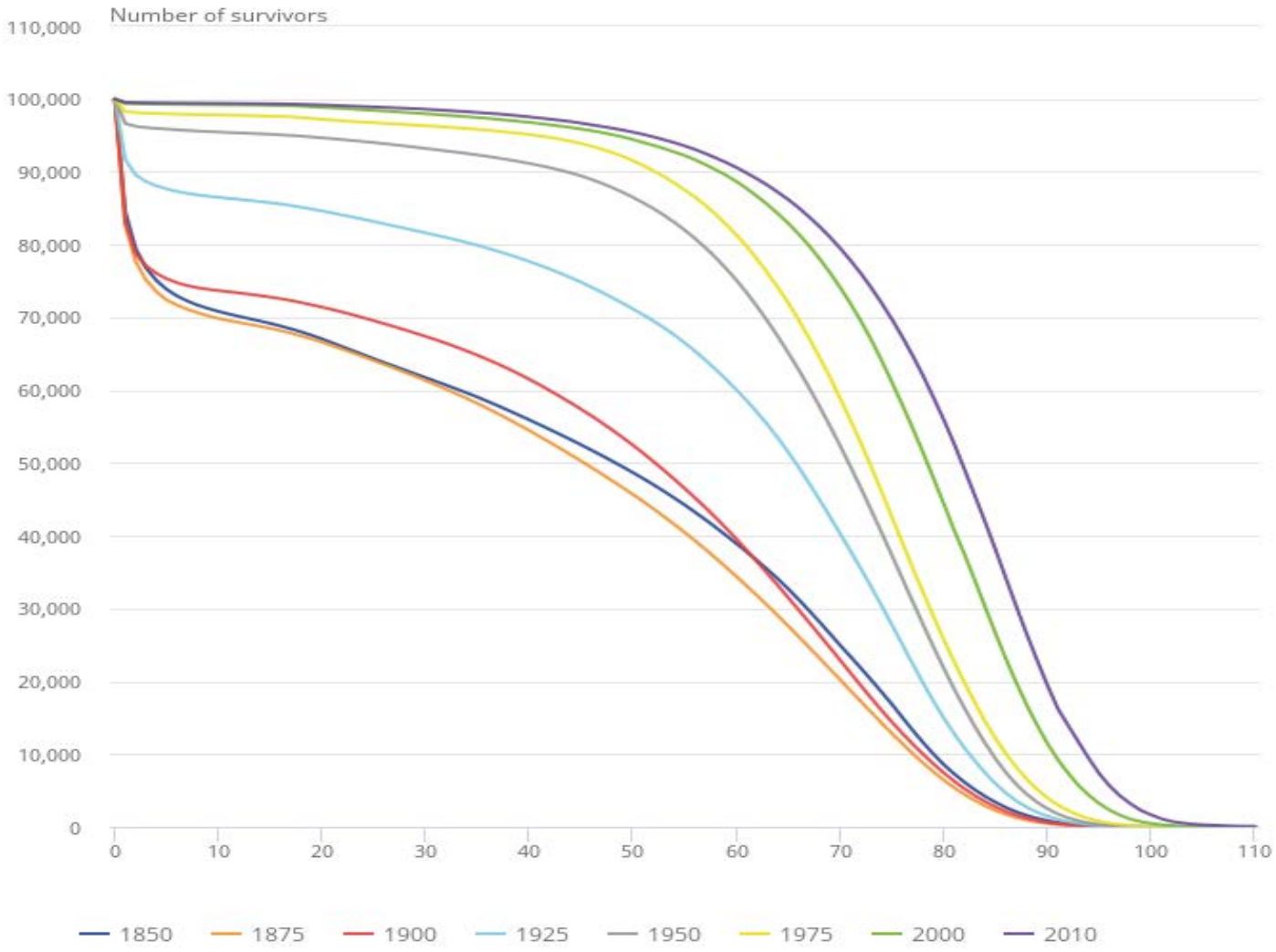
10 year cancer survival, prostate (L) breast (R)

(CRUK)





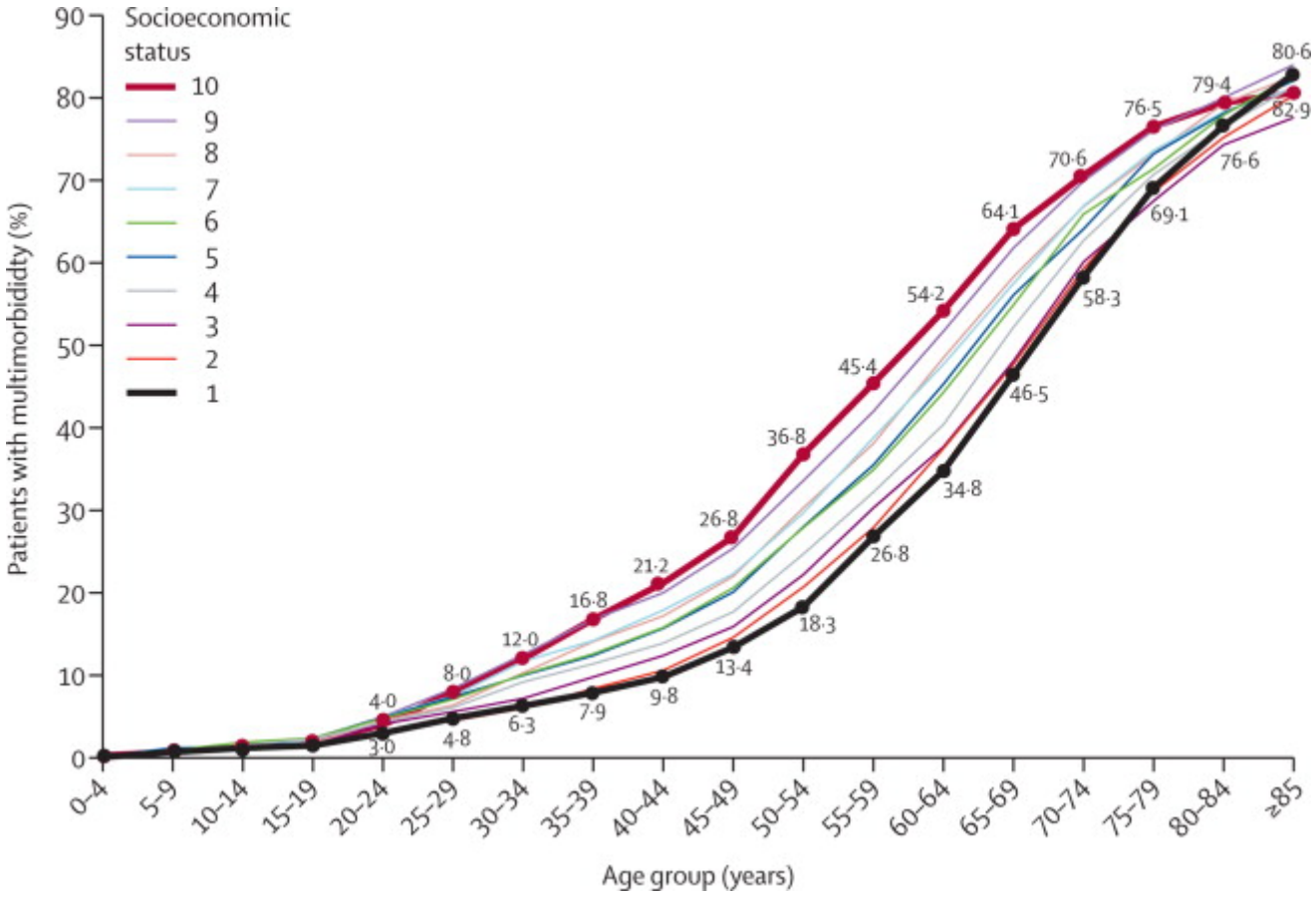
Mortality increasingly concentrated by age. *(ONS)*



Change in mortality 2001-2017 by agegroup

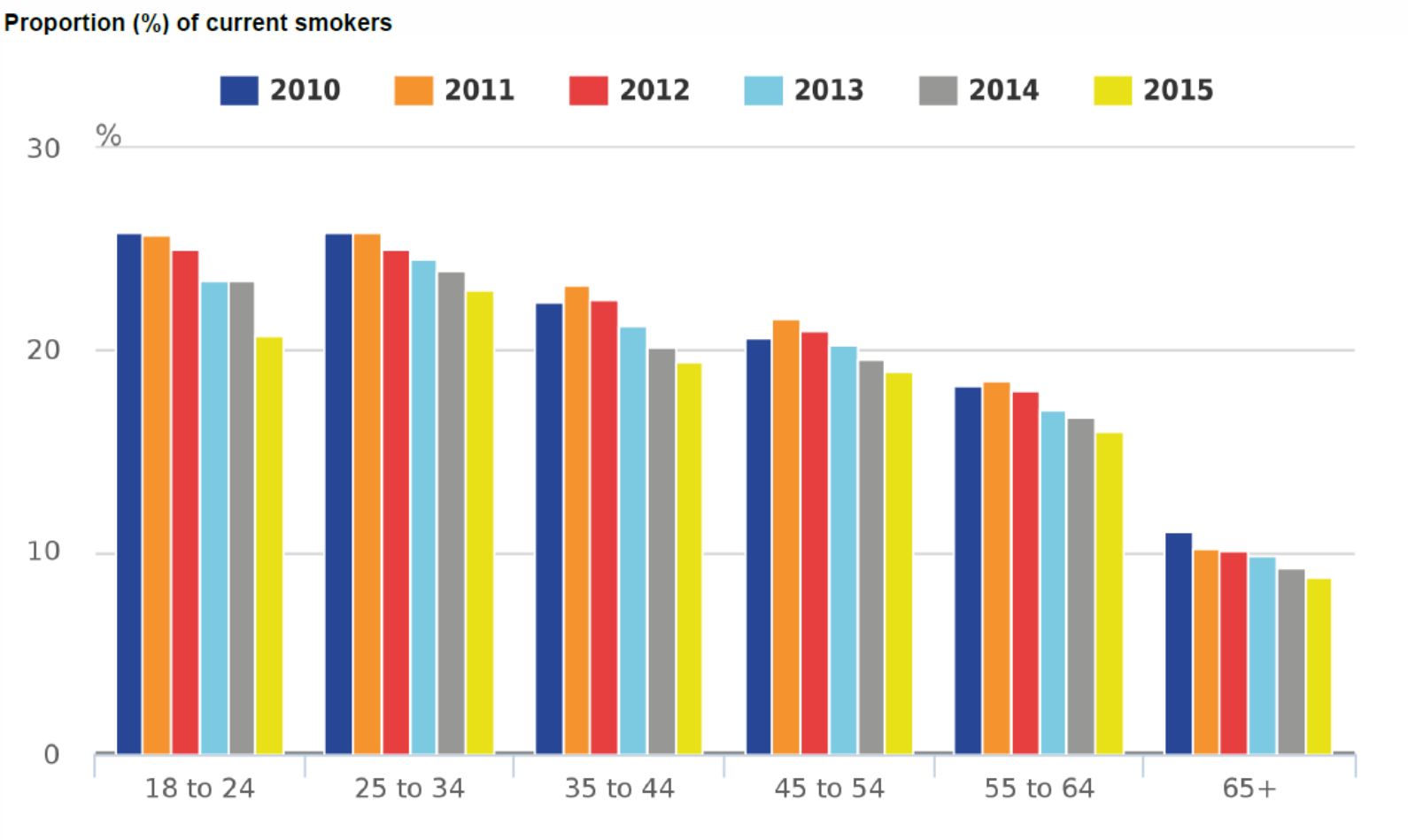
(ONS 2017)

Age and multimorbidity. Compounded by deprivation.



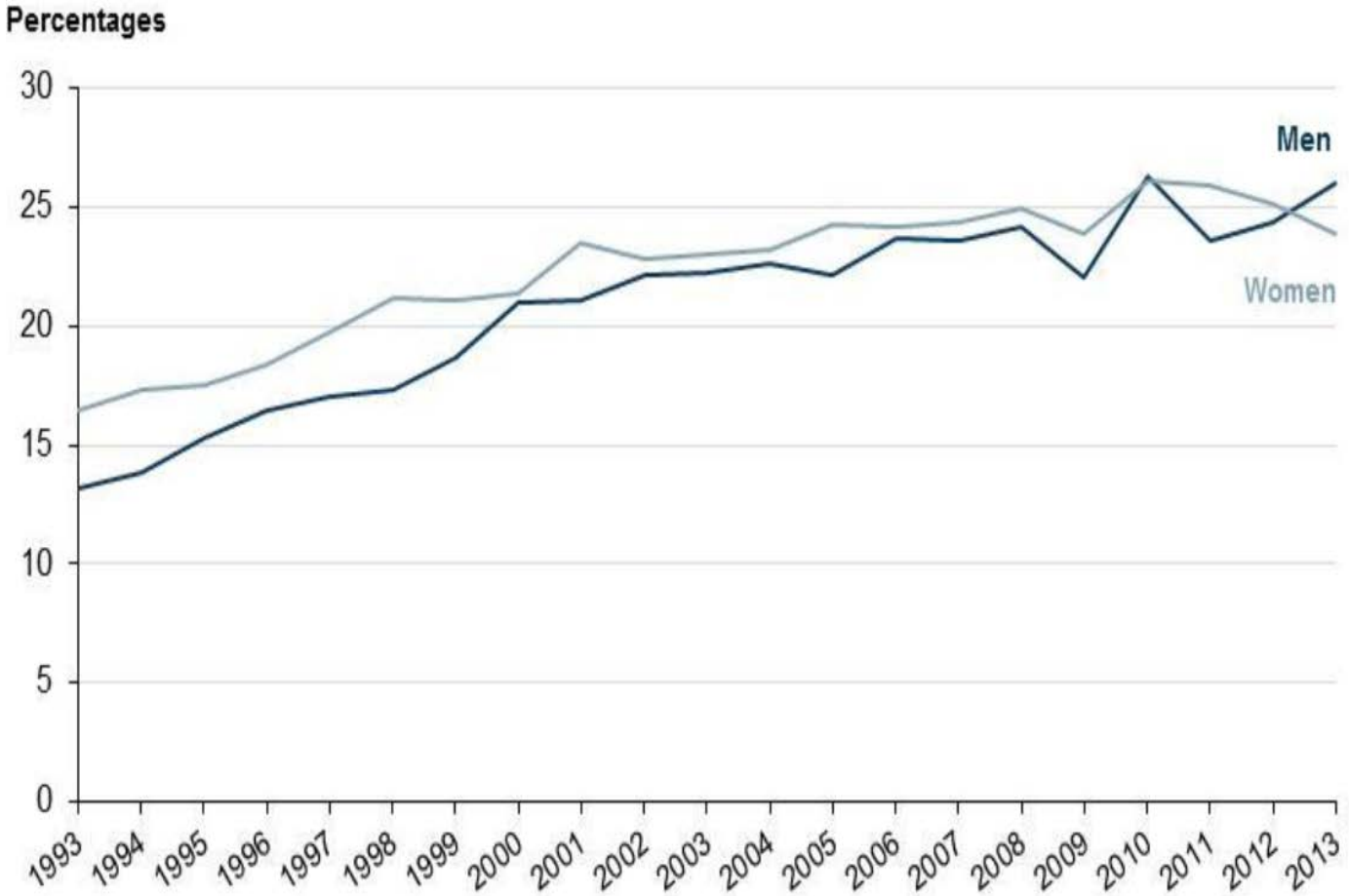
Barnett et al Lancet 2012

Current smokers by age *(ONS).*



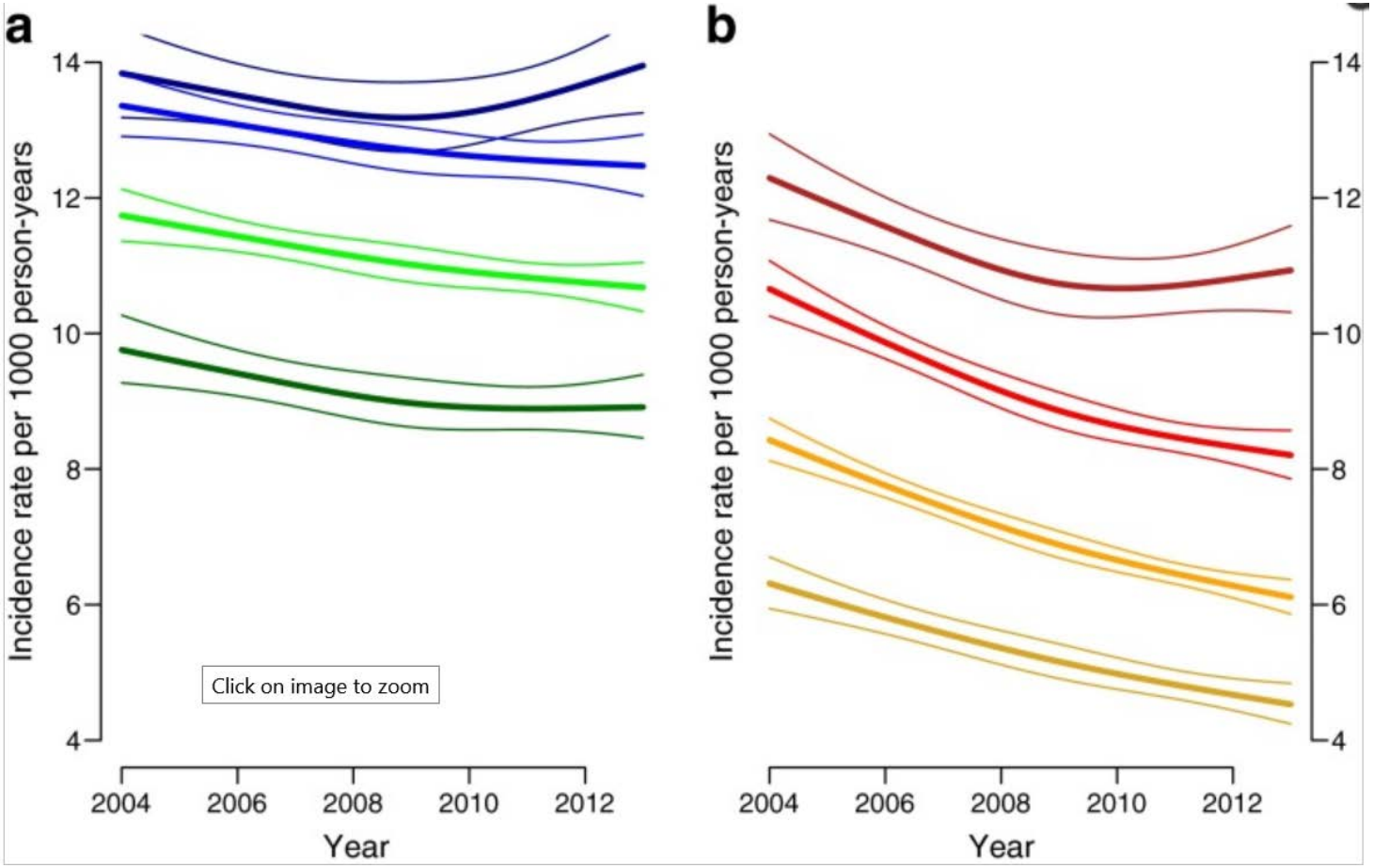
Source: Annual Population Survey - Office for National Statistics

Obesity in the UK. Over 2 decades from 15%-26%. Broadly stable last few years.

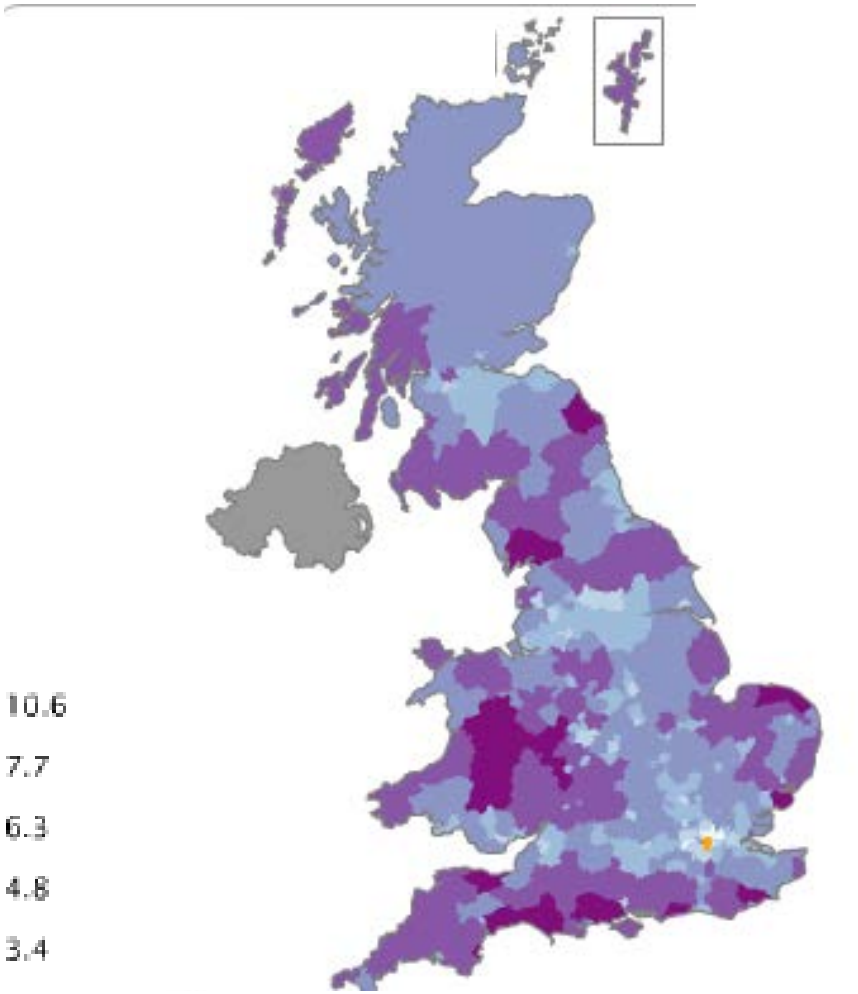


Percentage obese (BMI>30) by year.
Health Survey for England.

Diabetes- possibly slightly reducing incidence in men (a) and women (b) varying by deprivation group (Scottish data). Prevalence increasing. *Read S et al 2016*



Population 85 and over: 1992, 2015, 2033. If we want to tackle multimorbidity, we need to go to where it is common *(ONS).*

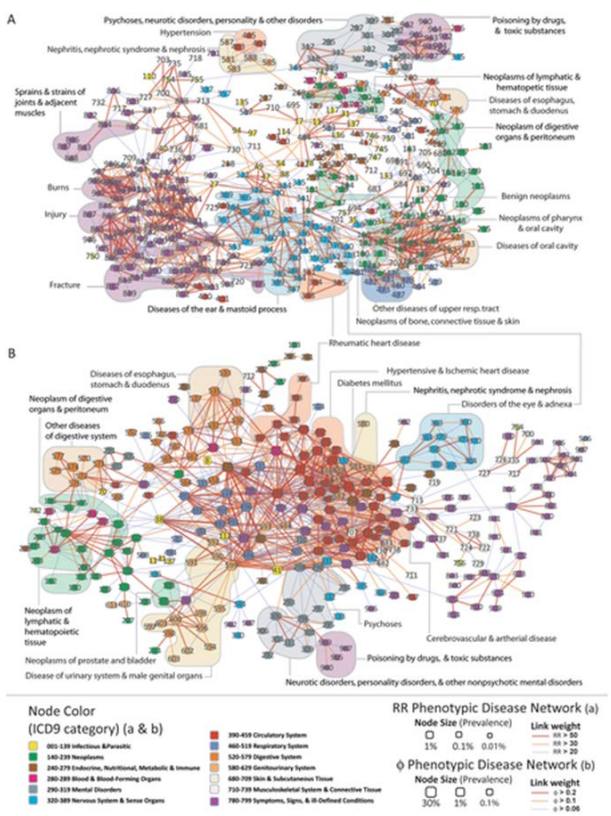


Problem statement from a science funders perspective.

- Multi-morbidity is increasing in absolute terms and relative to single morbidity. We must tackle it.
- Science has recently become better at being vertically organised for specific conditions ('bench to bedside' etc) but not horizontally between them.
- Current medical specialisation and guideline-based medicine is optimised for dealing with single diseases.
- Research groups, grant-giving bodies, journals all tend to handle multi-morbidity badly.
- Calls for multi-morbidity research often disappointing.
- Older people and multi-disease often systematically excluded from studies.

Identifying, then tackling, clusters is doable.

- Some major clusters we know- eg around smoking or obesity.
- Many need to be identified. They will give us biological and clinical insights.
- Some by chance. Most will be around risk factors.
- Some will occur in a predictable sequence allowing intervention.
- Some combinations will be particularly debilitating and a small intervention can have a big effect.



Hildago et al. PLoS Comp Biol

We need some organising framework.

- My *opinion* (ie happy to change it) is we should look in particular at:
- Common clusters (concentrate effort, arrange services).
- Particularly highly correlated clusters- there is likely to be some common risk factor currently unknown (understand, prevent).
- Clusters which are especially debilitating (modify).
- Doctor-induced clusters (the easiest to change- probably).

Clusters around risk factor, some unknown.

- Some risk factors are so powerful the clusters are easy to see with minimal effort.
- Smoking: coronary heart disease + COPD + peripheral artery disease + cancer.
- Diabetes: coronary heart disease + peripheral artery disease + renal failure + peripheral neuropathy.

- We should probably be trying to identify common clusters:
- as a minimum they will concentrate our efforts.
- we may identify modifiable risk factors.

Clusters which are synergistic, in a bad way, or especially debilitating.

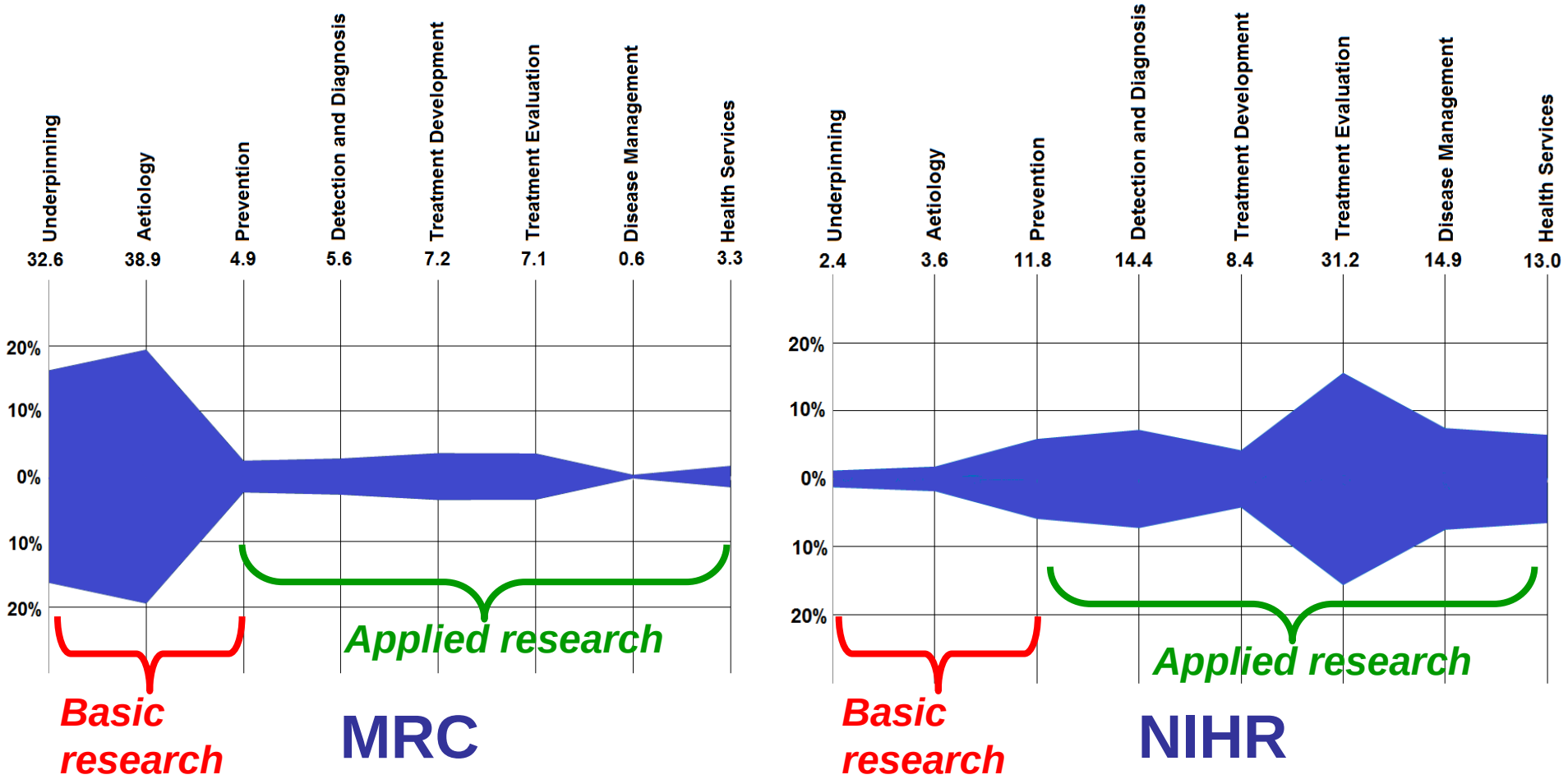
- Some combinations compound one another; a morbidity is a risk factor for others.
- Modifying one or two may substantially reduce the impact of all the others.
- Identifying synergistic clusters may allow simple interventions.

- Cataracts + proprioceptive loss + reduced muscle + osteoporosis + floral carpet = hip fracture.
- Mild dementia + renal failure + diuretics + osteoarthritis + poor vision = drug over- or underdosing = [stroke etc].

Doctor-induced.

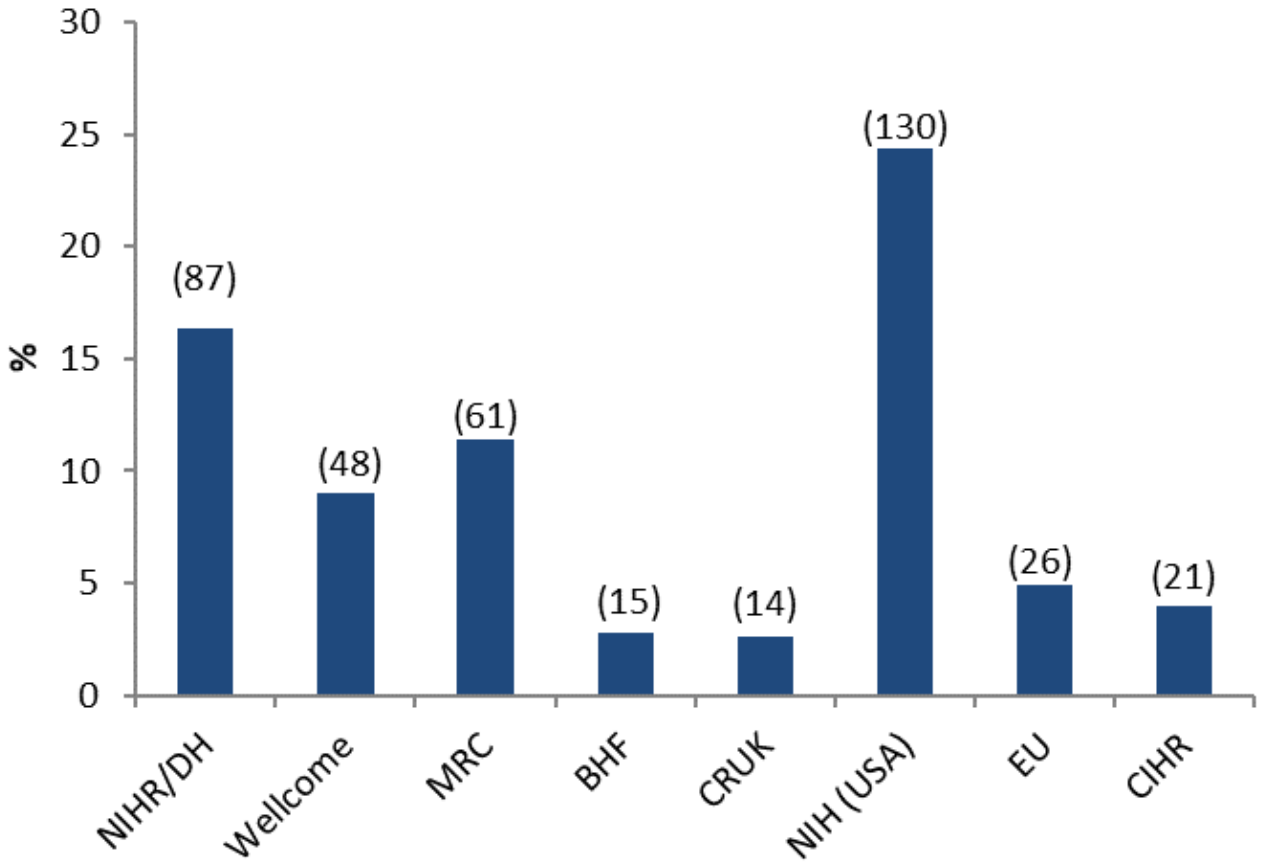
- Current guideline based care tends to polypharmacy in those with multiple morbidities. Once on 3 NICE pathways… NICE is interested in clusters.
- We have limited knowledge of the effects of age on correct dosing, most trials exclude multi-morbid participants, and identifying drug interactions in people with multiple morbidities is hard. We can assume some polypharmacy useless, some harmful.
- Most GPs and geriatricians undertake multiple N of 1 trials reducing drugs but this is seldom systematised or data captured.

Spend by UK public funder. NIHR at translational and applied end cf MRC. Wellcome and Charities.



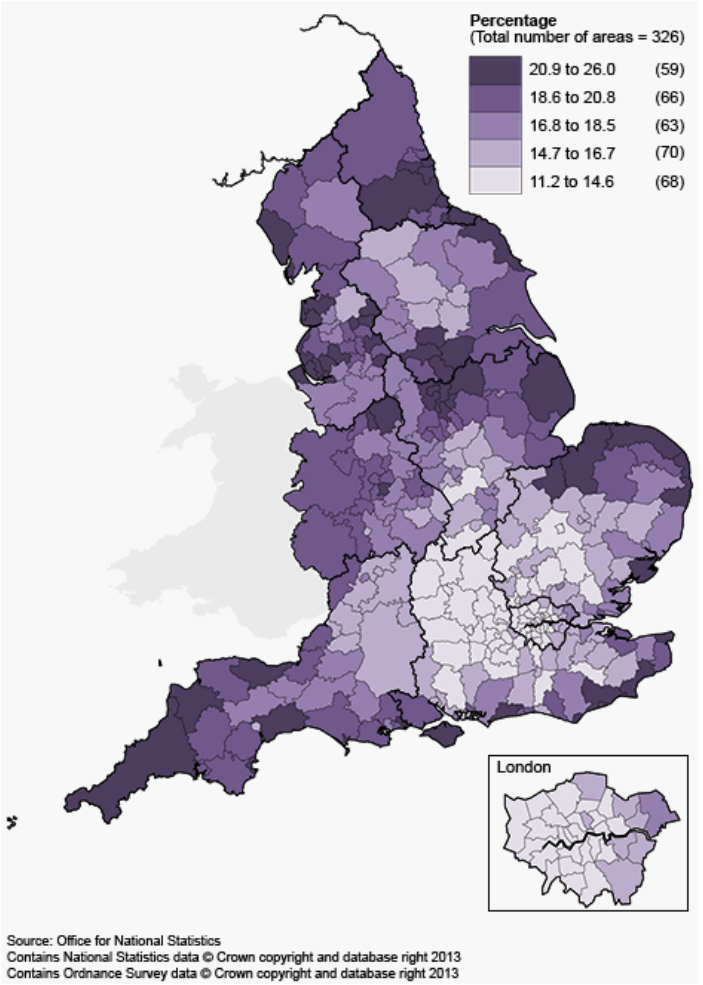
Research spend

If not us, then who? Number of articles in top 6 clinical journals over a 6 month period. *(R Mumford, unpublished 2017)*



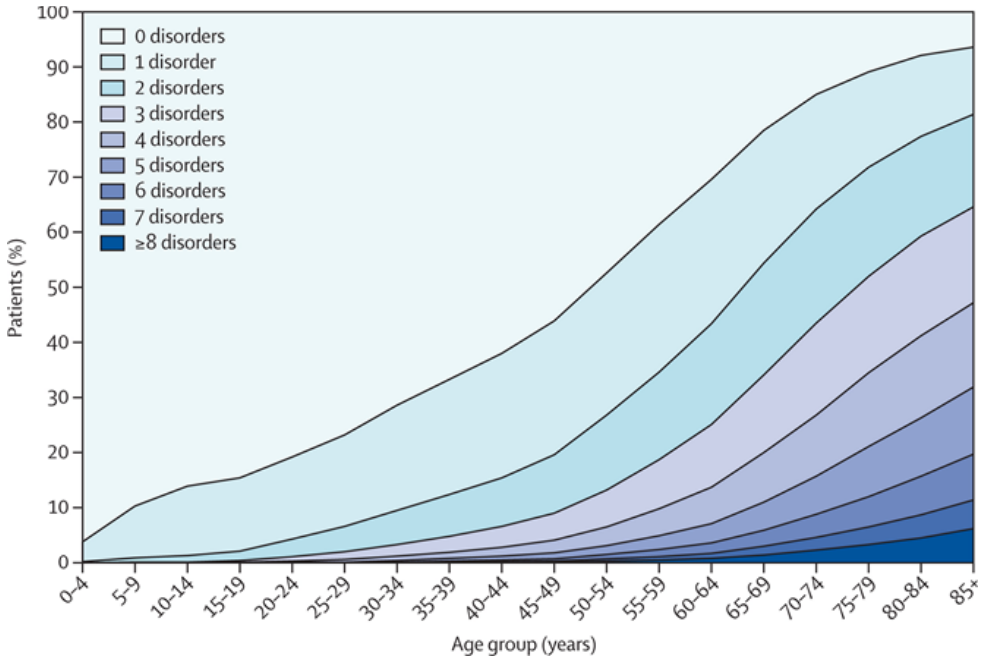
We do need to think seriously about geography.

- Population reporting daily activity limitations (ONS, 2011 data).
- Does not correlate well with research activity.
- Good scientific, as well as ethical, reasons the best research should go to the greatest need.
- Include representative population, study size.



Identifying, then tackling, the clusters of multimorbidity has to be a major task.

- Strong basic science, epidemiology, applied science essential.
- Pushing morbidity clusters to the right in age could be transformational.



Barnett et al 2012