MAP 2030
Modelling Ageing Populations to 2030

nda PROGRAMME

new dynamics of ageing
a cross-council research programme

Chronic disease and its impact on disability and the need for LTC

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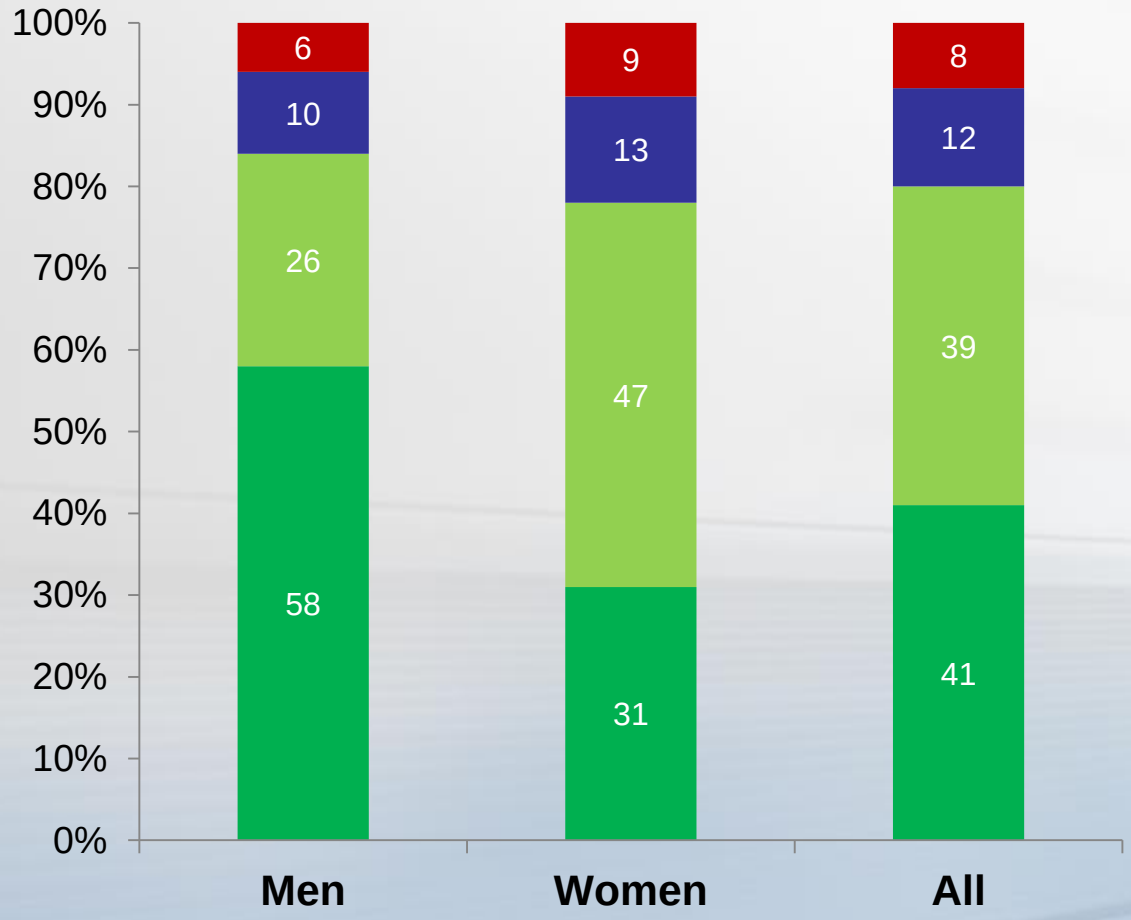
Outline

- Drivers of need for LTC
- What do we know about changing disability rates in the UK?
- Why focus on disease for need for LTC?
- Modelling disease and disability – SIMPOPGENDER
- Implications for LTC of health scenarios

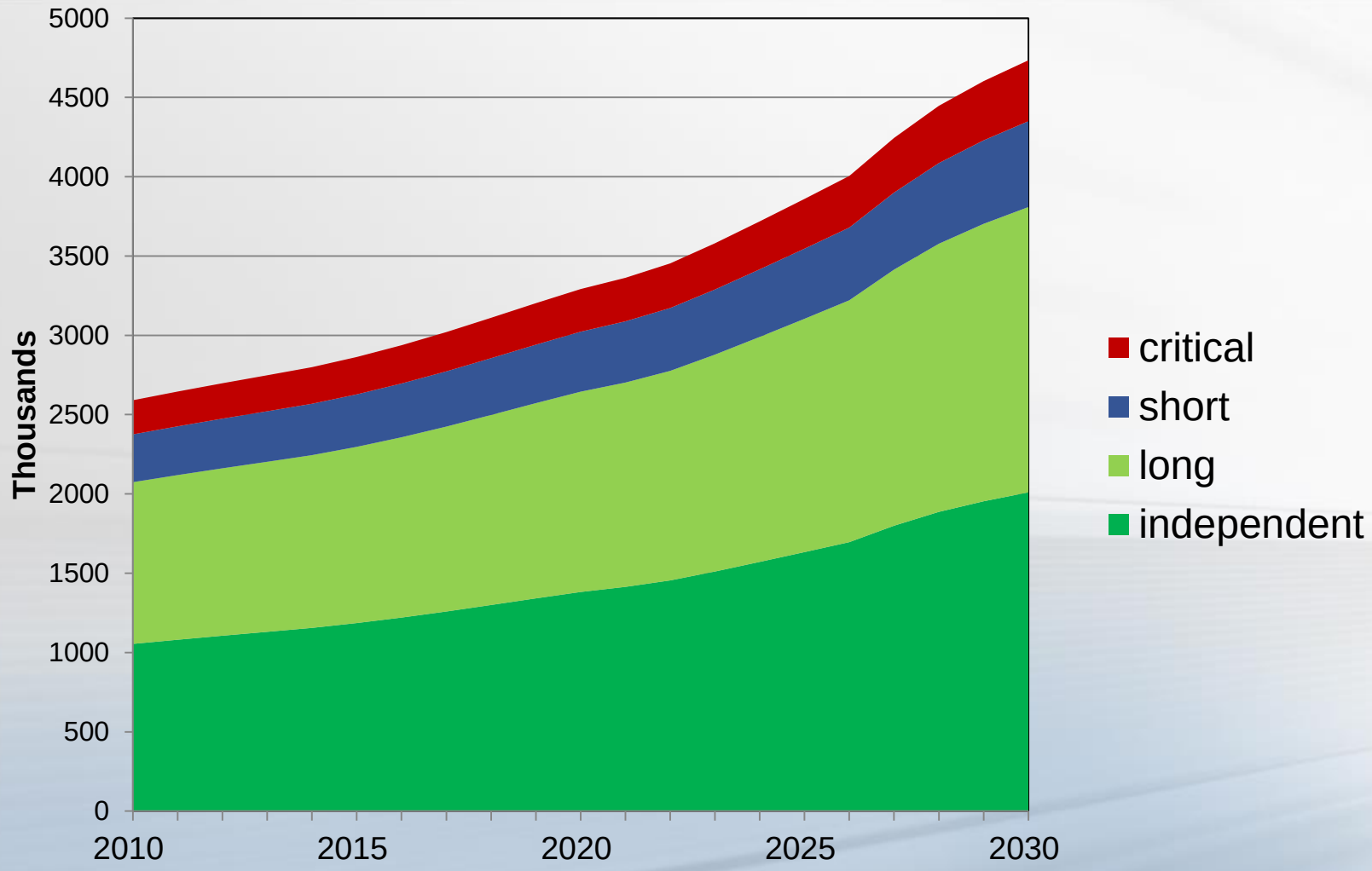
Drivers of need for LTC

- Major driver of need for LTC is disability
- Disability usually measured by activities of daily living:
  - Dressing, bathing, getting to and from the toilet
  - Assess ability to live independently
- Projections of future need for LTC have generally assumed:
  - constant age-specific prevalence of disability
  - improving disability rates alongside healthy ageing

Need for care



Projected numbers in England and Wales aged 80+ by interval-need dependency, 2010-2030



Are disability rates improving in the UK?

- Evidence for lower prevalence of disability in new cohorts entering old age is equivocal
  - CFAS Ely cohort (*BMC Public Health 2007;7:156*)
  - Gloucester cohort (*Age Ageing 2010;39:337-342*)

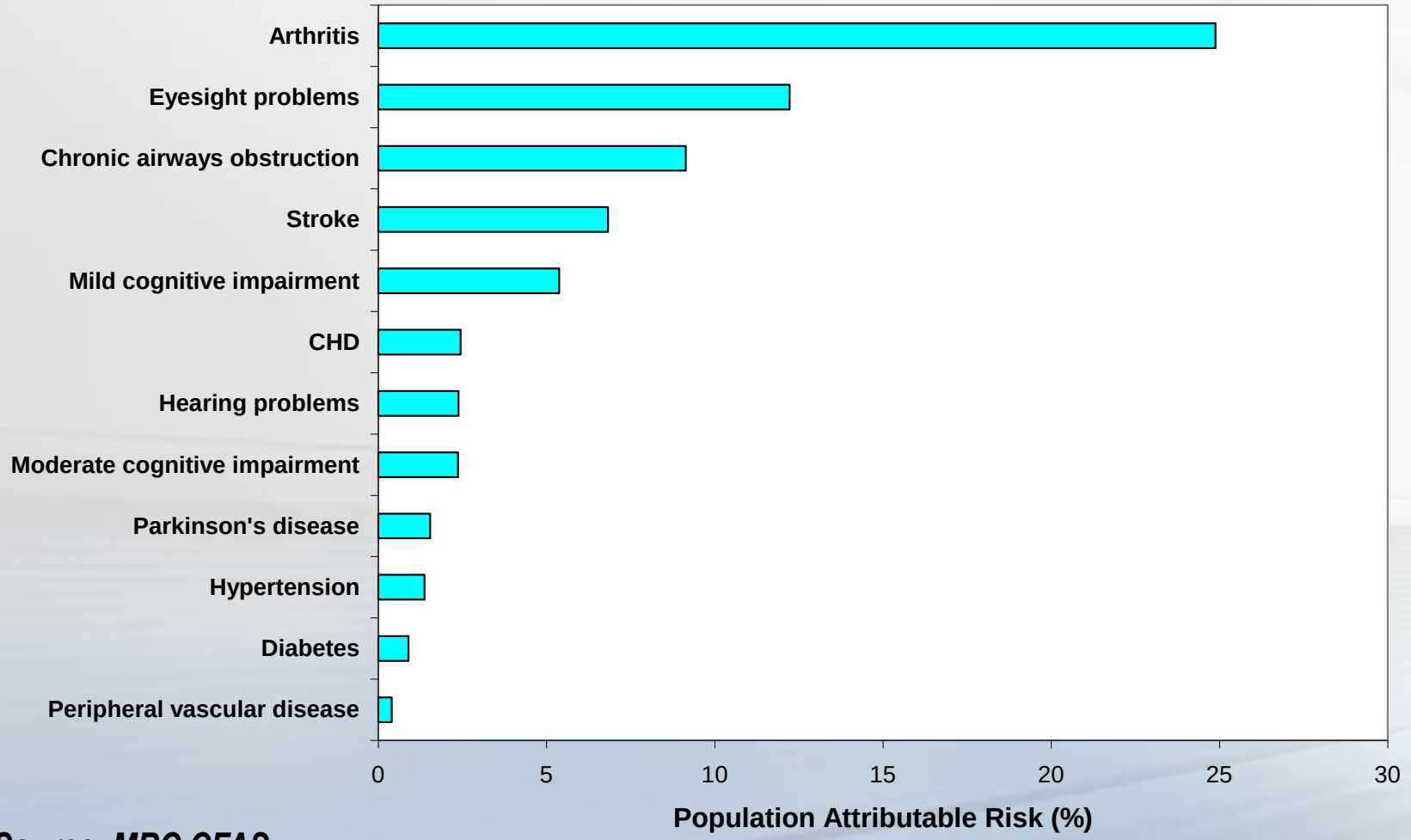
Prevalence of disability		1992	1997	1998	2008	% change
CFAS 65-69 yrs Moderate disability		4.9	6.4			↑ 31%
Gloucester 75-79 yrs high dependency*	M F			8.1 8.0	7.6 5.6	↓ 6% ↓ 30%

High dependency = memory problem or physical dependency (unable to walk inside without aid, needs help with washing, great difficulty dressing)

Why focus on disease?

- Disease is at the start of most conceptual models of the disablement process
- Major causes of disability in later life are: arthritis, CHD, dementia, stroke, sensory problems
- Substantial reductions in mortality from CHD and stroke have occurred
- Increases in obesity projected to continue impacting on CHD, stroke, arthritis, vascular dementia, diabetes
- Need models incorporating multiple diseases since risk factors (and treatments) may affect more than one disease e.g. better control of vascular risk factors

Causes of late life disability



Source: MRC CFAS

SIMPOP Projection model

- SIMPOP developed as part of the Modelling Ageing Population to 2030 (MAP2030) project.
- Produces projections of numbers of older people with disability and disability-free life expectancy (DFLE) **under different health/disease scenarios**
- Based on **two year transitions** to disability and death in MRC CFAS
- Improves on single disease models since
  - old age is characterised by multi-morbidity
  - risk factors and treatments may affect more than one disease e.g. better control of vascular risk factors

MRC Cognitive Function and Ageing Study

- Uses 5 centres
- stratified random sample aged 65+
- includes those in institutions
- N=13004 at baseline (1992)
- 2 year follow-up
- death information from National Death Registry

Main elements of SIMPOPGENDER

- Transition stage uses MRC CFAS to estimate 2 yr transitions to disability and death conditional on a range of diseases
- Projection stage applies transition rates to 'age' the population*
- Adjustments added to calibrate to Government Actuary's Department (GAD) 2006-based population projections
- Adjustments to prevalence of diabetes to calibrate with Health Survey for England 2005

**more detail in Jagger et al. Age and Ageing 2009;38:319–25*

Three types of projections

1. Projections of number of older people with disability (of a level to require social care) – results feed into PSSRU model
2. Projections of number of older people with: arthritis, CHD, stroke, diabetes, dementia (moderate or severe cognitive impairment)
3. Projections of life expectancy (LE), disability-free life expectancy (DFLE) and years with disability (DLE) – important for assessing compression/expansion of disability

- all projections available for men and women separately and by age group

Operationalising the disease scenarios

- In SIMPOPGENDER three parameters can be altered to simulate time trends in each disease or their treatments and risk factors
- *Prevalence of disease* – to reflect changes in cohorts or risk factors
- *Disabling effect of disease* – to reflect changes in treatments or severity of disease
- *Mortality from disease* - to reflect changes in treatments or severity of disease

Central health scenario

- No change in:
  - Age-specific prevalence of diseases
  - Incidence of and recovery rates to disability
  - Mortality rates from GAD principal projections
  - Prevalence of disability for new cohort aged 65-66 (sensitivity analyses performed)

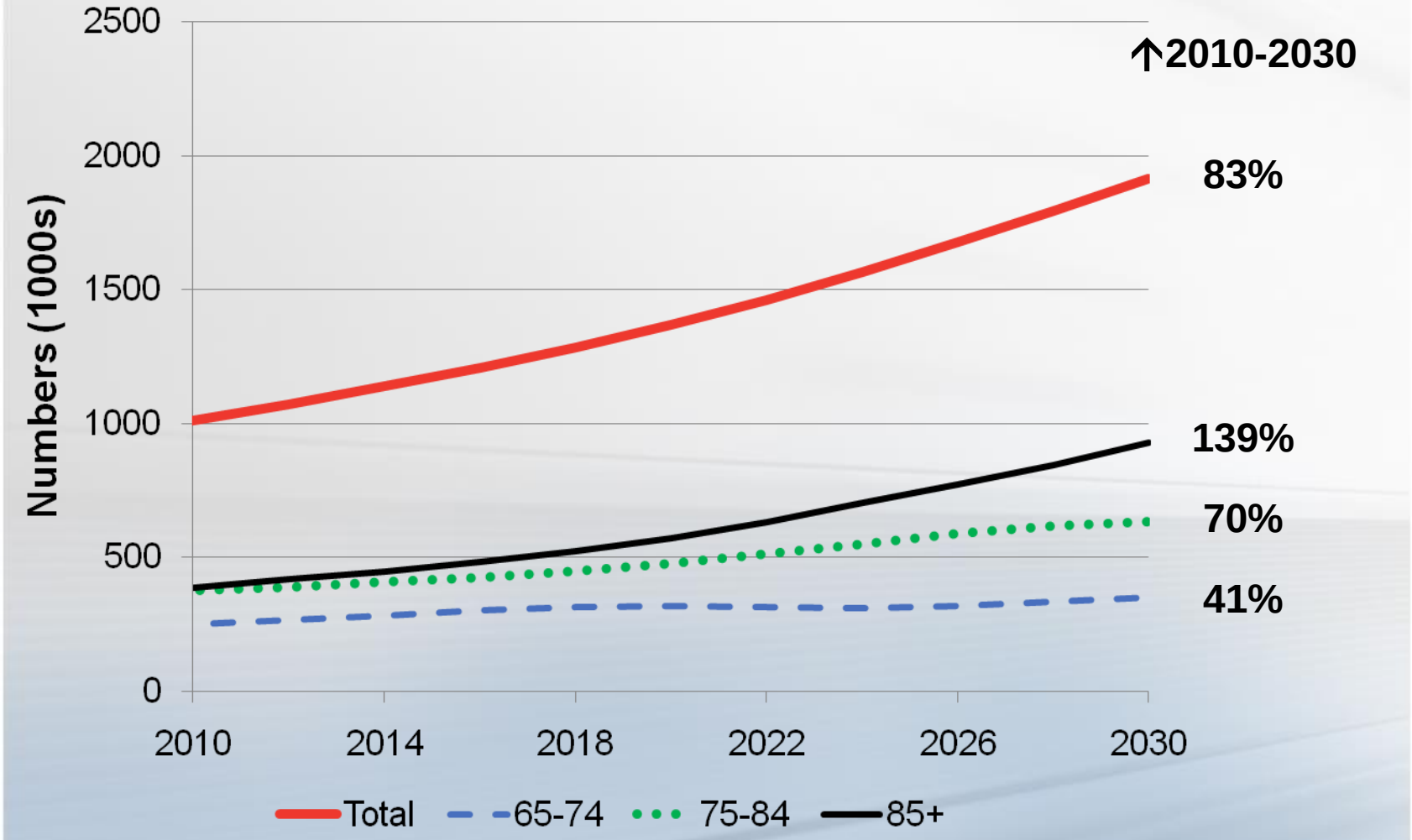
- Prevention strategies and effective treatments simply offset the negative influences of obesity and other cohort trends (emergence of ethnic minorities into older cohorts with increased CHD, stroke, diabetes)

Prevalence of disability 2010-2030

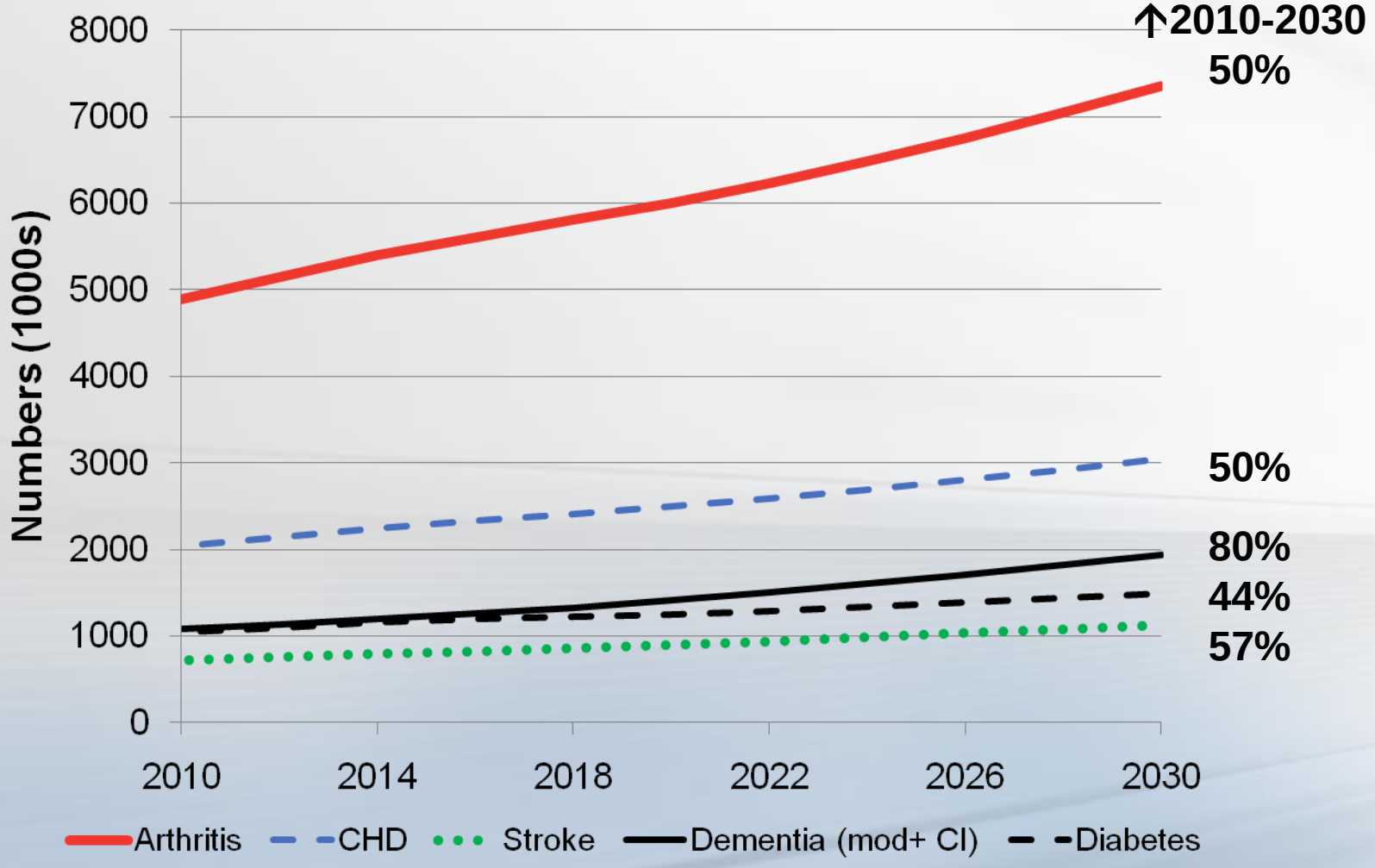
Central health scenario

Age group	Disability prevalence 2010	Disability prevalence 2030	Change in disability prevalence
65-69	4.2	4.3	0.1
70-74	6.4	6.7	0.3
75-79	9.1	10.0	0.9
80-84	15.6	17.4	1.8
85+	31.1	37.9	6.8

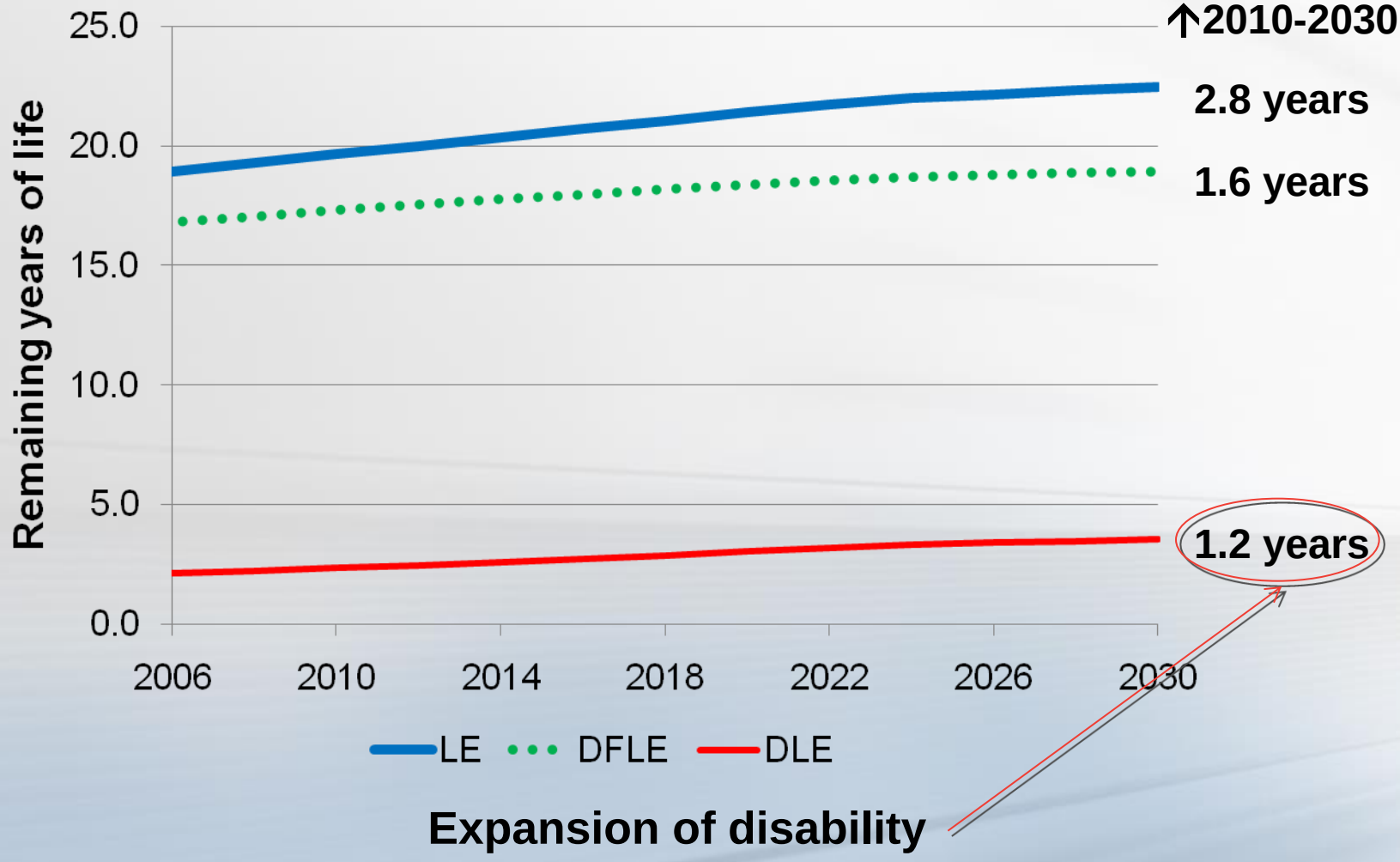
Numbers with disability by age 2010-2030



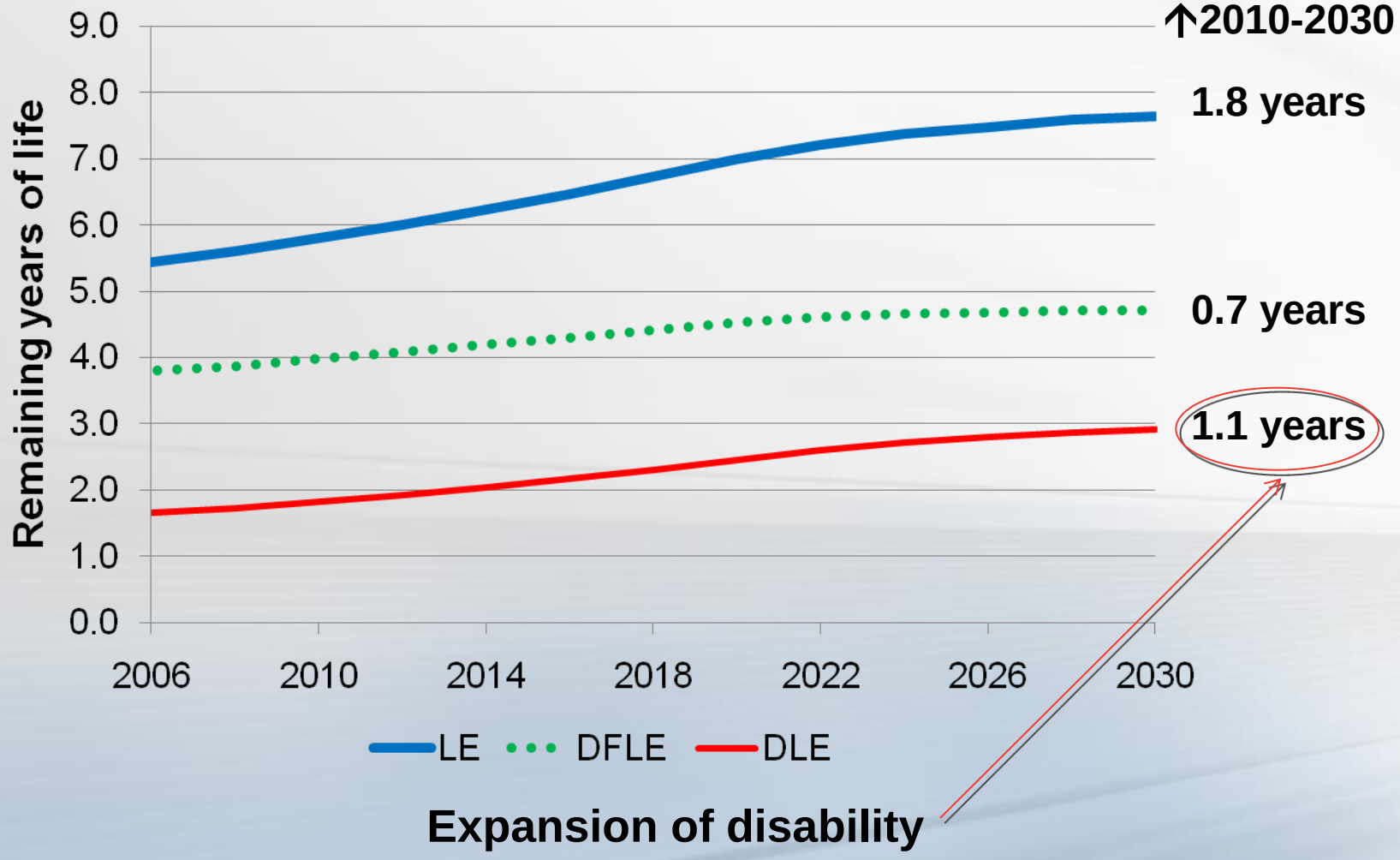
Numbers with key disease 2010-2030



Women's LE, DFLE and DLE at age 65



Women's LE, DFLE and DLE at age 85



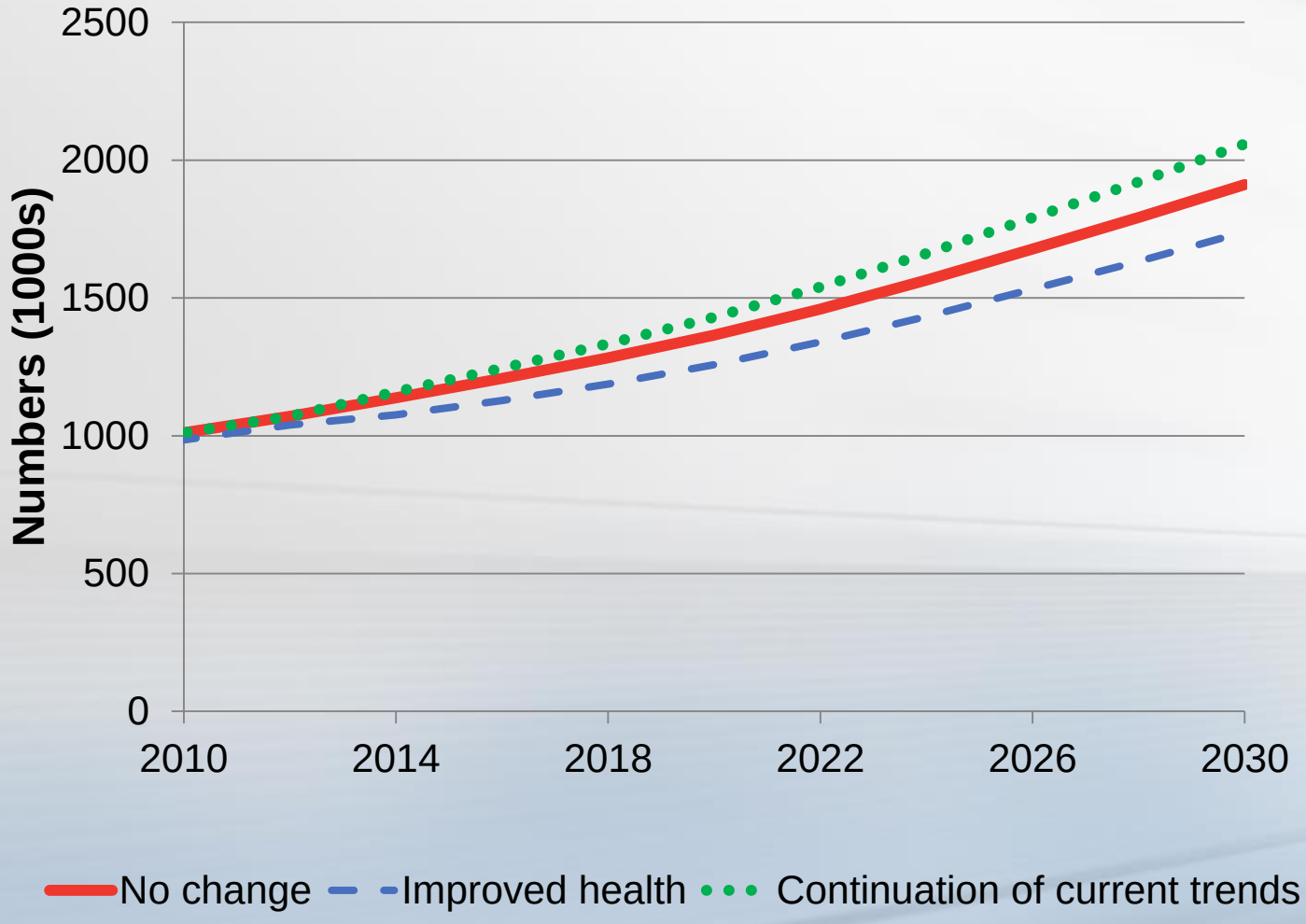
Impact of reduced disability in new cohorts

- If prevalence of disability for new cohort (65-66 yr olds) changes by:
  - 5% then 64,000 fewer with disability by 2030
  - 10% then 90,000 fewer with disability by 2030
- Little change in LE or %change from 2010-2030 in numbers with disability

Other health scenarios

- Continuation of current trends
  - Onset of disability INCREASED by 10% from 2012 in those with arthritis, stroke and CHD
  - Prevalence of arthritis, stroke, CHD and cognitive impairment INCREASED by 2% from 2012
  - Mortality from Stroke, CHD and mild cognitive impairment REDUCED by 5% from 2012
- Improved health
  - Onset of disability REDUCED by 10% from 2012 in those with arthritis, stroke and CHD
  - Prevalence of arthritis, stroke, CHD and cognitive impairment REDUCED by 2% from 2012
  - Mortality from Stroke, CHD and mild cognitive impairment REDUCED by 5% from 2012

Numbers with disability by health scenario



Prevalence of disability 2010-2030

Improved health scenario

Age group	Disability prevalence 2010	Disability prevalence 2030	Change in disability prevalence
65-69	3.3	2.6	-0.7
70-74	6.2	5.7	-0.5
75-79	9.1	8.9	-0.2
80-84	15.6	15.5	-0.1
85+	31.1	33.6	2.4

Limitations

- Evidence of effect of treatments on disability is lacking therefore ‘guestimates’
- Transitions based on 1991/2 older people – need new cohort but must include institutional population
- Model underestimates GAD LE by 1.2 years at age 65 and 0.8 years at age 85 – mortality for 65-69 yr age group in CFAS is higher than equivalent cohort LE
- Self-report data on disease

Strengths

- Very large cohort so can estimate low prevalence diseases
- Includes multiple diseases rather than single disease model
- Can simulate effect of joint risk factors eg obesity
- Can simulate effect of interventions that affect multiple diseases eg better vascular control
- First projections of DFLE that link back explicitly to diseases

Conclusions

- Under **Central Health Scenario** between 2010 and 2030
  - numbers of older people with disability will rise by 900,000 (83%) but numbers aged 85+ with disability will more than double
  - numbers with dementia will increase by 80%
  - prevalence of disability will increase
  - DFLE at age 65 will rise by 1.6 years but LE will rise by more (2.8 years) producing an **expansion of disability**
- Under **Improved Health Scenario**
  - prevalence of disability will be almost constant
  - 170,000 fewer with disability than Central Health Scenario
  - still expansion of disability

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