University of Leicester

PSSRU

Disability in later life: causes, consequences and future prospects

Carol Jagger, Ruth Matthews, Adelina Comas-Herrera, Raphael Wittenberg, Linda Pickard, Juliette Malley, Derek King and MRC CFAS

nda PROGRAMME new dynamics of ageing a cross-council research programme

MAP2030 Modelling Ageing Populations to 2030

MAP2030 Research Teams

- Mike Murphy, Mariachiara di Chesare (LSE)
- Carol Jagger, James Lindesay, Ruth Matthews (Leicester)
- Emily Grundy & Sanna Read (LSHTM)
- Ruth Hancock & Marcello Morciano (UEA)
- Raphael Wittenberg, Adelina Comas-Herrera, Linda Pickard, Derek King, Juliette Malley & Megan Challis (PSSRU)
- Chris Curry, John Adams, Sean James (PPI)

Supporting partner

- Department for Work and Pensions

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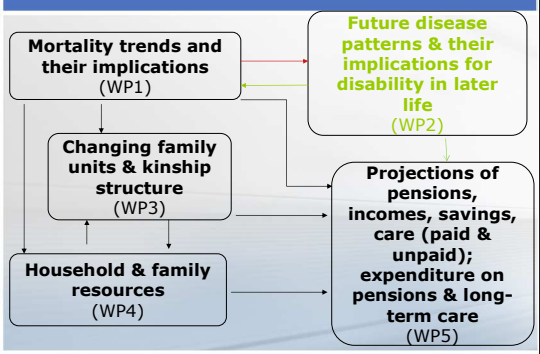
MAP2030



PLAN

- Why are disease and disability important and how do we predict future populations? (RM)
- How might disease impact on future disability? (CJ)
- What effect does this have on the need for LTC and future expenditure? (AC)

WHY ARE DISEASE AND DISABILITY IMPORTANT AND HOW DO WE PREDICT FUTURE POPULATIONS?

Background

- Growing numbers of frail and disabled older people
- Focus on quality of extra years lived
  - Ability to self care
- Population indicators such as disability free life expectancy (DFLE) more important

Background – disease and disability

- Disease at start of disability process
- Major causes:
  - Acute & chronic diseases
  - Sensory problems, arthritis, incontinence, dementia & depression
- Considerable temporal trends in disabling conditions

The data - MRC CFAS

- 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

Measures

Disability

- Inability to perform at least one of: put on shoes or socks, have a bath or all over wash, or transfer to and from bed

Diseases

- Self reported: 11 diseases, including diagnosed stroke, CHD and arthritis
- Diagnostic scales: cognitive impairment (MMSE 0-21: moderate or severe, 22-25: mild), angina and peripheral vascular disease.

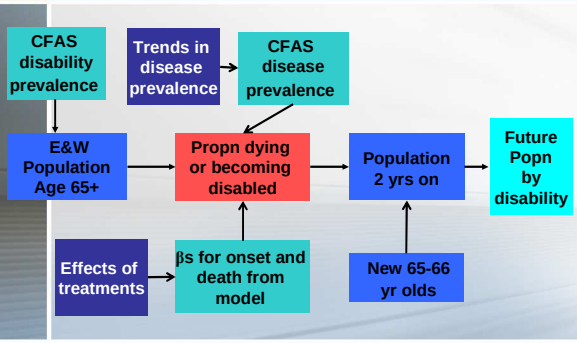
Transition model

- Trichotomous logistic regression model linking diseases with onset of disability or death in those NOT disabled at baseline (N=8,693)
- Observed probabilities of recovery or death by 2 year age group in those disabled at baseline
- Future enhancements:
  - Different severity levels of disability

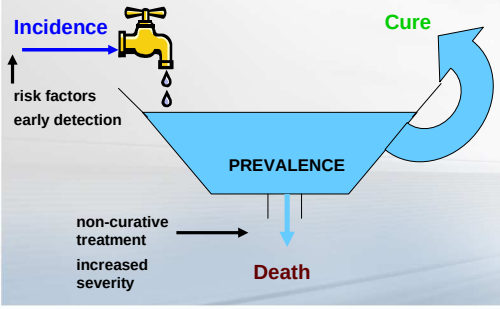
Simulation model

- Applies age-specific prevalence of disability as and transition rates to England & Wales population to estimate population by disability 2 years later.
- Future enhancements:
  - Gender specific projections
  - Extend projections to 2034

Simulation model (2)



What affects prevalence?



Literature review

Systematic review in disease areas for good evidence of:

- Important risk factors
  - association with disease, disability or survival with disease
  - risk factor trends
- Potentially effective preventative strategies and treatments
  - beneficial effect upon disease incidence, disease-specific disability or survival with disease

HOW MIGHT DISEASE IMPACT ON FUTURE DISABILITY?

Scenario 1: Population ageing alone

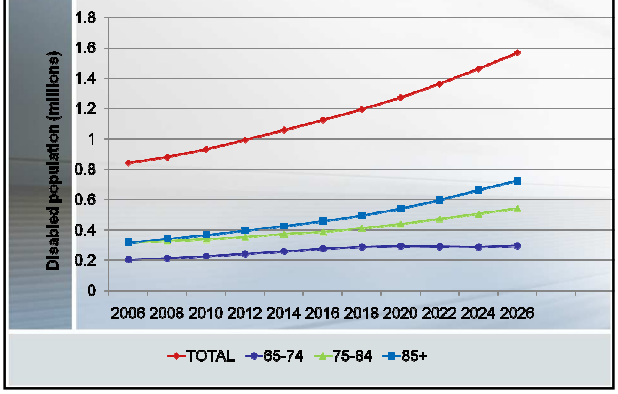
- Age-specific prevalence of diseases, incidence & recovery rates all remain the same.
- Mortality rates continue to fall according to levels set by GAD principal projection

Ageing alone

Comparison between 2006 and 2026:

- Total population increases from 8.9m to 12.3m
- Disabled population increases from 0.9m to 1.6m
- Numbers with disease increase by 40-60%:
  - arthritis increase from 4.7m to 6.5m
  - CHD increase from 2.0m to 2.8m
  - stroke increase from 0.7m to 1.0m
  - dementia increase from 0.8m to 1.3m

Size of disabled population: Ageing alone



Scenario 2: Current trends in health continue

- Prevalence of arthritis, stroke, CHD and cognitive impairment INCREASED by 2% every 2 years from 2012
- Onset of disability INCREASED by 10% from 2012 in those with arthritis, stroke and CHD
- Mortality from Stroke, CHD and mild cognitive impairment REDUCED by 5% from 2012

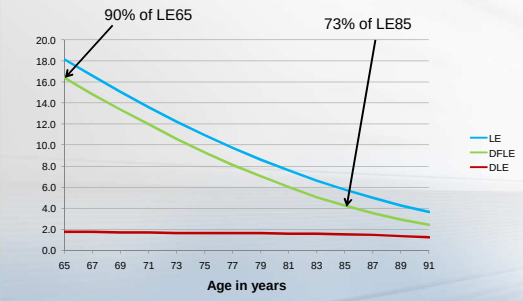
Scenario 3: Improving population health

- Prevalence of arthritis, stroke, CHD, and mild CI REDUCED by 2% every 2 years from 2012
- Onset of disability REDUCED by 10% in those with arthritis, stroke, CHD and mild CI from 2012
- Mortality REDUCED by further 5% in those with stroke, CHD and mild CI from 2015

Increases in disability and disease

	Ageing only	Current trends continue	Improved health
Increase in millions (%) from 2006 to 2026 in:			
Total population	3.48 (39%)	3.34 (38%)	3.69 (42%)
Disabled population	0.70 (82%)	0.80 (94%)	0.62 (73%)
Arthritis	1.87 (40%)	1.81 (39%)	2.00 (43%)
CHD	0.80 (40%)	0.77 (38%)	0.85 (42%)
Stroke	0.32 (48%)	0.33 (49%)	0.32 (48%)
Dementia	0.51 (63%)	0.53 (65%)	0.51 (63%)

LE, DFLE and DLE in 2006 under ageing only



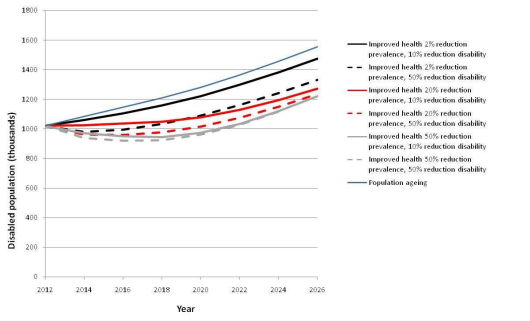
Increases in DFLE relative to LE

	Increase from 2006 to 2026 in years of			
	LE	DFLE	DLE	%DFLE/LE
At age 65				
Ageing only	2.6	1.5	1.1	-4.2
Current trends continue	2.1	0.8	1.2	-4.9
Improved health	3.4	2.3	1.0	-3.5
At age 85				
Ageing only	1.7	0.6	1.1	-8.3
Current trends continue	1.3	0.1	1.2	-11.6
Improved health	2.3	1.2	1.0	-5.1

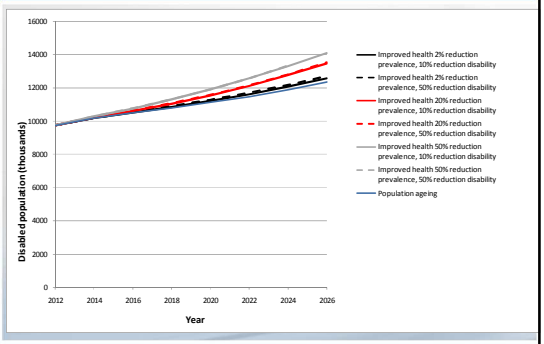
Further improvement in health

- Prevalence REDUCED by 2, 10, 20 & 50% every 2 years from 2012 for:
  - Arthritis
  - Stroke
  - CHD
  - Cognitive impairment (from 2016)
- Reductions of 10, 20 & 50% in disabling consequences of the diseases

Disabled population under further health improvements



Total population under further health improvements



Increases in DFLE relative to LE

REDUCTION in disabling effect/prevalence	Increase from 2006 to 2026 in			
	LE	DFLE	DLE	%DFLE/LE
At age 65				
Disabling effect 10% / Prevalence 2%	3.3	2.3	1.0	-3.1
Disabling effect 10% / Prevalence 10%	5.2	4.2	1.0	-2.1
Disabling effect 10% / Prevalence 50%	8.1	7.2	0.8	-0.4
Disabling effect 50% / Prevalence 50%	8.0	7.2	0.8	0
At age 85				
Disabling effect 10% / Prevalence 2%	2.2	1.2	1.0	-5.3
Disabling effect 10% / Prevalence 10%	3.5	2.6	0.9	0.2
Disabling effect 10% / Prevalence 50%	5.6	5.0	0.6	7.7
Disabling effect 50% / Prevalence 50%	5.6	5.0	0.6	7.7

Conclusions (1)

- Life expectancy will continue to rise, but most of extra years spent with disability
- Absolute compression of health is unlikely under any improvement in population health.
- A relative compression of disability could occur at age 85 if key diseases reduced by 10% and a 10% reduction in their disabling effect.
- Severity of disability considered may be important.

Conclusions (2)

- Ageing alone will produce 82% increase in numbers with significant disability and 40-60% increases in numbers with key diseases
- Improving population health results more older people overall and reductions in the prevalence of diseases barely contain the effects of population ageing on disability.
- If current trends continue there will be a 94% increase in numbers with disability and numbers with stroke and dementia will increase.

WHAT EFFECT DOES THIS HAVE ON THE NEED FOR LTC AND EXPENDITURE?

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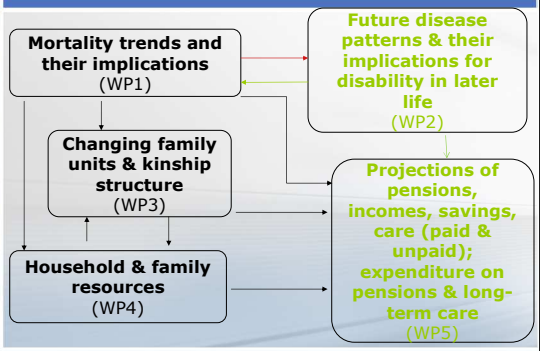


PSSRU MODEL

The PSSRU model aims to make projections of:

- Numbers of disabled older people
- Long-term care services and disability benefits
- Long-term care expenditure: public and private
- Social care workforce

A macro-simulation, cell-based model.

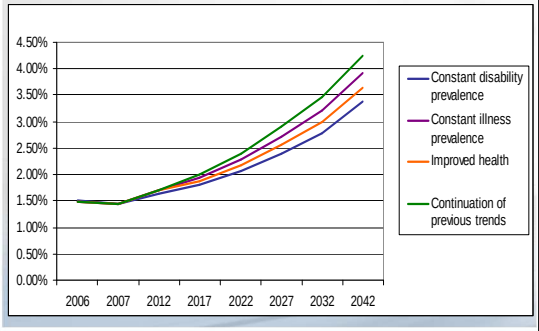
Linking the two models

- The age-specific prevalence of disability from the epidemiological model are incorporated in the PSSRU model for all projection years.
- The new disability scenarios substitute for the “base” assumption of constant age-specific prevalence of disability.

CENTRAL PSSRU BASE CASE

- Official principal population projection, by age, gender and marital status
- Unchanged age-specific disability rates
- No change in patterns of formal and informal care
- Unit costs rise by 2% per year in real terms (but constant for non-staff, non-capital costs)
- No change in financing system from current system in England

Future long-term care expenditure



Projected number of service users and long-term care expenditure.

	2006	2042			
		Constant Disability prevalence	Constant Illness prevalence	Improved health	Continuation of previous trends
Home care	293000	614000	644000	628000	663000
Institutional care	325000	779000	979000	875000	1098000
Total LTC Expenditure (£billion)	18	74	86	79	93
LTC Expenditure as% of GDP	1.5%	3.4%	3.9%	3.6%	4.2%

Conclusions

- The PSSRU model's base case scenario of constant age-specific disability prevalence assumes, implicitly, a decline in the prevalence, the disabling consequences and/or duration of chronic illnesses, in the context of increased life expectancy.
- Unless there is strong evidence that points in the direction of such declines, constant age-specific prevalence of disability is an optimistic (instead of neutral) assumption.
- Improvements in the future health of older people would have a substantial impact on future care needs and associated expenditure.

Future linkages

- Gender specific outputs from SIMPOP
- Use of standardised disability measure equivalent for all surveys with different severity levels
- Link with WP1 for different life expectancy variants