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The contribution of single and multiple chronic conditions to the deteriorating time trends in later-life disability

Part 2: Single and multiple conditions

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Short Report

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Background

The UK Government's Ageing Society Grand Challenge aims to ensure everyone spends an extra five years healthy and independent by 2035.[1] Previously in this project, we reported that, between 1991 and 2011, both men and women at age 65 gained more years free of disability than years with disability, due to lower chances of developing disability for men and women, and lower chances of dying with disability for men.[2] However, women reach the age at which the remaining years are divided equally between years with, and without, disability some 10 years earlier than men do.

In the second part of this project we seek to understand what is driving these DFLE gains, and identify gender differences. We focus on long-term conditions (the major drivers of disability)[3] and multiple long-term conditions (two or more conditions), the prevalence of which appears to be increasing faster than would be expected from population ageing.[4] Knowing whether gains in years with disability are from increases in prevalence of specific conditions or a rise in multiple conditions, and whether these explain gender differences, is important for informing treatment and preventive strategies. It will also inform approaches to support future cohorts of older adults requiring social care.

Specifically, we again use longitudinal (follow-up over multiple time points) data from the Cognitive Function and Ageing Studies (CFAS I and II), to determine whether the extra years with disability are because a) individual long-term conditions have become more prevalent and/or more disabling; or b) multiple long-term conditions (MLTC) have become more prevalent or disabling.

Methods

Data

The Cognitive Function and Ageing Studies (CFAS I and II) are two identical longitudinal studies of older people aged 65 years and over (including those in residential care) conducted in 1991 and approximately 20 years later, in three geographical centres (Cambridge, Newcastle and Nottingham). CFAS I comprises 7635 individuals and CFAS II 7796, with equal numbers aged 65-74 years and 75+ years. A subsample of participants had interviews with a friend, family member or carer nominated by the participant; these were important for cognitively frail participants as they provided an alternate source of information. Both CFAS I and II had follow-up interviews at two years. Further details of these are provided online[5] and in the full report.

Impairment in activities of daily living determined level of disability in both studies. Disability was categorised into: severe disability - needing help with either washing all over, preparing and cooking a hot meal, or putting on shoes and socks, or being housebound; mild to moderate disability - needing help with heavy housework, or shopping and carrying heavy bags; no disability - not needing help with any of the above activities and not housebound.

Long-term conditions were self-reported apart from cognitive impairment (defined as a score less than 26 on the Mini-Mental State Examination),[6] and included respiratory difficulties (asthma or chronic bronchitis), Coronary Heart Disease (CHD - angina or heart attack), arthritis, diabetes, visual impairment, hearing difficulties, peripheral vascular disease (PVD) and stroke. We defined multiple long-term conditions (MLTC) as two or more conditions, or,

for those with missing information on individual conditions, a percentage of health conditions of those measured exceeding 22.2% (2/9).

Statistical analyses

To compare the prevalence of each long-term condition at baseline between the two studies we fitted logistic regression models with adjustment for age and sex and inverse probability weighted for age, sex, deprivation and care home status to be population representative.

Disability-free life expectancy (DFLE) and life expectancy with any disability (DLE) with and without each single condition (or multiple conditions) were estimated using standard multi-state modelling techniques (Interpolated Markov Chain software version 0.99r19[7]) with presence/absence of each condition as a covariate. Total life expectancy (TLE) was modelled on date of death and, for comparability, date of death was included up to two years after the two-year follow-up interview. Analyses was separated for men and women in CFAS I and CFAS II. Further details of the modelling and weighting of the data to account for loss to follow-up are provided in the full report.

Results

The main findings are that, over the period between CFAS I and II (approximately 1991 to 2011):

Prevalence of long-term conditions at ages 65 years and over for women and men

- The odds of reporting diabetes and PVD more than doubled, CHD and hearing difficulties increased by 20% and cognitive impairment reduced by 40%, even allowing for differences in age and sex structure of the studies (Table 1).
- The prevalence of MLTC (defined as two or more) increased only in age group 65-74 years.

Table 1. Prevalence (%) of long-term conditions and multiple long term conditions (MLTC) in men and women aged 65 years and over in CFAS I and CFAS II, and odds ratio (OR) and 95% confidence interval (95%CI) of prevalence in CFAS II compared to CFAS I (age and sex adjusted)

	CFAS I %	CFAS II %	OR	95% CI	
Arthritis	52.9	55.0	1.1	(1.0	1.2)
CHD	17.7	21.0	1.2	(1.1	1.3)
Cognitive impairment	37.5	26.8	0.6	(0.5	0.6)
Diabetes	6.2	14.5	2.4	(2.2	2.7)
Hearing difficulties	22.5	26.9	1.2	(1.1	1.3)
PVD	4.3	10.7	2.2	(1.9	2.4)
Respiratory problems	19.2	19.5	1.0	(1.0	1.1)
Stroke	8.0	8.9	1.1	(1.0	1.3)
Vision impairment	13.6	15.2	1.1	(1.0	1.2)
MLTC	54.3	58.1	1.1	(1.0	1.1)

Life expectancy (LE), disability-free life expectancy (DFLE), and years with disability (DLE) at age 65

- LE and DFLE at age 65 for men with each single condition increased between CFAS I and CFAS II, gains in LE ranging from 3.5 to 6.0 years, and in DFLE from 1.8 to 4.9 years (Fig 1).
- Between CFAS I and II, gains in LE at age 65 for women with each condition were small, with, in some cases, a slight decrease, whilst gains in DFLE ranged from 0 to 3.5 years (Fig 1).
- For most single conditions, years free of disability (DFLE) exceeded those with disability (DLE)
- Men with cognitive impairment gained equal DFLE and DLE, but women with cognitive impairment only gained DLE (Fig 1).
- LE and DFLE at age 65 for men with MLTC increased between CFAS I and II by 4.7 years and 3.4 years respectively; women with MLTC gained 0.7 years in LE, and 1.3 years in DFLE.

Further details of results are provided in the full report.

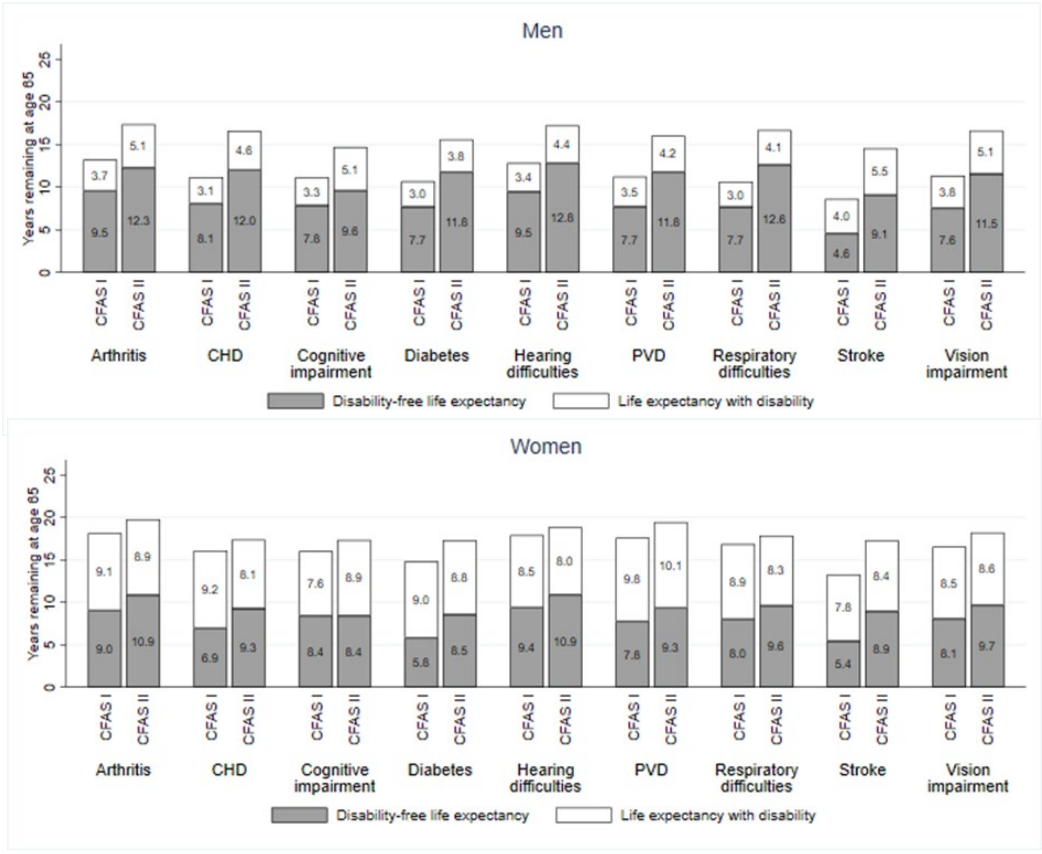

Figure 2. Disability-free life expectancy and life expectancy with disability at age 65 for men and women with a long-term condition in CFAS I and CFAS II

Conclusions

Despite increases in the prevalence of many long-term conditions, between 1991 and 2011 men with most single conditions, and with multiple conditions, still experienced gains in LE and DFLE at age 65. However, women with the same conditions saw little gain in LE and smaller gains in DFLE over the same period. Nevertheless, for both men and women, and for most conditions, more years were gained without disability than with disability, because

the risk of incident disability reduced. The findings of this report suggest increases in disability-free years are possible even in the presence of morbidity. Future interventions and treatments for conditions should focus on disability as an outcome, particularly for older women, if the Ageing Society Grand Challenge target of increasing healthy, independent years for all by 5 years by 2035 is to be met.[1]

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