

Modelling the growing need for social care in older people



Continuing ageing of populations raises many major questions beyond top-line predictions of the size of older groups over the coming decades. In *The Lancet Public Health*, Andrew Kingston and colleagues have addressed the issue of dependency in their new Population Ageing and Care Simulation (PACSim) modelling study,¹ forecasting that the largest change, relatively and absolutely, to 2035 in England will be growth in the number of men and women who will not have care needs. The authors estimate an increase in the number of independent adults aged 65 years or older from approximately 5.5 million in 2015 to 8.9 million in 2035. This would be an increase of 61.0% (range from ten simulations 60.6–62.0), which greatly exceeds the corresponding 36.0% (32.6–36.0) estimate for growth in the number of older people likely to need frequent, if not round-the-clock, care. Just the same, care provision at this intense level for more than 1 million people in 2035 will require careful thought and planning at both local and national level.

The innovation used to make this new forecast is to take an approach centred on three levels of dependency, observed in national surveys and then projected into the future. Kingston and colleagues' work builds on a recent analysis² using the two waves of the Cognitive Function and Ageing Studies (CFAS), in 1991 and 2011, which suggests an expansion of dependency over the past 20 years. This was the case particularly in the lower and higher of the three levels of dependency, and was in addition to the increased need due to the growing older population. The generalisability of the CFAS study, based in general practices in Cambridgeshire, Newcastle, and Nottingham (UK), depends on scaling up the observed proportions to the national level. When the proportions of people in the three dependency states in 2011 were applied to Office of National Statistics population projections for the UK, the predicted increase in the high dependency group was 400 000 (62%) between 2015 and 2035.² This forecast rate of increase is considerably larger than that estimated in the new PACSim study¹ based on more representative data. However, the two studies arrive at similar total numbers in the high-dependency group in 2035: more than 1 million people.

Projections of health-state occupancy are sensitive to modelling methods and input data. The basic method is

to apply observed estimates, stratified by demographic group, to population projections. Case definition is a key issue. With respect to the social care needs of older people, establishing such definitions is not straightforward because dependency is often measured indirectly, on the basis of a checklist of functional limitations—such as an activities of daily living (ADLs) questionnaire—that differ in their implications for the caregiver requirement. Inability to use the toilet without help is a more demanding limitation than needing help to shower or bath. The PACSim model defines severity following a nuanced and practical three-way categorisation developed more than 40 years ago³ on the basis of continence and dementia status, Mini-Mental State Examination score, and instrumental ADLs, such as needing help to prepare a hot meal, as well as ADLs.

Public health modelling is moving towards more realistic representation of the influences on future health-state occupancy. Our recently developed IMPACT-BAM (better ageing model) incorporated recent downwards trends in age-specific mortality rates and incidence of cardiovascular disease and dementia to forecast future disease burden and life expectancy among older people.^{4,5} The PACSim model takes account of likely future dynamics in the epidemiology of old age by conditioning health transitions according to multiple risk factors for dependence, including disease. Evidence is accumulating that this perspective is relevant to prevention policy as well as to predicting future need for social care in older people.⁶ Risk factors in the PACSim model were chosen on the basis of statistical significance of parameters in logistic models. Consequently, the underlying diseases and other risk factors determining transitions from independence to low dependency, low to moderate dependency, and moderate to high dependency are different. It is unclear whether selection on a biological rather than statistical basis would greatly alter forecasts. However, coherence of the model can be challenged when cancer, as a single category, is a risk factor for the transitions from independence to low dependency and from moderate to high dependency, but not for low to moderate dependency.

The new forecast¹ produces evidence of future divergence in needs for social care in men and women.

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Men are predicted to experience a compression of dependency, whereas women are predicted to experience an expansion of low and high dependency. For men in the period to 2025, the findings generated by PACSim and IMPACT-BAM differ in the predicted direction of travel. PACSim predicts a decline in years with dependency,¹ whereas IMPACT-BAM predicts growth in life expectancy with disability.⁵ Differences in findings such as this relatively short-term prediction highlight the potential to refine modelling techniques for the benefit of policy makers and the populations they serve.

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