The longevity conundrum: Population ageing in the UK

Thomas E. Padgett,[1] Alik Vodyanov,[1] Phil McEwan[1]

[1]Health Economics and Outcomes Research Ltd., Cardiff, UK

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An ageing population and a shrinking tax base –

Change is needed

to meet the predicted demand for healthcare

CONCLUSIONS

UK population ageing is expected to continue over the coming decades

This will **increase demand** for healthcare resources in an already strained system

The status quo is fiscally unsustainable

Net fiscal contribution is expected to decrease from -11.7 billion to -119.9 billion between 2026 and 2060

INTRODUCTION

- Many countries are experiencing growth in the absolute **number and proportion of older persons** in their populations[1]
- Age is strongly correlated with **increased healthcare resource use** (HCRU)[2]
- The UK National Health Service (NHS) is already **under pressure**, and is **struggling to meet targets** for patient waiting times and quality of treatment.[3] Accordingly, patient satisfaction is at **an all-time low**[4]

THE LONGEVITY CONUNDRUM

How can a shrinking workforce meet the care needs of a growing, ageing population?

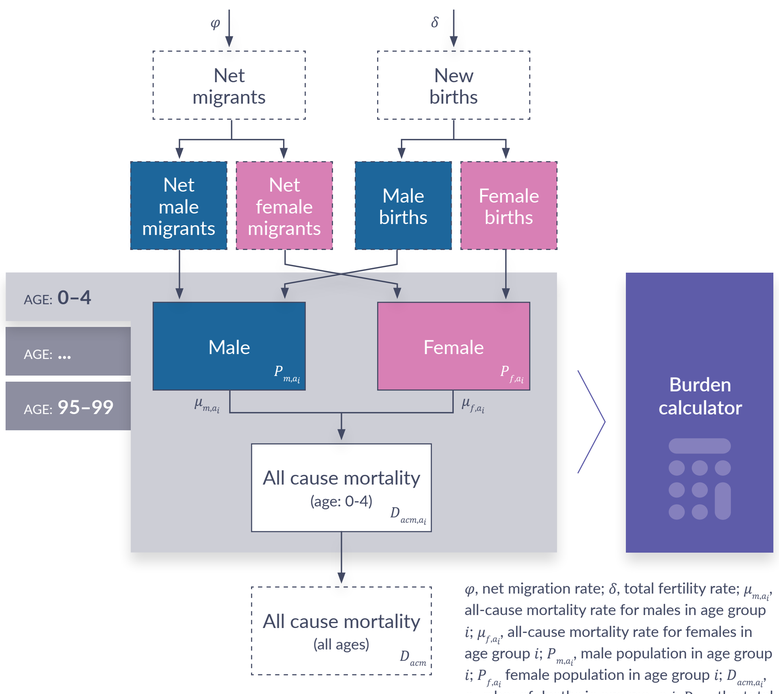
OBJECTIVES

- The objective of this work is to **predict the future age structure of the UK**, and to estimate how population revenue, spending, and HCRU will change

METHODS

- Using data from the Office for National Statistics, we developed an age- and sex-stratified, dynamic population model of the UK (Fig. 1)
- People enter the model through births and migration and leave via mortality
- Revenue and spending were determined using data from the Office for Budget Responsibility, and secondary care usage was predicted using data from the Secondary Usage Services dataset[2]

Figure 1. Age- and sex-stratified dynamic population model



φ, net migration rate; δ, total fertility rate; μ_{m,a_i}, all-cause mortality rate for males in age group i; μ_{f,a_i}, all-cause mortality rate for females in age group i; P_{m,a_i}, male population in age group i; P_{f,a_i} female population in age group i; D_{acm,a_i}, number of deaths in age group i; D_{acm}, the total number of deaths

LIMITATIONS

- Our modelling projects out the current trajectories of HCRU and NFC and does not consider the feedback loops that result from having constrained resource supply, politics of scarcity, or omitting an important feedback loop which could result in the deprioritisation of economically active people

RESULTS

Population ageing is expected to continue in the coming decades. Between 2026 and 2060:

- Our model predicts that the UK population will increase from 67.7m to 73.1m. The proportion of the population who are ≥65 years old will increase from 20.5% to 26.2%, and the average age will increase from 42.3 to 45.9 years
- This will be associated with substantial increases in HCRU. The annual number of inpatient bed days is predicted to increase by 39.1% (47.0m to 65.4m) whilst A&E admissions will increase by 13.5% (18.6 to 21.1m) and the number of outpatient procedures will increase by 19.4% (13.6m to 16.2m)
- The old-age dependency ratio (OADR; the ratio of economically active to inactive populations) is predicted to increase from 328 to 443, representing a greater burden on workers. Correspondingly, healthcare spending will increase from £265.9bn to £324.8bn

Figure 2. UK Population pyramids: a) 2002, b) 2026, c) 2060

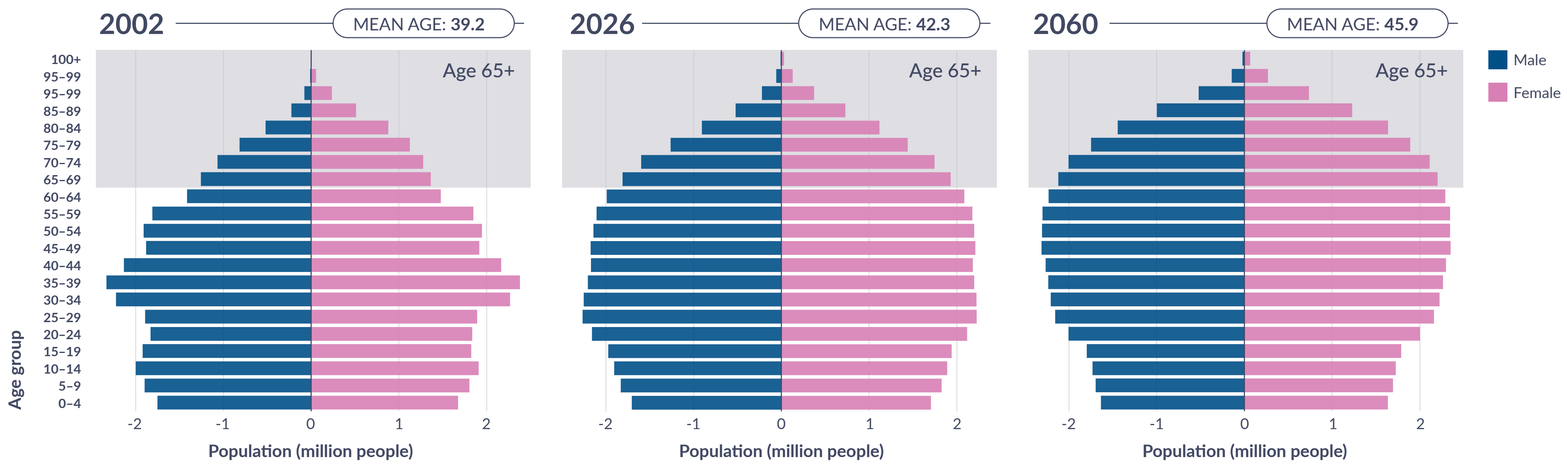
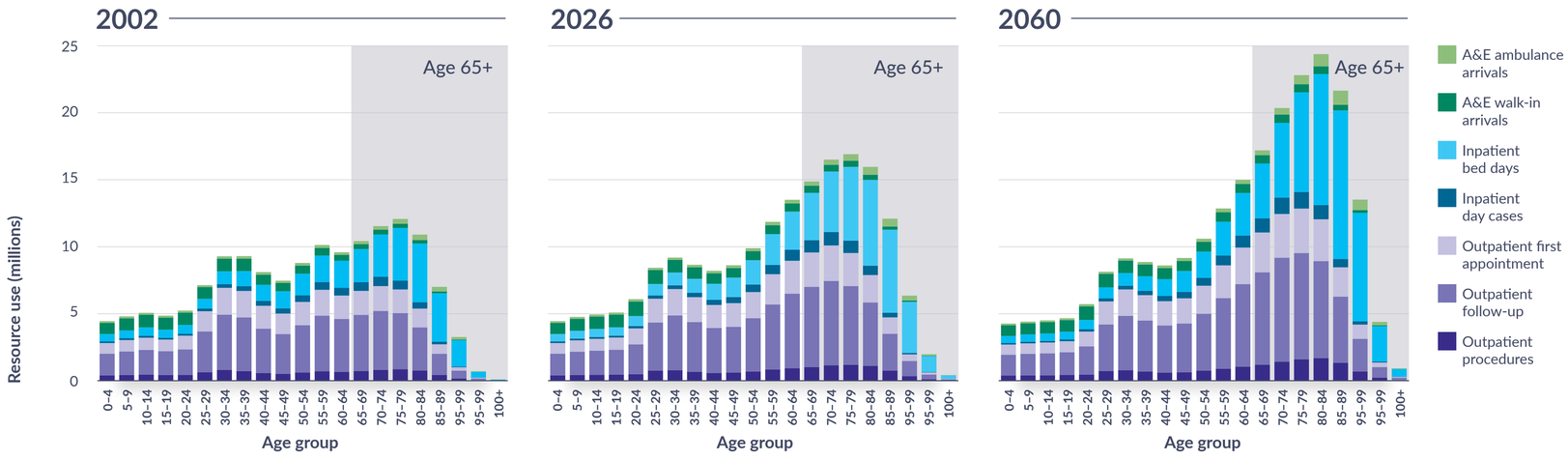


Figure 3. UK healthcare resource utilisation: a) 2002, b) 2026, c) 2060



Investment in healthy aging: a treatment for the government's worsening fiscal path

- The cumulative population-level net fiscal contribution (NFC) is predicted to reduce significantly from £484.0bn to −£1538.3bn between 2026 and 2060 (Fig. 4) due to changes in the OADR. This effect is predicted to accelerate over time due to the cumulative effects of population ageing, which are only partially mitigated by increasing the migration rate. Proportionally large shifts in fertility also do not improve public finances over this time horizon
- We demonstrate that increasing the healthy life expectancy by 5 years would result in an additional £91 billion of operating allowance (Fig. 5), highlighting the value of investments into therapeutic areas which will significantly improve the health span of the population

Figure 4. UK population cumulative net fiscal contributions, 2002-2060

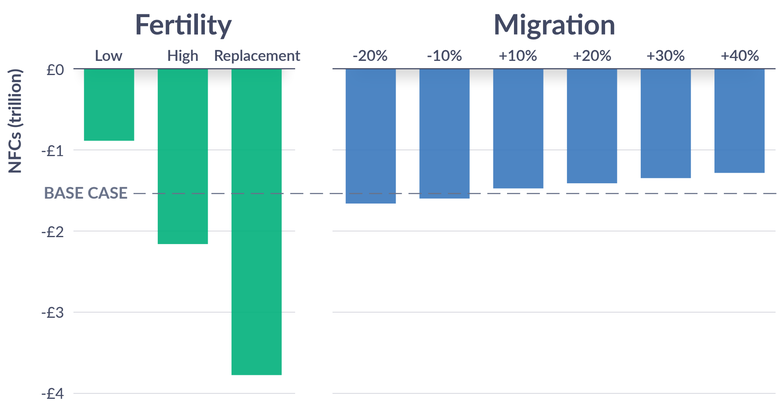
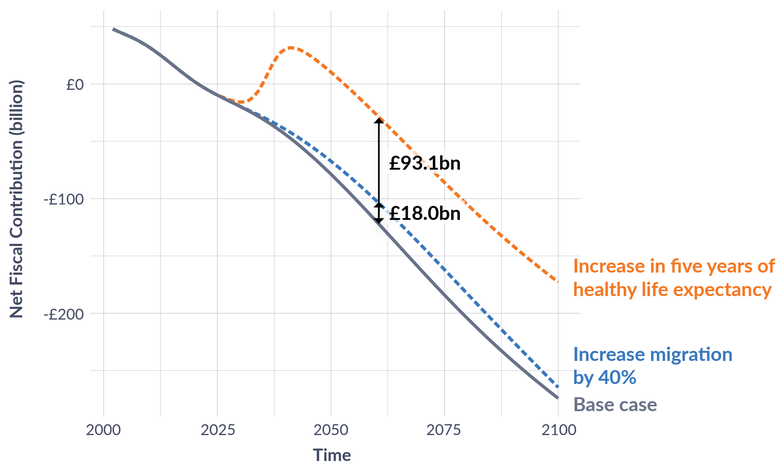


Figure 5. Comparing the net fiscal contribution of the UK under base case and increased health span scenarios



ABBREVIATIONS

A&E, accident and emergency; HCRU, healthcare resource usage; NFC, net fiscal contribution; NHS, National Health Service; OADR, old age dependency ratio (over 65/15-65 years x 1000)

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