with longer follow-up and are likely to be largely due to changes in behaviour caused by preclinical dementia.

also be used in an economic evaluation of alternative strategies for stroke management, including cognitive rehabilitation.

OP51 PROJECTING THE INCIDENCE AND PREVALENCE OF POST-STROKE COGNITIVE IMPAIRMENT AND DEMENTIA IN THE IRISH POPULATION AGED 40+ YEARS FROM 2015–2025

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Background Post-stroke cognitive impairment (PSCI) is a common consequence of stroke, leading to reduced quality of life and increased care needs. However, rehabilitation services for this condition in Ireland are very limited. The aim was to apply estimates of PSCI incidence to the Irish population and project the number with PSCI in the population in 2025.

Methods We developed a deterministic Markov model to estimate future incidence of PSCI in the population aged 40–89 years living in Ireland up to 2025. Population data, estimates and projections to 2025 were obtained from the Irish Central Statistics Office. Data from the Irish Longitudinal Study on Ageing were used to estimate age and sex specific stroke prevalence in 2014. Age and sex specific stroke incidence was estimated using 2015 public hospital discharge data (n=6,155). Transition probabilities across six health states defined by cognitive impairment, physical disability, dementia and death were estimated using data from stroke survivors in the English Longitudinal Study on Ageing (n=490) (2002–2011). Published data from the South London Stroke Register were used to estimate annual stroke recurrence.

Results The Irish population aged 40–89 years in 2015–2025 (n=2.7m) is projected to have a cumulative incidence of stroke of approximately 2.3% by 2025 (n=63,100). Of these incident strokes, approximately 22.5% are estimated to have died due to stroke (n=14,200), and 23.8% to have died of another cause (n=15,000) by 2025. Of the survivors in 2025 (n=30600), approximately 50.9% are predicted to have cognitive impairment without dementia (n=15500), and 19.4% to have dementia (n=5900). The total number of stroke survivors is projected to increase from 26700 in 2015 to 41400 in 2025, equivalent to a 55% increase in numbers, and the number with post-stroke dementia is projected to more than double from 3900 in 2015 to 8700 in 2025.

Discussion In 2025, over two thirds of Irish people who have survived a stroke in the preceding 10 years will have cognitive impairment. The number of people with post-stroke dementia is set to double between 2015 and 2025. The model is limited by its deterministic nature, and the assumption that age-specific disease incidence will remain stable. The model will be further developed to include a probabilistic sensitivity analysis, to model alternative scenarios for trends in disease incidence, and to extend the projections to 2035. The model will

OP52 DEMENTIA PROGRESSION IN THE AGEING POPULATION: A COMPUTER SIMULATION ACCOUNTING FOR INDIVIDUAL COGNITIVE AND FUNCTIONAL DECLINE VARIABILITY

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Aim To improve planning for the growing older population and the complex care needs of people with dementia, it is important to recognise the variability of individual cognitive and functional decline and associated care costs. However, many studies exploring care demand simplify varied patient trajectories by partitioning dementia patients into severity categories, therefore failing to capture heterogeneity. Our aim was to develop a computer simulation that models dementia progression longitudinally, driven by population-level dementia onset, mortality, and ageing and including individual variability.

Methods Each modelled age group contains two stocks and three flows using the System Dynamics methodology. A cognitively normal (CN) stock is connected via an incident flow to a stock representing people with dementia (PWD). The 65 to 105 year age range is modelled using eight contiguous 5-year age groups. Ageing is implemented by transferring CN and PWD survivors from each stock to the next oldest age group at 5-year intervals. Mortality flows complete the structure for each age group. Published sources provide flow rates. Agent-based methods are used to model individual attributes and outcomes for dementia cases. Progression is modelled by defining a progression rate type for each agent and deriving individual severity progression coefficients. These are based on fixed and random effects regression models, sampled from probability distributions.

Results Mean progression rates are consistent with published studies. By including individualised random effects, the model demonstrates a complex relationship between decline, severity and service use. Rapid decline leads to higher annual care costs with higher mortality rates. Slower decline leads to lower annual care costs over a longer time period. By incorporating these different trajectories within the model, dementia, care costs, and QALYs can be partitioned by fast, intermediate, and slow progression types to more fully support targeted recommendations for planning service delivery.

Discussion Our computer simulation model shows that accounting for the considerable variability in dementia progression rates as well as severity categories provides more accurate representation of the variation in patient trajectories and outcomes. This modelling method hybridises population-level epidemiology and individual-level pathology, allowing future