

LIFETIME COSTS OF CARE AND INSURANCE PREMIUMS

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METHODS OVERVIEW

- PSSRU dynamic microsimulation model
- PSSRU aggregate model with estimation using Sullivan's method
- University of Barcelona simulated cohort
- Nuffield Trust modelling of linked health and social care data

PSSRU MICROSIMULATION MODEL

- The DSM model uses data on people aged 65+ from the British Household Panel Survey
- Transitions, including mortality, disability and household composition, are modelled stochastically for each person each year
- An algorithm assigns care packages as function of need, mainly disability and household composition
- Unit costs are applied to each person's care pathway, generated in this way
- This yields distribution of estimated life-time costs of care from age 65

PSSRU AGGREGATE MODEL

- Data from analyses carried out with the PSSRU aggregate model, on use of services and on disability by age and gender
- Augmented life table using Sullivan's method to estimate expectation of life with disability and expectation of life in receipt of home care and residential care
- Unit costs are applied to each person's care pathway to yield estimate of life-time from age 65
- Advantage: great flexibility in terms of investigating impact of assumptions on future mortality and epidemiological changes
- Disadvantage: cannot estimate the distribution of lifetime costs of care

UB SIMULATED COHORT MODEL

- A proportion of individuals from the initial population is assigned to all possible use of services state except death
- Using mortality rates by age and gender of each individual, the numbers in each state is updated after one year
- As some individuals die, the number of people in every state initially decreases, but then increases as new people enter the state
- Assumed transition probabilities between states are used to assign states in the next age. Priority is given to transitions to the nearest possible state
- Unit costs are applied to each person's care pathway to yield estimate of life-time costs from age 65

NUFFIELD TRUST MODELLING USING ADMINISTRATIVE DATA

- Based on administrative data on services received over three years for local residents of three areas of England
- Includes services funded at least in part by local authorities only (but includes means-tested co-payments)
- Modelled transition probabilities for three states (no social care, community-based social care and permanent care home placements)
- Using mortality rates by age and gender of each individual, the numbers in each state is updated after one year based on the transition probabilities
- Unit costs are applied to each person's care pathway to yield estimate of life-time costs from age 65

KEY BASE CASE ASSUMPTIONS

- Mortality rates fall in line with ONS 2010-based principal population projections
- Disability rates by age and gender remain constant
- Patterns of care remain unchanged
- Unit costs of care remain constant at 2010/1 prices or rise by 2% per year in real terms
- Hotel costs in care homes (assumed to be £10k per year) are excluded
- Real interest rates are zero

PSSRU MICROSIMULATION MODEL

Estimated mean and median life-time costs of care at age 65, 2010/1 prices

	ALL	MALE	FEMALE
MEAN	26,250	18,500	33,250
MEDIAN	14,500	7,250	23,000

PSSRU MICROSIMULATION MODEL

Estimated mean and median life-time costs of care at age 65, 2010/1 prices, 2% annual real rise in care costs

	ALL	MALE	FEMALE
MEAN	36,250	25,700	46,000
MEDIAN	20,000	10,000	31,250

PSSRU MICROSIMULATION MODEL

Distribution of life-time costs of care at age 65,
2010/1 prices, 2% annual real rise in care costs

25%	500 or less
50%	20,000 or less
75%	53,500 or less
90%	97,500 or less

PSSRU AGGREGATE MODEL

Estimated average life-time receipt of care services after age 65, in years

	ALL	MALE	FEMALE
Residential care	1.0	0.6	1.4
Home care	1.5	1.2	1.9

PSSRU AGGREGATE MODEL

Estimated mean life-time costs of care at age 65, 2010/1 prices, under variant inflation assumptions

	ALL	MALE	FEMALE
0% real rise	37,000	25,000	48,000
2% real rise	58,000	39,000	77,000

PSSRU AGGREGATE MODEL

Estimated mean life-time costs of care at age 65, 2010/1 prices, zero real inflation, under variant mortality assumptions

LIFE EXPECTANCY	ALL	MALE	FEMALE
Low	41,000	29,000	53,000
Principal	37,000	25,000	48,000
High	34,000	22,000	44,000

PSSRU AGGREGATE MODEL

Estimated mean life-time costs of care at age 65, 2010/1 prices, zero real inflation, under variant disability assumptions

DISABILITY	ALL	MALE	FEMALE
Constant rates	37,000	25,000	48,000
Continued trends	45,000	30,000	60,000

PSSRU AGGREGATE MODEL

Estimated mean life-time costs of care at age 65, 2010/1 prices, zero real inflation, payment of £350pw on failing 2 Activities of Daily Living

	ALL	MALE	FEMALE
Current care	37,000	25,000	48,000
ADL failure	37,000	23,000	51,000

Failure of an ADL means inability to perform it without help or residence in a care home

UB SIMULATED COHORT MODEL

Estimated mean and median life-time costs of care at age 65, 2010/1 prices

	ALL	MALE	FEMALE
MEAN	30,000	19,500	40,000
MEDIAN	12,000	5,750	17,750

UB SIMULATED COHORT MODEL

Distribution of life-time costs of care at age 65,
2010/1 prices, 0% annual real rise in care costs

	MALE	FEMALE
25%	0	0
50%	5,750	17,750
75%	39,000	74,750
90%	57,500	117,750

UB SIMULATED COHORT MODEL

Estimated mean life-time costs of care at age 65, 2010/1 prices, zero real inflation, under variant mortality assumptions

LIFE EXPECTANCY	ALL	MALE	FEMALE
Low	33,250	22,000	43,750
Principal	30,000	19,500	40,000
High	27,250	17,000	36,750

UB SIMULATED COHORT MODEL

Estimated mean life-time costs of care at age 65, 2010/1 prices, zero real inflation, under variant disability assumptions

DISABILITY	ALL	MALE	FEMALE
Constant rates	30,000	19,500	40,000
Continued trends	33,750	21,750	45,000

NUFFIELD TRUST MODELLING USING ADMINISTRATIVE DATA

Estimated mean life-time costs of care at age 65, 2010/1 prices, 2% real cost increases, 0% real discount rate

	ALL*	MALE	FEMALE
Seaside town	£32,200	£23,700	£40,700
Costal and countryside area	£30,200	£17,500	£42,900
London suburb	£33,500	£18,200	£48,800
All areas*	£32,000	£19,800	£44,100

* Simple average

COMPARISON OF ESTIMATES

Estimated mean life-time costs of care at age 65,
2010/1 prices, zero real inflation

	ALL	MALE	FEMALE
PSSRU DSM	26,250	18,500	33,250
PSSRU Aggregate	37,000	25,000	48,000
UB Simulated Cohort	30,000	19,500	40,000
Nuffield Trust	32,000	19,800	44,100

ESTIMATED INSURANCE PREMIUMS

- Premiums need to take account not only of the expected benefits paid to enrolees but also various costs including admin costs and opportunity costs of reserves
- In the USA loss ratios, that is proportion of premiums paid out to enrolees, are 60% for individual policies but more for group policies

ESTIMATED INSURANCE PREMIUMS

- If life-time costs of care are in the range of £25,000 to £35,000 and loss ratios in the range 60% to 70%, lump sum premiums at age 65 would be in the range £35,000 to £60,000
- If it was assumed that care costs are likely to rise by an average of 2% per year in real terms but real interest rates remain constant, lump sum premiums at age 65 would be in the range £50,000 to £80,000

ESTIMATED INSURANCE PREMIUMS

- In the USA most enrollees pay regular monthly payments, or at least a combination of a lump sum and monthly payments, rather than lump sums at age 65
- Estimated monthly payments, on the basis of 2% real rise in care costs, would be in the range of £210 to £335 per month at constant 2010/1 prices