

Cognitive disability and direct care costs for elderly people

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Background Population ageing and the high costs of care support for elderly people have concentrated attention on economic issues. Is there an association between costs and cognitive disability?

Aims To compare service utilisation and direct costs for elderly people with different degrees of cognitive disability, and between people living in households and in communal establishments.

Method Secondary analysis of Office of Population Censuses and Surveys (OPCS) Disability Surveys data compared service utilisation and costs for 8736 elderly people with cognitive disability. Cost estimates were constructed for all health and social care services.

Results A much greater proportion of people at higher levels of cognitive disability lived in communal establishments, where their (direct) costs were much higher than when supported in households. Service utilisation patterns and costs varied with cognitive disability.

Conclusions It is important to look at the full range of living arrangements and support services when examining costs. The potential cost implications of pharmacotherapies, other treatments or new care arrangements cannot be appreciated without such a broad perspective.

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Population ageing is closely associated with higher utilisation of health and social care services (Organization for Economic Cooperation and Development, 1996). Psychiatric morbidity is of particular concern. New treatment or service arrangements provoke debate about their cost implications. For example, the potential cost-effectiveness of drugs to slow the progress of Alzheimer's disease has been keenly discussed. Little is known, however, about the costs of caring for elderly people with *different degrees* of cognitive disability, or about the comparative costs of communal and household-based care. Using a large national population-based data set we sought to examine these economic aspects of care for elderly people. The primary intention was to provide 'benchmark' information to inform debates about the potential costs of various treatment and service changes.

METHOD

Sampling

The Office of Population Censuses and Surveys (OPCS) conducted two disability surveys in the mid/late 1980s that examined separately the disability of adults within large national population-based sampling frames, one for communal establishments and the other for private households (Martin *et al*, 1988). Disability was measured across 13 domains: locomotion, reaching and stretching, dexterity, seeing, hearing, continence, communication, personal care, behaviour, intellectual functioning, consciousness (fits), digestion and disfigurement. The OPCS used the views of carer organisations, staff and researchers to scale scores in each of these 13 domains and to develop a composite measure of disability. The disability instrument has good inter-rater reliability; it is highly correlated with the Barthel Index (Collin *et al*, 1988) but is more comprehensive (McPherson *et al*,

1993; Wellwood *et al*, 1995). The intellectual functioning measure (Martin *et al*, 1988) has been used previously to estimate the prevalence of cognitive disability in the elderly (Opit, 1990) and the likely growth in the number of elderly people affected (Melzer *et al*, 1997a).

For the household survey, a random sample of over 100 000 domestic addresses was selected throughout Great Britain to receive an initial 'sift' questionnaire designed to detect disability in general, but including questions pertinent to the identification of older people with cognitive disability. People identified as being disabled (or their carers) were subsequently interviewed. Questions included degree of disability, personal circumstances and use of services.

Only facilities providing accommodation for disabled people were included in the communal establishments survey. One in 13 hospitals, hostels and residential and nursing homes were approached ($n=1408$); 63% were eligible for inclusion ($n=892$), of which two-thirds were randomly selected ($n=595$). Samples of residents were interviewed from each. To prevent overlaps between the two surveys, residents were selected for the communal establishments survey if: (a) they had been permanently resident in the communal establishment for the past six months; (b) resident for less than six months but in other residential care for the past six months, with no other place of residence at this time; (c) if they were likely to remain in residential care for the foreseeable future (Martin *et al*, 1988). In smaller establishments (fewer than 80 residents), one in four residents were included in the sample; in larger establishments one in 12 residents were included. Proxy interviewees (staff members) were used when residents were incapable of answering questions, or sometimes even when they were, and in some instances residents and staff were jointly interviewed.

Service utilisation

The OPCS asked extensive questions regarding service use by adults in households. Intensity of service utilisation for community-based services was determined using multiple-choice questions: every day (which we have assumed, for costing purposes, is equivalent to 365 times per annum); two or three times per week (120 per annum); once per week (52 per annum); once per month (12 per annum); and less than once per month (four per annum).

We defined and costed respite care as when the disabled person spent some time at a facility (nursing home, hostel, residential home), excluding holidays or breaks with family or friends.

The survey of adults in communal establishments collected less-detailed service-use data than the households survey, except in relation to general practitioner consultations (Kavanagh & Knapp, 1998). Generally there were data on whether or not people had used external services (e.g. social workers, day care), but few data on frequency of use. To provide indicative estimates (and thus enable broad comparisons with people in households), we were forced to make assumptions about the frequency of service use (Kavanagh & Knapp, 1997).

Costs

In previous work we estimated the aggregate national costs of cognitive disability among elderly people (Kavanagh *et al.*, 1995), using unit cost estimates taken from the 1995 Personal Social Services Research Unit compendium (Netten & Dennett, 1995). These are bottom-up, nationally based estimates of long-run marginal costs, and include allowances for capital and overheads. Where information was not available from this source on the typical workload generated by a visit from a care professional, we assumed that domestic visits lasted 20 minutes and took a further 20 minutes for travel and administration. For residents in local authority homes, we had to employ a single average cost estimate for residential care (£382 per week). For people in National Health Service (NHS) establishments we took weekly cost per resident as: £825 for establishments for geriatric medicine or the elderly; £769 for establishments for the elderly mentally ill; and £707 for psychiatric hospitals. It was possible to depart from these national unit cost estimates for certain services, as we now describe.

The OPCS collected information on resident fees in private and voluntary communal establishments, which we used as proxies for the opportunity cost of placement, up-rated to 1994/95 prices using the Department of Health's Personal Social Services price inflator. We included an additional amount to cover personal requisites such as toiletries and newspapers, proxied by the personal allowance paid by the Benefits Agency to people in institutions (£13 per week).

For people living in households, in order to compare on a like-with-like basis with communal establishments, the opportunity cost of housing was estimated using figures (admittedly somewhat dated) calculated by Challis & Davies (1986), who had engaged an experienced valuer to assess housing occupied by elderly people. Replacement values were discounted over 60 years at 7% per annum, uprated to 1994/95 prices using the Department of the Environment 'output price index for private housing', giving a weekly opportunity cost of £42. For people in hospital or a care home, food and heating are included in the 'hotel' cost, and people in these settings also purchase personal requisites such as toiletries. In costing care in private households, equivalents were included to ensure valid comparison, estimated using the 1994 Family Expenditure Survey figure for adult retired households (£88 per week).

No costs are attached to support by care-givers. The disability surveys only collected information on these inputs for people who received help with personal care tasks such as toileting.

Analyses

The samples of elderly disabled people were divided into three groups on the basis of their intellectual functioning or cognitive disability score, based on the typology of Opit (1990):

- (a) no or indiscernible cognitive disability (scores of 0–12);
- (b) mild/moderate cognitive disability (3–6); and
- (c) severe cognitive disability (≥ 7).

We included people aged 65 years or over, excluding those with a reported diagnosis of learning disability ('mental handicap' in the surveys) on the basis that their cognitive disability was more constant across their lifetime, while we were concerned with later-onset cognitive disability. A small number of people with anomalous coding were included: they were unable to complete the interview schedule because they were 'mentally incapable' and were recoded as having severe cognitive disability.

Analyses of variance and Bonferroni multiple comparison tests were used to examine whether there were differences in costs between the three cognitive disability groups. Although the distributions of some of our cost variables were non-normal and skewed to the right, we conducted

analyses on untransformed data (Barber & Thompson, 1998).

RESULTS

Demographic characteristics

The surveys included 5699 elderly disabled people in private households and 3037 in communal establishments. Of the 3037 people in communal establishments: 1000 interviews were conducted with subjects themselves; 587 with the subject and a member of staff; and 1450 with just a member of staff. For people in households, 4782 (85%) of interviews were with the subject themselves, 441 (8%) with the subject and a proxy interviewee and 439 (8%) with just a proxy interviewee. Interestingly, the proportion of interviews involving the subject alone fell from 91% among people with no cognitive disability to 61% among people with mild/moderate cognitive disability and 14% among people with severe cognitive disability.

The majority of elderly disabled people in households were women, particularly in the older age groups (Table 1). People living alone tended to be women (81%) and were most likely to be widowed (85% of women living alone) and older. Disabled elderly people in communal establishments were older and the proportion who were female and/or widowed was also much greater compared with elderly disabled people in households (Table 2).

Reported morbidity and disability

Mental health problems were commonly reported, particularly among the residents of communal establishments (>23%), especially private sector and NHS establishments (Table 3). Severe cognitive disability was less prevalent among people living alone in households compared with people living in households with others (2.6% *v.* 7.5%), and both were much lower than the prevalence among the residents of communal establishments, particularly those in NHS hospitals. Comorbidities, including musculoskeletal problems and cardiovascular and respiratory diseases, were also commonplace across all settings (Table 4).

Service utilisation and costs

Service use and costs varied by degree of cognitive disability among the household sample (Table 5). General practitioner services were the most commonly utilised.

For many services, the proportion of people using them and the intensity of use increased with the degree of cognitive disability. For example, hospital in-patient care was used by 17% of people without cognitive disability (mean 24 days), 25% of people with mild/moderate cognitive disability (32 days) and 32% with severe cognitive disability (38 days).

Similar trends were apparent for district nurses, nursing auxiliaries, community psychiatric nurses, community mental handicap nurses, private nurses, other nurses, chiropodist, laundry services, social workers, day centres and respite care in local authority homes. On the other hand, some service use displayed the opposite pattern: for instance, social club utilisation was higher for those with less cognitive disability. Many elderly people with severe cognitive disability apparently had no contact with specialist secondary care services.

For people living in households, mean service costs rose from £35 per week for people with no cognitive disability, to £75 for people with severe cognitive disability (Table 6). These were significantly different (one-way ANOVA: $P < 0.001$; Bonferroni multiple comparison test: none *v.* mild/moderate cognitive disability $P < 0.001$, none *v.* severe $P < 0.001$, mild/moderate *v.* severe $P < 0.001$). At each level of disability there was quite marked cost variation around the mean. The distribution was also highly skewed, reflecting the large proportions of non-users for many services, the small number of people who used the services very intensively and – at the uppermost end – people using in-patient care that had a high unit cost.

People living in communal establishments generally received most of their care and support services within the facility, with costs met from the facility budget. Quite a number of residents used a few external services (Martin *et al.*, 1989; Kavanagh & Knapp, 1997). The full costs of placement in communal establishments, plus the costs of external services used, varied between sectors (Table 7). Placement costs were greater for people with higher levels of cognitive disability in voluntary sector establishments (one-way ANOVA: $P = 0.011$; Bonferroni: none *v.* mild/moderate cognitive impairment $P = 1.000$, none *v.* severe $P = 0.009$, mild/moderate *v.* severe $P = 0.079$), but a similar relationship was not apparent in private sector homes (one-way ANOVA: $P = 0.629$). Placement cost

Table 1 Demographic characteristics of the sample of elderly people with disability living in private households

Characteristics	Male (n=2145)		Female (n=3678)		Total (n=5822)	
	n	%	n	%	n	%
Age group (years)						
65–69	542	25	598	16	1140	20
70–74	558	26	774	21	1332	23
75–79	516	24	909	25	1426	25
80–84	327	15	772	21	1100	19
85+	201	9	624	17	825	14
Household type						
Lives alone	434	20	1876	51	2310	40
Lives with others	1711	80	1802	49	3513	60
Marital status						
Married/cohabiting	1507	70	1075	29	2581	43
Single	98	4	319	9	416	7
Widowed	489	23	2191	60	2680	47
Divorced/separated	52	2	93	3	145	2

Source: Office of Population Censuses and Surveys, Social Survey Division (1989).

The data in this table were calculated using a basic sample weight to account for non-response, etc.

Table 2 Demographic characteristics of the sample of elderly people with disability resident in communal establishments

Characteristics	NHS		Local authority		Voluntary		Private	
	n	%	n	%	n	%	n	%
Gender								
Male	184	27	292	25	74	21	154	18
Female	504	73	860	75	285	79	684	82
Age group (years)								
65–69	55	8	50	4	30	8	27	3
70–74	83	12	98	9	33	9	60	7
75–79	163	24	209	18	64	18	135	16
80–84	155	23	301	26	97	27	224	27
85+	233	34	494	43	136	38	390	47
Marital status								
Married	114	17	66	6	14	4	56	7
Single	123	18	229	20	118	33	155	19
Widowed	434	63	817	71	220	61	603	72
Divorced/separated	13	2	39	3	6	2	20	2
Average length of stay (months)	67.9		36.7		74.5		25.6	

Data are weighted to account for non-response, etc.

variation within the voluntary and private samples was limited by the tendency of home charges to bunch around the Income Support (social security) payment levels in force at the time.

There was no significant difference in service costs by degree of cognitive disability

in private sector homes (one-way ANOVA: $P = 0.104$). Although there were statistically significant differences in service costs for residents in voluntary sector homes (one-way ANOVA: $P = 0.009$; Bonferroni: none *v.* mild/moderate $P = 0.072$, none *v.* severe $P = 0.358$, mild/moderate *v.* severe

Table 3 Cognitive disability in households and communal establishments¹

Severity score	Households alone	Households with others	NHS	Local authority	Private sector	Voluntary sector
None (% of sample)	90.1	85.2	41.0	47.3	52.4	63.1
Mild/moderate (% of sample)	7.3	7.3	21.8	23.7	21.1	21.7
Severe (% of sample)	2.6	7.5	37.2	28.8	26.5	15.2
Median score ²	0.0	0.0	6.0	3.5	2.0	0.0
Mean score ²	0.6	1.1	5.4	4.5	4.1	2.9
<i>n</i>	2286	3413	688	1152	836	359

1. Data are weighted to account for non-response, etc.

2. Scale range 0–13.

Table 4 Prevalence of reported morbidities among elderly disabled people resident in households and communal establishments¹

Category of morbidity	NHS establishment	Local authority establishment	Voluntary sector establishment	Private sector establishment	Household living alone	Household living with others
Musculoskeletal ² (% of sample)	35	42	45	45	56	47
Mental ³ (% of sample)	38	23	23	29	6	6
Cardiovascular ⁴ (% of sample)	13	18	20	19	22	23
Respiratory ⁵ (% of sample)	7	9	5	6	12	14
<i>n</i>	688	1152	359	836	2286	3413

1. Data are weighted to account for non-response, etc.

2. Includes rheumatoid arthritis, osteoarthritis, other arthritis not specified, rheumatism, back problems, knee problems, deformities, absence or loss of limb or part of limb, damage and other musculoskeletal conditions.

3. Includes senile dementia, schizophrenia, anxiety and phobia, depression and other mental illness.

4. Includes coronary disease, valve disease, hypertension, other heart conditions and other arterial and embolic conditions.

5. Includes bronchitis and emphysema, asthma, industrial diseases, sinusitis and other respiratory conditions.

$P=0.008$), there was no apparent relationship between external service costs and degree of cognitive disability. Costs were highest in the mild/moderate cognitive disability group. For private and voluntary sector communal establishments combined, total cost was not significantly different between the cognitive disability levels (one-way ANOVA: $P=0.527$; Bonferroni: none *v.* mild/moderate $P=1.000$, none *v.* severe $P=0.017$, mild/moderate *v.* severe $P=0.167$).

Combining the projected number of people with different levels of disability in each setting shows the balance of care with respect to cognitive disability (Table 8). Weighting the mean costs for each setting by the numbers of people in those settings gives a broad indication of the mean costs of care for people with various levels of cognitive disability.

Overall, there were considerable cost differences between the settings, which may partly reflect differences in disability. Certainly, there was a much higher prevalence of (severe) cognitive disability in higher cost settings such as NHS

hospitals. Costs were therefore greater for people with more severe cognitive disability. However, it is noteworthy that there were overlapping distributions of both costs and disability between settings.

DISCUSSION

The results in context

Our 'benchmark' analyses found that, among the household sample, disabled elderly people with greater cognitive disability used more services, more intensively and consequently had higher care costs. Ernst *et al* (1997) reached a similar conclusion in their American study. For elderly disabled people in voluntary sector communal establishments the fees charged for placement were higher for people with more severe cognitive disability. This result was not found among residents of private sector homes. However, the fees charged are only an approximation of the costs of care. The maximum social security payments in

force at the time of the survey attenuated variation in fees between residents. Identifying fully the effect of cognitive disability on cost within communal establishments would require research to monitor staff and other resources devoted to individual residents.

At higher levels of cognitive disability there are higher proportions of people resident in communal establishments rather than households, and higher cost facilities, consistent with evidence that cognitive decline is a key precipitating factor in admission into institutional care (Opit & Pahl, 1993).

Implications

The cost consequences of advanced cognitive disability have relevance for the management and treatment of dementia. If the cholinesterase inhibitor class of drugs can delay cognitive decline, and perhaps also postpone the need for admission to institutional care, then they may prove to be cost-effective, although unambiguous evidence is awaited (Knapp *et al*, 1998). It

Table 5 Service use and cost estimates for elderly people with disability resident in households (1994/95 prices)¹

Type of service	No cognitive disability (n=4969)			Mild/moderate cognitive disability (n=414)			Severe cognitive disability (n=316)		
	% Using service	Mean no. of visits/days ²	Weekly cost ² (£)	% Using service	Mean no. of visits/days ²	Weekly cost ³ (£)	% Using service	Mean no. of visits/days ²	Weekly cost ³ (£)
General practitioner	81.4	7.0	5.14	92.3	8.8	4.79	86.6	9.5	6.17
Hospital in-patient care	16.5	24.1	8.98	25.3	31.6	18.01	31.7	37.7	26.98
Hospital out-patient care or clinic visits	41.1	5.8	4.07	42.9	6.6	4.86	33.4	6.6	3.79
District nurse ⁴	15.5	12.6	0.44	26.0	12.5	0.72	36.7	13.7	1.12
Nursing auxiliary ⁴	3.4	50.2	0.16	8.0	54.9	0.42	12.2	74.1	0.86
Community psychiatric nurse ⁴	0.1	12.0	0.01	1.4	12.0	0.05	2.2	12.0	0.08
Community mental handicap nurse ⁴	1.0	24.0	0.07	1.4	12.0	0.05	4.6	71.6	1.01
Private nurse ⁴	0.5	111.3	0.12	1.3	365.0	1.09	2.2	354.4	0.97
Other nurse ⁴	6.9	13.4	0.15	11.1	12.0	0.21	12.7	30.7	0.63
Health visitor ²	0.5	12.0	0.02	0.7	12.0	0.03	2.2	12.0	0.08
Physiotherapist ⁴	1.3	22.8	0.13	1.7	12.0	0.07	1.0	12.0	0.05
Chiropodist ⁴	11.5	12.0	0.41	18.6	12.0	0.67	21.7	12.0	0.74
Occupational therapist ⁴	0.5	14.2	0.03	1.0	12.0	0.05	0.6	12.0	0.03
Home help ⁴	21.4	118.4	7.84	31.0	114.5	11.19	24.7	172.7	13.22
Meals on wheels ⁴	5.3	207.1	0.58	11.2	168.9	0.99	10.3	238.3	1.32
Incontinence service ⁴	0.6	23.1	0.03	3.1	74.6	0.45	3.1	25.8	0.15
Laundry service ⁴	0.9	37.0	0.07	1.5	20.6	0.06	3.2	46.0	0.28
Social worker ⁴	4.9	15.9	0.11	10.2	30.5	0.46	14.4	13.8	0.29
Private home help ⁴	5.2	99.8	1.47	3.9	74.0	0.84	4.7	165.9	2.22
Day centre	4.3	85.4	2.30	11.4	99.1	7.12	14.6	124.8	11.57
Adult training centre	0.1	87.5	0.07	0.0	0.0	0.00	0.0	0.0	0.00
Club for the disabled	1.8	44.3	0.38	1.6	53.9	0.41	2.0	31.7	0.31
Other day care	1.3	68.4	0.22	1.4	61.7	0.25	1.5	95.5	0.40
Other social club	15.4	62.1	3.04	13.5	65.1	2.53	2.9	98.2	0.81
Adult education centre	0.8	58.6	0.33	0.3	125.0	0.30	0.5	50.0	0.17
Respite – local authority home	0.6	11.5	0.06	3.5	13.6	0.50	8.3	16.1	1.13
Respite – convalescent home	0.9	13.9	0.09	1.1	14.0	0.14	0.6	14.0	0.08
Respite – hostel for disabled	0.4	10.9	0.03	1.3	10.6	0.12	0.5	14.0	0.06
Respite – home for disabled	0.2	10.1	0.02	0.4	5.0	0.02	0.9	9.8	0.08
Respite – nursing home	0.6	18.2	0.10	0.4	28.0	0.09	3.3	14.9	0.44

1. Data are weighted to account for non-response, etc.

2. Number of visits per annum or in-patient stays for people using the service.

3. Average weekly cost for everyone in the sample, not just those using the service.

4. Visits by professionals to people in their own household. People may also have come into contact with these professionals during out-patient or clinic visits. Unfortunately, it is not possible for this variable to be disaggregated fully.

needs to be remembered that cognitive disability is but one aspect influencing service use and admission to institutional care, because comorbidities are commonplace. Informal care is another important factor; indeed, people living alone had significantly higher costs compared with people in households living with others.

Only a minority of people in households with mild, moderate or even severe

cognitive disability were in contact with specialist services at the time of the surveys – a deficiency that persists (Cooper & Fearn, 1998) – and many people in communal establishments were resident in non-specialist accommodation. It is notable that the vast majority of people with cognitive disability had seen general practitioners, which raises many questions: What is the appropriate level of service provision?

Should general practitioners or specialists prescribe expensive drugs? Would primary care screening for mild cognitive disability improve the targeting of drug and other treatments? Models of care management that coordinate community resources and target them on the individual needs of elderly people with cognitive disabilities could also bring cost-effectiveness improvements (Challis *et al.*, 1997).

Table 6 Summary of costs for elderly disabled people living in households (£, 1994/95 prices)¹

Category of cost	No cognitive disability (n=4969) percentiles				Mild/moderate cognitive disability (n=414) percentiles				Severe cognitive disability (n=316) percentiles			
	Mean	25th	50th	75th	Mean	25th	50th	75th	Mean	25th	50th	75th
Family ²	131.52	130.09	130.09	130.09	131.61	130.09	130.09	130.09	132.55	130.09	130.09	130.09
National Health Service	14.44	0.00	2.67	10.35	25.12	0.00	4.93	18.72	35.31	2.67	6.03	36.57
Family Health Services Authority ³	3.11	0.31	1.53	3.68	4.82	0.92	2.65	6.12	6.25	0.88	2.83	8.22
Local authority	15.64	0.00	0.00	16.38	25.54	0.00	7.19	37.56	30.43	0.00	1.75	43.78
Service (all)	34.79	2.98	15.56	44.32	57.40	8.02	30.68	79.98	75.19	11.36	47.96	119.66
Total cost	164.72	133.07	145.65	174.41	187.08	138.11	160.77	210.07	204.54	141.45	178.05	249.75

1. Data are weighted to allow for non-response, etc.

2. This figure includes a housing cost estimate (£42.05) and an estimate for personal consumption costs (£88.03). If the number of days a person spent in hospital ≥ 100 then personal consumption costs were calculated by $[(13.10/7) \times \text{Number of days in hospital}] + [(88.03/7) \times (365 - \text{Number of days in hospital})]/365$. The costs of private home helps were also included in this category.

3. Estimates of Family Health Services Authority costs are probably an underestimate because we were unable to separate clinic visits to opticians, dentists, etc. from other visits to out-patient centres or clinics. Such costs are included under the NHS cost heading.

Table 7 Summary of average weekly costs for elderly people with disability resident in communal establishments (£, 1994/95)¹

Cost category	Voluntary (n=359)			Private (n=836)			Local authority (n=1152)	NHS (n=688)
	None	Mild/moderate	Severe	None	Mild/moderate	Severe	All residents	All residents
Communal placement	219.26	225.77	270.53	253.45	247.98	259.00	382.34	789.23
Family Health Services ²	6.90	10.04	12.30	8.11	10.48	10.60	5.82	0.18
National Health Service ³	8.36	10.20	4.76	15.13	7.30	8.38	8.74	2.88
Local Authority ⁴	23.19	32.25	10.30	11.61	11.11	7.12	12.15	12.65
External services (subtotal)	38.45	52.49	27.36	34.84	28.89	26.10	26.71	15.72
Total ⁵	271.24	293.09	311.38	301.70	289.45	298.32	422.15	820.31

1. Data are weighted to account for non-response, etc.

2. Includes general practitioners, opticians and dentists.

3. Includes hospital/clinic visits, nursing, physiotherapy, chiropody, etc.

4. Includes day care, social work, occupational therapy, etc.

5. The totals do not always tally because for some people service costs data were available but placement cost data were missing.

Table 8 Overall balance of care and cost estimates for elderly disabled people (1995/95 prices)

Place of residence	No cognitive disability		Mild/moderate cognitive disability		Severe cognitive disability	
	n	%	n	%	n	%
Households	2 871 738	94.8	239 181	77.0	182 866	66.7
Communal establishments						
Voluntary	23 917	0.8	8209	2.6	5777	2.1
Private	46 313	1.5	18 647	6.0	23 410	8.5
Local Authority	57 562	1.9	28 781	9.3	35 064	12.8
National Health Service	29 795	1.0	15 809	5.1	27 058	9.9
Average (mean) cost per person per week (£)		178.99		250.03		303.40

Strengths and weaknesses

The analyses have weaknesses. The OPCS disability surveys were conducted in the mid/late 1980s and employed a brief assess-

ment of cognitive disability. We have used cross-sectional data to explore what might be seen as a longitudinal question: How do resources or services respond to individual needs and circumstances? Cost esti-

mates were sometimes built up from less-than-comprehensive survey data. On the other hand, the data come from the most recent large-scale national population-based surveys of disability covering both

households and communal establishments. Most evidence in this field comes from local studies of elderly people living either in households or in communal establishments, but not both:

"Estimates of dependence require data which are nationally representative, include private households and communal establishments, have appropriate measures and are of adequate size. The only study in Britain to meet these criteria is the [OPCS survey]. None of the epidemiological studies of dementia carried out in the UK in the last decade can provide appropriate data for this task." (Melzer *et al*, 1997b)

Our analyses could be used in conjunction with prevalence estimates (Ely *et al*, 1997) to compare current local provision and costs to agencies with national pre-reform provision.

Post-survey changes

In the period since the surveys there have been policy and practice changes, many prompted by the 1990 NHS and Community Care Act, which, *inter alia*, emphasised reducing the rate of admission to long-term care. Consequently, differences between households and communal establishments in respect of the cognitive disability profiles of individuals may have widened. Contemporaneously, the substitution of nursing and residential home care for people who would previously have been in NHS hospitals probably increased the mean level of dependency in the former. It is difficult to disentangle the various influences, but certainly there was a pronounced increase in cognitive impairment (and dependency generally) in both residential and nursing homes between 1986 and 1996 (Darton, 1998). Such changes reinforce the need to look at both settings – households and institutions – and the cost variations within and between them.

Cognitive disability and care costs

Looking at the broad picture of support and care for elderly people with disabilities, the degree of cognitive disability is strongly associated with costs, with significant differences within the household sample and within communal establishments. These associations are often postulated but rarely demonstrated satisfactorily. We have provided national empirical estimates as benchmark information for future discussions.

CLINICAL IMPLICATIONS

- Cognitive disability among elderly people was associated with: greater service use among people resident in households, greater likelihood of residence in institutional care and higher costs.
- Most people with cognitive disability were not in contact with specialist services and increasing numbers were likely to be resident in non-specialist residential care.
- Most cognitively disabled people were in contact with primary care. New treatments or service arrangements should involve primary care. For example, targeting of treatments may require screening at the primary care level.

LIMITATIONS

- The benchmark provided by the data is now quite old.
- The data were cross-sectional rather than longitudinal.
- Service-use data for communal establishments were less comprehensive than for households.
- The role of informal carers has not been included in the analyses.

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