The prevalence of disability

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A recent report from the Office of Population Censuses and Surveys (OPCS) estimates that there are more than 6 million adults with one or more disabilities in Great Britain, and about 400,000 of them live in some kind of communal establishment [1]. The consequences and severity of their disabilities vary widely, depending on the age, social circumstances, abilities and other personal characteristics of the people affected, as well as on the services, advice and help available, which in many respects are inadequate, and when provided are too often fragmented and uncoordinated. In 1986 the Royal College of Physicians [2] drew attention to some of these defects and set out guidelines for the improvement and development of special health services for people with disabilities. To assist in the planning and evaluation of such services the report included estimates of the numbers of disabled people and of the prevalence of the major disabling conditions in a group general practice of 10,000 registered patients and in a health district serving 250,000 people reflecting the age and sex structure of the national population. The figures were based on various surveys, in particular the national sample survey carried out in 1968-9 [3] and a review of surveys carried out by or on behalf of local social services departments during 1972 and 1973 [4]. This paper revises and extends the estimates given in the College report, using the published figures and some additional tables from the OPCS surveys of adults with disabilities.

The OPCS surveys

The OPCS carried out a survey of disabled adults living in private households, and another survey of disabled adults permanently resident in communal establishments. For the survey of those living in private households, a large sample of the general population (100,000 addresses) in England, Scotland and Wales was screened and people with some form of disability were identified. Subsequently, interviewers approached all those people aged less than 60 years and half of those aged 60 or more who had been screened in at the first stage. For the survey of residents of communal establishments the initial screening was not considered necessary. Both surveys included people with mental, intellectual and sensory disabilities as well as with physical disabilities which had been the main concern of previous surveys. Other major differences from previous surveys were the focus on ‘disabilities’ rather than on impairments (‘disability’ was defined as any restriction or lack, resulting from an impairment, of ability to perform an activity in the manner or within the range considered normal for a human being), and the development, using a large number of judges, of a 10-point scale of severity of each disability and of multiple disabilities.

The scales of severity are precisely defined and details of illustrative cases given in the report. Category 1 represents the least severe disability, for example a man aged 50 who has difficulty in recognising a friend across the road, reading ordinary newsprint and following a conversation against background noise. Category 10 is the most severe, one example being a man aged 55 who, following a stroke, cannot walk at all, has very limited dexterity, is unable to feed or care for himself without help, whose vision is impaired and whose conversation is difficult to understand; another example is of a woman aged 86 with severe dementia of the Alzheimer type. These new scales will be of value in future studies and in monitoring services, as they provide a basis for comparing severity of disabilities between studies and between different services or the same service at different times.

Estimated numbers of adults with disabilities

The OPCS studies found that 14% of all adults (aged 16 years or more) in Great Britain had one or more disability. The prevalence of adults with disabilities in the total population (ie all ages) is 11%. Table 1 shows the estimated number of all adults with disabilities and of those in private households in ‘standard’ populations of 10,000 and of 250,000 people of the same age and sex distribution as that of the total population of Great Britain. Most disabled people are in private households; 6.8% are in communal establishments. Forty-four per cent of disabled adults have disabilities in the more severe categories (5-10). The estimates given in Table 1 are higher than those given in the College report. Some of the increase derives from the wider coverage of the OPCS surveys to include people at a lower level of severity and those with mental, intellectual and sensory disabilities, and from the increase in the number of older people in the population since the earlier studies. Because of these differences and the different definitions and methods used, figures

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from the OPCS surveys cannot be compared directly with those from earlier surveys.

Prevalence by age groups
The percentage distribution by age groups of all adults with disabilities is shown in Table 2. As there is no appropriate cut-off point between the younger and older disabled, and as the operational lower age for care by geriatricians varies from 65 to 80, the ages between 55 and 75 are shown in 5-year groups. In terms of broad age groups for planning, a case can be made for four groups, of those aged 16–24 (school leavers and young people), 25–54 (those developing families, jobs and careers), 55–74 (those reaching the end of employment and in active retirement), and people who are 75 or older, of whom half have disabilities due to multiple causes. The most important factor in any such categorisation, however, is not the chronological age, but the disadvantages faced by individual people with disabilities. This concept should be paramount in assessing the services and resources that ought to be available. Of people with disabilities living in private households, 92% are aged 75 years or more, 26% between 65 and 74, and 19% between 55 and 64. The figures confirm that the communal establishments are caring predominantly for older disabled people; 67% of adults with disabilities in communal establishments are aged 75 or more.

The estimated prevalence rates of adults with disabilities are shown in Table 3. There is a steep rise in prevalence rates with increasing age, from 25 per 1,000 young people to 207 per 1,000 people aged 60–64, and to 600 per 1,000 people aged 75 years or more.

Severity
The distribution of people according to the severity of their disabilities is shown in Table 4. Two features of the figures are the similarities in percentage distribution between those aged 16–24 and those aged 75 or over, and not surprisingly the greater proportion of people in communal establishments who have severer categories of disabilities. Overall, 83% of disabled people in communal establishments are in categories 5–10 compared with 42% of disabled people living in private households. However, if everyone is to have equal access to resources, this means that the community service requirements are considerable since, as has already been stated, the total number of people with disabilities in private households is very large. For planning and auditing the provision of services, estimates of the numbers of people with disabilities by age

Table 1. Estimated numbers of disabled adults in 'standard' populations.

|                      | All categories of severity per 10,000 | All categories of severity per 250,000 | Categories 5–10 per 10,000 | Categories 5–10 per 250,000 | Categories 7–10 per 10,000 | Categories 7–10 per 250,000 |
|----------------------|---------------------------------------|----------------------------------------|----------------------------|-----------------------------|---------------------------|-----------------------------|
| All disabled adults  | 1126                                  | 28,150                                 | 495                       | 12,386                      | 259                       | 6,474                       |
| Disabled adults in private households | 1050                                  | 26,250                                 | 430                       | 10,762                      | 210                       | 5,250                       |

Table 2. Percentage distribution of adults with disabilities in private households and in communal establishments.

| Age groups | 16–24 | 25–54 | 55–59 | 60–64 | 65–69 | 70–74 | 75+ |
|------------|-------|-------|-------|-------|-------|-------|-----|
| Disabled adults in private households | 3     | 20    | 8     | 11    | 12    | 14    | 32  |
| Disabled adults in communal establishments | 2     | 13    | 3     | 3     | 3     | 8     | 67  |

Age groups are of varying intervals; see text.

Table 3. Estimated prevalence rates of adults with disabilities and of those in private households per 1,000 people in each age group.

| Age groups | 16–24 | 25–54 | 55–59 | 60–64 | 65–69 | 70–74 | 75+ | All (16+) |
|------------|-------|-------|-------|-------|-------|-------|-----|-----------|
| All disabled adults | 25    | 59    | 157   | 207   | 280   | 350   | 600 | 142       |
| Disabled adults in private households | 24    | 57    | 154   | 202   | 272   | 335   | 519 | 135       |

Age groups are of varying intervals; see text.
Table 4. Percentage distribution of disabled adults by severity categories and age groups in private households and in communal establishments and of all disabled adults.

| Severity categories | Age groups | All (16+) |
|---------------------|------------|-----------|
|                     | 16-24      | 25-54     | 55-74     | 75+        |
| Private households  |            |           |           |            |
| (Least) 1-2         | 26         | 36        | 40        | 27         | 35         |
| 3-4                 | 23         | 26        | 25        | 22         | 24         |
| 5-6                 | 26         | 22        | 18        | 23         | 21         |
| 7-8                 | 15         | 12        | 11        | 18         | 14         |
| (Most) 9-10         | 10         | 4         | 5         | 10         | 7          |
| Communal establishments |        |           |           |            |
| (Least) 1-2         | 9          | 8         | 12        | 5          | 7          |
| 3-4                 | 2          | 12        | 14        | 10         | 11         |
| 5-6                 | 10         | 16        | 15        | 15         | 15         |
| 7-8                 | 18         | 23        | 20        | 24         | 23         |
| (Most) 9-10         | 60         | 41        | 39        | 46         | 45         |
| All disabled people | (Least)    |           |           |            |
| 1-2                 | 25         | 35        | 39        | 24         | 33         |
| 3-4                 | 22         | 25        | 25        | 21         | 23         |
| 5-6                 | 26         | 21        | 18        | 22         | 20         |
| 7-8                 | 16         | 13        | 11        | 18         | 14         |
| (Most) 9-10         | 11         | 6         | 6         | 15         | 9          |

Not all columns add up to 100 owing to rounding to whole numbers.

group and category of severity expected in ‘standard’ populations of 10,000 and 250,000 people are shown in Table 5, together with the percentage of each group who may be in communal establishments within or without the district.

These estimates from the OPCS surveys form the best available national benchmark. In extrapolating these figures to local circumstances, a number of points must be taken into account. Adjustment has to be made for the age and sex structure of the local population, for the presence of local communal establishments and for regional variations in prevalence rates.

The disabilities

Thirteen areas of disability formed the basis of the measures and scales of severity. The ten areas with prevalence rates of more than 10 afflicted adults per 1,000 of the population of all ages are listed in Table 6. The other three areas of disability considered in the

Table 5. Estimated numbers of adults with severer disabilities in each age and category group in ‘standard’ populations.

| Severity categories | Age groups | All (16+) |
|---------------------|------------|-----------|
|                     | 16-24      | 25-54     | 55-74     | 75+        |
| Population of 10,000, all ages |          |           |           |            |
| 5-6                 | 10         | 48        | 16        | 20         | 22         | 28         | 84         | 228         |
| 7-8                 | 6          | 29        | 10        | 12         | 15        | 18         | 71         | 161         |
| 9-10                | 4          | 13        | 4         | 6          | 9         | 9          | 57         | 102         |
| 5-10                | 20         | 90        | 30        | 38         | 46        | 55         | 212        | 491         |
| All people in each age group | 1484      | 3833      | 546       | 558        | 450       | 426        | 644        | 7941        |
| Population of 250,000, all ages |          |           |           |            |
| 5-6                 | 250        | 1200      | 400       | 500        | 550       | 700        | 2100       | 5700        |
| 7-8                 | 150        | 725       | 250       | 300        | 375       | 450        | 1775       | 4025        |
| 9-10                | 100        | 325       | 100       | 150        | 225       | 225        | 1425       | 2550        |
| 5-10                | 500        | 2250      | 750       | 950        | 1150      | 1375       | 5300       | 12,275      |
| Percent in communal establishments (within or without the district) |          |           |           |            |
| 5-6                 | 1.7        | 3.1       | 2.6       | 1.7        | 1.6       | 3.7        | 9.2        | 5.0         |
| 7-8                 | 5.1        | 7.5       | 4.2       | 4.6        | 6.4       | 5.5        | 17.1       | 10.9        |
| 9-10                | 21.8       | 28.4      | 14.5      | 20.7       | 13.7      | 26.9       | 41.3       | 32.7        |
| 5-10                | 7.2        | 8.25      | 4.8       | 5.75       | 5.5       | 8.2        | 20.5       | 12.8        |

*Age groups are of varying intervals; see text.

*Differences to figures in Table 1 due to rounding each cell to whole numbers.

*This is the total number of persons aged 16 or more, whether disabled or not, in a ‘standard’ population of 10,000 people.
Table 6. Estimated prevalence rates of the main disabilities among adults in Great Britain.

| Disability in regard to: | Adults in private households* per 1,000 population of all ages | All disabled adults* per 1,000 population of all ages |
|--------------------------|---------------------------------------------------------------|---------------------------------------------------|
| Locomotion               | 73                                                             | 79                                                |
| Personal care            | 39                                                             | 45                                                |
| Dexterity                | 28                                                             | 31                                                |
| Intellectual function    | 21                                                             | 27                                                |
| Behaviour                | 21                                                             | 24                                                |
| Reaching, stretching     | 20                                                             | 22                                                |
| Communication            | 18                                                             | 22                                                |
| Contintence              | 17                                                             | 21                                                |
| Hearing                  | 43                                                             | 47                                                |
| Seeing                   | 25                                                             | 30                                                |

*A person may have one or more type of disability.

OPCS report are: disfigurement; eating, drinking and digestive disabilities; and disabilities of consciousness. Table 6 shows the estimated total numbers of adults in private households and the estimated total numbers within each of the major areas of disability per 1,000 people. As any one disabled person can, and often does, have more than one disability, the totals of the columns in the table add up to considerably more than the total number of disabled people (348 compared with 113 in the second column). The combination of disabilities that many people experience emphasises the need for a broad understanding of disability and for the comprehensive and coordinated planning and development of services. Thus, disability in regard to locomotion requires resources for transport and access; disabilities of personal care, dexterity, reaching and stretching require special equipment, adaptations and personal help; impaired intellectual function and behaviour require services of personal surveillance; and disorders of communication, continence, hearing and seeing are essentially matters requiring the provision of equipment and advice about its use.

Underlying conditions

Although the relationships between disease and disorder, the resulting impairment(s) and disabilities are complex, it is obvious that the prevention or reduction in the incidence of any disabling condition and, when present, its treatment and control, are important components in limiting disability in individuals and in populations as a whole. Outstanding examples in this regard are the almost total eradication of poliomyelitis and the therapeutic control of some of the disabling effects of Parkinsonism. In answers to questions about the conditions underlying disabilities in the OPCS surveys, the most frequently mentioned were conditions of the musculo-skeletal system (46% of all disabled adults living in private households). Other conditions mentioned in descending order of frequency were disorders of hearing (38%), seeing (22%), the cardiovascular system (20%), the nervous and respiratory systems and the mind (13% each), the digestive system (6%) and the genito-urinary system (3%). For disabled adults living in communal establishments the list is dominated by mental disorders (56%), disorders of the musculo-skeletal system (37%) and of the nervous system (30%). Within these broad groupings, the most frequently occurring disorders were osteoarthritis and unspecified arthritis, rheumatoid arthritis, back problems, deafness, cataracts, coronary artery disease, stroke, bronchitis and emphysema, and depression among disabled adults in private households. Among those in communal establishments, senile dementia, arthritis, deafness and diabetes were frequently reported conditions.

Prevalence of disabling conditions

Figures that relate to the prevalence of a disease underlying disability will usually be larger than figures for the number of disabled people mentioning that disease, since not all the people with a disease are disabled by it, and methods and definitions used in epidemiological surveys are different from those used in disability surveys. In Table 7, figures of prevalence rates derived from the OPCS surveys and from epidemiological surveys of disorders are juxtaposed. The figures suggest that about 1 in every 5 people with arthritis is disabled at any point in time, as are about half the people with significant hearing loss (defined

Table 7. Prevalence rates per 10,000 of the population of all ages of conditions underlying disabilities in adults as reported by respondents in the OPCS surveys juxtaposed with prevalence rates derived from various epidemiological studies.

| Condition                     | Prevalence rates per 10,000 population |
|-------------------------------|----------------------------------------|
|                               | OPCS surveys | Epidemiological studies |
| Osteoarthrosis and ‘arthritis’| 288          | 1280 [5]; 2900 [6]      |
| Rheumatoid arthritis         | 43           | 100 [5]; 250 [6]        |
| Deafness                      | 430          | 1000 [7]                |
| Impaired vision               | 250          | 520 [8]                 |
| Coronary heart disease        | 86           | over 200 [9]            |
| Bronchitis and emphysema      | 69           | c. 180 [10]             |
| Stroke                        | 65           | 55 [11]; 100 [12]       |
| Parkinsonism                  | 11           | 11 [13]; 16 [14]        |
| Multiple sclerosis            | 10           | 11 [15]; 13 [16]        |
| Senile dementia               | 39           | 240 [17]                |
| Epilepsy                      | 30           | 50 [18]                 |
| Stomas                        | 7            | 16 [19]                 |
| Incontinence                  | 210          | c. 500 [20,21]          |
in the epidemiological study as a minimum of 35 db HL at 0.5, 1, 2 and 4 kHz in the better ear), about half of those with impaired vision (less than 6/18 Snellen with glasses), but almost all the people with stroke, Parkinsonism and multiple sclerosis. About 1 in 6 of the people estimated to show signs of senile dementia was identified as disabled in the OPCS surveys; presumably most of these were severely affected. About half the people estimated to be incontinent or to have a stoma reported a disability.

There are several explanations for these differences in addition to those due to the different methods and objectives of the studies quoted. There is probably some under-reporting due to embarrassment (eg incontinence), acceptance of some disability as normal occurrence in certain diseases (eg arthritis) and in old age (eg early dementia), and for other conditions the persons concerned may be obtaining adequate benefit from their equipment and appliances (eg spectacles and hearing aids) so that they are not disabled. Detailed studies of these differences are required; meanwhile, the figures in the table are the best indication available of the numerical relationships of reported disabilities to the prevalence of the underlying conditions.

Conclusion

The figures from the recent OPCS studies are now the best available national figures to use for planning and developing health services for people with disabilities. The figures adjusted for local factors and used in conjunction with additional local data can form the basis for auditing local services. Later reports from the OPCS surveys will provide information about the use made of services and about disabled children.

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References

1. Martin, J., Meltzer, H. and Elliot, D. (1988) The prevalence of disability among adults, OPCS Surveys of Disability in Great Britain, Report 1. London: HMSO.
2. Royal College of Physicians (1986) Physical disability in 1986 and beyond. Journal of the Royal College of Physicians of London, 20(3), 160.
3. Harris, A. I. (1971) Handicapped and impaired in Great Britain. London: HMSO.
4. Knight, R. and Warren, M. D. (1978) Physically disabled people living at home. DHSS Reports on Health and Social Subjects 13. London: HMSO.
5. Wood, P. H. N. (ed.) (1977) The challenge of arthritis and rheumatism. London: British League against Rheumatism,
6. Kelsey, J. L. (1982) Epidemiology of musculoskeletal disorders. Oxford: Oxford University Press.
7. Haggard, M., Gatehouse, S. and Davis, A. (1981) The high prevalence of hearing disorders and its implications for services in the UK. British Journal of Audiology, 15, 241.
8. Cullinan, T. R. (1978) Visually disabled people at home. Health Trends, 10, 90.
9. Morris, J. N. (1976) Uses of epidemiology. London: Churchill Livingstone.
10. McCarthy, M. (1982) Epidemiology and policies for health planning. London: King Edward’s Hospital Fund for London.
11. Weddell, J. M. (1980) Applications of a stroke register in planning. In Clinical neuroepidemiology (ed. F. C. Rose), pp 112–30. Tunbridge Wells: Pitman Medical.
12. Ostfield, A. M. (1980) A review of stroke epidemiology. Epidemiologic Reviews, 2, 136.
13. Sutchiffe, R. L. G., Prior, R., Mawby, B. and McQuillan, W. J. (1985) Parkinson’s disease in the district of the Northampton health authority, UK: a study of prevalence and disability. Acta Neurologica Scandinavica, 72, 363.
14. Mutch, W. J., Dingwall-Fordyce, L., Downie, A. W. et al. (1986) Parkinson’s disease in a Scottish city. British Medical Journal, 292, 534.
15. Williams, E. S. and McKeran, R. O. (1986) Prevalence of multiple sclerosis in a south London borough. British Medical Journal, 293, 237.
16. Shepherd, D. I. and Downie, A. W. (1978) Prevalence of multiple sclerosis in north-east Scotland. British Medical Journal, ii, 14.
17. Health Advisory Service (1982). The rising tide. Sutton: NHS Health Advisory Service.
18. Oxley, J. (1988) Epilepsy. In Rehabilitation of the physically disabled adult (ed. C. J. Goodwill and M. A. Chamberlain), p 426. London: Croom Helm.
19. Devlin, H. B. (1985) Stoma care today. Medicine Publishing Foundation.
20. Thomas, T. M., Playmat, K. R., Blannin, J. and Meade, T. W. (1980) Prevalence of urinary incontinence. British Medical Journal, 281, 1243.
21. Thomas, T. M., Egan, M., Walgrove, A. and Meade, T. W. (1984) The prevalence of faecal and double incontinence. Community Medicine, 6, 216.