Review of community prevalence of depression in later life

A. T. F. BEEKMAN, J. R. M. COPELAND and M. J. PRINCE

Background Despite considerable interest, there is no consensus regarding the prevalence of depression in later life.

Aims To assess the prevalence of late-life depression in the community.

Method A systematic review of community-based studies of the prevalence of depression in later life (55+). Literature was analysed by level of caseness at which depression was defined and measured.

Results Thirty-four studies eligible for inclusion were found. The reported prevalence rates vary enormously (0.4–35%). Arranged according to level of caseness, major depression is relatively rare among the elderly (weighted average prevalence 1.8%), minor depression is more common (weighted average prevalence 9.8%), while all depressive syndromes deemed clinically relevant yield an average prevalence of 13.5%. There is consistent evidence for higher prevalence rates for women and among older people living under adverse socio-economic circumstances.

Conclusions Depression is common in later life. Methodological differences between studies preclude firm conclusions about cross-cultural and geographical variation. Improving the comparability of epidemiological research constitutes an important step forward.

Declaration of interest The European Commission BIOMED I Initiative funded this Concerted Action Programme.

Especially in the industrialised parts of the world, ageing and the special circumstances of older people are taking an increasingly central place in public health. Depression is one of the most prevalent psychiatric conditions in later life (Blazer, 1989). It is associated with a decline in both well-being and daily functioning (Wells *et al*, 1989; Gurland, 1992; Ormel *et al*, 1994) and with higher risks of functional impairment, mortality and service utilisation (Gurland *et al*, 1983; Burvill & Hall, 1994; Beekman *et al*, 1997a). As depression is a treatable disorder, it may be one of the more prevalent and potentially amenable factors involved in the pathway to disability and service utilisation of older people. In past decades, a number of large-scale epidemiological studies have been carried out in order to learn more about the prevalence of late-life depression. Despite considerable interest, there is no consensus about this basic epidemiological issue (Snowdon, 1990; Blazer, 1994). Divergence of findings may be due to real differences in the samples studied, or to methodological differences between studies. Studies of real differences in the prevalence of depression across geographical and cultural areas in the world are of great interest, as they can help in elucidating the aetiology and cultural–ecological rooting, and the factors modifying the expression of depressive symptoms. Moreover, reliable data about the prevalence of depression are necessary in order to structure and project the services needed for delivery of adequate care in the community. However, methodological issues continue to confound comparison of the available data. Copeland *et al* (1986) advocated formulating clear criteria for diagnostic caseness in psychiatric epidemiological research. They indicated four levels of caseness: symptom, syndrome, diagnostic and criterion caseness. Results of prevalence studies on depression usually pertain to either syndrome or diagnostic caseness. Boyd & Weissman (1981) have shown that prevalence rates of depression

in younger age groups prove to be far less divergent when the studies are compared according to the type of diagnostic classification and instruments used.

The primary aim of this literature review is, therefore, to compare systematically the prevalence rates reported for late-life depression by level of caseness. The findings and the methodological issues encountered were used to obtain a set of reference data to compare with EURODEP findings.

METHOD

The literature survey was initiated with a computer-aided literature search (using Medline) covering eight years (1989–1996). References in the identified papers were used to search earlier studies. Only community-based studies regarding elderly subjects (55 years and older) were included. Further criteria for inclusion were: (a) sufficient number of subjects (more than 200), (b) sufficient information given regarding the sampling of respondents, and (c) that standardised diagnostic criteria and instruments were used to identify depressed subjects. Studies including only one birth cohort and studies restricted to the oldest age groups were excluded. Most studies turned out to be limited to elderly persons living independently in the community. The prevalence findings reported therefore exclude elderly people admitted to hospitals, nursing homes and other institutions. This selection of independent and therefore relatively healthy respondents probably influences the resulting prevalence rates. The 'true prevalence' of depression in the elderly is likely to be somewhat higher.

The literature was analysed according to the level of caseness of depression that was being assessed. All studies using rigorous diagnostic criteria for major depression were first identified (diagnostic level of caseness). Minor depression was defined as all depressive syndromes deemed clinically significant, but not fulfilling criteria for major depression (Blazer, 1994). This category includes a variety of often ill-defined depressive syndromes, and is included in DSM–IV (American Psychiatric Association, 1994) as a category for future research (Blazer, 1994; Tannock & Katona, 1995). Many studies did not make a distinction between major and minor depression. Results pertaining to all clinically relevant depressive syndromes were classified as 'major-plus-minor depression'

(syndrome level of caseness). Before the introduction of DSM, endogenous depression was diagnosed by research psychiatrists in a number of studies. The results were tabulated under 'major depression'.

The prevalence rates were taken directly from the articles. No attempt was made to adjust the results for important variables, such as age and gender, or to weight the results according to methodological differences. However, in calculating average rates of prevalence, the results were weighted according to the number of subjects participating in the study.

RESULTS

Prevalence

We defined 34 studies to be included in this survey. At first sight, the reported prevalence rates vary enormously: from 0.4% major depression in Japan (Komahashi *et al*, 1994) to 35% all depressive syndromes in Hong Kong (Woo *et al*, 1994). Arranging the studies according to level of caseness considerably reduced the extreme variation in results (Table 1). Considering major depression, the prevalence varied between 0.4% and 10.2%. All but one study reported prevalence rates of major depression below 5%, and 13 out of 16 studies reported rates less than 3%. The weighted average rate, calculated across 16 studies involving a total of 22 794 subjects, was 1.77%. Considering minor depression, three British–American studies, using comparable instruments, and one Finnish and one Dutch study reported prevalence rates between 8.3% and 14.3%. In the Japanese study, the rate of minor depression was very much lower. The weighted average rate of minor depression, derived from six studies involving 8857 subjects in total, was 10.22%. Considering all depressive syndromes deemed clinically relevant (major-plus-minor depression), the prevalence varied from 2.8% to 35%. Here the methodology of the studies was least uniform, resulting in widely differing rates of prevalence. Twenty out of twenty-eight studies had rates of prevalence between 0% and 18%. Low prevalence was found in both Japanese studies (Ihara, 1993; Komahashi *et al*, 1994), in one Singaporean study (Kua, 1992) and in one Dutch study (Bosma, 1990). High prevalence was found in one of the Finnish studies (Kivela *et al*, 1988), in Greece (Madianos *et al*, 1992), in a Hong Kong study (Woo *et al*, 1994) and in Israel (Cwikel & Ritchie, 1989). The weighted

Table I Prevalence of depression in the elderly: results of 34 community-based studies

First author	Year	Country	n	Instrument	Prevalence
Major depression					
Essen-Moller	1956	Sweden	443	Psychiatrist[1]	2%
Kay	1964	Australia (Tasmania)	505	Psychiatrist[1]	1.3%
Parsons	1965	UK	228	Psychiatrist[1]	0.9%
Blazer	1980	USA	997	DSM–III	1.8%
Gurland	1983	UK/USA	841	SHORT-CARE/ICD	1.9%
Kay	1985	Australia (Tasmania)	274	GMS/DSM–III	10.2%
O'Hara	1985	USA	3159	RDC	1.2%
Copeland	1987	UK	1070	GMS–AGECAT[2]	2.9%
Bland	1988	Canada	358	DIS	1.2%
Kivela	1988	Finland	1529	DSM–III	3.7%
Weissman	1988	USA	5499	DIS	1.0%
Lindesay	1989	UK	890	SHORT-CARE[3]	4.3%
Henderson	1993	Australia	945	CIE	1.0%
Komahashi	1994	Japan	1914	DSM–III	0.4%
Beekman	1995	Netherlands	3056	DIS	2.0%
Pahkala	1995	Finland	1086	DSM–III	2.2%
Minor depression					
Gurland	1983	UK/USA	841	CARE/ICD[4]	12.0%
Copeland	1987	UK	1070	GMS–AGECAT[5]	8.3%
Lindesay	1989	UK	890	SHORT-CARE[6]	13.5%
Komahashi	1994	Japan	1914	DSM–III	2.4%
Beekman	1995	Netherlands	3056	CES–D/DIS	12.9%
Pahkala	1995	Finland	1086	DSM–III	14.3%
Major+minor					
Blazer	1980	USA	997	OARS	14.7%
Eaton	1981	USA	338	CES–D	14.8%
Gurland	1983	UK/USA	841	SHORT-CARE/ICD	13.9%
Murrell	1983	USA	2517	CES–D	16.3%
Kay	1985	Australia (Tasmania)	274	GMS	16.0%
O'Hara	1985	USA	3159	CES–D	15.9%
Berkman	1986	USA	2806	CES–D	15.9%
Copeland	1987	UK	1087	GMS–AGECAT	11.2%
Morgan	1987	UK	1042	SAD	9.8%
Kivela	1988	Finland	1529	DSM–III[7]	26.9%
Lindesay	1989	UK	890	SHORT-CARE	17.8%
Kennedy	1989	USA	2137	CES–D	16.9%
Cwikel	1989	Israel	285	S–GDS	34.0%
Bosma	1990	Netherlands	328	DIS[7]	4.1%
Livingston	1990	UK	813	SHORT-CARE[4]	15.9%
Blazer	1991	USA	3998	CES–D	9.0%
Fuhrer	1992	France	2792	CES–D	13.6%
Kua	1992	Singapore	612	GMS–AGECAT	5.7%
Madianos	1992	Greece	251	CES–D	27.1%
Ihara	1993	Japan	695	CES–D	5.3%
Saunders	1993	UK	5222	GMS–AGECAT	10.0%
Komahashi	1994	Japan	1914	DSM–III	2.8%
Woo	1994	Hong Kong	1611	GDS	35.0%
Beekman	1995	Netherlands	3056	CES–D	14.9%
Lobo	1995	Spain	1080	GMS[7]–AGECAT	10.7%
Pahkala	1995	Finland	1086	DSM–III[7]	16.5%
Hooijer[8]	1995	Netherlands	4051	GMS–AGECAT	12.0%
Lauritzen	1996	Denmark	664	BDI	9.6%

1. Endogenous depression.
2. Depressive psychosis.
3. Severe depression.
4. Pervasive depression.
5. Depressive neurosis.
6. Mild depression.
7. All DSM affective disorders.
8. Further details available from the author upon request.

average rate for major-plus-minor depression, derived from 28 studies involving 46 075 subjects, was 13.34%.

Variation across demographic indices

The association between age and depression has received considerable attention, yet studies have reached conflicting conclusions. Again, level of caseness appears to be decisive for the results (Newman, 1989; Newman & Engel, 1991). Considering depressive symptoms, the elderly may have more of them (Zung, 1967; Schwab & Holzer, 1973; Kay et al, 1985), fewer (Eaton & Kessler, 1981), or equal numbers (George & Blazer, 1989; Livingston et al, 1990) when compared with younger adults. Among the elderly (55+), most studies find an increase in depressive symptoms with age (Newman & Engel, 1991). This association may spuriously implicate ageing as a cause of depression. The older old are more often physically ill or bereaved, and are more likely to be female. These are factors consistently associated with depression at all ages. Controlling for the confounding effects of these variables, Blazer et al (1991) and Beekman et al (1997b) found an inverse association between age and depression.

Findings regarding major depression appear to be more consistent. In most studies the prevalence decreases with age, with major depression becoming a relatively rare condition in the older old (Weissman et al, 1988; Newman, 1989). This finding may be due either to a lack of studies involving large enough numbers of older old subjects (Newman, 1989) or to older subjects leaving the populations under study. Leaving the population may be due to the age-related rise in dementia (Saunders et al, 1993) (disappearing when this is controlled for), increased mortality (Burvill & Hall, 1994), selective non-response in large-scale epidemiological studies, or major depression constituting a risk factor for admittance to institutions.

It is often suggested that the experience and reporting of depressive symptoms may be a function of birth cohort. This cohort-effect is taken as an indication that environmental circumstances may have a lasting effect on mood. Klerman & Lavori (1985) referred to our era as an "age of melancholy". People born after the Second World War are thought to be at a higher risk for depression, and to have earlier ages of incidence (Klerman & Lavori, 1985; Gershon

& Hamovit, 1987). Other researchers have also found a cohort effect, but in the opposite direction (Srole & Fischer, 1980). Hasin & Link (1988) showed that older people are less likely to recognise depressive symptoms than younger adults, leading to lower rates of self-reported symptoms. Another time-related issue is the period effect, which suggests that all birth cohorts tend to report more depressive symptoms in certain periods of time. Clearly, in cross-sectional studies, effects of age, cohort and period cannot be distinguished. This limits the validity of cross-sectional studies in which the association between aging and depression is investigated.

A host of studies have shown that women are more likely to be depressed than men (Pahkala et al, 1995). In an extensive review by Weissman & Klerman (1977), the effect of gender was explained in terms of methodology (report bias – women being more apt to report symptoms), psychopathology (women being more vulnerable and more exposed to aetiological factors) and socialisation (women's conflicting and unrewarding roles in society) (Billings & Moos, 1982; Krause, 1986). In a meta-analysis of published reports, Jorm (1987) concludes that differences between men and women are smallest in the older old and in children.

In practically all studies, associations have been found between depression and indicators of socio-economic status. This is found for all age groups and for both men and women. As expected, depression is more common with unfavourable circumstances. Associations are found with the type of housing, crowding, level of education, professional status and income (Warheit & Holzer, 1973; Murphy, 1982; Gurland et al, 1983; Romaniuk et al, 1983; Bosma, 1990). However, subjects with lower socio-economic status are exposed to more life events and have less social support. After controlling for life events and social support, the association between socio-economic status and depression was no longer significant in the study by Murphy (1982).

The effect of urban living has been studied less widely. Mostly, a lower prevalence of depression is found in rural areas (Weissman et al, 1988). This has been explained by the existence in rural areas of a different style of living, a more stable population, more close ties in networks, more social support and fewer unfavourable life events (Brown & Prudo, 1981; Mueller, 1981). The blessings of rural life are not supported by all researchers. After

controlling for age, gender and socio-economic circumstances, there was no effect of urbanicity in the study by Neff (1983). Moreover, in the elderly the results are contradictory. Murrell et al (1983) reported more depressive symptoms among older men in rural areas than in cities. Eaton & Kessler (1981) and O'Hara et al (1985) found more depressive symptoms in elderly people in urban areas.

DISCUSSION

The prevalence of late-life depression has been widely studied in many countries. At first sight, findings vary enormously: from 0.4% for major depression in Japan to 35% for all depressive syndromes in Hong Kong. This variation may be attributed largely to methodological differences in the studies available. Grouping the results according to the level of caseness at which depression was defined and measured diminished this variation. Major depression, diagnosed according to rigorous research diagnostic criteria, appears to be a relatively rare disease among the elderly, with an average prevalence rate of 1.8%. The average prevalence of minor depression was 10.2%. Considering all depressive syndromes deemed clinically relevant (major+minor depression), the average prevalence was 13.3%.

No attempt was made to arrive at more precise calculations of prevalence rates. We employed a small set of methodological inclusion criteria, which were drawn up prior to the review. However, these criteria were not very detailed and they were not used to weight the results. This is because the methodologies of the studies under review varied enormously, precluding more detailed comparisons of results. Some of the methodological differences between studies will be mentioned here, because they show that the reported findings must be interpreted with caution.

First of all, within the levels of caseness which were used to classify studies, there was still variation in the definition of depression. For instance, in major depression, data were derived using three groups of related instruments. In the studies based on research diagnostic criteria for major depression, developed in the USA, the DSM–III criteria (American Psychiatric Association, 1987) or the Diagnostic Interview Schedule (DIS; Robins et al, 1981) were the instruments used. The DIS is a highly structured interview, which relies

exclusively on symptoms self-reported by the respondents. As the DIS was developed for studies using trained lay interviewers, the clinical judgement of the interviewer plays no part in diagnosis. In studies using instruments based on the British tradition, GMS (Geriatric Mental State schedule; Copeland *et al*, 1976; Gurland *et al*, 1976) and SHORT-CARE (Gurland *et al*, 1984) (incorporating GMS) were used. GMS and SHORT-CARE are also highly structured interviews, but they rely more on the clinical judgement of the interviewers. In the studies based on diagnoses made by a research psychiatrist, clinical criteria for endogenous depression were used. Interviews were less structured, and clinical judgement was decisive for diagnosis. Therefore, the definition of major depression, the content of the items comprising the instruments and the way diagnosis was made all differ greatly across these three groups of instruments, precluding detailed comparisons of results.

All of the instruments used were developed and validated in the English language. Although most of the translated versions of these instruments have been validated, it is striking that the majority of outlying findings originate in non-English-speaking countries. This may be taken as an indication of culture-based differences in rates of depression, but may also indicate systematic bias due to translation.

Other methodological differences between studies include sampling (total population, random sample, stratified sample), response rates (enormous variation), the age range involved (over 55, over 65, predominately young old, even distribution across age strata), residential status (most, but not all, studies excluded the elderly in institutions), weighting procedures (most studies did not weight their findings back to the total elderly population) and the screening design used (one- *v.* two-stage screening).

Considering demographic variation, there is no consistent evidence linking old age with depression. If anything, the prevalence of major depression appears to decrease with age, which may be due largely to older people with major depression selectively leaving the population, and to the increasing levels of dementia. Within the older population, there does seem to be an increase in depressive symptoms. However, this should be attributed to age-related changes in risk factors, and not to ageing itself. Other time-related phenomena, such as cohort and period effects, further confound the findings of cross-sectional studies. The

effects of gender (more women tend to be depressed) and socio-economic circumstances (disadvantage is associated with more depression) are fairly consistently reported.

Drawing firm conclusions about the prevalence of late-life depression was precluded, primarily because of methodological differences and shortcomings in the available research. A formal meta-analysis of the available findings was not deemed feasible. However, the available data confirm that depression is highly prevalent among elderly people in many parts of the world. There appear to be important geographical and cross-cultural differences, which merit further study. Considering the importance of depression for the public health of older people, improving the comparability of available data must constitute an important step forward.

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CLINICAL IMPLICATIONS

■ Major depression is relatively rare among older people, while minor depression is more common.

■ There is consistent evidence for higher prevalence rates of depression in women, and in older people living under adverse socio-economic conditions.

■ Considering the vast numbers of older people suffering from depression, efforts to improve recognition and treatment should be focused on those most at risk and in primary care settings.

LIMITATIONS

■ Procedure, survey methods and diagnostic criteria differed between studies.

■ Formal meta-analysis was not considered justified.

■ Systematic bias may have occurred due to translating instruments into different languages.

A. T. F. BEEKMAN, PhD, Department of Psychiatry, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands; JOHN COPELAND, FRCPsych, Department of Psychiatry, Institute of Human Ageing, University of Liverpool, Liverpool; M. J. PRINCE, MD, Epidemiology Unit, London School of Hygiene and Tropical Medicine, London

Correspondence: Aartjan Beekman, Department of Psychiatry, Vrije Universiteit Amsterdam, PCA-Valeriusclinic, Valeriusplein 9, 1075 BG Amsterdam, The Netherlands