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Old Age Mental Disorders in Newcastle upon Tyne

Part I: A Study of Prevalence

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Community surveys abroad have shown that there is a high prevalence of serious mental illness in old age, much of which is not treated in hospital (Gruenberg, 1961; Nielsen, 1963). Most community surveys of the aged in this country have, however, been concerned chiefly with general medical and social problems (Sheldon, 1948; Simonds and Stewart, 1954), or have formed part of whole-population studies and recorded only the most severe kinds of mental disturbance in old age (Mayer-Gross, 1948). An exception is the study of a Scottish rural practice by Primrose (1962).

Our own enquiries had a number of aims. In the first place we wished to reach an estimate of the prevalence of mental ill-health in the general aged population of Newcastle and the relative frequency of the different forms, and to ascertain the proportion of cases receiving treatment or care in institutions of various kinds, compared with those remaining at home. In a field where the Health and Welfare Services are already under extreme pressure, data such as this are an indispensable starting point for deploying the available resources to optimal advantage. Secondly, it was desired to study in the community setting those forms of disability which rarely present for advice or attention at psychiatric clinics. Numerous reports have made it plain that medical services deal at the present time only with the visible part of the "iceberg" of mental disorder and handicap.

Thirdly, we hoped to be able to identify and follow the course of psychiatric disorders in the early stages of development before they are generally seen by psychiatrists. This is important from a number of viewpoints. It has been shown, for example (Kay and Roth, 1961), that in schizophrenic disorders of late life, the prodromal stages are marked by suspiciousness, hostility and withdrawals, which often merely caricature personality traits of long standing. The psychosis itself often begins in a sharp step-like fashion with the onset of hallucinations. This initiates a phase of the illness which often proves very resistant to treatment and which it would be clearly desirable to try to prevent. Similarly, in senile dementia it is usual for the patient to first come under psychiatric care as a result of an acute social or medical crisis, which may have already rendered the situation unfavourable for treatment and rehabilitation. The delineation of the clinical and social features of the early stages of all forms of psychiatric disability in old age was thus clearly of great importance from both prophylactic and therapeutic points of view.

In this paper, we are concerned with prevalence rates; with the distribution of cases at home and under institutional care of some kind; and with some implications for the organization of geriatric services.

Procedure

The survey was carried out by two distinct methods.

Method 1. Random Sampling from the Electoral Register

We sampled, at random, groups of old people living at home in certain areas (electoral wards) in Newcastle upon Tyne, and those found to be psychiatrically ill are referred to as the "domiciliary cases".

Sampling Procedure. In order to obtain 50–60 subjects of the required age in each ward, the names of 1,780 individuals were selected, at appropriate intervals (depending on the population of the ward), from the electoral register (1959) and each individual was asked by letter whether he or she was over the age of 65 or not. One thousand three hundred and seventy-seven replies were received. One hundred and fourteen people, who had not replied, were visited, and the ages of a further 116 were obtained from the Medical Executive Council. Twenty-three could not be traced. The balance represents those known to have died or moved out of the area since the compilation of the register.

The total sample comprised 309 subjects. Six of these refused to give formal interviews, but some information was obtained from 3 of them. In addition, 10 subjects whose permanent address was a Local Authority Welfare Home were excluded, as were 2 others who were found to be in geriatric wards when approached. These subjects were excluded because they formed part of the material investigated by Method 2.

Method 2. Cases Ascertained by a Census of Hospitals and Homes

It was desirable to carry out the investigation of "institutional cases" (i.e. those under care in mental hospitals, geriatric wards and local authority Homes) by another method, since mentally ill subjects might well have been omitted from the electoral register.

A census of patients aged 65 and over in these institutions took place on 1 November, 1960, and all those domiciled within the areas chosen for study were registered. Mental hospital records were examined, while patients in geriatric wards and Homes were interviewed. Owing, however, to death, inaccessibility for various reasons and other causes, only 134 out of the total of 187 were actually seen. In order not to overlook these cases it was assumed that the psychiatric disorders of various kinds were as prevalent among them as among the interviewed subjects.

By combining the results of these two methods an estimate could be made of the total prevalence of the various forms of psychiatric disorder within the areas studied. The standard errors of the calculated prevalence rates are, however, relatively large owing to the small size of the domiciliary random sample. Moreover, it was not possible to interview 41 residents of private Homes, who had originally been domiciled in the chosen areas. Nor could any precise estimate be made of the number of aged people living at home, whose names were not on the electoral register (though enquiries suggested that they were few). Finally, long-stay mental hospital patients, admitted before 1957, were not included in our statistics.

Areas Chosen for Study

The investigation was limited to five areas (electoral wards) with an estimated population, aged 65 and over, of 9,031. These areas were already known to differ widely in respect of certain socio-economic indices (Kay, Beamish and Roth, 1962) and were chosen for that reason. Since, however, the differences in the prevalence rates of psychiatric disorder in the different areas were found not to be statistically significant, these areas have been taken together in the present paper, which provides a general account of the results. These may be regarded, broadly speaking, representative of the aged urban population as a whole. Certain apparent differences in rates of admission to in-patient or residential care have already been described (Kay, Beamish and Roth, 1962) but further analysis and discussion must await the publication of the 1961 Census report for details about the age structure of different wards.

Interviewing. This took place during the summer and autumn of 1960. First, a social worker (S.A. or B.E.W.) obtained social and domestic data, to be reported in another paper. A second interview was carried out by a psychiatrist (D.W.K.K. or P.B.), who used a detailed medical and psychiatric inventory designed to record the subject's answers and his own observations, and arrived at a formal diagnosis. Multiple diagnoses were made, but the main diagnosis only is used here. The subjects themselves were always seen, but relatives gave supplementary information in some instances.

The diagnoses referred to in this paper were based on a final assessment, after consultation between the authors, and after taking into account a follow-up interview (P.B.) which took place 12–18 months later. The results of long-term follow-up will be described in detail at a later date. It should be noted that in the preliminary reports (Kay and Roth, 1962; Roth and Kay, 1962) cases in which a diagnosis of psychiatric disorder remained in doubt were set aside.

Classification and Definitions

The diagnostic criteria broadly followed those given by Roth (1955) among patients admitted to a mental hospital. Under the conditions of the survey, however, during which subjects were interviewed in their own homes, some modifications were necessary.

1. *Organic Syndromes*

(i) *Senile brain syndrome* was diagnosed when there was evidence of progressive mental deterioration, characterized by an "organic" mental syndrome (disorientation, failure of memory and intellect), provided that this was not due to specific causes such as neoplasms, chronic intoxications or cerebrovascular disease.

The cases were sub-divided into two groups, according to whether the mental deterioration was *severe* or *mild*. The clinical picture in the cases with severe mental deterioration was similar to that found among senile dements admitted to mental hospitals, i.e. there was evidence of disorganization of the personality and of failure in the common activities of everyday life. In the mild cases, these features were absent and the diagnosis rested on a clinical judgment, that the degree of deterioration exceeded that to be expected in a person of the subject's chronological age. The diagnosis was assisted by the use of a simple memory and information test (Roth and Hopkins, 1953).

(ii) *Arteriosclerotic brain syndrome* was diagnosed when impairment of memory and intellect was found in subjects who gave a history of a "stroke", or of recurrent epileptiform seizures or confusional episodes or who showed focal signs or symptoms indicative of cerebrovascular disease. As in the case of the senile brain syndrome, the group was sub-divided according to whether the mental deterioration was severe or mild.

(iii) *Other organic conditions* comprised acute confusional states associated with known physical illness, and acute or chronic conditions considered to be due to organic brain disease other than senile or arteriosclerotic.

2. *Functional Syndromes*

(i) *Schizophrenia* was diagnosed on the basis of the usual criteria of thought disorder, hallucinations in clear consciousness, paranoid delusions, emotional flattening or incongruity, and catatonic features. For reasons that have been indicated elsewhere (Kay and Roth, 1961) late paraphrenia was included with the schizophrenias. Chronic paranoid states have been shown to provide a background from which paraphrenic illnesses abruptly develop and these cases were also thus included with the schizophrenias. "Paranoid states" hence refers to markedly suspicious, hostile or withdrawn patients, from whom definite delusional ideas could not be elicited.

(ii) *Affective disorders and neuroses*. Cases showing one or more of the following groups of symptoms were assigned to this category: persistent or frequently recurring spells of depression, anxiety tension or irritability; phobias or panic attacks; anxious hypochondriacal preoccupations; vasomotor or somatic disturbances suggestive of anxiety; hysterical conversion symptoms or hysterical exaggeration of a physical disability.

An affective disorder was regarded as *endogenous* in the presence of marked retardation or agitation, or of depressive or hypochondriacal ideas held with delusional or quasi-delusional force; or of a sustained depressive (or manic) mood change accompanied by early wakening, diurnal variation with morning accentuation, and lack of responsiveness to environmental influences.

Further sub-divisions were made according to the *duration of illness* and the *severity*, and are defined below. In differentiating neuroses from personality disorders, the interviewers tried to establish that there existed a subjective awareness of malaise which the subject was able to distinguish from his normal condition.

(iii) Finally, a group comprising *other disorders*, such as mental subnormality or dullness, marked personality deviations or hypochondriasis without overt anxiety, was constituted for subjects who, though difficult to classify elsewhere, were not regarded as psychiatrically normal.

Statistics

The Chi-square test was used to test the significance of differences. In calculating standard errors of percentages or rates, the formulae:

$$\text{S.E.} = 100\sqrt{\frac{p \times q}{N}} \quad \text{or } 1{,}000\sqrt{\frac{p \times q}{N}}$$

were used, with the usual connotations. In Table V the standard errors of the combined rates were calculated from the formula:

$$\text{S.E.} = \frac{1{,}000}{N}\sqrt{NP\,(1-P)+np\,(1-p)\left(\frac{N}{n}\right)^2}$$

where N and n=the total aged population (9,013) and the random sample (309) respectively; P=the proportion of N psychiatrically ill and under care as found by Method 2; and p=the proportion of n psychiatrically ill and living at home (Method 1). Although the two samples are not strictly independent, calculation shows that the correlations between the rates given in the two columns in Table V are so small as to have a negligible effect on the standard errors derived from this formula.

The Composition of the Material

The age and sex distribution of the domiciliary random sample and the institution cases are given in Table I. There was a slightly greater number of both men and women over the age of 70 in our random sample than would have been expected from the figures of the 1951 Census (Registrar-General, 1951), but the 1961 report is not yet available.

Results

A. The Prevalence of Domiciliary Cases with Psychiatric Disorder (Table II)

1. *The Organic Syndromes*

Ten per cent. of the subjects were considered to be suffering from an organic brain syndrome.

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TABLE I

Sources of Material, and Distribution According to Age, Sex and Place of Residence

	Method 1 Subjects Selected by Random Sampling from Electoral Register and Found Living at Home			Method 2 Subjects Under Institutional Care on 1 November, 1960								
				Mental Hospitals and Units		Geriatric Wards		Welfare Homes		All Institutions		
	M	F	BS	M	F	M	F	M	F	M	F	BS
65–69 ..	42	58	100	3	6	4	10	6	6	13	22	35
70–74 ..	36	59	95	0	2	4	10	12	7	16	19	35
75– ..	36	66	102	4	6	10	24	48	46	62	76	138
All ages ..	114	183	297*	7	14	18	44	66	59	91	117	208

* 10 cases in welfare homes and 2 cases in geriatric wards at time of first interview, excluded.

A *senile brain syndrome* was found in 4·2 per cent., with severe deterioration in 1·3 per cent. An *arteriosclerotic brain syndrome* was found in 3·9 per cent., with severe deterioration in 2·6 per cent. Senile brain syndromes predominated among females, arteriosclerotic brain syndromes among males. Brain syndromes due to other causes were found in 1·9 per cent. The total prevalence of *severe* mental deterioration was 4·9 per cent., of *mild* deterioration 5·2 per cent.

Of the 13 cases with arteriosclerotic brain syndrome, 11 had a history of "strokes", and 2 of epileptiform seizures.

There were 6 cases with organic syndromes probably due to other causes, i.e. head injury (2), malnutrition, secondary carcinoma of lung, pernicious anaemia and cerebral embolism.

2. *Functional Disorders*

Functional psychiatric disorders were found in 31 per cent. of the subjects, in 25 per cent. of the men and 34 per cent. of the women.

(a) *Schizophrenia*, or a schizophrenic defect state, was diagnosed in one man and two women, representing a prevalence of 1 per cent. In all three cases the illness was probably of long standing and no case of recent onset (late paraphrenia) was found. In addition three women exhibited strongly paranoid attitudes without other symptoms suggestive of schizophrenia. None of these cases was, so far as could be determined, hallucinated and none was so severely disturbed as to require urgent hospital admission.

(b) *Affective disorders and neuroses.* The total prevalence amounted to 26 per cent. with a higher rate in women than in men. The illness varied considerably in severity and duration.

Endogenous affective disorder. Within the group of affective disorders, differentiation between endogenous and reactive (neurotic) states was difficult to make solely on the basis of the mental state at the time of interview. This was partly due to the absence of any cases showing indubitable "psychotic" features. Three cases were thought to be probably suffering from an endogenous depressive illness of only moderate severity, and one case appeared to be hypomanic. When the personality and family history, and the occurrence of previous attacks, were taken into account, five further cases were found in whom the present state, although more suggestive of a neurotic illness, may have been at least in part due to endogenous predisposition.

The prevalence of endogenous affective disorder may, therefore, be estimated to be about 1·3 per cent. (or if cases with previous attacks are reckoned, 3 per cent.), but because of some uncertainty about the nature of the illness the cases have been included in the broader group.

TABLE II

Prevalence Rates Per Cent. of Cases with Psychiatric Disorder Among Subjects Living at Home

	Males (N=115)		Females (N=194)		Total (N=309)	
1. Organic brain syndromes:						
Severe	6·1	12·2±3·0	4·1	8·8±2·0	4·9	10·0±1·7
Mild	6·1		4·6		5·2	
(*a*) Senile:						
Severe	0·0	2·6	2·1	5·2	1·3	4·2
Mild	2·6		3·1		2·9	
(*b*) Arteriosclerotic:						
Severe	5·2	8·7	1·0	1·0	2·6	3·9
Mild	3·5		0·0		1·3	
(*c*) Other:						
Severe	0·9	0·9	1·0	2·6	1·0	1·9
Mild	0·0		1·5		1·0	
2. Functional disorders		25·2±4·1		34·0±3·4		30·7±2·6
(*a*) Schizophrenia, chronic ..	0·9		1·0		1·0	
Late paraphrenia	0·0	0·9	0·0	2·6	0·0	1·9
Paranoid states	0·0		1·5		1·0	
(*b*) Affective disorders and neuroses:						
Moderate/severe	12·2	20·9	8·8	29·4	10·0	26·2
Mild	8·7		20·6		16·2	
(*c*) Other		3·5		2·1		2·6
3. All disorders		37·4±4·5		42·8±3·6		40·7±2·8

N.B.—The symbol ± indicates the standard error.

Severity of illness. This was judged by the severity of the symptoms complained of, the objective appearance at the time of interview, and the extent of disability, e.g. withdrawal from social contacts. A group in which the illness could be described as "moderate or severe" was contrasted with the remainder in which the illness was "mild".

Table II shows that in the majority of cases the illness was mild. There is a significant sex difference ($P<\cdot02$), men being relatively more often moderately ill, while among women mild illness predominated. Illness of moderate severity was found in 10 per cent., and was equally frequent in men and women.

Duration of illness. When the illness had begun during the senium, it was defined as "recent", in contrast to those conditions which appeared to be merely exaggerations or recrudescences of long-standing neurotic tendencies. Rather over half the cases were of "recent" onset in this sense. In some cases in both subgroups, however, there had been a previous attack, followed by greater, or less, freedom from symptoms (Table III).

B. Prevalence of Institution Cases with Psychiatric Disorder

Table IV shows the number of cases with the more important forms of psychiatric disorder actually in hospitals and Homes on the "census" date (1.11.60). The prevalence rates per 1,000 of population over the age of 65 were calculated on the assumption that there were 9,031 persons at risk.

It is apparent that the rates are small compared with those obtained from the domiciliary random sample, and further, that the mental hospitals and psychiatric units in this region care for only about one-fifth of the cases.

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TABLE III

Distribution of Recent and Chronic Illness and Previous Treatment Among the Cases with Affective Disorder or Neurosis Living at Home

	Recent Onset		Chronic		Total		All
	Moderate/ Severe	Mild	Moderate/ Severe	Mild	Moderate/ Severe	Mild	
With previous treatment ..	5	3	7	4	12	7	19
Without previous treatment	15	23	4	20	19	43	62
Total	20	26	11	24	31	50	81

C. Total Prevalence Rates of Psychiatric Disorder

The total prevalence is estimated (Table V) by combining the rates for the institution and domiciliary cases. By far the most frequent conditions are neuroses and allied disorders with a prevalence rate of 89 per 1,000 at risk, even if only those cases of at least moderate severity are included. Senile and arteriosclerotic brain syndromes of severe degree (dementia) form the next largest—but considerably smaller—group with a prevalence rate of 46 per 1,000. Manic depressive disorder occurs in about 14 per 1,000. Schizophrenia, excluding paranoid states, accounts for the fewest cases, 11 per 1,000 (the chronic hospital schizophrenics not being included). In each case the standard errors are relatively large owing to the small size of the domiciliary sample.

The rate for all forms of psychoses is 80·5 per 1,000, which does not differ significantly from the rate of 67·5 per 1,000 found by Nielsen (1963).

Table V also gives, in column 4, a rough estimate of the relative frequency of domiciliary compared to institution cases at any one time. It can be seen that the number of cases looked after at home far exceeds those under State care. With regard to severity of illness, patients living at home with severe brain syndromes were, in general, as seriously ill as those under care; but most of the severe and active cases of functional psychosis were found in hospital.

Discussion

In field surveys of old people living at home the precise demarcation of psychiatric disorders from minor divergences from normal health is unavoidably arbitrary. The whole situation in which interviews take place is quite different from that of the usual hospital or domiciliary consultation, when some definite problem is presented for which advice and treatment are desired by the patient, doctor or relative. Difficulties in demarcation arise particularly when mild organic syndromes have to be distinguished from the normal mental changes of ageing, when anxiety and depression have to be evaluated in a chronically anxious and worrying person, or when mild and transient symptoms have arisen in response to some environmental or physical change. Our impression was that if specialist psychiatric treatment had been offered it would have been considered unnecessary by many subjects. But since over three-quarters of those regarded as psychiatrically ill had consulted their own doctors during the previous three months on one count or another, it is clear that opportunities for appropriate treatment had not been lacking. This underlines how important it is for the general practitioner to recognize symptoms of psychiatric nature.

A second problem in diagnosing psychiatric disorder arises from the fact that the normal role of the aged person in the community is ill-defined. Several of the criteria of mental illness which are of help in arriving at a psychiatric formulation in the younger groups, are no longer appropriate. Old people have usually retired, so that regular employment cannot be regarded as a criterion of health, and in the social sphere also no definite role seems to be expected of

TABLE IV

Distribution of Cases Under Various Kinds of Institutional Care on 1 November, 1960 and Prevalence Rates per 1,000 Population Aged 65 or Over

	Number of Cases Under Care				Rates per 1,000
	Mental Hospitals	Geriatric Wards	Welfare Homes	Total	
Senile dementia	7	11	23	41	
Arteriosclerotic dementia	4 } 12	10 } 24	6 } 32	20 } 68	7·6
Other severe brain syndromes	1	3	3	7	
Manic-depressive disorder	6	0	0	6	0·7
Schizophrenia, chronic	?	0	2	2	
Paraphrenia of late onset	3 } 3	1 } 1	4 } 6	8 } 10	1·1
All psychoses	21	25	38	84	9·4
Brain syndromes, mild forms	0	20	28	48	5·3
Neuroses and allied disorders (moderate/severe forms)	0	9	8	17	
Character disorders, etc.	0 } 0	0 } 9	5 } 13	5 } 22	2·4
All disorders	21	54	78	154	17·1

TABLE V

Estimated Total Prevalence Rates for the Main Psychiatric Disorders per 1,000 Population Aged 65 Years or Over

	1	2	3	4
	Institutional Cases, per 1,000	Cases Living at Home, per 1,000	Total Prevalence per 1,000, with Standard Errors*	Approximate Ratios 2 : 1
Senile and arteriosclerotic dementia	6·8	38·8	45·6±11·0	6
Other severe brain syndromes	0·8	9·7	10·5± 5·0	
Manic-depressive disorder	0·7	12·9	13·6± 6·4	
Schizophrenia, chronic	(0·2)†	9·7	10·8± 5·6†	(12)
Paraphrenia, late onset	0·9	0·0		
Psychoses, all forms	9·4	71·1	80·5±14·7†	8
Brain syndromes, mild forms	5·3	51·8	57·1±12·6	
Neuroses and allied disorders (moderate/severe forms)	1·9	87·4	89·3±16·1	23
Character disorders, including paranoid states	0·5	35·6	36·1±10·5	
All disorders	17·1	245·9	263·0±24·5	14

* See text.

† Long-stay mental hospital schizophrenics not included.

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them. Nor can the pattern of sexual adjustment any longer provide useful information about the mental health. Thus diagnosis often has to depend on the subject's own account of his feelings and symptoms, and the disabilities attributed to them.

There are reasons, therefore, why prevalence rates for psychiatric illness among the aged in the community are likely to vary very considerably, depending on the objects of the investigation, the intensity with which it is carried out and the criteria used. The actual rates found in some previous surveys, or calculated from the data supplied by the authors, are shown in Table VI. The rates are given as percentages of the population at risk, i.e. over the age of 65, or in some studies, over 60. Considering the sources of divergence just referred to, the extent of agreement seems quite impressive.

Prevalence Rates for Organic Mental Syndromes

(*a*) Our rate of 4·6 per cent. with *severe mental deterioration* from senile or arteriosclerotic psychoses—or 5·6 per cent. from all causes—is considerably higher than the rates for senile and arteriosclerotic psychoses found in most large-scale population studies, where they vary from 0·1–0·8 per cent. (see Lin, 1953, for summary*). In the Scottish survey, carried out by Mayer-Gross (1948), however, a rate of about 5·5 per cent. can be inferred from the data provided.

On the other hand, our rate agrees quite well with those observed in general practitioner studies in Norway and in Scotland (Bremer, 1951; Primrose, 1962), where the authors were doctors personally acquainted with most of their patients, and with the results in the very thorough investigation of an entire Swedish rural population by Essen-Møller and his colleagues (1956). It also corresponds quite closely with Sheldon's (1948) rate for "demented" and "forgetful, childish", subjects among a sample of elderly people living in the community or Homes for the aged. It is slightly less than the findings in the Syracuse survey of a large population aged 65 or over (Gruenberg, 1961), in which 4·5 per cent. of those living at home had a certifiable degree of illness due to "psychoses of ageing", with a total prevalence of 6·8 per cent. when those in Homes or hospitals were added. It is possible, however, that these figures include cases with primary functional disorder. The most recent estimate of the prevalence of "severe dementia" (from Nielsen, 1963) is 3·1 per cent. (65 and over).

(*b*) The proportion of subjects—5·7 per cent. —with mild *mental deterioration* is actually rather smaller than the proportion of "mildly impaired" subjects found by Sheldon (1948)—11·2 per cent., by Essen-Møller (1956)—10·8 per cent., and by Nielsen (1963)—15·4 per cent. However, we did not include those in whom some apparent impairment of memory or

* Lin used "corrected expectancy", which gives values of double these figures.

TABLE VI

The Prevalence of the Main Psychiatric Syndromes of Old Age, According to Various Authors

	Percentages						
	Sheldon (1948) (N=369) 65+	Bremer (1951) (N=119) 60+	Essen-Møller (1956) (N=443) 60+	Syracuse (1961) (N=1,592) 65+	Primrose (1962) (N=222) 65+	Neilsen (1963) (N=978) 65+	This Study (N*) 65+
Senile and arteriosclerotic psychoses	3·9	2·5	5·0	—	3·6 } 4·5	3·1	4·6 } 5·6
Other organic syndromes ..	—	—	—	—	0·9 }	—	1·0 }
Major functional disorders	—	4·2†	1·1	—	1·4	3·7†	2·4
Psychoses, all forms	3·9	6·7	6·1	6·8	5·9	6·8	8·0
"Mild mental deterioration" ..	11·7	—	10·8	—	—	15·4	5·7
Neuroses and allied disorders (moderate/severe forms) ..	9·4 } 12·6	5·0 } 17·6	1·4 } 12·0	—	10·4 } 12·6	4·0 } 8·7	8·9 } 12·5
Character disorders	3·2 }	12·6 }	10·6 }	—	2·2 }	4·7 }	3·6 }

* See text.
† Includes "constitutional" and "psychogenic" psychoses.

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intellect was the only psychiatric symptom, unless focal signs pointing to cerebrovascular disease were also present, or unless there was some evidence that the deterioration was progressive. In Kral's terminology (1962) we tried to distinguish cases with "benign senescent forgetfulness" from those with a malignant amnestic syndrome in its incipient stage, but only follow-up will show to what extent we succeeded.

Important questions remain to be answered in regard to the early diagnosis of senile brain disease. Does mild mental deterioration generally presage severe deterioration (dementia) at a later date and, if so, within what interval of time? Is senile dementia always preceded by a stage of mild deterioration and, if so, can this stage be distinguished from the normal mental changes accompanying ageing? At post-mortem, senile brain degeneration appears to be related to age, in a quantitative and graded manner, but the onset of the clinical syndrome of dementia suggests that a *threshold* has been reached at which adaptation even to familiar surroundings has broken down. Although the association between dementia and brain degeneration is impressive (Corsellis, 1962), the extent of the degeneration varies considerably; moreover, occasionally, the brains of individuals who have never become demented have been found to show quite marked changes. The condition of the brain seems therefore to be only one of several factors determining the threshold at which dementia appears, and further study of these other factors is needed. The problem is to identify those subjects who are on the verge of failing, and to date no adequate means of doing this are available. For instance, in a follow-up of a group of patients with functional disorders, the presence of minor or equivocal "organic" psychiatric symptoms did not presage a high incidence of dementia (Kay, 1962).

The Prevalence Rates of Functional Disorders

(*a*) *The major functional psychoses*. The studies of Lin (1953) in Formosa, and of Sjögren (1948) and of Larsson and Sjögren (1954) in Sweden, indicate that from 0·6 to 0·8 per cent of the aged population were suffering from a schizophrenic or manic-depressive disorder, including some "inactive" cases, and some where the onset had been earlier in life. From Essen-Møller (1956) a roughly corresponding rate of 1·1 per cent. may be obtained, while Primrose (1962) found 1·4 per cent. of subjects over the age of 65 with psychoses not of senile or arteriosclerotic type.

The prevalence of 1·1 per cent. for *schizophrenia* in our survey did not include long-stay hospital patients; but this rate is in fact largely due to three subjects, encountered in their own homes, all of whom had almost certainly been ill for many years. No case with "late paraphrenia" was found at home, and the prevalence of this condition, amounting to only 0·1 per cent., was based entirely on eight cases already under care. But an earlier finding (Kay and Roth, 1961) that a period of increasing suspiciousness and withdrawal often preceded the onset of a paraphrenic psychosis proper led us to identify three additional cases (called here "paranoid states"), who were very hostile and suspicious and may possibly have been in a pre-psychotic phase. We hope to follow up these cases.

In the literature, the rates for schizophrenia in populations aged over 60 or 65 vary from 0·3–0·5 per cent. (Nielsen, 1963), with which our findings agree reasonably well.

The difficulty of differentiating mild or only moderately severe *endogenous depressions* from neurotic reactions in the domiciliary survey has already been referred to. The higher estimate (3 per cent.) is certainly too high if the diagnosis is based strictly on symptoms only, but the more conservative estimate of 1·3 per cent. agrees closely with Nielsen's (1963) rate of 1·2 per cent. Nielsen diagnosed psychogenic psychoses in a further 1·8 per cent. and arrived at a total prevalence rate for "functional" psychoses of 3·7 per cent.

It is important to distinguish endogenous cases, since the outcome and response to treatment is likely to be relatively good. This view is supported by the work of Post (1962), who made the interesting observation, in his follow-up study of 100 cases with affective disorder over the age of 60, that the outcome was best when

the family history was positive, when previous attacks with recovery had occurred earlier in life, when the personality was extraverted, and when the illness was severe. These are all features of manic-depressive disorder proper, and it seems justifiable to take them (as well as the symptomatology) into account when considering the "endogenous" or "neurotic" nature of affective illness in old age.

Our failure to encounter any subjects with *florid* psychotic states, whether schizophrenic or affective, in the field survey suggests that cases with severe primary functional disturbances are uncommon at this age. Those which do occur appear to be promptly removed to hospital. The possibility of specific treatment, as well as the risk of suicide, may be responsible for this—in contrast to the absence of effective therapy in most of the organic psychoses, which therefore tend to be cared for out of hospital until social reasons force some action to be taken.

(*b*) *Minor functional disorders*. The majority of the subjects considered to be psychiatrically ill fell into this group, the illness consisting of an admixture of depression and anxiety, usually in response to environmental or physical stress, but sometimes of uncertain causation. In Tables IV–VI these conditions are referred to non-committally as "neuroses and allied disorders" (manic-depressive disorder being excluded).

The rate found (24 per cent.) may appear at first sight to be unusually high; but the important fact has emerged from recent community studies that neurotic illness is common in old age. Kessel (1960) and Kessel and Shepherd (1962) showed that, while the rate of referral of neurotics to hospital falls steeply after the age of 60, the prevalence of neurosis in *general practice* remains surprisingly constant throughout adult life, at about 10 per cent. of the population at risk among men and 15 per cent. among women. Watts and Watts (1952) found that anxiety states were quite common in old people. Fry (1957) reported average yearly attendance rates with neuroses, over the age of 60, of more than 20 per cent. of the population at risk. Primrose (1962) reported that 10·3 per cent. of his practice, over the age of 65, was suffering from neuroses, and Sheldon (1948) found 9·4 per cent. of his sample of elderly people living in the community to be suffering from "morbid anxiety".

The wide prevalence of neurotic illness in old age has been amply revealed by these and other community studies (see Essen-Møller, 1956; Essen-Møller's terminology is unfamiliar to British readers, so that comparisons are difficult). In our own material, a sub-division could be made into mild or moderately severe forms. The latter, including the few probably "endogenous" cases, occurred in 10 per cent. of the sample, a figure which is in close agreement with the findings of the authors referred to above.

A further, rough, distinction could be made between cases who had fallen ill late in life, and those whose illnesses were exaggerations or recrudescences of long-standing personality traits. Excluding cases with any previous attacks, illnesses of recent onset and of at least moderate severity occurred in 5·0 per cent. of the subjects and this presumably represents the incidence of new neurotic illness in old age. Nielsen (1963) gave a rate of 4·0 per cent. for neuroses, but included subjects who had had neurotic symptoms "over a period of years".

In conclusion, there seems to be good evidence that from 5 to 10 per cent. of the aged population suffer from fairly definite neurosis. A further proportion, amounting to 10–20 per cent., appear to suffer from less well-defined milder conditions, often closely related to personality factors. Indeed, Phillips (1962) found that about a third of his sample of old people were suffering from "emotional maladjustment", according to reports from their own doctors.

(*c*) The third sub-division of the functional disorders consisted mostly of *eccentric* individuals, whose personality disorder seemed to be severe enough to justify a clinical diagnosis (2·6 per cent.). Table VI shows that the rates found by other authors for character disorders vary considerably. This may be due to diagnostic considerations, and it may be more meaningful to bracket together character disorders with neuroses. When this is done (Table VI) the agreement is rather striking.

Implications of the Survey for the Community Care of Psychiatric Disorders Among the Aged

Our results agree with those of other investigators, that the prevalence both of organic psychoses and of neuroses among old people living in the community, is high. It is clear that the numbers involved, even if only the severe organic states are considered, are far too great to be cared for wholly by the already overstretched in-patient services provided by the State. Not only is the fraction of cases actually receiving in-patient treatment at any one time small (emphasized also by Gruenberg, 1962, and by Nielsen, 1963), but the stay in hospital is in many instances remarkably brief: a matter of a few weeks, ending in death, during the course of an illness lasting perhaps several years. Evidently, the majority of cases are at present, and will continue to be, cared for throughout the greater part of their illness at home. Indeed the number of social and domestic contacts made and visits received by our dementing subjects was unexpectedly high, and several other studies, e.g. by Townsend (1957), have also shown that relatives are as a rule far from neglectful. But their ability to give prolonged care of an adequate standard is likely to depend on the amount of help they receive from the community services.

Registration of the Aged. Instances of tragic neglect among old people usually occur among those who are living alone, and this constitutes a strong argument for an official register for all old people. This could be made initially on retirement, with the co-operation of the Ministry of Pensions and National Insurance. A periodic review of their circumstances would follow, while regular visiting would be limited to those who were single, living alone, or over the age of 80, since these are particularly likely to need help. Post (1958) and Colwell and Post (1959) have pointed to the great need of elderly discharged patients for community care, and we have shown that this need also exists urgently among those who have never been admitted to hospital. The Community Mental Health Service might well undertake this kind of work, in co-operation with the general practitioner. A great deal of additional insight and experience could thereby be gained into the needs of old people, and opportunities would arise for studying methods of prophylaxis and early treatment, subjects about which very little is at present known.

Summary and Conclusions

1. The prevalence of psychiatric disorder of various kinds among subjects aged 65 or over was studied by two complementary methods, which could be combined to obtain an estimate of the total prevalence.

(a) *Domiciliary cases:* 309 subjects with addresses in one of five areas chosen for the investigation were selected at random from the electoral register and all subjects living at home were interviewed.

(b) *Institutional cases:* A census was made of patients and residents in mental hospitals, geriatric wards and welfare homes on 1 November, 1960, and a psychiatric assessment was made of all those whose home address lay within one of the five areas.

2. The prevalence of *organic brain syndromes* was high (10·3 per cent.). Senile and arteriosclerotic syndromes were about equally common, but the former was diagnosed more frequently in women, the latter in men. Brain syndromes due to other causes occurred in 1·9 per cent.

In about half the cases the mental deterioration was severe and was similar in degree to that usually found in demented mental hospital patients.

Fewer than one-fifth were actually being cared for in a hospital or Home.

3. The total prevalence of all forms of *functional disorder* was 31 per cent., with a somewhat higher rate among women than men. This group of disorders included a wide variety of conditions, but neuroses were by far the commonest. The large majority of cases were not receiving any formal psychiatric treatment;

fewer than one-tenth were under residential care of any kind.

4. Five per cent. of the domiciliary subjects suffered from a *neurotic* or an *affective illness* which was of at least moderate severity and had arisen late in life, constituting an entirely new development in the medical history. In the remainder, the illness was only mild, or recurrent, or consisted of an accentuation of long-standing personality traits. Six per cent. had had previous treatment.

5. Neither of the major functional psychoses, *schizophrenia* or *endogenous affective disorder*, could be identified with confidence among subjects seen at home, and all the active and established cases were already under care. But chronic, mild or incipient forms (including paranoid states) were judged to be present in about 3 per cent.

6. The findings demonstrate again that only a very small fraction of old people with psychiatric disorder are being cared for either as hospital in-patients or as residents of Homes. There is clearly an urgent need to extend the facilities for community care for this part of the population.

7. A review of the literature shows that the results of prevalence studies, where intensive methods have been used, are in quite good agreement.

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