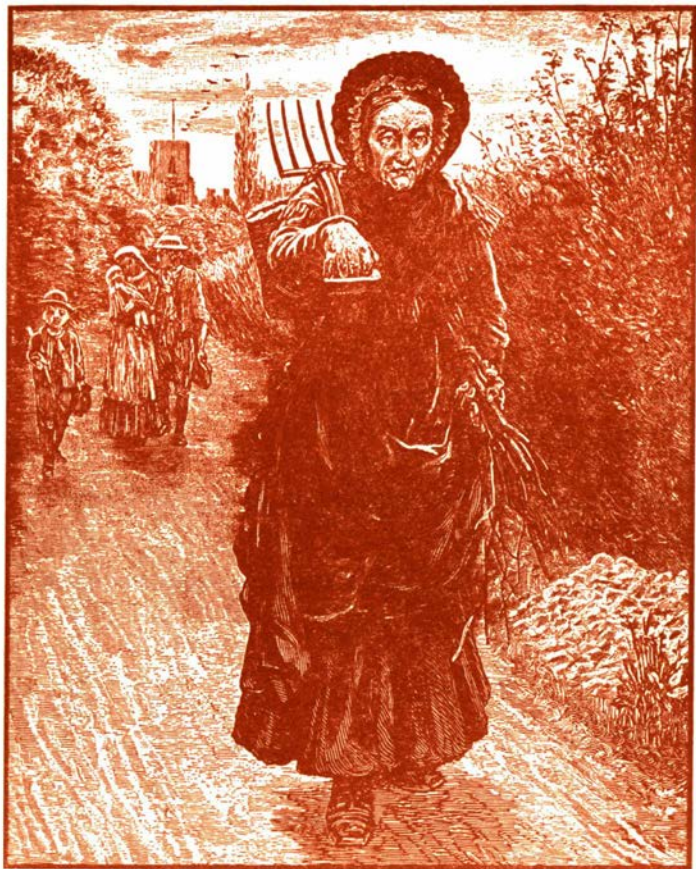


Old Age

26



Number 26 in a series of papers on current health problems published by the Office of Health Economics. Copies are available at 2s 6d, postage free. For previous papers see page 36.

© March 1968, Office of Health Economics.

Cover illustration from the Mary Evans Picture Library.

Old Age

Old Age

Old Age

Old Age



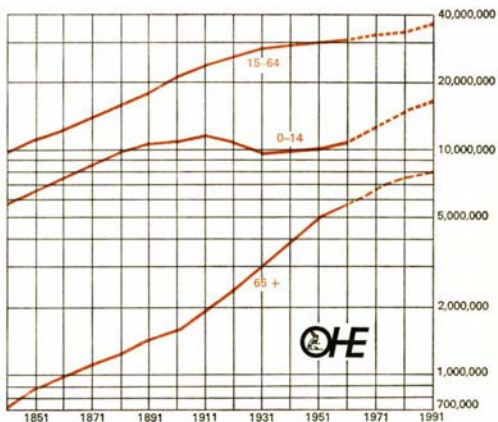
Office of Health Economics

162 Regent Street London W1

Figure 1

Population of England and Wales, by age, 1841 to 1961, and projections to 1991.

Source: 1961 census of England and Wales, Registrar General's Statistical Review of England and Wales, 1965, Part II.



Note: Logarithmic scale.

Old Age

IN 1966, in England and Wales, there were about six million persons aged 65 and over, more than 12 per cent of the total population. In 1901, the figures were one and a half million accounting for 5 per cent of the population.* The rise in the number of the aged, a fourfold increase, has been much faster than the rise among other age groups (Fig. 1). The number of children aged 0 – 14 is, today, almost exactly the same as the number in 1911. Table A shows the present aged population by sex, age and marital status.

At ages 75 and over there were more than twice as many women as men living. Two out of three women aged 75 and

Table A

Population aged 65 and over by sex, age and marital status, 1966, England and Wales.

Source: 1966 census of England and Wales.

		<i>Total</i>	<i>Widowed</i>	<i>% Widowed</i>
<i>Males:</i>	65–74	1,530,660	214,880	14
	75+	698,410	261,390	37
	Total	2,229,070	476,270	21
<i>Females:</i>	65–74	2,225,950	888,660	40
	75+	1,400,700	916,370	65
	Total	3,626,650	1,805,030	50
<i>Persons:</i>	65–74	3,756,610	1,103,540	29
	75+	2,099,110	1,177,760	56
	Total	5,855,720	2,281,300	39

*The number aged 85 and over rose from under 50,000 to nearly 350,000 between 1901 and 1966.

over were widows, and in 1966, in England and Wales, there were nearly one million such widows. In all, there were almost two million widows at ages 65 and over and nearly half a million widowers.

The rising trend in the proportion of the elderly in the population has been caused mainly by the fall in the number of births shortly after the turn of the century, although also partly by falling death rates at younger ages. Up to the present, the comparatively small reduction in death rates of the elderly has made little contribution to this growth in proportion. A lowering of fertility rates, however, will cause only a temporary 'ageing' of the population and this is now reaching its full extent. Mortality improvement causes a permanent 'ageing' of the population and this has yet to make its full effect felt. The inevitable result of the mortality improvement witnessed among children and young adults over the last thirty years^{1,2,3} will thus be a permanent increase in the number of old persons in the community. This successful fight against illness and disease in recent years has enabled a rising proportion to realise their potential life span. There has not been, however, over many generations, much progress in increasing this span,* nor has there been much progress in increasing the mental and physical fitness of individual old persons.

MORTALITY TRENDS

Old age, for the purposes of this paper, is defined arbitrarily as the age of 65 and over; this is a customary age division for administrative and statistical purposes and the normal age at which, in Britain, the State retirement pension becomes payable to men. No meaningful definition of 'old age' can be made which will apply to all elderly people and certainly no definition can be made on the basis of age alone. Ageing is normally a gradual process and many of the degenerative changes associated with it begin in early life.

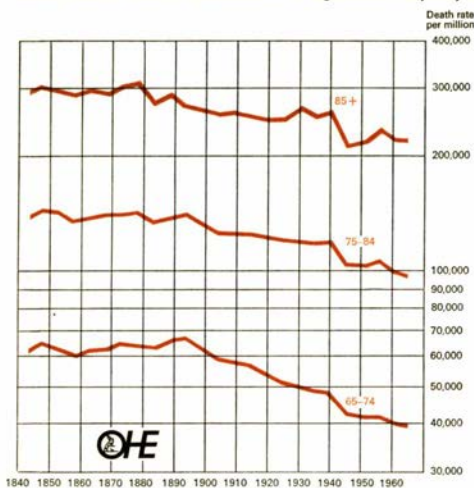
The death rate among persons aged 65 and over has fallen 22 per cent over the past 60 years, from 83 per 1000 in 1901-05 to 65 per 1000 in 1965 (cf.^{1,2,3}). Figure 2 shows the death rate for three age groups, 65-74 years, 75-84 years, and 85 years and over. At each age group there was little change in rates between 1841 (when records began) and about the turn of the century. During the period 1890 to the Second World War the rates fell slowly and steadily, a smaller decrease occurring among the very old than among those aged 64-74. A slightly faster fall in

*The expectation of life for males at birth was 44 years in 1891-1900 and 68 by 1962-64, but at the age of 65 the expectation of life had increased only two years over the 70 year period, from ten years in 1891-1900 to twelve in 1962-64.

Figure 2

All causes, death rate per million living, by age, 1841 to 1965, England and Wales.

Source: Registrar General's Statistical Review of England and Wales, 1965, Part I.



Note: (1) Five year averages.
(2) Logarithmic scale.

rates occurred during the war years, especially among the very old, although death rates among children, young and middle aged adults rose during this period.^{2,3}

It has been suggested that paradoxically the old benefited during this period of shortage and suffering perhaps because of greater involvement with the community, including greater work facilities, and also possibly because, with the advent of food rationing, they ate more nutritiously.⁴

Immediately after the war, rates rose and since then there has been a general slow downward movement with fairly large fluctuations from year to year. In recent years death rates among women have fallen faster than those among men and thus life expectancy among women at ages 65 and over has increased slightly, whereas among men it has hardly increased at all.

The thirty years since 1935 have not seen the dramatic fall in death rates among the elderly that were found among children² and young adults³; generally the older the age group the smaller has been the fall in death rate. This is, in part, because the most striking contribution of medicine and chemotherapy has, thus far, been in combatting the infectious diseases. Thirty years ago, these diseases, such as pneumonia and tuberculosis, made up a high proportion of deaths among the young and with the conquest of these diseases has come a proportionally high fall in death rates in the young. Among the old, where, then as now, the degenerative diseases, especially cardiovascular diseases, are the major causes of death, the conquest of the infections had a proportionally lesser effect.* Although there is no special pathology of the aged, disease has a greater effect on the aged body. Also, generally, there is less response to therapy in higher age groups.

The analysis and interpretation of death rates by cause is particularly difficult among the aged over long time periods. These difficulties arise because technical progress has made it easier now, compared with thirty years ago, to detect and to define the exact nature of certain diseases, particularly cardiovascular diseases which are so prevalent among the aged. Further, multiple causes of death due to general degenerative diseases give rise to problems in diagnosis and therefore in classification. Among the *very* old, certification of death by doctors cannot be so precise nor is the stated age always accurate. Thus in many of the diseases examined in the following pages, only broad trends can be assessed; the actual rates

*Between 1935 and 1965 the reduction in death rate in absolute terms has been, among 5-9 year olds, 1.64 per 1000 (from 2.04 to 0.40 per 1000) but among 65-74 year olds 9.2 per 1000 (from 47.5 per 1000 to 38.3 per 1000).

Table B

Leading causes of death, by sex and age, 1966, England and Wales.

Source: Registrar General's Statistical Review of England and Wales, 1966, part I.

		<i>Death rate per million</i>			<i>Percentage of all deaths</i>		
		65-74	75-84	85+	65-74	75-84	85+
Diseases of the heart	M	18,782	41,539	90,050	35	35	35
	F	9,536	29,101	75,019	34	36	37
Cancer	M	12,667	19,279	22,575	24	16	9
	F	6,288	10,166	13,699	22	13	7
Diseases of the nervous system	M	6,692	19,541	44,890	12	16	17
	F	5,264	17,473	42,171	18	21	21
Diseases of the respiratory system	M	8,941	22,119	50,842	17	18	20
	F	2,858	10,296	31,952	10	13	15
Diseases of the arteries	M	1,229	4,789	15,050	2	4	6
	F	616	3,363	13,029	2	4	6
All other causes	M	5,252	13,504	34,749	10	11	13
	F	4,000	10,663	28,160	14	13	14
All causes	M	53,563	120,771	258,156	100	100	100
	F	28,562	81,062	204,030	100	100	100

and changes in rates may not always be accurate.

An example of a steep downward trend, which almost certainly arises from a change in attitudes and in certification rather than any change in the prevalence of the disease entity, is shown in Figure 3. Fifty years ago deaths for males aged 75 and over from a disease rubric called 'old age' accounted for 29 per cent of all deaths at this age. In 1965 the disease rubric (which is now known as 'senility') accounted for less than 2 per cent of the total.

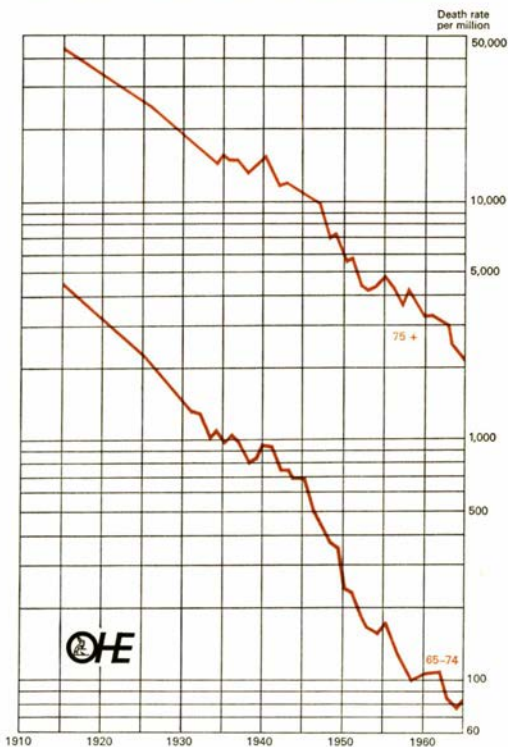
Accepting the above limitations of cause of death analysis, Figure 4 shows, for the age group 65 and over as a whole, the main causes of death over the past thirty years (a longer time period creates insuperable statistical problems), and Table B shows a current analysis by sex and age.

With the exception of deaths from 'senility' and, to a lesser extent, diseases of the nervous system, there have not been

Figure 3

Senility/old age, death rate per million males living, by age, 1911 to 1965, England and Wales.

Source: Registrar General's Decennial Supplement, England and Wales, 1931, Part III. Registrar General's Statistical Review of England and Wales, various years.



Note: (1) Female rates are similar and, in order to facilitate graphic presentation, are not shown.

(2) Ten year averages 1911 to 1930, annual rates 1931 to 1965.

(3) Logarithmic scale.

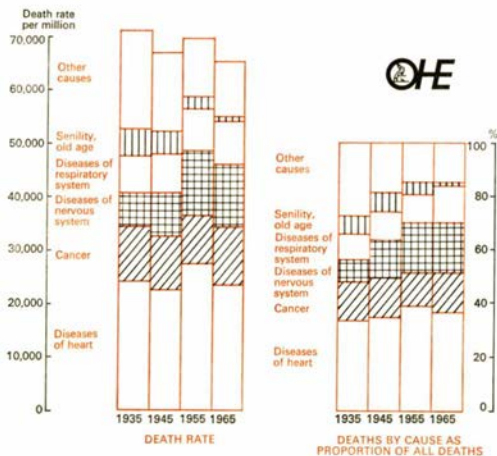
Figure 4

Leading causes of death, all persons, 65 and over, 1935, 1945, 1955 and 1965, England and Wales.

(a) Death rate per million living and

(b) Deaths by specified cause as proportion of all deaths.

Source: Registrar General's Statistical Review of England and Wales, various years.



large overall changes since 1935. In 1966 male rates are higher than female rates, particularly for diseases of the respiratory system, diseases of the heart and cancer. Cancer becomes increasingly less dominant with age (although its incidence continues to rise), and diseases of the respiratory and nervous systems become more so.

Diseases of the heart, mainly arteriosclerotic and degenerative heart disease, account for over one third of all deaths at these ages, almost the same as in 1935. Mortality rates since 1931 are shown in Figure 5. The significance of the increase in recorded deaths from coronary heart disease (in 1965, over 78,000 deaths at ages 65 and over, the largest single cause), and the decrease in recorded deaths from other myocardial degeneration (Fig. 6) has been discussed elsewhere.⁵ Although at these ages the difficulties of interpretation are even greater than at younger ages, nevertheless it is probable that there has been a real change in prevalence of these diseases, although not so large as the statistics might suggest.

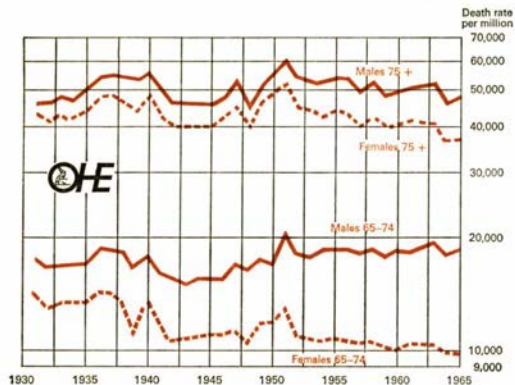
Diseases of the nervous system, mainly cerebral haemorrhage and thrombosis ('strokes'), are now the second leading cause of death, accounting for just under one fifth of all deaths. In 1935 they accounted for only 9 per cent of all deaths. Death rates for males are shown in Figure 7. Within this disease group, as with diseases of the heart, there have been two opposite trends which, when combined, have tended to cancel each other out. Cerebral haemorrhage as a classification has fallen steadily since 1931, and recorded death rates from cerebral embolism and thrombosis have risen, especially among women. Much of the rise, however, must be interpreted as a statistical, rather than an actual, rise, due to the three revisions of the International Statistical Classification of Diseases, Injuries and Causes of Death during the period since 1931.

Cancer accounts for one sixth of all deaths at ages 65 and over and mortality rates since 1910 are shown in Figure 8. It is only since 1936, however, that the statistics are on a reliably comparable basis. The overall trends mask changes in the pattern of cancers over the years. Cancer of the lung, the major site of cancer among 65-74 and 75-84 year old men, has risen very substantially. The other two main sites of cancer in men are the stomach and the prostate gland; the latter is the predominant cancer in the very elderly. Recorded deaths of the former have declined but for the latter there has been a slight increase. Among women, cancer of the breast and uterus are the major cancers at these ages. Both have declined over the past few years. It is hoped that widespread cervical cytology will reduce

Figure 5

Diseases of heart, death rate per million living, by sex and age, 1931 to 1965, England and Wales.

Source: Registrar General's Statistical Review of England and Wales, various years.

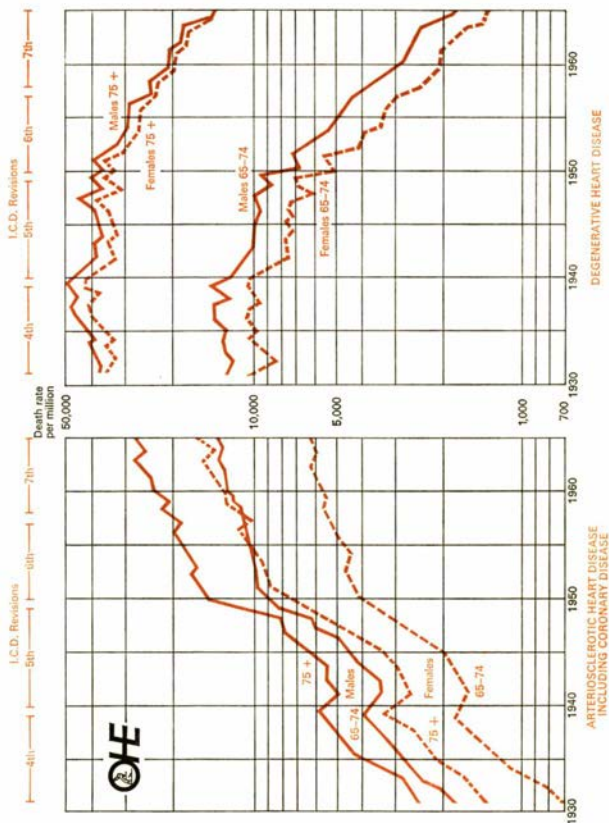


Note: (1) Annual rates throughout.
(2) Logarithmic scale.

Figure 6

Arteriosclerotic and degenerative heart disease, death rate per million living, by sex and age, 1931 to 1965, England and Wales.

Source: Registrar General's Statistical Review of England and Wales, various years.



Note: (1) Annual rates throughout.
(2) Logarithmic scale.

Figure 7

Diseases of the nervous system, death rate per million males, by age, 1931 to 1965, England and Wales.

Source: Registrar General's Statistical Review of England and Wales, various years.

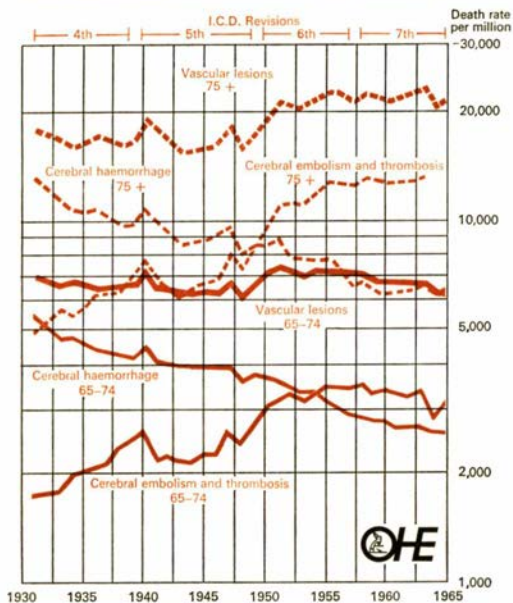
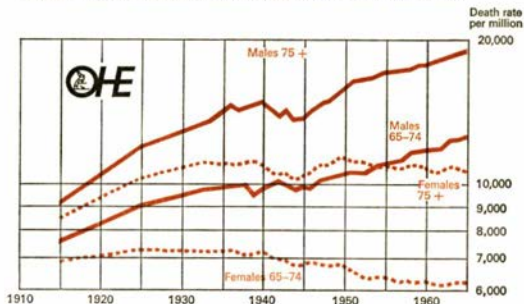


Figure 8

Malignant neoplasms (cancer), death rate per million living, by sex and age, 1911 to 1965, England and Wales.

Source: Registrar General's Decennial Supplement, England and Wales, 1931, Part III. Registrar General's Statistical Review of England and Wales, various years.



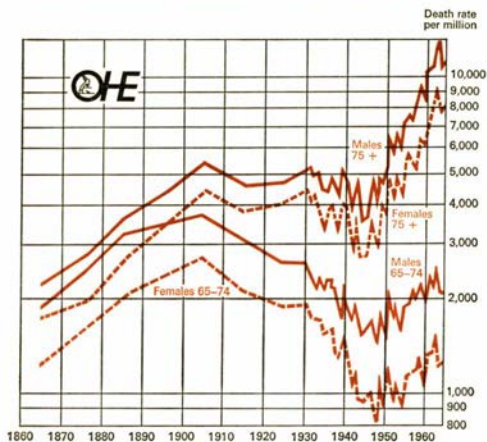
Note: (1) Ten year averages 1911 to 1930, five year average 1931-35, annual rates 1936 to 1965.

(2) Logarithmic scale.

Figure 9

Pneumonia, death rate per million living, by sex and age, 1861 to 1965, England and Wales.

Source: Registrar General's Decennial Supplement, England and Wales, 1931, Part III. Registrar General's Statistical Review of England and Wales, various years.

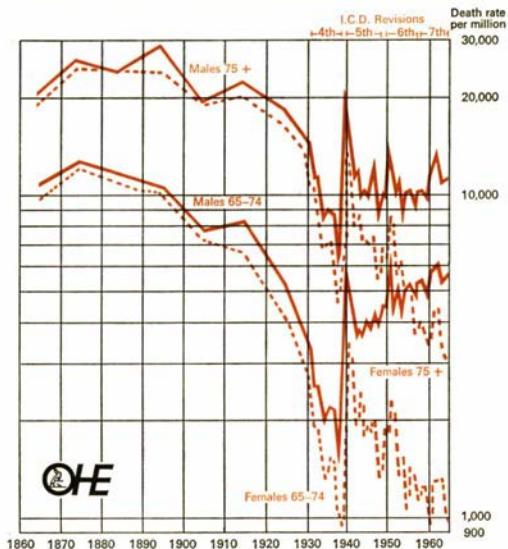


Note: (1) Ten year averages 1861 to 1930, annual rates 1931 to 1965.
(2) Logarithmic scale.

Figure 10

Bronchitis, death rate per million living, by sex and age, 1861 to 1965, England and Wales.

Source: Registrar General's Decennial Supplement, England and Wales, 1931, Part III. Registrar General's Statistical Review of England and Wales, various years.



Note: (1) Ten year averages 1861 to 1930, annual rates 1931 to 1965.
(2) Logarithmic scale.

still further deaths even at these ages from cancer of the cervix.

The proportion of those aged 65 and over dying from diseases of the respiratory system, mainly pneumonia and bronchitis, has risen slightly since 1935. Figures 9 and 10 show mortality rates from these diseases over the last hundred years. The 'spikiness' of the annual death rates in contrast to the smoothness of those relating to other diseases can be attributed largely to the weather and to the effects of influenza epidemics. Since the mid-1940s the sharp decline in death rates was halted.* Since then bronchitis rates among males have probably remained constant and both male and female pneumonia death rates have increased considerably. It is probable that acute attacks, particularly of bronchitis, are overcome, but each attack leaves the individual more vulnerable to the next attack. Present chemotherapy methods enable life to be saved but cannot always prevent lung damage. Thus it has been suggested that a greater number of persons with damaged lungs have been kept alive to the older ages, at which time they no longer respond to treatment.⁶ It is hoped that new chemotherapeutic agents will be devised to reach the invading bacteria more effectively than those already in existence.

Although accidental deaths and suicide rates continue to rise with age† and, particularly among females, a substantial proportion of all accidental deaths and suicides that take place occur among those aged 65 and over, the *proportion* of all deaths accounted for by accidents and suicide at each group falls sharply. In 1964 accidents, which constituted 60 per cent of 15–24 year old male deaths,³ accounted for only 2 per cent of deaths of men aged 85 and over.

SOCIOLOGICAL ASPECTS

With the exception of official vital statistics, very little work was conducted to ascertain the health, conditions, needs and problems of the aged until the late 1940s. There were one or two exceptions, including the Charles Booth studies⁷ and the 1909 Royal Commission on the Poor Law,⁸ but it was not until Sheldon's pioneering work⁹ appeared in 1948 that the sociological study of old age was put on a firm basis. In recent years many studies have appeared, although few have been scientifically based. A survey conducted in 1963 by Townsend and

*For bronchitis there have been large changes in death rates in the year immediately following International Disease Classification revisions. This was particularly true in 1940

†For suicides, among females, the death rates reach a peak at ages 65–74 and then fall at higher ages; among men (where the rates are higher than female death rates at all ages) they continue to rise with age.

Wedderburn¹⁰ gave the first national comprehensive figures concerning the welfare and living conditions of the aged. One of the aspects they investigated was where and with whom the aged lived (Table C).

They found that the vast majority lived in private households and of these the majority lived either with or near children or relatives. Nearly two million, however, were without a relative living with them or even nearby, of whom about 1,400,000 lived completely alone. 300,000 lived in institutions. Those in institutions lived mainly in National Health Service hospitals or Local Authority residential homes. Table D shows that those aged 65 and over occupied well over one third of all NHS hospital beds in the country, although they only accounted for some 12 per cent of the population. Of these beds for elderly inpatients a disproportionately high number are occupied by those who are single or widowed.

By 1963 almost half of the beds occupied by mentally ill women were occupied by those aged 65 and over. While the number of occupied beds in mental hospitals has fallen since 1954, the number of those occupied by persons aged 65 and over has increased from 45,000 to 52,000. It has been suggested that this is partly due to a residual build-up and the number will eventually fall. In non-psychiatric hospitals there are in the region of 80,000 beds occupied by those aged 65 and over. In all this gives a total of 130,000 aged persons in NHS hospitals.* The Hospital plan for England and Wales¹¹ suggested that 'with the further development of active treatment and rehabilitation and the wider and fuller provision of services for the elderly outside hospital' the same number of beds would suffice in 1975 as obtained in 1960, although the number of beds per 1000 persons aged 65 and over would be reduced from 10·8 to 9·4.† At the same time, an increase in residential home accommodation is envisaged, from 13·5 places per 1000 persons aged 65 and over in 1960 to 18·9 per 1000 in 1974.

Those who do not live in institutions naturally make heavy demands on domiciliary health and welfare services, a proportionally heavier demand than any other group of the population with the possible exception of infants and pregnant women.

Morbidity among those living at home has been measured in

*The figures given in Table C were calculated on a different basis. They are for Great Britain 1966, and include non-NHS hospitals.

†In Scotland, however, they are planning to increase bed provision from 10·8 to 13·3 per 1000.

Table C

Place of residence and proximity of relatives of those aged 65 and over, 1966, Great Britain.

Source: Derived from *The Aged in the Welfare State* by P. Townsend and D. Wedderburn (1965).

	<i>Number</i>	<i>%</i>	
Private households			
a. Children living at home	1,942,000	30	
b. Other relatives living at home	592,000	9	
c. No relatives at home, children near	953,000	15	
d. No relatives at home, other relatives living near	666,000	10	
e. No relatives at home or living near	1,955,000	30	
	6,108,000	—	94
Residential homes	110,000		2
Psychiatric hospitals and nursing homes	63,000		1
Other hospitals	121,000		2
Hotels, etc.	100,000		1
Total	6,502,000		100

Table D

Proportion of hospital beds occupied by those aged 65 and over, 1951, 1955, 1960 and 1963, England and Wales.

Source: Derived from Report on Hospital In-Patient Enquiry, various years. Registrar General's Mental Health Supplement, various years.

	<i>NHS Non-Psychiatric Hospitals</i>		<i>NHS Psychiatric (mental illness) Hospitals</i>	
	<i>Male</i> <i>%</i>	<i>Female</i> <i>%</i>	<i>Male</i> <i>%</i>	<i>Female</i> <i>%</i>
1951	*	*	21	33
1955	*	*	23	38
1960	32	38	26	45
1963	35	41	27	48

*Not available.

a survey conducted among General Practitioners in 1955-56.¹² Twenty-one per cent of all consultations made to doctors were made by the 12 per cent of the population aged 65 and over.* Similarly, 21 per cent, by value, of the pharmaceutical services are absorbed by those aged 65 years and over.¹³ Whereas mortality rates are higher among men than among women (Table B) the reverse is true for morbidity as measured by hospital in-patients and the use of the general medical and pharmaceutical services.

Although the use of medical services by those aged 65 and over is disproportionately high for hospital beds and for consultations with the General Practitioner it is remarkably low in the use of hospital out-patient facilities.¹⁴

Local Health Authorities keep a register of physically handicapped persons and although these have been criticised for being considerably incomplete (see Table F, for example), the proportion of those registered who are aged 65 and over is of interest (Table E). Table E also shows some of the services provided by the Local Health Authorities. Some authorities are now setting up day hospitals, day centres and geriatric clinics where ambulatory old persons can go to obtain medical treatment and social support.

In spite of the extent to which health and welfare services are provided for the aged, many studies have found that they are not comprehensive enough. Kay, Beamish and Roth in Newcastle¹⁵ suggested that only a very small fraction of those aged 65 and over who suffered from a psychiatric disorder were being cared for either as hospital in-patients or as residents in homes. Because the numbers were far too great to be cared for as in-patients they emphasised the need to extend community care facilities for the aged. Townsend and Wedderburn¹⁰ attempted, for the first time, to ascertain nationally the number of old persons in need of help who were not receiving it. 1966 estimates of these unmet needs (as defined for the survey) are shown in Table F.

It is probable that, despite the heavy demand and usage of health and welfare facilities by those aged 65 and over, there are still many unmet needs. The most urgent problem is perhaps the 5 per cent of old persons (over 300,000) living in private households alone and incapacitated.

The popular conception of the lives of old people in Britain was, until recently, one of ill-health, immobility, loneliness and social isolation from their families. It has now been shown that

*Figures derived from Intercontinental Medical Statistics, Limited gave 18 per cent for the United Kingdom in 1966.¹⁴

Table E

Number of persons aged 65 and over visited by, or registered with, the Local Health Authorities, 1966, England and Wales.

Source: Ministry of Health Annual Report, 1966.

	<i>Number</i>	<i>% of total persons on register, or total persons visited, who are aged 65 and over</i>
<i>Registered:</i>		
Blind	70,327	69
Partially sighted	19,726	62
Deaf or hard of hearing	13,126	33
Handicapped	66,728	41
<i>Visited:</i>		
Health visitors	312,673	-
Home nurses	464,859	54
Home helps	329,114	79

this description is applicable to only a minority of the aged, albeit an important minority. Tunstall¹⁶ found that of those living in private households 78 per cent do not live alone and 72 per cent claimed they were never lonely. The majority are not socially isolated and half of all old people are married. Townsend¹⁷ found very few old people isolated from their children and many who lived alone did so because they wanted to. Some without families, for example widows and single persons, found substitutes for a family in their neighbours. Townsend also found that family life and care of old persons by their families were not disappearing and suggested that without the care given to sick and infirm elderly people by the family the burden on the health and welfare services would be three to five times greater. Lowther and Williamson¹⁸ in a survey in Edinburgh found that the majority of relatives were willing to care for patients discharged from a geriatric unit of a hospital.

Nevertheless many old persons do not communicate with their family or do not have a family. Tunstall¹⁶ describes four forms of aloneness: living alone, social isolation, loneliness, and 'anomie'. He suggests that 1,300,000 people aged 65 and over live alone, many of them widows (see Table A for example) and many of them preferring this way of life. Social isolation is the lack of social contact, especially with other household

members or close kin. Loneliness is a feeling of being lonely whether or not the old person makes social contact. He suggested that one in fifteen old people are *often* lonely and a total of between one in three and one in four are *sometimes* lonely. 'Anomie' is defined as being cut off from the broad social values of society, or a sense of 'normlessness'. The main groups liable to aloneness are the single, the recently widowed and the housebound or disabled. Townsend¹⁷ suggested that social isolation is caused by a lack of relatives and also by enforced retirement. It is the socially isolated who claim a disproportionate share of the health and welfare services and isolation is the major cause of entry to hospital or other institution.

PHYSIOLOGICAL AND PSYCHOLOGICAL ASPECTS

Whether or not the aged are alone, there is an inevitable deterioration in physical and mental functioning. There have, in the past, been three theories of senescence, none mutually exclusive of the other. The first is that ageing is caused by loss or injury of cells which the body is unable to reproduce. Second is the theory that cells which are produced late in life are, in some way, not as good as the same type of cell produced when the body was younger. Finally it has been suggested that ageing is caused by changes in colloid formation in the body.*

There is overwhelming evidence to suggest that with the passage of time the majority (but not all) of tissues, organs and animals, including man, become increasingly vulnerable to rapid changes in their environment, to distress and to injury. It is important to stress that although there is deterioration, the age at which this occurs varies considerably from individual to individual and is to some extent conditioned on man by the cultural pattern of his society and to a degree by his own way of life.

Biologically, man's vigour progressively declines starting generally from an early age. Ageing produces a gradual loss of the properties of the elastic connective tissue, a reduction of the number of normally functioning cells including cells within the nervous system, a decrease in muscle strength and a lowering of the excretion of hormones, especially by the sex and the adrenal glands. It also tends to produce an increased amount of fat, a decrease in oxygen utilisation and a decrease in the quantity of blood pumped by the heart.¹⁹ Some of these changes are reflected in surveys of the health of the aged. Sheldon⁹ found the aged to have a high incidence of minor ill

*Examples of colloid structures are included in the walls of blood vessels.

Table F

Uses and unmet needs of selected facilities among those aged 65 and over, living in private households, 1966, Great Britain.

Source: Derived from *The Aged in the Welfare State* by P. Townsend and D. Wedderburn (1965).

<i>Service</i>	<i>Number</i>	<i>% of all aged 65 and over living in private households</i>
Home helps		
1. Receiving	268,000	4
2. Feeling a need for but not receiving	348,000	6
3. Not feeling a need but having difficulty and no help	281,000	5
Meals		
1. Receiving cooked meal from mobile service	69,000	1
2. Expressing a wish for hot meal from mobile service but not receiving one	361,000	6
Chiropody		
1. Having chiropody, public or voluntary	446,000	7
2. Having chiropody privately paid	690,000	11
3. No chiropody but feeling a need for some	703,000	13
Hearing		
1. Hearing difficulties but never having had aural examination or none for more than five years	1,363,000	22
2. Severe hearing difficulties but never having had aural examination or none for more than five years (included in 1)	220,000	4
Sight		
1. Severe difficulty, never having had examination of eyes or none for more than five years	342,000	6
2. Severe difficulty, not registered with local authority (Many persons are included under both items 1 and 2)	476,000	8
Doctor Visits		
1. Seen in previous week	782,000	13
2. Seen over a week but not over a month previously	1,245,000	20
3. Wanting to see more of G.P. (some included in items 1 or 2)	214,000	4
District Nurse		
1. Visiting regularly	48,000	1
Housing		
1. Lacking 3 basic amenities (indoor W.C., sole use of bath and kitchen)	372,000	6
2. Lacking 2 out of 3 basic amenities	1,343,000	22
Mobility		
1. Incapacitated and living alone or no children living near	311,000	5

health which affected their total way of life and the 1963 Royal College of Physician's, Edinburgh study²⁰ supported this evidence. Hobson²¹ suggested that at least one third of all over 65 suffer from impaired physical capacity as a result of chronic disease.

Lehman found that for creative mental activity, both quality and quantity reach their peak early in life, generally before the age of 40.²² Other psychological effects of age include changes in perception due to a deterioration of vision and hearing and, possibly, changes in the perception of depth and colour. Performance in intelligence tests falls off steadily after the age of 25 perhaps because, as Gilbert²³ has shown, older people are often impaired because of their slower speed of learning and capacity for retention of new verbal material. Short term memory probably deteriorates with age although the evidence concerning long term memory is conflicting. Thus, generally, the mental power of the individual declines with age and at the older ages certain forms of mental illness, such as senile psychosis, often begin to appear.

Apart from a decline in physical and psychological powers, factors such as loss of economic security, approaching death, the indifference of their children and the deaths of their contemporaries are all bound to affect the emotional make-up of the aged, although personality is an important variable in successful adjustment to ageing. Further factors include loss of sexual gratification and a feeling of loneliness and isolation and it has been suggested that retirement often leads to premature physical and mental illness.

ECONOMIC ASPECTS

In 1966, in Great Britain, 5,650,000 persons aged 65 and over received the state retirement pension.* Over one million of these received a supplementary benefit (previously national assistance). Although the majority of old persons receive state pensions or benefits the economic circumstances of the aged have been criticised on a number of grounds. Firstly, a minority of persons do not claim retirement pension or supplementary benefits. In a Ministry survey of persons of pensionable age it was estimated that 280,000 people claimed neither pension nor supplementary benefit although some presumably had private incomes or private insurance.²⁴ It was also estimated that 850,000 persons who were receiving a pension could have

*The standard weekly rate of the retirement pension is (January 1968) £4.10.0 for a single person and £7.6.0 for a married couple. In 1948 the single person rate was £1.6.0; it is now £2.5.0 in equivalent 1948 prices.

received assistance if they had applied for it. Wedderburn found that about 11 per cent of those aged 65 and over had incomes lower than the national assistance scale rates but did not receive assistance.¹⁰ Strenuous efforts are now being made to improve this situation.

Secondly, it is argued that the average weekly income level of the aged is too low. In the Ministry's survey of 1965²⁴ it was found that just under half of aged married couples have incomes of less than £10 per week, a little over half of the single men and two-thirds of the single women had less than £6 a week. Wedderburn concluded from her survey¹⁰ that the aged had levels of income a half or less below the levels of the population generally. The survey goes on to discuss need as well as income.

Thirdly, it is suggested that many old people rely solely on the state for their income and therefore by raising the state level of the minimum guaranteed weekly income, the incomes of the aged would come more into line with the working population. The Ministry's survey found that most of their sample had income in addition to the state pension and benefits. The Wedderburn survey put the emphasis on the three out of ten who had no additional income. It also showed that for seven out of ten the state income was their *main* source of money.

These two surveys also showed that few old people had substantial savings or assets, that the older the person the smaller their income and that the single and widowed women were the worst off. The Wedderburn survey concluded that some 600,000 to 700,000 individual old people were living below 'accepted' levels, the Ministry's survey that there were some 300,000 pensioners who were living solely on, or near to, the income derived from the state retirement pension.

In broader terms, the economic advantage to the community at large of better health and the conquest of disease are seen among the young and among the working population. On the other hand the decrease in mortality rates leading to a greater number of old persons alive in the community increases the community costs, while the very real benefits accruing from a greater expectation of life obtain to the individual. The state has benefited earlier from their productivity and contribution to tax.

The direct costs of the national health service absorbed by those aged 65 and over are shown in Table G. Nearly 30 per cent of the expenditure is absorbed by a group representing some 12 per cent of the population. In addition to these costs, expenditure on retirement benefits for 1965/66 in Great

Table G

National Health Service expenditure by services and age, 1966, UK.

Sources and method: See Appendix.

Service	Cost		% of Total Expenditure on Service		Expenditure per Capita	
	under 65 £m	65+ £m	under 65 %	65+ %	under 65 £	65+ £
Hospital	574	299	66	34	11.9	44.9
Pharmaceutical	126	34	79	21	2.6	5.1
General Medical	82	26	76	24	1.7	3.9
General Dental	69	6	92	8	1.5	0.9
Supplementary						
Ophthalmic	18	4	81	19	0.3	0.6
Local Authority Health	107	39	73	27	2.2	5.8
Total	976	408	71	29	20.2	61.2

Britain was £1238 million and nearly £150 million in national assistance was paid to supplement pensions.* The total expenditure on social benefits on those aged 65 and over probably exceeds £1650 million.

Although the proportion of the aged in the community is increasing it should be borne in mind that the total ratio of dependency (persons not 'working' to those who are), has actually fallen since 1901, and will probably be similar at the end of the century to that pertaining in 1901, a rise in the proportion of pensioners being offset by a fall in the proportion of child and non-working women dependents.†²⁵ In effect, the overall reduction in mortality and fertility has been accompanied by a shift of some of the burden of dependence from childhood to old age.

Further, the aged do make some economic contribution to the community; a proportion will continue in employment, although many work only part-time (Table H).

In spite of the proportion who are working, economic as well as social reasons suggest that a greater flexibility in retirement

*These expenditures are based on 'pensioners' and thus include women aged 60-64.

†It is possible that this dependency ratio has now reached its lowest point, both compared with the past fifty years and the next fifty years. It should be noted that the future estimates are based on the probable birth and death rates and therefore may well be subject to considerable error.

Table H

Employment status of those aged 65 and over, 1961, Great Britain.

Source: 1961 Census Report, Summary Tables.

	<i>Economically Active</i>		<i>Part-time Workers</i>	
	<i>No.</i>	<i>% of total</i>	<i>No.</i>	<i>% of economically active</i>
<i>Men:</i>				
65-69	361,970	40	57,580	16
70-74	138,810	21	39,050	28
75+	69,540	10	17,910	30
Total	570,320	25	114,540	21
<i>Women:</i>				
65-69	130,060	10	59,460	46
70-74	48,580	5	19,500	40
75+	23,820	2	5,900	25
Total	202,460	5	84,860	42

age should be encouraged. In 1921, when no widespread compulsory retirement system operated 89 per cent of 65-69 year old men were employed as were 27 per cent of those aged 75 and over.²⁵ It is difficult, of course, to ascertain the reasons for such high levels of employment; whether it was from necessity or from desire. Other economic considerations of increasing the employment of those over the age of 65 include the economic growth of the community and unemployment levels. Thus, although the aged do make an economic contribution it is small, their main contributions having been made during their working lives. The present burden represented by the maintenance of the elderly is unlikely to become smaller with the further increase in the number of elderly people due to improved mortality; with the gradual reduction of special groups of indigent elderly (some of whom over the age of 75 are not eligible for a state retirement pension); and as the minimum acceptable levels of income move upwards. Although dependence has no more than shifted from children to old people, children are maintained largely by the family (apart from education) whereas the old are, now, largely supported by the community, particularly with regard to health and welfare expenditure. Any economic benefits obtained by advances in health and welfare falls on individuals rather than community as a whole.

FUTURE ASPECTS

The number of persons aged 65 and over has increased rapidly in recent years, both in absolute terms and as a proportion of the total population; this proportion has now reached one in eight. The increase in the number of the aged has come about because more and more individuals reach, and die at, what has been termed the 'specific age' of man, between 70 and 80 years. This has been achieved by the conquest of diseases, particularly the infectious diseases, among infants, children and young adults. Among the aged, mortality has altered little over the last 30 years. Death rates have fallen by a comparatively small amount and the causes of death are much the same now as they were in the late 30s. Therefore, as Comfort suggests,²⁶ we are prolonging life only a little. Furthermore we are prolonging what he terms man's 'vigour' hardly at all.

Ideally, as Huxley suggested²⁷ people might remain alive apparently 'young' until the age of 90 and then die quickly. The emphasis should perhaps be placed on keeping people 'young', that is to improve the fitness of those living through the present length of retirement. Towards this aim two avenues can be considered. Firstly, as a long term possibility, the study of senescence, or gerontology, may give some clues. Much medical attention and research is turning to the study of the degenerative diseases and it may be there that the problems of biological ageing lie. It is also possible that these diseases are simply manifestations of some more complex and fundamental process and that more research into the age process itself, which includes the possibility of interfering with the timing mechanism of age changes, is needed. Comfort²⁶ suggests that there should be a greater co-ordination between medical clinicians and biologists in observing the aged and the increasing importance of gerontology should be recognised in medical and academic circles.*

The second approach would be to minimise physical and psychological deterioration in old age by preventive medical measures taken earlier in life. In some cases this may involve the more effective treatment of illnesses such as pneumonia or bronchitis where, although current treatment can cure the illness and save life, there is a certain degree of residual lung damage which can build up during repeated attacks. Eventually, in old age, the sufferer may become chronically disabled. This is one of the greatest challenges facing chemotherapy; to find antibiotics or combinations of antibiotics which can stop

*At present (1968) there is no University chair in gerontology in the country.

infections so quickly and effectively that the organ involved (for example, the lung) is undamaged. Preventive measures which involve the better understanding of disabling diseases such as rheumatism and arthritis are urgently needed. In certain types of arthritis associated with the menopause it is possible that hormone replacement therapy might have a prophylactic role. This approach of preventing disability *before* old age rather than preventing or postponing death itself or of treating established disability *in* old age will bring with it, apart from obvious benefits to the individual, economic gains to the community by a reduction of direct health and welfare expenditure on the aged.

However, in the meantime, as Tunbridge suggests 'in planning for the future, cognisance must be taken of the impaired efficiency and of the impaired health which is the lot of the majority of the over-70s and which is likely to remain a relatively unsolved problem for at least a generation'.²⁸

How should society tackle the problem of its elderly? In primitive societies the aged are often repositories of knowledge, imparters of wisdom and mediators in disputes.²⁹ However, in our society, the pace of technological change may make it increasingly difficult for the aged to function in these ways, as Leach suggests³⁰ 'in a changing world machines get obsolete very quickly; so do human beings'. The existence of a large number of old people in the community is a new problem arising for the first time as a result of the technological progress of the last few decades. Neither society as a whole nor individual persons concerned have yet become adjusted to it.

Society has, for many years, taken responsibility for its elderly. However, it is only now that they represent a large proportion of our total dependants that proper consideration is being given to the way in which this responsibility should be exercised. What, for example, is the most suitable way of ensuring that they have sufficient income for their needs? – in the Townsend and Wedderburn study¹⁰ one quarter of those who could have received state help did not apply. And where, and with whom, should the aged live?

Townsend suggested that more emphasis be placed on the family unit and that the roles of the family and the Welfare State should complement each other. He showed how young and old lived together with mutual benefit.¹⁷ On the other hand, it has been suggested that old people like to live with other old people rather than with the young. It is likely that individuals vary in this respect and further investigation is needed.

For those who do not need constant medical or nursing

facilities many more purpose built residential homes, and, wherever possible, special individual sheltered housing incorporating design features specific to the problems of the aged have been suggested. Local authorities are already making a firm contribution in this direction although further research and experimentation could be made between these authorities and hospitals with regard to the complex needs of the very frail and the mentally infirm.

For the aged sick who need mainly nursing care, the economics of a transfer from scarce hospital beds into nursing homes or even their own homes (supported by domiciliary health and welfare care) should be investigated. Greater emphasis on short stay geriatric units in hospitals and short stay accommodation in welfare homes, both supported, on discharge, by out-patient clinics for the ambulatory, day hospitals and day centres, have been urged.

The community has also attempted to meet the needs of the elderly, apart from the provision of money and housing. Many of the welfare services have been strongly criticised for their deficiency and often, where facilities are available, it is not known why they are not used. Routine medical examination of the elderly is often urged to enable progressive disorders to be diagnosed and treated as early as possible. Regular contact, by a member of a team of health and welfare workers headed by the general practitioner, with every aged person in the community might help to ensure a better standard of health and the provision of adequate welfare needs. To this aim greater co-ordination of the community services is needed, especially between the General Practitioner and the Local Health Authority. These services have grown up piecemeal, are needlessly complex and often duplicate each other. A government sponsored national council for the aged with a full time permanent staff as well as local committees could perhaps be valuable in leading to integration of the services. The national council could co-ordinate the necessary research and experimentation to assess the needs of the elderly, some of which have been outlined above.

One important aspect of re-thinking attitudes about the aged concerns retirement from work. Retirement is a comparatively new phenomenon, perhaps partly due to rising economic standards and partly to the increase in the number of persons unable, for health reasons, to continue in employment. Townsend¹⁷ considered that 'retirement from work is a tragedy for most men'. Often forced retirement leads to physical and mental deterioration. The older worker is often considered

steadier, more accurate and more conscientious, but he is also slower and often not able to continue in strenuous work. Retraining to non-manual jobs, sheltered or part-time work and outwork for the housebound are all problems which need to be overcome if the old are to be enabled to continue in work. Nevertheless, the present retirement age could be made more flexible by altering the practice whereby at a set chronological age many persons must stop work. Training for leisure can be important as well as training for work; possibly many retirement problems could thus be diminished.

As the proportion of the aged in the population has increased there has been a concurrent fall in the proportion of children. Thus, although there has been little change in the dependency-ratio, there has been a change in the economic burden on the community with the shift from family supported children to community supported old people. Before the 1930s, families bore the direct cost of housing and feeding large numbers of children. Now, instead, they must support, mainly through taxation, large numbers of elderly in the community. Although this dependency shift has stopped and, in the future, the proportion of children is expected to rise substantially, the proportion of the aged is also expected to rise. This, together with the necessary increase in standards among the elderly, will cause the costs to the community to continue to increase. Nevertheless, this increase must be related to the increasing well-being of our society as a whole and thus should not be an intolerable burden.

The approach of our advanced industrialised society towards its elderly, particularly its elderly chronic sick, is one of its most important challenges in the immediate future. However, in the longer term it is desirable to concentrate on ways in which the fitness of the aged can be improved. This will not only bring economic benefits to the community but will materially raise the quality of life for the elderly individual.

- 1 *Infants at Risk*. Office of Health Economics, 1964.
- 2 *The Lives of our Children; A Study in Childhood Mortality*. Office of Health Economics, 1962.
- 3 *Disorders which Shorten Life; A Review of Mortality Trends for those between the Ages of 15 and 44*. Office of Health Economics, 1966.
- 4 *Changes in Mortality Trends in England and Wales, 1931-1961*. US Department of Health, Education and Welfare, 1965.
- 5 *The Common Illness of Our Time; A Study of the Problem of Ischaemic Heart Disease*. Office of Health Economics, 1966.
- 6 *Pneumonia in Decline*. Office of Health Economics, 1963.
- 7 BOOTH, C. e.g. *The Aged Poor: Condition*. MacMillan, 1884.
- 8 *Report of the Royal Commission on the Poor Laws*, Cd. 4499, HMSO, 1909.
- 9 SHELDON, J. H. *The Social Medicine of Old Age*, OUP for Nuffield Foundation, 1948.
- 10 TOWNSEND, P. and WEDDERBURN, D. *The Aged in the Welfare State*, G. Bell & Sons, 1965.
- 11 *A Hospital Plan for England and Wales*, Cmnd. 1604, HMSO 1962.
- 12 LOGAN, W. P. D. and CUSHION, A. A., *Morbidity Statistics from General Practice, Vol. 1*. General Register Office, HMSO, 1958.
- 13 *British Medical Index*, 1966. Intercontinental Medical Statistics Ltd., 1966.
- 14 LOGAN, R. F. L. The Burden of the Aged in Society and on Medical Care. In *Medicine in Old Age*, Ed. by AGATE, J. N., The Royal College of Physicians of London, 1966.
- 15 KAY, D. W. K., BEAMISH, P. and ROTH, M. (1964) Old Age Mental Disorders in Newcastle Upon Tyne - 1. *Brit. J. of Psychiatry*, Vol. 110, No. 465.
- 16 TUNSTALL, J. *Old and Alone; A Sociological Study of Old People*, Routledge and Kegan Paul, 1966.
- 17 TOWNSEND, P. *The Family Life of Old People*, Routledge and Kegan Paul, 1957.
- 18 LOWTHER, C. P. and WILLIAMSON, J. (1966). Old People and their Relatives, *Lancet*, 2, 1459.
- 19 WOLFF, K. *The Biological, Sociological and Psychological Aspects of Ageing*. Charles C. Thomas, 1959.
- 20 *The Care of the Elderly in Scotland*. Royal College of Physicians, Edinburgh, 1963.
- 21 HOBSON, W. Functional Changes with Age in Relation to the Employment of the Elderly. In *The Biology of Ageing*, Ed. by YAPP, W. B. and BOURNE, G. H., The Institute of Biology, 1957.
- 22 LEHMAN, H. C. *Age and Achievement*, New Jersey: Princeton University Press, 1953.
- 23 GILBERT, J. G. *Understanding Old Age*. Ronald Press, 1952.

- 24 *Financial and Other Circumstances of Retirement Pensioners*. Report on an enquiry by Ministry of Pensions and National Insurance. HMSO, 1966.
- 25 BENJAMIN, B. Demographic Aspects of Ageing. In *The Biology of Ageing*, Ed. by YAPP, W. B. and BOURNE, G. H. The Institute of Biology, 1957.
- 26 COMFORT, A. *The Process of Ageing*. Weidenfeld & Nicholson, 1965.
- 27 HUXLEY, A. *Brave New World*.
- 28 TUNBRIDGE, R. E. Senescence - its clinical and pathological manifestations. In *Humanity and Subsistence* a symposium. Annales Nestlé, 1961.
- 29 SIMMONS, L. W. *Role of the Aged in Primitive Society*. Yale University Press, 1946.
- 30 LEACH, E. (1967) Fifth Reith Lecture, *The Listener*, Vol. 78, No. 2020.

Sources and Method for Table G

The total costs shown include National Health Service expenditure by Central and Local Government and also payments made by patients. The following is a brief description of the method and sources used for each of the services shown; further details can be obtained from the Statistical Department of the Office of Health Economics.

Hospital Services

These estimates have been based generally on time spent by patients in various types of hospital. Costs were equated with bed-days which were obtained by multiplying the number of discharges and deaths from hospitals by the average length of stay for each of the age groups. These were given, for each type of hospital, in the 1956-57 Hospital In-Patient Enquiry, Part 2 (HMSO 1961). They were then adjusted to obtain the 1966 estimate. For psychiatric hospitals the figures were taken from *A Census of Patients in Psychiatric Beds*, 1963, by E. M. Brooke, (HMSO 1967). These figures were also projected to 1966. The proportionate expenditure by hospital type was derived from the 1967 Hospitals Year Book (Institute of Hospital Administrators, 1966) and adjusted to bring the slight difference between the 1956-57 Hospital In-Patient Enquiry definitions, and current definitions, of hospital type, into alignment. These proportions were then applied to the 1966 total UK expenditure figure for the hospital services as given in the 1967 Annual Abstract of Statistics (HMSO 1967).

Pharmaceutical Services and General Medical Services

The sources for allocating the expenditure on general medical and pharmaceutical services were the 1966 British Medical Index and British Pharmaceutical Index. These publications are part of a medical research service provided by Intercontinental Medical Statistics, Limited. For the pharmaceutical services, an age breakdown based on the number of prescriptions written was applied to the expenditures on each of 45 pharmaceutical groups. For each age group, expenditures were added together and the total percentaged. These proportions were then applied to the 1966 UK expenditure figure for the pharmaceutical services as given in the 1967 Annual Abstract of Statistics (HMSO 1967). This latter source was also used to give total UK expenditure on the general medical services. The age breakdown used for the general medical services was taken from the British Medical Index and was based on total consultations. The IMS age groups were adjusted to bring them into line with the age groups used elsewhere in Table G. An adjustment was also made for the surgery/home consultation variation by age.

General Dental Services

The annual report of the Ministry of Health for 1966 (HMSO 1967) was used to obtain the proportionate age breakdown of expenditure. The group aged 45 and over was split into 45-64 year olds and those aged 65 and over by using an estimate given in No. 41 of the National Institute Economic Review (National Institute of Economic and Social Research, August, 1967). These proportions were then applied to the 1966 total UK expenditure on the general dental services as given in the 1967 Annual Abstract of Statistics (HMSO 1967).

Supplementary Ophthalmic Services

The annual report of the Ministry of Health for 1960 (HMSO 1961) was used to give an age breakdown for sight tests and also for authorised pairs of spectacles, for England and Wales, 1959. Costs for these items were also given and thus a proportionate cost breakdown for age was obtained. These figures were then adjusted for population changes to obtain 1966 figures which were then applied to the 1966 total UK expenditure on the supplementary ophthalmic services as given in the 1967 Annual Abstract of Statistics (HMSO 1967).

Local Authority Health Services

The annual report of the Ministry of Health for 1966 (HMSO 1967) was used to obtain proportionate age breakdowns for various Local Authority Health Services. Where figures were not given, estimates were made using the general population age structure, general practice consultation age structure, etc. The age group breakdowns were applied to the cost of each of the services and these were then added and repercentaged. This total

proportionate age breakdown was then applied to the 1966 UK expenditure on the local health authority services as given in the 1967 National Income and Expenditure (HMSO 1967) to which payments made by patients had been added. These latter payments were estimated from an adjusted England and Wales figure given in the annual report of the Ministry of Health for 1966 (HMSO 1967).

Acknowledgement

The Office of Health Economics wishes to thank Intercontinental Medical Statistics, Limited for making available some of their statistical data.