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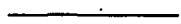
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Influence of ageing of the active population on health and health care in the Netherlands

by

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Chapter 1

Introduction

The population of the Netherlands has grown appreciably during the twentieth century, and this demographic development has been characterised not only by the numerical increase but also by a shift in the structural composition of the population resulting from ageing. Both these processes have influenced every aspect of Dutch society, but little attention has been given to their relationship with the biological process of ageing in the individual. This relationship deserves study, however, because even a rough impression of the interaction between the growth of the Netherlands' population and the biological process of ageing shows that : a) the number of older individuals is constantly increasing, and b) old age is often accompanied by infirmities ; from this it follows that we can expect an increasing number of old people with infirmities. If we then also take the demographic ageing process into consideration, it becomes evident that we must expect an increasingly higher proportion of infirm old people in the population. This holds even if we do not take into account other intervening factors such as new and improved forms of medical care and changing conceptions of disease and infirmity.

In the present exploratory survey of the subject we shall concentrate on the quantitative and relative changes occurring in the part of the population of the Netherlands that actively participates in the production process, i.e. the working population, and in particular the oldest age groups, with special attention to the ways in which the consequences of this demographic process influence or are related to the consequences of the biological process of ageing.

The central question can be formulated as follows : is a demographic ageing of the working population of the Netherlands taking place and, if so, what is the effect on the health of this population group ?

We shall start by examining in Chapter 1 the question of whether and, if so, to what extent the working population is ageing and whether this group ages more rapidly than the population as a whole. A statistical approach to this problem on the basis of Working-life Tables (cf. Appendix B) will also be discussed.

In Chapter 2 we shall discuss the health of the older part of the working population and the possibility of drawing conclusions concerning the disease patterns of this group in the Netherlands. In this connection special attention will be given to withdrawal from the working population on the basis of medical indications.

In Chapter 3 we shall attempt to demonstrate the mode of interaction between the demographic ageing process and biological ageing, and the consequences of this interaction for services and institutions in the field of health care.

Before proceeding, however, it will be well to define the most important concepts with which we are involved here. Ageing is understood as defined by Pressat, i.e. *"cette accumulation progressive de la population dans les groupes d'âges élevés".* [1] In other words : an increase of the percentage of older people in the population accompanied by an equal decrease of the younger age categories. For present purposes, we have arbitrarily taken the limit between young and old at 45 years. In certain cases, however, we shall draw on statistical material based on a different division. As the upper limit of the working population, we have taken the age of 70 years.

Under working population we understand "all persons performing work for others, whether self-employed or in return for wages, salary, or some other form of monetary reward, and being thus employed for at least 15 hours per week". This definition, which was applied by the Netherlands Central Bureau of Statistics (C.B.S.) for the last census, does not cover the total active population, which is usually considered to include all persons between 15 and 70 years of age, but only those persons actually involved in the production process.

1. R. Pressat, L'analyse démographique, méthodes, résultats, applications, Paris, 1961, p. 243.

The concept health will not be defined here. In spite of the many attempts to arrive at a good definition, the results usually refer to an ideal situation and are therefore difficult or impossible to apply. A good example of this is found in the frequently used definition of the World Health Organisation : "Health is a state of physical, social, and mental well-being, and not merely the absence of disease or infirmity". We shall attempt instead to describe the health of the working population by means of a number of indicators, with the qualification that we are well aware of the fact that these indicators give only a partial picture of the actual situation.

The aim of the present study was to analyse the relationship between the demographic ageing process and the biological ageing process, as well as the consequences of this relationship for the health of the working population. Our intention was not to perform a complete investigation but rather to explore an almost untouched field. We therefore preferred not to start with carefully formulated hypotheses requiring testing. What we have done is to attempt, on the basis of our central question, to analyse the various aspects of the problem in order to arrive at the formulation of a number of assumptions whose validity can be tested by more concrete investigations.

Support for these assumptions was sought in the relevant literature and by means of a secondary analysis of statistical material contained in annual and other reports. The treatment of this statistical material offered certain difficulties, since most of it had been collected for specific purposes for which special categories had been chosen, and these categories did not correspond to ours. Wherever possible, such material was reworked to permit comparison with our material, but in most cases this proved impossible with the means at our disposal. In this connection it will be clear why no attempt was made to use interpolation and extrapolation to arrive at estimates.

Chapter 2

Ageing

2.1 Ageing of the Dutch population

Before goining into the question of whether the labour force of the Netherlands is ageing, we must consider the total population of the country and its age composition during recent decades. [1]

In 1930, the Netherlands had 8 million inhabitants; and at the end of 1968 more than 12.7 million. The age composition over the same period can be roughly seen from Table I[1]. [1]

TABLE I

The Dutch population in the period 1930 - 1968, according to four age groups,
expressed as percentages of the total population

age groups (in years)	1930	1935	1940	1945	1950	1955	1960	1965	1968
0 - 14	30.6	29.3	27.9	27.8	29.4	29.9	30.0	28.1	27.6
15 - 45	46.1	46.6	46.9	46.2	43.6	41.7	40.7	42.3	42.4
45 - 69	19.7	20.2	21.1	21.7	22.2	23.2	23.6	23.4	23.6
70 and older	3.6	3.9	4.1	4.3	4.8	5.2	5.7	6.1	6.4

It is evident from Table I that the percentage of younger people (under 45 years of age) has shown a relative decrease while the percentage of older people has increased to the same degree, which means that the population has been ageing. In 1930, more than 23 per cent of the population was 45 or older, and by 1968 this percentage had risen to 30. The causes of this shift are largely traceable to the marked improvement of medical and social conditions, which reduced child mortality and at the same time led to the control of certain diseases formerly fatal at later ages. [1]

If this pattern is expressed in indices, as in Table II, it can be seen even more clearly that the oldest age categories have shown the strongest increase. [1]

TABLE II

The Dutch population in the period 1930 - 1968,
according to four age groups (Index : 1930 = 100)

age groups (in years)	1930	1940	1950	1960	1968
0 - 14	100	102	123	142	145
15 - 44	100	116	122	129	149
45 - 69	100	121	145	175	194
70 and older	100	129	170	229	266
Total	100	112	129	146	161

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1. Unless otherwise mentioned, the data in the Tables derive from various C.B.S. publications or from re-working of such data.

Due to these improved conditions the death rate has also been sharply reduced, as can be seen from Table III, which shows the rise of the average duration of life in the Netherlands, although in recent years the life expectation of men has dropped slightly.

TABLE III

Average lifespan of men and women in The Netherlands

Mortality tables	Average life expectation at birth	
	men	women
1931 - 1940	65.7	67.2
1947 - 1949	69.5	71.6
1950 - 1952	70.6	72.9
1953 - 1955	71.0	73.9
1956 - 1960	71.4	74.9
1961 - 1965	71.1	75.9

The age composition of the Dutch population is influenced by fluctuations in the birth rate as well as by the lowered death rate. Because of the high birth rate, the population is at present ageing less rapidly than would be the case if the birth rate was lower, and this effect is enhanced by the birth peak shortly after the Second World War. However, when these cohorts have reached the older age groups, this peak will contribute to a slight acceleration of the ageing of the Dutch population.

Other factors having an influence on the age composition of the population include emigration and immigration, but their influence is more complex than those of birth and death, because for a reliable evaluation of their effect on the Dutch population's age composition it would be necessary to analyse the age composition of the immigrants and emigrants. Generally speaking, however, it may be said that emigration as a rule has an ageing effect, since people willing to start a new life in a new country are usually of the 15 to 44-year group (sometimes with children as well). Immigration (mainly imported labour), to the contrary, temporarily makes the population younger because it is usually people in the same age group of 15 to 44 years who seek work in the Netherlands.

Thus, the chief determinants of the age composition of the Dutch population are the birth and death rates. A subservient role is played by emigration and immigration at present, in contrast to the situation directly after the Second World War, when the emigration figures were high.

2.2 Ageing of the working population

With respect to the working population - that part of the total population that is actively engaged in the production process - it is evident that the factors determining the age composition of the total population will have an influence here too. The emigration and immigration rates will be more important, since both concern mainly individuals belonging to this part of the population. In addition, other - socially determined - factors play a role in the age composition of the working population, for instance legislation concerning compulsory education, pensions, and social provisions.

The broad development of the age composition of the Dutch working population, as can be seen from the census figures for 1930, 1947, and 1960, shows - like the total population - a relative decrease in the younger groups and a corresponding increase in the number of older people (see Appendix B, Table 2). The percentage of the working population aged 40 or older was 34 and 40 in 1930 and 1960, respectively (for the total population these percentages were 29 and 35, respectively).

If the figures are analysed with respect to the question of whether the working population is ageing more rapidly than the rest of the population, it becomes evident from a comparison of the figures for 1930 and 1960 that this is certainly not the case, as can be seen from Table IV.

TABLE IV

Comparison of the total population and the working population,
according to sex and age group, in 1930 and 1960 (Index : 1930 = 100)

Sex	Age groups (in years)	Total population				Working population			
		1930		1960		1930		1960	
		%	Index	%	Index	%	Index	%	Index
Men	15 - 39	62.6	100	56.6	127	62.8	100	56.0	120
	40 - 69	37.4	100	43.4	163	37.2	100	44.0	159
Women	15 - 39	62.2	100	54.6	123	79.1	100	74.6	115
	40 - 69	37.8	100	45.4	168	20.9	100	25.4	149

Although the demographic ageing of the working population is partially to be attributed to the ageing of the total population of the Netherlands, an important role is also played by other factors as well. For one thing, increased interest in further education after completion of primary school has tended to raise the age at which young people enter the labour force. This can be seen from Table V.

TABLE V

Full-time school attendance among young Dutch males aged from 15 to 20 years
(as percentage of total population per age group)

Year	Age					
	15	16.	17	18	19	20
1930	29.6	20.8	13.5	9.1	5.7	4.0
1936	29.8	21.3	15.1	9.9	6.3	4.1
1946	44.9	32.7	22.7	15.6	11.7	7.4
1956.	48.7	33.4	22.5	17.9	12.7	9.0
1961	76.7	68.0	56.3	42.3	26.4	13.6
1964	84.0	74.9	62.7	48.0	31.0	15.8
1967	78.2	59.4	41.6	30.3	23.2	17.0

The percentage of 15 year olds attending school after finishing primary school in 1930 (30) is about the same as for 18 year olds in 1967. In other words, in 1930, 7 out of 10 started to work at the age of 15, but in 1967, 7 out of 10 started to work at the age of 18. It is evident that this pattern has contributed to the ageing of the working population[1].

But there has been an opposite effect on the age composition of the working population due to a change at the other end of the scale, i.e. to the extensive social legislation introduced after the end of the Second World War, covering old-age pensions, health insurance, and other

1. The decrease in the number of years for male students in Table V is striking, and no explanation can be offered for this phenomenon. The relevant statistics all give divergent figures consistently lower than the corresponding figures for 1964. The decrease is possibly due to a change in definition.

social provisions. As a result of this legislation, it is no longer necessary to continue working to the bitter end, and many now leave the labour force at the age of 65 without having to fear financial consequences. There is little quantitative information on this point, but an impression can be obtained on the basis of Working-life Tables[1].

2.3 Working-life Tables

Working-life Tables (cf. Appendix B) tell us something about the pattern of withdrawal from the working population. Our tables concern only the older age groups of this population, but it may safely be assumed that after the age of 45 any joining of the labour force is negligible.

In theory, dropping out of the working population can be classified according to three categories, i.e. retirement on reaching pension age, due to sickness and/or infirmity leading to permanent disability, and death. In practice, however, this distinction cannot be made due to lack of reliable data.

In preparing the Working-life Tables for men in 1955, 1960, and 1965 presented here, we assumed, to permit a distinction according to death and other causes, that the mortality in the various age groups of the working population does not differ significantly from that of the same age groups in the total population. Furthermore, we have assumed that the age-specific activity rate in the indicated years was the same for the 45 - 49, 50 - 54, 55 - 59, and 60 - 64 year groups, and that for the two remaining classes, i.e. 65 - 69 and 70 and older, the figures of the Netherlands Central Planning Office could be used (see Table 3).

With respect to the working-life expectancy, it can be seen from the relevant Table that there has been a gradual retrogression. This pattern is as it were the numerical reflection of either a change in the dropping out due to death or changes in the dropping-out due to other causes. With respect to death, it is clear that this factor shows an ascending line for all age classes. With respect to the other factors, which include permanent disability and reaching of the pension age, a similar ascending line is seen for all the age classes except those of 50 - 54 and 55 - 59 years, which show a decrease.

Whereas the increase due to death could be an indication of deteriorating health of the older working population in the years in question, the dropping-out due to other causes is more complex. A role could be played here by deteriorating health with advancing age as well as by improved social legislation. In Chapter 3 we shall examine the question of the health level of the older working population and see whether we can distinguish an effect of this level on separation from the working population.

1. See also S.L. Wolfbein, *"The length of working life"*, in Proceedings of the 4th Congress of the International Association of Gerontology, Firenza 1957, pp. 153 - 184.

Chapter 3

The health of the older working population

Any attempt at a quantitative determination of the health of the older working population to evaluate its influence on withdrawal from the working population encounters many difficulties. Exact information about the size of this population is available only for the census years, and only an approximation can be made for the intervening years. Nothing at all is known about the health of the total older population. Generalisations from incidental reports provide a basis for only very rough estimates.

The available material almost exclusively concerns the dependent working population, i.e. those who perform work for others in return for wages, a salary, or some other form of monetary reward. The independent working population, i.e. self-employed persons, are virtually unmentioned in the literature.

The approach we shall use here to evaluate the health of the older working population is the analysis of statistical material on sick-leave and disability. We shall then examine unemployment and pension procedures, with special consideration of the medical factors involved in the latter.

Mortality as such will not be taken into consideration; since to the best of our knowledge there is no material available in which a distinction is made between those belonging to the working population and those no longer employed at the time of death.

3.1 Sick-leave

According to the system of social legislation in the Netherlands, sick-leave includes all absence due to sickness or infirmity lasting less than 52 weeks. Longer absence is considered as temporary or permanent disability.

On the basis of two absence variables, i.e.:

a) the absence frequency, which is the number of absences in a given period divided by the average number of personnel in the same period, and

b) the average duration of sickness, which is the number of days of absence in a given period divided by the number of absences in the same period,

an attempt will be made to use the available statistical material to form a picture of the health of the working population[1].

It should be mentioned that : *a)* sickness is only one indicator for the health of the older population group, and *b)* in all cases the material concerns a "select" population, which means that few or no reliable generalisations can be made with respect to the entire working population.

In the interpretation of the data it must also be taken into account that not every sickness leads to sick-leave and that not all absence is due to sickness. That both can lead to an appreciable distortion of the picture of the health of the older working population, is re-affirmed by the results of a study performed in the city of Zutphen (see Appendix B, Table 4)[2].

We wish to discuss in some detail here the material contained in the report on diagnosis statistics of the Netherlands Institute of Preventive Medicine T.N.O., which was the most

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1. Report of the sub-committee on Normalisation of terms, units and proportional measures in the sick-absence and insurance-payment statistics, of the National Committee for Health Statistics, The Hague, July 1959.
2. C.A.A. Bramlage, Gezondheid en ziekte te Zutphen, Enquete naar de gezondheidszorg bij 536 gezinnen, Assen, 1962, Tabellenboekje.

comprehensive available[1]. This material pertains to a varying number of industrial companies. The statistics were collected between 1956 and 1964 from between 75,000 and 128,000 persons employed by these companies (representing about one-fiftieth of the total Dutch working population). The age composition of this material for the indicated years shows a certain degree of ageing of the population in the sense of a relative increase of the 35 - 44, 45 - 54, and 55 year and older age groups. The oldest age groups show the strongest relative increase (see Appendix B, Table 5).

With respect to the absence frequency and the average duration of absence in the period from 1956 to 1964, only the latter shows a significant increase for the total population of the study (see Appendix B, Tables 6 and 7). Although at first glance the absence frequency seems to show an increase, the rank correlation test of Spearman (alpha = 0.05) shows that it is not significant.

If these two absence variables are analysed per age group, the absence frequency in the 25 - 34, 45 - 54, and 55 and older age groups proves to show a significant increase (see Appendix B, Table 6), but the possibility cannot be excluded that this increase is due to a shift in the age composition of the population. Standardisation according to age (taking the age composition in 1960 as basis) shows a non-significant rise. Therefore, the occurrence of an increase in frequency in the three age groups mentioned must be ascribed to some factor or factors other than age.

For the average duration of absence the total picture does show a significant rise, but this disappears after standardisation according to age. The rise must be attributed to the 55 year and older age group, on the one hand because of a slight rise in the average duration of absence (10 per cent from 1956 through to 1964), but on the other hand because in the absolute sense more men of this age belong to the population (see Appendix B, Table 7).

Philipsen argues that the rise in the average duration of absence is a result of the increase in the number of older men[2]. This hypothesis is supported by analysis of a third absence variable i.e. the pattern of the relative duration of absence for the oldest age group, which shows - despite small fluctuations - that there is no significant increase in any of the age groups (see Appendix B, Table 8).

In addition to this general pattern of sickness absence it would be of interest to know whether there are any trends to be distinguished with respect to particular sicknesses or sickness groups. Unfortunately, data for the frequency and duration of absence due to sickness were only available for the 1960 - 1964 period, which is too short to indicate trends.

With respect to the two oldest age groups distinguished in the material of the Netherlands Institute for Preventive Medicine T.N.O., it is possible to determine the extent to which the various main diagnostic groups led to sick-leave and thus, more or less indirectly, the occurrence of these sicknesses in the older age-groups. The same main diagnostic groups are referred to here (see Appendix A)[3].

Tables 9 and 10 show the number of absences per 1,000 men and the number of days of absence per 1,000 men. The acute diseases of the respiratory organs are shown between parentheses. If we do not take these latter diseases into consideration (for example, influenza), which are usually of short duration, seasonal, and often occur epidemically, we see that diseases of the digestive and locomotor organs are the most frequent causes of sick-leave : for the men of 45 - 54 years this value fluctuates around 50 per cent and for the oldest age group around 45 per cent (Table VI).

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1. Annual reports 1956 - 1964 and diagnosis statistics of the N.I.P.G./T.N.O.

2. H. Philipsen, Enkele aspecten van het stijgend ziekteverzuim, in : Mens en Onderneming, juli 1966, p. 213.

3. For the division into broad diagnostic groups, see Appendix A.

TABLE VI

Number of absences per 1,000 men, according to three main diagnostic groups and two age groups, with exclusion of the acute diseases of the respiratory tract

Main diagnostic group	45 - 54 years					55 years and older				
	1960	1961	1962	1963	1964	1960	1961	1962	1963	1964
9	170.6	168.9	167.6	174.7	171.3	142.8	143.7	150.6	143.3	148.3
13	157.8	155.0	173.5	173.6	176.3	140.2	138.0	153.4	153.8	163.6
other	319.7	328.9	361.5	366.8	374.3	321.0	334.6	378.9	392.3	404.5
Total	648.1	651.8	702.6	715.1	721.9	604.0	616.3	682.9	689.4	716.4

The exclusion of the acute diseases of the respiratory tract also reveals an increasing frequency of absence due to all the other diseases taken together. This could actually be due to increased sickness, but it could also be the result of differences in the definition of diseases. Hogerzeil has put forward a classification providing for subdivision of the sixteen main diagnostic groups [1], as follows :

1) Objective syndromes, including diseases having objectively demonstrable and measurable pathological features. The main diagnostic groups 1 - 4, 6, 7, 8b, 10, 12, and 14 belong to this category.

2) Objective-subjective syndromes and subjectives syndromes. Defined as diseases as a rule having objective pathological features but becoming known only as a result of subjective complaints. Both the disease and the subjective complaints cannot be seen apart from various environmental factors. This category includes the main diagnostic groups 5, 9, 13 and 15.

3) Acute diseases of the respiratory tract. Including influenza, head colds, and the like. Belonging to the main diagnostic group 8a.

4) Cases for which the diagnosis is not known. In the absence of statistics this category mainly concerns unverified cases. Main diagnostic group 16.

When the material of the Netherlands Institute for Preventive Medicine T.N.O. is grouped according to this classification, we obtain the picture shown in Table VII.

TABLE VII

Number of absences per 1,000 men, according to age group and macro-diagnosis groups. Absolute and index values : 1960 = 100

macro-group	45 - 54 years									
	1960		1961		1962		1963		1964	
1	176.2	100	164.7	93	173.1	98	166.1	94	167.8	95
2	418.8	100	420.5	100	437.6	104	447.7	107	447.7	107
3	496.3	100	349.7	83	487.5	98	490.7	120	368.0	88
4	53.1	100	66.5	125	91.9	173	104.4	197	106.2	200

macro-group	55 years and older									
	1960		1961		1962		1963		1964	
1	202.9	100	191.9	94	222.6	109	212.8	105	212.7	105
2	354.2	100	358.7	101	388.7	110	383.5	108	399.1	113
3	486.8	100	317.7	65	452.3	93	440.3	90	346.6	71
4	46.9	100	55.7	119	71.7	153	93.2	198	103.8	221

1. H.H.W. Hogerzeil, Health care policies and macro-diagnostics-group, in : Tijdschrift voor Sociale Geneeskunde, 44 (1966), pp. 77 - 88, particularly pp. 78 - 80.

It is evident from Table VII that macro-group 4 shows a marked increase. Macro-groups 1 and 3 show a certain amount of fluctuation, macro-group 2 a small increase. Both Hogerzeil and Philipsen observed a similar increase in the frequency of sick-leave due to this type of affection.[1] The influence of other pathological factors on the sickness pattern can be expected to be strongest in this group. This absence rate will be influenced the most strongly by changed views concerning "being sick", changes of which the root may be ascribable to a multiplicity of factors.

The Institute material has been analysed in still another way by Philipsen[2]. For 3,762 men who had been part of the population throughout, he was able to follow the sick-leave pattern transversally over the period from 1957 to 1968. For his analysis he made use of a classification of the main diagnostic groups corresponding in general with those used by Hogerzeil, macro-group 3 being the same, but macro-groups 1 and 2, while retaining the same name, were based by Philipsen on the severity of the affection, according to which absences were assigned to one of these two groups. Thus, he started from the individual diseases and then determined whether they coincided with the patterns corresponding to the macro-diagnoses[3]. As fourth group Philipsen took the "other affections", in which he included accidents, affections of the oral cavity (toothache, etc.), skin diseases, and anomalies of the central nervous system and the sensory organs. Table 10 shows the main points of his analysis of the sick-leave frequency on the basis of the diagnoses. According to Philipsen, the following conclusions can be drawn from this Table.

A. After the twenty-fifth year, ageing is accompanied by an increase in the number of cases of sick-leave due to objective syndromes.

B. For all cohorts there is a very distinct increase in the number of cases of sick-leave based on subjective-objective syndromes, mostly involving complaints of stomach-ache (intestinal 'flu) and the like, backache and the like, or headache and the like.

C. The number of sick-leave due to influenza and head colds decreases by about 20 per cent for all cohorts except the youngest[4].

The Committee for the Investigation of Sickness Absence, which was set up by the *Gemeenschappelijk Administratie Kantoor* (G.A.K.) (Communal Administration Office) for several social security and health insurance provisions, says in its report that ". . . the increased sick-absence is the result of various factors. Only for a few causes of sickness is it probable that there has been a real increase of the number of cases (increased morbidity); these are the so-called health-insurance law accidents and the "psychic diseases". The increased duration of the absences can to a great extent be explained on the basis of the increased (average) age of the working population (ageing). The remaining share of the increase in sickness-absence must be ascribed to changes in the need for absence, the necessity for absence, and the opportunity for absence"[5].

In other words, there has been no increase in morbidity for the two affections mentioned, and other changes in sick-leave patterns must be ascribed to ageing of the working population and new attitudes toward absence. The obscuring effect that the absence pattern has on the other two factors makes it virtually impossible to determine whether the health of the older working population has deteriorated and, if so, to what degree this has occurred and what role in this has been played by the ageing of the working population.

1. See H.H.W. Hogerzeil, *op. cit.* and H. Philipsen, *op. cit.*

2. H. Philipsen en A.K. de Vries - van der Zee, Generatie en Ziekteverzuim I : Statistische analyse, Leiden, 1970.

3. *op. cit.*, pp. 17 - 20.

4. *op. cit.*, pp. 32 - 33.

5. Faktoren welke voor het ziekteverzuim van belang zijn, rapport van de commissie onderzoek ziekteverzuim ingesteld door het Gemeenschappelijk Administratiekantoor, no date, p. 44.

To summarise the foregoing, the following may be said : 1) No conclusions can be drawn about the health of the total older working population. As a result of the absolute increase in numbers there will be more cases of long sick-absence, which in turn will have the effect of increasing the average duration of sickness. It is difficult to determine whether, and if so to what degree, there has been a relative deterioration of the health of the total older working population. 2) To investigate the health of the older working population it will be necessary to take into consideration not only medical but also many other factors. The classification of the main diagnostic groups subdivided into four macro-diagnostic groups designed by Hogerzeil and modified by Philipsen supplies a first step toward the distinction between medical and other factors. 8) With respect to the morbidity pattern of the total working population, the ageing of this population will be expressed as an increase in the number of objective-syndrome cases accompanied by an increase in the average duration of sickness-absence.

3.2 Disability

Having discussed sick-leave in the preceding section; i.e. the absence due to sickness or infirmity lasting less than one year, we may turn now to sick-leave with a duration of more than a year. According to Dutch social legislation, this is considered to be temporary or permanent disability, depending on whether the separation from the working population is temporary or final.

Here again, all the available material applies to the dependent working population. But even if more material could have been drawn on, long-term comparison would have been virtually impossible due to legislative changes concerning total and partial disability dating from 1967.

The material contained in the well-documented annual reports for 1968 and 1969 of the *Gemeenschappelijke Medische Dienst* (G.M.D.) (Joint Medical Service) give only a rough impression of the cases reported to and treated by this Service[1]. Since no data are available for the dependent working population in these years and there are also no data in the annual reports concerning the total population to which the data apply, no ratios could be calculated for the years in question.

In 1968 and 1969, 117,442 and 122,351 reports, respectively, of disability were received by the G.M.D. Table 11 shows the relative distribution over the main diagnostic groups and age categories for these cases. In the G.M.D annual report for 1968 it is stated that if only the opinions given after one year of sick-leave due to a given disease or infirmity (the so-called termination of waiting-time advice) in the highest disability class are taken into consideration; the higher age groups are relatively somewhat more strongly represented, i.e. 72 per cent older than 44 years, 61 per cent older than 49, 47 per cent older than 54, and 28 per cent older than 59. The frequencies calculated on the basis of an estimate of the total number of insured individuals working under the conditions stipulated by the workmen's compensation law, i.e. about 3,113,000 persons as of 31 December 1967, indicate that for the 50 year and older group the frequency of disability amounts to 4.15 per 100 insured individuals and for the 60 - 64 year age group even to 7.36 per 100. If age is not taken into account the frequency amounts to 1.20 per 100 insured individuals[2]. In other words, after the age of 50, 4,150 out of 100,000 individuals withdraw from the working population due to permanent disability. For the 60 - 64 year age group, this figure is 7,360 per 100,000.

In 1968, a total of 37,335 opinions and in 1969 a total of 44,884 were given after one year of sick-leave due to a given disease or infirmity. The distribution over the various disability classes is shown in Table VIII.

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1. Annual report 1968, Gemeenschappelijk Medische Dienst, no date.
2. *op. cit.*, p. 34.

TABLE VIII

Opinions given at the termination of the waiting-time,
according to disability class. Absolute figures and percentages*

Disability class	Opinions given at the termination of waiting-time					
	1969		1968		1967	
	Number	%	Number	%	Number	%
less than 15%	1,444	3.2	1,580	4.2	640	4.3
15 - 25%	831	1.9	477	1.3	122	0.8
25 - 35%	1,209	2.7	882	2.4	173	1.2
35 - 45%	718	1.6	536	1.4	112	0.8
45 - 55%	3,973	8.8	2,675	7.2	812	5.5
55 - 65%	809	1.8	798	2.1	292	2.0
65 - 80%	1,023	2.3	903	2.4	318	2.2
80% or more	34,877	77.7	29,484	79.0	12,226	83.2
Total	44,884	100.0	37,335	100:0	14,695	100.0

* The 1967 data refer to the period from July 1st through 31 December 1968, not the entire year.

For a classification of these opinions according to the various main diagnostic groups, reference is made to Table 12 (Appendix B). Unfortunately, the report does not include a Table in which an attempt is made to show the relationships between age, degree of disability, and main diagnostic groups. Van Norren does give some figures concerning prolonged sick-leave, but without a classification according to age and diagnosis[1]. His material shows, however, that the number of absences lasting more than a year has increased appreciably, mainly due to an absolute increase of the older age groups in his population (see Appendix B, Tables 13 and 14). According to Van Norren, the increase in the absences lasting more than a year is the result of a number of factors[2]. His material indicates an increased incidence of diseases associated with advanced age, i.e. heart infarction and emphysema.

TABLE IX

Annual numbers of new cases of prolonged sickness-absence (12 months or more)
per 10,000 insured individuals reported to the Philips health insurance department,
according to disease (taken from C. van Norren, 1967)

Disease	1948/50	1954/56	1960/62	1963/65
Tuberculosis	23	8	3	2
Neoplasms	2	1	2	4
Mental diseases	2	2	4	5
Heart infarction	1	2	3	7
Emphysema	1	2	3	7
Diseases of the locomotor organs	1	2	3	6
Others	7	8	9	11
Total	37	23	27	42

1. C. van Norren, Werkhervatting na langdurig ziekteverzuim, Eindhoven, 1966, p. 38.
2. C. van Norren, Het verschijnsel van toenemende invaliditeit bij oudere werknemers, in : Tijdschrift voor Sociale Geneeskunde, 45 (1967). p. 791.

As a result of improved therapeutic methods, many patients live longer who would formerly have died in a more advanced stage of the disease, and this will be expressed in the prolonged sickness- absence.

Van Norren's material shows that prolonged sick-leave (temporary or permanent disability) has increased and that it is not so much the relative ageing as the absolute increase in the number of older individuals that must be taken into account as a factor here. Here, too, it holds that a relative ageing of a group will enhance this process. In another article he says that "experience has shown that individuals of for instance 55 years and older resume work only with great difficulty after an absence of a year or more. Therefore, an absence of this kind at these ages is virtually the same as permanent disability" (i.e. permanent withdrawal from the working population)[1].

From the foregoing we may draw the following general conclusions : 1) As in the case of sick-leave, for disability an absolute increase of the number of prolonged temporary or permanent separations from the working population due to sickness or infirmity can be expected in connection with ageing of the population. From the available material it is impossible to determine the extent to which there has been a deterioration of the health of the working population. 2) Temporary withdrawal from the working population after the age of 55 years as the result of sickness or infirmity and lasting more than a year will usually mean a permanent withdrawal. This hypothetical conclusion requires further testing.

3.3 Unemployment

Data deriving from the provincial labour exchanges show that the percentage of unemployment is usually higher for older age groups than for the younger ones. Comparison between the data pertaining to 1957 and 1967 indicates that the differences tend to diminish (see Appendix B, Table 15). It is evident from the data that the average duration of unemployment is longer for older than for younger age groups, and that individuals without work for more than twelve months belong mainly to the age group of 50 years and older (See Appendix B, Table 16).

What are the factors complicating the re-employment of unemployed older individuals ? In Appendix 2 of the report of the *Sociaal-Economische Raad* (S.E.R.) (Socio-Economic Council) on labour-market policy, one of the factors mentioned is "the physical condition of the older individuals"[2]. But very little is known about this and other relevant factors. A recent investigation into the composition of this group and the possibilities for the adaptation to employment of older workers gives some limited information about the relationship between the various complicating factors[3]. For instance, it was found that medical factors are involved in 46.2 per cent of the cases (see Appendix B, Table 17), but these medical factors are not specified.

Material made available by the Director General of Labour Supply gives a rough idea of the diagnostic groups most frequently underlying difficulties in re-employment. A study of this material, which concerns 5,268 diagnoses made in 3,252 unemployed individuals of 50 to 65 years during the first six months of 1969, shows that only 22 per cent of the diagnoses involved a 00-handicap, which means that there were no (existing) anomalies having little or no influence on the relationship with the work performed (see Appendix B, Table 18). In 2.7 per cent of the diagnoses the individuals in question were considered unfit to resume work, mainly on the basis of psychosis, psychopathy or diseases of the cardiovascular system and respiratory tract. The remaining 74 per cent of the diagnoses led in all cases to restrictions with respect to re-employment, the most frequent causes lying in psychosis and psychopathy, organic diseases of the nervous and sensory systems, cardiovascular diseases, and diseases of the respiratory tract and locomotor aparatus (see Appendix B, Table 18).

1. C. van Norren, Arbeid - Leeftijd - Handicap, in A.V.O., orgaan van de Nederlandse vereniging Actio Vincit Omnia, 42 (1970), p. 13. See also J.A. Weijel, De plaats van de psychotherapie in de sociale verzekering, in Tijdschrift voor Sociale Geneeskunde, 48 (1970), pp. 135 - 140, who comes to the same conclusion.
2. Oudere werknemers, Appendix II, Advies over het arbeidsmarktbeleid van de Sociaal-Economische Raad, Den Haag, 1968, p. 13.
3. Onderzoek naar de samenstelling en de mogelijkheden voor arbeidsinpassing van de groep werkloze oudere arbeidskrachten per ultimo september 1969, Districtsbureau voor de Arbeidsvoorziening, 's-Hertogenbosch, 1970, p. 9.

Thus, it may be said that although little material is available concerning the medical indications for unemployment, this factor plays an important part in the difficulties experienced by older individuals in returning to the production process. In less than half of these cases it is the diseases belonging to macro-group 2, i.e. the objective-subjective and subjective syndromes, which form the complicating factor. The diseases falling under macro-group 1 occur to the same degree. '

3.4 Retirement on pension

We have distinguished sick-leave, disability, and unemployment as three forms of temporary or permanent withdrawal from the working population, but pensioned retirement must also be considered as a factor. If we define retirement on a pension as the withdrawal from the working population either at a stipulated age' or for reasons other than health and/or availability of work, an attempt can be made to form a quantitative picture of this factor. But even an approximation of the number of persons pensioned annually cannot be given. The available figures concerning pensioned individuals are without exception cumulative, with no specification of the annual additions and subtractions (see Appendix B, Table 19). '

In terms of our definition of retirement on pension, medical factors are of course, never the cause of this retirement. When early retirement on pension occurs, what it actually means is withdrawal from the working population because of disability due to sickness or infirmity. ' This is clearly shown, for instance, by some data concerning early pensioning of government employees, from which it can be seen that in 1966, 1967, and 1968, more than 80 per cent of the cases of total disability belonged to the older age group (see Appendix B, Table 20)[1]. Of the total number of current total disability pensions, more than 50 per cent fall in the oldest age group and in the highest disability class (80 to 100 per cent). Here again, what is involved is unfitness for work and not retirement on pension. '

3.5 Discussion

In the foregoing, sick-leave, disability, unemployment, and pensioned retirement have been discussed as forms of temporary or permanent withdrawal from the working population, taking only the medical aspects into consideration as causal factors. It became clear that certain diseases or infirmities lead more frequently to this withdrawal at advanced ages, particularly diseases belonging to the main diagnostic groups 7 and 13 (diseases of the circulatory system and locomotor organs). '

Health may also lead, however, to shifts within the working population, since instead of withdrawal an individual may on medical grounds change to lighter or otherwise more suitable work either within the same company or by changing employers. These fluctuations within the working population are even more difficult to determine than the four aspects just discussed. ' There is no official system within which these changes must be reported, and they are not included in the data concerning social provisions. '

Some information can nonetheless be obtained from certain sources. From data of the medical service of the Netherlands Railways, for instance, it is evident that of the 5,090 periodic examinations performed by this service in 1964 in railway personnel, 86 led to more detailed examinations[2]. The conclusions drawn from the results of these latter examinations are shown in Table X. '

Twenty-four persons (28 per cent) were found to have limited fitness for work on the basis of the diagnosis and required placement in another job. For 30 (35 per cent) the final result of the examination was limited fitness, and some of these individuals could be retained with suitable work. The 31 per cent found to be totally unfit for any work at all belonged to the oldest age groups (see also Tables 22 - 24 in Appendix B for the diagnoses). Of the 86

1. Annual reports of the Algemeen Burgerlijk Pensioenfonds.
2. C.J. Snepvangers, Over het nut en de gevolgen van periodiek geneeskundig onderzoek, in : Tijdschrift voor Sociale Geneeskunde, 44 (1966), pp. 468 ff.

TABLE X

Results of 86 physical examinations among 5,090 periodic examinations,
according to age and diagnostic conclusion. Absolute numbers
(Data taken from C.J. Snepvangers, 1966)

Diagnostic conclusion	Age groups in years						
	21 - 25	26 - 40	41 - 50	51 - 55	56 - 60	61 - 65	Total
Unfit for any work					6	21	27
Very limited fitness		5	6	1	11	1	24
Limited fitness	1	3	2	4	12	8	30
Fit for work		2	3				5
Total	1	10	11	5	29	30	86

individuals, 37 (43 per cent) belonging to the oldest age groups (51 years and older) had to be
placed elsewhere or given more suitable work in their former function. If we then generalise
with respect to the total working population, this would mean that about 2 per cent of the total
population would be found at a periodic physical examination to require further investigation,
and that of these 2 per cent about 43 per cent would have to be considered for placement in a
job with lighter or more suitable work or would have to do lighter work in their former function.
If we take the working population as comprising 4 million individuals, then about 17,000 per-
sons varying in age from 50 to 65 years would require a change to lighter work for medical
reasons. The validity of this assumption must be determined by further research.

Chapter 4

The consequences of demographic ageing

What are the consequences for health services and institutions of the demographic age-
ing process in the working population ? It will be clear from the preceding sections that few
conclusions can be reached regarding this point. Although no marked ageing of the total working
population can be demonstrated, the character of the health of the older working population
remains obscure.

The most important trends in the demographic and biological ageing process can be
shown schematically as follows :

A. The demographic development of the working population

absolute increase older age groups

absolute growth of total working population

year n ⟶ WORKING POPULATION ⟶ year (n + x)

varying age composition

relative increase in older age groups
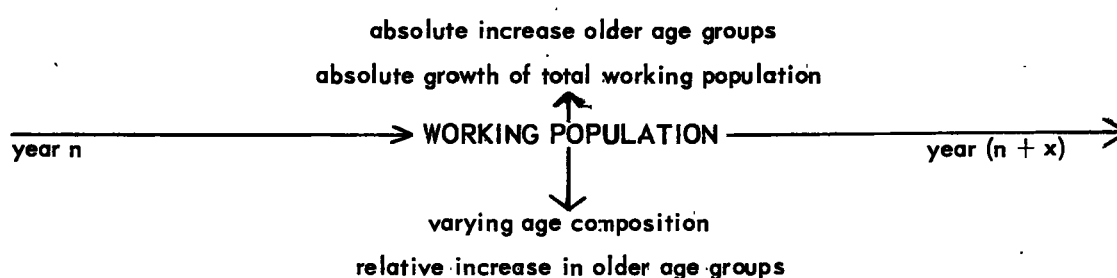
B. Biological ageing process in man and its main consequences

young ⟶ INDIVIDUAL ⟶ old

certain diseases begin to occur
more multi-pathology
duration of sickness becomes longer
sickness frequency decreases
sickness leads more often to disability
unemployment lasts longer
increased chance of death
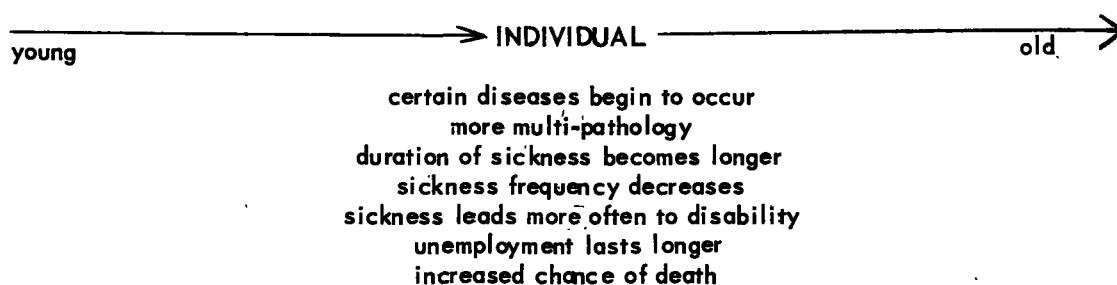
It is difficult - and on the basis of the existing material virtually impossible - to form
an opinion concerning the interaction between the two processes, and therefore also concerning
the social and economic consequences of this interaction. Lack of material makes forecasting
on this point difficult, but there is also a whole complex of factors which impose extreme
caution when reaching conclusions. This complex of factors is dominated by the present rapid
development within the field of the medical sciences, as a result of which current trends may
soon undergo radical changes. For instance, in the preliminary report entitled "Geneesmiddelen
voor de wereld van morgen" (Drugs for the world of tomorrow) published by the *Stichting Voor-
lichtingscentrum Farmaceutische Industrie* (a foundation established by the pharmaceutical in-
dustry for the dissemination of information) it is stated that : a) organ transplantations will be
universally applied, rejection phenomena can be suppressed, organ banks will be established;
b) drugs can promote the learning process, arteriosclerosis can be controlled; c) medicaments
will impede the deposition of fat in tissue, wound healing can be accelerated; and d) biochemi-
cal anomalies in the organism will become correctable, thus permitting cures in schizophrenia
and arthritis[1].

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1. See short report in the *Nieuwe Rotterdamsche Courant* of 14 October 1970.

It is clear that the field of health care is very complex, and that study cannot be limited to the past. To formulate adequate policies in this field and to reach a level of more than incidental investigation of these problems, it will be necessary in the first instance to define the area of the problem, both theoretically and practically. What is in fact required is an understanding of the determinants that in various ways affect the health of the working population and their consequences for the services and institutions functioning in this field. In our opinion, all we know now is that certain factors are involved, but their relative weight and other additional factors remain unknown or obscure. It will be necessary to develop not only techniques for the economic analysis of the cost and effectiveness of health projects but also techniques for demographic and sociological analysis, so that we can identify and measure processes taking place in the (working) population and their consequences for health care. These techniques are indispensable, because it is clear that the present rapid developments in medicine will have their effects in the field of health care, but at the same time rapid demographic and social changes will result from new developments in the field of medicine. Demographic, economic, socio-cultural, and scientific developments will determine trends in sickness and infirmity, and at present little is known about the way in which these effects take place.

On the basis of our study of the literature we can say almost nothing about demographic developments within the working population. Without better and more reliable basic material it will be impossible to form a picture of the fluctuations within the working population and the possibilities for analysis of this material. The same holds for the health level of the older working population, but on this point even less information is available. There is some material on the dependent working population but almost none concerning the independent working population.

With respect to the economic consequences of the interaction between the demographic and biological ageing processes, we can form some idea from estimates based on Working-life Tables (see Appendix B, Table 3). If we consider that if an individual who withdraws from the working population at a given age had continued to work for the number of years shown in column 9 of Table 3 for his age groups in the working population, we arrive at the figures shown in Table XI for the number of working years lost per 100,000 men in 1955, 1960, and 1965.

TABLE XI

Number of lost working years per 100,000 men, according to withdrawal
due to death or other causes. Absolute numbers

Year	Total number of lost working years	Number of lost years resulting from withdrawal due to	
		death	other causes
1955	539,043.05	38,913.48	500,129.98
1960	510,087.77	35,486.80	474,600.97
1965	465,218.87	34,822.05	430,396.82

Table 25 (Appendix B) gives a further subdivision according to age groups. If we consider only the age groups from 45 to 60 years, we see - assuming that here the number of years lost by withdrawal on a pension basis is of very limited importance - that the withdrawal due to death amounts to about 14 per cent of the total number of lost working years. The remaining 86 to 87 per cent must in our opinion be ascribed mainly to withdrawal due to disability. For 1968 we have seen that the G.M.D. (Joint Medical Service) estimates the number of withdrawals from the working population due to total disability at 4,150 per 100,000. Again on the basis of the above assumption, the Working-life Tables indicate that in 1965 the difference between the total withdrawal and the withdrawal due to death amounts to 3,475 men aged between 50 and 55 years. Regardless of the discrepancy between these two estimates, which can be due to a) an increase of withdrawal due to total disability in the years between 1965 and 1968 and/or b) a

result of different assumptions underlying the two estimates, it is evident that both figures must be considered high, and also that the resulting number of lost working years is exceedingly high. If we could also calculate the number of working years lost due to temporary withdrawal from the working population because of sickness or infirmity, it would certainly be clear that a large number of man hours are lost annually for medical reasons. The economic consequences of this loss are difficult to determine, but it unquestionably leads to a reduction of the national income, not only from this loss but from the need for services and institutions in the field of health care. The crux of the problem here is that a situation must be created in which on the one hand the number of working years lost due to sickness or infirmity can be reduced to a minimum and on the other hand the services and institutions working in the field of health care can function as efficiently and economically as possible.

In our opinion such a situation can only be reached if a fundamental change is made from the still predominantly curative approach to a predominantly preventive one. Concretely, this possibly would mean universal periodic medical examination of the entire working population and associated possible changes in the work performed. The slogan of the health services and institutions would then become : Prevention is better than cure. It is true that such periodic examinations are already carried out by certain companies and institutions (see pages 12 to 15), and the potentially favourable effects of this practice, both sociologically and economically, will be evident. It is to be feared, however, that the introduction of a periodic examination of this kind for the total labour force will for the present remain virtually impossible. Even a restriction to the older working population would not make this plan feasible. The main diffi- culty is not financial but rather the lack of manpower, equipment, and the means to apply the results. A periodic physical examination would only fulfil its main purpose if other work could be found for those who prove to require such a change. The study done in the Dutch province of Brabant has shown that this is particularly difficult in many of the cases of older employees, because the medical findings make employers reluctant to give them jobs. This means that one of the first steps must be to change the attitude of employers. But this is not the only problem. Physical ageing, with all its consequences for the individual's health, is accompanied by the obsolescence of skills and experience. The same advances in our knowledge that will soon be able to preserve relatively good health at higher ages, will also contribute to the expulsion from the production process of relatively healthy older workers at increasingly younger ages or force them to be satisfied with performing less-skilled work because they cannot keep up with new developments.

Broad diagnostic groups of the Netherlands National List 1955,
Specification by numbers in code of I.S.C. 1955

Code	Description	Numbers from the nomenclature, for coding of diseases and accidents
I	Infective diseases	001 - 047, 050, 053 - 064, 071 - 091, 093, 094, 096 - 130, 132 - 134, 138
II	Neoplasms	140 - 239
III	Allergic, endocrine, metabolic and nutritional disorders	240, 242, 243, 245 - 289
IV	Diseases of the blood and blood-forming organs	290 - 299
V	Psychoses, psychoneuroses and psychopathological disorders	300 - 314, 317.5, 318 - 326, 354, 780.6 790, 791
VI	Disease of the central and peripheral nervous system and of the sense organs	095, 330 - 353, 355 - 398, 780 with the exception of 780.6, 781
VII	Diseases of the heart and circulatory system	315, 400 - 468, 782
VIII	Diseases of the respiratory organs	051, 241, 317.0, 470 - 527, 783
IX	Diseases of the digestive organs	048, 049, 070, 092, 316, 530 - 587, 784, 785
X	Diseases of the genio-urinary system and complications of pregnancy, child-birth and the puerperium	317.1, 590 - 652, 670 - 689, 786, 789, 792
XI	Delivery without complications	660
XII	Diseases of the skin	052, 131, 135 - 137, 244, 317.2, 317.3, 690 - 716
	070 Bacterial diseases of the skin	052, 690 - 698
	071 Other diseases of the skin	131, 135 - 137, 244, 317.2, 317.3, 700 - 716
XIII	Diseases of organs of movement	317.4, 720 - 741, 743 - 749, 787
XIV	Congenital malformations	750 - 759
XV	Accidents	742, N 800 - N 999
	090 Accidents on duty	742, N 800 - N 999
	091 Accidents off duty	N 800 - N 999
XVI	Unknown causes of morbidity	000, 788, 793 - 795

TABLE 1

Age composition of the Dutch population in the period from 1930 to 1968
(per December 31st), in thousands
Data of Netherlands Central Bureau of Statistics (C.B.S.)

age (in years)	1930	1935	1940	1945	1950	1955	1960	1965	1968
0 - 14	306.4	293.2	278.8	278.1	293.9	299.2	299.8	281.6	275.5
15 - 19	93.8	88.8	93.1	86.5	79.2	76.2	79.7	97.0	86.9
20 - 24	89.4	88.3	83.1	86.2	78.9	72.6	70.4	74.4	88.7
25 - 29	82.1	84.1	81.2	76.8	77.7	71.2	66.3	66.1	68.2
30 - 34	72.8	76.7	77.4	75.3	69.0	71.1	65.8	62.5	61.3
35 - 39	65.0	67.6	71.1	71.8	67.1	63.5	65.9	61.6	60.5
40 - 44	57.4	60.0	62.7	65.6	64.1	62.0	59.0	61.4	58.5
45 - 49	51.9	52.7	55.5	57.4	58.9	59.1	57.3	54.6	57.7
50 - 54	47.1	46.9	48.2	50.2	51.5	54.2	54.4	52.5	50.3
55 - 59	39.8	41.6	42.3	42.9	44.7	46.8	49.1	49.0	48.5
60 - 64	32.4	34.4	36.6	36.5	37.2	39.7	41.4	43.2	43.8
65 - 69	25.9	26.6	28.6	30.0	30.3	31.9	34.0	35.1	36.1
70 and older	36.0	38.9	41.4	42.7	47.5	52.5	56.7	61.0	64.0

TABLE 2

Age composition of the Dutch working population
based on 1930, 1947, and 1960 census figures, in per cent. (C.B.S.)

Age (in years)	1930	1947	1960
0 - 14	0.1	•	•
15 - 19	17.0	14.6	14.1
20 - 24	16.0	14.8	13.8
25 - 39	32.7	32.6	31.7
40 - 49	15.4	17.6	17.9
50 - 64	15.2	16.8	20.0
65 - 69	2.2	2.2	1.6
70 and older	1.5	1.4	0.9
absolute total	2,719,204	3,179,242	4,168,626

TABLE 3

Working-life Tables for men of 45 years and older, 1955, 1960, and 1965 (C.B.S.)

Age group (in years)	No. living per 100,000 live births in total population	Working population age-specific activity rate %	Working population age-specific activity rate abs.	Withdrawal from working population	Withdrawal coefficients Total	Withdrawal coefficients Due to death	Withdrawal coefficients Other causes	Worklife-expectancy (in years)	Average life-expectancy (in years) * age	Average life-expectancy (in years) * value
									(1951 - 1955)	
45 - 49	96,704	98.1	94,867	1,671	0.01761	0.00442	0.01319	16.81	40	34.8
50 - 54	96,277	96.8	93,196	3,913	0.04198	0.00712	0.03686	12.00	50	25.8
55 - 59	95,592	93.4	89,283	12,926	0.14478	0.01141	0.13337	7.50	60	17.7
60 - 64	94,501	80.8	76,357	38,782	0.50790	0.01823	0.48967	3.95	65	14.1
65 - 69	92,778	40.5	37,575	22,434	0.59705	0.02861	0.56844	2.51	70	10.9
70 and older	90,124	16.8	15,141							
									(1956 - 1960)	
45 - 49	97,174	98.1	95,328	1,636	0.01716	0.00396	0.01320	16.29	40	34.7
50 - 54	96,789	96.8	93,692	3,938	0.04203	0.00716	0.03487	11.56	50	25.7
55 - 59	96,096	93.4	89,754	13,049	0.14539	0.01211	0.13328	7.05	60	17.7
60 - 64	94,932	80.8	76,705	45,783	0.59687	0.01888	0.57799	3.16	65	14.1
65 - 69	93,140	33.2	30,922	21,074	0.68152	0.02993	0.65159	2.09	70	10.9
70 and older	90,352	10.9	9,848							
									(1961 - 1965)	
45 - 49	97,393	98.1	95,543	1,686	0.01765	0.00434	0.01331	15.70	40	34.3
50 - 54	96,970	96.8	93,857	3,998	0.04260	0.00785	0.03475	10.97	50	25.3
55 - 59	96,209	93.4	89,859	13,139	0.14622	0.01309	0.13313	6.43	60	17.4
60 - 64	94,950	80.8	76,720	51,344	0.66924	0.02102	0.64822	2.45	65	14.0
65 - 69	92,954	27.3	25,376	18,811	0.74129	0.03257	0.70872	1.79	70	11.0
70 and older	89,926	7.3	6,565							

* Data taken from Mortality Tables for the Netherlands over 1961 - 1965 (Sterftetafels voor Nederland, (1961 - 1965), 's-Gravenhage 1967, Table 10, page 50).

TABLE 4

Relationship between sickness and absence in a sample
drawn from the total population of the city of Zutphen, 1957 - 1958, in per cent
(C.A.A. Bramlage, Gezondheid en ziekte te Zutphen, Enquete naar de
gezondheidszorg bij 536 gezinnen, Assen, 1962.
Analysis of Table 57, p. 60 by H. Philipsen, in : *Stijgend ziekteverzuim*,
Mens en Onderneming, Sept. 1966, p. 284)

Age group	Absence without sickness	Sickness without absence	Sickness with absence	Absolute numbers
15 - 24	19	24	57	243
25 - 44	18	36	46	578
45 - 64	12	42	46	419

TABLE 5

Age distribution of the diagnosis statistics in study performed by the
Netherlands Institute of Preventive Medicine T.N.O., in thousands (%₀)
and absolute figures (See reference 7)
(Figures represent averages of annual frequencies)

Year	Age groups (in years)					Total figures
	15 - 24	25 - 34	35 - 44	45 - 54	55 and older	
1956	174	307	235	177	107	89,452
1957	190	277	240	178	115	115,386
1958	159	278	251	190	122	86,575
1959	159	272	254	190	125	85,831
1960	159	260	251	194	136	79,122
1961	160	246	253	199	142	78,922
1962	168	229	251	202	150	71,479
1963	166	229	250	204	160	70,654
1964	166	223	252	202	155	67,796
Difference between 1956 and 1964	- 8	- 80	+ 17	+ 25	+ 48	

TABLE 6
Absence frequency of the male employees in the N.I.P.M./T.N.O. study averaged over the period from 1956 to 1964, according to age

Year	Age groups (in years)					Total	Standardised total
	15 - 24	25 - 34	35 - 44	45 - 54	55 and older		
1956	0.99	1.11	1.12	0.95	0.96	1.06	1.06
1957	1.25	1.30	1.20	1,08	1.00	1.19	1.18
1958	1.06	1.18	1.12	1.02	0.99	1.09	1.09
1959	1.24	1.31	1.24	1.07	1.04	1.20	1.20
1960	1.18	1.31	1.24	1.14	1.09	1.21	1.21
1961	1.09	1.22	1.11	1.00	0.92	1.09	1.09
1962	1.20	1.41	1.29	1.19	1.14	1.26	1.27
1963	1.30	1.45	1.30	1.20	1.13	1.27	1.28
1964	1.19	1.39	1.19	1,09	1.06	1.19	1.20
*decrease or increase	0	+	0	+	+	0	+

* + = significantly increasing ; 0 = no significant increase or decrease. Rank correlation test of Spearman (Alpha = 0.05)

TABLE 7
Average duration of absence (in days) of male employees in the N.I.P.M./T.N.O. study, averaged over 1956 - 1964 according to age

Year	Age groups (in years)					Total	Standardised total
	15 - 24	25 - 34	35 - 44	45 - 54	55 and older		
1956	8.4	10.5	14.1	19.0	27.1	14.0	15.0
1957	8.1	10.2	12.9	16.8	23.5	12.8	13.7
1958	8.4	10.4	13.8	18.5	27.1	14.2	14.8
1959	9.0	11.0	14.3	19.8	27.2	14.8	15.4
1960	8.9	10.9	14.2	18.8	25.7	14.7	14.7
1961	8.6	10.6	14.2	18.6	26.6	14.6	14.6
1962	8.9	10.9	14.2	19.2	28.3	15.4	15.1
1963	8.4	10.3	14.0	18.8	28.4	15.2	15.0
1964	7.9	9.9	14.2	19.1	29.7	15.1	15.0
*decrease or increase	0	0	0	0	+	+	0

* + = significantly increasing ; 0 = no significant increase of decrease. Spearman rank correlation test (Alpha = 0.05)

TABLE 8

Relative absence pattern of male employees in the N.I.P.M./T.N.O. study,
according to age, in thousands (‰)

| Year | Number of days absence | | | | | | Total number of absences |
	1	2 - 3	4 - 7	8 - 14	15 - 42	43 and over	
45 - 54 years							
1958	50	98	290	286	185	91	16,735
1959	46	92	279	292	194	97	17,409
1960	44	84	275	305	201	91	17,598
1961	55	95	279	278	202	91	15,712
1962	53	89	285	290	193	90	17,195
1963	55	95	279	287	200	88	17,367
1964	71	104	281	260	189	95	14,954
55 years and older							
1958	33	74	249	286	222	136	10,473
1959	31	69	232	292	237	139	11,160
1960	30	62	225	309	242	132	11,769
1961	37	72	238	278	239	136	10,366
1962	32	64	236	290	237	141	12,171
1963	38	62	222	285	228	145	12,798
1964	56	78	232	257	229	148	11,207
All ages							
1958	79	144	333	248	137	59	94,567
1959	72	134	332	259	142	61	103,063
1960	68	123	319	275	155	60	95,688
1961	80	138	323	246	150	63	85,757
1962	72	124	329	262	149	64	89,975
1963	75	127	325	258	156	63	89,863
1964	104	143	323	224	142	65	80,945

TABLE 9

Number of absences and number of days absent per 1,000 male employees in the N.I.P.M./T.N.O. study
for 1960 - 1964, according to age and broad diagnostic group

Broad diagnostic groups	Number of absences					Number of days absent				
	1960	1961	1962	1963	1964	1960	1961	1962	1963	1964
45 - 54 years										
1	3.1	3.9	4.1	3.9	4.5	121	264	234	271	193
2	5.1	5.5	5.8	5.6	4.8	355	469	480	448	464
3	3.1	3.8	4.7	4.1	4.8	87	140	158	159	185
4	1.0	1.0	0.8	0.6	1.3	59	49	43	39	86
5	57.0	58.7	57.4	56.0	61.3	1,451	1,486	1,453	1,397	1,508
6	37.3	35.1	38.8	34.3	35.1	1,239	1,116	1,375	1,265	1,114
7	27.5	25.4	26.9	25.5	26.0	1,804	1,220	1,614	1,856	1,677
8	523.0	375.2	517.4	517.5	392.0	6,451	4,536	6,300	6,401	4,812
8 a	(496.3)	(349.7)	(487.5)	(490.7)	(368.0)	(5,616)	(3,697)	(5,165)	(5,320)	(3,986)
9	170.6	168.9	167.6	174.7	171.3	3,316	3,217	3,192	3,255	2,901
10	25.3	20.8	19.9	25.6	23.9	655	453	633	640	525
12	46.6	43.3	41.7	39.3	43.2	943	902	913	764	839
13	157.8	155.0	173.5	173.6	176.3	3,652	3,329	4,585	4,084	4,659
14	0.5	0.5	0.5	0.3	0.2	12	19	29	24	18
15	33.4	37.9	39.1	40.4	38.8	810	873	1,014	939	957
16	53.1	66.5	91.9	104.4	106.2	557	400	827	1,137	922
Total	1,144.4	1,001.5	1,190.1	1,205.8	1,089.9	21,512	18,673	22,850	22,677	20,661
55 years and older										
1	3.6	4.5	4.8	5.4	4.5	253	300	366	359	437
2	8.7	9.0	10.6	9.1	9.1	976	857	1,533	1,191	1,067
3	3.3	5.7	4.7	5.4	3.4	178	204	142	280	159
4	1.3	1.3	1.7	1.0	0.7	86	49	139	27	79
5	46.3	49.7	52.4	51.5	55.0	1,338	1,480	1,683	1,826	1,773
6	35.8	32.1	40.6	32.9	36.3	1,644	1,625	2,302	1,723	1,773
7	56.4	48.4	55.4	55.5	57.7	4,371	4,019	4,723	4,685	5,283
8	523.5	350.7	496.5	486.7	387.4	8,375	5,804	8,720	9,062	7,382
8 a	(486.8)	(317.7)	(452.3)	(440.3)	(346.6)	(6,738)	(4,309)	(6,108)	(6,212)	(4,694)
9	142.8	143.7	150.6	143.3	148.3	3,476	3,557	3,370	3,499	3,677
10	23.1	25.7	24.7	22.5	26.5	831	960	1,040	813	1,307
12	33.8	31.8	35.6	34.4	33.2	848	896	946	829	739
13	140.2	138.0	153.4	153.8	163.6	3,915	3,671	4,835	4,731	5,236
14	0.2	0.3	0.2	0.2	0.5	21	34	8	36	54
15	42.3	27.3	32.3	34.9	32.3	721	592	994	967	786
16	46.9	55.7	71.7	93.2	103.8	999	690	1,290	1,995	1,784
Total	1,090.8	924.0	1,135.2	1,129.7	1,062.0	28,032	24,539	32,091	32,022	31,536

TABLE 10

Sickness frequency per man per year in seven age cohorts for 1967,
according to macro-diagnosis and percentage increase in relation to 1959*

(H. Philipsen and A.K. de Vries-van der Zee, *Generatie en ziekteverzuim I :*
Statistical analysis, N.I.P.M./T.N.O., Leiden, 1970, p. 31)

	1	2	3	4	5	6	7
a. Frequency in 1967 due to :							
Objective syndromes	0.06	0.15	0.16	0.17	0.18	0.19	0.19
Objective-subjective syndromes	0.42	0.36	0.41	0.41	0.37	0.35	0.31
Acute respiratory diseases	0.54	0.50	0.40	0.36	0.32	0.35	0.31
Other affections	0.30	0.19	0.17	0.17	0.17	0.16	0.14
Total	1.32	1.20	1.14	1.11	1.02	1.05	0.95
b. Percentage increase in relation to 1959 :							
Objective syndromes	0%	63%	54%	91%	72%	48%	61%
Objective-subjective syndromes	123%	32%	63%	40%	80%	41%	28%
Acute respiratory diseases	5%	- 22%	- 23%	- 25%	- 25%	- 16%	- 19%
Other affections			heterogeneous datum				
Total	38%	1%	13%	11%	10%	13%	12%

* The employees in this study (1958 - 1968) were divided into 7 age cohorts according to age on 1 January 1968. Cohorts 1 to 7 covered the ages 14 - 19 plus 20 - 24, 25 - 29, 30 - 34, 35 - 39, 40 - 44, 45 - 49, and 50 - 56, respectively.

TABLE 11

Sickness reported to the Joint Medical Service in 1968 and 1969,
according to age groups and broad diagnostic groups, in per cent (Annual reports C.M.S.)

Broad diagnostic groups	Year	Age groups in years										%	Total abs.	%
		-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64			
1	1968	7.6	17.2	11.0	10.2	9.4	8.8	10.8	8.5	8.6	7.8	100	1,762	1.5
	1969	6.2	15.3	13.0	10.6	11.1	10.2	9.8	8.8	7.3	7.7	100	1,605	1.3
2	1968	2.2	5.6	4.6	4.4	6.4	9.4	12.7	13.6	18.5	22.6	100	3,726	3.2
	1969	2.0	6.2	5.0	4.8	5.8	9.3	12.2	14.7	18.5	21.5	100	3,354	2.7
3	1968	2.1	6.9	7.0	6.9	10.6	11.4	12.0	13.1	14.8	15.2	100	1,233	1.1
	1969	2.7	7.1	66.6	8.4	8.7	11.7	13.8	12.6	14.0	14.4	100	1,400	1.1
4	1968	7.5	10.0	7.0	6.8	7.9	10.5	11.2	13.1	11.7	14.4	100	429	0.4
	1969	5.3	10.9	8.6	8.2	10.1	10.3	12.9	8.4	10.7	14.6	100	487	0.4
5	1968	3.1	10.4	9.8	10.8	12.7	13.4	12.9	10.7	9.0	7.3	100	14,887	12.6
	1969	3.1	10.5	9.3	10.5	12.6	13.6	13.5	10.2	9.4	7.4	100	17,819	14.5
6	1968	2.9	6.5	6.5	7.7	9.8	11.2	12.9	12.1	15.0	16.5	100	9,425	8.0
	1969	2.5	6.4	6.8	8.4	10.1	11.7	13.4	12.5	14.0	14.1	100	9,843	8.0
7	1968	0.5	1.4	1.4	2.1	4.0	7.6	12.7	17.6	23.2	29.5	100	13,013	12.8
	1969	0.4	1.5	1.6	2.5	4.5	7.5	14.3	17.6	22.9	27.2	100	14,217	11.6
8	1968	1.5	3.1	3.0	4.6	6.1	8.5	11.9	14.1	19.9	27.3	100	8,612	7.3
	1969	1.5	3.4	3.5	55.0	6.8	8.0	12.7	14.4	19.1	25.5	100	8,719	7.1
9	1968	2.3	6.9	9.0	10.2	11.1	12.3	12.4	11.5	12.1	12.2	100	11,099	9.4
	1969	2.1	7.4	9.2	9.9	11.7	11.9	13.2	11.2	12.5	10.9	100	11,456	9.4
10	1968	3.4	7.7	6.4	7.6	9.0	11.0	13.6	11.9	13.4	16.0	100	3,312	2.8
	1969	2.7	8.1	7.1	7.9	10.3	12.1	14.7	12.6	11.5	12.9	100	3,305	2.7
11	1968	14.8	45.2	25.5	10.3	4.4	1.9	0.5	0.2	-	-	100	2,768	2.4
	1969	13.2	43.5	26.4	9.7	4.8	1.9	0.5	-	-	-	100	3,095	2.5
12	1968	5.6	9.9	8.4	8.9	9.8	11.6	12.8	10.3	11.4	11.2	100	2,132	1.8
	1969	4.2	10.4	8.3	9.7	11.0	11.8	13.0	10.2	10.8	10.6	100	2,282	1.8
13	1968	2.4	5.8	6.5	8.2	10.7	12.1	13.3	13.0	13.9	14.2	100	27,675	23.5
	1969	2.6	6.1	6.7	8.8	10.8	12.0	14.2	12.8	13.7	12.2	100	29,019	23.7
14	1968	9.5	21.5	12.2	9.1	11.0	9.3	12.6	5.7	4.8	4.3	100	419	0.4
	1969	9.8	17.0	14.4	10.5	11.4	11.1	9.8	6.2	5.2	4.6	100	306	0.3
15	1968	11.6	16.6	11.6	9.4	9.0	8.4	8.7	8.3	8.5	8.0	100	14,069	12.0
	1969	11.8	17.1	12.0	9.5	9.2	8.0	9.1	8.3	8.0	7.0	100	14,748	12.1
16	1968	4.5	8.3	6.0	7.0	9.1	9.9	10.0	11.9	17.3	16.0	100	881	0.8
	1969	3.7	11.1	8.9	8.8	9.9	9.0	10.9	10.2	13.8	13.7	100	696	0.6
Total	1968	3.8	8.3	7.4	7.7	9.1	10.5	12.0	12.1	13.8	15.2	100	117,442	100
	1969	3.8	8.8	7.7	8.1	9.6	10.5	12.7	11.9	13.3	13.5	100	122,351	100

TABLE 12

Opinions given by the Joint Medical Service in connection with estimation of degree of disability after a year of sickness, per diagnostic group, in per cent (Annual reports 1968 and 1969 C.M.S.)

Broad diagnostic groups	Year	In per cent degree of disability								%	Total abs.	%
		-15	15 - 25	25 - 35	35 - 45	45 - 55	55 - 65	65 - 80	80 - 100			
1	1968	6.4	1.3	1.5	0.7	7.6	1.4	1.5	79.5	100	1,118	3.0
	1969	3.2	1.3	1.8	1.0	11.0	1.1	1.3	79.2	100	1,082	2.4
2	1968	2.0	0.6	1.1	0.4	6.7	2.0	1.5	85.7	100	1,575	4.2
	1969	1.2	0.5	1.0	0.9	7.9	1.3	1.7	85.5	100	1,715	3.8
3	1968	6.0	0.5	3.2	0.8	8.3	1.5	2.0	77.5	100	774	2.0
	1969	2.8	1.3	3.2	1.0	10.3	2.6	1.7	77.1	100	689	1 1.5
4	1968	1.5	-	2.5	-	5.4	1.9	1.5	87.2	100	203	0.6
	1969	4.7	1.6	1.6	-	11.1	3.2	1.6	76.2	100	63	0.1
5	1968	6.8	0.7	4.8	1.0	6.1	1.3	2.0	80.3	100	4,140	11.2
	1969	4.9	1.4	1.9	1.0	8.7	1.4	1.8	78.9	100	5,146	11.5
6	1968	3.1	1.2	2.3	1.2	5.9	1.7	2.3	82.2	100	3,086	8.3
	1969	3.3	2.3	3.2	1.7	9.1	2.1	2.3	76.1	100	2,459	5.5
7	1968	2.0	1.4	2.3	1.7	9.2	3.1	3.7	76.6	100	8,103	21.7
	1969	1.5	1.5	2.4	1.4	10.3	2.6	3.5	76.8	100	10,036	22.4
8	1968	1.6	1.0	1.3	0.9	4.2	2.0	2.3	86.7	100	3,877	10.4
	1969	1.6	1.1	1.9	1.1	5.8	1.5	1.9	85.2	100	4,536	10.1
9	1968	6.3	1.6	2.1	1.5	8.9	1.9	2.1	75.6	100	1,169	3.1
	1969	4.2	3.0	3.2	1.6	9.3	1.8	1.8	75.1	100	1,584	3.5
10	1968	5.2	0.9	2.3	1.1	8.7	4.1	2.3	75.4	100	439	1.2
	1969	1.9	1.0	2.3	1.3	11.5	1.5	0.8	79.8	100	620	1.4
11	1968	26.3	-	-	-	-	-	-	73.7	100	19	0.1
	1969	5.3	-	-	-	5.3	-	-	89.5	100	19	-
12	1968	7.1	1.2	3.0	1.5	5.8	1.7	1.3	78.4	100	463	1.2
	1969	9.3	3.2	5.1	0.7	4.6	0.2	1.0	75.8	100	409	0.9
13	1968	4.9	1.6	2.7	1.9	6.8	2.2	2.1	77.8	100	8,377	22.4
	1969	3.9	2.2	3.0	2.2	8.2	1.6	2.2	76.7	100	10,625	23.7
14	1968	4.9	1.2	3.7	2.3	7.0	1.6	1.4	78.0	100	514	1.4
	1969	5.4	2.8	2.7	3.7	10.0	0.6	1.6	73.1	100	669	1.5
15	1968	7.6	2.1	5.0	1.9	9.3	1.9	2.4	69.8	100	2,279	6.1
	1969	5.4	2.8	2.8	0.8	7.9	1.7	1.5	77.1	100	1,478	3.3
16	1968	6.6	1.1	2.3	1.2	7.4	1.6	2.1	76.8	100	1,229	3.3
	1969	4.4	2.9	5.0	2.4	10.3	1.6	2.2	71.3	100	3,754	8.4
Total	1968	4.2	1.3	2.4	1.4	7.2	2.1	2.4	79.0	100	37,335	100
	1969	3.2	1.9	2.7	1.6	8.9	1.8	2.3	77.7	100	44,884	100

TABLE 13

Age composition of group working for weekly wages belonging to the Philips
Health Insurance Fund in 1949, 1956 and 1962. Absolute numbers, percentages,
and indices (1949 = 100)

(C. van Norren, *Werkhervatting na langdurig ziekteverzuim,* Eindhoven 1966, p. 38)

Age groups (in years)	1949			1956			1962		
15 - 24	5,591	31	100	10,108	36	181	15,556	38	278
25 - 34	5,231	29	100	8,424	30	161	10,644	26	203
35 - 44	3,607	20	100	4,493	16.	125	8,187	20	227
45 - 54	2,705	15	100	3,369	12	.125·	4,094	10	151
55 - 64	902	5	100	1,685	6	186.	2,454	6	272·
Total	18,036	100	100	28,079	100	156.	40,935	100	227

TABLE 14

Annual number of absences (not due to tuberculosis) longer than one year per 10,000
insured by Philips. In the 1951 - 1966 period the total number of such absences
amounted to 1,178

(C. van Norren, *Het verschijnsel van toenemende invaliditeit bij oudere werknemers,*
in Tijdschrift voor Sociale Geneeskunde, 1967, p: 791)

Age group (in years)	1951/1953		1954/1956		1957/1959		1960/1962		1963/1966		1966	
15 - 24	4	100	2	50	4	100	5	125	·6	150	9	225.
25 - 34	8·	100	6	75	11	137	11	137	12·	150	15	·188
35 - 44	12	100	12·	100	21	175	26	218	47	392·	41	342·
45 - 54	24	100	40	167	40	167	·63	263	92	383	159	663
55 - 64	113	100	143	127	83	73	148·	131	308·	273	440	389

TABLE 15

Male unemployment, in absolute numbers and percentages of the dependent working
population per age group (quarterly averages), according to age group in 1957 - 1967
(Ministry of Health and Social Affairs)

Year	under 25 years		25 - 39		40 - 49		50 - 64		Total	
1957	6,189	1.1	10,821	1.2	7,164	1.6	11,784	2.4	35,958	1.5
1958	13,615	2.5	24,853	2.7	14,044	2.9	20,919	4.2	73,431	3.0
1960	4,298	0.8	9,652·	1.0	7,259	1.5	14,242	2.8	35,450	1.4
1961	3,236	0.5	6,440	0.7	5,335	1.1	10,880	2.1	25,891	1.0
1963	4,385	0.7	7,445	0.8	5,607	0.9	10,065	1.9	27,502	1.1
1965	5,870	0.9	8,296	0.9	5,266	0.9	8,607	1.6	28,039	1.0
1966	9,368	1.4	11,957	1.2·	6,710	1.1	10,070	1.8	38,105	1.4
1967	21,397	3.1	24,160	2.5	11,854	1.9	17,459	3.1	·74,870	2.7

TABLE 16

Male unemployment in 1953 - 1968, according to age groups and number of months of unemployment (quarterly averages, as percentage of the total number of unemployed men in the relevant period)

(C.B.S. Sociale Maandstatistieken 1953 t/m 1968. Analysis of statistics per quarter)

Year	under 25 years					25 - 39					40 - 49					50 - 64					Total
	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e	
1953	7.5	5.9	2.3	0.7	0.4	9.8	10.0	6.0	3.7	3.2	5.0	5.4	5.2	2.9	3.4	5.4	6.2	5.0	4.5	7.8	74,815
1954	6.9	5.4	1.5	0.3	0.2	10.6	11.0	4.3	2.1	2.5	5.7	6.8	3.2	2.1	3.6	6.6	8.6	4.9	3.9	9.8	56,331
1955	8.7	5.1	1.0	0.2	0.2	11.7	10.0	3.7	1.8	2.1	6.2	6.4	2.9	1.8	3.4	7.3	8.8	4.7	3.8	10.2	37,209
1956	8.6	5.4	0.9	0.3	0.3	11.9	10.5	2.8	1.4	2.0	6.7	7.0	2.5	1.7	3.0	8.2	10.2	4.4	3.5	8.7	28,775
1957	11.6	4.3	0.7	0.3	0.3	15.8	8.6	2.5	1.4	1.8	8.4	5.3	2.2	1.4	2.6	9.9	7.7	4.1	3.4	7.7	35,958
1958	9.0	6.8	1.9	0.5	0.3	11.6	12.3	5.9	2.4	1.6	5.5	6.2	3.5	2.0	2.0	6.2	7.8	5.3	3.6	5.6	73,432
1959	6.9	5.5	1.5	0.4	0.5	9.4	10.7	4.8	2.5	3.3	4.7	5.9	3.3	2.2	3.8	5.8	8.3	5.3	4.4	10.7	56,924
1960	6.3	3.9	0.9	0.4	0.7	9.3	8.3	3.5	1.8	4.4	5.0	5.2	2.8	1.2	5.6	7.0	7.0	7.9	4.6	15.8	35,451
1961	6.9	3.7	3.0	1.8	2.8	7.6	6.3	2.7	1.5	4.3	4.2	4.3	2.4	1.7	5.9	5.7	7.5	5.2	4.8	17.5	25,891
1962	8.3	3.8	0.6	9.3	0.8	10.3	6.6	2.5	1.4	4.1	5.5	4.6	2.2	1.7	6.2	7.0	7.3	4.9	4.5	17.3	24,876
1963	7.9	5.8	1.0	0.3	0.8	8.7	10.3	3.2	1.4	3.5	4.4	6.7	2.6	1.5	5.3	5.2	9.4	4.1	3.2	14.6	27,495
1964	10.7	5.9	0.9	0.5	1.0	10.8	7.9	2.8	1.5	4.0	5.4	4.9	2.3	1.6	5.3	6.5	7.2	4.0	2.9	14.0	22,477
1965	11.6	6.4	1.4	0.6	1.0	11.7	9.4	3.5	1.6	3.3	5.3	5.2	2.6	1.6	4.1	6.3	7.2	4.0	2.9	10.3	28,039
1966	13.8	7.6	1.7	0.5	0.8	13.6	9.8	3.9	1.7	2.5	5.7	5.0	2.5	1.5	3.0	6.7	6.6	3.6	2.7	7.0	35,104
1967	10.5	9.8	4.6	1.6	0.6	9.2	11.4	6.4	2.7	2.0	3.6	4.9	3.2	2.1	2.0	4.2	6.2	4.5	3.8	4.6	74,870
1968	9.2	9.1	4.0	1.9	1.3	7.4	9.3	5.8	3.9	4.3	3.0	4.2	3.1	2.7	3.7	3.4	5.6	4.8	5.2	8.5	69,933

a = unemployed less than 1 month

b = unemployed 1 to 3 months

c = unemployed 3 to 6 months

d = unemployed 6 to 12 months

e = unemployed less than 12 months

TABLE 17

Male and female unemployment, according to three age groups
and factors complicating re-employment (n = 1,443)

(*Onderzoek naar de samenstelling en de mogelijkheden voor arbeidsinpassing
van de groep werkloze oudere arbeidskrachten per ultimo september 1969*
District Employment Office of the province of Noord-brabant, 's-Hertogenbosch, 1970)

Nature of complicating factor	50 - 54		55 - 59		60 - 64		Total	
	Men	Women	Men	Women	Men	Women	Men	Women
Medical	193	14	193	32	209	24	595	70
Level of skill	36	2	36	5	46	7	118	14
Social behaviour pattern	37	3	22	2	19	1	78	6
Personnel reduction	3	-	7	1	4	-	14	1
Large insurance payments	13	-	17	1	11	2	41	3
Wage demands	7	3	6	1	7	-	20	4
Other causes	40	9	31	14	35	13	106	36
None	92	7	94	8	127	9	313	24
Total	421	38	406	64	458	56	1,285	158

TABLE 18

Diagnoses made in 3,252 individuals seeking work in the first six months of 1969, according to age group, broad diagnostic group, and degree of assistance in placement, in per cent

(Ministry of Health and Social Affairs, Directorat-General of placement of assistance)

Age (in years)	Degree of placement	Broad diagnostic groups																	Total	
		00	1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	%	absolute
50 - 54	a	10	2	-	6	1	27	4	13	6	8	3	3	12	-	2	2	21	433
	b	-	5	-	10	3	39	-	15	15	3	-	-	5	-	5	2	2	39
	c	-	1	-	3	-	13	12	16	10	4	1	1	32	-	6	1	76	1,556
	d	-	-	-	4	-	19	8	23	4	-	4	-	8	-	-	30	1	26
	Total	2	2	-	4	-	16	10	15	9	5	2	1	27	-	5	2	100	2,054
55 - 59	a	5	1	-	5	1	20	6	16	8	8	2	4	17	-	3	4	20	367
	b	-	-	-	1	1	21	3	24	24	3	5	-	9	-	1	7	4	67
	c	-	1	-	3	-	10	11	19	9	5	1	1	33	-	6	1	75	1,400
	d	-	-	-	-	-	30	7	17	10	7	7	3	7	-	3	10	1	30
	Total	1	1	-	3	-	12	10	19	10	5	2	2	23	-	5	2	100	1,864
60 - 64	a	17	1	-	6	-	8	6	14	6	10	3	2	13	-	3	11	27	367
	b	-	-	-	3	-	10	3	37	16	10	-	-	8	-	-	10	3	38
	c	-	1	-	3	-	8	14	22	12	7	2	1	23	-	4	3	69	934
	d	-	-	-	9	-	-	-	28	28	-	9	-	18	-	-	10	1	11
	Total	5	1	-	4	-	8	11	21	11	8	2	1	20	-	4	5	100	1,350
Total	a	11	2	-	6	1	19	5	15	6	9	2	3	14	-	2	5	22	1,167
	b	-	1	-	4	1	24	2	25	19	5	2	-	8	-	1	8	3	144
	c	-	1	-	3	-	10	12	19	10	5	1	1	30	-	6	2	74	3,890
	d	-	-	-	3	-	21	6	21	10	3	6	1	9	-	1	18	1	67
	Total	2	1	-	3	-	13	10	18	10	6	2	1	26	-	5	3	100	
	Absolute	124	64	-	183	17	666	540	939	509	297	92	80	1,356	-	242	159		5,268

a = placeable without restrictions   b = not placeable (rejected)   c = medical restrictions   d = still under study

TABLE 19

Pensioned individuals (old age or disability) paid from industry or company pension funds in the 1958 - 1967 period. Absolute numbers

(Annual reports Verzekeringskamer)

	Year									
	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Old-age pensions	106,726	118,818	132,584	147,814	162,545	176,068	190,805	206,379	223,178	241,195
Disability pensions	8,931	9,635	10,884	10,352	10,359	10,822	10,621	10,835	11,303	11,276
Total	115,657	128,453	143,468	158,166	172,894	186,890	210,426	217,214	234,481	252,471

TABLE 20

Total disability as judged after medical examination by the *Algemeen Burgerlijk Pensioenfonds* (covering government employees), according to age, in 1966, 1967, and 1968. Absolute numbers and percentages.

(Annual reports)

Age group (in years)	1966		1967		1968	
	abs.	%	abs.	%	abs.	%
20 - 30			26	0.8	39	1.1
30 - 40	313	14.2	86	2.8	124	3.5
40 - 50			341	10.8	412	11.5
50 - 60	970	44.0	1,311	41.7	1,470	40.9
60 - 65	920	41.8	1,376	43.9	1,545	43.0
Total	2,203	100.0	3,140	100.0	3,590	100.0

TABLE 21

Distribution according to age and percentage total disability of the disability pensions paid by the
Algemeen Burgerlijk Pensioenfonds (as of Dec. 1968) to individuals under 65 years of age
Absolute numbers and percentages of total

(Annual reports 1966 - 1968)

Percentage disability	20 - 30		30 - 40		40 - 50		50 - 55		55 - 60		60 - 65		Total	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
15	1	0	46	0.4	282	2.3	280	2.3	336	2.8	732	6.0	1,677	13.8
15 - 25	1	0	7	0	6	0	4	0	10	0.1	6	0	34	0.3
25 - 35	·	·	4	0	19	0.2	16	0.1	19	0.2	11	0.1	69	0.6
35 - 45	2	0	7	0	34	0.3	35	0.3	29	0.2	24	0.2	131	1.0
45 - 55	1	0	17	0.1	66	0.5	71	0.6	88	0.7	82	0.7	325	2.7
55 - 65	1	0	23	0.2	114	0.9	150	1.2	220	1.8	273	2.2	781	6.4
65 - 80	5	0	46	0.4	188	1.5	250	2.1	475	3.9	841	6.9	1,806	14.9
80 - 100	29	0.2	146	1.2	608	5.0	771	6.3	1,514	12.4	4,290	35.2	7,358	60.4
Total	41	0.3	296	2.4	1,317	10.8	1,577	12.9	2,691	22.1	6,259	51.4	12,181	100.0

TABLE 22

Diagnoses leading to rejection of 27 individuals in a group of 5,090 employees of the Netherlands Railways, according to age. Absolute numbers

(C.J. Snepvangers, *Over het nut en de gevolgen van periodiek geneeskundig onderzoek*, in Tijdschrift voor Sociale Geneeskunde 44 (1966) pp. 468 ff.)

Diagnosis	56 - 60 years	61 - 65 years	Total
Heart infarction or other cardiovascular diseases	1	6	7
Hypertension with cardiac anomalies	-	2	2
Pre-senility + generalised atherosclerosis	3	5	8
Spondylarthrosis	1	3	4
Chronic asthmatic bronchitis	1	2·	3
Deafness	-	2	2·
Diabetes mellitus	-	1	1
Total	6	21	27

TABLE 23

Diagnoses for persons with high degree of disability and therefore re-employable only in other work, pertaining to 24 individuals in a group of 5,090 employees of the Netherlands Railways, according to age. Absolute numbers

(C.J. Snepvangers, Ibid.)

Diagnosis	26 - 40	41 - 50	51 - 55	56 - 60	61 - 65	Total
Heart infarction or other cardiovascular diseases	1	1	1	3		6
Hypertension		2		2		4
Pre-senility +· generalised atherosclerosis				1		1
Spondylarthrosis				1		1
Chronic asthmatic bronchitis		1		2		3
Deafness		1		1	1	3
Macular degeneration, etc.	1	1				2·
Coxarthrosis	1					1
Ulcus duodeni	1					1
Multiple myeloma				1		1
Psychoneurosis	1					1
Total	5	6·	1	11	1	24

TABLE 24

Diagnoses of partial disability in cases partially maintainable in suitable form
of the original type of work, concerning 30 individuals in a group of 5,090 employees
of the Netherlands Railways, according to age. Absolute numbers

(C.J. Snepvangers, *Ibid.*)

Diagnosis	Years						Total
	21 - 25	26 - 40	41 - 50	51 - 55	56 - 60	61 - 65	
Heart infarction or other cardiovascular diseases				3	2	4	9
Hypertension			1		3		4
Pre-senility					1	1	2
Spondylarthrosis			1		1	1	3
Chronic asthmatic bronchitis	1				1	2	4
Deafness		1		1	2		4
Psychoneurosis	2				1		3
Recurrent hernia ing.					1		1
Total	1	3	2	4	12	8	30

TABLE 25

Number of working years lost by withdrawal from the working population per 100,000 men, according to age and reason for withdrawal. Absolute numbers and cumulative totals

Year	Age-group (in years)	Work-life expectancy	Number of lost working years					
			Due to total withdrawal		Due to death		Due to withdrawal for other causes	
				Cum. total		Cum. total		Cum. total
1955	45 - 49	16.81	29,602.41	29,602.41	7,430.02	7,430.02	22,172.39	22,172.39
	50 - 54	12.00	50,376.00	79,978.41	8,544.00	15,974.02	41,832.00	64,004.39
	55 - 59	7.50	108,585.00	188,563.41	8,557.50	24,531.52	100,027.50	164,031.89
	60 - 64	3.95	200,620.50	389,183.91	7,200.85	31,732.37	193,419.65	357,441.54
	65 - 69	2.51	149,859.55	539,043.46	7,181.11	38,913.48	142,678.44	400,119.98
1960	45 - 49	16.29	27,953.64	27,953.64	6,450.84	6,450.84	21,502.80	21,502.80
	50 - 54	11.56	48,585.68	76,539.32	8,276.96	14,727.80	40,308.72	61,811.52
	55 - 59	7.05	102,499.95	179,039.27	8,537.55	23,265.35	93,962.40	155,773.92
	60 - 64	3.16	188,610.92	367,650.19	5,966.08	29,231.43	182,644.84	338,418.76
	65 - 69	2.09	142,437.68	510,087.87	6,255.37	35,486.80	136,182.31	474,601.07
1965	45 - 49	15.70	27,710.50	27,710.50	6,813.80	6,813.50	20,896.70	20,896.70
	50 - 54	10.97	46,734.20	74,444.70	8,611.45	15,424.95	38,122.75	59,019.45
	55 - 59	6.43	94,019.46	168,464.16	8,416.87	23,842.12	85,602.59	144,622.04
	60 - 64	2.45	163,963.80	332,427.96	5,149.90	28,992.02	158,813.90	303,435.94
	65 - 69	1.79	132,690.91	465,118.87	5,830.03	34,822.05	126,860.03	430,296.82

Summary

This analysis of the data in the literature was performed as an approach to the problem of the ageing of the working population of the Netherlands and the consequences of this ageing for the health of that population. Attention was paid to the changes occurring in the age structure of the (working) population, and an attempt was made to determine these shifts on the basis of Tables of Working-life. Consideration was also given to the health of the older working population (54 - 70 years), which was analysed in terms of four factors : sick-absence, disability, unemployment, and retirement on pension. Lastly, the consequences of the combination of the demographic and biological ageing processes for the services and institutions concerned with health care were touched.

The main conclusions drawn from this exploratory study are the following :

1. A demographic ageing of the total working population is taking place, but less rapidly than the demographic ageing of the total population of the Netherlands.

2. Little can be said about the health of the older working population, because the available data are meagre or inadequate. Therefore, opinions on this point can bear only a speculative or hypothetical character.

3. With respect to the morbidity of the total working population, the demographic ageing of this group is expressed in an increase in the number of objective cases of sickness with an associated increase in the average duration of sick-absences.

4. Temporary withdrawal from the working population due to disability or unemployment after the age of 55 years will usually mean a definitive separation.

Demographic ageing can be expected to have the effect of a catalyst in making the need for good - i.e. preventive - health care for the older age groups in the working population more acute. In addition to an increasing financial investment (manpower, buildings, etc.) in this sector of health care, a change in attitude toward the older employees may be considered an urgent necessity.