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VITAL and HEALTH STATISTICS
ANALYTICAL STUDIES

Infant and Perinatal Mortality in Denmark

Statistical description and analysis of long-term trends in stillbirth, infant, and perinatal mortality in Denmark; discussion of risk factors associated with infant mortality from an obstetrician's and from a pediatrician's point of view; and description of demographic characteristics, the Danish health system, and registration.

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FOREWORD

This report is one of a group of analytical studies designed to delineate the perinatal and infant mortality problem in the United States. Of particular interest is the fact that the United States is not alone in experiencing an important change in the infant mortality trend. For a number of other countries as well, infant mortality is no longer declining at its former pace.

Although our primary concern is with the problem of perinatal and infant mortality in the United States, it was felt that much could be learned from the experience of other developed countries with advanced medical systems. In several of these countries, levels of infant mortality which are lower than that in the United States have been achieved. The National Center for Health Statistics arranged with a number of investigators to prepare comprehensive reports on perinatal and infant mortality in their own countries. Contracts were negotiated with investigators in Denmark, England and Wales, the Netherlands, Norway, Scotland, and the United States. Four reports evolving from these contracts appear in Series 3 of the *Vital and Health Statistics* reports:

- No. 4, "Infant and Perinatal Mortality in the United States"
- No. 5, "Infant and Perinatal Mortality in Scotland"
- No. 6, "International Comparison of Infant and Perinatal Mortality: The United States and Six West European Countries"
- No. 8, "Infant Mortality Problems in Norway"

The present report for Denmark is the fifth in this group of studies on perinatal and infant mortality.

This report was prepared in four parts. Part I and the appendixes by Mr. P. C. Matthiessen focus primarily on a demographic description of Denmark and a statistical analysis of fertility and perinatal and infant mortality. Professor Dyre Trolle analyzes in Part II the trends in stillbirth and mortality in the first week of life from an obstetrical point of view. In Part III, Dr. Zachau-Christiansen views the trend in mortality after the first week of life as a pediatrician. Professor Trolle and Dr. Zachau-Christiansen discuss the future of infant mortality in Denmark in Part IV. Throughout the report, emphasis is placed on the period in which the infant mortality rates in the United States began to level off, i.e., 1951-62. The methodology, findings, and conclusions are those of the investigators.

Iwao M. Moriyama, Ph.D.
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IN THIS REPORT detailed statistics are provided on changes in infant and perinatal mortality in Denmark since the early 1900's. The analysis focuses on sizable decreases in late neonatal and postneonatal mortality, compared with smaller decreases in perinatal mortality. Changes in parameters of infant and perinatal mortality trends are discussed in detail. Risk factors associated with infant mortality are further analyzed by an obstetrician and by a pediatrician. Changes in the structure of population, the socioeconomic situation, provisions for maternal and child care, and the Danish health and vital statistics systems are described.

During the 20th century the infant mortality rate in Denmark has declined rather consistently from 134.2 infant deaths per 1,000 live births in 1901 to 20.0 in 1962. The predominant decline since 1901 has occurred in mortality of infants 7 days-11 months of age. Mortality in the first 7 days of life did not start to fall until after 1940. Likewise, the decline in stillbirth and perinatal mortality did not start until after 1940. The greatest reductions for stillbirth, perinatal, and infant mortality in Denmark have been since 1951; whereas, it was during this period, 1951-62, that the decline in infant mortality in the United States began to diminish. A considerable part of the decline has been for deaths caused by infective diseases and diseases of the respiratory and digestive systems. Limited reductions have occurred for congenital malformations, birth injuries, and immaturity.

Prematurity contributes heavily to perinatal and infant mortality and future declines of significance will depend upon control of low birth weight infants. Close cooperation of obstetricians and pediatricians toward the goal of decreasing perinatal and infant mortality is urged.

SYMBOLS

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INFANT AND PERINATAL MORTALITY IN DENMARK

P. C. Matthiessen, Dyre Trolle, and B. Zachau-Christiansen, *University of Copenhagen*^a

PART I. STATISTICAL DESCRIPTION AND ANALYSIS

AGE AT DEATH

Throughout the 20th century, in Denmark a large decline in the infant mortality rate has taken place, from 134.2 per 1,000 live births in 1901 to 20.0 in 1962 (table 1 and fig. 1). In 1960-62 infant mortality in the Faroe Islands and in Greenland was 24.7 and 70.9 infant deaths per 1,000 live births, respectively. When these two areas are included with the rest of Denmark the total infant mortality rate in 1960-62 is 22.2 per 1,000 instead of 21.1. The small difference made in the infant mortality rates by including these two areas did not seem to justify using them in this report. In addition to the fact that the statistics from the Faroe Islands and Greenland are less complete, the annual proportion of live births only amounts to about 2.5 percent of the births in the rest of Denmark.

The large reduction in infant mortality is most obvious in the beginning of the century, and then again after 1930, and since then has continued to this day (1962). The decline in mortality varies greatly within each age at death (fig. 2). Mortality during the first calendar day of life did not start falling until after 1940. At this point it should be emphasized that deaths in the *first day* are based on the calendar day of life, and not

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on a 24-hour day. Although mortality from 1 through 6 days of life also did not start to fall until after 1940, it has changed only slightly since then. From the beginning of the century a marked decline has occurred in mortality of infants 7 days-11 months of age. Considerable decline for all ages in infant mortality has occurred from 1951.

A large part of infant mortality today occurs during the first week of life, and table A shows the distribution of deaths in the first week of life by age. In 1949-51 as well as in 1959-61 more

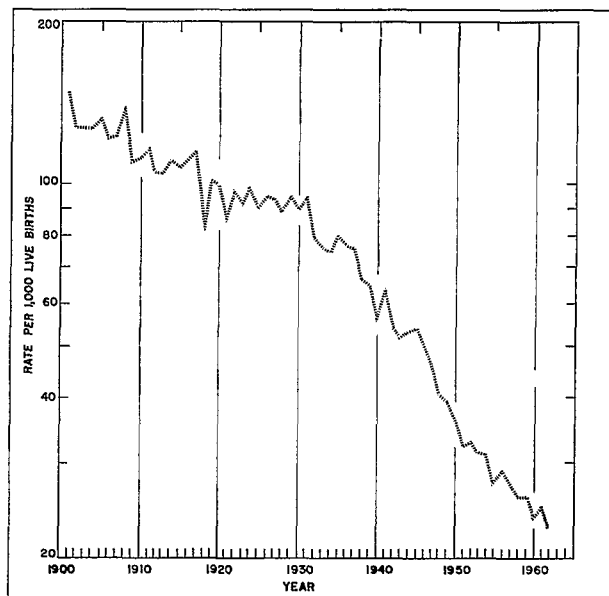


Figure 1. Infant mortality rates: Denmark, 1901-62.

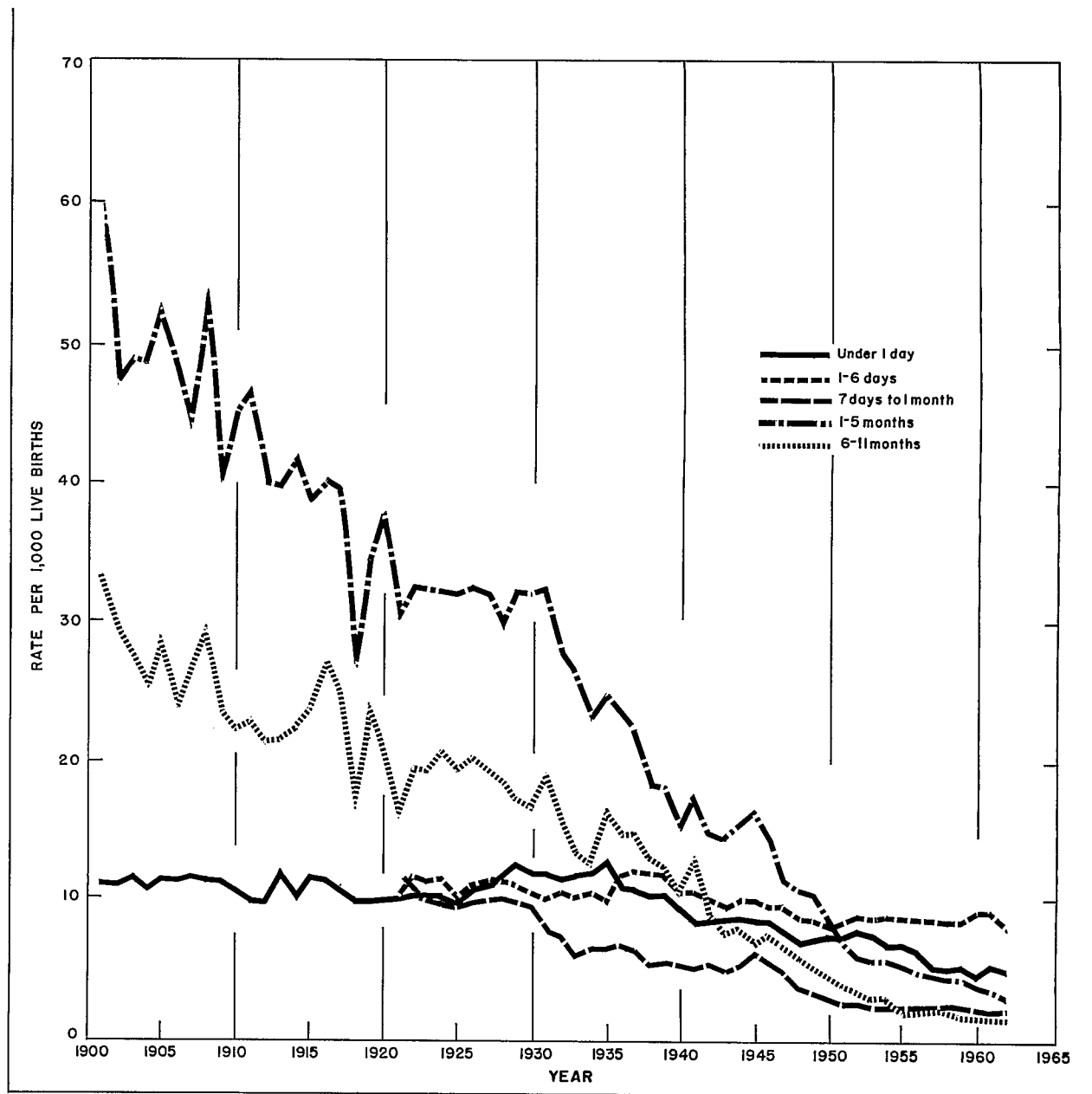


Figure 2. Infant mortality rates by age: Denmark, 1901-62.

than four-fifths of these deaths occurred within the first 3 days. In this age group there seems to be a decline only within the first 2 days of life.

Table 2 illustrates the change by sex in stillbirth^b and perinatal mortality since 1901. Perinatal mortality in any one year is calculated as the number of stillbirths plus deaths under 7 days

per 1,000 total births. Both stillbirth and perinatal mortality rates have gone down throughout the

^b[Ed. note: The World Health Organization recommends use of the term "fetal death" for all pregnancy terminations which show no evidence of life after complete expulsion or extraction from the mother; in European vital statistics the term "stillbirth" is used to denote such terminations at 28 or more weeks of gestation.]

Table A. Number and rate of deaths in the first week of life, and percent change, by age: Denmark, 1949-51 and 1959-61

Age ¹	Number		Mortality rate ²		Percent change in rate from 1949-51 to 1959-61
	1949-51	1959-61	1949-51	1959-61	
Under 7 days-----	3,723	3,196	157.7	141.1	-11
Under 1 day-----	1,748	1,185	74.1	52.3	-29
1 day-----	1,016	923	43.0	40.7	-5
2 days-----	420	514	17.8	22.7	+28
3 days-----	198	254	8.4	11.2	+33
4 days-----	148	126	6.3	5.6	-11
5 days-----	107	110	4.5	4.9	+9
6 days-----	86	84	3.6	3.7	+3

¹Based on calendar days since birth.

²Deaths in first week of life per 10,000 live births.

century. From 1901 through 1962 the number of stillbirths per 1,000 total births declined from 24.2 to 11.9, while from 1921 through 1962 perinatal mortality decreased from 44.6 to 24.9. As with the infant mortality rate, if the Faroe Islands and Greenland were included with the rest of Denmark, the total stillbirth rate would not be changed appreciably—from 12.3 to 12.5 in 1960-62. The relative decline for both the stillbirth and perinatal mortality rates is much smaller than that for infant mortality. It is characteristic that the decline did not really start until after 1940. The greatest decline has taken place from 1951 through 1962—35 percent for the stillbirth rate and 27 percent for the perinatal mortality rate.

CAUSE OF DEATH

Table 3 presents the development of different causes of infant death from 1931 through 1962. The distribution for the period 1951-62 has been made on the basis of the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death* (Sixth Revision for 1951-57, and Seventh Revision for 1958-62). Table B shows the international (ICD) code numbers which have been used within the 16 groups.

In general infant deaths have been grouped in the same way for the period 1931-50 as for 1951-

62. During 1931-50 two different classifications for cause of death were used, namely, the Inter-scandinavian Nomenclature of Causes of Death of 1926 from 1931-40 and the International List of Causes of Death of 1938 from 1941-50. The difference between these two lists is limited; therefore, data for the period 1931-50 are fairly comparable. However, transition to the period 1951-62 is reliable only for the first five and the last cause-of-death groups.

A comprehensive view of the development of infant and neonatal mortality by cause is shown in table B where the relative changes during the periods 1931 to 1940, 1941 to 1950, and 1951 to 1962 are given. The decline in infant mortality since 1931 is primarily due to the decline in deaths caused by infective diseases and diseases of the respiratory and digestive systems, which by 1962 are of minor importance. These diseases appear mainly in the later part of the first year of life and explain the marked decline in mortality at the later ages.

During 1951-62 there were considerable declines for almost every cause of death. Here also the decline for infective diseases and diseases of the respiratory and digestive systems is especially noticeable.

Neonatal mortality has fallen less than total infant mortality, because it is particularly dominated by such causes as congenital malformations,

Table B. Percent change in infant and neonatal mortality rates, by cause of death: Denmark, from 1931 to 1940, 1941 to 1950, and 1951 to 1962

Cause of death ¹	Infant mortality			Neonatal mortality		
	From 1931 to 1940	From 1941 to 1950	From 1951 to 1962	From 1931 to 1940	From 1941 to 1950	From 1951 to 1962
All causes-----	-31	-44	-31	-15	-23	-17
1. Infective and parasitic diseases-(001-138,340-344,690-695,765-768)	-48	-68	-62	-20	-53	-27
2. Influenza and pneumonia----- (480-493,763)	-56	-65	-74	-42	-54	-38
3. All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394,400-475,500-527)	-47	-56	-75	-71	-75	-67
4. Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn----- (543,571,572,764)	-65	-71	-62	-60	-81	-89
5. All other diseases of digestive system----- (530-542, 544-570, 573-587)	-38	-25	-33	-64	-83	+25
6. Congenital malformations----- (750-759)	+3	-29	-40	-1	-28	+4
7. Birth injuries----- (760, 761)	+8	-21	-28	-1	-24	-25
8. Intracranial and spinal injury at birth----- (760)	---	---	-37	---	---	-36
9. Other birth injury----- (761)	---	---	+100	---	---	-72
10. Postnatal asphyxia and atelectasis---- (762)	---	---	+20	---	---	+20
11. Hemolytic diseases of newborn (erythroblastosis)----- (770)	---	---	-20	---	---	-11
12. Immaturity with mention of any other subsidiary condition, or unqualified----- (774, 776)	-13	-9	-24	-13	-7	-19
13. Other defined and ill-defined diseases peculiar to early infancy--- (769, 771-773)	+4	-42	-49	-30	-35	-51
14. Symptoms and ill-defined conditions----- (780-793, 795)	-53	-68	+17	-72	-86	-50
15. All other diseases----- (Residual)	-72	-65	-20	-86	+29	-8
16. Accidents----- (E800-E999)	-12	+50	-62	-9	+27	-89

¹The Seventh Revision of the International Classification of Diseases (1955) was used to classify causes of death for 1958-62; the Sixth Revision of the International Classification of Diseases (1948) for 1951-57; the International List of Causes of Death of 1938 for 1941-50; and the Interscandinavian Nomenclature of Causes of Death of 1926 for 1931-40.

birth injuries, and immaturity which have undergone limited reductions. Details of neonatal and postneonatal mortality are shown in tables 4 and 5. Among secondary causes of infant death, immaturity was dominant in 1960-62.

From table C one can get a comprehensive view of the structure of cause of death among

stillbirths in the period 1956-60. Difficulties in labor (Y34), placental and cord conditions (Y36), and diseases of fetus and ill-defined causes (Y39) cover a considerable part of stillbirths. It must be pointed out, however, that almost all of the last group (Y39) is comprised of ill-defined causes.

Table C. Average annual number and rate of stillbirths, by sex and cause of death:
Denmark, 1956-60

Cause of death ¹	Average annual number		Rate per 10,000 total births			
	Both sexes	Male	Female	Both sexes	Male	Female
All causes------(Y30-Y39)	1,151	619	532	150.5	157.2	143.3
Chronic disease in mother------(Y30)	16	9	7	2.1	2.3	1.9
Acute disease in mother------(Y31)	6	3	3	0.8	0.8	0.8
Diseases and conditions of pregnancy and childbirth------(Y32)	55	28	27	7.2	7.1	7.3
Absorption of toxic substance from mother------(Y33)	-	-	-	-	-	-
Difficulties in labor------(Y34)	153	90	63	20.0	22.9	17.0
Other causes in mother------(Y35)	6	3	3	0.8	0.8	0.8
Placental and cord conditions------(Y36)	344	195	149	45.0	49.5	40.1
Birth injury------(Y37)	32	21	11	4.2	5.3	3.0
Congenital malformations of fetus------(Y38)	110	45	65	14.4	11.4	17.5
Diseases of fetus and ill-defined causes------(Y39)	429	225	204	56.1	57.1	55.0
Syphilis------(Y39.0)	-	-	-	-	-	-
Infection other than syphilis, erythroblastosis, and other cause originated in the fetus------(Y39.1, Y39.2, Y39.3)	33	18	15	4.3	4.6	4.0
Maceration, cause not specified------(Y39.4)	212	112	100	27.7	28.4	26.9
Other ill-defined or unspecified cause------(Y39.5, Y39.6)	184	95	89	24.1	24.1	24.0

¹ The Seventh Revision of the International Classification of Diseases (1955) was used to classify causes of death for 1958-62; and the Sixth Revision of the International Classification of Diseases (1948) for 1951-57.

BIRTH WEIGHT

Data by birth weight as shown in this report are derived from two sources. One source of information is the midwives' birth registers. The distribution of live births by birth weight taken from this source is published annually by the National Health Service. The second source of information is the birth certificates from which statistical information is abstracted and forwarded to the Statistical Department. Published data by specified birth weight are not available from this source, but two special studies using records for 1954-55 and 1959 are reported here for the first time.

The distribution of live births by birth weight in 1959 was such that 6.9 percent of all live births weighed 2,500 grams or less:

<i>Birth weight in grams</i>	<i>Percentage distribution</i>
All weights -----	100.0
1,000 or less -----	0.2
1,001-1,500-----	0.7
1,501-2,000-----	1.5
2,001-2,500-----	4.5
2,501-3,000-----	18.2
3,001-3,500-----	37.3
3,501-4,000-----	27.7
4,001-4,500-----	8.4
4,501-5,000-----	1.3
5,001 or more -----	0.2

The average birth weight was 3,320 grams. In calculating average birth weight, weights under

Table D. Number and percentage distribution of live births and stillbirths and still-birth rates, by birth weight: Denmark, 1960-62

[Data based on midwife registers]

Birth weight	Total births	Live births	Still-births	Total births	Live births	Still-births	Still-births
	Number			Percentage distribution			Rate ¹
Total-----	233,218	230,202	3,016	100.0	100.0	100.0	12.9
1,000 grams or less-----	891	544	347	0.4	0.2	11.5	389.5
1,001-2,500 grams-----	13,995	12,660	1,335	6.0	5.5	44.3	95.4
2,501 grams or more-----	218,332	216,998	1,334	93.6	94.3	44.2	6.1

¹Rate per 1,000 total births of specified birth weight.

1,000 and over 6,000 grams were estimated as 950 and 6,100 grams, respectively.

Table D shows the distribution of live births and stillbirths by birth weight in 1960-62. This distribution is based on data from the midwife registers and differs from those published by the Statistical Department. It appears that 5.7 percent of all liveborn infants weighed 2,500 grams or less. The table also shows the marked differences in the distribution of stillbirths by birth weight.

The correlation between birth weight and infant mortality is elucidated in the analysis of birth weights for all live births and infant deaths in 1954 and 1955 (table E). Unfortunately, the classification of weight is not quite in accordance with the classification of 1959; for example, the interval 2,000-2,499 grams is used for 1954-55 data, whereas 2,001-2,500 grams was used in 1959. As it was not possible to correct this discrepancy, the distributions by birth weight

Table E. Percentage distribution of live births and infant mortality rates, by sex and birth weight: Denmark, 1954-55

Birth weight	Both sexes	Male	Female	Both sexes	Male	Female
	Percentage distribution of live births			Rate per 1,000 live births of specified group		
Total-----	100.0	100.0	100.0	25.7	29.2	22.1
999 grams or less-----	0.2	0.2	0.2	1,000.0	1,000.0	1,000.0
1,000-1,499 grams-----	0.6	0.6	0.6	658.6	742.3	567.3
1,500-1,999 grams-----	1.1	1.1	1.2	280.5	343.1	215.5
2,000-2,499 grams-----	3.7	3.4	4.0	85.2	108.5	64.4
2,500-2,999 grams-----	14.2	12.1	16.4	26.6	33.4	21.2
3,000-3,499 grams-----	35.3	32.6	38.1	12.4	13.7	10.9
3,500-3,999 grams-----	30.8	32.8	28.7			
4,000 grams or more-----	14.1	17.2	10.8			

in 1954-55 and in 1959 are not quite comparable. However, this discrepancy is of little importance, since the main purpose here is to illustrate the relationship between birth weight and infant mortality.

The average birth weight for 1954-55 was 3,405 grams (calculated by estimating birth weights under 1,000 grams to be 950, and those over 4,000 to be 4,250 grams). It is notable that of the 5.6 percent live births which weighed 2,499 grams or less, 215.2 per 1,000 died in the first year of life. Among the remaining live births weighing 2,500 grams or more, only 14.5 per 1,000 died. Over half the deaths among births under 2,500 grams occurred on the first calendar day of life, contrasted with about one-fifth in the weight group of 2,500 grams or more (table F).

Table F. Infant mortality rates, by age and birth weight: Denmark, 1954-55

Age	Total	2,499	2,500
		grams or less	grams or more
		Rate per 1,000 live births of specified birth weight	
Under 1 year-	25.7	215.2	14.5
Under 1 day ¹ ----	9.1	113.0	3.0
1-6 days ¹ -----	6.4	65.9	2.8
7 days-11 months ¹ -----	10.2	36.3	8.7

¹Based on calendar days since birth.

Table G. Infant mortality rates, by birth weight and cause of death: Denmark, 1954-55

Cause of death	Total	2,499	2,500
		grams or less	grams or more
		Rate per 10,000 live births of specified birth weight	
All causes-----	257.4	2,152.3	145.1
Infective and parasitic diseases----- (001-138, 340-344, 690-695, 765-768)	7.8	24.5	6.8
Influenza and pneumonia----- (480-493, 763)	25.3	76.9	22.3
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394, 400-475, 500-527)	8.1	18.6	7.5
Gastritis, duodentis, enteritis, and colitis, including diarrhea of newborn----- (543, 571, 572, 764)	8.1	22.3	7.2
All other diseases of digestive system----- (530-542, 544-570, 573-587)	2.3	8.2	2.0
Congenital malformations----- (750-759)	40.4	150.4	33.9
Birth injuries----- (760, 761)	30.7	186.6	21.5
Intracranial and spinal injury at birth----- (760)	27.1	162.1	19.1
Other birth injury----- (761)	3.6	24.5	2.4
Postnatal asphyxia and atelectasis----- (762)	41.1	472.2	15.5
Hemolytic diseases of newborn (erythroblastosis)----- (770)	5.6	33.8	3.9
Immaturity with mention of any other subsidiary condition, or unqualified----- (774, 776)	31.3	531.7	1.7
Other defined and ill-defined diseases peculiar to early infancy----- (769, 771-773)	39.4	593.4	6.5
Symptoms and ill-defined conditions----- (780-793, 795)	5.2	8.2	5.0
All other diseases----- (Residual)	5.8	15.2	5.3
Accidents----- (E800-E999)	6.3	10.5	6.0

Roughly 75 percent of the deaths of infants weighing less than 2,500 grams at birth were caused by postnatal asphyxia and atelectasis, immaturity, and other defined and ill-defined diseases peculiar to early infancy (table G). On the other hand, these same causes comprised only about 15 percent of the deaths in the higher weight group.

SEX

Age at Death

Tables 6 and 7 present infant mortality for the different ages at death from 1901 through 1962 for males and females, respectively. It appears from the tables that the decline in mortality has run parallel for males and females, the decline for each sex being greatest in the later part of the first year of life. Infant mortality for males was higher for each age of death. Earlier examinations have shown that the relation between the mortality for males and that for females has been constant at least since 1931.¹ This corresponds with the fact that the percent decline in mortality has remained of the same magnitude for both sexes. Therefore, all the observations from 1931 through 1962 can be pooled to show the percent excess of male over female infant deaths:

Under 1 year-----	32
Under 7 days-----	37
Under 1 day-----	34
1-6 days-----	40
7 days to 1 month-----	25
1-5 months-----	33
6-11 months-----	21

These data were derived using a method for obtaining optimal estimates used to characterize a population during a specified period of time.¹

The excess mortality of males reaches a maximum during 1-6 days and a minimum during 6-11 months after birth. The summary excess infant mortality amounts to 32 percent. For the period 1931-62 excess mortality for males amounted to 16 percent for stillbirths and 25 percent for perinatal deaths.

Cause of Death

The reduction in infant mortality for individual causes of death follows the same pattern for each sex, namely a marked decline for infective and parasitic diseases and diseases of the respiratory and digestive systems. Although the amount of excess male mortality differs from cause to cause, the decline in infant mortality has taken place in a uniform manner, so that the proportion of excess has remained substantially the same throughout 1931-62.

Because of the changing nomenclature of causes of death, it is possible to group all dead infants from 1931-62 only for cause-of-death groups 1-5 and 16 (table B). For the remaining causes, only the period 1951-62 can be used (table H). Within the various cause groups there were considerable variations from the average male excess infant and neonatal mortality of 32 and 35 percent, respectively. For infective and parasitic diseases excess mortality for males appeared to be higher during the first month of life than during the entire first year. In the case of all other diseases of the respiratory and digestive systems, symptoms and ill-defined conditions, accidents, and "all other diseases" the situation was opposite. As far as the rest of the causes are concerned, the excess was almost equal for mortality during the first month of life and during the total year.

Table C presents the distribution of still-born males and females by cause of death for the period 1956-60. Since distribution of the large number of ill-defined causes is the same for males and females, the table shows that a considerable proportion of excess mortality among males was due to placental and cord conditions (Y36).

Birth Weight

The distribution of liveborn males and females by birth weight shows that 5.3 percent of male and 6.0 percent of female births weighed under 2,500 grams in 1954-55 (table E). The average birth weights were 3,459 and 3,347 grams for males and females, respectively.

From one weight group to another mortality for males was higher than that for females. The

Table H. Percent difference of male over female infant and neonatal mortality rates, by cause of death: Denmark, 1931-62

Cause of death ¹	Infant mortality	Neonatal mortality
	Percent difference	
All causes-----	+32	+35
Infective and parasitic diseases----- (001-138, 340-344, 690-695, 765-768)	+17	+46
Influenza and pneumonia----- (480-493, 763)	+26	+22
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394, 400-475, 500-527)	+40	-1
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn----- (543, 571, 572, 764)	+42	+40
All other diseases of digestive system----- (530-542, 544-570, 573-587)	+80	+57
Congenital malformations ² ----- (750-759)	+19	+24
Birth injuries ² ----- (760, 761)	+71	+70
Intracranial and spinal injury at birth ² ----- (760)	+72	+73
Other birth injury ² ----- (761)	+59	+55
Postnatal asphyxia and atelectasis ² ----- (762)	+40	+42
Hemolytic diseases of newborn (erythroblastosis) ² ----- (770)	+84	+83
Immaturity with mention of any other subsidiary condition, or unqualified ² ----- (774, 776)	+26	+26
Other defined and ill-defined diseases peculiar to early infancy ² ----- (769, 771-773)	+35	+35
Symptoms and ill-defined conditions ² ----- (780-793, 795)	+56	+14
All other diseases ² ----- (Residual)	+35	+9
Accidents----- (E800-E999)	+26	+11

¹ The Seventh Revision for the International Classification of Diseases (1955) was used to classify causes of death for 1958-62; the Sixth Revision of the International Classification of Diseases (1948) for 1951-57; the International List of Causes of Death of 1938 for 1941-50; and the Inter-Scandinavian Nomenclature of Causes of Death of 1926 for 1931-40.

² 1951-62.

Table J. Percentage distribution of live births by sex and birth weight: Denmark, 1959

Birth weight	Male	Female	Birth weight	Male	Female
Total-----	100.0	100.0			
1,000 grams or less-----	0.3	0.3	3,501-4,000 grams-----	30.6	24.6
1,001-1,500 grams-----	0.6	0.7	4,001-4,500 grams-----	10.5	6.3
1,501-2,000 grams-----	1.5	1.5	4,501-5,000 grams-----	1.8	0.9
2,001-2,500 grams-----	4.1	4.9	5,001-5,500 grams-----	0.2	0.1
2,501-3,000 grams-----	15.7	20.8	5,501-6,000 grams-----	-	0.0
3,001-3,500 grams-----	34.7	39.9	6,001 grams or more-----	-	-

highest excess mortality was in the weight group 2,000-2,499 grams (68 percent) and the lowest was in the weight group 2,500-2,999 grams (26 percent). A more detailed distribution by birth weight for liveborn males and females in 1959 is shown in table J. This distribution makes possible a more accurate calculation of the average birth weight, which was 3,379 grams for male and 3,256 grams for female births. It can be seen that 6.5 and 7.4 percent of the liveborn males and females weighed 2,500 grams or less.

MARITAL STATUS OF THE MOTHER

Age at Death

Infant mortality follows the same general trend for babies born in and out of wedlock, declining the most in the later part of the first

year of life (table 8). However, mortality of illegitimate infants is higher at all ages and this excess mortality increased noticeably during 1942-47.¹ After 1947 it stabilized at a level lower than during 1942-47, yet at one higher than during 1931-41. For this reason infant deaths from 1951 through 1962 have been used to indicate percent excess mortality of illegitimate infants for each age:

Under 1 year-----	58
Under 7 days-----	77
Under 1 day-----	83
1-6 days-----	73
7 days to 1 month-----	62
1-5 months-----	24
6-11 months-----	2

The trend during 1931-62 for stillbirth and perinatal mortality by legitimacy is shown in

Table K. Percent difference in infant mortality rates for illegitimate over legitimate births, by cause of death: Denmark, 1951-52

Cause of death	Percent difference
All causes-----	+58
Infective and parasitic diseases----- (001-138, 340-344, 690-695, 765-768)	+17
Influenza and pneumonia----- (480-493, 763)	+21
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394, 400-475, 500-527)	+44
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn----- (543, 571, 572, 764)	+49
All other diseases of digestive system----- (530-542, 544-570, 573-587)	+9
Congenital malformations----- (750-759)	-
Birth injuries----- (760, 761)	+52
Intracranial and spinal injury at birth----- (760)	+47
Other birth injury----- (761)	+90
Postnatal asphyxia and atelectasis----- (762)	+107
Hemolytic diseases of newborn (erythroblastosis)----- (770)	-23
Immaturity with mention of any other subsidiary condition, or unqualified----- (774, 776)	+116
Other defined and ill-defined diseases peculiar to early infancy----- (769, 771-773)	+75
Symptoms and ill-defined conditions----- (780-793, 795)	+84
All other diseases----- (Residual)	+8
Accidents----- (E800-E999)	+109

¹ The Seventh Revision of the International Classification of Diseases (1955) was used to classify causes of death for 1958-62; and the Sixth Revision (1948), for 1951-57.

table 9. There was a considerable decline for both legitimate and illegitimate stillbirths and perinatal deaths. Still, during 1951-62 illegitimate infants had a higher mortality—20 percent higher in the stillbirth rate and 48 percent higher in the perinatal mortality rate.

Cause of Death

Mortality among both illegitimate and legitimate infants declined the most for deaths from infective and parasitic diseases and diseases of the respiratory and digestive systems. For practically every cause of death, during 1951-62 illegitimate infants showed a marked excess mortality, which was particularly prominent for post-natal asphyxia and atelectasis, immaturity, and accidents (table K).

Birth Weight

The distribution by birth weight of infants born in 1954-55 indicates that 5.3 and 9.5 percent of the legitimate and illegitimate infants, respectively, weighed less than 2,500 grams. The average birth weights were 3,418 grams for legitimate and 3,227 grams for illegitimate babies.

Mortality among liveborn illegitimate infants per 1,000 illegitimate live births was higher for all weight groups:

	<i>Legitimate</i>	<i>Illegitimate</i>
Total-----	24.8	38.8
Under 2,500 grams- 2,500 grams or more-----	211.5 14.3	244.6 17.1

The higher total mortality for illegitimate infants is, therefore, not solely due to the comparatively greater number of liveborn illegitimate infants weighing less than 2,500 grams.

INTERRELATIONSHIPS AMONG INFANT MORTALITY, MOTHER'S AGE, AND TOTAL-BIRTH ORDER

Total-Birth Order and Mother's Age

Earlier studies have shown that infant mortality is influenced by mother's age and parity.² However, these two factors are so closely inter-related that it is difficult to determine how much is contributed by each of the factors. In only a very few cases is it possible to analyze, for instance, the change in infant mortality at increasing maternal age for a fixed total-birth order. In most cases one has to be content with information which makes possible only an examination of the variation of mortality at increasing mother's age, whereby the distribution by birth order changes. Table L shows the percentage distribution of total births in 1951-53 by age of mother and total-birth order, which includes all previous live births, stillbirths, miscarriages, and abortions.

Age at Death

Infant mortality decreases from birth order 1 to 2, then increases for higher orders (table 10). This general trend is found in mortality for ages up to 1 month; whereas mortality for ages over 1 month increases after the first pregnancy. Furthermore, the relative difference between mortality of the lowest and highest birth orders is greatest in the last part of the first year of life.

As seen in the following data for 1954-55, the relationship between maternal age and infant mortality per 1,000 live births is rather weak:

All ages-----	25.7
Under 20 years-----	24.4
20-24 years-----	25.6
25-29 years-----	23.0
30-34 years-----	25.1
35 years and over-----	33.0

Table L. Percentage distribution of total births, by total-birth order and age of mother: Denmark, 1951-53

Total-birth order	Age of mother						
	All ages	Under 20 years	20-24 years	25-29 years	30-34 years	35-39 years	40 years and over
Total-----	100.0	100.0	100.0	100.0	100.0	100.0	100.0
First-----	33.0	83.8	52.3	26.7	12.4	7.1	6.0
Second-----	29.4	14.7	33.2	36.8	28.1	16.9	10.8
Third-----	17.9	1.4	10.7	21.2	26.8	23.9	17.0
Fourth-----	9.4	0.1	2.9	9.3	16.0	19.6	17.5
Fifth-----	4.8	0.0	0.7	3.7	8.4	13.1	13.9
Sixth and over-----	5.6	-	0.2	2.3	8.3	19.4	34.8

There does not seem to be a significant increase in mortality until mother's age 35 years and over.

The decline in the stillbirth rate from 1931-33 to 1960-62 amounted to about 50 percent. It was greatest for first births, 56 percent, and smallest for the highest order, 22 percent (table M).

Table M. Stillbirth rates, by total-birth order: Denmark, selected years, 1931-62

Total-birth order	1960-1962	1951-1953	1941-1943	1931-1933
Total--	12.3	18.3	21.7	24.2
First-----	12.5	20.9	24.9	28.6
Second-----	8.9	13.4	14.9	16.6
Third-----	11.6	15.8	19.4	17.4
Fourth-----	14.3	19.2	23.2	22.8
Fifth-----	19.1	21.4	22.4	25.9
Sixth and over-----	26.6	32.2	33.3	34.0

Cross-tabulation of stillbirths by age of mother and total-birth order is shown in table N. For the total and for each birth order the stillbirth rate decreases from mothers under 20 years old to mothers 20-24 years old, and increases for older mothers. Second births show a smaller stillbirth rate than do first births for each mother's age group. Stillbirths per 1,000 legitimate and per 1,000 illegitimate total births at fixed mother's age and birth order show considerable excess mortality for illegitimate births.

Cause of Death

The connection between birth order and cause of death for 1960-62 is shown in table 11. For a number of causes of death, infant mortality appears to be strongly related to birth order. In general, infants of birth orders 4 and higher have a greater chance of death. It is important to note that for some causes of death (in particular, birth injuries, postnatal asphyxia and atelectasis, and immaturity with mention of any other subsidiary condition, or unqualified), there is a lower mortality rate for birth order 2 than for 1. In these cases, mortality increases as birth order increases after the second birth.

Table N. Stillbirth rates, by total-birth order and age of mother: Denmark, 1951-53

Total-birth order	Age of mother						
	All ages	Under 20 years	20-24 years	25-29 years	30-34 years	35-39 years	40 years and over
	Rate per 1,000 total births of specified group						
Total-----	18.3	16.5	14.0	16.0	19.0	28.8	42.5
First-----	20.9	17.5	17.2	22.3	34.3	55.8	61.9
Second-----	13.4	10.3	10.2	12.2	16.0	25.5	45.4
Third-----	15.8	20.4	10.0	13.6	15.9	24.4	32.4
Fourth-----	19.2	-	12.1	14.9	17.1	24.5	41.8
Fifth-----	21.4	-	22.8	21.9	15.8	24.3	31.0
Sixth and over-----	32.2	-	18.9	20.1	22.7	34.5	48.2

Table O. Percentage distribution of live births, by age of mother, legitimacy, and birth weight; and average birth weight by age of mother and legitimacy: Denmark, 1954-55

Legitimacy and birth weight	Age of mother					
	All ages	Under 20 years	20-24 years	25-29 years	30-34 years	35 years and over
	Percentage distribution					
Total-----	100.0	100.0	100.0	100.0	100.0	100.0
2,499 grams or less-----	5.6	8.2	6.2	4.8	5.0	5.2
2,500 grams or more-----	94.4	91.8	93.8	95.2	95.0	94.8
Legitimate-----	100.0	100.0	100.0	100.0	100.0	100.0
2,499 grams or less-----	5.3	7.7	6.0	4.7	4.9	5.0
2,500 grams or more-----	94.7	92.3	94.0	95.3	95.1	95.0
Illegitimate-----	100.0	100.0	100.0	100.0	100.0	100.0
2,499 grams or less-----	9.5	9.5	9.7	8.9	11.1	8.4
2,500 grams or more-----	90.5	90.5	90.3	91.1	88.9	91.6
	Average birth weight in grams					
Total-----	3,405	3,256	3,342	3,426	3,468	3,512
Legitimate-----	3,418	3,277	3,352	3,431	3,474	3,519
Illegitimate-----	3,227	3,208	3,214	3,264	3,232	3,317

Table P. Infant mortality rates, by legitimacy, birth weight, and age of mother: Denmark, 1954-55

Legitimacy and birth weight	Age of mother					
	All ages	Under 20 years	20-24 years	25-29 years	30-34 years	35 years and over
	Rate per 1,000 live births of specified group					
Total-----	25.7	24.4	25.6	23.6	25.1	33.8
2,499 grams or less-----	215.2	195.7	206.1	227.8	204.3	251.8
2,500 grams or more-----	14.5	9.1	13.7	13.2	15.6	21.1
Legitimate-----	24.8	20.5	24.3	22.9	24.9	32.7
2,499 grams or less-----	211.5	180.0	199.8	224.9	204.0	248.1
2,500 grams or more-----	14.3	7.3	13.3	13.0	15.6	21.2
Illegitimate-----	38.8	33.0	42.4	43.6	38.9	43.3
2,499 grams or less-----	244.6	224.0	253.7	276.4	208.8	314.8
2,500 grams or more-----	17.1	13.1	19.8	20.8	17.8	18.5

Table Q. Percentage distribution of live births, by total-birth order, legitimacy, and birth weight; and average birth weight by total-birth order and legitimacy: Denmark, 1954-55

Legitimacy and birth weight	Total-birth order						
	Total	1	2	3	4	5	6 and over
	Percentage distribution						
Total-----	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2,499 grams or less-----	5.6	6.7	5.2	4.8	5.0	5.8	4.9
2,500 grams or more-----	94.4	93.3	94.8	95.2	95.0	94.2	95.1
Legitimate-----	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2,499 grams or less-----	5.3	6.2	5.0	4.6	4.9	5.7	4.7
2,500 grams or more-----	94.7	93.8	95.0	95.4	95.1	94.3	95.3
Illegitimate-----	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2,499 grams or less-----	9.5	9.8	8.2	10.1	7.4	11.1	10.6
2,500 grams or more-----	90.5	90.2	91.8	89.9	92.6	88.9	89.4
	Average birth weight in grams						
Total-----	3,405	3,290	3,419	3,470	3,505	3,524	3,571
Legitimate-----	3,418	3,304	3,420	3,475	3,509	3,530	3,578
Illegitimate-----	3,227	3,201	3,243	3,277	3,346	3,341	3,373

Table R. Infant mortality rates, by total-birth order, legitimacy, and birth weight: Denmark, 1954-55

Legitimacy and birth weight	Total-birth order						
	Total	1	2	3	4	5	6 and over
	Rate per 1,000 live births of specified group						
Total-----	25.7	25.6	21.8	25.6	27.9	33.1	39.3
2,499 grams or less-----	215.2	194.9	200.2	224.0	270.3	251.8	313.2
2,500 grams or more-----	14.5	13.5	12.1	15.7	15.2	19.6	25.3
Legitimate-----	24.8	23.7	21.2	25.2	27.7	32.5	39.0
2,499 grams or less-----	211.5	186.6	193.7	224.0	268.2	246.2	321.9
2,500 grams or more-----	14.3	12.9	11.9	15.6	15.3	19.7	25.2
Illegitimate-----	38.8	37.9	39.2	39.7	36.5	52.9	47.4
2,499 grams or less-----	244.6	229.3	306.6	223.7	321.4	347.8	206.9
2,500 grams or more-----	17.1	17.2	15.1	19.1	14.0	16.2	28.6

Birth Weight

As far as all live births are concerned, birth weight increases with increasing mother's age (table O). The proportion of live births less than 2,500 grams is especially reduced from mothers of ages under 20 years to those 25-29 years. Furthermore, the average weight at birth is lower for illegitimate infants for all ages of mothers, since the proportion of live births less than 2,500 grams is greater among illegitimate births. The relative increase in infant mortality at increasing maternal age intervals takes place primarily among live births weighing 2,500 grams or more (table P).

Average birth weight is increased at higher birth orders (table Q). The proportion of live births under 2,500 grams decreases noticeably from the first to third birth orders, but increases thereafter. The relative increase in mortality after the second birth occurs primarily among infants of 2,500 grams or more (table R). At constant maternal age by birth weight and con-

stant total-birth order by birth weight, mortality is, as a rule, considerably higher among illegitimate live births.

OCCUPATION OF FAMILY HEAD

Cause of Death

In table 12 data have been gathered to show infant mortality among different occupational groups by cause of death. Considerable differences appear from occupational group to group. While salaried employees and persons self-employed outside agriculture show that about 21.0 per 1,000 of the liveborn infants die within the first year of life, laborers both in and outside agriculture show 35.0 and 31.0, respectively, and the domestic workers show 43.4 (mainly illegitimate children). In general, each individual cause of death appears more frequently in the occupational groups with the higher overall infant mortality, i.e., laborers in agriculture, forestry, and fishing, and domestic workers.

Table S. Percentage distribution of live births and infant mortality rates, by birth weight and occupation of family head; and average birth weight by occupation of family head; Denmark, 1954-55

Occupation of family head	Total	2,499 grams or less	2,500 grams or more	Average birth weight
	Percentage distribution of live births			Grams
Total-----	100.0	5.6	94.4	3,405
Self-employed in manufacturing, construction, and commerce-----	100.0	5.0	95.0	3,419
Self-employed in professional services----	100.0	4.9	95.1	3,368
Salaried employees and public servants----	100.0	6.4	93.6	3,345
Self-employed in agriculture, forestry, and fishing-----	100.0	3.8	96.2	3,563
Laborers (excluding agriculture)-----	100.0	6.5	93.5	3,354
Laborers in agriculture, forestry, and fishing-----	100.0	5.0	95.0	3,447
Domestic workers, unknown, and unspecified-----	100.0	8.9	91.1	3,263
	Rate per 1,000 live births of specified group			
Total-----	25.7	215.2	14.5	...
Self-employed in manufacturing, construction, and commerce-----	20.8	194.1	11.6	...
Self-employed in professional services----	17.8	202.4	8.3	...
Salaried employees and public servants----	22.3	182.5	11.4	...
Self-employed in agriculture, forestry, and fishing-----	24.9	263.2	15.4	...
Laborers (excluding agriculture)-----	26.8	199.0	14.9	...
Laborers in agriculture, forestry, and fishing-----	33.3	279.1	20.3	...
Domestic workers, unknown, and unspecified-----	44.0	261.5	22.7	...

Birth Weight

Table S shows the distribution of live births in 1954-55 by birth weight for the various occupational groups, and also mortality for live-born children weighing 2,500 grams or more and less than 2,500 grams. Based on infant mortality the rank of the different occupational groups was, with one exception, the same in 1954-55 as in 1951 and 1953. The only difference is that, while children of self-employed in professional services had the lowest infant mortality rate in 1954-55

they had the second lowest in 1951 and 1953. The proportion of live births weighing less than 2,500 grams at birth varied from one occupational group to another. It was smallest among self-employed in agriculture and greatest among domestic workers and "unknown." The highest and lowest average birth weights were found in the same two groups, respectively.

The differences, with regard to infant mortality, from occupational group to group are most apparent among liveborn children of 2,500 grams or more. Mortality for liveborn infants weighing

less than 2,500 grams at birth was 29 percent higher among domestic workers and unknown occupations than among self-employed in professional services. At higher birth weights infant mortality was 173 percent higher.

SEASONAL VARIATION

The variation in infant mortality throughout the year for different ages at death is shown in table T. When analyzing seasonal variation of infant mortality by age at death, special calculations must be performed in order to minimize the effect of changing numbers of live births under risk. Deaths under 1 month are related to the number of live births in the same calendar month. However, infant deaths from 1-5 months in age for a particular calendar month are related to the number of live births in the previous 5 months. For instance, deaths which occurred in December are related to live births in July-November. Similarly, infant deaths of ages 6-11 months are regarded in relation to live births of the previous 6-11 months.

For deaths from 1-11 months in age there is a pronounced seasonal variation. Mortality reaches a minimum in the summer months and a maximum in the winter months. Stillbirths and perinatal deaths show a similar seasonal variation, although it is much less pronounced than that for deaths after the first month of life (table U).

The distribution of live births in 1954-55 by birth weight shows the smallest proportion of live births less than 2,500 grams in August, 4.9 percent. The highest proportion was in the winter months—6.5 percent in January. The highest average birth weight, 3,433 grams, occurred in October.

AREA OF RESIDENCE

The differences in infant mortality among the Capital, provincial towns, and rural districts^c

^cThe *Capital* is composed of 3 completely urban municipalities--Copenhagen, Frederiksberg, and Gentofte; *provincial towns*, of 88 completely urban towns and cities; and *rural districts*, of 1,260 municipalities, some of which are partly urban. In 1960 about 35 percent of the population in rural districts lived in suburban and urbanized areas of 1,000 inhabitants and more.

are small especially in recent years (table 13). Nevertheless, rural districts seem to show a slightly lower mortality. Infant mortality by age at death shows that mortality during the first week of life was lowest in the rural districts, whereas mortality *after* the first week of life was usually highest. Although in recent years the Capital has had a slightly lower rate of stillbirths, there is little difference among the three areas (table 14).

In order to examine a possible connection between degree of urbanization and infant mortality, the 88 provincial towns of the country have been divided into groups by number of inhabitants (table W). Examination of each group indicates that the size of town has apparently no influence on the infant mortality rate.

Further comparison of infant mortality in these three areas is shown in table 15. Here infant deaths in 1960-62 have been distributed by cause of death and age. In the first week of life the higher mortality in the Capital compared with that in rural districts and provincial towns is mainly due to congenital malformations, birth injuries, and postnatal asphyxia and atelectasis. On the other hand, influenza and pneumonia and, again, congenital malformations cause higher mortality in the provincial towns and rural districts *after* the first week of life.

DISCUSSION

Statistical appraisal of the decline in infant mortality after 1930 is especially a matter of illustrating whether the decline is due to the improved standard of living and medical progress or is due merely to changes in the composition and number of the births by sex, parity, residence, et cetera. Examination of this composition leads to the conclusion that distributions by sex, marital status, single or multiple births, and month of birth give small variations which have had only minor influence on the infant mortality. (See Appendix II for discussion of fertility.) The same is the case with changes in the mother's residence caused by urbanization, since the geographic variation of mortality is very slight.

Great changes, however, are seen in the distribution by birth order and today there is a much smaller number of births of higher birth orders,

Table T. Infant mortality rates, by age and month of death: Denmark, 1960-62

Month of death	Under 7 days ¹	Under 1 day ¹	1-6 days ¹	7 days to 1 month ¹	1-5 months	6-11 months
Rate per 10,000 live births of specified month						
January-----	148.8	53.6	95.2	17.5	9.6	3.5
February-----	138.4	45.4	93.0	29.2	8.9	3.6
March-----	140.6	45.1	95.5	20.4	8.4	3.7
April-----	107.9	45.8	62.1	15.8	8.2	3.2
May-----	130.1	52.1	78.0	14.1	7.7	2.2
June-----	140.6	50.5	90.1	24.5	6.5	3.2
July-----	148.7	56.1	92.6	14.9	4.4	1.6
August-----	133.8	47.4	86.4	19.3	4.2	2.0
September-----	127.0	50.3	76.7	22.3	5.3	2.7
October-----	160.4	52.4	108.0	23.8	5.6	2.2
November-----	149.9	55.0	94.9	22.5	7.0	2.2
December-----	147.4	49.3	98.1	25.8	9.2	2.9

¹ Based on calendar days since birth.

Table U. Stillbirth and perinatal mortality rates, by month of death: Denmark, selected years, 1931-62

Month of death	1960-62		1951-53		1941-43		1931-33	
	Still-birth rate	Perinatal mortality rate	Still-birth rate	Perinatal mortality rate	Still-birth rate	Perinatal mortality rate	Still-birth rate	Perinatal mortality rate
Rate per 1,000 total births of specified month								
Total-	12.3	26.0	18.3	34.3	21.7	39.5	24.2	45.4
January---	14.0	28.7	20.1	37.5	25.5	46.7	26.8	50.8
February--	13.0	26.6	20.2	36.5	23.5	42.7	26.7	47.2
March-----	11.9	25.8	18.1	33.8	21.9	38.9	22.5	44.1
April-----	10.5	21.1	17.0	32.8	21.2	38.4	22.8	42.9
May-----	12.5	25.3	18.3	32.9	21.7	39.7	21.5	42.9
June-----	12.6	26.5	17.2	33.7	22.0	38.1	24.6	48.7
July-----	11.4	26.1	16.9	33.2	20.2	39.7	23.9	43.5
August----	12.4	25.6	17.3	33.2	18.6	37.0	22.5	42.9
September-	12.1	24.6	16.8	30.7	19.8	36.0	22.2	41.1
October---	11.8	27.6	17.5	34.3	21.3	38.6	26.8	47.5
November--	12.4	27.2	19.4	36.1	23.7	41.3	24.7	46.7
December--	13.1	27.7	20.4	37.1	21.5	39.0	26.8	48.1

which have the highest mortality. In itself this change causes a decline in the mortality. Calculations show, however, that the change would

cause a decline of only 5 percent from 1931-35 to 1960-62, whereas the real decline totaled 70 percent.

Table W. Stillbirth, perinatal, and infant mortality rates, by age and size of town: provincial towns, Denmark, 1960-62

Size of town	Perinatal mortality rate	Stillbirth rate	Infant mortality rate		
			Under 1 year	Under 7 days ¹	7 days-11 months ¹
	Rate per 1,000 total births of specified size of town		Rate per 1,000 live births of specified size of town		
Total-----	27.3	12.6	22.3	14.9	7.4
Under 2,000-----	25.5	12.7	19.9	12.9	7.0
2,000-3,999-----	26.3	10.7	24.9	15.7	9.2
4,000-5,999-----	28.9	13.9	23.1	15.1	8.0
6,000-9,999-----	27.5	12.4	23.4	15.2	8.2
10,000-19,999-----	27.8	13.3	21.3	14.3	7.0
20,000-29,999-----	28.5	11.9	23.3	16.8	6.5
30,000-49,999-----	26.2	10.8	23.3	15.5	7.8
50,000 or more-----	26.4	13.0	20.9	13.5	7.4

¹Based on calendar days since birth.

PART II. STILLBIRTH AND MORTALITY DURING FIRST WEEK OF LIFE FROM AN OBSTETRICAL POINT OF VIEW

The reasons for the decline in the relative number of stillbirths and deaths up to the age of 1 year from 1901 to 1962 are not only manifold, but also intermixed, sometimes positively correlated, sometimes negatively. Thus, it is hardly possible to determine the proportional importance of each single factor. However, to facilitate discussion, the reasons have been divided into two main groups—demographic and medical factors.

DEMOGRAPHIC FACTORS

In a country like Denmark the population is homogeneous and has changed little for years. With very few exceptions, everyone belongs to the Lutheran State Church. In spite of growing urbanization during the last 30 years, after 1943 there have been only small differences in infant mortality among the three geographical groupings—the Capital, the provincial towns, and the rural districts. The size of town does not seem to have influenced the mortality in any way. (See Appendix III for detailed demographic description of Denmark.)

Economy, social standards, occupation, upbringing, and education are more or less knit together and, likewise, are connected with family size and the size and sanitary standard of the dwelling unit; the better the conditions, the less the mortality. Milieu, upbringing, and education influence pregnant women, so that the better the background, the better the outcome of pregnancy.³

Marital status has a visible influence on infant mortality. Although unmarried mothers generally are younger and have lower parity numbers than do the married, their infants have a higher mortality rate, supposedly because relatively more of the unmarried mothers have poor demographic and medical conditions.

The pregnant woman's build, especially her height, also influences the outcome of pregnancy. Both perinatal mortality and the incidence of low birth weight infants are less for women taller than 160 centimeters (63 inches).^{4,5} The same

favorable conditions are found for women with heart volume of more than 600 milliliters and hemoglobin concentration of more than 75 percent.^{6,7}

The mortality rate is higher for multiple than for single births, first and foremost because about 50 percent are births of low weight opposed to 5 to 9 percent for single births, and because the number of complicated pregnancies and deliveries is higher for multiple births. Although the incidence of multiple pregnancies is small, the decline in multiple births during the last 30 years caused by changes in distribution by mother's age and parity has some importance for the total infant mortality rate.

Excess mortality for males plays no significant part in the decline in the mortality rate from 1931-62. During these years the relative number of male and female births was the same, and the relationship between infant mortality for males and females has been constant.

MEDICAL FACTORS

Medical factors associated with reduced infant mortality are extremely comprehensive. They involve obstetric and pediatric care and prophylaxis, and also care and prophylaxis within all medical branches both prior to and during pregnancy. Thus, the general health of the whole population is of great importance. The medical factors may be divided into those before pregnancy, during pregnancy and delivery, and during the first week of life. (See Appendix IV for description of the Danish health system.)

Factors Before Pregnancy

The still improving development of the health organization in connection with extended welfare work and health education have the effect that each pregnant woman needs to show a minimum of initiative in order to obtain prophylactic, therapeutic, and economic help. For example, treatment of venereal diseases is obligatory.

Preventive health control (for instance, control of tuberculosis, care of infants and school children, and discovery of the source of venereal infection), immunizations, sex education, information on appropriate diet, on vitamin and iron supply, on tobacco and alcohol excess, and on other topics in connection with shortened working hours, public inspection of factories and workshops, better wages, and so forth, have helped the health of the population to improve constantly.

Often investigations of causes of premature delivery make it possible to correct problems before the next pregnancy. For instance, surgical reconstruction of the uterus, removal of uterine tumors, and care of inadequately treated general diseases improve conditions for the next pregnancy. Planned parenthood also improves results. The influence of mother's age, parity, and marital status has been discussed. Elderly women run a greater risk of having complicated deliveries and of developing diseases triggered by pregnancy. High parity is more frequently connected with abnormal fetal presentation, and thus complicated delivery. The interval between deliveries also plays a part, such that the number of low birth weight babies is less when the interval is more than 2 years but less than 6 years.⁸

Information on contraception is recommended when the woman's health is unsatisfactory, even though temporarily, because of chronic diseases, hereditary disease, and recurrent severe diseases arising during pregnancy. It is also recommended as a means of planned parenthood. If a population as a whole is contraceptive minded, this may influence infant mortality favorably. However, the result will be unsatisfactory from a social point of view if contraception is used only by the better-off part of the population.

Another prophylactic measure is sterilization. The first Danish law permitting sterilization was enacted in 1929. Under the law of 1934, according to certain provisions, sterilization may be undertaken on mentally deficient persons, and, under a 1935 legal act, on other psychically abnormal and normal persons. In 1956 a special law was enacted to permit sterilization for eugenic indications when a legal abortion is performed. Sterilization may also be undertaken for purely medical indications, such as disease of the genital system, and also for women when

pregnancy aggravates a chronic disease, or when a severe disease caused by pregnancy reoccurs.

The total number of sterilizations in Denmark is not known. During the first 4½ years after the enactment of the law of 1934, 994 sterilizations were performed on feeble-minded persons (680 on females and 314 on males);⁹ and in a report on sterilization and castration¹⁰ it is mentioned that during the 14 years from 1949-62, 1,963 sterilizations were done (1,414 on females and 549 on males). While during the first years the average was 220 sterilizations per year (150 females and 70 males), the average during the last 7 years has been only 94 per year (71 females and 23 males). The number of sterilizations performed under the acts of 1935 and 1956 are available only for 1957-59; about 351 females and 50 males per year were sterilized. An average of 1,898 women per year were sterilized for medical reasons.

Castration was made legal in 1929, with an amendment to the act in 1935. From 1929-61, 943 castrations were performed, among them, five on women.¹¹ The operation has been performed on feeble-minded persons, psychopaths, sexually abnormal persons, and lunatics; more than 80 percent of these had committed a sexual crime before the operation.¹²

Factors During Pregnancy and Delivery

Hand in hand with therapy, prophylaxis is of great importance. Factors of preventive care may be divided into antenatal care, legal abortion, development of obstetric departments, progress in medical knowledge and ability, and also changed views as to methods of delivery.

Antenatal care.—Antenatal care has been improving throughout the 20th century. Since 1945 all women have been allowed nine free consultations during pregnancy. Three of these visits are with a physician—as early as possible, in the 25th week, and in the 34th to 36th week—and the other six with a midwife in the 20th, 30th, 33d, 37th, 38th, and 39th weeks. When related to the number of live births, the ratio of pregnant women taking advantage of these free consultations has been growing over the last 16 years.¹³ The ratio of first visits to physicians by women

for prenatal care per 100 live births has increased from 1946 to 1962:

1946-----	75
1947-51-----	80
1952-56-----	93
1957-61-----	99
1962-----	102

In 1962, the number of women making their first visits to physicians exceeded the number of live births, since some pregnancies result in other than a live birth.

Among women who make the first prenatal visit to physicians, greater percentages are making subsequent second and third visits to physicians, as well as visits to midwives:

<i>Year</i>	<i>Second and third visits to physicians</i>	<i>Visits to midwives</i>
1946-----	63	52
1947-51-----	68	55
1952-56-----	72	57
1957-61-----	75	60
1962-----	77	63

It should be added that a small part of the pregnant women do not make use of this privilege, but prefer, for some reason or other, to consult a specialist or an obstetric department.

Besides the routine examinations (weight, blood pressure, hemoglobin, urine, and pelvic measurement) the Wassermann test is done, and since 1958 the rhesus type has been determined early in pregnancy. Furthermore, rhesus-negative women are examined for anti-D, and if no antibodies are present, other examinations are made in the 34th and 36th weeks. If anti-D is found, the woman is referred to a special obstetric department.

Under the provisions of various acts all working women are granted leave around the time of delivery. Civil servants are given 6 weeks after the delivery with full pay (and any amount of time prior to delivery if unable to work), salaried employees ("white-collar" employees), 3 months prior to delivery and 2 months after with half pay, and those paid by the week ("blue-collar" workers),

8 weeks prior to delivery and 6 weeks after, during which time they receive a per diem of approximately \$4. Members of the sick benefit clubs are given half a liter of free milk daily from the 12th week of pregnancy and one liter (1.0567 quarts) for 6 months after birth, if the child lives.

Legal abortion.—Even before 1939 legal abortion was permitted on medical indication though only to a small extent; since 1932 it has been the physician's duty to report abortions to the National Health Service. After October 1, 1939, abortion has been allowed only under the provisions of the act of 1937 (amended in 1956). Table 16 shows the frequency of intervention as well as the number of births, the number of hospitalized spontaneous and illegal abortions, the estimated number of nonhospitalized abortions, and the estimated number of ectopic pregnancies.

Before the act of 1939 legal abortion was mainly performed on medical indication, although a small part (2.5 percent) was based on eugenics.¹⁴ After 1939 abortion has been mostly done to prevent serious danger to the woman's life or health. The danger must not necessarily be from a disease as such, but may be of a physical or psychical nature.¹⁵ This is further underlined in the act of 1956 by the following amendment: "When judging the danger one must on the basis of an estimate of all facts, including the conditions under which the woman is living, consider not only the physical or psychical disease in itself but also a present or imminent physical or psychical weakness."

After the 1939 law about 20 percent of the women who applied were granted permission for legal abortion. Since then the percentage has been evenly increasing and during the last 5 years it has been between 45 and 50 percent.¹⁶ Between 80-85 percent of the abortions are performed in cases of danger to the mother's health. About 75 percent of the women having abortions are married, about 10 percent, unmarried, and about 15 percent, formerly married.¹⁷

Development of obstetric departments.—The first obstetric department in Denmark was founded in Copenhagen in 1750 and the first hospital for treatment of patients with a chance of recovering was founded in 1757. During the next 200 years more and more hospitals were built but new obstetric departments were not established until much later. In 1931 there were only 8 obstetric

departments, 6 of them in the Capital; in 1962 the number had increased to 16, including 7 in the Capital. This decentralization has made obstetric treatment available all over the country not only for pathological cases, but also for those which are potentially dangerous.

It is estimated that in 1931 a little less than 90 percent of the births were home deliveries, 2-3 percent deliveries at private clinics, about 2 percent at general hospitals, and around 8 percent in obstetric departments. A midwife was present at practically all deliveries. Only one-seventh of the home deliveries were attended by a physician. At hospitals physicians were always available.

In 1962 there were 46 percent home deliveries, 10 percent deliveries at private clinics, 21 percent at general hospitals, and 23 percent in obstetric departments. Again, a midwife was present at practically all deliveries. Physicians were always available at hospitals and were present at three-quarters of the home deliveries.

It should be mentioned that midwives have been trained in Denmark since 1714. Originally the training lasted 1 year; from 1927-39, 2 years; and since 1940, 3 years. Training includes both theory and practice. Consequently Danish midwives are well qualified. For medical students, training in obstetrics has been obligatory since 1761, and an examination in obstetrics has been required since 1788.

In 1962 there were 362 midwives employed by the government and 271 private practicing midwives. Both assist at home deliveries or accompany their patients to an obstetric department. In addition, 53 midwives were employed at obstetric departments.

Progress in medical knowledge and ability.—Obstetrics has been influenced by progress in medical knowledge and ability. Antenatal care allows the physician to intervene at an early state, if small deviations from the normal are found. Uterotonics, blood transfusions, antibiotics, serological examinations, anesthetics, and so forth have been of great importance during the last 30 years. During the 1960's hormonal estimations have become routine in antenatal care. Estrogen analyses are especially helpful as a means of avoiding stillbirths, infant deaths, and permanent damage to infants.

Methods of delivery.—Attitudes toward and knowledge of methods of delivery have also changed. During the last 30 years maternal mortality in connection with cesarean section has practically disappeared so that now it does not exceed the maternal mortality for vaginal deliveries. Therefore, cesarean section can now be indicated not only in the interest of the mother, but also solely for the sake of the infant. This is extremely important, since retrospective child examinations have shown that difficult deliveries may cause not only dead infants, but also permanent damage to surviving infants. Prophylactic and therapeutic interventions at threatening premature delivery are of great importance, as the premature infants form an increasing proportion of stillbirths as well as infant deaths.

Factors During the First Week of Life

As regards the treatment of the newborn infant, medical progress is important for all asphyctic, premature, rhesus-affected, and other sick infants. The recently instituted cooperation of pediatricians in obstetric wards has proven very valuable.

LOW BIRTH WEIGHT INFANTS

From 5 to 9 percent of the live births are of low birth weight. Before the influence of medical factors on the decline in stillbirths and perinatal mortality is assessed, it shall be demonstrated how much low birth weight babies influence infant mortality. Unfortunately neither the Danish medical statistics nor the publications from the Statistical Department have trend data on this problem. The Swedish Medical Service,¹⁸ however, gives figures for 1948-62 (well over 125,000 down to almost 110,000 births per year for all Sweden), and figure 3 has been drawn on the basis of these figures. Even though the incidence of low birth weight infants has been increasing somewhat in the period mentioned (from 4.0 to 5.0 percent), it is evident that their share in the stillbirths, perinatal mortality, and mortality in the first week of life has gone up very much during the 15 years in question, i.e., from 35 to 50 percent, 44 to 58 percent, and 59 to 70 percent,

respectively. In Denmark the increase in the proportion of low birth weight infants among perinatal and infant deaths is known only for stillbirths, viz., from 41 to 59 percent.¹³

The direct cause of this increase in Sweden is illustrated in figure 4 where the percent decrease in mortality since 1948 is given for stillbirths and deaths in the first week of life for all infants, for infants of 2,500 grams or less, for infants of 2,501 grams or more,

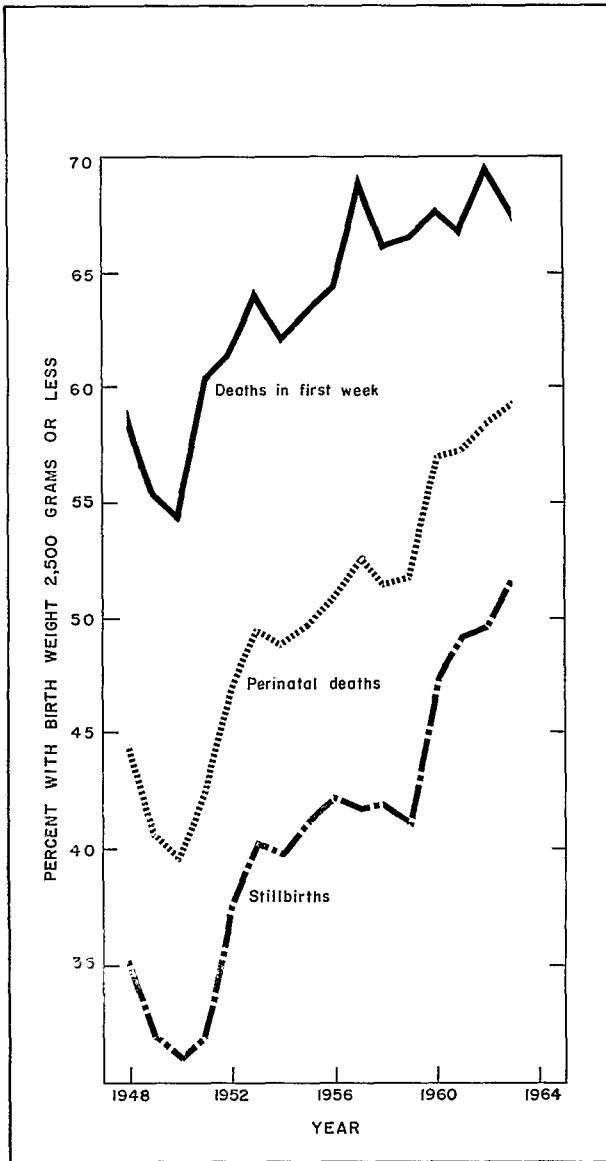


Figure 3. Percent of stillbirths, perinatal deaths, and deaths in the first week of life with birth weight of 2,500 grams or less: Sweden, 1948-62.

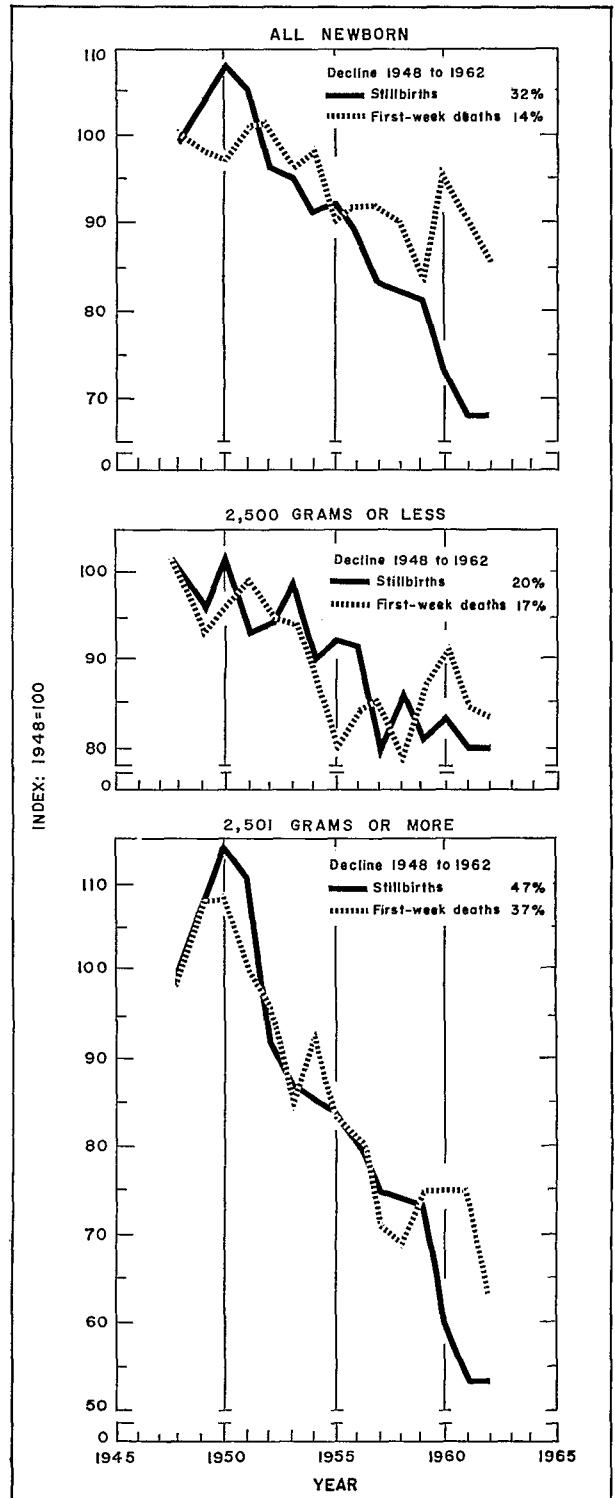


Figure 4. Yearly indexes of stillbirth rates and death rates in the first week of life, by birth weight: Sweden, 1948-62.

and for infants of 2,501 grams or more. The perinatal mortality rates dropped 26, 17, and 44 per cent, respectively.

FACTORS IN THE DECREASING RATES DURING THE PERINATAL PERIOD

Figure 5 illustrates the stillbirth rate, perinatal mortality rate, and the rate for mortality in the first week of life over the last 30 years. On

the whole both the stillbirth rate and the mortality rate for the first week of life have been unchanged through 1940. Thereafter, a clear drop is seen. Thus, unexpectedly, before 1940 the favorable changes in demographic and medical factors in this century have affected neither the stillbirth rate nor the mortality rate in the first week of life.

With respect to the sudden drop after 1940 neither demographic factors nor general improvement of the health of the population has changed so remarkably that these circumstances can explain the decline. Neither are planned parenthood and

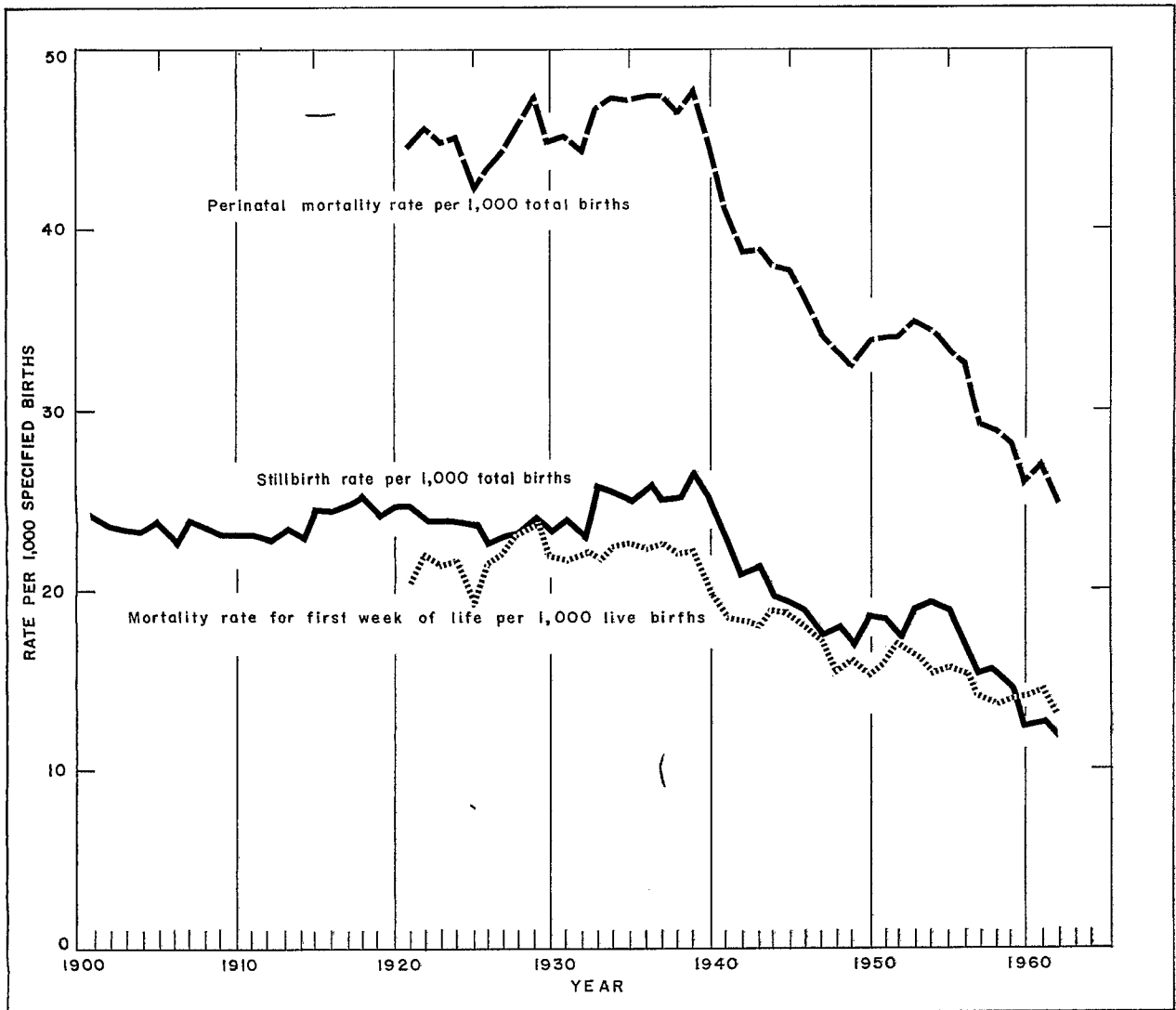


Figure 5. Stillbirth rates, mortality rates in the first week of life, and perinatal mortality rates: Denmark, 1901-62.

contraception explanations, since these prophylactic measures did not increase in a sudden and violent manner after 1940. Sterilizations were performed before 1940, and although the exact number over the years is not known, there is no basis for believing that a changed attitude toward this operation occurred after 1940 resulting in a sudden increase of sterilizations. Free antenatal care and the establishment of more obstetrical departments did not begin until after 1945, and apart from this, their favorable influence on the mortality would not have caused a sudden drop.

The number of legal abortions¹⁹ is seen in table 16. The relative number has been small and, from 1936 to 1941, constant. Thereafter a rather even but steep ascent is seen until 1955; the ratio of abortions increased from 7.1 in 1941 to 69.4 per 1,000 total births in 1955, an increase of 877 percent. Since then the rate has decreased from 69.4 to 50.8 per 1,000 total births in 1962, a 27 percent decrease.

It is difficult to determine how much legal abortions have influenced the rates, but the following points to the conclusion that they have not caused the decline in perinatal mortality after 1940. First, the decrease in perinatal mortality set in before legal abortions increased; second, mortality went up during the years 1950-54 in spite of the legal abortions reaching their maximum in these years; and third, mortality again declined after 1954 while simultaneously legal abortions were declining.

Progress in medical knowledge and ability, especially regarding obstetrics and pediatrics, and the changed attitude toward methods of delivery have, of course, contributed to the decline in mortality, but the progress has not been so remarkable that it explains the sudden decrease after 1940. Of course, one must consider the sulfanilamides, but these were in use as early as 1938; furthermore, stillbirths account for two-thirds of the decrease in the perinatal mortality rate after 1940.

In order to find an explanation for the decrease in stillbirths and deaths during the first week of life after 1940 a detailed examination is needed. For this purpose figure 6 has been drawn. Only the perinatal mortality rate is shown because the stillbirth rate and the mortality rate for deaths in the first week of life follow the same pattern.

The decrease in the mortality rate is present over the years from 1941-49 and 1955-62, whereas there was a small increase from 1950-54.

Perinatal Mortality, 1941-49

The years from 1941-49 are notable because they include both the World War II period with German occupation, blackout, curfew, underground activity (many households sheltered persons unknown to them), food rationing, and so forth, and the postwar period. Nevertheless, the perinatal mortality rate dropped from 44.7 (1940) to 32.5 (1949) per 1,000 total births, i.e., 27 percent.

Figure 6 shows the following characteristics for 1941-49. The birth rate increased evenly until 1946, and declined thereafter. The maximum increase in the birth rate was 28 percent. The proportion of low birth weight infants went down during most of the period, and the drop was considerable, from 81 (1940) to 46 per 1,000 total births, i.e., 43 percent. During the War the number of illegitimate births increased from 88 to 99 per 1,000 total births (13 percent), followed by a decline after the War to 74 (25 percent).

While a likely explanation can be given for the decrease in perinatal mortality since 1942, it has not been possible to explain the decrease in 1941 (and perhaps 1940). An analysis for 1941 shows that the decrease is seen for both the stillbirth rate and the mortality rate in the first week of life for infants of married and unmarried women. The birth rate, the relative number of low birth weight infants, the distribution of births by mother's age and parity,²⁰ the relative number of legal abortions, the proportion of legitimate and illegitimate births, and the proportion of male and female births have all been nearly the same as in the preceding 2 years. It is strange that Norway, Sweden, the Netherlands, and England and Wales have a similar sudden drop in 1941.²¹

However, the continued decrease in the perinatal mortality rate between 1942 and 1949 can be explained solely from the decrease in the relative number of low birth weight infants. If the proportion of low birth weight babies had been unchanged up to 1949 the perinatal mortality rate would have been on a level or rather have increased a little. The reason why the relative number of low birth weight babies went down during the War is pre-

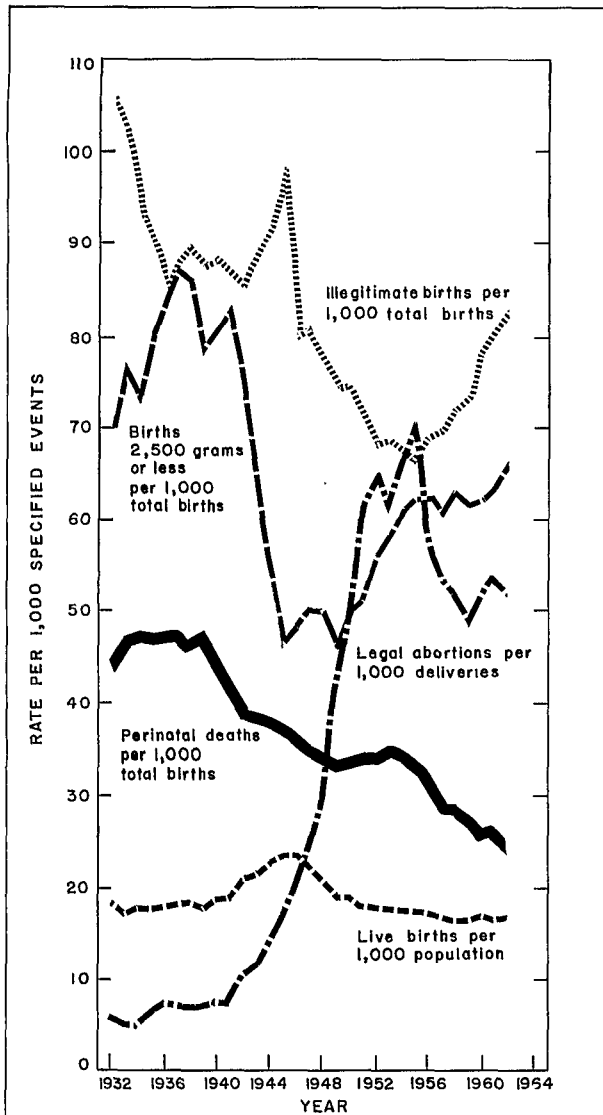


Figure 6. Selected rates associated with birth and with perinatal mortality: Denmark, 1932-62.

sumably connected with the big increase in the birth rate. This increase is probably due to the previously mentioned changes in the daily life during the War. An otherwise hidden healthy reserve of married as well as unmarried women was brought to light. This may explain that although the incidence of births to unmarried women rose during the War, the incidence of low birth weight babies unexpectedly went down. Possibly also changes in diet on account of food rationing played a part. The change in parity numbers for

married as well as unmarried parturients, on the other hand, cannot explain the decrease in the low birth weight infants. Although the relative number of primiparae dropped by 15 percent, while secundiparae and tertiparae increased 13 and 20 percent, respectively,²⁰ a calculation shows that this would lower the percentage of low birth weight babies only 0.1. The proportion of higher parity numbers is small and changes over the years in question are not important.

Perinatal Mortality, 1950-54

The years 1950-54 were stable with good socioeconomic conditions and no unemployment. Perinatal mortality increased a little from 32.5 (in 1949) to 34.4 (in 1954) per 1,000 total births (6 percent). The birth rate decreased slightly (8 percent). The number of low birth weight infants increased once more from 46 to 61 per 1,000 total births—33 percent. The decrease in the number of illegitimate births continued from 74 to 67 per 1,000 total births—9 percent.

If the number of low birth weight infants had not increased and all other conditions had remained stationary, the perinatal mortality rate would have shown a small decline. The increase took place in spite of the continued decrease in the relative number of births to unmarried mothers, and in spite of an unchanging relative number of births by parity.

Perinatal Mortality, 1955-62

The period from 1955-62 was equally favorable, but in addition more intensive obstetrical care was activated and examinations for rhesus antibodies were performed on all pregnant women. Perinatal mortality declined from 34.4 (1954) to 24.9 per 1,000 total births (28 percent). The birth rate hardly changed, but the number of low birth weight infants increased slightly from 61 to 66 per 1,000 total births (an increase of 8 percent). Illegitimacy rose once again from 67 to 83 illegitimate births per 1,000 total births (24 percent).

The decrease in the perinatal mortality rate, which occurred in spite of the simultaneous increase in the relative number of low birth weight babies and also of illegitimate births, is most

likely due to better utilization of antenatal care and the establishment of new obstetrical departments, progress in medical knowledge, and changed views of methods of delivery. Kaern²² has shown the importance of the obstetrical departments and antenatal care. By dividing Denmark into four geographic zones with approximately the same number of births, he found the stillbirth rate during the 3-year period 1954-56 smallest for zone I (Greater Copenhagen), 16 per 1,000 total births, and largest for zone IV (North and West Jutland), 20 per 1,000 total births. Perinatal mortality examined for the year 1956 was lowest in zone I, 31 per 1,000 total births, and highest in zone IV, 36 per 1,000 total births. The infants were divided into two groups, one weighing over 2,500 grams and the

other weighing 2,500 grams or less; and the perinatal mortality in zone I was found to be 11 and 278 per 1,000 total births, respectively, while in zone IV it was 19 and 339. According to Kaern the explanation is that zone I had adequate obstetrical service—77 percent of the deliveries took place in obstetrical departments and antenatal care was utilized to a large extent. Zone IV had no obstetrical departments or practicing specialist. Only 17 percent of the deliveries took place at general hospitals, and antenatal care was not greatly utilized. A similar conclusion that adequate obstetrical service and antenatal care lead to lower stillbirth and perinatal mortality was reached in another study based on a selected small section of Denmark.²³

PART III. PEDIATRIC CONSIDERATIONS ON MORTALITY AFTER THE FIRST WEEK OF LIFE

The portion of the population in need of pediatric assistance has been approximately constant during the last 30 years, since the age group under 15 years has declined only from 27.5 to 25.1 percent. An important change in living conditions has resulted in a steady decline in infant mortality from 134 infant deaths per 1,000 live births in the beginning of the century to 20 in 1962. Incidentally, the rate is still declining and in 1964 was only 18 per 1,000 live births. The only period in which there seems to have been some stagnation in decline was during World War II. In other words, while at the turn of the century every 7th child of all liveborn infants died during the first year of life, by 1962 every 50th child in the same age interval died.

PEDIATRIC CARE

The decrease in infant mortality can undoubtedly be explained partly by changes in family structure (for instance, the higher incidence of marriage and fewer children per married couple), partly by improved standard of living, and partly by development of health organizations. Since health organizations will be discussed later, only a few words will be added here about preventive care for children.

The first hospital for children was founded in 1850, but was actually of importance to few children. In 1931 there were seven pediatric departments, five of which were independent, and only one of the seven was outside the Capital. In 1962 the number of departments had increased to 10, with 4 of these outside the Copenhagen area; however, only one small department for pediatric surgery had been established.

Under the provisions of a law enacted in 1908 local Child Welfare Authorities were established, especially because of the high infant mortality rate among illegitimate children. Also because of the high infant mortality, especially in Copenhagen, the United Nursing Help of the Copenhagen Parishes established in 1908 a number of infant care centers where the mothers could bring their

infants, and later also preschool children at some places, for health examinations. These infant care centers have been established in few municipalities outside Copenhagen. The centers were subsidized in 1937 by the introduction of the law on visiting public health nurses. At that time 33 percent of the children in the municipality of Copenhagen were examined at the centers; by 1945 the proportion had increased to 80 percent. Nevertheless the infant care centers have had decreasing importance since 1946, with the enactment of a law providing free examinations of all preschool children by general practitioners. These examinations are given at the age of 5 weeks and 5, 10, and 15 months, and around the following 5 birthdays of the child—nine examinations in all. At these consultations (especially the second, third, and fourth), among other things the physician will immunize free of charge against diphtheria, tetanus, pertussis, and poliomyelitis. In 1949, 50 percent of the children were examined, 66 percent in towns and 41 in rural districts, but with a considerably higher proportion of infants than of preschool children. The figures for 1961 are 63, 67, and 60 percent, respectively.

Until 1941 few persons were immunized against diphtheria, but in 1943 immunization became general and in 1962, 88 percent of the children were sufficiently immunized when they reached school age. Tetanus vaccine was added in 1950. General pertussis immunization was not started until 1961, and poliomyelitis immunization was begun in 1956. Nowadays few infants are immunized against tuberculosis, but at school age 44 percent of the children have been BCG-immunized. This immunization takes place almost solely at the chest clinics. Since the last century smallpox immunization has been compulsory, and over 99 percent are carried out before school age.

The work of the visiting public health nurses had already begun in certain areas, especially in the municipality of Copenhagen, some years before 1937, but they supervised only infants who, mainly because they were illegitimate, were under supervision of the Child Welfare Authorities.

Since 1937 there have been increasing numbers of public health nurses in this country (658 in 1962). In 1945, 50 percent and in 1962, 68 percent of Danish infants were supervised by health nurses. However, only about one-third of the country is covered by this service. In 1962, 99.1 percent of the families who had this kind of nursing supervision available to them received the complete series of home visits. Homes are visited 10 times during the first year of life with frequent visits in the first months. Furthermore experimental supervision by health nurses of children until the age of 3 years has been introduced in some places.

The health nurse weighs and measures the infant, and if symptoms of illness should be present, refers the infant to a physician. However, the health nurse may give advice regarding skin infections and digestive troubles. It is the health nurse's duty to give the mother instruction on nutrition and vitamin dosages and especially to try to keep the breast feeding going as long as possible. At present, investigations seem to show that 10 percent of the infants are not breast fed or are nursed only a few days. After the age of 3 months 60 percent are still nursed, but only 10 percent solely; after the age of 6 months 30 percent are partly, while almost none are only breast fed. In 1963 the duty of examining the urine of the infant sometime in the first weeks of life for phenylketonuria (Følling's disease) was imposed on the health nurses. In districts without visiting health nurses the screening must be done by the physician when the 5-week-old child is brought for his first health examination.

MORTALITY AFTER THE FIRST WEEK OF LIFE

In 1921 mortality after the first week of life accounted for 74 percent of the total infant mortality, whereas in 1962 it was only 34 percent. Figures for mortality after the first month are 60 and 24 percent of the total. In the age group 7 days to 1 month, where data are available since 1921, mortality was almost unchanged up to 1930—10.7-9.4 per 1,000 live births—but since then there has been a steady decline to 2.1 in 1962, i.e., a drop to less than one-fifth of the 1921 rate. In the age

group 1-5 months mortality was 60 per 1,000 live births at the beginning of the century. The decrease seems to have been almost constant from year to year, and by 1930 the mortality rate was almost cut in half (32 per 1,000 live births). Since then it has fallen to one-tenth (3.1): a total drop to one-twentieth of the rate in the beginning of this century. The age group 6-11 months shows an identical decline: from 33 in 1901 down to 17 in 1930, and to 1.6 per 1,000 live births in 1962.

The reason for the big difference in the decrease is probably that the causes of death after the first month of life differ from the causes during the last 3 weeks of the first month of life, which in turn differ from the causes of death in the first week of life. Deaths from hemolytic diseases, postnatal asphyxia and atelectasis, birth injuries, and immaturity occur mainly in the first month of life (table 4) and especially in the first week. The decrease has been rather moderate, and deaths from postnatal asphyxia and atelectasis have even increased, although this undoubtedly is due to a mere change in registration.

Table 5, which includes specified causes of death for the age group over 1 month, illustrates clearly the influence of the introduction of sulfanilamides, penicillin, and other antibiotics on influenza and pneumonia. Postneonatal mortality from influenza and pneumonia, from gastritis and duodenitis (in this age group mainly infections of the digestive tract), and from infective and parasitic diseases has in the last 30 years decreased to about one-twenty-fifth the 1931 rate, which is considerably better than the decrease for all causes down to less than one-tenth. As for other causes of death, accidents together with symptoms and ill-defined conditions have dropped to about one-third, congenital malformations only to two-thirds, and the group "all other causes" to one-thirteenth the rates in 1931.

The influence of low and high birth weight can only be estimated by cause in relation to the total infant mortality. Mortality among low birth weight infants from infections and congenital malformations is 5 times higher than among infants over 2,500 grams at birth; from birth injuries, 8 times; from asphyxia and atelectasis, 30 times; from hemolytic diseases, 9 times; and from maternal toxemia (infants of diabetic mothers included), 90

times higher. In the groups of symptoms and ill-defined diseases, accidents, and all other causes, however, it is only twice as high.

It may be concluded that low birth weight influences both early and late neonatal mortality. In the years 1954-55 the proportion of low birth weight infants was 5.6 percent, and they accounted for 65 percent of the deaths in the first week of life and 20 percent of the neonatal deaths after the first week. This proportion of mortality is more than would be expected from the percent of low birth weight infants. Unfortunately, there is insufficient information on the influence after the first month of life.

From a pediatrician's point of view the influence of social factors on infant mortality is important enough to be emphasized and discussed again. The influence is illustrated by comparing mortality of infants born in and out of wedlock and by relating mortality to the occupation of the family head and the mother's place of residence. Throughout the years examined there has been an excess mortality rate for illegitimate births. The main reason for this is that unmarried mothers give birth to low birth weight infants twice as frequently as do married mothers. However, in both weight groups, over 2,500 grams and 2,500 grams or less, the excess mortality rate for illegitimate infants is preponderant. Excess mortality of illegitimate infants is highest for postnatal asphyxia and atelectasis (107 percent), immaturity (116 percent), and accidents (109 percent). Accidents in the age group over 1 month are mainly sudden, unexpected death, and this probably points to illegitimate infants being less carefully taken care of than legitimate infants.

The distribution of infant mortality rates by occupation is seen in table 12, and by mother's residence in table 15. Both factors are closely connected with the size of family. Thus, the lowest social classes from the three areas—Capital,

provincial towns, and rural districts—have the largest families and therefore, perhaps, do not take as good care of their children. In any case table 10 illustrates that both in 1951-53 and in 1960-62 there was an increasing infant mortality rate with higher birth order after the first month of life (while deaths in the first month of life showed lower mortality for the secondborn). Furthermore, within all occupational groups there are more children per family in the rural districts than in the provincial towns.

There is a marked excess mortality for infants from the occupation groups of farm hands and domestics (the latter group consists mainly of unmarried mothers) than for managers and employees (self-employed in manufacturing, construction, commerce, and professional services, salaried employees, and public servants). Thus, infant mortality rates for influenza and pneumonia are 4 times greater among children of farm hands and domestics than among those whose parents are self-employed in professional services or are salaried employees and public servants (table 12). For infections in the digestive system the mortality rate is 18 times greater among infants of farm hands than among those of self-employed in professional services. Two remarkable differences are the 27 times higher mortality for symptoms and ill-defined conditions among infants of farm hands compared with that among salaried employees' and the public servants' children, and the 14 times greater mortality compared with that among infants of managers.

Presumably, there is among farm hands a tendency not to send for a physician, because the child's illness is not considered serious or is not observed. It is important to emphasize that in Denmark infant mortality due to birth injuries and congenital malformations shows no marked differences from one social class to another.

PART IV. THE FUTURE

Future endeavors to reduce stillbirth and infant mortality naturally should be directed toward utilization and development of everything known to favor a decreasing mortality rate, including the close cooperation of obstetricians, pediatricians, pediatric surgeons, and anesthesiologists. Highest gains may be obtained by controlling the incidence of low birth weight infants, which contribute heavily to total perinatal mortality. An increase in these births alone may cause a standstill or an increase in the total perinatal mortality rate. Intensified care of premature births and investigation of new treatment should bring fast results, particularly if neonatologists (pediatricians who specialize in the care of newborn infants) are attached to obstetric departments.

It should be mentioned that even today too many perinatal deaths are caused by negligence on the part of pregnant women or of medical persons who are responsible for them during pregnancy and delivery. The assumption that 20-25 percent of perinatal deaths among infants weighing more than 2,500 grams at birth are caused by such negligence and, thus, might be avoided, is probably not too farfetched.^{24,25}

Negligence on the part of the parents is also a problem during the child's first year. In a prospective child health study the development during the first year of life of 9,191 children born at University Hospital, Copenhagen, in 1959-61 was examined to determine if negligence might have caused death.²⁶ A total of 42 children died during the postneonatal period and, of these, 22 died from infections. Of the latter, 16 were found dead

in their beds which supports the assumption that parents should be better informed on the possible seriousness of even minor symptoms during infancy, although one must realize that this, in turn, may give parents many unnecessary worries and general practitioners still more work. Negligence on the part of medical persons was in no case the cause of death.

In the efforts to lower mortality after the first month of life, it would be good if more pediatric departments were made available and their facilities extended to people from certain social groups who do not avail themselves sufficiently of the medical services offered them. On the other hand, it cannot be expected that such progress will procure any notable decrease in the total infant mortality rate. Even if the mortality rate for deaths after the first month of life were cut in half, the total infant mortality rate of 20 per 1,000 live births in 1962 would be lowered to about 18, while mortality in the first week, if cut in half, would cause a drop to 13 per 1,000 live births. The latter is possible only if more efforts can be devoted to investigation, prevention, and therapy for causes of low birth weight and congenital malformations.

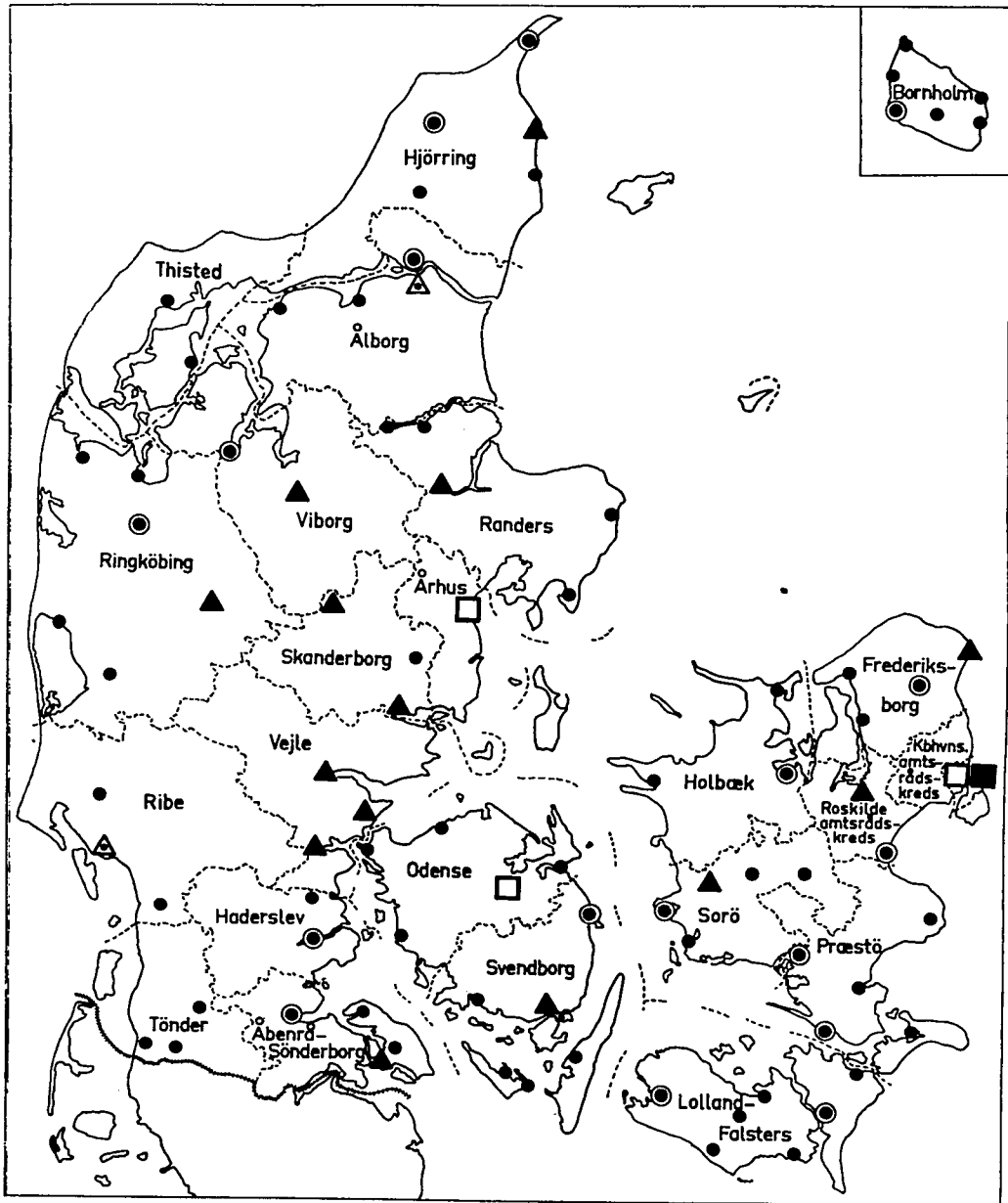
Finally, it should be emphasized that although infant mortality is considered low in this country, one should never rest content and assume that the bottom level has been reached. Although periodic stagnation or even increases may occur in the future (as in the past), improved knowledge and techniques can in the long run result only in a decreasing infant mortality rate.

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Boundaries of county medical districts and population size of towns: Denmark, 1960.

- Towns under 10,000 inhabitants
- ◎ Towns 10,000-20,000 inhabitants
- ▲ Towns 20,000-50,000 inhabitants
- △ Towns 50,000-100,000 inhabitants
- Towns 100,000-150,000 inhabitants
- Copenhagen: 721,381 inhabitants

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Table 1. Infant mortality rates by age at death: Denmark, 1901-62

Year	Under 1 year	Under 7 days ¹	Under 1 day ¹	1-6 days ¹	7 days to 1 month ^{1,2}	1-5 months	6-11 months
	Rate per 1,000 live births						
1962-----	20.0	13.2	4.9	8.3	2.1	3.1	1.6
1961-----	21.8	14.6	5.4	9.2	2.0	3.6	1.6
1960-----	21.5	13.9	4.7	9.2	2.2	3.8	1.6
1959-----	22.4	13.8	5.5	8.3	2.5	4.5	1.6
1958-----	22.4	13.7	5.1	8.6	2.5	4.4	1.8
1957-----	23.4	14.0	5.3	8.7	2.4	4.7	2.3
1956-----	24.9	15.3	6.5	8.8	2.4	4.8	2.4
1955-----	25.2	15.6	6.8	8.8	2.3	5.3	2.0
1954-----	26.9	15.5	6.6	8.9	2.5	5.8	3.1
1953-----	27.2	16.3	7.7	8.6	2.3	5.7	2.9
1952-----	28.9	16.8	7.9	8.9	2.5	5.9	3.7
1951-----	28.8	15.9	7.4	8.5	2.4	6.8	3.7
1950-----	30.7	15.4	7.4	8.0	2.8	8.2	4.3
1949-----	34.5	16.0	7.4	8.6	3.1	10.4	5.0
1948-----	35.3	15.5	6.9	8.6	3.6	10.5	5.7
1947-----	40.4	17.2	7.7	9.5	4.8	11.6	6.8
1946-----	45.8	18.0	8.5	9.5	5.5	14.5	7.8
1945-----	48.3	18.6	8.6	10.0	6.3	16.5	6.9
1944-----	47.7	18.8	8.8	10.0	5.4	15.5	8.0
1943-----	44.8	18.0	8.5	9.5	4.9	14.4	7.5
1942-----	47.0	18.2	8.3	9.9	5.4	14.8	8.6
1941-----	55.0	18.7	8.2	10.5	5.0	17.9	13.4
1940-----	50.2	20.0	9.5	10.5	5.2	14.9	10.1
1939-----	58.1	22.1	10.3	11.8	5.5	18.1	12.4
1938-----	58.7	22.0	10.1	11.9	5.3	18.2	13.2
1937-----	66.1	22.6	10.6	12.0	6.4	22.4	14.7
1936-----	67.3	22.3	10.6	11.7	6.8	23.6	14.6
1935-----	71.0	22.6	13.0	9.6	6.5	25.0	16.9
1934-----	64.4	22.4	11.9	10.5	6.5	23.0	12.5
1933-----	67.6	21.7	11.7	10.0	6.0	26.4	13.5
1932-----	72.3	21.8	11.3	10.5	7.4	27.7	15.4
1931-----	81.4	21.7	11.8	9.9	7.8	32.4	19.5
1930-----	80.0	22.0	11.9	10.1	9.4	32.0	16.6
1929-----	82.9	23.7	12.6	11.1	9.7	32.2	17.3
1928-----	80.8	23.1	12.0	11.1	10.0	29.4	18.3
1927-----	83.4	22.1	10.9	11.2	9.9	32.0	19.4
1926-----	84.4	21.6	10.7	10.9	9.8	32.5	20.5

Table 1. Infant mortality rates by age at death: Denmark, 1901-62—Con.

Year	Under 1 year	Under 7 days ¹	Under 1 day ¹	1-6 days ¹	7 days to 1 month ^{1,2}	1-5 months	6-11 months
Rate per 1,000 live births							
1925-----	79.8	19.4	9.5	9.9	9.3	31.9	19.2
1924-----	84.5	21.6	10.1	11.5	9.8	32.2	20.9
1923-----	82.9	21.4	10.3	11.1	9.8	32.4	19.3
1922-----	85.4	22.0	10.3	11.7	11.1	32.6	19.7
1921-----	77.0	20.3	10.1	10.2	10.7	30.1	15.9
1920-----	90.2	---	10.0		21.6	38.0	20.6
1919-----	91.6	---	9.7		23.1	34.5	24.3
1918-----	74.2	---	9.8		21.6	26.5	16.3
1917-----	99.5	---	10.8		24.3	39.6	24.8
1916-----	99.8	---	11.4		20.7	40.3	27.4
1915-----	95.0	---	11.7		21.5	38.5	23.3
1914-----	98.3	---	9.9		24.3	42.0	22.1
1913-----	93.5	---	12.1		20.3	39.6	21.5
1912-----	93.2	---	9.5		22.8	39.8	21.1
1911-----	105.7	---	9.7		26.0	46.8	23.2
1910-----	102.2	---	10.4		24.7	45.1	22.0
1909-----	97.7	---	11.4		23.6	39.6	23.1
1908-----	123.2	---	11.2		28.6	53.7	29.7
1907-----	108.4	---	11.7		26.0	43.8	26.9
1906-----	108.9	---	11.2		27.1	47.2	23.4
1905-----	121.0	---	11.5		27.9	52.7	28.9
1904-----	111.5	---	10.5		27.5	48.5	25.0
1903-----	115.9	---	11.6		27.9	48.9	27.5
1902-----	113.8	---	10.9		26.9	46.7	29.3
1901-----	134.2	---	11.2		29.8	59.8	33.4

¹Based on calendar days since birth.

²For the sake of international comparison it would have been desirable to replace the age group 7 days to 1 month with the age group 7-27 days. This is, however, possible only from 1957; therefore the original age group has been retained to maintain the historical continuity. To estimate the importance of this difference the number of deaths has been calculated for the age group from 7-27 days per 1,000 live births from 1957-62. This gives the following figures:

1957	1958	1959	1960	1961	1962
2.3	2.4	2.4	2.1	1.9	2.0

By comparing these figures with those in this table, it will be seen that the difference in the rates is only 0.1.

Table 2. Stillbirth and perinatal mortality rates, by sex: Denmark, 1901-62

Year	Total		Male		Female	
	Perinatal mortality rate	Still-birth rate	Perinatal mortality rate	Still-birth rate	Perinatal mortality rate	Still-birth rate
	Rate per 1,000 total births of specified sex					
1962-----	24.9	11.9	28.0	12.6	21.6	11.1
1961-----	26.9	12.5	29.1	13.0	24.6	12.1
1960-----	26.2	12.4	28.7	13.0	23.6	11.8
1959-----	28.2	14.6	30.8	14.7	25.4	14.5
1958-----	28.9	15.5	31.8	16.1	25.9	14.8
1957-----	29.1	15.3	32.0	15.9	25.9	14.6
1956-----	32.4	17.4	36.4	18.7	28.2	16.1
1955-----	33.3	17.9	35.3	17.9	31.1	17.9
1954-----	34.4	19.3	38.5	20.2	30.1	18.3
1953-----	34.9	19.0	39.1	20.6	30.4	17.2
1952-----	34.0	17.5	38.5	18.9	29.3	16.0
1951-----	33.9	18.3	37.8	19.8	29.8	16.7
1950-----	33.7	18.5	37.3	19.7	29.8	17.2
1949-----	32.5	16.8	35.3	17.3	29.5	16.3
1948-----	33.1	17.9	36.9	19.1	29.1	16.6
1947-----	34.3	17.4	38.9	18.9	29.4	15.9
1946-----	36.4	18.7	40.8	20.5	31.7	16.8
1945-----	37.6	19.4	41.8	21.2	33.1	17.4
1944-----	38.1	19.6	43.1	22.2	32.7	16.8
1943-----	38.9	21.3	43.4	22.8	34.1	19.6
1942-----	38.7	20.9	42.7	21.9	34.5	19.8
1941-----	41.3	23.0	46.5	24.6	35.7	21.4
1940-----	44.7	25.2	50.1	27.9	39.0	22.4
1939-----	47.7	26.2	51.1	27.7	44.0	24.6
1938-----	46.5	25.1	50.2	26.7	42.6	23.4
1937-----	47.5	25.5	53.3	27.9	41.4	22.9
1936-----	47.5	25.8	52.1	27.3	42.7	24.2
1935-----	47.1	25.1	52.3	26.9	41.7	23.3
1934-----	47.3	25.5	51.7	26.7	42.6	24.2
1933-----	46.9	25.8	51.6	27.9	42.0	23.5
1932-----	44.3	23.0	48.5	25.2	39.9	20.8
1931-----	45.1	23.9	51.0	26.8	38.8	20.8

Table 2. Stillbirth and perinatal mortality rates, by sex: Denmark, 1901-62--Con.

Year	Total		Male		Female	
	Perinatal mortality rate	Still-birth rate	Perinatal mortality rate	Still-birth rate	Perinatal mortality rate	Still-birth rate
	Rate per 1,000 total births of specified sex					
1930-----	44.9	23.4	49.2	25.3	40.4	21.4
1929-----	47.3	24.2	51.8	25.3	42.6	23.0
1928-----	45.9	23.3	50.0	24.9	41.6	21.7
1927-----	44.5	23.0	48.9	24.8	39.9	21.0
1926-----	43.5	22.7	48.4	24.9	38.4	20.4
1925-----	42.5	23.6	47.6	25.9	37.3	21.2
1924-----	45.0	23.8	51.0	26.5	38.5	21.0
1923-----	44.9	24.0	49.8	26.1	39.7	21.7
1922-----	45.5	24.0	50.9	26.1	39.7	21.8
1921-----	44.6	24.8	50.0	27.3	38.8	22.1
1920-----	---	24.9	---	26.8	---	22.9
1919-----	---	24.4	---	25.8	---	22.8
1918-----	---	25.2	---	26.6	---	23.9
1917-----	---	24.9	---	27.4	---	22.3
1916-----	---	24.7	---	26.3	---	22.9
1915-----	---	24.7	---	26.3	---	22.9
1914-----	---	23.0	---	25.4	---	20.6
1913-----	---	23.4	---	26.2	---	20.4
1912-----	---	23.0	---	25.1	---	20.7
1911-----	---	23.1	---	26.0	---	20.1
1910-----	---	23.1	---	24.9	---	21.2
1909-----	---	23.2	---	25.2	---	21.2
1908-----	---	23.6	---	25.4	---	21.8
1907-----	---	24.0	---	26.5	---	21.4
1906-----	---	22.6	---	24.3	---	20.9
1905-----	---	23.8	---	25.0	---	22.5
1904-----	---	23.5	---	26.0	---	20.9
1903-----	---	23.5	---	26.4	---	20.5
1902-----	---	23.6	---	25.8	---	21.4
1901-----	---	24.2	---	26.2	---	22.1

Table 3. Infant mortality rates by cause of death: Denmark, 1931-62

Cause of death ¹	1962	1961
All causes-----	20.0	21.8
Infective and parasitic diseases----- (001-138,340-344,690-695,765-768)	0.5	0.6
Influenza and pneumonia----- (480-493,763)	1.0	1.1
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394,400-475,500-527)	0.2	0.3
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn----- (543,571,572,764)	0.3	0.4
All other diseases of digestive system----- (530-542,544-570,573-587)	0.2	0.3
Congenital malformations----- (750-759)	4.4	4.4
Birth injuries----- (760,761)	2.3	2.8
Intracranial and spinal injury at birth----- (760)	1.9	2.2
Other birth injury----- (761)	0.4	0.6
Postnatal asphyxia and atelectasis----- (762)	4.2	5.1
Hemolytic diseases of newborn (erythroblastosis)----- (770)	0.4	0.4
Immaturity with mention of any other subsidiary condition, or unqualified----- (774,776)	3.1	3.3
Other defined and ill-defined diseases peculiar to early infancy---- (769,771-773)	2.0	1.8
Symptoms and ill-defined conditions----- (780-793,795)	0.7	0.4
All other diseases----- (Residual)	0.4	0.5
Accidents----- (E800-E999)	0.3	0.4

Cause of death ¹	1946	1945
All causes-----	45.8	48.3
Infective and parasitic diseases----- (001-138,340-344,690-695,765-768)	4.3	4.7
Influenza and pneumonia----- (480-493,763)	9.3	8.5
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394,400-475,500-527)	0.9	1.1
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn----- (543,571,572,764)	3.7	5.2
All other diseases of digestive system----- (530-542,544-570,573-587)	0.3	0.3
Congenital malformations----- (750-759)	5.3	6.1
Birth injuries----- (760,761)	2.7	2.1
Intracranial and spinal injury at birth----- (760)	---	---
Other birth injury----- (761)	---	---
Postnatal asphyxia and atelectasis----- (762)	---	---
Hemolytic diseases of newborn (erythroblastosis)----- (770)	---	---
Immaturity with mention of any other subsidiary condition, or unqualified----- (774,776)	12.8	12.3
Other defined and ill-defined diseases peculiar to early infancy---- (769,771-773)	3.7	5.3
Symptoms and ill-defined conditions----- (780-793,795)	1.1	0.8
All other diseases----- (Residual)	1.1	1.0
Accidents----- (E800-E999)	0.6	0.9

¹The Seventh Revision of the International Classification of Diseases (1955) was used to classify causes of death for 1958-62; the Sixth Revision of the International Classification of Diseases (1948) for 1951-57; the International List of Causes of Death of 1938 for 1941-50; and the Interscandinavian Nomenclature of Causes of Death of 1926 for 1931-40.

Table 3. Infant mortality rates by cause of death: Denmark, 1931-62—Con.

1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948	1947
Rate per 1,000 live births													
21.5	22.4	22.4	23.4	24.9	25.2	26.9	27.2	28.9	28.8	30.7	34.5	35.3	40.4
0.6	0.5	0.5	0.9	0.8	0.8	0.8	1.2	1.4	1.3	1.4	2.8	3.0	2.6
1.4	1.8	1.9	1.9	1.8	1.9	3.2	2.8	3.5	3.9	5.3	6.6	6.5	8.2
0.5	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.6	0.8	0.7	0.9	1.0	1.3
0.4	0.5	0.5	0.7	0.5	0.7	0.9	0.7	0.9	0.8	0.9	1.2	1.6	2.6
0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5
4.4	4.4	4.5	4.0	4.7	4.0	4.1	4.9	4.6	4.6	4.6	4.4	4.5	5.0
2.5	2.4	2.5	2.2	2.6	3.2	3.0	2.8	3.4	3.2	2.2	2.4	2.3	2.5
2.3	2.1	2.1	1.9	2.3	2.7	2.7	2.6	3.1	3.0	---	---	---	---
0.2	0.3	0.4	0.3	0.3	0.5	0.3	0.2	0.3	0.2	---	---	---	---
4.9	4.5	4.2	4.7	4.4	4.6	3.8	3.8	3.5	3.5	---	---	---	---
0.5	0.5	0.5	0.4	0.5	0.7	0.5	0.6	0.7	0.5	---	---	---	---
3.0	3.2	2.8	2.8	3.4	3.3	3.0	3.4	3.3	4.1	9.8	10.6	10.6	11.7
1.9	2.5	3.0	3.3	3.7	3.4	4.6	4.3	4.8	3.9	3.2	3.1	2.7	3.5
0.3	0.4	0.3	0.4	0.5	0.5	0.6	0.4	0.5	0.6	0.7	0.6	1.0	0.9
0.4	0.5	0.4	0.7	0.5	0.5	0.6	0.5	0.6	0.5	0.7	0.7	0.6	0.7
0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.8	1.0	0.9

1944	1943	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
47.7	44.8	47.0	55.0	50.2	58.1	58.7	66.1	67.3	71.0	64.4	67.6	72.3	81.4
4.6	3.7	3.5	4.4	3.9	5.7	4.9	5.3	7.3	8.8	4.9	5.6	8.3	7.5
8.8	9.3	9.9	15.1	11.3	14.8	14.5	18.5	17.2	17.7	16.2	19.5	18.8	25.6
1.2	1.2	1.4	1.6	1.0	1.2	1.5	1.1	1.0	1.6	1.0	1.1	1.6	1.9
3.9	2.7	2.6	3.1	2.8	3.7	4.3	5.1	5.4	6.1	6.1	6.9	8.1	8.1
0.4	0.3	0.3	0.4	0.5	0.4	0.5	0.7	0.4	0.7	0.5	0.5	0.7	0.8
5.5	5.4	5.7	6.5	6.3	6.2	6.3	7.2	6.5	6.6	5.8	6.3	5.6	6.1
1.9	1.9	2.0	2.8	2.6	3.2	3.2	2.9	2.9	2.7	3.1	2.6	2.5	2.6
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12.7	11.0	11.4	10.8	10.9	10.3	11.1	13.1	12.7	13.3	11.9	11.7	12.7	12.6
5.7	5.9	6.1	5.5	7.1	7.9	7.6	6.4	7.2	7.1	7.3	6.3	7.1	6.8
1.3	1.5	2.0	2.2	1.7	1.8	1.7	2.4	2.3	2.5	2.7	3.2	3.1	3.6
0.9	1.2	1.5	2.0	1.4	2.3	2.5	2.7	3.8	3.2	4.0	3.4	3.2	5.0
0.8	0.7	0.6	0.6	0.7	0.6	0.6	0.7	0.6	0.7	0.9	0.5	0.6	0.8

Table 4. Neonatal mortality rates by cause of death: Denmark, 1931-62

Cause of death ¹	1962	1961
All causes-----	152.6	165.5
Infective and parasitic diseases----- (001-138,340-344,690-695,765-768)	1.9	2.1
Influenza and pneumonia----- (480-493,763)	2.1	1.6
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394,400-475,500-527)	0.1	0.3
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn----- (543,571,572,764)	0.1	0.9
All other diseases of digestive system----- (530-542,544-570,573-587)	1.0	1.4
Congenital malformations----- (750-759)	26.9	25.5
Birth injuries----- (760,761)	23.1	28.4
Intracranial and spinal injury at birth----- (760)	18.6	22.8
Other birth injury----- (761)	4.5	5.6
Postnatal asphyxia and atelectasis----- (762)	42.0	50.7
Hemolytic diseases of newborn (erythroblastosis)----- (770)	3.9	3.4
Immaturity with mention of any other subsidiary condition, or unqualified----- (774,776)	31.4	32.4
Other defined and ill-defined diseases peculiar to early infancy--- (769,771-773)	18.2	16.5
Symptoms and ill-defined conditions----- (780-793,795)	0.6	0.7
All other diseases----- (Residual)	1.2	0.9
Accidents----- (E800-E999)	0.1	0.7

Cause of death ¹	1946	1945
All causes-----	235.5	248.6
Infective and parasitic diseases----- (001-138,340-344,690-695,765-768)	6.3	7.7
Influenza and pneumonia----- (480-493,763)	6.1	7.8
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394,400-475,500-527)	0.7	1.1
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn----- (543,571,572,764)	7.1	9.7
All other diseases of digestive system----- (530-542,544-570,573-587)	0.9	0.3
Congenital malformations----- (750-759)	31.2	36.7
Birth injuries----- (760,761)	25.4	20.5
Intracranial and spinal injury at birth----- (760)	---	---
Other birth injury----- (761)	---	---
Postnatal asphyxia and atelectasis----- (762)	---	---
Hemolytic diseases of newborn (erythroblastosis)----- (770)	---	---
Immaturity with mention of any other subsidiary condition, or unqualified----- (774,776)	121.0	115.9
Other defined and ill-defined diseases peculiar to early infancy--- (769,771-773)	31.5	43.4
Symptoms and ill-defined conditions----- (780-793,795)	2.3	2.3
All other diseases----- (Residual)	1.6	1.4
Accidents----- (E800-E999)	1.4	1.8

¹The Seventh Revision of the International Classification of Diseases (1955) was used to classify causes of death for 1958-62; the Sixth Revision of the International Classification of Diseases (1948) for 1951-57; the International List of Causes of Death of 1938 for 1941-50; and the Interscandinavian Nomenclature of Causes of Death of 1926 for 1931-40.

Table 4. Neonatal mortality rates by cause of death: Denmark, 1931-62—Con.

1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948	1947
Rate per 10,000 live births													
161.1	162.9	161.5	164.4	176.6	179.4	180.0	185.8	193.3	183.2	182.1	191.0	190.9	220.1
2.1	1.2	2.3	1.7	2.1	2.2	2.0	2.7	3.3	2.6	3.3	4.9	5.5	5.5
3.0	2.8	4.3	3.8	1.8	2.1	3.4	1.9	2.1	3.4	3.3	2.6	4.7	6.1
-	-	0.1	0.5	0.3	0.6	0.5	0.3	0.5	0.3	0.2	0.4	0.6	0.9
0.5	0.7	0.9	1.2	0.4	0.8	1.0	0.9	1.0	0.9	0.8	1.4	2.0	5.5
1.4	1.2	0.8	1.1	0.9	0.8	0.9	1.1	0.8	0.8	1.0	0.6	1.2	1.3
25.8	27.3	23.6	21.4	25.7	22.6	24.2	30.0	29.2	25.9	25.8	24.0	24.1	28.2
25.4	23.5	24.6	21.4	24.2	30.6	29.2	27.6	32.6	30.6	20.7	23.0	21.5	24.6
23.0	20.8	20.9	---	21.6	25.8	26.3	25.4	30.0	29.0	---	---	---	---
2.4	2.7	3.7	---	2.6	4.8	2.9	2.2	2.6	1.6	---	---	---	---
48.4	43.4	41.1	47.0	43.9	45.3	37.3	37.2	35.0	34.9	---	---	---	---
4.5	4.6	4.6	3.9	4.7	6.4	4.1	5.8	6.5	4.4	---	---	---	---
30.2	32.1	28.1	27.1	34.0	33.7	29.3	33.1	32.5	38.9	95.9	103.5	102.3	112.3
17.6	24.0	29.3	31.4	35.1	32.0	44.3	41.9	46.3	37.1	28.0	27.3	24.4	32.2
0.9	0.5	0.4	1.5	1.3	0.6	2.0	1.0	1.4	1.2	0.8	1.4	1.5	0.9
0.9	1.2	1.1	1.9	1.0	1.4	0.9	1.7	0.9	1.3	0.9	1.0	0.7	1.0
0.4	0.4	0.3	0.5	1.2	0.3	0.9	0.6	1.2	0.9	1.4	0.9	2.4	1.6

1944	1943	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
242.1	228.9	235.6	237.0	251.6	275.0	272.4	290.2	291.3	291.1	289.0	276.7	292.1	295.1
7.4	6.6	7.4	7.0	7.4	9.1	8.5	11.3	12.0	12.1	8.9	8.8	9.6	9.3
5.4	6.6	7.4	7.2	8.4	11.3	8.3	14.1	13.9	12.1	14.7	15.6	13.5	14.5
0.8	0.7	0.8	0.8	0.4	0.4	0.2	0.2	0.3	0.5	0.9	0.3	1.4	1.4
5.8	3.9	1.8	4.2	2.9	5.6	3.8	4.4	5.9	6.4	6.9	6.5	11.6	7.3
1.0	0.6	0.5	0.6	0.4	0.4	0.4	0.9	0.3	1.1	0.2	0.3	0.5	1.1
31.7	32.5	31.9	35.8	36.5	41.4	41.5	42.4	37.7	36.9	35.0	37.6	33.4	36.7
17.9	19.0	19.7	27.2	25.8	30.8	29.2	28.0	28.6	26.4	30.3	25.8	25.2	26.1
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121.7	103.1	108.7	103.5	102.7	98.3	106.1	124.9	119.7	126.3	114.0	111.0	117.9	117.8
45.0	49.1	50.5	43.0	60.3	67.4	63.3	54.7	57.7	57.2	61.6	53.1	60.6	57.7
3.3	3.2	3.9	5.9	3.7	5.6	5.6	5.3	9.2	6.4	10.0	11.8	11.9	13.1
1.3	2.1	1.1	0.7	1.1	2.9	2.6	2.4	4.5	2.9	4.8	4.1	4.0	7.9
0.8	1.5	1.9	1.1	2.0	1.8	2.9	1.6	1.5	2.8	1.7	1.8	2.5	2.2

Table 5. Postneonatal mortality rates by cause of death: Denmark, 1931-62

Cause of death ¹	1962	1961
All causes-----	47.8	52.6
Infective and parasitic diseases----- (001-138,340-344,690-695,765-768)	3.3	3.7
Influenza and pneumonia----- (480-493,763)	7.8	9.4
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394,400-475,500-527)	1.9	2.6
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn----- (543,571,572,764)	3.3	2.8
All other diseases of digestive system----- (530-542,544-570,573-587)	1.0	1.7
Congenital malformations----- (750-759)	16.2	19.0
Birth injuries----- (760,761)	-	-
Intracranial and spinal injury at birth----- (760)	-	-
Other birth injury----- (761)	-	-
Postnatal asphyxia and atelectasis----- (762)	0.3	0.5
Hemolytic diseases of newborn (erythroblastosis)----- (770)	0.4	0.3
Immaturity with mention of any other subsidiary condition, or unqualified----- (774,776)	-	0.1
Other defined and ill-defined diseases peculiar to early infancy---- (769,771-773)	1.4	1.3
Symptoms and ill-defined conditions----- (780-793,795)	6.6	3.3
All other diseases----- (Residual)	3.2	4.3
Accidents----- (E800-E999)	2.4	3.1

Cause of death ¹	1946	1945
All causes-----	222.7	234.3
Infective and parasitic diseases----- (001-138,340-344,690-695,765-768)	36.5	39.7
Influenza and pneumonia----- (480-493,763)	86.8	76.4
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394,400-475,500-527)	8.7	9.9
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn----- (543,571,572,764)	29.9	42.7
All other diseases of digestive system----- (530-542,544-570,573-587)	2.2	2.3
Congenital malformations----- (750-759)	22.1	24.5
Birth injuries----- (760,761)	1.5	0.5
Intracranial and spinal injury at birth----- (760)	---	---
Other birth injury----- (761)	---	---
Postnatal asphyxia and atelectasis----- (762)	---	---
Hemolytic diseases of newborn (erythroblastosis)----- (770)	---	---
Immaturity with mention of any other subsidiary condition, or unqualified----- (774,776)	6.2	6.2
Other defined and ill-defined diseases peculiar to early infancy---- (769,771-773)	5.0	9.4
Symptoms and ill-defined conditions----- (780-793,795)	9.0	6.0
All other diseases----- (Residual)	9.8	8.9
Accidents----- (E800-E999)	5.0	7.3

¹The Seventh Revision of the International Classification of Diseases (1955) was used to classify causes of death for 1958-62; the Sixth Revision of the International Classification of Diseases (1948) for 1951-57; the International List of Causes of Death of 1938 for 1941-50; and the Interscandinavian Nomenclature of Causes of Death of 1926 for 1931-40.

Table 5. Postneonatal mortality rates by cause of death: Denmark, 1931-62--Con.

1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948	1947
Rate per 10,000 live births													
53.8	61.6	62.8	69.2	72.9	72.2	88.4	86.4	95.7	105.3	125.3	153.8	161.7	184.3
3.4	3.7	3.1	7.7	5.9	5.5	5.9	8.8	10.9	10.8	10.6	23.0	24.5	20.4
11.0	15.3	15.1	15.0	15.9	17.0	28.7	26.1	33.0	35.8	50.4	63.2	60.0	76.2
5.0	6.5	6.3	5.6	6.9	7.7	7.3	8.2	5.9	8.1	6.5	8.4	9.5	11.8
3.4	4.6	3.7	5.8	5.1	6.1	8.3	5.8	8.2	7.6	8.7	11.0	14.0	20.4
1.3	0.8	0.9	2.1	1.2	0.9	2.5	1.9	2.5	2.6	2.3	3.6	3.5	3.3
19.2	17.4	20.5	18.7	21.2	16.9	17.0	19.2	15.6	19.3	20.1	19.8	21.2	21.7
0.1	0.3	0.3	0.1	2.0	1.3	1.0	0.6	0.8	1.0	0.9	1.2	1.2	0.6
0.1	0.3	0.3	---	2.0	1.3	1.0	0.6	0.8	0.9	---	---	---	---
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0.5	1.2	0.9	0.3	0.4	0.9	0.5	0.8	0.5	0.5	---	---	---	---
0.3	0.1	0.1	0.4	-	0.3	0.5	0.1	0.9	0.4	---	---	---	---
-	0.3	0.3	0.4	0.1	0.3	0.3	0.3	0.1	0.9	2.6	2.9	4.1	5.0
1.4	0.8	1.1	1.5	1.8	1.6	1.7	1.5	1.7	2.4	3.5	3.4	2.7	2.9
2.4	3.1	2.7	2.5	3.9	4.0	3.9	3.2	3.8	4.8	6.0	5.0	8.2	8.5
2.6	3.7	3.2	4.8	3.9	4.0	5.2	3.8	5.3	3.9	5.7	5.5	5.4	6.0
3.2	3.8	4.6	4.3	4.6	5.7	5.6	6.1	6.5	7.2	8.0	6.8	7.4	7.5

1944	1943	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
234.8	219.3	234.0	312.4	249.9	305.6	315.2	370.4	382.3	419.3	355.4	399.7	430.8	518.9
38.2	30.0	27.7	37.4	31.1	47.4	40.0	42.0	61.1	75.6	39.8	47.6	73.2	65.2
82.4	87.0	91.8	144.1	104.1	136.6	137.3	170.2	158.5	165.5	147.3	178.2	173.3	242.6
11.7	11.5	12.8	14.7	10.0	11.6	14.9	11.1	9.5	15.5	9.4	10.4	14.8	17.6
33.2	23.0	24.5	26.5	25.0	31.2	39.6	46.7	48.2	54.6	54.4	62.8	69.0	73.4
2.8	2.4	2.5	3.7	4.6	3.2	4.8	6.1	3.3	6.1	5.1	5.1	6.7	6.7
23.5	21.9	24.6	29.0	26.5	20.8	21.9	29.4	27.6	29.0	23.2	25.2	23.0	24.4
1.2	0.5	0.8	0.8	0.3	0.7	0.9	0.6	0.4	0.8	0.6	-	0.2	0.2
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5.2	6.6	5.3	4.2	5.8	4.7	5.7	6.2	6.8	6.3	4.8	6.4	8.7	8.2
11.8	9.5	10.4	12.2	11.1	11.6	13.3	9.5	14.3	13.3	11.7	10.2	10.8	9.8
9.7	11.9	15.7	16.3	13.7	12.7	11.5	18.2	14.2	18.9	16.9	20.7	19.3	23.2
8.2	10.0	13.4	18.9	12.4	20.5	22.1	24.9	33.9	29.6	35.0	29.9	27.8	41.7
6.9	5.0	4.5	4.6	5.3	4.6	3.2	5.5	4.5	4.1	7.2	3.2	4.0	5.9

Table 6. Infant mortality rates among males by age: Denmark, 1901-62

Year	Under 1 year	Under 7 days ¹	Under 1 day ¹	1-6 days ¹	7 days to 1 month ¹	1-5 months	6-11 months
	Rate per 1,000 male live births						
1962-----	22.8	15.6	5.7	9.9	2.0	3.5	1.7
1961-----	24.7	16.4	6.1	10.3	2.5	4.0	1.8
1960-----	23.9	15.8	5.2	10.6	2.3	4.3	1.5
1959-----	25.7	16.3	6.6	9.7	2.8	4.9	1.7
1958-----	25.7	16.0	5.8	10.2	2.6	5.0	2.1
1957-----	27.2	16.3	6.1	10.2	2.8	5.6	2.5
1956-----	29.1	18.1	7.5	10.6	2.6	5.8	2.6
1955-----	27.6	17.8	7.3	10.5	2.0	5.7	2.1
1954-----	31.1	18.7	7.5	11.2	2.6	6.5	3.3
1953-----	31.2	18.9	8.9	10.0	2.8	6.3	3.2
1952-----	32.6	19.9	9.3	10.6	2.6	6.2	3.9
1951-----	32.4	18.3	8.1	10.2	2.6	7.5	4.0
1950-----	35.4	18.0	8.9	9.1	3.3	9.4	4.7
1949-----	39.0	18.3	8.6	9.7	3.6	11.7	5.4
1948-----	40.2	18.1	8.1	10.0	3.9	11.7	6.5
1947-----	45.9	20.4	9.5	10.9	5.4	13.2	6.9
1946-----	51.3	20.7	9.5	11.2	6.1	16.1	8.4
1945-----	54.1	21.1	9.1	12.0	7.2	18.4	7.4
1944-----	53.1	21.4	10.1	11.3	6.1	17.1	8.5
1943-----	51.3	21.1	10.0	11.1	5.8	16.1	8.3
1942-----	53.9	21.2	10.0	11.2	6.5	17.0	9.2
1941-----	62.9	22.4	9.8	12.6	5.9	19.6	15.0
1940-----	56.3	22.8	10.7	12.1	5.8	16.4	11.3
1939-----	64.5	24.0	11.0	13.0	5.9	21.2	13.4
1938-----	65.9	24.2	11.5	12.7	5.8	21.0	14.9
1937-----	75.1	26.1	12.1	14.0	7.0	25.8	16.2
1936-----	76.6	25.4	12.0	13.4	7.3	27.0	16.9
1935-----	80.6	26.0	14.8	11.2	7.4	28.9	18.3
1934-----	73.5	25.7	13.7	12.0	7.1	26.4	14.3
1933-----	76.0	24.3	13.0	11.3	6.3	31.1	14.3
1932-----	79.5	23.9	12.2	11.7	7.9	32.0	15.7
1931-----	93.0	24.8	13.2	11.6	8.3	38.2	21.7

Table 6. Infant mortality rates among males by age: Denmark, 1901-62—Con.

Year	Under 1 year	Under 7 days ¹	Under 1 day ¹	1-6 days ¹	7 days to 1 month ¹	1-5 months	6-11 months
	Rate per 1,000 male live births						
1930-----	89.1	24.5	13.4	11.1	10.6	36.3	17.7
1929-----	93.7	27.1	14.5	12.6	10.5	37.7	18.4
1928-----	89.5	25.7	13.6	12.1	11.3	33.6	18.9
1927-----	92.9	24.7	12.0	12.7	10.6	36.2	21.4
1926-----	94.5	24.7	12.1	12.6	11.1	36.5	22.2
1925-----	90.5	22.2	10.4	11.8	10.0	36.7	21.6
1924-----	97.6	25.2	11.7	13.5	11.5	37.9	23.0
1923-----	91.9	24.3	11.6	12.7	11.0	36.2	20.4
1922-----	96.0	25.5	12.1	13.4	11.8	37.5	21.2
1921-----	85.8	23.4	11.7	11.7	11.5	34.1	16.8
1920-----	99.4	---	11.8		23.9	41.7	22.0
1919-----	101.1	---	11.1		24.9	39.7	25.4
1918-----	82.6	---	11.6		23.9	29.6	17.5
1917-----	112.9	---	12.6		27.5	45.6	27.2
1916-----	110.8	---	13.7		23.0	45.0	29.1
1915-----	107.4	---	13.6		24.4	43.4	26.0
1914-----	109.8	---	11.6		27.8	46.9	23.5
1913-----	103.7	---	13.8		22.6	44.3	23.0
1912-----	104.5	---	11.1		25.9	44.9	22.6
1911-----	115.2	---	10.6		28.5	51.7	24.4
1910-----	111.9	---	11.5		27.5	49.4	23.5
1909-----	108.8	---	13.8		26.6	44.3	24.1
1908-----	135.3	---	13.0		31.7	59.4	31.2
1907-----	120.7	---	12.9		30.5	49.1	28.2
1906-----	120.0	---	12.6		30.2	52.6	24.6
1905-----	132.1	---	12.6		30.7	57.9	30.9
1904-----	125.9	---	12.5		31.0	55.9	26.5
1903-----	126.7	---	12.6		31.1	54.0	29.0
1902-----	126.8	---	12.6		30.5	52.5	31.2
1901-----	148.9	---	12.3		33.8	67.2	35.6

¹Based on calendar days since birth.

Table 7. Infant mortality rates among females by age: Denmark, 1901-62

Year	Under 1 year	Under 7 days ¹	Under 1 day ¹	1-6 days ¹	7 days to 1 month ¹	1-5 months	6-11 months
	Rate per 1,000 female live births						
1962-----	17.1	10.7	4.0	6.7	2.1	2.8	1.5
1961-----	18.7	12.7	4.8	7.9	1.4	3.2	1.4
1960-----	19.0	11.9	4.2	7.7	2.1	3.2	1.8
1959-----	19.0	11.2	4.4	6.8	2.1	4.2	1.5
1958-----	18.9	11.2	4.3	6.9	2.3	3.8	1.6
1957-----	19.2	11.5	4.5	7.0	2.0	3.7	2.0
1956-----	20.5	12.3	5.4	6.9	2.2	3.8	2.2
1955-----	22.5	13.5	6.3	7.2	2.4	4.8	1.8
1954-----	22.3	12.1	5.6	6.5	2.4	5.0	2.8
1953-----	22.9	13.4	6.4	7.0	1.9	5.0	2.6
1952-----	24.9	13.5	6.5	7.0	2.5	5.5	3.4
1951-----	25.0	13.3	6.6	6.7	2.1	6.2	3.4
1950-----	25.8	12.8	6.0	6.8	2.2	6.9	3.9
1949-----	29.6	13.4	6.1	7.3	2.6	9.1	4.5
1948-----	30.0	12.7	5.6	7.1	3.2	9.3	4.8
1947-----	34.7	13.8	5.8	8.0	4.2	10.1	6.6
1946-----	40.0	15.2	7.4	7.8	5.0	12.8	7.0
1945-----	42.1	15.9	7.9	8.0	5.3	14.5	6.4
1944-----	41.8	16.1	7.5	8.6	4.5	13.7	7.5
1943-----	37.8	14.7	7.0	7.7	3.9	12.6	6.6
1942-----	39.7	15.0	6.4	8.6	4.2	12.5	8.0
1941-----	46.5	14.7	6.4	8.3	4.1	16.2	11.5
1940-----	43.7	17.0	8.2	8.8	4.6	13.3	8.8
1939-----	51.2	19.9	9.5	10.4	5.0	14.9	11.4
1938-----	51.2	19.6	8.6	11.0	4.8	15.4	11.4
1937-----	56.6	19.0	9.1	9.9	5.7	18.8	13.1
1936-----	57.6	19.0	9.1	9.9	6.3	20.2	12.1
1935-----	60.8	18.9	11.0	7.9	5.6	20.8	15.5
1934-----	54.7	18.9	10.0	8.9	5.8	19.5	10.5
1933-----	58.6	18.9	10.2	8.7	5.6	21.4	12.7
1932-----	64.7	19.6	10.3	9.3	6.9	23.2	15.0
1931-----	69.0	18.4	10.3	8.1	7.3	26.2	17.1

Table 7. Infant mortality rates among females by age: Denmark, 1901-62—Con.

Year	Under 1 year	Under 7 days ¹	Under 1 day ¹	1-6 days ¹	7 days to 1 month ¹	1-5 months	6-11 months
	Rate per 1,000 female live births						
1930-----	70.3	19.3	10.4	8.9	8.1	27.5	15.4
1929-----	71.6	20.1	10.5	9.6	8.9	26.5	16.1
1928-----	71.6	20.3	10.1	10.2	8.7	25.0	17.6
1927-----	73.5	19.3	9.7	9.6	9.3	27.6	17.3
1926-----	73.7	18.3	9.3	9.0	8.4	28.3	18.7
1925-----	68.6	16.5	8.6	7.9	8.6	26.9	16.6
1924-----	70.7	17.9	8.5	9.4	8.0	26.1	18.7
1923-----	73.4	18.4	8.9	9.5	8.5	28.4	18.1
1922-----	74.1	18.4	8.5	9.9	10.4	27.2	18.1
1921-----	67.7	17.0	8.4	8.6	9.9	26.0	14.8
1920-----	80.6	---	8.1	19.2		34.2	19.1
1919-----	81.4	---	8.3	21.2		28.8	23.1
1918-----	65.3	---	8.0	19.1		23.1	15.1
1917-----	85.7	---	9.0	21.0		33.3	22.4
1916-----	88.3	---	9.1	18.2		35.5	25.5
1915-----	81.9	---	9.7	18.3		33.5	20.4
1914-----	86.2	---	8.2	20.6		36.8	20.6
1913-----	83.0	---	10.3	18.0		34.7	20.0
1912-----	81.3	---	7.7	19.5		34.5	19.6
1911-----	95.8	---	8.9	23.3		41.7	21.9
1910-----	92.1	---	9.3	21.8		40.6	20.4
1909-----	86.1	---	9.0	20.4		34.7	22.0
1908-----	110.8	---	9.5	25.3		47.8	28.2
1907-----	95.5	---	10.4	21.3		38.3	25.5
1906-----	97.2	---	9.8	23.7		41.6	22.1
1905-----	109.2	---	10.4	25.0		47.0	26.8
1904-----	96.3	---	8.4	23.9		40.7	23.3
1903-----	104.6	---	10.6	24.4		43.6	26.0
1902-----	100.2	---	9.2	23.2		40.5	27.3
1901-----	119.1	---	10.1	25.8		52.1	31.1

¹Based on calendar days since birth.

Table 8. Infant mortality rates by legitimacy and age: Denmark, 1931-62

Year	Under 1 year		Under 7 days ^f		Under 1 day ¹	
	Legit- imate	Illegit- imate	Legit- imate	Illegit- imate	Legit- imate	Illegit- imate
	Rate per 1,000 live births of specified legitimacy					
1962-----	18.9	31.8	12.3	22.7	4.6	7.6
1961-----	20.9	31.9	13.7	24.2	5.1	9.6
1960-----	20.8	30.2	13.3	21.3	4.4	8.4
1959-----	21.4	34.8	13.2	21.0	5.2	9.8
1958-----	21.2	37.8	12.8	26.0	4.8	9.3
1957-----	22.3	38.1	13.2	25.1	5.1	9.0
1956-----	24.1	36.1	14.5	24.6	6.2	9.7
1955-----	24.3	37.0	15.1	24.1	6.5	11.5
1954-----	26.0	39.2	14.7	25.5	6.2	11.1
1953-----	26.3	40.2	15.3	28.7	7.2	14.9
1952-----	27.6	46.3	15.9	29.4	7.5	14.6
1951-----	28.0	40.0	15.1	26.8	7.0	12.3
1950-----	29.4	47.6	14.4	29.1	6.9	14.2
1949-----	33.3	49.6	15.3	24.4	7.0	12.2
1948-----	34.2	48.7	15.0	21.2	6.6	10.2
1947-----	38.3	65.6	16.3	27.6	7.3	13.0
1946-----	42.7	82.6	17.1	28.3	8.1	12.6
1945-----	45.0	78.0	17.1	31.9	7.7	16.2
1944-----	44.8	76.2	17.7	29.9	8.5	12.2
1943-----	42.5	68.4	17.1	27.6	8.0	14.2
1942-----	44.4	75.3	17.0	31.4	7.6	16.1
1941-----	53.4	71.7	17.9	26.2	7.7	12.8
1940-----	48.3	69.1	19.0	30.3	8.7	17.2
1939-----	55.8	82.2	21.0	32.5	9.6	17.2
1938-----	56.4	83.0	20.6	36.3	9.4	17.6
1937-----	64.4	83.2	21.3	36.5	9.7	20.5
1936-----	64.3	100.6	20.7	39.9	9.5	22.2
1935-----	68.9	92.9	21.3	36.0	12.0	22.9
1934-----	62.4	84.2	21.3	33.0	11.2	19.0
1933-----	65.0	90.7	20.4	33.2	10.4	22.6
1932-----	69.3	97.9	20.5	32.7	10.5	17.6
1931-----	78.3	107.3	20.5	31.9	10.9	19.1

Table 8. Infant mortality rates by legitimacy and age: Denmark, 1931-62—Con.

Year	1-6 days ¹		7 days to 1 month		1-5 months		6-11 months	
	Legitimate	Illegitimate	Legitimate	Illegitimate	Legitimate	Illegitimate	Legitimate	Illegitimate
	Rate per 1,000 live births of specified legitimacy							
1962-----	7.7	15.1	1.9	3.7	3.1	3.2	1.6	2.2
1961-----	8.6	14.6	1.9	2.1	3.6	4.1	1.7	1.5
1960-----	8.9	12.9	2.1	3.0	3.7	4.9	1.7	1.0
1959-----	8.0	11.2	2.2	5.7	4.4	6.3	1.6	1.8
1958-----	8.0	16.7	2.3	4.6	4.3	5.5	1.8	1.7
1957-----	8.1	16.1	2.3	4.6	4.6	5.0	2.2	3.4
1956-----	8.3	14.9	2.4	2.5	4.8	5.8	2.4	3.2
1955-----	8.6	12.6	2.1	3.8	5.1	7.7	2.0	1.4
1954-----	8.5	14.4	2.5	3.5	5.8	6.5	3.0	3.7
1953-----	8.1	13.8	2.3	2.8	5.7	6.3	3.0	2.4
1952-----	8.4	14.8	2.4	4.2	5.7	8.5	3.6	4.2
1951-----	8.1	14.5	2.3	3.0	6.8	7.8	3.8	2.4
1950-----	7.5	14.9	2.6	4.7	8.0	10.1	4.4	3.7
1949-----	8.3	12.2	3.0	4.4	9.9	17.3	5.1	3.5
1948-----	8.4	11.0	3.4	5.7	10.3	13.9	5.5	7.9
1947-----	9.0	14.6	4.6	7.6	10.7	23.2	6.7	7.2
1946-----	9.0	15.7	5.0	11.8	13.1	32.0	7.5	10.5
1945-----	9.4	15.7	5.8	11.2	15.2	27.9	6.9	7.0
1944-----	9.2	17.7	4.9	9.8	14.3	27.9	7.9	8.6
1943-----	9.1	13.4	4.5	8.6	13.6	22.8	7.3	9.4
1942-----	9.4	15.3	4.9	10.1	14.1	23.5	8.4	10.3
1941-----	10.2	13.4	5.0	5.9	17.1	26.3	13.4	13.3
1940-----	10.3	13.1	4.9	8.3	14.3	21.1	10.1	9.4
1939-----	11.4	15.1	5.2	8.7	17.3	26.7	12.3	14.3
1938-----	11.2	18.7	5.2	6.4	17.5	26.1	13.1	14.2
1937-----	11.6	16.0	6.4	6.2	22.1	24.7	14.6	15.8
1936-----	11.2	17.7	6.4	11.5	23.0	31.0	14.2	18.2
1935-----	9.3	13.1	6.4	7.4	24.4	31.3	16.8	18.2
1934-----	10.1	14.0	6.3	8.5	22.4	29.5	12.4	13.2
1933-----	10.0	10.6	5.9	6.7	25.4	35.1	13.3	15.7
1932-----	10.0	15.1	7.0	11.1	26.4	38.9	15.4	15.2
1931-----	9.6	12.8	7.4	10.9	31.1	43.4	19.3	21.1

¹Based on calendar days since birth.

Table 9. Stillbirth and perinatal mortality rates by legitimacy: Denmark, 1931-62

Year	Legitimate		Illegitimate	
	Perinatal mortality rate	Still-birth rate	Perinatal mortality rate	Still-birth rate
	Rate per 1,000 total births			
1962-----	24.1	11.9	34.1	11.7
1961-----	25.7	12.1	40.9	17.1
1960-----	25.5	12.4	34.0	12.9
1959-----	27.7	14.6	35.0	14.3
1958-----	28.0	15.5	40.9	15.3
1957-----	28.0	15.0	42.8	18.2
1956-----	31.5	17.2	45.1	20.9
1955-----	32.5	17.7	44.2	20.5
1954-----	33.2	18.8	50.7	25.8
1953-----	33.5	18.4	53.7	25.8
1952-----	32.8	17.2	50.9	22.2
1951-----	32.9	18.1	52.5	21.1
1950-----	32.4	18.3	49.7	21.3
1949-----	31.7	16.6	42.4	18.6
1948-----	32.3	17.6	42.0	21.2
1947-----	33.3	17.4	45.5	18.4
1946-----	35.3	18.5	49.0	21.3
1945-----	36.1	19.4	51.1	19.8
1944-----	36.8	19.4	50.9	21.6
1943-----	37.7	21.0	51.3	24.4
1942-----	37.3	20.7	53.8	23.1
1941-----	40.4	22.9	50.0	24.4
1940-----	43.3	24.8	58.9	29.4
1939-----	46.6	26.1	58.9	27.3
1938-----	45.1	25.1	60.5	24.3
1937-----	45.9	25.2	63.5	28.1
1936-----	45.6	25.3	68.6	29.9
1935-----	45.3	24.5	65.9	31.0
1934-----	45.8	25.0	62.3	30.4
1933-----	45.2	25.4	61.7	29.5
1932-----	42.7	22.6	58.1	26.3
1931-----	44.1	24.1	53.4	22.1

Table 10. Infant mortality rates, by total-birth order and age: Denmark, 1951-53 and 1960-62

Total-birth order ¹	Under 1 year	Under 7 days ²	Under 1 day ²	1-6 days ²	7 days to 1 month ²	1-5 months	6-11 months
<u>1960-62</u>							
Rate per 10,000 live births of specified birth order							
Total-----	211.2	139.0	50.2	88.8	20.7	35.1	16.4
First-----	200.9	139.6	47.0	92.6	20.6	29.2	11.5
Second-----	189.1	117.4	41.9	75.5	19.4	35.0	17.3
Third-----	208.8	139.1	47.6	91.5	17.5	35.2	17.0
Fourth-----	251.7	158.5	71.2	87.3	20.0	48.8	24.4
Fifth-----	271.0	181.0	75.0	106.0	28.0	41.0	21.0
Sixth and over-----	324.2	208.0	78.6	129.4	39.8	48.7	27.7
<u>1951-53</u>							
Total-----	283.1	163.3	76.9	86.4	24.1	61.4	34.3
First-----	276.9	179.5	82.4	97.1	24.5	47.0	25.9
Second-----	243.2	129.2	63.6	65.6	21.0	57.7	35.3
Third-----	271.1	149.0	67.9	81.1	23.1	67.7	31.3
Fourth-----	318.9	174.4	84.2	90.2	25.3	78.7	40.5
Fifth-----	332.6	189.0	87.2	101.8	20.9	67.3	55.4
Sixth and over-----	472.2	255.4	123.0	132.4	42.6	112.7	61.5

¹Total-birth order refers to all pregnancies ever experienced by mother, including abortions, miscarriages, stillbirths, and live births.

²Based on calendar days since birth.

[Ed. note. The slight differences in the rates for the infant period (under 1 year) between this table and table 11 are due to the distribution of cases with unknown total-birth order].

Table 11. Infant mortality rates, by cause of death and total-birth order: Denmark, 1960-62

Cause of death (Seventh Revision— International Lists, 1955)	Total-birth order ¹						
	Total	1	2	3	4	5	6 and over
	Rate per 10,000 live births of specified birth order						
All causes-----	211.2	200.5	189.5	208.8	251.7	272.0	323.1
Infective and parasitic diseases----(001-138,340-344,690-695,765-768)	5.5	5.5	5.1	4.3	8.8	5.0	7.8
Influenza and pneumonia----- (480-493,763)	11.6	7.9	9.7	12.4	21.5	24.0	19.9
All other diseases of respiratory system; diseases of the circulatory system; and cer- tain diseases of ear and mastoid process----- (390-394,400-475,500-527)	3.3	2.6	3.9	3.6	2.9	2.0	5.5
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn- (543,571,572,764)	3.7	2.6	4.7	3.1	2.9	8.0	5.5
All other diseases of digestive system----- (530-542,544-570,573-587)	2.6	2.9	2.6	2.4	3.4	2.0	1.1
Congenital malformations----- (750-759)	44.2	38.2	44.1	45.0	51.2	56.0	64.2
Birth injuries----- (760,761)	25.7	29.1	18.4	22.7	32.7	29.0	44.3
Intracranial and spinal injury at birth----- (760)	21.5	25.1	15.4	18.4	27.3	22.0	36.5
Other birth injury----- (761)	4.2	4.0	3.0	4.3	5.4	7.0	7.8
Postnatal asphyxia and atelectasis----- (762)	47.5	47.5	42.6	47.9	48.8	56.0	69.7
Hemolytic diseases of newborn (erythroblastosis)----- (770)	4.2	1.9	3.0	6.5	10.3	9.0	4.4
Immaturity with mention of any other sub- sidiary condition, or unqualified--- (774,776)	31.4	34.0	26.0	28.7	33.7	40.0	47.6
Other defined and ill-defined diseases peculiar to early infancy----- (769,771-773)	19.0	19.1	17.1	19.2	14.6	27.0	33.2
Symptoms and ill-defined conditions----- (780-793,795)	4.8	3.0	4.2	4.8	11.2	5.0	11.1
All other diseases----- (Residual)	4.4	3.9	3.9	4.8	7.3	5.0	3.3
Accidents----- (E800-E999)	3.3	2.3	4.2	3.4	2.4	4.0	5.5

¹Total-birth order refers to all pregnancies ever experienced by mother, including abortions, miscarriages, stillbirths, and live births.

[Ed. note. The slight differences in the rates for all causes between this table and table 10 are due to the distribution of cases with unknown total-birth order.]

Table 12. Average infant mortality rates, by cause of death and occupation of family head: Denmark, 1951 and 1953

Cause of death (Sixth Revision—International Lists, 1948)	Total	Self-employed in manufacturing, construction, and commerce	Self-employed in professional services	Salaried employees and public servants
		Rate per 10,000 live births of specified occupation of family head		
All causes-----	280.3	209.1	210.0	219.5
Infective and parasitic diseases----- (001-138, 340-344, 690-695, 765-768)	12.5	6.3	5.2	6.1
Influenza and pneumonia----- (480-493, 763)	33.5	21.9	16.6	15.0
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394, 400-475, 500-527)	8.4	5.4	2.1	4.2
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn--- (543, 571, 572, 764)	7.5	3.9	1.0	3.8
All other diseases of digestive system----- (530-542, 544-570, 573-587)	3.2	2.4	3.1	0.5
Congenital malformations----- (750-759)	47.2	40.9	45.8	41.8
Birth injuries----- (760, 761)	29.9	24.3	29.1	30.1
Intracranial and spinal injury at birth--- (760)	28.0	23.8	29.1	28.2
Other birth injury----- (761)	1.9	0.5	-	1.9
Postnatal asphyxia and atelectasis----- (762)	36.7	30.1	33.3	32.4
Hemolytic diseases of newborn (erythroblastosis)----- (770)	5.4	6.3	4.2	4.2
Immaturity with mention of any other subsidiary condition, or unqualified----- (774, 776)	36.6	25.3	22.9	30.6
Other defined and ill-defined diseases peculiar to early infancy----- (769, 771-773)	41.5	37.0	32.2	38.5
Symptoms and ill-defined conditions-- (780-793, 795)	5.1	1.0	1.0	0.5
All other diseases----- (Residual)	5.4	1.9	7.3	6.6
Accidents----- (E800-E999)	7.4	2.4	6.2	5.2

Cause of death (Sixth Revision—International Lists, 1948)	Self-employed in agriculture, forestry, and fishing	Laborers (excluding agriculture)	Laborers in agriculture, forestry, and fishing	Domestic workers, unknown, and unspecified
	Rate per 10,000 live births of specified occupation of family head			
All causes-----	258.5	310.0	349.6	434.5
Infective and parasitic diseases----- (001-138, 340-344, 690-695, 765-768)	12.5	16.5	15.1	23.6
Influenza and pneumonia----- (480-493, 763)	31.3	34.8	64.2	57.8
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394, 400-475, 500-527)	7.7	12.6	7.8	12.9
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn--- (543, 571, 572, 764)	4.9	8.9	18.5	6.4
All other diseases of digestive system----- (530-542, 544-570, 573-587)	2.1	3.9	6.3	4.3
Congenital malformations----- (750-759)	49.8	47.6	52.0	47.1
Birth injuries----- (760, 761)	32.0	31.3	25.7	36.4
Intracranial and spinal injury at birth--- (760)	28.2	29.9	22.8	34.3
Other birth injury----- (761)	3.8	1.4	2.9	2.1
Postnatal asphyxia and atelectasis----- (762)	25.8	46.8	29.2	70.6
Hemolytic diseases of newborn (erythroblastosis)----- (770)	7.0	4.9	4.4	6.4
Immaturity with mention of any other subsidiary condition, or unqualified----- (774, 776)	31.7	40.7	44.2	81.3
Other defined and ill-defined diseases peculiar to early infancy----- (769, 771-773)	38.0	42.5	49.1	57.8
Symptoms and ill-defined conditions-- (780-793, 795)	4.2	6.1	13.6	6.4
All other diseases----- (Residual)	7.0	4.3	5.4	10.7
Accidents----- (E800-E999)	4.5	9.1	14.1	12.8

Table 13. Infant mortality rates, by age and mother's place of residence: Denmark, 1943-62

Year	Capital ¹			Provincial towns ²			Rural districts ³		
	Under 1 year	Under 7 days ⁴	7 days-11 months ⁴	Under 1 year	Under 7 days ⁴	7 days-11 months ⁴	Under 1 year	Under 7 days ⁴	7 days-11 months ⁴
	Rate per 1,000 live births of specified residence of mother								
1962---	20.2	14.9	5.3	21.2	13.4	7.8	19.5	12.6	6.9
1961---	24.6	18.1	6.5	22.8	15.8	7.0	20.6	13.0	7.6
1960---	21.1	15.1	6.0	22.9	15.4	7.5	20.9	12.9	8.0
1959---	24.1	16.6	7.5	23.8	14.8	9.0	21.4	12.6	8.8
1958---	22.5	15.2	7.3	24.6	15.4	9.2	21.4	12.4	9.0
1957---	24.2	16.0	8.2	24.0	14.1	9.9	22.8	13.4	9.4
1956---	23.9	17.2	6.7	24.3	15.0	9.3	25.6	14.8	10.8
1955---	25.7	18.2	7.5	24.9	16.2	8.7	25.1	14.7	10.4
1954---	22.9	16.3	6.6	28.9	16.5	12.4	27.0	14.7	12.3
1953---	25.8	16.9	8.9	28.7	17.6	11.1	26.9	15.4	11.5
1952---	23.0	16.1	6.9	30.3	17.6	12.7	30.0	16.6	13.4
1951---	24.2	15.8	8.4	30.9	17.4	13.5	29.3	15.2	14.1
1950---	27.4	16.2	11.2	32.4	16.4	16.0	31.0	14.7	16.3
1949---	28.9	16.5	12.4	35.4	16.5	18.9	35.8	15.5	20.3
1948---	31.7	---	---	34.8	---	---	36.8	---	---
1947---	38.0	---	---	40.6	---	---	41.3	---	---
1946---	43.3	---	---	54.1	---	---	42.6	---	---
1945---	51.2	---	---	55.0	---	---	43.8	---	---
1944---	47.8	---	---	54.7	---	---	44.2	---	---
1943---	34.5	---	---	55.6	---	---	43.9	---	---

¹Capital: Consists of three municipalities (Copenhagen, Frederiksberg, and Gentofte) with a total of 923,974 inhabitants in 1960. These three municipalities are completely urban.

²Provincial towns: Consist of 88 towns and cities with a total of 1,242,477 inhabitants in 1960. These 88 towns and cities are completely urban and most of them have been towns and cities for several centuries.

³Rural districts: Consist of about 1,260 municipalities with a total of 2,418,835 inhabitants in 1960. Some of these municipalities are partly urban. In 1960, 35 percent of the population in the rural districts lived in suburban or urban areas of 1,000 inhabitants or more.

⁴Based on calendar days since birth.

Table 14. Stillbirth and perinatal mortality rates by mother's place of residence:
Denmark, 1943-62

Year	Capital ¹		Provincial towns ²		Rural districts ³	
	Perinatal mortality rate	Still-birth rate	Perinatal mortality rate	Still-birth rate	Perinatal mortality rate	Still-birth rate
	Rate per 1,000 total births of specified residence of mother					
1962-----	24.4	9.8	25.6	12.3	24.7	12.2
1961-----	29.7	11.8	28.2	12.5	25.6	12.8
1960-----	24.1	9.1	28.2	13.0	25.9	13.1
1959-----	29.0	12.6	30.5	15.9	26.9	14.5
1958-----	27.3	12.3	31.4	16.2	28.2	16.0
1957-----	29.8	14.0	29.1	15.2	28.8	15.6
1956-----	32.2	15.2	32.3	17.6	32.5	18.0
1955-----	32.9	15.0	34.6	18.7	32.8	18.3
1954-----	36.2	20.2	35.5	19.2	33.4	19.0
1953-----	35.5	19.0	35.2	17.9	34.6	19.4
1952-----	32.4	16.5	36.0	18.8	33.5	17.2
1951-----	31.6	16.1	35.5	18.5	33.9	18.9
1950-----	35.3	19.3	35.1	19.0	32.4	18.0
1949-----	32.8	16.6	34.2	18.0	31.6	16.4
1948-----	---	15.4	---	19.7	---	17.9
1947-----	---	18.2	---	18.7	---	16.5
1946-----	---	18.1	---	20.6	---	18.0
1945-----	---	17.7	---	19.9	---	19.8
1944-----	---	18.4	---	20.7	---	19.5
1943-----	---	20.8	---	21.2	---	21.5

¹Capital: Consists of three municipalities (Copenhagen, Frederiksberg, and Gentofte) with a total of 923,974 inhabitants in 1960. These three municipalities are completely urban.

²Provincial towns: Consist of 88 towns and cities with a total of 1,242,477 inhabitants in 1960. These 88 towns and cities are completely urban and most of them have been towns and cities for several centuries.

³Rural districts: Consist of about 1,260 municipalities with a total of 2,418,835 inhabitants in 1960. Some of these municipalities are partly urban. In 1960, 35 percent of the population in the rural districts lived in suburban or urban areas of 1,000 inhabitants or more.

Table 15. Infant mortality rates, by age, cause of death, and mother's place of residence: Denmark, 1960-62

Cause of death (Seventh Revision-- International Lists, 1958)	Capital ¹			Provincial towns ²			Rural districts ³		
	Under 1 year	Under 7 days ⁴	7 days- 11 months ⁴	Under 1 year	Under 7 days ⁴	7 days- 11 months ⁴	Under 1 year	Under 7 days ⁴	7 days- 11 months ⁴
	Rate per 10,000 live births of specified residence of mother								
All causes-----	219.6	160.4	59.2	222.8	148.7	74.1	203.3	128.5	74.8
Infective and parasitic diseases----- (001-138, 340-344, 690-695, 765-768)	4.4	0.3	4.1	5.1	0.5	4.6	6.0	0.6	5.4
Influenza and pneumonia----- (480-493, 763)	4.9	1.4	3.5	11.6	0.6	11.0	13.6	1.0	12.6
All other diseases of respiratory system; diseases of the circulatory system; and certain diseases of ear and mastoid process----- (390-394, 400-475, 500-527)	3.0	-	3.0	2.7	-	2.7	3.6	-	3.6
Gastritis, duodenitis, enteritis, and colitis, including diarrhea of newborn----- (543, 571, 572, 764)	2.1	-	2.1	3.2	-	3.2	4.3	-	4.3
All other diseases of digestive system----- (530-542, 544-570, 573-587)	4.1	0.5	3.6	3.4	1.3	2.1	2.0	1.2	0.8
Congenital malformations----- (750-759)	45.0	23.6	21.4	44.1	17.2	26.9	43.9	17.6	26.3
Birth injuries----- (760, 761)	43.6	41.4	2.2	23.2	21.1	2.1	21.8	20.3	1.5
Intracranial and spinal injury at birth----- (760)	36.2	34.3	1.9	19.3	17.4	1.9	18.4	16.9	1.5
Other birth injury----- (761)	7.4	7.1	0.3	3.9	3.7	0.2	3.4	3.4	0.0
Postnatal asphyxia and atelectasis----- (762)	62.8	59.2	3.6	48.3	45.1	3.2	42.8	40.2	2.6
Hemolytic diseases of newborn (erythroblastosis)----- (770)	3.3	2.7	0.6	5.2	4.7	0.5	4.0	3.1	0.9
Immaturity with mention of any other subsidiary condition, or unqualified----- (774, 776)	24.4	22.2	2.2	38.3	36.2	2.1	30.1	28.8	1.3
Other defined and ill-defined diseases peculiar to early infancy----- (769, 771-773)	11.5	8.5	3.0	25.1	19.8	5.3	18.2	14.3	3.9
Symptoms and ill-defined conditions----- (780-793, 795)	3.3	-	3.3	4.7	1.1	3.6	5.3	0.6	4.7
All other diseases----- (Residual)	3.6	0.3	3.3	3.9	0.8	3.1	4.8	0.8	4.0
Accidents----- (E800-E999)	3.6	0.3	3.3	4.0	0.3	3.7	2.9	0.1	2.8

¹Capital: Consists of three municipalities (Copenhagen, Frederiksberg, and Gentofte) with a total of 923,974 inhabitants in 1960. These three municipalities are completely urban.

²Provincial towns: Consist of 88 towns and cities with a total of 1,242,477 inhabitants in 1960. These 88 towns and cities are completely urban and most of them have been towns and cities for several centuries.

³Rural districts: Consist of about 1,260 municipalities with a total of 2,418,835 inhabitants in 1960. Some of these municipalities are partly urban. In 1960, 35 percent of the population in the rural districts lived in suburban or urban areas of 1,000 inhabitants or more.

⁴Based on calendar days since birth.

Table 16. Summary of pregnancy outcome: Denmark, 1932-63

Year	Total number of pregnancies	Number of deliveries ¹	Number of legal abortions ²	Number of hospitalized spontaneous and illegal abortions ³	Estimated number of non-hospitalized abortions ^{3,4}	Estimated number of ectopic pregnancies ⁵	Pregnancies per 1,000 population	Deliveries per 1,000 population
1962---	---	77,785	3,997	---	---	---	---	16.7
1961---	98,985	76,459	4,124	10,778	7,189	435	21.4	16.6
1960---	98,611	76,118	3,918	10,885	7,257	433	21.5	16.6
1959---	---	74,071	3,589	---	---	---	---	16.3
1958---	---	74,885	3,897	---	---	---	---	16.6
1957---	---	75,458	4,023	---	---	---	---	16.8
1956---	---	77,128	4,477	---	---	---	---	17.3
1955---	---	77,197	5,434	---	---	---	---	17.4
1954---	---	76,848	5,140	---	---	---	---	17.5
1953---	---	78,696	4,795	---	---	---	---	18.0
1952---	---	77,251	5,031	---	---	---	---	17.8
1951---	---	76,958	4,743	---	---	---	---	17.9
1950---	104,892	79,965	4,101	12,219	8,146	461	24.6	18.7
1949---	105,215	80,161	3,425	12,700	8,467	462	24.9	18.9
1948---	109,918	85,214	2,543	13,007	9,671	483	26.3	20.3
1947---	115,093	91,951	2,240	12,238	8,159	505	27.8	22.2
1946---	117,439	96,513	1,950	11,076	7,384	516	28.6	23.5
1945---	115,732	95,475	1,577	10,903	7,269	508	28.6	23.6
1944---	107,969	91,106	1,286	9,062	6,041	474	27.0	22.8
1943---	99,731	84,826	977	8,094	5,396	438	25.3	21.5
1942---	92,733	80,072	824	6,800	4,530	407	23.8	20.5
1941---	82,799	71,939	519	5,986	3,991	364	21.5	18.6
1940---	79,940	70,825	522	4,945	3,297	351	20.8	18.4
1939---	---	68,716	484	---	---	---	---	18.1
1938---	---	69,219	483	---	---	---	---	18.3
1937---	---	68,129	486	---	---	---	---	18.2
1936---	---	67,170	510	---	---	---	---	18.1
1935---	---	65,818	423	---	---	---	---	17.9
1934---	---	65,772	327	---	---	---	---	18.0
1933---	---	63,480	326	---	---	---	---	17.6
1932---	---	65,128	370	---	---	---	---	18.2

¹Statistisk Departement: Befolkningens bevaegelser 1931-62. Copenhagen, 1931-64.

²Sundhedsstyrelsen: Medicinalberetning for Kongeriget Danmark 1931-62. Copenhagen, 1933-64.

³H. Hoffmeyer and M. Nørgaard, Konceptionshyppighed og svangerskabsforløb, Ugeskr. Laeg. 126:355-371, 1964.

⁴Hoffmeyer and Nørgaard's estimate in 1964 was 30-50 percent nonhospitalized abortions; however, here 40 percent is used.

⁵T. Kaern, Extrauteringravidditet på grundlag af et københavnsk materiale, Nord. Med. 41:406-411, 1949. Kaern estimates 0.44 percent ectopic pregnancies per total number of conceptions.

APPENDIX I

DEFINITIONS AND REGISTRATION

Definitions

These definitions have been in force throughout the last 100 years.

Live birth.—A live birth is defined as an infant who after delivery shows evidence of life, regardless of the length of gestation. According to Danish practice, breathing is taken as evidence of life.

Stillbirth.—A stillbirth is a fetus delivered after the 28th week of pregnancy without evidence of life. In practice, the pregnancy is considered to be of this duration, if the infant weighs 1,000 grams or more.

Abortion.—An abortion is a fetus delivered before the end of the 28th week of pregnancy without evidence of life.

Infant death.—An infant death is the death of a liveborn infant within the first year of life.

Perinatal death.—A perinatal death is a stillbirth or the death of a liveborn infant within the first week of life.

Registration

Live births.—It is the midwife's duty to report a birth to the vicar of the area in which the birth occurs within 1 week. Furthermore, she must inform the parents (or the unmarried mother) that they (or she) must report the birth to the parish registrar within 2 days (or in some rural districts within 8 days) and must at that time present birth and marriage certificates. If no midwife is present at the delivery, the duties mentioned rest upon the physician.

The vicar and the parish registrar must compare the birth reports received. Every 3 months the vicar delivers the reports to the Statistical Department. Every week the parish registrar delivers his reports to the national registrar of the mother's municipal town.

Stillbirths.—A stillbirth certificate is issued by the midwife and presented to the vicar, or in some big towns to the municipal burial authorities, by the parents or sometimes by the midwife. In towns and most rural districts there must be a death certificate, as well as a stillbirth certificate, issued by a physician. This is compulsory if no midwife has attended the delivery. The death certificate is presented to the vicar or the burial authorities by the parents.

Once a month the vicar or the burial authorities forward the stillbirth certificates and the death certificates to the health officers who go through them and, if necessary, consult the parents or the physician before sending the certificates to the National Health Service with any necessary supplementary remarks and corrections.

In the National Health Service coding of causes of death is made on the basis of the death certificates under expert supervision of physicians. The certificates are thereafter sent to the Statistical Department for statistical coding and analyses. The final tabulation takes place both in the Statistical Department of the Ministry of Economics and in the National Health Service of the Ministry of Home Affairs.

Deaths.—For any death, a certificate must be issued after examination of the dead. When death is caused by accident or violence or is in any way suspicious (generally a total of about 10 percent), the death certificate must be issued by the health officer connected with the police. In towns the death certificates must always be issued by a physician, but in rural districts if the distance between the residences of the dead person and the nearest physician exceeds 2 kilometers (about 1-1/4 miles), they may be issued by a lay coroner. While the certificates from lay coroners in 1931-35 were 10.6 percent of all death certificates, in the rural districts the corresponding percentage was 0.1 in 1961.

The death certificates are presented to the vicar or the burial authorities by the parents and are then handled in the same way as the death certificates for stillborn infants. The vicar or the burial authorities report the death to the population registry or make sure that the parents have reported it.

Registration completeness.—The statistics for live births, stillbirths, and deaths possess a very high degree of accuracy, because the system of registration is based on an old and well practiced tradition. The double registration of liveborn infants insures the registration of every birth, and the same may be said about stillborn infants, which are nowadays registered twice. The examination of the stillbirth certificates and the death certificates undertaken by the health officers and the National Health Service makes certain that the correct cause of death is established. In case of doubt the matter is discussed with the person who has issued the certificate. A special form is used for death certificates for the age group under 1 year, since information on legitimacy and parity is requested.

APPENDIX II. FERTILITY

This appendix describes the distribution of births by different demographic characteristics which influence perinatal and infant mortality rates, especially with view to changes in the composition of births from 1931 through 1962.

The relationship between male and female births has remained constant during this period. Approximately 51 percent of the births are males and 49 percent, females.

The proportion of illegitimate births showed a slight decrease up to 1951-53 (10.5 in 1931-33 to 6.9 percent). Since then there has been an increase to 8.1 percent.

From 1931-33 to 1960-62 a decrease from 1.5 to 1.2 percent occurred in the proportion of multiple births (live and still). The slight decrease in multiple births was caused by the smaller proportion of births among mothers of older ages. Multiple births are more frequent in the older ages until 40 years of age. In 1941-45 there were about 2.2 multiple births for every 1,000 parturients 35-39 years old, while there were only 0.7 for parturients 15-19 years and 1.7 for parturients 40 years and older. In 1951-55 the rate had decreased to 1.9 for mothers 35-39 years and to 1.5 for mothers 40 years and older. The rate remained the same for the younger mothers.

In general, there has been a smaller proportion of births to mothers in the higher ages. In 1931-33 women of 30 years and older delivered 39.3 percent of all births against only 26.5 percent in 1960-62. As the higher birth orders occur among older women, a concentration of births in the lower ages must mean a corresponding concentration in lower birth orders.

Table I. Percentage distribution of total births by total-birth order: Denmark, selected years, 1931-62

Total-birth order	1960-1962	1951-1953	1941-1943	1931-1933
Total-----	100.0	100.0	100.0	100.0
First-----	34.8	33.0	36.9	33.3
Second-----	29.8	29.4	27.2	23.1
Third-----	18.1	17.9	15.4	14.5
Fourth-----	8.9	9.4	8.3	9.3
Fifth-----	4.4	4.8	4.7	6.1
Sixth and over----	4.0	5.5	7.5	13.7

In 1960-62, 82.7 percent of all births were first, second, or third births, while in 1931-33 only 70.9 percent were of these orders (table I).

These changes in the distribution of births by total-birth order and age of mother are not due to changed composition of women by age, but to a strongly increased frequency of births among the lower ages, together with a decreasing frequency of births in the higher ages (table II). The prominent increase among the lower ages, especially among mothers 20-24 years old, is due to the fact that more of these mothers are married nowadays. In the census of 1930, 28.3 percent of all women between 20-24 years were married, while the corresponding figure for the census of 1960 was 53.2 percent.

The distribution of births by calendar month has remained practically unchanged throughout the last 30 years. The maximum has been in March and the minimum in November.

Data from the 1940 census are shown in table III to illustrate fertility in the different occupational groups. The table covers the fertility trend from 1926-40, since the rates are based on marriages of 12 to 15 years in duration. The table also shows rates for three areas: the Capital, provincial towns, and rural districts. The first two areas are completely urban, while in 1960 only 35 percent of the population in the rural districts lived in urban conditions, i.e., suburban or urban areas of 1,000 inhabitants or more.

Table II. Deliveries per 1,000 females by age of mother: Denmark, selected years, 1931-62

Age of mother	1960-1962	1951-1953	1941-1943	1931-1933
15-19 years-----	42.1	40.2	28.0	22.5
20-24 years-----	171.3	156.7	130.4	101.3
25-29 years-----	156.8	151.1	147.5	122.9
30-34 years-----	87.2	94.7	107.0	96.1
35-39 years-----	38.3	50.3	61.1	63.2
40-44 years-----	11.2	16.3	20.5	25.4
45 years and over--	0.7	1.1	1.6	2.4

Table III. Ratio of children to marriages of 12-15 years of duration, by area of residence and occupation of head of household: Denmark, 1926-40

Area and occupation	Children per 100 marriages
<u>Capital</u>	
Self-employed-----	131
Salaried employees in manufacturing, construction, and commerce-----	125
Public servants-----	129
Laborers-----	143
<u>Provincial towns</u>	
Self-employed-----	173
Salaried employees in manufacturing, construction, and commerce-----	159
Public servants-----	164
Laborers-----	194
<u>Rural districts</u>	
Self-employed in agriculture-----	249
Self-employed (excluding agriculture)-----	206
Salaried employees in manufacturing, construction, and commerce-----	180
Public servants-----	205
Laborers (excluding agriculture)-----	240
Laborers in agriculture-----	274

A comparison among occupational groups in each of the three areas shows evident differences, although they are limited in the Capital and provincial towns. As far as all three areas are concerned, laborers had the highest fertility and salaried employees, the lowest. Fertility increases from the most urbanized area (Capital) to the least urbanized areas (rural districts). The higher fertility among certain occupations and in certain areas means more births of higher birth orders. Thus, perinatal and infant mortality are influenced, since mortality varies according to order of birth.

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APPENDIX III

DEMOGRAPHIC DESCRIPTION OF DENMARK

Area and Climate

Denmark, excluding the Faroe Islands and Greenland, covers an area of about 43,000 square kilometers (16,600 square miles). The 1960 census showed a population of 4,585,000 persons, or a density of about 107 inhabitants per square kilometer (276 per square mile).

About 73 percent of the total area is agricultural, and about 10 percent is forests and plantations. The climate is temperate coast climate with average temperatures from -0.1 to 16.0 degrees centigrade (31.8-60.8 degrees Fahrenheit) in the coldest and warmest months, i.e., February and July.

Growth of Population

The census of 1930 was on a *de facto* basis (population actually present) while the following were on the *de jure* principle (resident population). The percentages of growth per year vary between 0.6 and 1.1:

Census	Population	Annual growth (percent)
1930-----	3,551,000	
1935-----	3,696,000	0.8
1940-----	3,844,000	0.8
1945-----	4,045,000	1.1
1950-----	4,281,000	1.0
1955-----	4,448,000	0.8
1960-----	4,585,000	0.6

In figure I the four components of population growth are shown, that is, live births, deaths, immigrants, and emigrants. Throughout the period from 1930-62 net migrations (immigration minus emigration) have been of minor importance so that the growth of population is determined mainly by the difference between the incidence of births and deaths. As the incidence of death varies within rather narrow limits, the considerable population growth from 1940-50 was due mainly to the

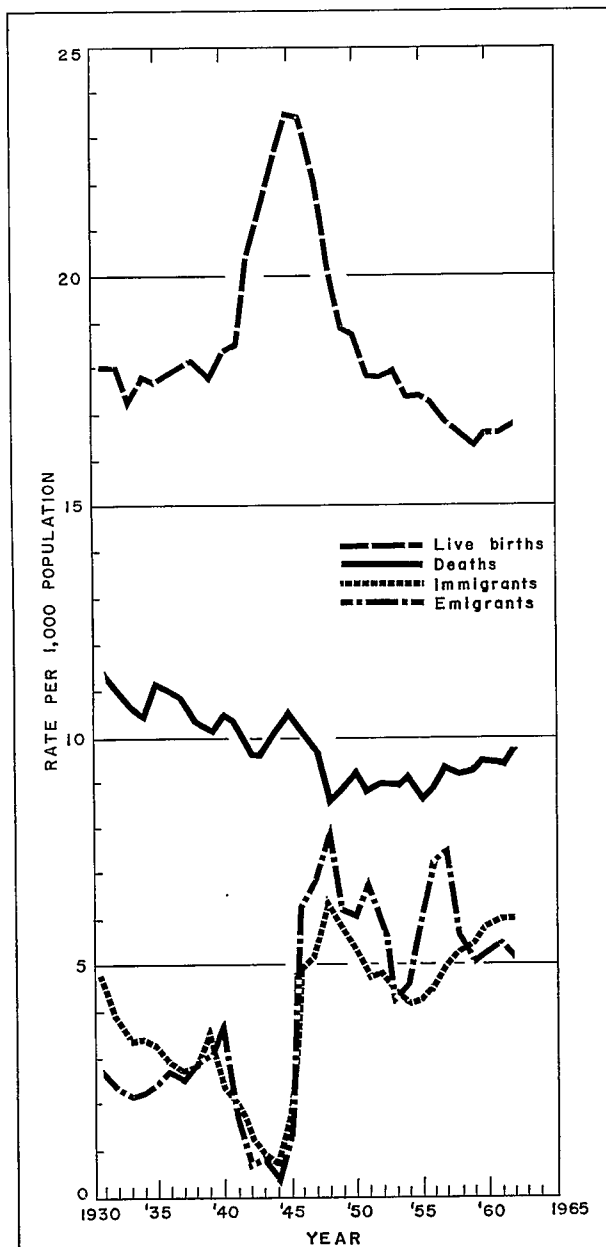


Figure I. Live birth, death, immigrant, and emigrant rates: Denmark, 1931-60.

rise in the birth rate during the War and afterwards, when the birth rate during one single year (1945) reached 23.5 per 1,000 population (table IV).

Sex, Age, and Marital Status

During every year from 1930 to 1960 there has been an excess of females in the Danish population. In 1930 the excess amounted to 78,000 or 1,045 females per 1,000 males, while in 1960 the excess was only 38,800 or 1,017 females per 1,000 males. The decrease in the excess of females was due in part to the change from the traditional net emigration to a net immigration during the 1930's (the majority migrating were males), and in part to the large birth cohorts during the 1940's (107 liveborn males per 100 liveborn females).

The distribution of the population by age in 1930 was such that about 27 percent were under 15 years,

while about 7 percent were 65 years or more. This age structure should be regarded against the background of the decrease in the birth rate which started in Denmark in the end of the last century and which declined from about 31 (1890) to about 19 (1930) per 1,000 population. This development has involved a still decreasing proportion in the youngest group and at the same time an increasing proportion of elderly persons. As is well known, the decrease of the death rate has had little influence on the age distribution of the population.

As is shown below this trend was not concluded in 1930, because the proportion of children continued to decrease and that of elderly persons to increase during the period 1930-60. Only the large birth cohorts in the 1940's caused a temporary change in the development of the group under 15 years:

Table IV. Live birth, death, immigrant, and emigrant rates: Denmark, 1931-62

Year	Live birth rate	Death rate	Immigrant rate	Emigrant rate
Rate per 1,000 population				
1962-----	16.7	9.7	6.0	5.2
1961-----	16.6	9.4	6.0	5.4
1960-----	16.6	9.5	5.8	5.2
1959-----	16.3	9.3	5.4	5.0
1958-----	16.5	9.2	5.2	5.6
1957-----	16.8	9.3	4.9	7.5
1956-----	17.2	8.9	4.5	7.2
1955-----	17.3	8.7	4.2	6.0
1954-----	17.3	9.1	4.1	4.5
1953-----	17.9	9.0	4.4	4.2
1952-----	17.8	9.0	4.8	5.7
1951-----	17.8	8.8	4.7	6.7
1950-----	18.7	9.2	5.3	6.0
1949-----	18.9	8.9	5.8	6.1
1948-----	20.3	8.6	6.3	7.9
1947-----	22.1	9.7	5.2	6.9
1946-----	23.4	10.2	4.9	6.3
1945-----	23.5	10.5	1.7	1.3
1944-----	22.7	10.2	0.7	0.4
1943-----	21.4	9.6	0.9	0.8
1942-----	20.4	9.6	1.2	0.7
1941-----	18.5	10.3	2.0	1.6
1940-----	18.3	10.4	2.3	3.7
1939-----	17.8	10.1	3.6	3.0
1938-----	18.1	10.3	2.8	2.9
1937-----	18.0	10.8	2.7	2.5
1936-----	17.8	11.0	2.9	2.6
1935-----	17.7	11.1	3.2	2.4
1934-----	17.8	10.4	3.4	2.2
1933-----	17.3	10.6	3.3	2.1
1932-----	18.0	11.0	3.8	2.3
1931-----	18.0	11.4	4.6	2.7

Age	1930	1940	1950	1960
Percentage distribution				
All ages-----	100.0	100.0	100.0	100.0
Under 15 years-----	27.5	24.0	26.4	25.1
15-64 years -----	65.2	68.2	64.5	64.3
65 years and over -----	7.3	7.8	9.1	10.5

In 1930, 40.1 and 38.5 percent of males and females, respectively, were married. The proportion of marriage has increased evenly and reached 47.5 and 46.7 percent in 1960. This is due mainly to the increasing frequency of marriage within the individual age groups

Economic Activity and Place of Residence

While 28 percent of the Danish population was attached to agriculture in 1940, there have been such great changes in the economic structure of society during the following 20 years that the proportion in agriculture decreased to about 19 in 1960. This decrease corresponds with an increase in the economic activities in the towns, where the civil and professional services especially show a large relative increase:

Economic activity	1940	1960
	Percent	
Manufacturing-----	33.4	36.5
Commerce-----	12.6	13.5
Transport-----	6.5	7.2
Administrations and professions -----	7.0	10.7

At the same time, there has been a change in the distribution of the population by occupational status. The proportion of self-employed among heads of households decreased from about 33 to about 26 percent,

while the group "salaried employees" increased from about 15 to 20 percent.

The immense growth of economic activity in towns caused increasing urbanization. In 1930 about 58 percent of the population lived in towns of 250 inhabitants or more, but in 1960 the percentage had increased to 73. At the same time, an increased concentration of the population in bigger towns has taken place. While towns with 10,000 inhabitants or more in 1930 held about 41 percent of the population, the corresponding figure was 56 in 1960.

Size of Households and Distribution of Dwellings by Facilities

The average number of persons per household in 1960 was 2.96 against 3.66 in 1930. The rather considerable decrease is due partly to changes in the agricultural structure which have caused a large reduction in the number of farm hands, and partly to changes in the way of life so that different family generations do not live together as they did earlier. Lastly, there has been a decrease in the number of children in each family.

The standard of dwellings in 1960, based on a random sample of 10 percent of all dwellings in Denmark, is indicated by the following distribution of facilities:

Facility	Percent of dwellings
Electricity and/or gas-----	95.9
Central heating-----	47.0
Bathroom-----	49.2
Water closet-----	85.4

Standard of Living

Measured in fixed prices the net national income per capita in Denmark has risen 63 percent from 1938 to 1963. A conversion of the net national income per capita into dollars by use of the official rate of exchange would not give an acceptable basis for comparing the standard of living in the United States and Denmark, for the rate of exchange does not express the relation between the buying power for Danish kroner and American dollars. A more realistic conversion according to buying power has been tried on the basis of calculations made in 1955 by the Organization for Economic Cooperation and Development which estimates \$1=5.50 Danish kroner. If this rate of exchange is used, the net national income per capita in 1963 was \$1,316.

Probability of Death

The probability of death for males and females for selected ages is indicated in table V for each 5 years from 1931 through 1960 and for 1961-62. For males, as well as for females, there was a large decrease in the probability of death until 1951-55. The decrease was greatest for the ages under 15 years and was as much as 73 percent for males and females under 1 year in age. The decrease diminished for higher ages, so that for the highest ages it was only about 15 percent. Furthermore, it is a characteristic feature that the decrease in probability of death was greatest for females. The overall decrease corresponds with the increase in the average expected lifetime for newborn males (from

Table V. Life table mortality rates at specified ages by sex: Denmark, 1931-62

[Number of deaths during specified year of age per 100,000 persons alive at beginning of year of age]

Age in years	1961-62		1956-60		1951-55		1946-50		1941-45		1936-40		1931-35	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0----	2,439	1,867	2,687	1,999	3,170	2,355	4,534	3,470	5,525	4,175	7,084	5,405	8,147	6,308
1----	153	137	168	155	243	195	356	319	529	458	726	589	901	718
2----	102	69	111	68	150	108	201	174	252	211	286	235	374	300
3----	99	65	77	56	110	77	127	112	183	160	199	166	237	201
4----	57	42	69	47	74	56	112	82	125	110	173	145	164	146
5----	64	32	62	39	68	46	86	57	113	90	136	98	134	132
10----	42	22	43	28	42	27	59	39	88	66	98	70	113	78
15----	53	24	53	32	53	41	73	58	113	84	108	92	147	123
20----	119	53	115	43	122	54	158	86	209	156	206	169	256	224
25----	96	46	104	55	128	74	170	127	225	190	224	194	266	278
30----	116	78	116	95	145	108	187	162	223	214	228	249	268	305
35----	134	115	145	126	157	141	211	208	258	265	281	307	324	356
40----	233	181	218	184	221	210	291	272	335	321	389	353	401	456
45----	350	268	341	270	364	318	455	386	462	461	525	535	584	574
50----	608	410	599	437	618	475	664	575	740	671	754	729	832	782
55----	1,025	639	1,004	686	986	736	1,053	828	1,087	938	1,191	993	1,244	1,182
60----	1,701	996	1,582	1,065	1,536	1,176	1,626	1,342	1,710	1,489	1,885	1,622	1,866	1,759
65----	2,687	1,676	2,576	1,741	2,473	1,903	2,493	2,213	2,633	2,468	2,886	2,720	3,097	2,770
70----	4,087	2,947	4,073	3,110	3,951	3,399	4,053	3,768	4,375	4,110	4,901	4,379	4,825	4,422
75----	6,437	5,304	6,514	5,580	6,484	5,963	6,668	6,319	7,044	6,740	7,729	7,489	7,837	7,587
80----	10,507	9,307	10,331	9,495	10,420	9,969	11,174	10,487	11,788	11,338	12,793	12,162	12,181	11,338
85----	16,940	15,170	16,690	15,599	16,542	15,911	17,074	16,083	18,143	17,925	19,213	18,407	18,955	17,925

62.0 to 69.8 years) and females (from 63.8 to 72.6). The decrease during 1931-51 was first of all due to a reduction in mortality from tuberculosis and other infective diseases, and diseases of the respiratory and digestive systems.

After 1951 the picture is, however, essentially different. As far as males are concerned, the decrease in probability of death continued for the youngest and some of the middle ages; however there was stagnation or an increase for ages 40 years and over. For females the decrease continued for all ages. The increase in average expected lifetime during this period (1951-62), therefore, is slight for newborn males (0.6 years) compared with that for females (1.8 years). The

increase in probability of death for males over 40 years old was primarily caused by increasing occurrence of heart diseases and cancer of the lung.

The greater decrease in the probability of death for females meant increased excess deaths among males. For 1961-62 the excess increases up to ages 20-30 years, decreases until 40 years of age, increases again until about 60 years, and finally decreases. The great excess in the probability of deaths for males in the younger ages is especially due to greater risk of accidents; whereas the excess for males between ages 40 and 60 is associated with the fact that heart diseases are more frequent among males than among females.



APPENDIX IV

ORGANIZATION OF THE DANISH HEALTH SYSTEM

The Danish health system is based on the general practitioner. In 1931, there were 1,674 general practitioners, 792 doctors at hospitals, and about 100 health officers. A total of 2,536 doctors were registered, about 1 per 1,406 inhabitants. In the 164 hospitals in Denmark about 7,000 nurses were employed. Patients had a total of 6,044,726 sick days, an average of 33 sick days per patient.

In 1962 Denmark had a total of 5,948 doctors, or about 1 per 774 inhabitants. Of these 2,441 were general practitioners, 3,217 were hospital doctors, and the rest (290) were health officers and scientists. In the 144 hospitals in Denmark 17,900 nurses were employed. The number of sick days amounted to 8,845,915, about 16 days per patient.

Medical care is administered largely through a network of sick-benefit clubs, to which 85 percent of the population belongs. These clubs, which came into being just after the middle of the last century, have had state support since 1892, making the membership fees very reasonable. Each club generally has a contract with a group of physicians, and each member of such a club may choose a physician for a year at a time. The physician is required to provide medical service on demand. All medical care connected with hospitalization, and at least part of the fee for private specialist consultations and medicine expenses are covered by the club membership. Chronically sick persons or other needy ones are further insured through

the aid of the local institutions supported by the municipality.

Persons with incomes above a certain level are required to pay higher than average fees for membership or may provide themselves with private insurance. Everyone is helped by the very low hospital fees, which, because of the large state and municipal support given all hospitals, amount to less than 10 percent of the actual cost. Moreover, some are helped by the state reduction in prices of medicine.

In 1962 Denmark was divided into 63 health districts (compared with 70 in 1931), and these districts were grouped into 22 state districts. The duties of the health officers are supervisory and administrative. They serve as consultants to the municipalities, carry out the forensic affairs of the district, and superintend the medical personnel and district institutions in which children or adults are nursed, taught, or are permanently living.

The central administrative organ for public health is the National Health Service of Denmark, which, like the local health officers, is in principle supervisory and consultative only, with responsibility for the numerous county organs through which health services are administered. The National Health Service of Denmark is headed by a physician and includes among others a department of medical statistics directed by a trained statistician.



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