

**A study of infant mortality
from linked records:**

Comparison of Neonatal Mortality From Two Cohort Studies

United States, January-March 1950 and 1960

Comparison of neonatal mortality in the United States based on two cohort studies for infants born alive during January-March 1950 and 1960; includes consideration of color, sex, plurality, weight at birth, gestation, age of mother, total-birth order, cause of death, and age at death.

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PREFACE

This is the third in a group of analytical studies appearing in *Vital and Health Statistics*, Series 20, dealing with death in the first year of life among infants born alive in the United States in 1960. The first report (Series 20, No. 7) was concerned with methods of study and registration aspects, and the second (Series 20, No. 12) dealt with infant mortality by birth weight, period of gestation, and other variables.

The mortality data are derived from infant death records linked to live-birth records for the same infants, representing the mortality experience among the 1960 cohort of liveborn infants. Because the purpose of the present report is to compare the experience of the 1960 cohort with an earlier cohort which was limited to neonatal mortality, it was necessary to limit the present report to the neonatal period as well.

In the conduct of the study, use was made of procedures already in existence for the regular production of national vital statistics. The National Center for Health Statistics had microfilm copies of the original records and computer tapes which contained selected data taken from the records. The States and some cities had alphabetic indexes of births and deaths and were in a position to complete the linkage between the birth and death records. Although the study was carried out by the National Center for Health Statistics, the cooperative assistance of State and city offices of vital records contributed substantially to the final outcome. This study of infant mortality is but one example in a long history of cooperative Federal-State relations in vital statistics.

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SYMBOLS

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Quantity zero-----	-
Quantity more than 0 but less than 0.05-----	0.0
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A STUDY OF INFANT MORTALITY FROM LINKED RECORDS

COMPARISON OF NEONATAL MORTALITY FROM TWO COHORT STUDIES

Helen C. Chase, Dr. P.H., *National Academy of Sciences*^a

INTRODUCTION

As routinely published in official vital statistics, infant mortality rates and their components are derived from two independent sets of records: the numerators are based on death certificates, and the denominators are based on live-birth certificates. Each set of records is tabulated separately according to characteristics contained therein, and the summary figures for deaths are divided by those for births, and the result is multiplied by a constant (usually 1,000) to produce the desired results. For characteristics which appear on both records (e.g., color and sex), infant mortality rates can be computed in this manner. For other characteristics such as age of mother, order of birth, or birth weight, it is impossible to compute infant mortality rates in this manner because these items of information are not repeated on the death records.

To study infant mortality in relation to the latter items, the death record for each specific individual must be linked to the birth record

for the same individual and the data for live births and for the linked infant deaths must be tabulated according to the desired basic factors. For the United States, two nationwide studies of linked records relating to infancy are available: one study of *neonatal* death among infants born alive in January-March 1950 and another study of *infant* death among infants born alive in 1960. The purpose of the present report is to compare the results of the two studies. Because the earlier study was limited to deaths in the first 4 weeks of life (neonatal period), the present comparison is necessarily limited to that period.

At the turn of the century, infant mortality in the United States was probably in excess of 100 deaths per 1,000 live births. That is, about 1 of every 10 liveborn infants died in the first year of life. During the first half of the 20th century, the rates fell rapidly until, in 1950, infant mortality was 29.2 per 1,000 live births—a relative decrease of about 70 percent (figure 1). During the 1950's the rapidity of the decline decelerated, and between 1956 and 1958 there were actually small increases in the infant mortality rates. Thereafter, the rates began to decline once more. Since 1965, there is again a suggestion of a definite decline in infant mortality, but at a slower pace than before 1950. This decline has been occurring for only a few years,

^aDr. Chase is Staff Associate (Biostatistics) at the Health Services Research Study, Institute of Medicine, National Academy of Sciences. At the time this study was conducted, she was Statistician (Health), Office of Health Statistics Analysis, National Center for Health Statistics.

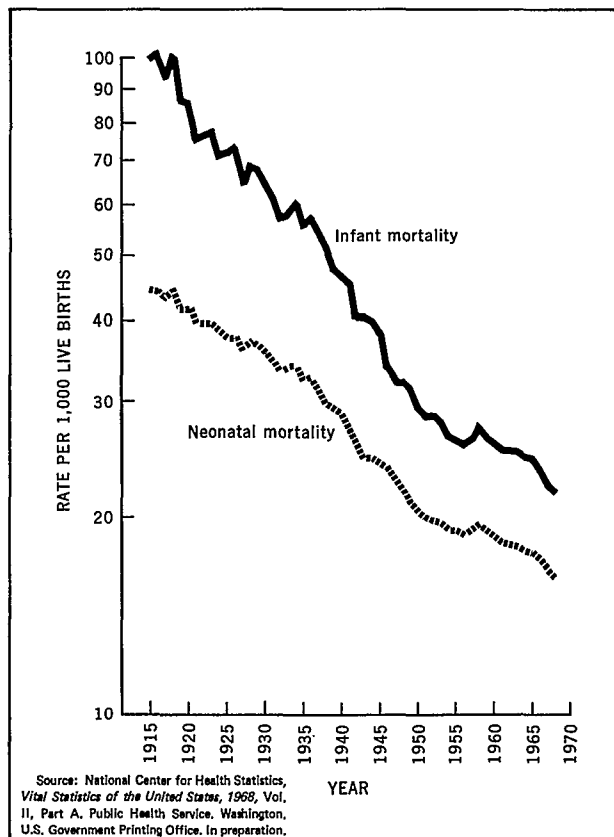


Figure 1. Infant and neonatal mortality rates: United States, 1915-68.

and it may still be too soon to identify it as the precursor of a new long-term trend.

The first year is a hazardous period of life. In 1960, the number of deaths in the infant period exceeded the number in the remaining 29 years of the first 30 years of life combined. The mortality rate for the first year of life is not exceeded until the age group 65-74 years of age.

The first 4 weeks of life (the neonatal period) have assumed increasing relative importance in infant mortality. Since 1900, because of the more rapid decline in mortality in the last 11 months of the infant period and the slower decline in the neonatal period, the relative importance of neonatal mortality has increased. In 1915-19, 45 percent of infant deaths were in the neonatal period. By 1968, this proportion had risen to 74 percent.

Highlights

In this report, a comparison is made between the neonatal mortality experience of two cohorts of infants who were born alive in the United States during January-March 1950 and during all of 1960. For white infants, the rates were 18.9 per 1,000 live births for the earlier cohort and 16.9 for the later cohort; the rates for all other infants remained unchanged at 26.7. Lower rates were noted in the later cohort for both males and females and for single but not for plural births.

Survival of infants weighing more than 1,500 grams at birth was improved in the later cohort, but the assessment of births below that weight was inconclusive because of possible reporting artifacts. While the difference in low birth weight infants (2,500 grams or less) remained relatively small between the two cohorts for white infants (7.0 and 6.8 percent), for the remaining infants the proportion increased from 9.7 to 12.9 percent.

Decreased rates in neonatal mortality are evident in the 1960 cohort for each total-birth order for white infants and for first births and those of fifth order or higher for all other infants. Increases in neonatal mortality were noted among the latter infants for second through fourth births, which included a total of 45 to 50 percent of all of these births.

Data by cause of death indicate an increased concentration in the later cohort for causes such as postnatal asphyxia and atelectasis (Seventh Revision ICD group 762) and ill-defined diseases peculiar to early infancy (772,773).

Neonatal mortality was lower in the later cohort for all age categories except 1-23 hours of age. Increases were limited to groups of infants who weighed 2,500 grams or less at birth. For infants who weighed more than 2,500 grams, the usual pattern of decreases in neonatal mortality was present between the two cohorts for every age interval.

To develop more current information, similar linked record studies should be conducted for later cohorts. In addition, there should be further epidemiologic and demographic studies of weight gain; birth weight, race, and socioeconomic level; and birth weight and gestation as they relate to neonatal and infant mortality.

Description of 1950 Study

The earlier nationwide study of neonatal mortality in the United States was a byproduct of a study of the completeness of live-birth registration.^{1,2} The study was conducted by the National Office of Vital Statistics, which is now a part of the National Center for Health Statistics, in cooperation with the U.S. Bureau of the Census and State vital statistics agencies. When a census enumerator called at a household to complete the census return on or shortly after April 1, 1950, he was directed to complete an Infant Card for any child in the household who was born during January, February, or March of that year. The Infant Card was to be completed irrespective of whether the child was dead or alive at the time of the census. These cards were compared with live-birth certificates for the same 3-month period; and, as a byproduct, the neonatal deaths among this group of births were identified by the State vital statistics agencies. Since the neonatal death and live-birth records for specific individuals were linked, the neonatal mortality experience among this group of infants was analyzed. The results of this study, with particular emphasis on weight at birth, are available in a number of publications.³⁻⁶ The rates shown in these reports are cohort mortality rates; that is, they represent the probability or risk of death among a given group of infants who were born alive during the first 3 months of 1950.

Description of 1960 Study

The procedures for the 1960 study differed in some respects from the 1950 study. One important difference is that the study was based entirely on registered vital events, and it lacked the benefits which could have been derived from household visits like those made by census enumerators 10 years earlier. As a result, the 1960 study cannot be used to evaluate the completeness of live-birth registration. The only aspect of registration which can be analyzed is the registration of live births for those infants who died under 1 year of age. These aspects of the study have been reported in another publication in considerable detail.⁷

In 1959 the National Center for Health Statistics (NCHS) invited the States to participate in a cohort study of infant mortality. The study depended on identifying all deaths under 1 year of age among the cohort of infants born alive in the United States in 1960. The States were asked to supply copies of the linked infant death and live-birth certificates from their official permanent files, and these were forwarded to the National Center for Health Statistics. These certificates are patterned after the Standard Certificates of Live Birth and Death (appendixes I and II). To complete the national file of linked records, a number of other searches were required in other States for infants who moved across State boundaries between the time of birth and death; and at the Center a search was made of microfilm copies of certificates and computer tapes of statistical records. As a result, a nationwide file of linked infant death and live-birth records was compiled, of which only the neonatal records are of particular interest to this comparison. In addition to the 78,330 linked neonatal death records, there were 1,190 neonatal death records for which no birth records could be found and 92 linked neonatal death records supplied by the States for which no record could be found at the Center. While the 1960 study included all deaths in the first year of life, the present comparison covers only the neonatal period, an age interval comparable to that of the January-March 1950 study. The study procedures and a consideration of the efficacy of the record linkage procedures are reported elsewhere.⁷

Relevance to Present Situation

Although the data which form the basis of the present report refer to mortality among infants born a number of years ago, there was relatively little change in infant mortality as late as 1965. The data are, therefore, important in considering the changes between the two cohorts and for a number of years thereafter. Although there are no comparable cohort mortality rates after the 1960 cohort, there are data for live births which can be compared with the 1960 data to gain a better understanding of the relevance of the 1960 study to present patterns and problems.

LIMITATIONS OF DATA

For this report, the basic data consist of neonatal mortality rates for two cohorts of live births—i.e., infants born alive during January-March 1950 and those born in 1960. Certain differences in the conduct of the two studies have already been mentioned. The earlier study had the advantage of including unregistered live births, while the latter did not. However, the high degree of completeness of birth registration in January-March 1950 (98 percent) enhanced the confidence in the live-birth statistics produced for the country as a whole. Although the proportions varied according to State, the national data for live births were considered acceptably complete for use in the later study. For the 1960 study, the States were requested to supply copies of linked records for all deaths which met the study criteria. These records were supplemented with neonatal deaths identified through searches in other States and at NCHS. The combined file was used to produce tabulations for the numerators of the mortality rates. The live-birth data for the denominators were taken from the publication *Vital Statistics of the United States, 1960* and from unpublished tabulations for that year at the National Center for Health Statistics.

In the earlier study for births in January-March 1950, linked birth certificates could not be found for 2.4 percent of the neonatal death records, 2.0 percent for white, and 4.6 percent for all other infants.¹ As has been mentioned, in the study for 1960, it was impossible to determine the incompleteness of birth registration. As would be expected in a large-scale study, live-birth records could not be found for a number of neonatal deaths, and the unlinked neonatal deaths are omitted from the study. They represent 2.1 percent of the neonatal deaths, 1.7 percent for the white, and 3.2 percent for all other neonatal deaths. The level of under-registration of live births for the neonatal deaths in the 1960 study was less than in the earlier study, and it is therefore assumed that live-birth registration in 1960 was at least equal to and probably more complete than that in 1950.

Another difference between the two studies is the method in which the unregistered events were handled statistically. In the January-March

1950 study, the live-birth data were adjusted to include the unregistered events, while the data in the 1960 study were not. Estimates of the effect of this factor can be made, and on the national level the bias is not serious. However, if the data were to be examined more closely for individual States, the effects would be serious for some of the States. The discrepancies associated with incomplete birth registration or linkage failures were felt to be relatively minor and within acceptable limits for the analysis of nationwide data.

The preparation of a new set of punched cards for the 1960 study introduced some inconsistencies with published data even though the same instruction manual was used for punching. Many of these were resolved after they were identified through geographic area tabulations, but some could not be detected through this means.

Another limitation of the data from the two studies for comparative purposes rests in the fact that the data for January-March 1950 reflect the live births which occurred in the first quarter of the year, while the data for 1960 reflect the live births which occurred throughout the entire year. Neonatal mortality in the first quarter of the year is about 3 percent lower than the annual rate, and therefore the rates for January-March 1950 were probably underestimates of the rate for the year 1950 by approximately that degree.⁸ This differential should be kept in mind when comparing the experience in the two studies.

A further limitation of the data is the result of sampling the records for preparation of the live-birth data for 1960. For that year, every second live-birth record for each State was punched, yielding a 50-percent systematic sample. Tabulated frequencies were doubled for publication. However, for the present study, all linked infant death and live-birth records were included whether the corresponding birth record fell into the sample or not. Estimates of the sampling errors for the 1960 cohort are included in appendix III. The data for the earlier study of events in 1950 were not based on a sample but on complete counts of live births and neonatal deaths and consequently are not subject to sampling errors.

Not all of the 79,612 neonatal deaths which

were identified in the 1960 study could be linked to the corresponding live-birth certificates. Of this number, 78,330 were linked, leaving 1.6 percent unlinked. The proportions which remained unlinked are shown by age at death, color, and sex in table A. The sex of the infant apparently bore little relationship to the success in linkage for the neonatal period. Color, on the other hand, was quite important. The linkage failure for neonatal deaths among infants other than white (2.5 percent) was about twice the rate for white infants (1.3 percent). By age at death, the linkage failure rates were highest for infants who died soon after birth (first hour) and for those in the last half of the neonatal period.

The linkage failures by cause of death and color are shown in table B. The residual group of causes which is listed last had the highest failure rate and was associated at least in part with unidentified foundlings whose records could not be linked. Among the next highest rates are those associated with infective diseases such as pneumonia and diarrhea, which are more prominent toward the end of the neonatal period when neonates have left the hospitals. With two exceptions, the linkage failure rates were lower among white infants than among all other

infants. The rates shown in tables A and B give an estimate of the deficiencies in the rates for the 1960 cohort which were associated with failures in record linkage. These are presented for reference in assessing differences between the results of the two studies.

PRESENTATION OF DATA

A frequent concomitant of neonatal death is the suboptimal development of the fetus at birth, which may be characterized by low birth weight or by curtailed gestation or both. Detailed data showing live births, neonatal deaths, and appropriate rates for the 1960 cohort are presented in tables 1-9. The January-March 1950 study emphasized weight at birth and its relationship to neonatal mortality, and four reports containing detailed statistics are currently available.³⁻⁶ Because of the volume of the data, the detailed tables for January-March 1950 are not reproduced in the present report. Summary tables comparing the experience of the January-March 1950 cohort and 1960 cohort are included with the text.

The comparative tables for January-March 1950 and 1960 represent the events as they occurred at two points in time. When differences

Table A. Percent unlinked neonatal death records by age at death, color, and sex: United States live-birth cohort, 1960

Age at death	Total			White			All other		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Percent unlinked neonatal deaths								
Under 28 days	1.6	1.6	1.6	1.3	1.4	1.3	2.5	2.3	2.7
Under 1 hour	3.3	3.4	3.2	3.0	3.2	2.8	4.6	4.2	4.9
1-23 hours	1.2	1.2	1.2	1.0	1.1	0.9	1.9	1.7	2.2
1 day	1.3	1.3	1.2	1.1	1.2	0.9	2.0	1.8	2.3
2 days	1.2	1.1	1.3	1.0	0.9	1.2	1.7	1.7	1.6
3 days	1.6	1.5	1.9	1.2	1.3	1.2	3.1	2.2	4.6
4-6 days	1.7	1.7	1.6	1.3	1.2	1.4	2.9	3.3	2.2
7-13 days	2.4	2.3	2.4	1.9	1.7	2.2	3.5	4.0	2.9
14-27 days	2.7	2.7	2.7	2.2	2.3	1.9	3.7	3.3	4.1

Table B. Percent unlinked neonatal death records by cause of death and color: United States live-birth cohort, 1960

Cause of death (Seventh Revision of the International Lists, 1955)	Total	White	All other
All causes	1.5	1.2	2.4
Congenital malformations 750-759	1.2	1.1	1.6
Certain diseases of early infancy 760-776	1.3	1.1	2.1
Birth injuries 760, 761	2.3	1.0	2.6
Intracranial and spinal injury at birth 760	1.2	0.8	2.8
Other birth injury 761	1.3	1.1	2.5
Postnatal asphyxia and atelectasis 762	1.1	0.9	1.6
Pneumonia of newborn 763	1.9	1.6	2.5
Diarrhea of newborn 764	3.0	4.1	2.0
Other infections of newborn 765-768	2.5	1.7	4.1
Neonatal disorders arising from maternal toxemia 769	1.9	1.7	2.7
Hemolytic disease of newborn (erythroblastosis) 770	1.0	1.0	1.4
Hemorrhagic disease of newborn 771	1.5	1.6	1.1
Ill-defined diseases peculiar to early infancy, including nutritional maladjustments 772, 773	1.2	0.9	2.0
Immaturity with mention of any other subsidiary condition 774	1.0	0.9	1.1
Immaturity unqualified 776	1.5	1.2	2.3
All other causes Residual	4.8	4.1	6.2

Note: Percents shown in this table do not agree precisely with those shown in table A. Ninety-two of the 79,612 neonatal death records which were linked by the States but could not be found in NCHS tapes, were included in data used to prepare table A but were excluded from this table.

are noted between the two sets of data, whether positive or negative, they do not necessarily denote a continuing pattern of increase or decrease over the decade. Conclusions regarding trends should not be made without additional interdecade data. The present study is an example in point. During the preliminary analysis of the data, certain rather impressive differences with regard to birth weight and color were noted between the two cohorts. However, to determine whether these findings were representative of a trend throughout this period, another study of the patterns of birth weight distributions based on annual changes for the period 1950 through 1967 was undertaken.⁹

The cohort rates in both studies represent the probability of death since they were based on the population at risk. Consequently, they are not expected to agree exactly with the rates routinely published in *Vital Statistics of the United States* which are based on neonatal deaths and live births that occur in the same calendar year. Also, in tables in which the data are shown by age at death in this report, the rates are based on survivors at the beginning of each age interval, rather than all live births.

Two indicators of maturity, birth weight and period of gestation, are available from live-birth certificates. The recording of gestation has been found to be very inaccurate in those areas where

RESULTS OF THE STUDY

the certificates require "weeks" or "months of gestation."^{9,10} In 1960, the certificates for a few registration areas asked for the date at which the last normal menses began and used this to calculate gestation age. As a result, the periods of gestation had a more rational distribution. The certificates for only four areas (14.3 percent of the live-birth certificates for the country) were based on this type of inquiry; therefore the recorded data for the country as a whole are deemed to be deficient. As a result, far greater emphasis in this report was placed on birth weight as the primary indicator of maturity. This was not intended to indicate a preference for birth weight over gestation as an indicator of maturity. The 1968 revision of the Standard Certificate of Live Birth, which has been recommended to the States by the Surgeon General of the Public Health Service, requires the "date last normal menses began." This will permit the calculation of the weeks of gestation in a uniform manner by computer. Future studies may be expected to gain from this improvement in the basic data.

Color, Sex, and Plurality

The risk of neonatal death by color, sex, and plurality for the January-March 1950 and the 1960 live-birth cohorts are presented in table C. The rates were 20.0 per 1,000 live births for the earlier cohort and 18.4 for the later cohort. Decreases were noted between the two studies among both male and female infants. The overall rates reflect the decrease in the large group of white infants from 18.9 to 16.9, but the risk of death for all other infants remained unchanged at 26.7 per 1,000. The relative positions of the comparable rates among single births are essentially the same as for all births because 98 percent of all live births are single births. For births in plural sets, the risk of neonatal death was very high, and there was apparently little change between the two cohorts. In view of the comparatively small number of plural births, the rates for this group tended to fluctuate more

Table C. Risk of neonatal death and percent change in risk by color, sex, and plurality: United States live-birth cohorts, January-March 1950 and 1960

Color and sex	All births			Single births			Plural births		
	January-March 1950 ¹	1960	Percent change	January-March 1950 ¹	1960	Percent change	January-March 1950 ¹	1960	Percent change
	Rate per 1,000 live births								
Total	20.0	18.4	-8.0	18.3	16.7	-8.7	98.6	100.6	+2.0
Male	22.7	20.8	-8.4	20.9	19.0	-9.1	107.9	110.9	+2.8
Female	17.1	15.8	-7.6	15.6	14.3	-8.3	88.9	90.1	+1.3
White	18.9	16.9	-10.6	17.3	15.3	-11.5	94.4	96.0	+1.7
Male	21.6	19.2	-11.1	20.0	17.5	-12.5	103.6	107.0	+3.3
Female	16.0	14.4	-10.0	14.5	13.0	-10.3	85.2	84.9	-0.4
All other	26.7	26.7	-	24.4	24.2	-0.8	118.0	118.7	+0.6
Male	29.4	29.9	+1.7	26.9	27.3	+1.5	128.2	126.5	-1.3
Female	23.9	23.5	-1.7	21.8	21.1	-3.2	107.1	110.9	+3.5

¹ Excludes data for Massachusetts.

than for single births. The lower neonatal mortality among females was marked and was consistent regardless of plurality or color. Since the primary focus of this report is on a comparison between the two cohorts, the significant factors to be noted from table C are the decrease between the cohorts for both sexes, the decrease for single but not for plural births, and the decrease for white infants but not for other infants.

Between the two cohorts, there was a relative decrease of 8.0 percent in the risk of neonatal death for all live births. If adjustment had been made for the seasonal factor, the rate for the year 1950 would have been about 3 percent higher (20.6), and the estimated relative decrease between the two groups would have been about 10.7 percent. The seasonal adjustment must be kept in mind in gauging the small differences shown in table C.

Decreases were noted between the two studies among both male and female infants and were substantial: 8.4 and 7.6 percent, respectively. However, it is apparent that the major contributor to the decreases for the total group was the experience of the single white births, which constituted 82.9 percent of the total group. While the risk of neonatal death dropped from 18.9 to 16.9 per 1,000 live births for white infants, it remained unchanged at 26.7 for all other infants. The decreases for white male and white female infants were around 10 percent, but the small changes for all other male and female infants offset each other.

The lesser risk of neonatal death noted for single white births was not apparent for plural births, and if allowances for seasonal factors are made, the small increases which were observed for plural births may be illusory. However, the lack of change in risk of neonatal death for plural births in contrast with the notable decrease for single white births is significant for obstetrical planning.

Weight at Birth

Weight at birth is an important correlate of neonatal survival. For infants weighing 2,500 grams or less at birth (low birth weight infants), 7.8 percent of the total, the risk of neonatal

death was very high: 171.6 per 1,000 live births in the 1960 birth cohort (table D). That is, of every 1,000 low birth weight infants who were born alive in 1960, on the average 171.6 died during the first 4 weeks of life. For the remaining 92.2 percent of infants, the rate was much lower—5.5 per 1,000. The ratio between the two rates (30:1) represents the relative risk of neonatal death to a newborn infant if that infant weighs 2,500 grams or less at birth; such infants have 30 times the risk of dying in the first 4 weeks of life compared with infants weighing more than 2,500 grams at birth.

For most of the birth weight range (4,000 grams or less), the risk of death was inversely related to weight at birth. Virtually all infants weighing less than 1,000 grams at birth died during the neonatal period (figure 2). The rates dropped precipitously in succeeding weight groups up to and including 3,000 grams. Maximum survival occurred at 3,501-4,000 grams, and the risk of neonatal death was again higher among heavier infants. The general contour of the curves for the two cohorts is similar in shape. There was relatively little difference in the rates for low birth weight infants, but there was considerable improvement for the remaining birth weight categories.

Between the two cohorts, there was relatively little change in the risk of death for low birth weight infants (a relative decrease of 1.2 percent), while for infants weighing more than 2,500 grams at birth there was a substantial decrease: 29.5 percent (table D). For the latter group, the decreases were of about the same magnitude regardless of sex, color, or plurality. In only one instance, that of white female infants of plural sets, was the relative decrease less than 20 percent. Thus, there was substantial improvement in survival for the 92.2 percent of infants who weighed over 2,500 grams at birth.

On the other hand, the risk of neonatal death for the low birth weight groups taken as a whole remained remarkably unchanged. The relatively small changes which were observed—some positive, some negative—implied that relatively little progress had been made between the two cohorts in improving the survival of low birth weight infants. For the lowest weight group (1,000 grams or less), the data indicated increases in every comparison followed by decreases in higher weight groups in virtually every

Table D. Risk of neonatal death by plurality, color, birth weight, and sex: United States live-birth cohorts, January-March 1950 and 1960

[Births and deaths for which birth weight was not stated are distributed in proportion to those with stated birth weights]

Plurality, color, and birth weight	Both sexes		Male		Female	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
ALL BIRTHS						
<u>Total</u>	Rate per 1,000 live births					
All birth weights	20.0	18.4	22.7	20.8	17.1	15.8
2,500 grams or less	173.7	171.6	213.9	208.9	138.9	138.5
2,501 grams or more	7.8	5.5	9.1	6.4	6.4	4.5
1,000 grams or less	871.7	912.8	894.2	929.6	848.0	894.6
1,001-1,500 grams	551.3	521.5	621.8	585.7	478.2	451.3
1,501-2,000 grams	211.0	180.6	265.0	226.3	160.5	136.7
2,001-2,500 grams	50.4	41.4	67.4	55.0	36.6	30.2
2,501-3,000 grams	12.6	9.9	16.6	13.1	9.5	7.5
3,001-3,500 grams	6.7	4.7	8.1	5.7	5.3	3.7
3,501-4,000 grams	5.6	3.6	6.4	4.1	4.6	3.0
4,001-4,500 grams	7.5	4.2	7.7	4.4	7.2	3.9
4,501 grams or more	14.2	8.7	13.7	8.6	15.1	9.0
<u>White</u>						
All birth weights	18.9	16.9	21.6	19.2	16.0	14.4
2,500 grams or less	175.8	177.4	218.8	216.3	138.4	142.3
2,501 grams or more	7.1	5.1	8.3	5.9	5.8	4.2
1,000 grams or less	883.3	924.1	905.0	940.9	861.0	905.5
1,001-1,500 grams	562.1	555.1	643.1	613.1	474.5	488.5
1,501-2,000 grams	214.6	198.4	271.9	245.6	160.4	151.9
2,001-2,500 grams	50.6	45.0	69.1	60.1	35.5	32.4
2,501-3,000 grams	12.0	10.1	15.9	13.4	9.1	7.5
3,001-3,500 grams	6.2	4.4	7.6	5.3	4.9	3.5
3,501-4,000 grams	4.9	3.3	5.6	3.7	4.1	2.7
4,001-4,500 grams	6.7	3.6	6.9	3.8	6.4	3.3
4,501 grams or more	12.0	7.7	10.8	7.6	14.7	7.8
<u>All other</u>						
All birth weights	26.7	26.7	29.4	29.9	23.9	23.5
2,500 grams or less	164.7	154.8	192.8	186.9	141.3	127.8
2,501 grams or more	11.9	7.7	13.9	9.0	9.7	6.3
1,000 grams or less	821.4	883.7	849.9	899.5	789.0	867.5
1,001-1,500 grams	507.0	434.2	524.7	508.2	491.6	363.0
1,501-2,000 grams	195.7	130.3	235.1	168.7	161.1	96.3
2,001-2,500 grams	49.5	30.7	60.0	39.3	41.2	23.9
2,501-3,000 grams	15.4	9.4	19.9	12.1	11.8	7.2
3,001-3,500 grams	9.7	6.4	10.9	7.6	8.4	5.2
3,501-4,000 grams	10.5	6.6	12.2	7.3	8.4	5.7
4,001-4,500 grams	12.5	10.1	13.1	10.8	11.4	9.1
4,501 grams or more	20.2	16.3	23.1	16.4	16.0	16.2

See footnote at end of table.

Table D. Risk of neonatal death by plurality, color, birth weight, and sex: United States live-birth cohorts, January-March 1950 and 1960—Con.

[Births and deaths for which birth weight was not stated are distributed in proportion to those with stated birth weights]

Plurality, color, and birth weight	Both sexes		Male		Female	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
SINGLE BIRTHS						
<u>Total</u>						
Rate per 1,000 live births						
All birth weights	18.3	16.7	20.9	19.0	15.6	14.3
2,500 grams or less	173.4	170.2	215.6	208.7	137.1	136.3
2,501 grams or more	7.7	5.4	9.0	6.4	6.3	4.5
1,000 grams or less	871.7	904.8	895.1	919.8	846.7	888.3
1,001-1,500 grams	562.3	527.4	629.1	591.7	489.6	456.4
1,501-2,000 grams	228.9	197.1	281.1	244.0	178.3	150.7
2,001-2,500 grams	52.8	43.9	71.1	58.6	38.3	31.9
2,501-3,000 grams	12.6	10.0	16.7	13.2	9.5	7.5
3,001-3,500 grams	6.7	4.7	8.1	5.7	5.3	3.7
3,501-4,000 grams	5.6	3.6	6.4	4.1	4.6	3.0
4,001-4,500 grams	7.4	4.2	7.6	4.4	7.2	3.8
4,501 grams or more	14.2	8.7	13.7	8.6	15.1	9.0
<u>White</u>						
All birth weights	17.3	15.3	20.0	17.5	14.5	13.0
2,500 grams or less	176.7	177.3	222.1	217.2	137.1	141.3
2,501 grams or more	7.1	5.1	8.3	5.9	5.8	4.2
1,000 grams or less	880.2	916.6	903.8	931.1	855.2	900.2
1,001-1,500 grams	575.0	562.2	648.5	617.9	489.9	497.2
1,501-2,000 grams	238.4	218.7	294.5	265.9	182.2	170.2
2,001-2,500 grams	53.5	48.2	73.2	64.7	37.7	34.5
2,501-3,000 grams	12.2	10.2	16.1	13.6	9.2	7.6
3,001-3,500 grams	6.2	4.4	7.6	5.3	4.9	3.5
3,501-4,000 grams	4.9	3.3	5.6	3.7	4.0	2.7
4,001-4,500 grams	6.7	3.6	6.8	3.8	6.5	3.3
4,501 grams or more	12.1	7.7	10.8	7.6	14.7	7.8
<u>All other</u>						
All birth weights	24.4	24.2	26.9	27.3	21.8	21.1
2,500 grams or less	159.5	150.4	187.2	183.7	137.0	122.5
2,501 grams or more	11.7	7.6	13.7	9.0	9.6	6.2
1,000 grams or less	835.2	875.3	858.5	890.6	809.0	859.3
1,001-1,500 grams	511.0	438.4	537.4	517.9	488.8	438.4
1,501-2,000 grams	190.0	138.1	221.3	180.0	163.1	100.8
2,001-2,500 grams	50.0	31.4	62.1	40.2	40.6	24.4
2,501-3,000 grams	15.1	9.3	19.7	12.0	11.3	7.1
3,001-3,500 grams	9.5	6.4	10.7	7.6	8.4	5.2
3,501-4,000 grams	10.4	6.6	12.1	7.3	8.4	5.7
4,001-4,501 grams	12.3	10.1	13.0	10.8	11.2	9.1
4,501 grams or more	20.3	16.3	23.2	16.4	16.0	16.2

See footnote at end of table.

Table D. Risk of neonatal death by plurality, color, birth weight, and sex: United States live-birth cohorts, January-March 1950 and 1960—Con.

[Births and deaths for which birth weight was not stated are distributed in proportion to those with stated birth weights]

Plurality, color, and birth weight	Both sexes		Male		Female	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
PLURAL BIRTHS						
<u>Total</u>						
Rate per 1,000 live births						
All birth weights	98.6	100.6	107.9	110.9	88.9	90.1
2,500 grams or less	175.6	179.7	204.4	210.4	149.7	152.2
2,501 grams or more	11.8	8.1	13.2	8.7	10.0	7.4
1,000 grams or less	871.5	950.3	890.2	977.2	853.4	923.0
1,001-1,500 grams	503.7	493.3	585.8	556.4	434.1	427.6
1,501-2,000 grams	145.4	113.0	200.4	147.6	100.8	83.7
2,001-2,500 grams	32.9	23.0	43.1	29.5	23.3	17.3
2,501-3,000 grams	11.3	8.7	13.7	9.3	8.6	8.0
3,001-3,500 grams	10.4	7.0	*	7.8	*	5.9
3,501-4,000 grams	*	*	*	*	*	*
4,001-4,500 grams	*	*	*	-	*	*
4,501 grams or more	-	*	-	*	-	-
<u>White</u>						
All birth weights	94.4	96.0	103.6	107.0	85.2	84.9
2,500 grams or less	171.0	177.9	199.9	210.9	145.3	148.2
2,501 grams or more	9.0	7.2	10.5	7.8	7.2	6.5
1,000 grams or less	898.0	958.7	910.8	987.5	886.2	928.7
1,001-1,500 grams	507.1	522.0	615.6	589.6	418.8	450.1
1,501-2,000 grams	129.5	118.8	179.3	157.6	90.6	85.9
2,001-2,500 grams	30.2	22.5	42.7	29.0	18.4	16.8
2,501-3,000 grams	8.5	7.4	11.8	7.9	*	6.9
3,001-3,500 grams	*	6.5	*	7.3	*	5.4
3,501-4,000 grams	*	*	*	*	*	*
4,001-4,500 grams	*	*	*	-	-	*
4,501 grams or more	-	*	-	*	-	-
<u>All other</u>						
All birth weights	118.0	118.7	128.2	126.5	107.1	110.9
2,500 grams or less	196.9	186.1	224.5	208.5	170.5	166.1
2,501 grams or more	25.3	12.6	26.6	13.5	23.8	11.6
1,000 grams or less	754.0	926.9	808.8	947.0	689.7	907.7
1,001-1,500 grams	489.0	412.8	472.5	459.3	505.5	367.2
1,501-2,000 grams	218.4	94.6	287.7	115.8	152.5	76.3
2,001-2,500 grams	45.6	25.0	*	31.6	46.2	19.2
2,501-3,000 grams	25.8	14.5	*	15.3	*	13.6
3,001-3,500 grams	*	*	*	*	*	*
3,501-4,000 grams	*	*	*	*	*	-
4,001-4,500 grams	*	*	*	-	*	-
4,501 grams or more	-	-	-	-	-	-

¹ Excludes data for Massachusetts.

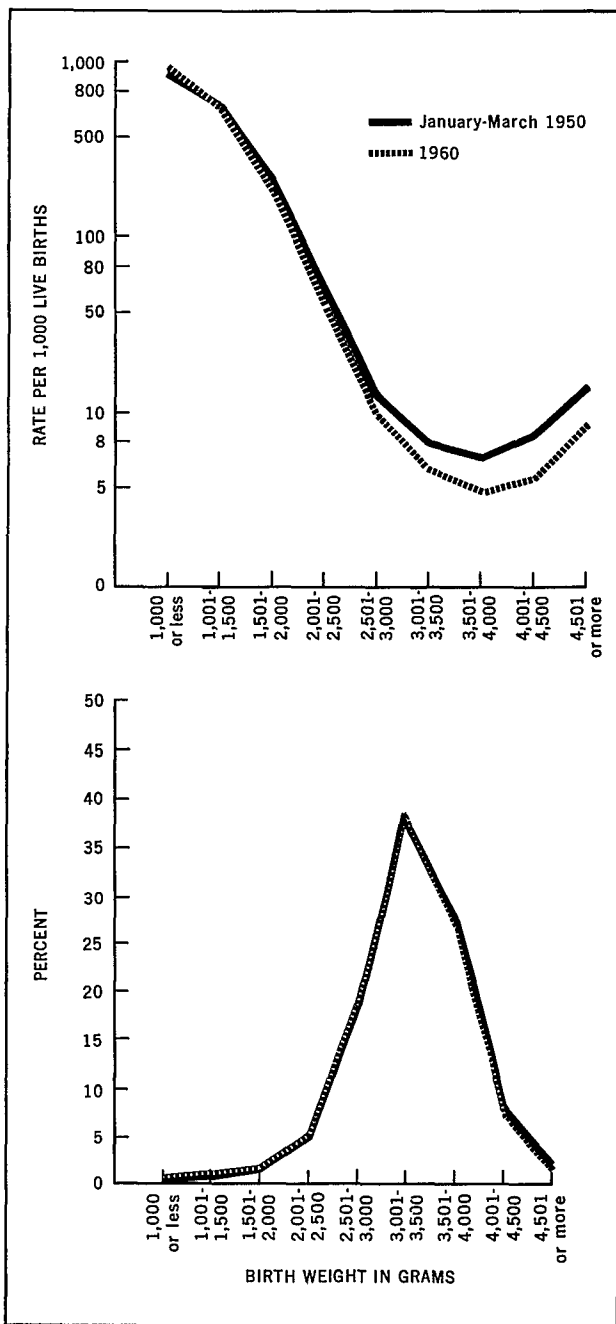


Figure 2. Risk of neonatal death and percent of live births by birth weight: United States live-birth cohorts, January-March 1950 and 1960.

instance. The atypical behavior of the lowest weight group is believed to be associated with more complete registration in 1960 of live births and the neonatal deaths among them, and the group is very small. For the remaining weight

groups comprising the low birth weight group, there were decreases with very few exceptions. These decreases became larger as the weight of the infant increased. As a result of these arithmetic relationships, it appeared that there was no change for the low birth weight group taken as a whole. On closer examination, it became evident that this lack of change for low birth weight infants was the net result of *increases* for infants weighing 1,000 grams or less at birth and *decreases* for the remaining birth weight groups.

In addition to the level of the rates, another factor affecting the overall mortality rates is the distribution of live births by weight at birth. In view of the marked differentials in the level of mortality by weight at birth, any group which has an inordinate concentration of low birth weight infants would experience a higher overall mortality rate due to that fact alone even if the weight-specific rates were identical to another group with fewer low birth weight infants. In 1960, there were higher proportions of live births in each of the birth weight groups under 3,000 grams than in the earlier cohort (table E). The proportion of low birth weight infants increased from 7.4 to 7.8 percent of all live births and was noted to have developed gradually over the decade.⁹

Color.—The risk of neonatal death for white and for all other infants for the two cohorts are shown in figure 3. For white neonates, the rates were almost identical in the two studies for all groups weighing 3,000 grams or less at birth. Significant decreases were evident at all other weight groups. For other than white infants, on the other hand, decreases were noted throughout the entire birth weight span, except for the very small group of infants weighing 1,000 grams or less at birth.

The distributions of live births by birth weight and color showed minor increases and decreases in random fashion for white infants, but regular and sizable increases for all other infants in all weight groups through 3,000 grams. When the data were combined for low birth weight infants, the proportion for other than white infants increased from 9.7 to 12.9 percent, a significant increase, a trend which was progressive throughout the decade.⁹ The shift of the entire birth weight distribution for other than white infants is summarized in figure 3.

Table E. Percentage distribution of live births by birth weight for color, plurality, and sex groups: United States live-birth cohorts, January-March 1950 and 1960

[Live births for which birth weight was not stated are distributed in proportion to those with stated birth weight]

Birth weight	Total		Color				Plurality				Sex			
			White		All other		Single		Plural		Male		Female	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
	Percentage distribution													
All birth weights . . .	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less . . .	7.4	7.8	7.0	6.8	9.7	12.9	6.4	6.8	53.0	53.9	6.7	7.1	8.1	8.5
2,501 grams or more . . .	92.6	92.2	93.0	93.2	90.3	87.1	93.6	93.2	47.0	46.1	93.3	92.9	91.9	91.5
1,000 grams or less	0.5	0.6	0.4	0.5	0.6	1.0	0.4	0.5	4.0	4.9	0.5	0.6	0.5	0.6
1,001-1,500 grams	0.6	0.7	0.6	0.6	0.8	1.2	0.5	0.5	5.6	5.6	0.6	0.7	0.6	0.6
1,501-2,000 grams	1.4	1.5	1.3	1.3	1.8	2.5	1.1	1.2	14.2	14.0	1.3	1.4	1.4	1.5
2,001-2,500 grams	4.9	5.1	4.7	4.5	6.4	8.3	4.4	4.6	29.2	29.4	4.3	4.5	5.6	5.7
2,501-3,000 grams	18.1	18.5	17.7	17.2	20.6	25.3	17.9	18.3	29.5	29.4	15.4	15.8	21.0	21.3
3,001-3,500 grams	37.7	38.0	38.1	38.1	35.1	37.1	38.2	38.5	14.1	13.8	36.1	36.3	39.4	39.7
3,501-4,000 grams	27.1	26.8	27.7	28.2	23.5	18.9	27.6	27.3	2.8	2.5	29.8	29.5	24.2	23.9
4,001-4,500 grams	7.7	7.5	7.8	8.0	7.3	4.6	7.8	7.6	0.6	0.3	9.5	9.2	5.8	5.6
4,501 grams or more	2.1	1.5	1.8	1.6	3.8	1.2	2.1	1.4	0.1	0.0	2.6	2.1	1.5	1.0

¹ Excludes data for Massachusetts.

The increase is not attributable to changing distributions of live births by age of mother, plurality, or sex and is probably not due in its entirety to higher proportions of other than white infants who were delivered in hospitals and the resulting improvement in accuracy of reported birth weights.⁹ The increase in the proportion of low birth weight infants coupled with very high mortality among infants weighing 2,500 grams or less at birth had a marked effect on the color-specific rates for other than white infants. Despite the sizable decreases in neonatal mortality in each birth weight group, the shift in the birth weight distribution was large enough to make the risk of neonatal death of the 1960 cohort equal to the risk for the January-March 1950 cohort.

Sex.—The risk of neonatal death for male and female newborn infants by weight at birth followed the same pattern as for color: very high rates among those of very low birth weight, minimal rates at 3,501-4,000 grams, and increased mortality for heavier infants (figure 4 and table D). There was apparently little improvement between the two cohorts in survival of infants weighing 3,000 grams or less at birth, although it was greater for females. There was considerable improvement in each of the weight groups beginning with 3,001 grams.

The distributions of live births showed minor

shifts toward lower birth weight for both males and females. When these increases were accumulated for infants weighing 2,500 grams or less at birth, the proportions of low birth weight infants increased from 6.7 to 7.1 percent for males and from 8.1 to 8.5 percent for females.

Plurality.—The risk of neonatal death among single and plural births is shown in figure 5 and table D. For single births, the rates decreased to some degree for all but the lowest weight group, and the decreases were substantial beginning with 1,501 grams. For plural births, the figure shows a marked reduction in mortality particularly at the upper end of the birth weight range. However, the decreases at the upper limit applied to very small numbers of births.

Between the January-March 1950 and the 1960 cohorts, there were small increases in the proportions of live births in the lower birth weight groups for single births (figure 5 and table E). Except for the weight group 1,001-1,500 grams where the proportions remained unchanged, the proportion in each weight group through 3,500 grams was higher for the 1960 cohort than for the earlier cohort.

For plural births, there did not seem to be any regular pattern of increases in low birth weight. When the low birth weight infants were summed, the effect of the changes was relatively small: the increment for single births was from

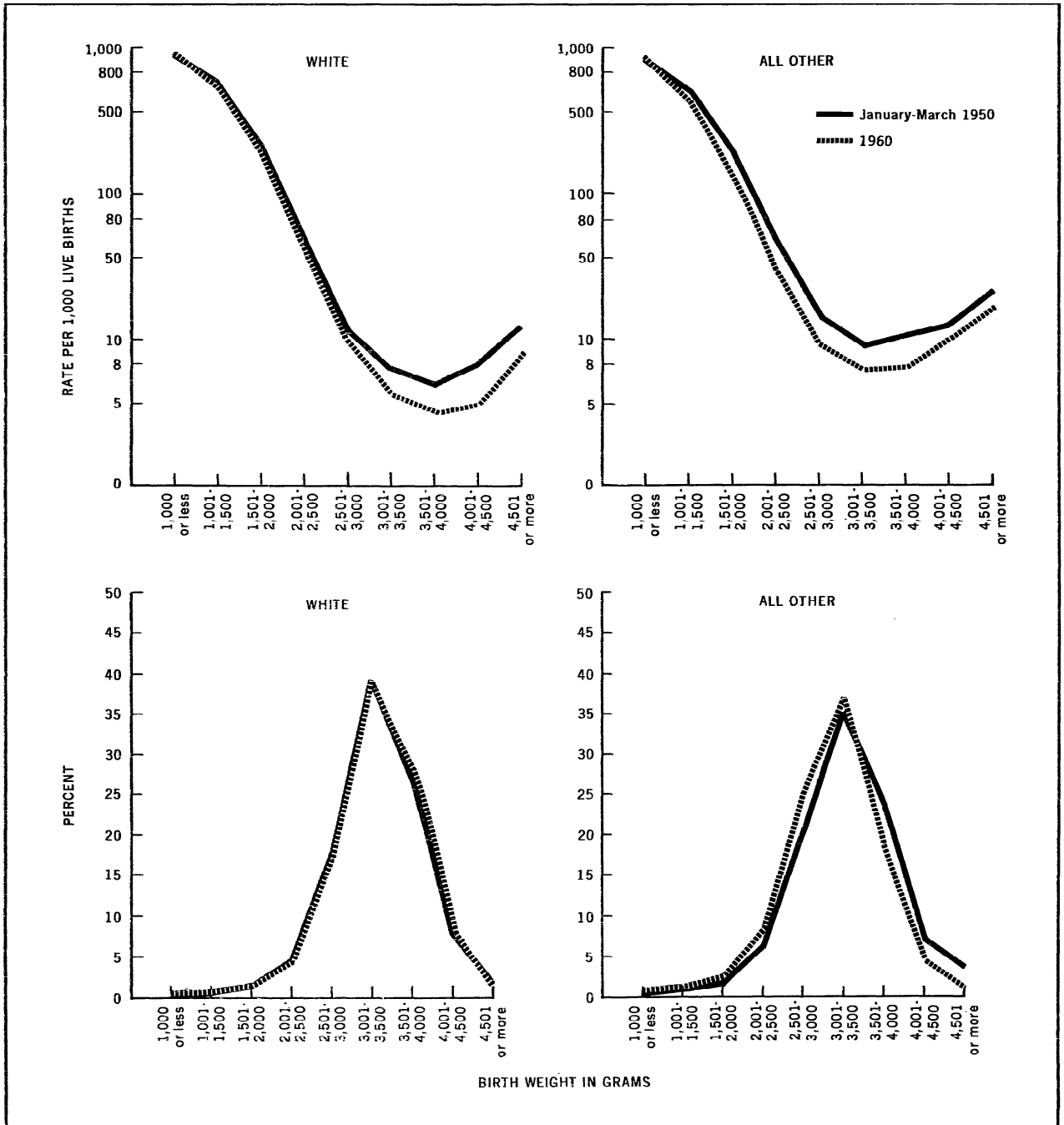


Figure 3. Risk of neonatal death and percent of live births by birth weight and color: United States live-birth cohorts, January-March 1950 and 1960.

6.4 to 6.8 percent between the two cohorts, and for plural births it was from 53.0 to 53.9 percent. The differential in birth weight is more pronounced between plurality groups than between sex or color groups.

Period of Gestation

To a great extent, the birth weight of an infant is dependent on its gestation age: the longer the period of gestation, the heavier the

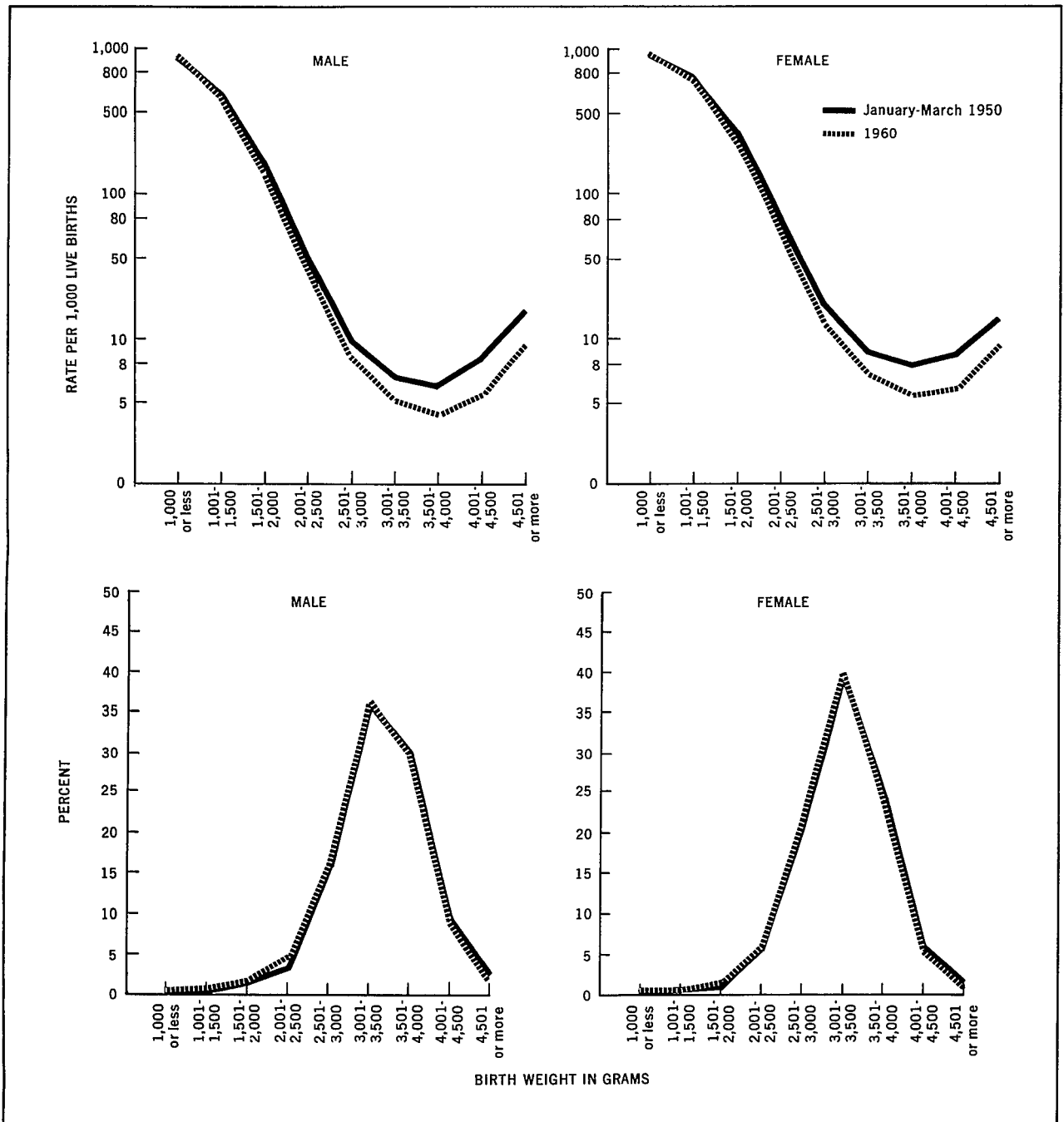


Figure 4. Risk of neonatal death and percent of live births by birth weight and sex: United States live-birth cohorts, January-March 1950 and 1960.

infant. Infants born after only 5 months of gestation weigh less, on the average, than those born after the full period of 10 lunar months of gestation and have a much greater risk of death. However, within this oversimplified concept,

there are a great many variations. Even for equal periods of gestation, there are variations in mean birth weight: male infants are heavier than females, white infants are heavier than other infants, infants of single deliveries are heavier

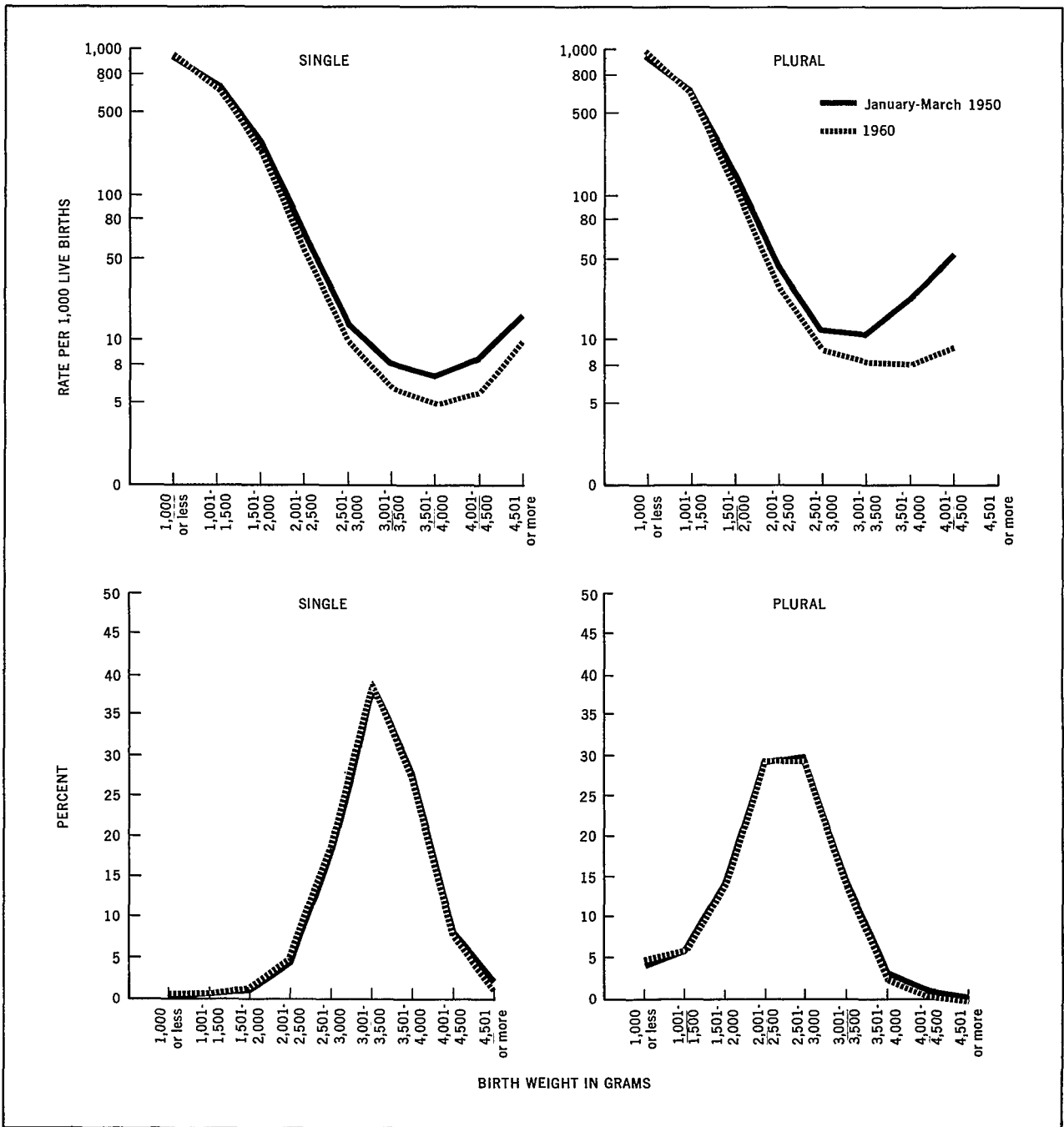


Figure 5. Risk of neonatal death and percent of live births by birth weight and plurality: United States live-birth cohorts, January-March 1950 and 1960.

than infants born in plural sets. Because of the complex nature of these interrelationships, it is important to consider gestation as well as weight at birth when analyzing neonatal mortality.

The recorded period of gestation has been a source of concern to vital statisticians for many years. Until 1968, almost all States required the reporting of gestation in "completed weeks."

Unusually high concentrations of births were reported at 36 and 40 weeks. This is judged to result from inaccurate calculation of the period of gestation: months and half-months are multiplied by 4, rather than actually calculating the gestation periods from the first day of the last menstrual period to the date of birth.

By 1960, only four of the registration areas had changed the item on the certificate from "completed weeks of gestation" to "first day of last menstrual period" (LMP) or similar wording. Personnel in vital statistics offices or computers, where these were available, then proceeded to calculate the period of gestation. The reporting of LMP has resulted in much more credible distributions of live births by weeks of gestation. The redistribution of period of gestations associated with the use of the LMP date has caused a marked decline in proportions of live births at 40 weeks and to a lesser degree at 36 weeks and increases at other weeks. This particular statistical artifact has a bearing on the data presented for the two cohorts presently under study. In 1950, none of the gestation data included in the national tabulations were derived from LMP dates. By 1960, four registration areas were using the newer method of calculation. During this same interval, there were sporadic attempts to improve the recorded weeks of gestation in other registration areas. As a result, the distributions of live births and neonatal deaths in the two cohort studies are not directly comparable. Some live births similar to those which were reported as 36 weeks in the 1950 cohort, for example, were distributed to other gestation groups in the 1960 cohort, and apparently more were shifted to 37-39 weeks than to 32-35 weeks.⁹ The effect of this redistribution of periods of gestation is shown in table F. The gestation groups that are presented are those which were available for the January-March 1950 cohort. For each population subgroup, there were marked decreases in the proportion of live births at 36 weeks and increases at 32-35 weeks and 37 weeks and over. As a consequence, infants classified as 36 weeks in 1960 were, on the average, of lower birth weight than those in the January-March 1950 group:

Birth weight	Infants with 36 completed weeks of gestation	
	January-March 1950	1960
	Percentage distribution	
Total	100.0	100.0
1,000 grams or less	0.0	0.1
1,001-1,500 grams	0.3	0.8
1,501-2,000 grams	2.3	5.8
2,001-2,500 grams	9.7	23.3
2,501-3,000 grams	18.7	27.0
3,001-3,500 grams	33.0	24.3
3,501-4,000 grams	25.2	13.6
4,001-4,500 grams	8.0	4.0
4,501 grams or more	2.8	1.2

The changes were probably associated to some degree with the allocation of infants of heavier weight to other gestation intervals and, perhaps, to some degree to an increase in the proportion of low birth weight infants. Such disruptions in the basic distributions of live births by period of gestation affected the mortality experience in the individual cells and clouded any trends which may have occurred. It is particularly unfortunate that the change was so marked at 36 weeks, because the dichotomy for preterm infants is usually between "less than 37 weeks" and "37 weeks or more." The drift from 36 weeks to higher gestations because of a statistical artifact could well appear in the data as a decrease in the proportion of preterm infants. Statistically, the gross inaccuracies in the reporting of completed weeks of gestation preclude factual documentation of the increase or decrease of preterm infants based on period of gestation. By default, only inferential conclusions may be drawn.

For these reasons, table G is presented without analytical comment, merely to illustrate the aberrations introduced by faulty data. For example, at 37 weeks and over, neonatal mortality in 1960 was lower than in January-March 1950 in each age group. At 36 weeks there was no consistent pattern. This was due, in part, to

Table F. Percentage distribution of live births by period of gestation for plurality, color, and sex groups: United States live-birth cohorts, January-March 1950 and 1960

[Live births for which period of gestation was not stated are distributed in proportion to those with stated gestation]

Plurality, color, sex, and year	Total	Period of gestation				
		Under 28 weeks	28-31 weeks	32-35 weeks	36 weeks	37 weeks and over
<u>ALL BIRTHS</u>						
<u>Total</u>		Percentage distribution				
Both sexes:						
January-March 1950 ¹	100.0	0.6	0.9	2.0	8.5	88.0
1960	100.0	0.7	0.9	2.3	3.3	92.8
Male:						
January-March 1950 ¹	100.0	0.6	0.9	2.1	8.4	87.9
1960	100.0	0.7	0.9	2.4	3.3	92.6
Female:						
January-March 1950 ¹	100.0	0.6	0.9	2.0	8.5	88.1
1960	100.0	0.6	0.8	2.2	3.3	93.1
<u>White</u>						
Both sexes:						
January-March 1950 ¹	100.0	0.6	0.8	2.0	7.8	88.8
1960	100.0	0.6	0.7	2.1	3.0	93.6
Male:						
January-March 1950 ¹	100.0	0.6	0.9	2.1	7.8	88.7
1960	100.0	0.6	0.8	2.2	3.0	93.3
Female:						
January-March 1950 ¹	100.0	0.5	0.8	2.0	7.8	88.9
1960	100.0	0.5	0.7	2.0	2.9	93.9
<u>All other</u>						
Both sexes:						
January-March 1950 ¹	100.0	0.8	1.3	2.1	12.5	83.3
1960	100.0	1.2	1.6	3.6	5.2	88.4
Male:						
January-March 1950 ¹	100.0	0.8	1.3	1.9	12.5	83.5
1960	100.0	1.3	1.6	3.6	5.1	88.4
Female:						
January-March 1950 ¹	100.0	0.8	1.3	2.2	12.5	83.2
1960	100.0	1.2	1.6	3.6	5.3	88.3

See footnote at end of table.

Table F. Percentage distribution of live births by period of gestation for plurality, color, and sex groups: United States live-birth cohorts, January-March 1950 and 1960

[Live births for which period of gestation was not stated are distributed in proportion to those with stated gestation]

Plurality, color, sex, and year	Total	Period of gestation				
		Under 28 weeks	28-31 weeks	32-35 weeks	36 weeks	37 weeks and over
<u>SINGLE BIRTHS</u>						
<u>Total</u>		Percentage distribution				
January-March 1950 ¹	100.0	0.5	0.8	1.9	8.4	88.4
1960	100.0	0.6	0.8	2.1	3.2	93.3
<u>White</u>						
January-March 1950 ¹	100.0	0.5	0.8	1.8	7.7	89.2
1960	100.0	0.5	0.6	1.9	2.8	94.1
<u>All other</u>						
January-March 1950 ¹	100.0	0.7	1.2	1.9	12.4	83.7
1960	100.0	1.1	1.5	3.4	5.1	89.0
<u>PLURAL BIRTHS</u>						
<u>Total</u>						
January-March 1950 ¹	100.0	4.0	5.2	10.8	12.7	67.3
1960	100.0	4.5	5.3	12.1	10.1	68.0
<u>White</u>						
January-March 1950 ¹	100.0	3.9	5.3	11.4	12.3	67.2
1960	100.0	4.2	4.9	12.3	10.3	68.3
<u>All other</u>						
January-March 1950 ¹	100.0	4.6	4.8	8.2	14.6	67.9
1960	100.0	5.7	7.0	11.3	9.3	66.8

¹ Excludes data for Massachusetts.

Table G. Risk of neonatal death by birth weight and period of gestation: United States live-birth cohorts, January-March 1950 and 1960

[Births and deaths for which birth weight or gestation was not stated are distributed in proportion to those with stated birth weight and gestation]

Birth weight	Total		Period of gestation									
			Under 28 weeks		28-31 weeks		32-35 weeks		36 weeks		37 weeks and over	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
	Rate per 1,000 live births											
Total	20.0	18.4	788.4	798.1	379.4	396.3	121.3	110.5	18.4	29.0	8.8	6.6
2,500 grams or less	173.7	171.6	829.2	834.6	420.2	436.8	169.2	152.9	76.3	66.3	48.4	42.8
2,501 grams or more	7.8	5.5	99.6	35.0	86.3	41.3	40.2	26.2	10.3	13.0	7.1	5.0
1,000 grams or less	871.7	912.8	906.2	930.1	822.7	894.2	782.6	788.8	*	746.7	*	668.7
1,001-1,500 grams	551.3	521.5	758.7	699.0	541.6	536.9	411.1	408.4	378.8	341.8	351.6	344.1
1,501-2,000 grams	211.0	180.6	586.9	417.7	332.9	291.7	197.2	172.0	142.4	118.3	122.8	117.9
2,001-2,500 grams	50.4	41.4	*	171.5	188.3	154.4	91.7	78.9	50.9	40.9	33.4	28.4
2,501-3,000 grams	12.6	9.9	*	*	116.9	57.2	50.5	34.8	17.1	19.4	10.8	8.7
3,001-3,500 grams	6.7	4.7	*	*	*	27.4	24.2	17.7	8.9	9.4	6.3	4.5
3,501-4,000 grams	5.6	3.6	*	*	65.4	*	*	10.7	6.8	7.5	5.5	3.5
4,001-4,500 grams	7.5	4.2	*	*	*	*	94.7	*	9.9	8.6	6.7	4.1
4,501 grams or more	14.2	8.7	*	*	*	*	*	*	14.9	16.0	13.7	8.3

¹ Excludes data for Massachusetts.

the allocation of some of the heavier weight infants into the next higher gestation interval in 1960. The period of gestation was therefore deemed to be of limited use in this presentation.

Age of Mother

In addition to the factors previously mentioned, neonatal mortality is also related to the age of mother at the time of the infant's birth (figure 6). The rates were somewhat elevated for infants born to mothers under 20 years of age, fell to a minimum in the age group 25-29, and increased thereafter to their maximum in the highest age group shown (45 years and over). Mortality in the first 4 weeks of life was lower for the 1960 cohort than for the earlier cohort for each maternal age group (table H). The difference was greatest for ages 35-44. For a number of cells in this table, the frequencies were small and the data were so labeled.

For white infants, the risk of neonatal death was lower in 1960 for each age group of mothers

except the oldest group, where there was apparently a small increase. For all other infants, the risk of neonatal death in 1960 was higher than in January-March 1950 among infants born to mothers under 25 years of age, and lower for those born to mothers above that age. There was much less variation in the rates by age of mother among other infants than among white infants.

Within specified maternal age groups, the risk of neonatal death varied by birth weight. The rates were lower for the 1960 cohort than for the January-March 1950 cohort for all but the lowest birth weight group. The increase in this group is believed to be associated with improved birth registration of very small infants. Few of these small infants survive, and the rates for these small infants should probably be even closer to 1,000 per 1,000. As anticipated, the pattern for white births determined the pattern for all births.

For other than white infants, more of the cells are based on small numbers. Nevertheless, the same patterns are suggested as were noted for white births: increases in neonatal mortality at less than 1,000 grams at birth and decreases at

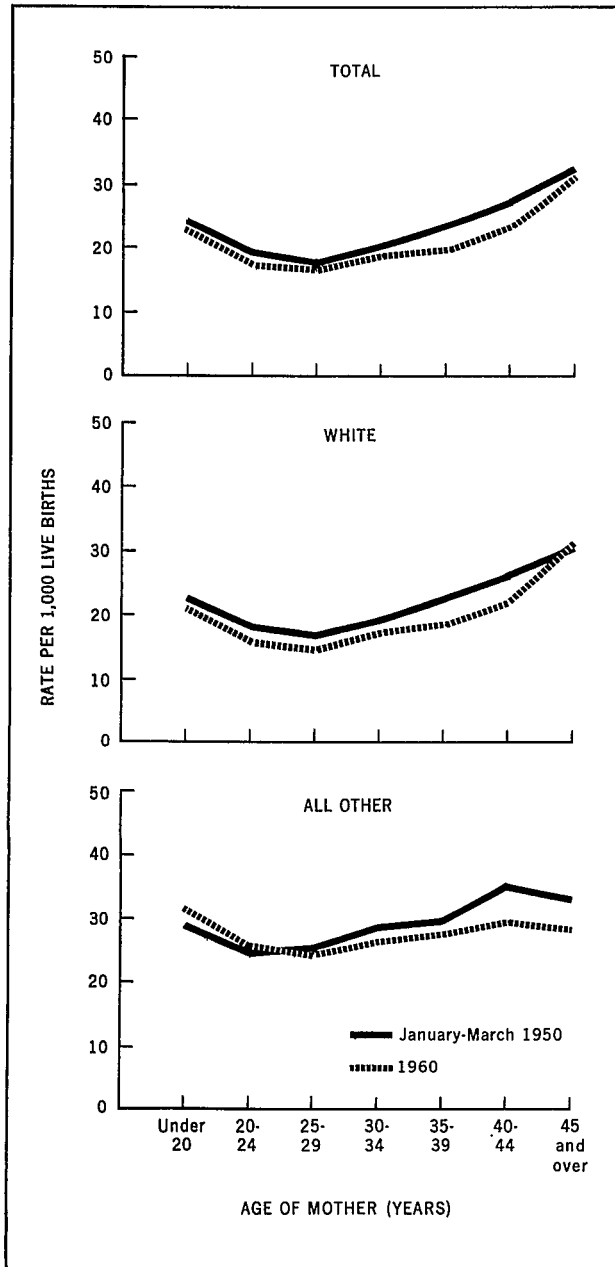


Figure 6. Risk of neonatal death by age of mother and color: United States live-birth cohorts, January-March 1950 and 1960.

all other levels. For mothers under 20 years and for those 20-24 years of age, although the rates by birth weight were higher for the 1960 birth cohort than for the January-March 1950 cohort, it was nevertheless true that there were decreases

between the two cohorts over time in the birth weight groups containing the largest proportion of live births.

Because the rates are elevated at certain maternal age levels, the overall rates are also affected by the distributions of live births by age of mother. A population with higher proportions of very young mothers would be expected to have higher neonatal mortality, other factors being equal.

The proportion of low birth weight infants was 7.4 percent in the January-March 1950 cohort and 7.8 percent in the 1960 cohort (table J). Regardless of age of mother, the proportion of low birth weight infants was higher in the 1960 group. The largest increments in low birth weight were at the two ends of the mother's age range. When the data for the total group was subclassified by birth weight, there were small increases in each birth weight group through 3,500 grams with offsetting decrements above that weight. Within specific maternal age groups, the changes in proportions were generally small and would not be considered important except for the uniformity of their occurrence.

The changes in proportions of low birth weight infants were not uniform for either color group. The proportion was a little *lower* in the later cohort for white infants (7.0 versus 6.8 percent) and considerably *higher* in the later cohort for all other infants (9.7 versus 12.9 percent). For white infants, there were either small decreases or no decrease in the proportions of infants in most of the groups under 3,000 grams, and there were increases in the proportions of infants in most of the groups between 3,500 and 4,500 grams. For all other infants, there were increases in the proportions of infants in each maternal age group under 45 years cross-classified by each birth weight group under 3,500 grams, except for one instance when there was no change. Regardless of mother's age, there were decrements in the proportions of infants in the weight groups 3,501 grams or more. For both white and all other infants, there were decreases in the heaviest weight group (4,501 grams or more), irrespective of mother's age. In addition to differences in the direction of the change, the

Table H. Risk of neonatal death by color, birth weight, and age of mother: United States live-birth cohorts, January-March 1950 and 1960

[Births and deaths for which birth weight or age of mother was not stated are distributed in proportion to those with stated birth weight and age of mother]

Color and birth weight	Total		Age of mother					
			Under 20 years		20-24 years		25-29 years	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
Total	Rate per 1,000 live births							
All birth weights	20.0	18.4	24.1	22.9	19.0	17.3	17.6	16.6
2,500 grams or less	173.7	171.6	183.4	179.2	172.7	171.3	164.8	169.3
2,501 grams or more	7.8	5.5	8.2	5.4	7.0	4.8	7.1	5.1
1,000 grams or less	871.7	912.8	848.0	886.6	879.6	908.0	884.8	933.3
1,001-1,500 grams	551.3	521.5	585.8	556.4	562.1	537.2	565.4	512.3
1,501-2,000 grams	211.0	180.6	228.6	186.4	220.6	191.9	199.5	176.1
2,001-2,500 grams	50.4	41.4	59.1	37.7	46.3	40.5	42.3	40.8
2,501-3,000 grams	12.6	9.9	12.9	8.9	11.5	8.8	11.9	9.7
3,001-3,500 grams	6.7	4.7	6.9	4.3	5.7	4.2	6.4	4.5
3,501-4,000 grams	5.6	3.6	5.7	4.0	5.3	3.1	2.5	3.2
4,001-4,500 grams	7.5	4.2	8.5	4.5	6.8	3.7	6.0	3.6
4,501 grams or more	14.2	8.7	*	8.4	10.6	7.3	12.6	7.7
White								
All birth weights	18.9	16.9	22.4	20.4	18.0	15.9	16.7	15.3
2,500 grams or less	175.8	177.4	196.2	193.1	173.1	176.3	166.0	173.3
2,501 grams or more	7.1	5.1	7.3	4.7	6.6	4.6	6.4	4.8
1,000 grams or less	883.3	924.1	876.3	904.0	889.5	913.1	888.0	946.4
1,001-1,500 grams	562.1	555.1	623.0	606.9	570.7	569.6	574.6	549.0
1,501-2,000 grams	214.6	198.4	236.6	218.7	228.2	208.2	206.7	191.9
2,001-2,500 grams	50.6	45.0	62.3	43.6	45.4	44.1	42.7	43.4
2,501-3,000 grams	12.0	10.1	12.1	8.8	11.4	9.1	11.1	9.9
3,001-3,500 grams	6.2	4.4	6.4	3.8	5.3	3.9	6.1	4.2
3,501-4,000 grams	4.9	3.3	4.8	3.4	4.9	2.9	4.1	3.0
4,001-4,500 grams	6.7	3.6	7.1	3.5	6.6	3.4	5.4	3.1
4,501 grams or more	12.0	7.7	*	7.8	10.0	6.3	8.3	6.9
All other								
All birth weights	26.7	26.7	28.6	31.4	24.8	25.3	24.6	24.2
2,500 grams or less	164.7	154.8	158.5	154.4	171.0	156.2	157.4	155.8
2,501 grams or more	11.9	7.7	10.8	7.7	9.2	6.3	12.4	7.0
1,000 grams or less	821.4	883.7	777.8	858.7	842.9	894.2	907.9	895.2
1,001-1,500 grams	507.0	434.2	474.6	467.2	538.9	448.1	515.3	409.3
1,501-2,000 grams	195.7	130.3	213.0	125.6	189.3	143.6	156.6	126.2
2,001-2,500 grams	49.5	30.7	53.2	27.2	50.0	28.8	39.4	31.3
2,501-3,000 grams	15.4	9.4	14.7	9.1	12.0	7.7	16.8	8.8
3,001-3,500 grams	9.7	6.4	8.4	6.3	7.8	5.6	9.4	6.3
3,501-4,000 grams	10.5	6.6	9.0	7.7	8.5	5.0	11.7	5.1
4,001-4,500 grams	12.5	10.1	*	12.7	8.4	7.7	10.3	9.0
4,501 grams or more	20.2	16.3	*	*	*	16.7	26.0	13.9

See footnote at end of table.

Table H. Risk of neonatal death by color, birth weight, and age of mother: United States live-birth cohorts, January-March 1950 and 1960—Con.

[Births and deaths for which birth weight or age of mother was not stated are distributed in proportion to those with stated birth weight and age of mother]

Color and birth weight	Age of mother							
	30-34 years		35-39 years		40-44 years		45 years and over	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
Total	Rate per 1,000 live births							
All birth weights	20.0	18.3	23.6	19.7	27.2	23.1	32.4	31.3
2,500 grams or less	174.8	169.9	182.5	166.1	185.1	168.5	*	194.4
2,501 grams or more	8.1	6.0	10.3	7.0	14.1	9.9	24.8	13.7
1,000 grams or less	885.6	914.5	836.4	926.1	*	932.3	*	*
1,001-1,500 grams	510.0	499.8	489.6	459.5	552.6	452.0	*	*
1,501-2,000 grams	195.5	166.7	202.6	162.6	231.8	183.9	*	*
2,001-2,500 grams	50.7	42.3	66.9	47.5	80.3	58.0	*	100.3
2,501-3,000 grams	13.4	11.5	15.9	12.7	20.2	17.2	*	30.5
3,001-3,500 grams	6.8	5.2	9.5	6.2	14.6	9.5	*	11.7
3,501-4,000 grams	5.7	4.0	7.6	4.8	11.5	6.8	*	*
4,001-4,500 grams	8.5	4.2	10.1	5.7	*	7.5	*	*
4,501 grams or more	15.4	9.6	15.9	10.6	*	12.2	*	*
White								
All birth weights	18.9	17.0	22.6	18.4	26.1	22.0	30.2	31.8
2,500 grams or less	175.6	174.2	183.5	171.3	189.9	172.3	*	225.2
2,501 grams or more	7.2	5.6	9.6	6.4	12.9	9.2	22.1	13.0
1,000 grams or less	896.3	924.7	859.4	935.8	*	939.2	*	*
1,001-1,500 grams	517.7	534.0	485.1	478.0	*	458.9	*	*
1,501-2,000 grams	196.2	181.9	194.9	173.1	225.0	196.3	*	*
2,001-2,500 grams	50.0	44.7	69.7	50.5	83.9	58.4	*	114.4
2,501-3,000 grams	12.2	11.5	15.2	12.3	21.4	16.9	*	*
3,001-3,500 grams	6.0	4.9	9.1	5.9	12.9	9.0	*	*
3,501-4,000 grams	5.2	3.5	6.9	4.1	9.1	6.3	*	*
4,001-4,500 grams	7.2	3.5	9.0	4.7	*	6.7	-	*
4,501 grams or more	13.6	8.8	13.4	8.9	*	10.4	*	-
All other								
All birth weights	28.7	26.4	29.9	27.3	35.0	29.4	*	28.9
2,500 grams or less	170.2	155.5	176.4	147.5	157.9	153.2	-	*
2,501 grams or more	15.2	8.8	15.4	11.0	22.9	13.8	*	*
1,000 grams or less	821.8	884.4	*	892.1	*	905.3	-	*
1,001-1,500 grams	460.9	398.7	*	397.0	*	422.4	-	*
1,501-2,000 grams	190.7	119.0	244.0	126.2	*	134.9	-	-
2,001-2,500 grams	55.1	33.8	50.6	36.5	*	56.1	-	*
2,501-3,000 grams	22.6	11.6	20.7	14.4	*	18.8	*	*
3,001-3,500 grams	13.1	6.8	12.3	8.4	*	12.4	*	*
3,501-4,000 grams	10.4	8.1	13.0	9.9	*	10.4	*	*
4,001-4,500 grams	18.3	10.3	*	13.5	*	*	*	*
4,501 grams or more	*	15.4	*	20.5	*	*	-	*

¹ Excludes data for Massachusetts.

Table J. Percentage distribution of live births by color, birth weight, and age of mother: United States live-birth cohorts, January-March 1950 and 1960

[Births for which birth weight or age of mother was not stated are distributed in proportion to those with stated birth weight and age of mother]

Color and birth weight	Total		Age of mother					
			Under 20 years		20-24 years		25-29 years	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
Total	Percentage distribution							
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	7.4	7.8	9.1	10.1	7.3	7.5	6.7	7.0
2,501 grams or more	92.6	92.2	90.9	89.9	92.7	92.5	93.3	93.0
1,000 grams or less	0.5	0.6	0.5	0.8	0.5	0.5	0.4	0.5
1,001-1,500 grams	0.6	0.7	0.8	0.9	0.6	0.6	0.5	0.6
1,501-2,000 grams	1.4	1.5	1.7	2.0	1.3	1.4	1.2	1.3
2,001-2,500 grams	4.9	5.1	6.0	6.4	4.9	4.9	4.5	4.7
2,501-3,000 grams	18.1	18.5	20.8	21.4	19.2	19.1	17.6	17.8
3,001-3,500 grams	37.7	38.0	39.2	39.4	39.1	39.5	38.0	38.0
3,501-4,000 grams	27.1	26.8	24.0	23.2	26.2	26.3	28.0	27.7
4,001-4,500 grams	7.7	7.5	5.7	5.1	6.7	6.6	7.8	7.9
4,501 grams or more	2.1	1.5	1.3	0.7	1.5	1.1	2.0	1.6
White								
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	7.0	6.8	8.1	8.3	6.9	6.6	6.5	6.2
2,501 grams or more	93.0	93.2	91.9	91.7	93.1	93.4	93.5	93.8
1,000 grams or less	0.4	0.5	0.5	0.6	0.4	0.5	0.4	0.4
1,001-1,500 grams	0.6	0.6	0.7	0.8	0.6	0.5	0.5	0.5
1,501-2,000 grams	1.3	1.3	1.6	1.7	1.2	1.2	1.2	1.1
2,001-2,500 grams	4.7	4.5	5.3	5.3	4.7	4.4	4.4	4.2
2,501-3,000 grams	17.7	17.2	19.5	19.0	18.7	17.9	17.4	16.9
3,001-3,500 grams	38.1	38.1	40.1	40.1	39.6	39.7	38.3	38.1
3,501-4,000 grams	27.7	28.2	25.4	25.9	26.7	27.7	28.3	28.9
4,001-4,500 grams	7.8	8.0	5.9	5.8	6.7	7.1	7.8	8.3
4,501 grams or more	1.8	1.6	1.0	0.8	1.3	1.1	1.7	1.7
All other								
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	9.7	12.9	12.1	16.2	9.6	12.7	8.4	11.6
2,501 grams or more	90.3	87.1	87.9	83.8	90.4	87.3	91.6	88.4
1,000 grams or less	0.6	1.0	0.6	1.3	0.7	1.0	0.6	1.0
1,001-1,500 grams	0.8	1.2	1.0	1.5	0.8	1.1	0.7	1.1
1,501-2,000 grams	1.8	2.5	2.3	3.1	1.7	2.4	1.5	2.2
2,001-2,500 grams	6.4	8.3	8.1	10.3	6.4	8.2	5.6	7.4
2,501-3,000 grams	20.6	25.3	24.4	29.8	22.0	26.6	19.1	23.7
3,001-3,500 grams	35.1	37.1	36.3	37.0	36.2	38.5	35.3	37.7
3,501-4,000 grams	23.5	18.9	19.8	14.0	22.9	17.8	25.3	20.7
4,001-4,500 grams	7.3	4.6	5.2	2.4	6.4	3.7	7.8	5.1
4,501 grams or more	3.8	1.2	2.2	0.7	3.0	0.8	4.2	1.2

See footnote at end of table.

Table J. Percentage distribution of live births by color, birth weight, and age of mother: United States live-birth cohorts, January-March 1950 and 1960—Con.

[Births for which birth weight or age of mother was not stated are distributed in proportion to those with stated birth weight and age of mother]

Color and birth weight	Age of mother							
	30-34 years		35-39 years		40-44 years		45 years and over	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
Total	Percentage distribution							
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	7.2	7.5	7.7	8.0	7.7	8.3	6.1	9.7
2,501 grams or more	92.8	92.5	92.3	92.0	92.3	91.7	93.9	90.3
1,000 grams or less	0.5	0.6	0.5	0.6	0.4	0.5	0.2	0.6
1,001-1,500 grams	0.6	0.6	0.6	0.6	0.6	0.7	0.5	0.9
1,501-2,000 grams	1.3	1.4	1.5	1.6	1.6	1.6	1.1	1.9
2,001-2,500 grams	4.7	4.9	5.0	5.2	5.1	5.5	4.3	6.3
2,501-3,000 grams	16.6	17.1	15.9	16.4	14.9	16.2	14.3	15.2
3,001-3,500 grams	36.1	36.0	33.7	34.4	31.9	32.9	32.3	33.1
3,501-4,000 grams	28.4	28.2	28.8	28.5	29.1	28.2	27.4	27.6
4,001-4,500 grams	9.1	9.0	10.3	9.9	11.4	10.9	12.5	10.9
4,501 grams or more	2.7	2.2	3.7	2.8	4.9	3.4	7.5	3.4
White								
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	7.0	6.8	7.5	7.3	7.5	7.9	5.7	8.9
2,501 grams or more	93.0	93.2	92.5	92.7	92.5	92.1	94.3	91.1
1,000 grams or less	0.5	0.5	0.5	0.5	0.4	0.5	0.2	0.6
1,001-1,500 grams	0.6	0.5	0.6	0.6	0.6	0.6	0.4	0.8
1,501-2,000 grams	1.3	1.2	1.5	1.4	1.5	1.5	1.1	1.9
2,001-2,500 grams	4.6	4.5	4.9	4.8	5.0	5.2	4.0	5.6
2,501-3,000 grams	16.6	16.3	15.8	15.7	15.0	15.5	15.2	14.3
3,001-3,500 grams	36.4	36.1	34.1	34.5	32.3	33.0	32.5	33.6
3,501-4,000 grams	28.7	29.2	29.2	29.4	29.4	28.9	26.6	28.6
4,001-4,500 grams	9.0	9.4	10.2	10.4	11.5	11.3	12.5	11.3
4,501 grams or more	2.3	2.2	3.2	2.8	4.5	3.3	7.5	3.3
All other								
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2,500 grams or less	8.8	12.0	9.0	11.9	8.9	11.1	7.4	13.5
2,501 grams or more	91.2	88.0	91.0	88.1	91.1	88.9	92.6	86.5
1,000 grams or less	0.6	1.0	0.7	0.9	0.3	0.7	-	0.6
1,001-1,500 grams	0.7	1.1	0.7	1.0	0.9	0.9	0.8	1.2
1,501-2,000 grams	1.6	2.3	1.9	2.4	2.1	2.2	0.8	2.1
2,001-2,500 grams	5.8	7.6	5.7	7.6	5.7	7.4	5.8	9.6
2,501-3,000 grams	17.2	21.8	16.1	20.9	14.7	20.4	10.7	19.1
3,001-3,500 grams	33.4	35.7	30.8	34.0	29.6	32.1	31.4	30.6
3,501-4,000 grams	25.7	22.1	26.5	23.1	27.7	24.1	30.6	23.3
4,001-4,500 grams	9.4	6.4	10.7	7.4	11.4	8.6	12.4	9.3
4,501 grams or more	5.6	2.0	7.0	2.8	7.7	3.7	7.4	4.2

¹ Excludes data for Massachusetts.

magnitude of the changes for other than white infants exceeded those for white infants:

Age of mother	Change in proportion of live births at 2,500 grams or less, January-March 1950 to 1960	
	White	All other
All ages	-0.2	+3.2
Under 20 years	+0.2	+4.1
20-24 years	-0.3	+3.1
25-29 years	-0.3	+3.2
30-34 years	-0.2	+3.2
35-39 years	-0.2	+2.9
40-44 years	+0.4	+2.2
45 years and over	+3.2	+6.1

In addition to changes in the risk of neonatal death between the two cohorts and to changes in the proportions of low birth weight infants by mother's age, there have also been changes in the distributions of live births by age of mother (table K). Between January-March 1950 and 1960, there were *increases* in the proportions of infants with mothers under 25 years among white infants and *decreases* in the proportions among all other infants. The magnitude of the differences in distributions of live births by age

of mother probably did not greatly affect the proportions of low birth weight infants or the risk of neonatal death. The relatively small changes in the distributions are applicable to mortality rates with relatively small variation. The magnitude of the differences in distributions by birth weight have a much greater effect on neonatal mortality because the increases were larger and were present in each of the components of the low birth weight groups, and these are the most vulnerable to death.

Total-Birth Order

Apart from age of mother at time of birth, birth order is also associated with the risk of neonatal death. Data shown in this report for the two cohorts relate to the total-birth order which is defined as the number of children ever born to mothers, including fetal deaths.

The decrement in neonatal mortality between January-March 1950 and 1960 is reflected in each birth order for the total group and for the white group (table L and figure 7). For other than white infants, decreases were apparent only for first births and births of fifth or higher order. Increases in the risk of neonatal death were observed for second through fourth births, which included 45 to 50 percent of the total

Table K. Percentage distribution of live births by age of mother and color: United States live-birth cohorts, January-March 1950 and 1960

[Births for which age of mother was not stated are distributed in proportion to those with stated age of mother.]

Age of mother	Total		White		All other	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
All ages	100.0	100.0	100.0	100.0	100.0	100.0
Under 20 years	12.3	13.9	10.7	12.8	21.9	20.3
20-24 years	31.8	33.5	31.6	33.9	32.5	31.5
25-29 years	28.6	25.7	29.5	26.2	22.9	22.9
30-34 years	16.7	16.2	17.3	16.3	13.1	15.1
35-39 years	8.3	8.5	8.5	8.5	7.4	8.0
40-44 years	2.2	2.2	2.2	2.2	1.9	2.1
45 years and over	0.1	0.1	0.1	0.1	0.2	0.1

¹ Excludes data for Massachusetts.

Table L. Risk of neonatal death and percentage distribution of live births by total-birth order and color: United States live-birth cohorts, January-March 1950 and 1960

[Births and deaths for which birth order was not stated are distributed in proportion to those with stated birth order]

Total-birth order ¹	Total		White		All other	
	January-March 1950 ²	1960	January-March 1950 ²	1960	January-March 1950 ²	1960
	Rate per 1,000 live births					
All birth orders	20.0	18.4	18.9	16.9	26.7	26.7
First	19.1	16.4	17.8	15.0	28.9	25.7
Second	17.8	17.4	16.9	16.1	25.4	27.2
Third	19.7	17.1	19.3	15.9	22.3	25.8
Fourth	21.1	18.4	20.3	17.2	25.0	25.4
Fifth and over	26.9	23.5	26.0	21.8	29.1	28.0
	Percentage distribution					
All birth orders	100.0	100.0	100.0	100.0	100.0	100.0
First	31.2	25.4	32.3	26.2	24.6	21.0
Second	30.0	23.8	31.3	24.8	21.9	18.3
Third	17.1	19.0	17.3	19.6	16.2	15.3
Fourth	8.7	12.6	8.3	12.7	10.8	12.1
Fifth and over	13.0	19.3	10.8	16.7	26.4	33.4

¹ Total-birth order refers to number of children ever born to this mother including fetal deaths.

² Excludes data for Massachusetts.

births of other than white infants. The net result of the increases and decreases for this group resulted in no change in the overall rate.

Another significant change occurred between the January-March 1950 and 1960 cohorts. In the earlier cohort, neonatal mortality was higher for first births than for second births, but in the later cohort it was lower for first births than second births among both color groups.

Simultaneously with the changes in neonatal mortality by total-birth order which were just described, there have also been changes in the distributions of live births by birth order (table L). The data indicate a decrease in the proportions of first and second births and increases in the remaining higher order births—a pattern which applied to white births as well. For other than white births, the decreases were apparent for first, second, and third births.

Closely associated with total-birth order is

age of mother at time of birth. When the risks of neonatal death were derived for cross-classifications of age of mother and total-birth order, the increments in mortality between the two cohorts were highlighted (table M). Decreases in mortality were apparent throughout the distribution for white infants only. For all other infants, there were increases in mortality in a number of instances, chiefly in higher birth orders. Further comparisons of the risk of death between the two cohorts using total-birth order and birth weight are precluded by the unavailability of live-birth data containing these variables.

Cause of Death

Changes in neonatal mortality which occurred between the two study periods were also examined in relation to causes of death. Rates are shown by cause, weight at birth, and color in

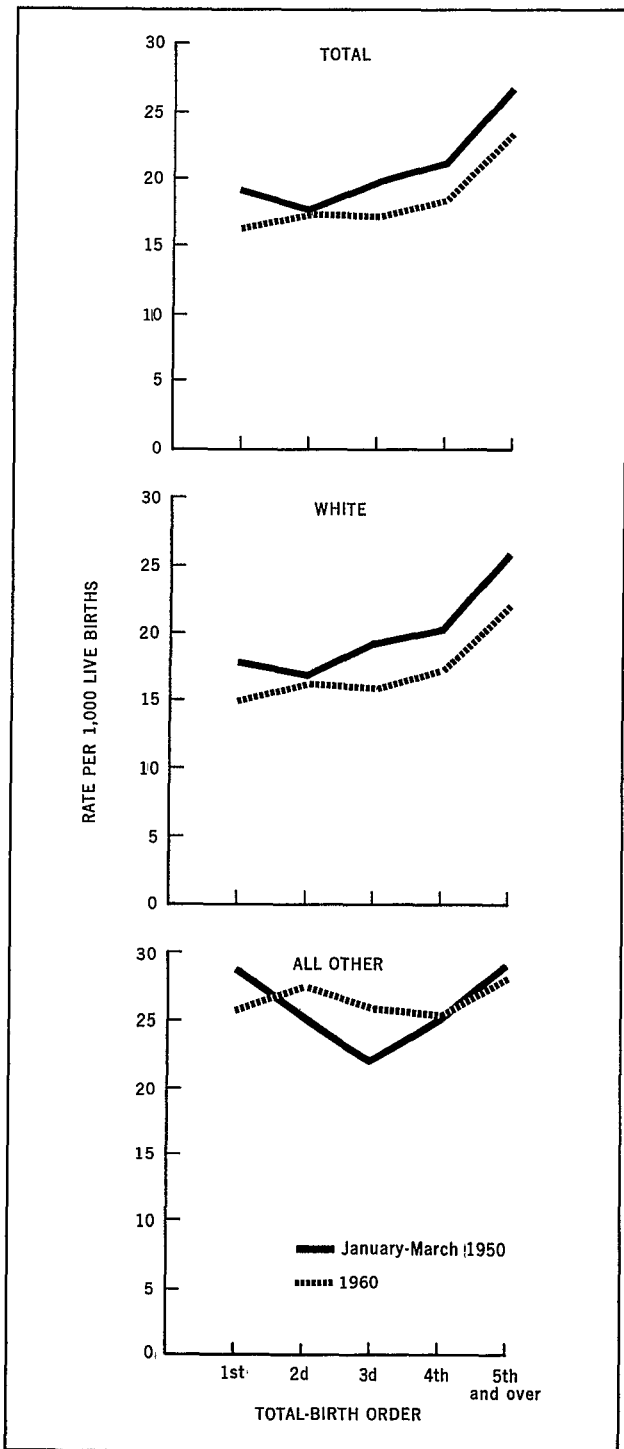


Figure 7. Risk of neonatal death by total-birth order and color: United States live-birth cohorts, January-March 1950 and 1960.

table N. For all infants, there were relatively large increases in mortality for two categories: postnatal asphyxia and atelectasis (ICD cause number 762) and ill-defined diseases peculiar to early infancy (772, 773). These increases were, in part, due to a change in the coding of causes of death between the Sixth and Seventh Revisions of the *International Statistical Classification of Diseases, Injuries, and Causes of Death*. Some of the deaths which were allocated to ICD category 774, Immaturity with mention of any other subsidiary condition, and to one of the causes in the residual category in the January-March 1950 cohort, were allocated to the two cause groups mentioned above (762 and 772, 773) in the 1960 cohort. However, the combined increase in categories 762 and 772,773 (1.8 per 1,000) was more than double the decrease in the other categories combined (0.7 per 1,000). This increase exceeds the amount which would be expected from coding changes alone. Not much significance can be attached to minor changes in mortality between the two periods because of more subtle changes in the allocation to causes of death using the two classifications.

When the data are separated for white and all other infants, it appears that for white infants there were decreases in mortality due to congenital malformations (750-759), certain diseases of early infancy (760-776), and causes in the residual category. In the subclassifications, the only increases were in the two groups most severely affected by the changes in coding procedures.

Among other than white infants, in addition to the changes noted for white infants, there were small increases between the two cohorts in a number of categories whose combined effect was equal to decreases in other categories, with the result that there was no change in the overall rate (26.7). The greatest increases were for postnatal asphyxia and atelectasis and for ill-defined diseases peculiar to early infancy (3.2 per 1,000)—the same categories for which there were large increases for white infants.

The risk of death by cause for the total group is largely a reflection of the patterns for the 7.8 percent of the infants weighing 2,500 grams or

Table M. Risk of neonatal death by color, age of mother, and total-birth order: United States live-birth cohorts, January-March 1950 and 1960

[Births and deaths for which age of mother and birth order were not stated are distributed in proportion to those with stated age of mother and birth order]

Color and age of mother ¹	Total		Total-birth order ²									
			First		Second		Third		Fourth		Fifth and over	
	January-March 1950 ³	1960	January-March 1950 ³	1960	January-March 1950 ³	1960	January-March 1950 ³	1960	January-March 1950 ³	1960	January-March 1950 ³	1960
Total	Rate per 1,000 live births											
All ages	20.0	18.4	19.1	16.4	17.8	17.4	19.7	17.1	21.1	18.4	26.9	23.5
15-19 years	23.8	22.7	21.2	18.9	28.1	28.7	35.3	34.4	45.2	39.9	*	65.4
20-24 years	19.0	17.3	16.6	13.6	18.2	15.8	22.0	18.7	24.9	23.2	35.8	32.7
25-29 years	17.6	16.6	17.3	14.5	14.3	13.8	17.7	14.4	19.6	16.6	25.5	23.2
30-34 years	20.0	18.3	24.1	20.9	16.1	16.0	16.9	14.4	18.8	15.9	25.5	22.1
35-39 years	23.6	19.7	28.7	24.5	20.3	19.3	19.8	17.0	21.5	17.1	26.1	21.1
40-44 years	27.2	23.1	30.9	28.0	25.3	25.0	26.4	21.7	23.6	18.9	28.0	23.9
White												
All ages	18.9	16.9	17.8	15.0	16.9	16.1	19.3	15.9	20.3	17.2	26.0	21.8
15-19 years	22.3	20.4	19.8	17.3	27.2	26.3	41.4	31.7	*	36.1	*	71.5
20-24 years	18.0	15.9	15.5	12.8	17.5	15.0	22.5	17.7	25.9	22.1	37.5	31.0
25-29 years	16.7	15.3	16.4	13.5	14.0	13.1	17.1	13.6	18.8	15.7	25.9	22.0
30-34 years	18.9	17.0	22.3	19.4	15.2	15.2	16.8	13.7	18.5	15.1	24.4	20.6
35-39 years	22.6	18.4	28.1	22.7	20.2	18.4	19.9	16.2	20.1	16.3	24.9	19.6
40-44 years	26.1	22.0	29.8	27.8	26.3	24.8	25.5	20.9	22.1	18.4	26.5	22.5
All other												
All ages	26.7	26.7	28.9	25.7	25.4	27.2	22.3	25.8	25.0	25.4	29.1	28.0
15-19 years	28.3	30.9	26.6	25.8	29.9	35.8	28.6	39.0	43.2	43.7	*	60.4
20-24 years	24.8	25.3	27.7	22.0	23.5	22.7	20.5	24.0	22.9	26.1	34.3	35.1
25-29 years	24.6	24.2	31.8	24.7	20.3	22.4	23.9	22.3	23.6	22.2	24.9	26.0
30-34 years	28.7	26.4	49.2	35.8	32.6	25.3	18.7	23.3	21.7	24.1	28.7	26.8
35-39 years	29.9	27.3	*	41.7	*	30.1	*	28.0	38.3	25.7	30.3	26.6
40-44 years	35.0	29.4	*	*	*	*	*	33.5	*	26.3	34.5	29.4

¹ Data for mothers under 15 years and 45 years and over are not shown separately, but are included in the totals for the cohort groups.

² Total-birth order refers to number of children ever born to this mother including fetal deaths.

³ Excludes data for Massachusetts.

less at birth. Most of the deaths are among low birth weight infants, and they have the greatest effect on the rates for all infants. The rates by cause for infants weighing more than 2,500 grams are of less influence on the total group.

Age at Death

All data representing the risk of death which have been presented to this point relate to the neonatal period as a whole. The risk of death is

Table N. Risk of neonatal death by birth weight, cause of death, and color: United States live-birth cohorts, January-March 1950 and 1960

[Births and deaths for which birth weight was not stated are distributed in proportion to those with stated birth weight]

Birth weight and cause of death (Seventh Revision of the International Lists, 1955)	Total		White		All other	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
<u>All birth weights</u>						
Rate per 1,000 live births						
All causes	20.0	18.4	18.9	16.9	26.7	26.7
Congenital malformations 750-759	2.5	2.3	2.7	2.4	1.6	1.8
Certain diseases of early infancy 760-776	15.9	15.2	15.0	13.7	20.9	22.9
Birth injuries 760, 761	3.2	2.4	3.2	2.3	3.2	2.7
Intracranial and spinal injury 760	1.4	0.7	1.4	0.7	1.8	1.1
Other birth injury 761	1.8	1.6	1.9	1.6	1.4	1.6
Postnatal asphyxia and atelectasis 762	3.6	4.5	3.5	4.1	4.0	6.5
Pneumonia of newborn 763	0.8	0.8	0.7	0.6	1.7	1.8
Diarrhea of newborn 764	0.2	0.1	0.1	0.1	0.3	0.4
Other infections of newborn 765-768	0.1	0.2	0.1	0.1	0.2	0.4
Neonatal disorders arising from maternal toxemia 769	0.3	0.2	0.3	0.2	0.4	0.3
Hemolytic disease of newborn (erythroblastosis) 770	0.6	0.5	0.7	0.5	0.3	0.2
Hemorrhagic disease of newborn 771	0.2	0.1	0.2	0.1	0.4	0.3
III-defined diseases peculiar to early infancy in- cluding nutritional maladjustment . 772, 773	0.8	1.7	0.7	1.5	1.7	2.4
Immaturity with mention of any other subsidiary condition 774	0.2	0.2	0.2	0.2	0.2	0.4
Immaturity unqualified 776	5.7	4.5	5.3	3.9	8.6	7.6
All other causes Residual	1.6	0.9	1.1	0.7	4.1	2.0
<u>2,500 grams or less</u>						
All causes	173.7	171.6	175.8	177.4	164.7	154.8
Congenital malformations 750-759	11.4	11.0	12.9	12.8	5.1	5.8
Certain diseases of early infancy 760-776	157.2	156.7	159.2	161.3	148.6	143.3
Birth injuries 760, 761	23.3	21.4	25.9	24.1	12.3	13.6
Intracranial and spinal injury 760	6.5	5.0	6.6	5.2	6.0	4.5
Other birth injury 761	16.8	16.4	19.2	18.9	6.3	9.1
Postnatal asphyxia and atelectasis 762	33.6	46.6	34.9	48.4	28.0	41.6
Pneumonia of newborn 763	4.5	4.3	4.1	3.7	6.3	5.9
Diarrhea of newborn 764	1.0	0.4	0.8	0.2	1.8	1.0
Other infections of newborn 765-768	0.4	1.0	*	0.9	*	1.4
Neonatal disorders arising from maternal toxemia 769	3.5	2.0	3.7	2.1	2.4	1.7

See footnote at end of table.

Table N. Risk of neonatal death by birth weight, cause of death, and color: United States live-birth cohorts, January-March 1950 and 1960—Con.

[Births and deaths for which birth weight was not stated are distributed in proportion to those with stated birth weight]

Birth weight and cause of death (Seventh Revision of the International Lists, 1955)	Total		White		All other	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
<u>2,500 grams or less—Con.</u>	Rate per 1,000 live births					
Hemolytic disease of newborn (erythroblastosis) 770	3.1	2.4	3.6	3.0	*	0.7
Hemorrhagic disease of newborn 771	1.5	0.9	1.4	0.9	2.0	0.9
Ill-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	8.3	18.2	7.8	18.9	10.8	16.2
Immaturity with mention of any other subsidiary condition 774	2.9	3.0	3.1	3.0	2.1	3.0
Immaturity unqualified 776	75.1	56.5	73.7	56.2	81.0	57.4
All other causes Residual	5.1	3.9	3.7	3.2	10.9	5.7
<u>2,501 grams or more</u>						
All causes	7.8	5.5	7.1	5.1	11.9	7.7
Congenital malformations 750-759	1.8	1.6	1.9	1.6	1.3	1.2
Certain diseases of early infancy 760-776	4.7	3.2	4.3	2.9	7.3	5.0
Birth injuries 760, 761	1.7	0.7	1.6	0.7	2.3	1.0
Intracranial and spinal injury 760	1.0	0.4	1.0	0.3	1.4	0.5
Other birth injury 761	0.7	0.4	0.6	0.3	0.9	0.5
Postnatal asphyxia and atelectasis 762	1.2	0.9	1.1	0.9	1.5	1.3
Pneumonia of newborn 763	0.6	0.5	0.5	0.4	1.2	1.2
Diarrhea of newborn 764	0.1	0.8	0.1	0.0	0.2	0.3
Other infections of newborn 765-768	0.0	0.1	0.0	0.1	*	0.2
Neonatal disorders arising from maternal toxemia 769	0.1	0.1	0.1	0.1	*	0.1
Hemolytic disease of newborn (erythroblastosis) 770	0.5	0.3	0.5	0.4	0.2	0.1
Hemorrhagic disease of newborn 771	0.2	0.1	0.1	0.1	0.3	0.2
Ill-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	0.2	0.3	0.1	0.3	0.7	0.4
Immaturity with mention of any other subsidiary condition 774	0.0	0.0	0.0	0.0	*	*
Immaturity unqualified 776	0.2	0.1	0.2	0.0	0.5	0.2
All other causes Residual	1.2	0.7	0.9	0.6	3.2	1.5

¹ Excludes data for Massachusetts.

not uniform throughout the first month of life, and the changes between January-March 1950 and 1960 are, likewise, not uniform by age (table O). In this table, the rates shown for each age group are based on the number of survivors at the beginning of each age interval. This was done to make a direct comparison of the risks of death in each age group between the two cohorts.

For the total births, mortality was lower for the 1960 cohort than for the earlier cohort in each age interval except 1-23 hours; the same pattern prevailed for white infants. For all other infants, the decreases were limited to the age groups from 2 days through the end of the neonatal period. Furthermore, the increases were limited to the low birth weight group. For infants weighing more than 2,500 grams, there were decreases between the two cohorts in every age interval.

In presenting these data, attention must be drawn to the inappropriateness of comparing the rates for time intervals of unequal length without adjusting for the differences in the periods of exposure to death. For example, for the 1960 cohort the rate for the first hour of life is shown as 1.8 per 1,000 live births for all races and describes the risk of death for only 1 hour (table O). At the other end of the age scale, the risk of death at age 14 through 27 days is 1.0 per 1,000 infants alive at the beginning of that age interval, and the period includes 672 hours of exposure to possible death. If an adjustment were made for the length of exposure, the hourly risk in the first hour of life would be much higher in relation to the hourly risk in the last 2 weeks of the neonatal period, somewhat of the order of a ratio of 1,210 to 1. However, since the purpose of the present report is to compare experience of the January-March 1950 with the 1960 cohort, this adjustment was not made in table O.

DISCUSSION

The results of the comparison of neonatal mortality among the January-March 1950 and the 1960 live-birth cohorts demonstrate important relationships between neonatal mortality and factors apparent at birth. In table P, relative

ratios are presented to compare the levels of the rates for a number of characteristics with a common base for each cohort. The rate for each birth cohort is set equal to 1.00, and the ratios of the rates to the base rate are shown in the last two columns. For example, in the January-March 1950 live-birth cohort, white infants experienced neonatal mortality which was 95 percent of the level of the total rate. In other words, their mortality was 5 percent below the overall rate. The 1960 cohort showed a greater range between the rates for white and all other infants (0.92 versus 1.45) compared with the January-March 1950 cohort (0.95 versus 1.34). Thus, in a relative sense, the two groups were farther apart in 1960 than in January-March 1950.

Differentials by sex remained fairly stable. For the January-March 1950 cohort, male infants experienced mortality which was 14 percent above the overall rate. Neonatal mortality for female infants was 14 percent below the rate for the two sexes combined. For each of the sexes, there was virtually no change between the two cohorts in their relation to overall neonatal mortality.

Infants born of plural deliveries are subject to a much higher risk of death than are single births. In the earlier cohort, the neonatal mortality of single born infants was 8 percent below the overall experience. In sharp contrast, neonatal mortality among infants born of plural deliveries was five times the overall rate. For single births, the relative position remained unchanged between the two cohorts, but for plural births the ratio was higher in the later cohort. This observation may be related to improved prenatal survival, accompanied by elevated postnatal mortality. Two explanations have been offered to account for this phenomenon: one obstetrical, the other statistical. From the obstetrical viewpoint, it is contended that relatively more infants of this weight class who formerly died *in utero* may now survive to be delivered as live births; however, because of their physiological immaturity, they succumb soon after delivery. From the statistical viewpoint, it is contended that registration of very small infants has improved during the decade, and the increase in the ratios in the later cohort may be due to improved registration of very small

Table O. Probability of neonatal death by birth weight, age at death, and color: United States live-birth cohorts, January-March 1950 and 1960

[Births and deaths for which birth weight was not stated are distributed in proportion to those with stated birth weight]

Birth weight and age at death	Total		White		All other	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
All birth weights	Rate per 1,000 survivors ²					
All ages	20.0	18.4	18.9	16.9	26.7	26.7
Under 1 hour	20.0	1.8	2.0	1.7	2.4	2.4
1-23 hours	7.7	8.4	7.3	7.7	9.6	12.0
1 day	3.0	2.7	2.9	2.5	3.6	3.8
2 days	2.0	1.8	2.0	1.7	2.3	2.1
3-6 days	2.6	1.9	2.4	1.7	4.0	2.8
7-13 days	1.4	1.0	1.2	0.8	2.4	1.7
14-27 days	1.5	1.0	1.3	0.8	2.7	2.2
<u>2,500 grams or less</u>						
All ages	173.7	171.6	175.8	177.4	164.7	154.8
Under 1 hour	18.4	17.7	19.2	18.9	15.0	14.2
1-23 hours	81.1	90.3	82.7	93.8	73.9	80.1
1 day	29.2	28.5	30.4	30.1	24.2	23.9
2 days	18.2	17.6	19.3	19.2	13.6	13.0
3-6 days	21.0	16.8	20.6	17.2	23.0	15.8
7-13 days	10.3	7.1	9.6	6.5	13.3	8.7
14-27 days	8.1	5.0	6.9	3.9	13.1	8.3
<u>2,501 grams or more</u>						
All ages	7.8	5.5	7.1	5.1	11.9	7.7
Under 1 hour	0.7	0.5	0.7	0.5	1.0	0.6
1-23 hours	1.9	1.6	1.8	1.5	2.8	2.0
1 day	1.1	0.8	1.0	0.7	1.6	1.0
2 days	0.9	0.6	0.8	0.6	1.2	0.7
3-6 days	1.4	0.8	1.2	0.7	2.2	1.1
7-13 days	0.8	0.5	0.7	0.5	1.4	0.8
14-27 days	1.0	0.7	0.9	0.6	1.7	1.4

¹ Excludes data for Massachusetts.

² Survivors are those children in each specified group who were alive at the beginning of each age interval.

Table P. Risk of neonatal death and ratio to base rate for selected characteristics: United States live-birth cohorts, January-March 1950 and 1960

Characteristic	Risk of death		Ratio to total rate	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960
Total	20.0	18.4	1.00	1.00
<u>Color</u>				
White	18.9	16.9	.95	.92
All other	26.7	26.7	1.34	1.45
<u>Sex</u>				
Male	22.7	20.8	1.14	1.13
Female	17.1	15.8	.86	.86
<u>Plurality</u>				
Single	18.3	16.7	.92	.91
Plural	98.6	100.6	4.93	5.47
<u>Birth weight</u>				
1,000 grams or less	871.8	912.8	43.59	49.61
1,001-1,500 grams	551.3	521.5	27.57	28.34
1,501-2,000 grams	211.0	180.6	10.55	9.82
2,001-2,500 grams	50.4	41.4	2.52	2.25
2,501-3,000 grams	12.6	9.9	.63	.54
3,001-3,500 grams	6.7	4.7	.34	.26
3,501-4,000 grams	5.6	3.6	.28	.20
4,001-4,500 grams	7.5	4.2	.38	.23
4,501 grams or more	14.2	8.7	.71	.47
<u>Period of gestation</u>				
Under 28 weeks	788.4	798.1	39.42	43.38
28-31 weeks	379.4	396.3	18.97	21.54
32-35 weeks	121.3	110.5	6.07	6.01
36 weeks	18.4	29.0	.92	1.58
37 weeks and over	8.8	6.6	.44	.36

See footnote at end of table.

Table P. Risk of neonatal death and ratio to base rate for selected characteristics: United States live-birth cohorts, January-March 1950 and 1960—Con.

Characteristic	Risk of death		Ratio to total rate	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960
<u>Age of mother</u>	Rate per 1,000 live births		Ratio to rate for total	
Under 20 years	24.1	22.9	1.21	1.24
20-24 years	19.0	17.3	.95	.94
25-29 years	17.6	16.6	.88	.90
30-34 years	20.0	18.3	1.00	.99
35-39 years	23.6	19.7	1.18	1.07
40-44 years	27.2	23.1	1.36	1.26
45 years and over	32.4	31.3	1.62	1.70
<u>Total-birth order</u>				
First	19.1	16.4	.96	.89
Second	17.8	17.4	.89	.95
Third	19.7	17.1	.99	.93
Fourth	21.1	18.4	1.06	1.00
Fifth and over	26.9	23.5	1.35	1.28

¹ Excludes data for Massachusetts.

infants, many of whom die soon after birth. Presently, these two possibilities cannot be unraveled.

The ratios by birth weight achieved the highest magnitude of any of the ratios for other characteristics. For each weight group up through 2,500 grams, neonatal mortality was higher than the rate for the overall group. For infants above that weight, the risk of neonatal death is roughly between 30 and 80 percent below overall mortality.

One notable difference between the two cohorts is the higher ratio for the 1960 cohort than for the earlier cohort among infants who weighed 1,500 grams or less at birth. This observation reflects a greater concentration of neonatal mortality in this weight range in the later cohort and may be associated with the obstetrical reason or statistical artifact which was mentioned in the preceding paragraph.

Comparing the experience of the 1960 cohort with that of the January-March 1950 cohort, it would seem that the relative survival of the group weighing 1,500 grams or more at birth has improved, while the situation for those weighing less is inconclusive.

Relative ratios are presented in table Q for white and all other infants separately for a selected group of characteristics. The ratios are presented first in relation to the rates for the overall group, and then for each of the two color groups in relation to the overall rates for that particular group. This approach permits the comparison of the rates for white infants and all other infants with the total experience and of the subgroups of each color group to its own experience. As was anticipated, the ratios repeat relationships which have already been noted; i.e., there was comparatively little change in the relative positions of the sexes in the two

Table Q. Risk of neonatal death and ratios to specified base rates for selected characteristics, by color: United States live-birth cohorts, January-March 1950 and 1960

Item	Risk of death		Ratio to total group		Ratio to color group	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
WHITE	Rate per 1,000 live births		(Base 20.0 = 1.00)	(Base 18.4 = 1.00)	(Base 18.9 = 1.00)	(Base 16.9 = 1.00)
Total	18.9	16.9	.95	.92	1.00	1.00
Sex						
Male	21.6	19.2	1.08	1.04	1.14	1.14
Female	16.0	14.4	.80	.78	.85	.85
Plurality						
Single	17.3	15.3	.87	.83	.92	.91
Plural	94.4	96.0	4.72	5.22	4.99	5.68
Birth weight						
1,000 grams or less	883.3	924.1	44.17	50.22	46.74	54.68
1,001-1,500 grams	562.1	555.1	28.11	30.17	29.74	32.85
1,501-2,000 grams	214.6	198.4	10.73	10.78	11.35	11.74
2,001-2,500 grams	50.6	45.0	2.53	2.45	2.68	2.66
2,501-3,000 grams	12.0	10.1	.60	.55	.63	.60
3,001-3,500 grams	6.2	4.4	.31	.24	.33	.26
3,501-4,000 grams	4.9	3.3	.25	.18	.26	.20
4,001-4,500 grams	6.7	3.6	.34	.20	.35	.21
4,501 grams or more	12.0	7.7	.60	.42	.63	.46
Age of mother						
Under 20 years	22.4	20.4	1.12	1.11	1.19	1.21
20-24 years	18.0	15.9	.90	.86	.95	.94
25-29 years	16.7	15.3	.84	.83	.88	.91
30-34 years	18.9	17.0	.95	.92	1.00	1.01
35-39 years	22.6	18.4	1.13	1.00	1.20	1.09
40-44 years	26.1	22.0	1.31	1.20	1.38	1.30
45 years and over	30.2	31.8	1.51	1.73	1.60	1.88
Total-birth order						
First	17.8	15.0	.89	.82	.94	.89
Second	16.9	16.1	.85	.88	.89	.95
Third	19.3	15.9	.97	.86	1.02	.94
Fourth	20.3	17.2	1.02	.93	1.07	1.02
Fifth and over	26.0	21.8	1.30	1.18	1.38	1.29

See footnote at end of table.

Table Q. Risk of neonatal death and ratios to specified base rates for selected characteristics, by color: United States live-birth cohorts, January-March 1950 and 1960—Con.

Item	Risk of death		Ratio to total group		Ratio to color group	
	January-March 1950 ¹	1960	January-March 1950 ¹	1960	January-March 1950 ¹	1960
<u>ALL OTHER</u>	Rate per 1,000 live births		(Base 20.0 = 1.00)	(Base 18.4 = 1.00)	(Base 26.7 = 1.00)	(Base 26.7 = 1.00)
Total	26.7	26.7	1.34	1.45	1.00	1.00
<u>Sex</u>						
Male	29.4	29.9	1.47	1.62	1.10	1.12
Female	23.9	23.5	1.20	1.28	.90	.88
<u>Plurality</u>						
Single	24.4	24.2	1.22	1.32	.91	.91
Plural	118.0	118.7	5.90	6.45	4.42	4.45
<u>Birth weight</u>						
1,000 grams or less	821.4	883.7	41.07	48.03	30.76	33.10
1,001-1,500 grams	507.0	434.2	25.35	23.60	18.99	16.26
1,501-2,000 grams	195.7	130.3	9.79	7.08	7.33	4.88
2,001-2,500 grams	49.5	30.7	2.48	1.67	1.85	1.15
2,501-3,000 grams	15.4	9.4	.77	.51	.58	.35
3,001-3,500 grams	9.7	6.4	.49	.35	.36	.24
3,501-4,000 grams	10.5	6.6	.53	.36	.39	.25
4,001-4,500 grams	12.5	10.1	.63	.55	.47	.38
4,501 grams or more	20.2	16.3	1.01	.89	.76	.61
<u>Age of mother</u>						
Under 20 years	28.6	31.4	1.43	1.71	1.07	1.18
20-24 years	24.8	25.3	1.24	1.37	.93	.95
25-29 years	24.6	24.2	1.23	1.32	.92	.91
30-34 years	28.7	26.4	1.44	1.43	1.07	.99
35-39 years	29.9	27.3	1.50	1.48	1.12	1.02
40-44 years	35.0	29.4	1.75	1.60	1.31	1.10
45 years and over	*	28.9	...	1.57	...	1.08
<u>Total-birth order</u>						
First	28.9	25.7	1.45	1.40	1.08	.96
Second	25.4	27.2	1.27	1.48	.95	1.02
Third	22.3	25.8	1.12	1.40	.84	.97
Fourth	25.0	25.4	1.25	1.38	.94	.95
Fifth and over	29.1	28.0	1.46	1.52	1.09	1.05

¹ Excludes data for Massachusetts.

cohorts, and there was a suggestion of less favorable relative positions in the later cohort for infants born in plural sets, infants of very low birth weight (1,500 grams or less), and infants born to mothers 45 years or older. Thus, the same conclusions are reached whether the base rate is that for total live births or for each color group.

The report highlights some of the high risk groups which remained resistant to sizable decreases between the January-March 1950 and the 1960 cohorts. For example, despite significant decreases in the risk of neonatal death in almost all birth weight groups, the risk of neonatal death for other than white infants as a whole failed to show a change: It was 26.7 per 1,000 live births for both cohorts. This figure was 34 percent higher than the overall rate in the earlier cohort and 45 percent higher than the overall rate for the later cohort.

Male infants experienced a higher risk of neonatal death than their female counterparts for infants of both color groups and in both cohorts. Infants born of plural deliveries experienced very high neonatal mortality compared with single infants in both cohorts as well.

The highest relative risk of neonatal death was for infants of low birth weight. Because of the extremely high magnitude of the relative risk, the total rate was markedly affected even when small changes occurred in the distributions of live births by weight at birth. The data from the present study can be used to consider which of the two factors could have had a greater statistical effect on the differences in the overall rates between the two cohorts. For illustration, adjusted rates are computed under two different assumptions to gauge how the rates would have varied in the two cohorts if (a) the weight distributions had been identical, but the mortality rates varied, and (b) the rates had been identical, but the weight distributions varied. Which of these two alternatives could theoretically have caused the greatest variation in the adjusted rates by color in the two cohorts?

The statistical effect on neonatal mortality of changes in distributions by weight at birth can be examined using the birth weight distributions shown in table E in conjunction with the overall neonatal mortality rates for the total 1960 cohort (table D). The hypothetical neonatal

mortality rates which were obtained were as follows:

<u>Color group</u>	<u>January-March</u> <u>1950</u>	<u>1960</u>
Total	17.3	19.0
White	16.1	16.9
All other	20.7	28.6

With only *one set of neonatal mortality rates* (1960 cohort rates), but with the actual observed distributions of live births by birth weight for the two cohorts, the rates for the four detailed cells varied from 16.1 to 28.6. These rates reflect the potential influence of birth weight distributions, since the mortality rates were identical for all groups. This range (16.1 to 28.6) demonstrates the marked statistical effect of actual distributions of infants by weight at birth on neonatal mortality rates.

Similarly, one could simulate the alternative situation by using a *single distribution of live births by weight at birth*, but with the observed risks of neonatal death for the four groups shown in the previous paragraph. In this instance, one obtains an understanding of the statistical effect of the variations in mortality rates on a constant distribution of birth weights (1960 total live births):

<u>Color group</u>	<u>January-March</u> <u>1950</u>	<u>1960</u>
Total	22.0	19.0
White	21.6	19.5
All other	24.5	18.8

Using the *single base of live births* and the observed neonatal rates, the rates varied from 18.8 to 24.5. This range is smaller than that obtained when the rates were held constant and the birth weight distributions varied. It would seem, therefore, that the observed differences in the distributions of births by weight group exerted a greater influence on differentials in the risk of neonatal death than did observed variations in the weight-specific neonatal mortality rates.

In considering the practical implications of these findings with regard to birth weight, two possibilities present themselves. On the one

hand, one could attempt (through prevention or therapy) to reduce mortality among newborn infants, particularly low birth weight infants. However, since the great majority of neonatal deaths are due to causes for which there are no glowing solutions, this approach has not been fruitful, until the present. Because there are no simple mass preventive measures such as treatment of water supplies or mass inoculation procedures which are effective, progress will necessarily be slow.

As a second alternative, one might attempt to alter the birth weight distributions of newborn infants. This goal could theoretically be achieved by preventing preterm delivery, but this has also proven to be a difficult objective to achieve. However, another alternative has recently been recommended. In a recent report, the Committee on Maternal Nutrition of the National Academy of Sciences took cognizance of varying obstetric practices with regard to the restriction of weight gain among pregnant women.¹¹ The report stated:

Current obstetric practice in the United States tends to restrict weight gain during pregnancy. In view of the evidence available, one may raise the question of whether the practice is in effect contributing to the large number of low birth weight infants to the perinatal- and infant-mortality rates.

Elsewhere in the same report, the Committee concluded:

An average gain in weight during pregnancy of 24 pounds (range of 20 to 25 pounds) is considered reasonable. . . . Limiting the weight gain of normal women to 10 to 14 pounds is not justified; because of the possibility of adverse effects on birth weight and neurological development, weight-reduction programs and severe caloric restriction should not be undertaken.

The interrelationship of maternal and infant health implies that epidemiological studies recognize the continuum of pregnancy.¹² This concept embraces all factors relating to the mother, the fetus, and the newborn infant as a continuous process of reproduction from the time of conception until some specified time following birth. It advocates that reproduction should not be separated conceptually into two periods which are separated by the birth of the infant. The effect of such a unified philosophy is to bring the specialties of obstetrics and pediatrics into closer cooperation. In practice, this implies that obstetricians will make prenatal

information available to pediatricians. In some hospitals, pediatricians are present in delivery rooms before babies are delivered. Such closer cooperation is advocated because of the possible effect which prenatal or intranatal care of the mother may have on the fetus and infant. Elements of maternal care such as prenatal weight gain, medications and drugs which are taken during pregnancy, prenatal infective diseases, or the use of anesthesia during the intrapartum period must be considered from the viewpoint of their effects on the fetus and infant as well as on the mother.

Baird and his associates¹³⁻¹⁸ have extended the concept of continuum of pregnancy to include the developing years of the mother as well. Studies which have included the height of the mother, her husband's and father's social class, and her nutrition have espoused the philosophy that the best reproductive results are among groups of women whose youthful development is most favorable to a healthful physical and social state. This view includes the importance of the well being of the potential mother from the time of her birth through the period of her growth and development, with conception occurring at those ages which portend the best outcome for mother and infant, with adequate prenatal care, and with delivery under auspicious conditions. Birth weight is an important illustration of this point. On the one hand, it can be viewed as an endpoint of the mother's health and physical development, while, on the other hand, it can be viewed as a characteristic of the beginning of an infant's extrauterine life, and can be closely associated with infant survival and well-being.

AREAS FOR FURTHER STUDY

The present comparisons suggest a number of areas which need further research and are amenable to epidemiologic or demographic studies.

Weight Gain

Among the areas requiring definitive evaluation is the effect of modification of the recommended weight gain of pregnant women on the birth weight, neurological state, and mortality of

their infants. Such a study is a natural outgrowth of the recommendation of the National Academy of Sciences.¹¹

Birth Weight, Race, and Socioeconomic Level

Another hypothesis which is in need of testing is the relationship of socioeconomic factors and food and nutrient intakes to the birth weight of infants in both color groups. There is a significant difference between the mean birth weight of these two groups of infants in the United States. It is not clear whether the difference is due entirely to either socioeconomic or biological factors, or to a combination of the two factors. While some investigators may feel that the resolution of such questions are relatively unimportant,¹⁹ an answer to this question would greatly clarify the methods needed to modify the birth weight differentials between these groups of infants. In view of the complexities of other sociological and human physiological factors, it would indeed be surprising if the difference in mean birth weight between white and all other infants could be attributable *in toto* to either of these two factors.

The evidence with regard to the interrelationships is not entirely conclusive. Data published annually in this country have shown differentials in infant and neonatal mortality and in birth weight between white and all other infants.²⁰ Since "all other" infants are composed of about 90 percent Negroes, the contrast is therefore broadly interpreted on a racial basis; i.e., Caucasian compared with Negro infants. However, the classification by color (or race) is confounded with socioeconomic differentials because of the high correlation between race and socioeconomic level. Other studies have further documented the inverse relationship between infant mortality and socioeconomic level (as determined from the father's occupation group) even when the data are limited only to white infants.^{21,22} Data from New York City have demonstrated similar socioeconomic gradients within both of these groups,²³ and similar results have been reported from North Carolina when the mother's education was used as the indicator of socioeconomic level.²⁴ The evidence which is presently available indicates that there

is an inverse association between mean birth weight and socioeconomic level as well as between infant mortality and socioeconomic level, and these relationships are present for both color groups.

As yet unanswered is the following question: If the differences in birth weight which are attributable to socioeconomic differences were eliminated, would differences still exist in the mean birth weight between racial groups? Studies from the State of Hawaii²⁵⁻²⁷ have documented differences in mean birth weight for several racial groups such as Caucasian, Japanese, Hawaiian, and Filipino; and a study of birth weight of infants born in Sweden and in the United States have shown significant differences.²⁸ However, the relationship of socioeconomic levels to these findings is unclear.

There is virtually no information available concerning racial differences in birth weight of equal socioeconomic levels for this country. A frequently expressed need for future research in this area is the need for a simple standardized indicator of socioeconomic level similar to the five-class grouping of social classes used by British vital statisticians. The introduction of completed years of education on the 1968 Revisions of the Standard Certificates of Live Birth and Fetal Death may provide this vehicle. While the lack of such information should not deter the deliberate solution of problems related to socioeconomic differentials, increased information regarding racial differences between similar socioeconomic levels would clarify the goals which the Nation could expect to achieve.

Birth Weight and Gestation

At approximately 10-year intervals, the Surgeon General of the U.S. Public Health Service recommends to the States revised copies of the Standard Certificates as suggested models after which the States can pattern their documents. The States have the option of adopting the entire form, rejecting the entire form, or modifying the form. Although there is never complete agreement on all items in all State certificate forms, the States generally pattern their documents after the Standard Certificates. The most recent revisions are the 1968 Revisions of the Standard Certificates.

The 1968 Revisions of the Standard Certificates of Live Birth and Fetal Death reflect the chronic dissatisfaction caused by the reporting of gestation in weeks by hospital staffs and physicians. The latest revisions recommend that the certificate request the "date last normal menses began" in contrast to the "weeks of gestation." From the new item and the date of birth, the period of gestation can be computed, and data by period of gestation can be made available.

In 1967, only five registration areas (two States and three cities) in the United States requested the first day of the last menstrual period on their live-birth certificates. In 1968, in response to the introduction of the 1968 Revisions of the Standard Certificates of Live Birth and Fetal Death, 36 States and the District of Columbia were using the new item. The number of live births which occurred in the five areas in 1967 accounted for only 17.1 percent of all live births. In 1968 the proportion represented by the 36 States and the District of Columbia was 69.3 percent.

The effect of the new item on the distribution of live births by period of gestation is marked. Its magnitude can perhaps be appreciated by comparing the distribution of live births by gestation for the areas following the two methods of recording:

Period of gestation	Live births by area: United States, 1968	
	Areas reporting LMP	All other areas
	Percentage distribution	
Total	100.0	100.0
Under 20 weeks	0.0	0.0
20-27 weeks	0.5	0.5
28-31 weeks	0.9	0.7
32-35 weeks	3.9	1.9
36 weeks	2.5	2.9
37-39 weeks	29.1	13.5
40 weeks	18.1	64.2
41-42 weeks	18.7	5.3
43 weeks and over	5.9	0.8
Not stated	20.3	10.1

When the actual LMP and birth dates are used, the proportion of certificates at 40 weeks is

roughly one-third the proportion classified at 40 weeks when the reported weeks are used. The difference is redistributed to neighboring gestation classes. The percent of certificates with gestation not stated is twice as high in areas using the actual dates, and no State had a percentage not stated which was smaller than the average for all States in which weeks of gestation was recorded. While this is not surprising for the first year of the widespread use of this newer method of recording, an examination of the 1967 data for the five registration areas indicated a proportion which was almost equally high (16.3 percent). Greater effort will be required to achieve higher rates of completeness in the reporting of the date of the first day of the last menstrual period. The importance of the information implies that some concerted effort should be made to demonstrate to the providers of the information that it is useful and can be obtained. This may require a detailed study of the reasons for failing to obtain the information on a sample of cases. For patients who are receiving prenatal care, information on the menstrual history is obtained to estimate the date of delivery and to make arrangements with the hospital in anticipation of delivery. For these cases, at least, a study of the reasons for the failure to secure the information on date of the onset of the last menstrual period is possible.

Another area for epidemiologic study is the relationship of gestation and birth weight to infant health and survival. Studies of special population or insurance groups have shown that mortality varies with birth weight as well as gestation when the data are cross-classified.^{21,23,29} As was mentioned earlier, the recorded gestations for the Nation as a whole have been too inaccurate to permit conclusions when birth weight and gestation are considered simultaneously. The availability of gestation information based on the date of the onset of the last menstrual period will open new opportunities for study.

Linked Records Studies

This study also highlights the amount of information which can be gleaned from studies of linked records. While the present study deals with information for 1960 at the latest, it

demonstrates the need to produce infant mortality data periodically from linked records.

Cohort studies of infant mortality are a necessary adjunct to the production of routine infant mortality rates produced from vital statistics. In a majority of States, infant or neonatal death records are routinely linked to the corresponding birth records. Such data should be made an integral part of national vital statistics for monitoring infant mortality. Without cohort studies from linked records, populationwide studies of infant or neonatal mortality based on certain very important characteristics (e.g., age of mother, age of father, birth weight, plurality) are impossible. Populationwide studies are essential to avoid the unintended biases which may be introduced by the self-selection of groups admitted to certain hospitals, or clustered in certain cities. The experience for individual hospitals, cities, or States often do not provide sufficient numbers of cases for analysis because of relatively small groups in some cells, and nationwide studies are the only available means of answering questions regarding the complete range of some factors.

The studies of the January-March 1950 and 1960 cohorts were a decade apart, and another decade has already passed. The Program Area Committee on Child Health of the American Public Health Association recommended in 1967 that such studies be undertaken at 5-year intervals.³⁰ If these recommendations were followed, the next cohort studies should be for the 1965 and 1970 cohorts. From available data, it is apparent that since 1960 the proportion of low birth weight infants continues to be large enough to remain a matter of concern:

Year	Percent of low birth weight infants		
	Total	White	All other
1950	7.5	7.1	10.2
1960	7.7	6.8	12.8
1961	7.8	6.9	13.0
1962	8.0	7.0	13.1
1963	8.2	7.1	13.6
1964	8.2	7.1	13.9
1965	8.3	7.2	13.8
1966	8.3	7.2	13.9
1967	8.2	7.1	13.6
1968	8.2	7.0	13.0

Thus, the problems of the proportion of low birth weight infants outlined in this report have not diminished. What the risk of neonatal death by weight at birth since 1960 may be is not known, and will not be known until cohort data for more recent periods become available.

SUMMARY AND CONCLUSION

The results of this study of neonatal mortality from linked records have added much information regarding differences between infants born in January-March 1950 and those born in 1960. Among the outstanding differences are those between white infants and all other infants. The risk of neonatal death for white infants was 18.9 per 1,000 live births in the earlier cohort, and 16.9 in the later cohort. For all other infants the rate remained unchanged at 26.7. Lower rates in the later cohort were evident for males and for females, and for single but not for plural births.

Although the risk of neonatal death by weight at birth was lower in 1960 than in January-March 1950 for other than white infants in each of the weight groups except the small group of infants weighing 1,000 grams or less at birth, the rates for the total group of these infants in the two cohorts remained unchanged: 26.7. This observation resulted from the shifting of the distribution of weight at birth toward lower weights between the two periods in time. This observed shift in weight distribution was not accompanied by a comparable phenomenon for white infants. The distribution of infants by weight at birth is considered in greater depth in another report.⁹ It was concluded that the rate increase among other than white infants was not associated with changing distributions of age of mother, plurality, or sex, nor was it entirely attributable to increasing proportions of these infants who are born in hospitals. The analysis by period of gestation and birth weight was precluded by the poor quality of the reported periods of gestation for the Nation as a whole.

When, in the present report, the risk of neonatal death was examined by age of mother, it was apparent that, for white infants, there was a small increase in mortality for infants born to mothers 45 years of age and over in the later cohort (table Q and figure 6). However, these infants constitute only one-tenth of 1 percent of

live births. In all other age of mother groups, the risks of neonatal death for the 1960 cohort were lower than for the earlier cohort. For all other infants, on the other hand, there were increased risks for infants born to mothers under 25 years of age, and these constituted over 50 percent of the live births for this group.

By birth order, there was also a notable difference (table Q and figure 7). For white infants, the risk of neonatal death was lower in the 1960 cohort than in the January-March 1950 cohort regardless of birth order. For all other infants, the risk of neonatal death was higher in 1960 for second, third, and fourth births which together constituted 45.7 percent of the live births in this color group.

By cause of death, higher risks of neonatal death were noted in the 1960 cohort from postnatal asphyxia and atelectasis (ICD 762) and from ill-defined diseases peculiar to early infancy (ICD 772,773) for both color groups. These increases are larger than the decreases attributable to the use of two revisions of the International Statistical Classification for coding causes of death. The changes in mortality were limited to the group of infants weighing 2,500 grams or less at birth, and this small group of infants (7.8 percent) contributes the largest share to neonatal mortality (72.6 percent). In addition to these two cause groups (ICD 762 and 772,773), there were relatively smaller increases in a number of cause categories for other than white infants which, when added to those mentioned previously, were sufficient to overcome the decreases in other cause groups and kept the risk of neonatal death among these infants unchanged at 26.7 for the two cohorts.

The risk of death was higher in the 1960 cohort than in the January-March 1950 cohort for both white and all other infants at 1-23 hours of age. For the former group this age interval was the only one for which there was an increase, while for the latter group there was no change in the first hour of life and an increase at 1 day of age.

Neonatal mortality continues to be the major component of infant mortality: 73.2 percent of the total. As the bulk of infant deaths becomes more and more concentrated in the neonatal period, the focus of medical interest is also changing. Concentration on the early postnatal period brings the concerns of obstetricians and pediatricians closer together. Closer cooperation between the two specialties should enhance the outlook for both mothers and their infants.

There has been considerable discussion regarding what a realistic goal for infant or neonatal mortality might be for the United States.¹⁹ Other nations have achieved rates which are considerably below those for this country, so that one can conclude that the irreducible minimum has not been achieved.³¹ Among the lowest rates which were found in the present study is a neonatal mortality rate of 3.0 per 1,000 live births for white infants, weighing between 3,501 and 4,000 grams at birth, with mothers 25-29 years of age. This rate is far below the overall neonatal mortality rate of 18.4 for the 1960 live-birth cohort, and could probably not be achieved by the totality of live births in the near future. Nevertheless, it is indicative of the fact that there is considerable room for improvement.

This report has attempted to examine a number of factors which are known to be associated with neonatal mortality. Its purpose is to establish the degree of their relationship to neonatal mortality and to the changes which occurred between the January-March 1950 and 1960 live-birth cohorts. The study method which was selected was that of cohort rates derived from linked infant-death and live-birth records. Because the study was based on official vital records, a number of other relevant factors such as family income, housing, and so forth were not available for study. Despite these limitations, the study provides substantial guidance for the medical profession, program directors, and health planners.

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Table 1. Live births by plurality, birth weight, color, and sex, and percentage distribution by birth weight: United States live-birth cohort, 1960

Plurality and birth weight	Total			White			All other		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Number of live births									
All live births									
All birth weights	4,257,850	2,179,708	2,078,142	3,600,744	1,848,192	1,752,552	657,106	331,516	325,590
1,000 grams or less	24,323	12,657	11,666	17,493	9,194	8,299	6,830	3,463	3,367
1,001-1,500 grams	27,756	14,494	13,262	20,040	10,712	9,328	7,716	3,782	3,934
1,501-2,000 grams	61,905	30,318	31,587	45,676	22,695	22,981	16,229	7,623	8,606
2,001-2,500 grams	217,436	98,170	119,266	163,131	74,157	88,974	54,305	24,013	30,292
2,501-3,000 grams	787,037	343,962	443,075	621,089	269,586	351,503	165,948	74,376	91,572
3,001-3,500 grams	1,616,543	790,805	825,738	1,372,850	666,769	706,081	243,693	124,036	119,657
3,501-4,000 grams	1,139,043	643,405	495,638	1,014,875	572,664	442,211	124,168	70,741	53,427
4,001-4,500 grams	317,813	201,083	116,730	287,680	182,602	105,078	30,133	18,481	11,652
4,501-5,000 grams	58,522	39,597	18,925	51,507	35,279	16,228	7,015	4,318	2,697
5,001 grams or more	7,472	5,217	2,255	6,403	4,534	1,869	1,069	683	386
<u>Single live births</u>									
All birth weights	4,171,166	2,136,114	2,035,052	3,531,362	1,813,202	1,718,160	639,804	322,912	316,892
1,000 grams or less	20,054	10,505	9,549	14,345	7,589	6,756	5,709	2,916	2,793
1,001-1,500 grams	22,937	12,037	10,900	16,488	8,882	7,606	6,449	3,155	3,294
1,501-2,000 grams	49,758	24,734	25,024	36,426	18,449	17,977	13,332	6,285	7,047
2,001-2,500 grams	191,971	86,282	105,689	142,956	64,740	78,216	49,015	21,542	27,473
2,501-3,000 grams	761,527	330,918	430,609	600,065	258,888	341,177	161,462	72,030	89,432
3,001-3,500 grams	1,604,541	783,893	820,648	1,362,723	660,912	701,811	241,818	122,981	118,837
3,501-4,000 grams	1,136,833	642,038	494,795	1,012,995	571,491	441,504	123,838	70,547	53,291
4,001-4,500 grams	317,589	200,919	116,670	287,488	182,460	105,028	30,101	18,459	11,642
4,501-5,000 grams	58,492	39,575	18,917	51,481	35,261	16,220	7,011	4,314	2,697
5,001 grams or more	7,464	5,213	2,251	6,395	4,530	1,865	1,069	683	386
<u>Plural live births</u>									
All birth weights	86,684	43,594	43,090	69,382	34,990	34,392	17,302	8,604	8,698
1,000 grams or less	4,269	2,152	2,117	3,148	1,605	1,543	1,121	547	574
1,001-1,500 grams	4,819	2,457	2,362	3,552	1,830	1,722	1,267	627	640
1,501-2,000 grams	12,147	5,584	6,563	9,250	4,246	5,004	2,897	1,338	1,559
2,001-2,500 grams	25,465	11,888	13,577	20,175	9,417	10,758	5,290	2,471	2,819
2,501-3,000 grams	25,510	13,044	12,466	21,024	10,698	10,326	4,486	2,346	2,140
3,001-3,500 grams	12,002	6,912	5,090	10,127	5,857	4,270	1,875	1,055	820
3,501-4,000 grams	2,210	1,367	843	1,880	1,173	707	330	194	136
4,001-4,500 grams	224	164	60	192	142	50	32	22	10
4,501-5,000 grams	30	22	8	26	18	8	4	4	-
5,001 grams or more	8	4	4	8	4	4	-	-	-

Table 1. Live births by plurality, birth weight, color, and sex, and percentage distribution by birth weight: United States live-birth cohort, 1960—Con.

Plurality and birth weight	Total			White			All other		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
<u>All live births</u>	Percentage distribution								
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1,000 grams or less	0.6	0.6	0.6	0.5	0.5	0.5	1.0	1.0	1.0
1,001-1,500 grams	0.7	0.7	0.6	0.6	0.6	0.5	1.2	1.1	1.2
1,501-2,000 grams	1.5	1.4	1.5	1.3	1.2	1.3	2.5	2.3	2.6
2,001-2,500 grams	5.1	4.5	5.7	4.5	4.0	5.1	8.3	7.2	9.3
2,501-3,000 grams	18.5	15.8	21.3	17.2	14.6	20.1	25.3	22.4	28.1
3,001-3,500 grams	38.0	36.3	39.7	38.1	36.1	40.3	37.1	37.4	36.8
3,501-4,000 grams	26.8	29.5	23.9	28.2	31.0	25.2	18.9	21.3	16.4
4,001-4,500 grams	7.5	9.2	5.6	8.0	9.9	6.0	4.6	5.6	3.6
4,501-5,000 grams	1.4	1.8	0.9	1.4	1.9	0.9	1.1	1.3	0.8
5,001 grams or more	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1
<u>Single live births</u>									
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1,000 grams or less	0.5	0.5	0.5	0.4	0.4	0.4	0.9	0.9	0.9
1,001-1,500 grams	0.5	0.6	0.5	0.5	0.5	0.4	1.0	1.0	1.0
1,501-2,000 grams	1.2	1.2	1.2	1.0	1.0	1.0	2.1	1.9	2.2
2,001-2,500 grams	4.6	4.0	5.2	4.0	3.6	4.6	7.7	6.7	8.7
2,501-3,000 grams	18.3	15.5	21.2	17.0	14.3	19.9	25.2	22.3	28.2
3,001-3,500 grams	38.5	36.7	40.3	38.6	36.4	40.8	37.8	38.1	37.5
3,501-4,000 grams	27.3	30.1	24.3	28.7	31.5	25.7	19.4	21.8	16.8
4,001-4,500 grams	7.6	9.4	5.7	8.1	10.1	6.1	4.7	5.7	3.7
4,501-5,000 grams	1.4	1.9	0.9	1.5	1.9	0.9	1.1	1.3	0.9
5,001 grams or more	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1
<u>Plural live births</u>									
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1,000 grams or less	4.9	4.9	4.9	4.5	4.6	4.5	6.5	6.4	6.6
1,001-1,500 grams	5.6	5.6	5.5	5.1	5.2	5.0	7.3	7.3	7.4
1,501-2,000 grams	14.0	12.8	15.2	13.3	12.1	14.5	16.7	15.6	17.9
2,001-2,500 grams	29.4	27.3	31.5	29.1	26.9	31.3	30.6	28.7	32.4
2,501-3,000 grams	29.4	29.9	28.9	30.3	30.6	30.0	25.9	27.3	24.6
3,001-3,500 grams	13.8	15.9	11.8	14.6	16.7	12.4	10.8	12.3	9.4
3,501-4,000 grams	2.5	3.1	2.0	2.7	3.4	2.1	1.9	2.3	1.6
4,001-4,500 grams	0.3	0.4	0.1	0.3	0.4	0.1	0.2	0.3	0.1
4,501-5,000 grams	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	-
5,001 grams or more	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-

Table 2. Neonatal deaths and risk of neonatal death, by plurality, birth weight, color, and sex: United States live-birth cohort, 1960

Plurality and birth weight	Total			White			All other		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
<u>All neonatal deaths</u>									
Number of neonatal deaths									
All birth weights	78,330	45,442	32,888	60,773	35,537	25,236	17,557	9,905	7,652
1,000 grams or less	22,202	11,766	10,436	16,166	8,651	7,515	6,036	3,115	2,921
1,001-1,500 grams	14,474	8,489	5,985	11,124	6,567	4,557	3,350	1,922	1,428
1,501-2,000 grams	11,179	6,860	4,319	9,064	5,574	3,490	2,115	1,286	829
2,001-2,500 grams	9,010	5,403	3,607	7,341	4,459	2,882	1,669	944	725
2,501-3,000 grams	7,817	4,501	3,316	6,253	3,600	2,653	1,564	901	663
3,001-3,500 grams	7,581	4,504	3,077	6,016	3,563	2,453	1,565	941	624
3,501-4,000 grams	4,149	2,642	1,507	3,328	2,127	1,201	821	515	306
4,001-4,500 grams	1,341	891	450	1,036	692	344	305	199	106
4,501-5,000 grams	416	274	142	327	220	107	89	54	35
5,001 grams or more	161	112	49	118	84	34	43	28	15
<u>Neonatal deaths among single live births</u>									
All birth weights	69,613	40,609	29,004	54,109	31,792	22,317	15,504	8,817	6,687
1,000 grams or less	18,145	9,663	8,482	13,148	7,066	6,082	4,997	2,597	2,400
1,001-1,500 grams	12,097	7,122	4,975	9,270	5,488	3,782	2,827	1,634	1,193
1,501-2,000 grams	9,806	6,036	3,770	7,965	4,905	3,060	1,841	1,131	710
2,001-2,500 grams	8,424	5,052	3,372	6,887	4,186	2,701	1,537	866	671
2,501-3,000 grams	7,596	4,380	3,216	6,097	3,515	2,582	1,499	865	634
3,001-3,500 grams	7,497	4,450	3,047	5,950	3,520	2,430	1,547	930	617
3,501-4,000 grams	4,134	2,631	1,503	3,315	2,118	1,197	819	513	306
4,001-4,500 grams	1,339	891	448	1,034	692	342	305	199	106
4,501-5,000 grams	416	274	142	327	220	107	89	54	35
5,001 grams or more	159	110	49	116	82	34	43	28	15
<u>Neonatal deaths among plural live births</u>									
All birth weights	8,717	4,833	3,884	6,664	3,745	2,919	2,053	1,088	965
1,000 grams or less	4,057	2,103	1,954	3,018	1,585	1,433	1,039	518	521
1,001-1,500 grams	2,377	1,367	1,010	1,854	1,079	775	523	288	235
1,501-2,000 grams	1,373	824	549	1,099	669	430	274	155	119
2,001-2,500 grams	586	351	235	454	273	181	132	78	54
2,501-3,000 grams	221	121	100	156	85	71	65	36	29
3,001-3,500 grams	84	54	30	66	43	23	18	11	7
3,501-4,000 grams	15	11	4	13	9	4	2	2	-
4,001-4,500 grams	2	-	2	2	-	2	-	-	-
4,501-5,000 grams	-	-	-	-	-	-	-	-	-
5,001 grams or more	2	2	-	2	2	-	-	-	-

Table 2. Neonatal deaths and risk of neonatal death, by plurality, birth weight, color, and sex: United States live-birth cohort, 1960—Con.

Plurality and birth weight	Total			White			All other		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
<u>All neonatal deaths</u>									
Rate per 1,000 live births									
All birth weights	18.4	20.8	15.8	16.9	19.2	14.4	26.7	29.9	23.5
1,000 grams or less	912.8	929.6	894.6	924.1	940.9	905.5	883.7	899.5	867.5
1,001-1,500 grams	521.5	585.7	451.3	555.1	613.1	488.5	434.2	508.2	363.0
1,501-2,000 grams	180.6	226.3	136.7	198.4	245.6	151.9	130.3	168.7	96.3
2,001-2,500 grams	41.4	55.0	30.2	45.0	60.1	32.4	30.7	39.3	23.9
2,501-3,000 grams	9.9	13.1	7.5	10.1	13.4	7.5	9.4	12.1	7.2
3,001-3,500 grams	4.7	5.7	3.7	4.4	5.3	3.5	6.4	7.6	5.2
3,501-4,000 grams	3.6	4.1	3.0	3.3	3.7	2.7	6.6	7.3	5.7
4,001-4,500 grams	4.2	4.4	3.9	3.6	3.8	3.3	10.1	10.8	9.1
4,501-5,000 grams	7.1	6.9	7.5	6.3	6.2	6.6	12.7	12.5	13.0
5,001 grams or more	21.5	21.5	21.7	18.4	18.5	18.2	40.2	41.0	*
<u>Neonatal deaths among single live births</u>									
All birth weights	16.7	19.0	14.3	15.3	17.5	13.0	24.2	27.3	21.1
1,000 grams or less	904.8	919.8	888.3	916.6	931.1	900.2	875.3	890.6	859.3
1,001-1,500 grams	527.4	591.7	456.4	562.2	617.9	497.2	438.4	517.9	362.2
1,501-2,000 grams	197.1	244.0	150.7	218.7	265.9	170.2	138.1	180.0	100.8
2,001-2,500 grams	43.9	58.6	31.9	48.2	64.7	34.5	31.4	40.2	24.4
2,501-3,000 grams	10.0	13.2	7.5	10.2	13.6	7.6	9.3	12.0	7.1
3,001-3,500 grams	4.7	5.7	3.7	4.4	5.3	3.5	6.4	7.6	5.2
3,501-4,000 grams	3.6	4.1	3.0	3.3	3.7	2.7	6.6	7.3	5.7
4,001-4,500 grams	4.2	4.4	3.8	3.6	3.8	3.3	10.1	10.8	9.1
4,501-5,000 grams	7.1	6.9	7.5	6.4	6.2	6.6	12.7	12.5	13.0
5,001 grams or more	21.3	21.1	21.8	18.1	18.1	18.2	40.2	41.0	*
<u>Neonatal deaths among plural live births</u>									
All birth weights	100.6	110.9	90.1	96.0	107.0	84.9	118.7	126.5	110.9
1,000 grams or less	950.3	977.2	923.0	958.7	987.5	928.7	926.9	947.0	907.7
1,001-1,500 grams	493.3	556.4	427.6	522.0	589.6	450.1	412.8	459.3	367.2
1,501-2,000 grams	113.0	147.6	83.7	118.8	157.6	85.9	94.6	115.8	76.3
2,001-2,500 grams	23.0	29.5	17.3	22.5	29.0	16.8	25.0	31.6	19.2
2,501-3,000 grams	8.7	9.3	8.0	7.4	7.9	6.9	14.5	5.3	13.6
3,001-3,500 grams	7.0	7.8	5.9	6.5	7.3	5.4	*	*	*
3,501-4,000 grams	*	*	*	*	*	*	*	*	-
4,001-4,500 grams	*	-	*	10.4	-	*	-	-	-
4,501-5,000 grams	-	-	-	*	-	-	-	-	-
5,001 grams or more	*	*	-	*	*	-	-	-	-

Table 3. Live births by color, birth weight, and period of gestation, and percentage distribution by birth weight and period of gestation: United States live-birth cohort, 1960

Color and birth weight	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks or more	Not stated ¹
Total	Number of live births								
All birth weights	4,257,850	1,656	24,154	34,210	93,726	132,370	640,114	3,087,898	243,722
1,000 grams or less	24,323	1,199	16,013	3,635	779	139	100	369	2,089
1,001-1,500 grams	27,756	70	5,400	11,586	5,744	1,043	768	1,167	1,978
1,501-2,000 grams	61,905	30	1,399	11,008	23,142	7,697	6,687	7,779	4,163
2,001-2,500 grams	217,436	26	453	4,416	32,505	30,825	52,452	83,523	13,236
2,501-3,000 grams	787,037	85	368	1,713	16,769	35,733	176,346	510,276	45,747
3,001-3,500 grams	1,616,543	135	328	1,241	10,069	32,113	254,054	1,226,362	92,241
3,501-4,000 grams	1,139,043	90	155	480	3,797	18,000	121,119	932,280	63,122
4,001-4,500 grams	317,813	12	22	113	752	5,272	24,505	269,584	17,553
4,501-5,000 grams	58,522	6	12	14	140	1,341	3,564	50,272	3,173
5,001 grams or more	7,472	3	4	4	29	207	519	6,286	420
White									
All birth weights	3,600,744	1,056	17,432	24,102	71,342	99,508	549,198	2,619,812	218,294
1,000 grams or less	17,493	765	11,792	2,552	504	71	63	242	1,504
1,001-1,500 grams	20,040	34	3,942	8,376	4,238	712	555	682	1,501
1,501-2,000 grams	45,676	20	924	7,822	17,538	5,606	5,214	5,239	3,313
2,001-2,500 grams	163,131	14	258	3,019	25,455	23,078	42,050	58,292	10,965
2,501-3,000 grams	621,089	49	175	1,062	12,776	27,828	146,179	393,389	39,631
3,001-3,500 grams	1,372,850	88	201	823	7,318	23,892	220,366	1,036,971	83,191
3,501-4,000 grams	1,014,875	69	110	353	2,814	13,545	108,827	830,781	58,376
4,001-4,500 grams	287,680	10	22	87	582	3,806	22,354	244,323	16,496
4,501-5,000 grams	51,507	6	6	8	92	846	3,141	44,458	2,950
5,001 grams or more	6,403	1	2	-	25	124	449	5,435	367
All other									
All birth weights	657,106	600	6,722	10,108	22,384	32,862	90,916	468,086	25,428
1,000 grams or less	6,830	434	4,221	1,083	275	68	37	127	585
1,001-1,500 grams	7,716	36	1,458	3,210	1,506	331	213	485	477
1,501-2,000 grams	16,229	10	475	3,186	5,604	2,091	1,473	2,540	850
2,001-2,500 grams	54,305	12	195	1,397	7,050	7,747	10,402	25,231	2,271
2,501-3,000 grams	165,948	36	173	651	3,993	7,905	30,167	116,887	6,116
3,001-3,500 grams	243,693	47	127	418	2,751	8,221	33,688	189,391	9,050
3,501-4,000 grams	124,168	21	45	127	983	4,455	12,292	101,499	4,746
4,001-4,500 grams	30,133	2	-	26	170	1,466	2,151	25,261	1,057
4,501-5,000 grams	7,015	-	6	6	48	495	423	5,814	223
5,001 grams or more	1,069	2	2	4	4	83	70	851	53

See footnote at end of table.

Table 3. Live births by color, birth weight, and period of gestation, and percentage distribution by birth weight and period of gestation: United States live-birth cohort, 1960—Con.

Color and birth weight	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks or more	Not stated ¹
Total	Percentage distribution by birth weight								
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1,000 grams or less	0.6	72.4	66.3	10.6	0.8	0.1	0.0	0.0	0.9
1,001-1,500 grams	0.7	4.2	22.4	33.9	6.1	0.8	0.1	0.0	0.8
1,501-2,000 grams	1.5	1.8	5.8	32.2	24.7	5.8	1.0	0.3	1.7
2,001-2,500 grams	5.1	1.6	1.9	12.9	34.7	23.3	8.2	2.7	5.4
2,501-3,000 grams	18.5	5.1	1.5	5.0	17.9	27.0	27.5	16.5	18.8
3,001-3,500 grams	38.0	8.2	1.4	3.6	10.7	24.3	39.7	39.7	37.8
3,501-4,000 grams	26.8	5.4	0.6	1.4	4.1	13.6	18.9	30.2	25.9
4,001-4,500 grams	7.5	0.7	0.1	0.3	0.8	4.0	3.8	8.7	7.2
4,501-5,000 grams	1.4	0.4	0.0	0.0	0.1	1.0	0.6	1.6	1.3
5,001 grams or more	0.2	0.2	0.0	0.0	0.0	0.2	0.1	0.2	0.2
White	Percentage distribution by birth weight								
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1,000 grams or less	0.5	72.4	67.6	10.6	0.7	0.1	0.0	0.0	0.7
1,001-1,500 grams	0.6	3.2	22.6	34.8	5.9	0.7	0.1	0.0	0.7
1,501-2,000 grams	1.3	1.9	5.3	32.5	24.6	5.6	0.9	0.2	1.5
2,001-2,500 grams	4.5	1.3	1.5	12.5	35.7	23.2	7.7	2.2	5.0
2,501-3,000 grams	17.2	4.6	1.0	4.4	17.9	28.0	26.6	15.0	18.2
3,001-3,500 grams	38.1	8.3	1.2	3.4	10.3	24.0	40.1	39.6	38.1
3,501-4,000 grams	28.2	6.5	0.6	1.5	3.9	13.6	19.8	31.7	26.7
4,001-4,500 grams	8.0	0.9	0.1	0.4	0.8	3.8	4.1	9.3	7.6
4,501-5,000 grams	1.4	0.6	0.0	0.0	0.1	0.9	0.6	1.7	1.4
5,001 grams or more	0.2	0.1	0.0	-	0.0	0.1	0.1	0.2	0.2
All other	Percentage distribution by birth weight								
All birth weights	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1,000 grams or less	1.0	72.3	62.8	10.7	1.2	0.2	0.0	0.0	2.3
1,001-1,500 grams	1.2	6.0	21.7	31.8	6.7	1.0	0.2	0.1	1.9
1,501-2,000 grams	2.5	1.7	7.1	31.5	25.0	6.4	1.6	0.5	3.3
2,001-2,500 grams	8.3	2.0	2.9	13.8	31.5	23.6	11.4	5.4	8.9
2,501-3,000 grams	25.3	6.0	2.9	6.4	17.8	24.1	33.2	25.0	24.1
3,001-3,500 grams	37.1	7.8	1.9	4.1	12.3	25.0	37.1	40.5	35.6
3,501-4,000 grams	18.9	3.5	0.7	1.3	4.4	13.6	13.5	21.7	18.7
4,001-4,500 grams	4.6	0.3	-	0.3	0.8	4.5	2.4	5.4	4.2
4,501-5,000 grams	1.1	-	0.1	0.1	0.2	1.5	0.5	1.2	0.9
5,001 grams or more	0.2	0.3	0.0	0.0	0.0	0.3	0.1	0.2	0.2

See footnote at end of table.

Table 3. Live births by color, birth weight, and period of gestation, and percentage distribution by birth weight and period of gestation: United States live-birth cohort, 1960—Con.

Color and birth weight	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks or more	Not stated ¹
<u>Total</u>		Percentage distribution by gestation							
All birth weights	100.0	0.0	0.6	0.8	2.2	3.1	15.0	72.5	5.7
1,000 grams or less	100.0	4.9	65.8	14.9	3.2	0.6	0.4	1.5	8.6
1,001-1,500 grams	100.0	0.3	19.5	41.7	20.7	3.8	2.8	4.2	7.1
1,501-2,000 grams	100.0	0.0	2.3	17.8	37.4	12.4	10.8	12.6	6.7
2,001-2,500 grams	100.0	0.0	0.2	2.0	14.9	14.2	24.1	38.4	6.1
2,501-3,000 grams	100.0	0.0	0.0	0.2	2.1	4.5	22.4	64.8	5.8
3,001-3,500 grams	100.0	0.0	0.0	0.1	0.6	2.0	15.7	75.9	5.7
3,501-4,000 grams	100.0	0.0	0.0	0.0	0.3	1.6	10.6	81.8	5.5
4,001-4,500 grams	100.0	0.0	0.0	0.0	0.2	1.7	7.7	84.8	5.5
4,501-5,000 grams	100.0	0.0	0.0	0.0	0.2	2.3	6.1	85.9	5.4
5,001 grams or more	100.0	0.0	0.1	0.1	0.4	2.8	6.9	84.1	5.6
<u>White</u>									
All birth weights	100.0	0.0	0.5	0.7	2.0	2.8	15.3	72.8	6.1
1,000 grams or less	100.0	4.4	67.4	14.6	2.9	0.4	0.4	1.4	8.6
1,001-1,500 grams	100.0	0.2	19.7	41.8	21.1	3.6	2.8	3.4	7.5
1,501-2,000 grams	100.0	0.0	2.0	17.1	38.4	12.3	11.4	11.5	7.3
2,001-2,500 grams	100.0	0.0	0.2	1.9	15.6	14.1	25.8	35.7	6.7
2,501-3,000 grams	100.0	0.0	0.0	0.2	2.1	4.5	23.5	63.3	6.4
3,001-3,500 grams	100.0	0.0	0.0	0.1	0.5	1.7	16.1	75.5	6.1
3,501-4,000 grams	100.0	0.0	0.0	0.0	0.3	1.3	10.7	81.9	5.8
4,001-4,500 grams	100.0	0.0	0.0	0.0	0.2	1.3	7.8	84.9	5.7
4,501-5,000 grams	100.0	0.0	0.0	0.0	0.2	1.6	6.1	86.3	5.7
5,001 grams or more	100.0	0.0	0.0	-	0.4	1.9	7.0	84.9	5.7
<u>All other</u>									
All birth weights	100.0	0.1	1.0	1.5	3.4	5.0	13.8	71.2	3.9
1,000 grams or more	100.0	6.4	61.8	15.9	4.0	1.0	0.5	1.9	8.6
1,001-1,500 grams	100.0	0.5	18.9	41.6	19.5	4.3	2.8	6.3	6.2
1,501-2,000 grams	100.0	0.1	2.9	19.6	34.5	12.9	9.1	15.7	5.2
2,001-2,500 grams	100.0	0.0	0.4	2.6	13.0	14.3	19.2	46.5	4.2
2,501-3,000 grams	100.0	0.0	0.1	0.4	2.4	4.8	18.2	70.4	3.7
3,001-3,500 grams	100.0	0.0	0.1	0.2	1.1	3.4	13.8	77.7	3.7
3,501-4,000 grams	100.0	0.0	0.0	0.1	0.8	3.6	9.9	81.7	3.8
4,001-4,500 grams	100.0	0.0	-	0.1	0.6	4.9	7.1	83.8	3.5
4,501-5,000 grams	100.0	-	0.1	0.1	0.7	7.1	6.0	82.9	3.2
5,001 grams or more	100.0	0.2	0.2	0.4	0.4	7.8	6.5	79.6	5.0

¹ Includes Massachusetts and Maryland, except for Baltimore.

Table 4. Neonatal deaths and risk of neonatal death, by birth weight, color, and period of gestation: United States live-birth cohort, 1960

Color and birth weight	All gestations	Period of gestation								
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks or more	Not stated ¹	
Total		Number of deaths								
All birth weights	78,330	1,076	19,479	13,387	10,131	3,747	5,814	18,254	6,442	
1,000 grams or less	22,202	1,016	14,985	3,238	607	102	58	247	1,949	
1,001-1,500 grams	14,474	38	3,793	6,144	2,291	346	249	397	1,216	
1,501-2,000 grams	11,179	13	585	3,189	3,918	892	750	920	912	
2,001-2,500 grams	9,010	1	80	671	2,509	1,230	1,448	2,315	756	
2,501-3,000 grams	7,817	-	18	95	569	676	1,545	4,284	630	
3,001-3,500 grams	7,581	1	10	34	175	298	1,181	5,346	536	
3,501-4,000 grams	4,149	6	3	8	40	133	423	3,223	313	
4,001-4,500 grams	1,341	-	1	6	14	45	120	1,068	87	
4,501-5,000 grams	416	-	2	1	2	15	30	334	32	
5,001 grams or more	161	1	2	1	6	10	10	120	11	
White										
All birth weights	60,773	676	14,585	10,277	8,393	2,970	4,898	13,910	5,064	
1,000 grams or less	16,166	642	11,105	2,343	396	63	41	153	1,423	
1,001-1,500 grams	11,124	22	2,949	4,726	1,802	243	189	262	931	
1,501-2,000 grams	9,064	7	442	2,564	3,296	700	625	694	736	
2,001-2,500 grams	7,341	1	64	532	2,190	1,000	1,202	1,711	641	
2,501-3,000 grams	6,253	-	16	74	505	600	1,330	3,211	517	
3,001-3,500 grams	6,016	1	6	27	152	231	1,016	4,150	433	
3,501-4,000 grams	3,328	2	2	4	33	91	360	2,561	275	
4,001-4,500 grams	1,036	-	1	6	13	28	98	821	69	
4,501-5,000 grams	327	-	-	1	1	9	27	260	29	
5,001 grams or more	118	1	-	-	5	5	10	87	10	
All other										
All birth weights	17,557	400	4,894	3,110	1,738	777	916	4,344	1,378	
1,000 grams or less	6,036	374	3,880	895	211	39	17	94	526	
1,001-1,500 grams	3,350	16	844	1,418	489	103	60	135	285	
1,501-2,000 grams	2,115	6	143	625	622	192	125	226	176	
2,001-2,500 grams	1,669	-	16	139	319	230	246	604	115	
2,501-3,000 grams	1,564	-	2	21	64	76	215	1,073	113	
3,001-3,500 grams	1,565	-	4	7	23	67	165	1,196	103	
3,501-4,000 grams	821	4	1	4	7	42	63	662	38	
4,001-4,500 grams	305	-	-	-	1	17	22	247	18	
4,501-5,000 grams	89	-	2	-	1	6	3	74	3	
5,001 grams or more	43	-	2	1	1	5	-	33	1	

See footnote at end of table.

Table 4. Neonatal deaths and risk of neonatal death, by birth weight, color, and period of gestation: United States live-birth cohort, 1960-Con.

Color and birth weight	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks or more	Not stated ¹
<u>Total</u>		Rate per 1,000 live births							
All birth weights	18.4	649.8	806.5	391.3	108.1	28.3	9.1	5.9	26.4
1,000 grams or less	912.8	847.4	935.8	890.8	779.2	733.8	580.0	669.4	933.0
1,001-1,500 grams	521.5	*	702.4	530.3	398.9	331.7	324.2	340.2	614.8
1,501-2,000 grams	180.6	*	418.2	289.7	169.3	115.9	112.2	118.3	219.1
2,001-2,500 grams	41.4	*	176.6	151.9	77.2	39.9	27.6	27.7	57.1
2,501-3,000 grams	9.9	*	*	55.5	33.9	18.9	8.8	8.4	13.8
3,001-3,500 grams	4.7	*	*	27.4	17.4	9.3	4.6	4.4	5.8
3,501-4,000 grams	3.6	*	*	*	10.5	7.4	3.5	3.5	5.0
4,001-4,500 grams	4.2	-	*	*	*	8.5	4.9	4.0	5.0
4,501-5,000 grams	7.1	-	*	*	*	*	8.4	6.6	10.1
5,001 grams or more	21.5	*	*	*	*	*	*	19.1	*
<u>White</u>									
All birth weights	16.9	640.2	836.7	426.4	117.6	29.8	8.9	5.3	23.2
1,000 grams or less	924.1	839.2	941.7	918.1	785.7	887.3	650.8	632.2	946.1
1,001-1,500 grams	555.1	*	748.1	564.2	425.2	341.3	340.5	384.2	620.3
1,501-2,000 grams	198.4	*	478.4	327.8	187.9	124.9	119.9	132.5	222.2
2,001-2,500 grams	45.0	*	248.1	176.2	86.0	43.3	28.6	29.4	58.5
2,501-3,000 grams	10.1	-	*	69.7	39.5	21.6	9.1	8.2	13.0
3,001-3,500 grams	4.4	*	*	32.8	20.8	9.7	4.6	4.0	5.2
3,501-4,000 grams	3.3	*	*	*	11.7	6.7	3.3	3.1	4.7
4,001-4,500 grams	3.6	-	*	*	*	7.4	4.4	3.4	4.2
4,501-5,000 grams	6.3	-	-	*	*	*	8.6	5.8	9.8
5,001 grams or more	18.4	*	-	-	*	*	*	16.0	*
<u>All other</u>									
All birth weights	26.7	666.7	728.1	307.7	77.6	23.6	10.1	9.3	54.2
1,000 grams or less	883.7	861.8	919.2	826.4	767.3	*	*	740.2	899.1
1,001-1,500 grams	434.2	*	578.9	441.7	324.7	311.2	281.7	278.4	597.5
1,501-2,000 grams	130.3	*	301.1	196.2	111.0	91.8	84.9	89.0	207.1
2,001-2,500 grams	30.7	-	*	99.5	45.2	29.7	23.6	23.9	50.6
2,501-3,000 grams	9.4	-	*	32.3	16.0	9.6	7.1	9.2	18.5
3,001-3,500 grams	6.4	-	*	*	8.4	8.1	4.9	6.3	11.4
3,501-4,000 grams	6.6	*	*	*	*	9.4	5.1	6.5	8.0
4,001-4,500 grams	10.1	-	-	-	*	*	10.2	9.8	*
4,501-5,000 grams	12.7	-	*	-	*	*	*	12.7	*
5,001 grams or more	40.2	-	*	*	*	*	-	38.8	*

¹ Includes Massachusetts and Maryland, except for Baltimore.

Table 5. Live births by plurality, color, age of mother, and birth weight, and percentage distribution by birth weight: United States live-birth cohort, 1960

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
ALL LIVE BIRTHS											
<u>Total</u>		Number of live births									
All ages	4,257,850	24,323	27,756	61,905	217,436	787,037	1,616,543	1,139,043	317,813	58,522	7,472
Under 20 years	593,746	4,505	5,611	11,777	38,065	127,316	234,207	137,840	30,127	3,988	310
Under 15 years	6,780	114	136	199	648	1,969	2,510	1,000	174	24	6
15-19 years	586,966	4,391	5,475	11,578	37,417	125,347	231,697	136,840	29,953	3,964	304
20-24 years	1,426,912	7,583	8,864	19,558	70,553	272,849	563,508	374,708	93,747	14,203	1,339
25-29 years	1,092,816	5,667	6,157	13,694	50,838	194,656	415,265	302,992	85,802	15,792	1,953
30-34 years	687,722	4,023	4,132	9,611	33,921	117,392	247,869	193,751	61,861	13,244	1,918
35-39 years	359,908	2,042	2,331	5,665	18,676	59,163	123,852	102,518	35,700	8,545	1,416
40-44 years	91,564	473	615	1,501	5,054	14,873	30,129	25,802	10,009	2,602	506
45 years and over	5,182	30	46	99	329	788	1,713	1,432	567	148	30
<u>White</u>											
All ages	3,600,744	17,493	20,040	45,676	163,131	621,089	1,372,850	1,014,875	287,680	51,507	6,403
Under 20 years	460,654	2,771	3,584	7,686	24,401	87,630	184,936	119,147	26,900	3,351	248
Under 15 years	2,524	25	36	66	163	575	1,005	539	105	10	-
15-19 years	458,130	2,746	3,548	7,620	24,238	87,055	183,931	118,608	26,795	3,341	248
20-24 years	1,219,962	5,514	6,503	14,620	53,644	217,885	483,857	337,915	86,038	12,804	1,182
25-29 years	942,112	4,216	4,537	10,413	39,704	158,969	358,479	271,863	78,057	14,144	1,730
30-34 years	588,402	3,002	3,086	7,284	26,415	95,698	212,376	171,802	55,524	11,609	1,606
35-39 years	307,426	1,588	1,797	4,397	14,676	48,200	106,015	90,415	31,841	7,303	1,194
40-44 years	77,976	378	499	1,197	4,055	12,104	25,771	22,527	8,843	2,183	419
45 years and over	4,212	24	34	79	236	603	1,416	1,206	477	113	24
<u>All other</u>											
All ages	657,106	6,830	7,716	16,229	54,305	165,948	243,693	124,168	30,133	7,015	1,069
Under 20 years	133,092	1,734	2,027	4,091	13,664	39,686	49,271	18,693	3,227	637	62
Under 15 years	4,256	89	100	133	485	1,394	1,505	461	69	14	6
15-19 years	128,836	1,645	1,927	3,958	13,179	38,292	47,766	18,232	3,158	623	56
20-24 years	206,950	2,069	2,361	4,938	16,909	54,964	79,651	36,793	7,709	1,399	157
25-29 years	150,704	1,451	1,620	3,281	11,134	35,687	56,786	31,129	7,745	1,648	223
30-34 years	99,320	1,021	1,046	2,327	7,506	21,694	35,493	21,949	6,337	1,635	312
35-39 years	52,482	454	534	1,268	4,000	10,963	17,837	12,103	3,859	1,242	222
40-44 years	13,588	95	116	304	999	2,769	4,358	3,275	1,166	419	87
45 years and over	970	6	12	20	93	185	297	226	90	35	6

Table 5. Live births by plurality, color, age of mother, and birth weight, and percentage distribution by birth weight: United States live-birth cohort, 1960—Con.

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
SINGLE LIVE BIRTHS											
<u>Total</u>		Number of live births									
All ages	4,171,166	20,054	22,937	49,758	191,971	761,527	1,604,541	1,136,833	317,589	58,492	7,464
Under 20 years	586,328	3,752	4,916	10,292	35,812	125,740	233,655	137,750	30,117	3,988	306
Under 15 years	6,720	98	132	184	627	1,965	2,510	1,000	174	24	6
15-19 years	579,608	3,654	4,784	10,108	35,185	123,775	231,145	136,750	29,943	3,964	300
20-24 years	1,402,794	6,193	7,331	15,889	63,382	265,879	560,640	374,249	93,695	14,199	1,337
25-29 years	1,069,098	4,715	4,976	10,584	43,911	187,382	411,691	302,340	85,766	15,782	1,951
30-34 years	669,232	3,318	3,270	7,381	28,511	111,654	244,961	193,196	61,787	13,236	1,918
35-39 years	349,196	1,661	1,879	4,312	15,636	55,875	122,078	102,138	35,664	8,537	1,416
40-44 years	89,404	387	523	1,211	4,417	14,226	29,809	25,730	9,993	2,602	506
45 years and over	5,114	28	42	89	302	771	1,707	1,430	567	148	30
<u>White</u>											
All ages	3,531,362	14,345	16,448	36,426	142,956	600,065	1,362,723	1,012,995	287,488	51,481	6,395
Under 20 years	455,186	2,258	3,065	6,626	22,769	86,436	184,474	119,071	26,892	3,351	244
Under 15 years	2,500	19	34	62	155	571	1,005	539	105	10	-
15-19 years	452,686	2,239	3,031	6,564	22,614	85,865	183,469	118,532	26,787	3,341	244
20-24 years	1,200,490	4,461	5,383	11,793	47,905	212,061	481,385	337,526	85,994	12,802	1,180
25-29 years	922,904	3,500	3,674	8,033	34,133	152,928	355,446	271,301	78,027	14,134	1,728
30-34 years	573,524	2,493	2,444	5,586	22,080	91,004	209,931	171,323	55,454	11,603	1,606
35-39 years	298,862	1,293	1,469	3,360	12,309	45,476	104,558	90,093	31,815	7,295	1,194
40-44 years	76,230	316	423	959	3,539	11,570	25,515	22,477	8,829	2,183	419
45 years and over	4,166	24	30	69	221	590	1,414	1,204	477	113	24
<u>All other</u>											
All ages	639,804	5,709	6,449	13,332	49,015	161,462	241,818	123,838	30,101	7,011	1,069
Under 20 years	131,142	1,494	1,851	3,666	13,043	39,304	49,181	18,679	3,225	637	62
Under 15 years	4,220	79	98	122	472	1,394	1,505	461	69	14	6
15-19 years	126,922	1,415	1,753	3,544	12,571	37,910	47,676	18,218	3,156	623	56
20-24 years	202,304	1,732	1,948	4,096	15,477	53,818	79,255	36,723	7,701	1,397	157
25-29 years	146,194	1,215	1,302	2,551	9,778	34,454	56,245	31,039	7,739	1,648	223
30-34 years	95,708	825	826	1,795	6,431	20,650	35,030	21,873	6,333	1,633	312
35-39 years	50,334	368	410	952	3,327	10,399	17,520	12,045	3,849	1,242	222
40-44 years	13,174	71	100	252	878	2,656	4,294	3,253	1,164	419	87
45 years and over	948	4	12	20	81	181	293	226	90	35	6

Table 5. Live births by plurality, color, age of mother, and birth weight, and percentage distribution by birth weight: United States live-birth cohort, 1960—Con.

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
PLURAL LIVE BIRTHS											
<u>Total</u>		Number of live births									
All ages	86,684	4,269	4,819	12,147	25,465	25,510	12,002	2,210	224	30	8
Under 20 years	7,418	753	695	1,485	2,253	1,576	552	90	10	-	4
Under 15 years	60	16	4	15	21	4	-	-	-	-	-
15-19 years	7,358	737	691	1,470	2,232	1,572	552	90	10	-	4
20-24 years	24,118	1,390	1,533	3,669	7,171	6,970	2,868	459	52	4	2
25-29 years	23,718	952	1,181	3,110	6,927	7,274	3,574	652	36	10	2
30-34 years	18,490	705	862	2,230	5,410	5,738	2,908	555	74	8	-
35-39 years	10,712	381	452	1,353	3,040	3,288	1,774	380	36	8	-
40-44 years	2,160	86	92	290	637	647	320	72	16	-	-
45 years and over	68	2	4	10	27	17	6	2	-	-	-
<u>White</u>											
All ages	69,382	3,148	3,552	9,250	20,175	21,024	10,127	1,880	192	26	8
Under 20 years	5,468	513	519	1,060	1,632	1,194	462	76	8	-	4
Under 15 years	24	6	2	4	8	4	-	-	-	-	-
15-19 years	5,444	507	517	1,056	1,624	1,190	462	76	8	-	4
20-24 years	19,472	1,053	1,120	2,827	5,739	5,824	2,472	389	44	2	2
25-29 years	19,208	716	863	2,380	5,571	6,041	3,033	562	30	10	2
30-34 years	14,878	509	642	1,698	4,335	4,694	2,445	479	70	6	-
35-39 years	8,564	295	328	1,037	2,367	2,724	1,457	322	26	8	-
40-44 years	1,746	62	76	238	516	534	256	50	14	-	-
45 years and over	46	-	4	10	15	13	2	2	-	-	-
<u>All other</u>											
All ages	17,302	1,121	1,267	2,897	5,290	4,486	1,875	330	32	4	-
Under 20 years	1,950	240	176	425	621	382	90	14	2	-	-
Under 15 years	36	10	2	11	13	-	-	-	-	-	-
15-19 years	1,914	230	174	414	608	382	90	14	2	-	-
20-24 years	4,646	337	413	842	1,432	1,146	396	70	8	2	-
25-29 years	4,510	236	318	730	1,356	1,233	541	90	6	-	-
30-34 years	3,612	196	220	532	1,075	1,044	463	76	4	2	-
35-39 years	2,148	86	124	316	673	564	317	58	10	-	-
40-44 years	414	24	16	52	121	113	64	22	2	-	-
45 years and over	22	2	-	-	12	4	4	-	-	-	-

Table 5. Live births by plurality, color, age of mother, and birth weight, and percentage distribution by birth weight: United States live-birth cohort, 1960—Con.

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
ALL LIVE BIRTHS											
<u>Total</u>											
Percentage distribution											
All ages	100.0	0.6	0.7	1.5	5.1	18.5	38.0	26.8	7.5	1.4	0.2
Under 20 years	100.0	0.8	0.9	2.0	6.4	21.4	39.4	23.2	5.1	0.7	0.1
Under 15 years	100.0	1.7	2.0	2.9	9.6	29.0	37.0	14.7	2.6	0.4	0.1
15-19 years	100.0	0.7	0.9	2.0	6.4	21.4	39.5	23.3	5.1	0.7	0.1
20-24 years	100.0	0.5	0.6	1.4	4.9	19.1	39.5	26.3	6.6	1.0	0.1
25-29 years	100.0	0.5	0.6	1.3	4.7	17.8	38.0	27.7	7.9	1.4	0.2
30-34 years	100.0	0.6	0.6	1.4	4.9	17.1	36.0	28.2	9.0	1.9	0.3
35-39 years	100.0	0.6	0.6	1.6	5.2	16.4	34.4	28.5	9.9	2.4	0.4
40-44 years	100.0	0.5	0.7	1.6	5.5	16.2	32.9	28.2	10.9	2.8	0.6
45 years and over	100.0	0.6	0.9	1.9	6.3	15.2	33.1	27.6	10.9	2.9	0.6
<u>White</u>											
All ages	100.0	0.5	0.6	1.3	4.5	17.2	38.1	28.2	8.0	1.4	0.2
Under 20 years	100.0	0.6	0.8	1.7	5.3	19.0	40.1	25.9	5.8	0.7	0.1
Under 15 years	100.0	1.0	1.4	2.6	6.5	22.8	39.8	21.4	4.2	0.4	-
15-19 years	100.0	0.6	0.8	1.7	5.3	19.0	40.1	25.9	5.8	0.7	0.1
20-24 years	100.0	0.5	0.5	1.2	4.4	17.9	39.7	27.7	7.1	1.0	0.1
25-29 years	100.0	0.4	0.5	1.1	4.2	16.9	38.1	28.9	8.3	1.5	0.2
30-34 years	100.0	0.5	0.5	1.2	4.5	16.3	36.1	29.2	9.4	2.0	0.3
35-39 years	100.0	0.5	0.6	1.4	4.8	15.7	34.5	29.4	10.4	2.4	0.4
40-44 years	100.0	0.5	0.6	1.5	5.2	15.5	33.0	28.9	11.3	2.8	0.5
45 years and over	100.0	0.6	0.8	1.9	5.6	14.3	33.6	28.6	11.3	2.7	0.6
<u>All other</u>											
All ages	100.0	1.0	1.2	2.5	8.3	25.3	37.1	18.9	4.6	1.1	0.2
Under 20 years	100.0	1.3	1.5	3.1	10.3	29.8	37.0	14.0	2.4	0.5	0.0
Under 15 years	100.0	2.1	2.3	3.1	11.4	32.8	35.4	10.8	1.6	0.3	0.1
15-19 years	100.0	1.3	1.5	3.1	10.2	29.7	37.1	14.2	2.5	0.5	0.0
20-24 years	100.0	1.0	1.1	2.4	8.2	26.6	38.5	17.8	3.7	0.7	0.1
25-29 years	100.0	1.0	1.1	2.2	7.4	23.7	37.7	20.7	5.1	1.1	0.1
30-34 years	100.0	1.0	1.1	2.3	7.6	21.8	35.7	22.1	6.4	1.6	0.3
35-39 years	100.0	0.9	1.0	2.4	7.6	20.9	34.0	23.1	7.4	2.4	0.4
40-44 years	100.0	0.7	0.9	2.2	7.4	20.4	32.1	24.1	8.6	3.1	0.6
45 years and over	100.0	0.6	1.2	2.1	9.6	19.1	30.6	23.3	9.3	3.6	0.6

Table 5. Live births by plurality, color, age of mother, and birth weight, and percentage distribution by birth weight: United States live-birth cohort, 1960—Con.

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
<u>SINGLE LIVE BIRTHS</u>											
<u>Total</u>		Percentage distribution									
All ages	100.0	0.5	0.5	1.2	4.6	18.3	38.5	27.3	7.6	1.4	0.2
Under 20 years	100.0	0.6	0.8	1.8	6.1	21.4	39.9	23.5	5.1	0.7	0.1
Under 15 years	100.0	1.5	2.0	2.7	9.3	29.2	37.4	14.9	2.6	0.4	0.1
15-19 years	100.0	0.6	0.8	1.7	6.1	21.4	39.9	23.6	5.2	0.7	0.1
20-24 years	100.0	0.4	0.5	1.1	4.5	19.0	40.0	26.7	6.7	1.0	0.1
25-29 years	100.0	0.4	0.5	1.0	4.1	17.5	38.5	28.3	8.0	1.5	0.2
30-34 years	100.0	0.5	0.5	1.1	4.3	16.7	36.6	28.9	9.2	2.0	0.3
35-39 years	100.0	0.5	0.5	1.2	4.5	16.0	35.0	29.2	10.2	2.4	0.4
40-44 years	100.0	0.4	0.6	1.4	4.9	15.9	33.3	28.8	11.2	2.9	0.6
45 years and over	100.0	0.5	0.8	1.7	5.9	15.1	33.4	28.0	11.1	2.9	0.6
<u>White</u>											
All ages	100.0	0.4	0.5	1.0	4.0	17.0	38.6	28.7	8.1	1.5	0.2
Under 20 years	100.0	0.5	0.8	1.5	5.0	19.0	40.5	26.2	5.9	0.7	0.1
Under 15 years	100.0	0.8	1.4	2.5	6.2	22.8	40.2	21.6	4.2	0.4	-
15-19 years	100.0	0.5	0.7	1.5	5.0	19.0	40.5	26.2	5.9	0.7	0.1
20-24 years	100.0	0.4	0.4	1.0	4.0	17.7	40.1	28.1	7.2	1.1	0.1
25-29 years	100.0	0.4	0.4	0.9	3.7	16.6	38.5	29.4	8.5	1.5	0.2
30-34 years	100.0	0.4	0.4	1.0	3.8	15.9	36.6	29.9	9.7	2.0	0.3
35-39 years	100.0	0.4	0.5	1.1	4.1	15.2	35.0	30.1	10.6	2.4	0.4
40-44 years	100.0	0.4	0.6	1.3	4.6	15.2	33.5	29.5	11.6	2.9	0.5
45 years and over	100.0	0.6	0.7	1.7	5.3	14.2	33.9	28.9	11.4	2.7	0.6
<u>All other</u>											
All ages	100.0	0.9	1.0	2.1	7.7	25.2	37.8	19.4	4.7	1.1	0.2
Under 20 years	100.0	1.1	1.4	2.8	9.9	30.0	37.5	14.2	2.5	0.5	0.0
Under 15 years	100.0	1.9	2.3	2.9	11.2	33.0	35.7	10.9	1.6	0.3	0.1
15-19 years	100.0	1.1	1.4	2.8	9.9	29.9	37.6	14.4	2.5	0.5	0.0
20-24 years	100.0	0.9	1.0	2.0	7.7	26.6	39.2	18.2	3.8	0.7	0.1
25-29 years	100.0	0.8	0.9	1.7	6.7	23.6	38.5	21.2	5.3	1.1	0.2
30-34 years	100.0	0.9	0.9	1.9	6.7	21.6	36.6	22.9	6.6	1.7	0.3
35-39 years	100.0	0.7	0.8	1.9	6.6	20.7	34.8	23.9	7.6	2.5	0.4
40-44 years	100.0	0.5	0.8	1.9	6.7	20.2	32.6	24.7	8.8	3.2	0.7
45 years and over	100.0	0.4	1.3	2.1	8.5	19.1	30.9	23.8	9.5	3.7	0.6

Table 5. Live births by plurality, color, age of mother, and birth weight, and percentage distribution by birth weight: United States live-birth cohort, 1960—Con.

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
PLURAL LIVE BIRTHS											
Total											
All ages	100.0	4.9	5.6	14.0	29.4	29.4	13.8	2.5	0.3	0.0	0.0
Under 20 years	100.0	10.2	9.4	20.0	30.4	21.2	7.4	1.2	0.1	-	0.1
Under 15 years	*	*	*	*	*	*	*	*	*	*	*
15-19 years	100.0	10.0	9.4	20.0	30.3	21.4	7.5	1.2	0.1	-	0.1
20-24 years	100.0	5.8	6.4	15.2	29.7	28.9	11.9	1.9	0.2	0.0	0.0
25-29 years	100.0	4.0	5.0	13.1	29.2	30.7	15.1	2.7	0.2	0.0	0.0
30-34 years	100.0	3.8	4.7	12.1	29.3	31.0	15.7	3.0	0.4	0.0	-
35-39 years	100.0	3.6	4.2	12.6	28.4	30.7	16.6	3.5	0.3	0.1	-
40-44 years	100.0	4.0	4.3	13.4	29.5	30.0	14.8	3.3	0.7	-	-
45 years and over	*	*	*	*	*	*	*	*	*	*	*
White											
All ages	100.0	4.5	5.1	13.3	29.1	30.3	14.6	2.7	0.3	0.0	0.0
Under 20 years	100.0	9.4	9.5	19.4	29.8	21.8	8.4	1.4	0.1	-	0.1
Under 15 years	*	*	*	*	*	*	*	*	*	*	*
15-19 years	100.0	9.3	9.5	19.4	29.8	21.9	8.5	1.4	0.1	-	0.1
20-24 years	100.0	5.4	5.8	14.5	29.5	29.9	12.7	2.0	0.2	0.0	0.0
25-29 years	100.0	3.7	4.5	12.4	29.0	31.5	15.8	2.9	0.2	0.1	0.0
30-34 years	100.0	3.4	4.3	11.4	29.1	31.5	16.4	3.2	0.5	0.0	-
35-39 years	100.0	3.4	3.8	12.1	27.6	31.8	17.0	3.8	0.3	0.1	-
40-44 years	100.0	3.6	4.4	13.6	29.6	30.6	14.7	2.9	0.8	-	-
45 years and over	*	*	*	*	*	*	*	*	*	*	*
All other											
All ages	100.0	6.5	7.3	16.7	30.6	25.9	10.8	1.9	0.2	0.0	-
Under 20 years	100.0	12.3	9.0	21.8	31.8	19.6	4.6	0.7	0.1	-	-
Under 15 years	*	*	*	*	*	*	*	*	*	*	*
15-19 years	100.0	12.0	9.1	21.6	31.8	20.0	4.7	0.7	0.1	-	-
20-24 years	100.0	7.3	8.9	18.1	30.8	24.7	8.5	1.5	0.2	0.0	-
25-29 years	100.0	5.2	7.1	16.2	30.1	27.3	12.0	2.0	0.1	-	-
30-34 years	100.0	5.4	6.1	14.7	29.8	28.9	12.8	2.1	0.1	0.1	-
35-39 years	100.0	4.0	5.8	14.7	31.3	26.3	14.8	2.7	0.5	-	-
40-44 years	100.0	5.8	3.9	12.6	29.2	27.3	15.5	5.3	0.5	-	-
45 years and over	*	*	*	*	*	*	*	*	*	*	*

Table 6. Neonatal deaths and risk of neonatal death, by plurality, color, age of mother, and birth weight: United States live-birth cohort, 1960

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
<u>ALL NEONATAL DEATHS</u>											
<u>Total</u>											
Number of deaths											
All ages	78,330	22,202	14,474	11,179	9,010	7,817	7,581	4,149	1,341	416	161
Under 20 years	13,603	3,994	3,122	2,195	1,434	1,129	1,004	553	136	27	9
Under 15 years	279	88	58	47	31	27	16	9	3	-	-
15-19 years	13,324	3,906	3,064	2,148	1,403	1,102	988	544	133	27	9
20-24 years	24,644	6,885	4,762	3,753	2,855	2,407	2,358	1,159	351	93	21
25-29 years	18,109	5,289	3,154	2,412	2,073	1,896	1,862	974	313	100	36
30-34 years	12,601	3,679	2,065	1,602	1,435	1,355	1,281	779	259	98	48
35-39 years	7,093	1,891	1,071	921	887	750	771	494	202	70	36
40-44 years	2,118	441	278	276	293	256	285	176	75	27	11
45 years and over	162	23	22	20	33	24	20	14	5	1	-
<u>White</u>											
All ages	60,773	16,166	11,124	9,064	7,341	6,253	6,016	3,328	1,036	327	118
Under 20 years	9,419	2,505	2,175	1,681	1,063	769	694	409	95	23	5
Under 15 years	81	23	15	17	11	9	3	3	-	-	-
15-19 years	9,338	2,482	2,160	1,664	1,052	760	691	406	95	23	5
20-24 years	19,400	5,035	3,704	3,044	2,368	1,984	1,909	976	292	72	16
25-29 years	14,457	3,990	2,491	1,998	1,724	1,581	1,505	815	243	82	28
30-34 years	9,983	2,776	1,648	1,325	1,181	1,104	1,038	601	194	81	35
35-39 years	5,661	1,486	859	761	741	592	622	374	150	49	27
40-44 years	1,719	355	229	235	237	204	231	142	59	20	7
45 years and over	134	19	18	20	27	19	17	11	3	-	-
<u>All other</u>											
All ages	17,557	6,036	3,350	2,115	1,669	1,564	1,565	821	305	89	43
Under 20 years	4,184	1,489	947	514	371	360	310	144	41	4	4
Under 15 years	198	65	43	30	20	18	13	6	3	-	-
15-19 years	3,986	1,424	904	484	351	342	297	138	38	4	4
20-24 years	5,244	1,850	1,058	709	487	423	449	183	59	21	5
25-29 years	3,652	1,299	663	414	349	315	357	159	70	18	8
30-34 years	2,618	903	417	277	254	251	243	178	65	17	13
35-39 years	1,432	405	212	160	146	158	149	120	52	21	9
40-44 years	399	86	49	41	56	52	54	34	16	7	4
45 years and over	28	4	4	-	6	5	3	3	2	1	-

Table 6. Neonatal deaths and risk of neonatal death, by plurality, color, age of mother, and birth weight: United States live-birth cohort, 1960—Con.

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
NEONATAL DEATHS AMONG SINGLE BIRTHS											
<u>Total</u>											
Number of deaths											
All ages	69,613	18,145	12,097	9,806	8,424	7,596	7,497	4,134	1,339	416	159
Under 20 years	12,245	3,304	2,720	2,025	1,365	1,108	999	552	136	27	9
Under 15 years	263	77	56	45	30	27	16	9	3	-	-
15-19 years	11,982	3,227	2,664	1,980	1,335	1,081	983	543	133	27	9
20-24 years	21,811	5,549	3,978	3,305	2,670	2,353	2,338	1,155	349	93	21
25-29 years	16,068	4,388	2,571	2,083	1,939	1,841	1,830	969	313	100	34
30-34 years	11,092	2,996	1,669	1,357	1,325	1,292	1,272	776	259	98	48
35-39 years	6,299	1,526	901	778	815	725	754	492	202	70	36
40-44 years	1,944	361	238	241	278	253	284	176	75	27	11
45 years and over	154	21	20	17	32	24	20	14	5	1	-
<u>White</u>											
All ages	54,109	13,148	9,270	7,965	6,887	6,097	5,950	3,315	1,034	327	116
Under 20 years	8,422	2,031	1,862	1,543	1,010	755	690	408	95	23	5
Under 15 years	74	17	14	17	11	9	3	3	-	-	-
15-19 years	8,348	2,014	1,848	1,526	999	746	687	405	95	23	5
20-24 years	17,211	4,013	3,104	2,691	2,218	1,941	1,893	973	290	72	16
25-29 years	12,887	3,307	2,033	1,745	1,620	1,543	1,478	810	243	82	26
30-34 years	8,821	2,273	1,333	1,119	1,097	1,060	1,031	598	194	81	35
35-39 years	5,055	1,211	724	646	688	577	610	373	150	49	27
40-44 years	1,587	296	198	204	228	202	231	142	59	20	7
45 years and over	126	17	16	17	26	19	17	11	3	-	-
<u>All other</u>											
All ages	15,504	4,997	2,827	1,841	1,537	1,499	1,547	819	305	89	43
Under 20 years	3,823	1,273	858	482	355	353	309	144	41	4	4
Under 15 years	189	60	42	28	19	18	13	6	3	-	-
15-19 years	3,634	1,213	816	454	336	335	296	138	38	4	4
20-24 years	4,600	1,536	874	614	452	412	445	182	59	21	5
25-29 years	3,181	1,081	538	338	319	298	352	159	70	18	8
30-34 years	2,271	723	336	238	228	232	241	178	65	17	13
35-39 years	1,244	315	177	132	127	148	144	119	52	21	9
40-44 years	357	65	40	37	50	51	53	34	16	7	4
45 years and over	28	4	4	-	6	5	3	3	2	1	-

Table 6. Neonatal deaths and risk of neonatal death, by plurality, color, age of mother, and birth weight: United States live-birth cohort, 1960-Con.

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
NEONATAL DEATHS AMONG PLURAL BIRTHS											
<u>Total</u>		Number of deaths									
All ages	8,717	4,057	2,377	1,373	586	221	84	15	2	-	2
Under 20 years	1,358	690	402	170	69	21	5	1	-	-	-
Under 15 years	16	11	2	2	1	-	-	-	-	-	-
15-19 years	1,342	679	400	168	68	21	5	1	-	-	-
20-24 years	2,833	1,336	784	448	185	54	20	4	2	-	-
25-29 years	2,041	901	583	329	134	55	32	5	-	-	2
30-34 years	1,509	683	396	245	110	63	9	3	-	-	-
35-39 years	794	365	170	143	72	25	17	2	-	-	-
40-44 years	174	80	40	35	15	3	1	-	-	-	-
45 years and over	8	2	2	3	1	-	-	-	-	-	-
<u>White</u>											
All ages	6,664	3,018	1,854	1,099	454	156	66	13	2	-	2
Under 20 years	997	474	313	138	53	14	4	1	-	-	-
Under 15 years	7	6	1	-	-	-	-	-	-	-	-
15-19 years	990	468	312	138	53	14	4	1	-	-	-
20-24 years	2,189	1,022	600	353	150	43	16	3	2	-	-
25-29 years	1,570	683	458	253	104	38	27	5	-	-	2
30-34 years	1,162	503	315	206	84	44	7	3	-	-	-
35-39 years	606	275	135	115	53	15	12	1	-	-	-
40-44 years	132	59	31	31	9	2	-	-	-	-	-
45 years and over	8	2	2	3	1	-	-	-	-	-	-
<u>All other</u>											
All ages	2,053	1,039	523	274	132	65	18	2	-	-	-
Under 20 years	361	216	89	32	16	7	1	-	-	-	-
Under 15 years	9	5	1	2	1	-	-	-	-	-	-
15-19 years	352	211	88	30	15	7	1	-	-	-	-
20-24 years	644	314	184	95	35	11	4	1	-	-	-
25-29 years	471	218	125	76	30	17	5	-	-	-	-
30-34 years	347	180	81	39	26	19	2	-	-	-	-
35-39 years	188	90	35	28	19	10	5	1	-	-	-
40-44 years	42	21	9	4	6	1	1	-	-	-	-
45 years and over	-	-	-	-	-	-	-	-	-	-	-

Table 6. Neonatal deaths and risk of neonatal death, by plurality, color, age of mother, and birth weight: United States live-birth cohort, 1960—Con.

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
ALL NEONATAL DEATHS											
Total		Rate per 1,000 live births									
All ages	18.4	912.8	521.5	180.6	41.4	9.9	4.7	3.6	4.2	7.1	21.5
Under 20 years	22.9	886.6	556.4	186.4	37.7	8.9	4.3	4.0	4.5	6.8	*
Under 15 years	41.2	771.9	426.5	236.2	47.8	13.7	*	*	*	-	-
15-19 years	22.7	889.5	559.6	185.5	37.5	8.8	4.3	4.0	4.4	6.8	*
20-24 years	17.3	908.0	537.2	191.9	40.5	8.8	4.2	3.1	3.7	6.5	15.7
25-29 years	16.6	933.3	512.3	176.1	40.8	9.7	4.5	3.2	3.6	6.3	18.4
30-34 years	18.3	914.5	499.8	166.7	42.3	11.5	5.2	4.0	4.2	7.4	25.0
35-39 years	19.7	926.1	459.5	162.6	47.5	12.7	6.2	4.8	5.7	8.2	25.4
40-44 years	23.1	932.3	452.0	183.9	58.0	17.2	9.5	6.8	7.5	10.4	*
45 years and over	31.3	766.7	478.3	202.0	100.3	30.5	11.7	*	*	*	-
White											
All ages	16.9	924.1	555.1	198.4	45.0	10.1	4.4	3.3	3.6	6.3	18.4
Under 20 years	20.4	904.0	606.9	218.7	43.6	8.8	3.8	3.4	3.5	6.9	*
Under 15 years	32.1	920.0	*	*	*	*	*	*	-	-	-
15-19 years	20.4	903.9	608.8	218.4	43.4	8.7	3.8	3.4	3.5	6.9	*
20-24 years	15.9	913.1	569.6	208.2	44.1	9.1	3.9	2.9	3.4	5.6	*
25-29 years	15.3	946.4	549.0	191.9	43.4	9.9	4.2	3.0	3.1	5.8	16.2
30-34 years	17.0	924.7	534.0	181.9	44.7	11.5	4.9	3.5	3.5	7.0	21.8
35-39 years	18.4	935.8	478.0	173.1	50.5	12.3	5.9	4.1	4.7	6.7	22.6
40-44 years	22.0	939.2	458.9	196.3	58.4	16.9	9.0	6.3	6.7	9.2	*
45 years and over	31.8	*	*	253.2	114.4	*	*	*	*	-	-
All other											
All ages	26.7	883.7	434.2	130.3	30.7	9.4	6.4	6.6	10.1	12.7	40.2
Under 20 years	31.4	858.7	467.2	125.6	27.2	9.1	6.3	7.7	12.7	*	*
Under 15 years	46.5	730.3	430.0	225.6	41.2	*	*	*	*	-	-
15-19 years	30.9	865.7	469.1	122.3	26.6	8.9	6.2	7.6	12.0	*	*
20-24 years	25.3	894.2	448.1	143.6	28.8	7.7	5.6	5.0	7.7	15.0	*
25-29 years	24.2	895.2	409.3	126.2	31.3	8.8	6.3	5.1	9.0	*	*
30-34 years	26.4	884.4	398.7	119.0	33.8	11.6	6.8	8.1	10.3	*	*
35-39 years	27.3	892.1	397.0	126.2	36.5	14.4	8.4	9.9	13.5	16.9	*
40-44 years	29.4	905.3	422.4	134.9	56.1	18.8	12.4	10.4	*	*	*
45 years and over	28.9	*	*	-	*	*	*	*	*	*	-

Table 6. Neonatal deaths and risk of neonatal death, by plurality, color, age of mother, and birth weight: United States live-birth cohort, 1960—Con.

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
NEONATAL DEATHS AMONG SINGLE BIRTHS											
<u>Total</u>											
All ages	16.7	904.8	527.4	197.1	43.9	10.0	4.7	3.6	4.2	7.1	21.3
Under 20 years	20.9	880.6	553.3	196.8	38.1	8.8	4.3	4.0	4.5	6.8	*
Under 15 years	39.1	785.7	424.2	244.6	47.8	13.7	*	*	*	-	-
15-19 years	20.7	883.1	556.9	195.9	37.9	8.7	4.3	4.0	4.4	6.8	*
20-24 years	15.5	896.0	542.6	208.0	42.1	8.8	4.2	3.1	3.7	6.5	15.7
25-29 years	15.0	930.6	516.7	196.8	44.2	9.8	4.4	3.2	3.6	6.3	17.4
30-34 years	16.6	903.0	510.4	183.9	46.5	11.6	5.2	4.0	4.2	7.4	25.0
35-39 years	18.0	918.7	479.5	180.4	52.1	13.0	6.2	4.8	5.7	8.2	25.4
40-44 years	21.7	932.8	455.1	199.0	62.9	17.8	9.5	6.8	7.5	10.4	*
45 years and over	30.1	750.0	476.2	*	106.0	31.1	11.7	*	*	*	-
<u>White</u>											
All ages	15.3	916.6	562.2	218.7	48.2	10.2	4.4	3.3	3.6	6.4	18.1
Under 20 years	18.5	899.5	607.5	232.9	44.4	8.7	3.7	3.4	3.5	6.9	*
Under 15 years	29.6	*	*	*	*	*	*	*	-	-	-
15-19 years	18.4	899.5	609.7	232.5	44.2	8.7	3.7	3.4	3.5	6.9	*
20-24 years	14.3	899.6	576.6	228.2	46.3	9.2	3.9	2.9	3.4	5.6	*
25-29 years	14.0	944.9	553.3	217.2	47.5	10.1	4.2	3.0	3.1	5.8	15.0
30-34 years	15.4	911.8	545.4	200.3	49.7	11.6	4.9	3.5	3.5	7.0	21.8
35-39 years	16.9	936.6	492.9	192.3	55.9	12.7	5.8	4.1	4.7	6.7	22.6
40-44 years	20.8	936.7	468.1	212.7	64.4	17.5	9.1	6.3	6.7	9.2	*
45 years and over	30.2	*	*	*	117.6	*	*	*	*	-	-
<u>All other</u>											
All ages	24.2	875.3	438.4	138.1	31.4	9.3	6.4	6.6	10.1	12.7	40.2
Under 20 years	29.2	852.1	463.5	131.5	27.2	9.0	6.3	7.7	12.7	*	*
Under 15 years	44.8	759.5	428.6	229.5	*	*	*	*	*	-	-
15-19 years	28.6	857.2	465.5	128.1	26.7	8.8	6.2	7.6	12.0	*	*
20-24 years	22.7	886.8	448.7	149.9	29.2	7.7	5.6	5.0	7.7	15.0	-
25-29 years	21.8	889.7	413.2	132.5	32.6	8.6	6.3	5.1	9.0	*	*
30-34 years	23.7	876.4	406.8	132.6	35.5	11.2	6.9	8.1	10.3	*	*
35-39 years	24.7	856.0	431.7	138.7	38.2	14.2	8.2	9.9	13.5	16.9	*
40-44 years	27.1	915.5	400.0	146.8	56.9	19.2	12.3	10.5	*	*	*
45 years and over	29.5	*	*	*	*	*	*	*	*	*	-

Table 6. Neonatal deaths and risk of neonatal death, by plurality, color, age of mother, and birth weight: United States live-birth cohort, 1960—Con.

Plurality, color, and age of mother	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
NEONATAL DEATHS AMONG PLURAL BIRTHS											
<u>Total</u>											
Rate per 1,000 live births											
All ages	100.6	950.3	493.3	113.0	23.0	8.7	7.0	*	*	-	*
Under 20 years	183.1	916.3	578.4	114.5	30.6	13.3	*	*	-	-	-
Under 15 years	*	*	*	*	*	-	-	-	-	-	-
15-19 years	182.4	921.3	578.9	114.3	30.5	13.4	*	*	-	-	-
20-24 years	117.5	961.2	511.4	122.1	25.8	7.7	7.0	*	*	-	-
25-29 years	86.1	946.4	493.6	105.8	19.3	7.6	9.0	*	-	-	*
30-34 years	81.6	968.8	459.4	109.9	20.3	11.0	*	*	-	-	-
35-39 years	74.1	958.0	376.1	105.7	23.7	7.6	*	*	-	-	-
40-44 years	80.6	930.2	434.8	120.7	*	*	*	-	-	-	-
45 years and over	*	*	*	*	*	-	-	-	-	-	-
<u>White</u>											
All ages	96.0	958.7	522.0	118.8	22.5	7.4	6.5	*	*	-	*
Under 20 years	182.3	924.0	603.1	130.2	32.5	*	*	*	-	-	-
Under 15 years	*	*	*	-	-	-	-	*	-	-	-
15-19 years	181.9	923.1	603.5	130.7	32.6	*	*	*	-	-	-
20-24 years	112.4	970.6	535.7	124.9	26.1	7.4	*	*	*	-	-
25-29 years	81.7	953.9	530.7	106.3	18.7	6.3	8.9	*	-	-	*
30-34 years	78.1	988.2	490.7	121.3	19.4	9.4	*	*	-	-	-
35-39 years	70.8	932.2	411.6	110.9	22.4	*	*	*	-	-	-
40-44 years	75.6	951.6	407.9	130.3	*	*	-	-	-	-	-
45 years and over	*	*	*	*	*	-	-	-	-	-	-
<u>All other</u>											
All ages	118.7	926.9	412.8	94.6	25.0	14.5	*	*	-	-	-
Under 20 years	185.1	900.0	505.7	75.3	*	*	*	-	-	-	-
Under 15 years	*	*	*	*	*	-	-	-	-	-	-
15-19 years	183.9	917.4	505.7	72.5	*	*	*	-	-	-	-
20-24 years	138.6	931.8	445.5	112.8	24.4	*	*	*	-	-	-
25-29 years	104.4	923.7	393.1	104.1	22.1	*	*	-	-	-	-
30-34 years	96.1	918.4	368.2	73.3	24.2	*	*	-	-	-	-
35-39 years	87.5	1,046.5	282.3	88.6	*	*	*	*	-	-	-
40-44 years	101.4	875.0	*	*	*	*	*	-	-	-	-
45 years and over	-	-	-	-	-	-	-	-	-	-	-

Table 7. Neonatal deaths and risk of neonatal death, by color, sex, cause, and birth weight: United States live-birth cohort, 1960

Color, sex, and cause of death [Seventh Revision of the International Lists, 1955]	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
TOTAL										
<u>Both sexes</u>										
All causes	78,330	22,202	14,474	11,179	9,010	7,817	7,581	4,149	1,341	577
Congenital malformations 750-759	9,821	238	595	1,093	1,730	2,118	2,310	1,279	339	119
Certain diseases of early infancy 760-776	64,515	21,844	13,687	9,748	6,653	4,801	4,309	2,279	806	388
Birth injuries 760, 761	10,007	2,865	1,644	1,469	1,110	929	1,010	586	252	142
Intracranial and spinal injury at birth . 760	3,129	258	416	531	454	444	508	311	145	62
Other birth injury 761	6,878	2,607	1,228	938	656	485	502	275	107	80
Postnatal asphyxia and atelectasis 762	19,028	5,115	4,310	3,563	2,463	1,531	1,158	589	214	85
Pneumonia of newborn 763	3,461	125	343	421	522	664	733	453	138	62
Diarrhea of newborn 764	449	3	28	45	67	99	124	62	14	7
Other infections of newborn 765-768	744	33	90	101	112	126	168	79	22	13
Neonatal disorders arising from maternal toxemia 769	966	213	148	150	142	117	97	53	27	19
Hemolytic disease of newborn (erythroblastosis) 770	2,095	61	100	210	431	545	474	201	53	20
Hemorrhagic disease of newborn 771	606	51	68	86	83	100	98	72	34	14
III-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	7,139	2,030	1,621	1,381	1,007	530	367	150	39	14
Immaturity with mention of any other subsidiary condition 774	1,023	254	331	257	141	27	9	2	1	1
Immaturity unqualified 776	18,997	11,094	5,004	2,065	575	133	71	32	12	11
All other causes Residual	3,994	120	192	338	627	898	962	591	196	70
<u>Male</u>										
All causes	45,442	11,766	8,489	6,860	5,403	4,501	4,504	2,642	891	386
Congenital malformations 750-759	5,548	105	287	549	939	1,161	1,372	825	228	82
Certain diseases of early infancy 760-776	37,551	11,591	8,110	6,117	4,094	2,831	2,574	1,439	536	259
Birth injuries 760, 761	6,000	1,569	976	943	692	541	624	385	178	92
Intracranial and spinal injury at birth . 760	1,990	135	240	363	289	269	330	214	107	43
Other birth injury 761	4,010	1,434	736	580	403	272	294	171	71	49
Postnatal asphyxia and atelectasis 762	11,259	2,723	2,533	2,274	1,552	928	695	369	128	57
Pneumonia of newborn 763	2,024	68	193	257	296	386	418	271	94	41
Diarrhea of newborn 764	252	2	15	19	33	54	77	37	9	6
Other infections of newborn 765-768	437	14	48	61	58	74	103	53	17	9
Neonatal disorders arising from maternal toxemia 769	559	101	84	89	86	78	56	34	17	14
Hemolytic disease of newborn (erythroblastosis) 770	1,121	32	49	103	219	272	262	135	38	11
Hemorrhagic disease of newborn 771	371	30	41	57	48	56	63	44	23	9
III-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	4,248	1,051	960	894	642	347	228	92	23	11
Immaturity with mention of any other subsidiary condition 774	606	140	204	151	91	16	3	1	-	-
Immaturity unqualified 776	10,674	5,861	3,007	1,269	377	79	45	18	9	9
All other causes Residual	2,343	70	92	194	370	509	558	378	127	45

Table 7. Neonatal deaths and risk of neonatal death, by color, sex, cause, and birth weight: United States live-birth cohort, 1960-Con.

Color, sex, and cause of death [Seventh Revision of the International Lists, 1955]	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
TOTAL-Con.										
Female										
Number of neonatal deaths										
All causes	32,888	10,436	5,985	4,319	3,607	3,316	3,077	1,507	450	191
Congenital malformations 750-759	4,273	133	308	544	791	957	938	454	111	37
Certain diseases of early infancy 760-776	26,964	10,253	5,577	3,631	2,559	1,970	1,735	840	270	129
Birth injuries 760, 761	4,007	1,296	668	526	418	388	386	201	74	50
Intracranial and spinal injury at birth 760	1,139	123	176	168	165	175	178	97	38	19
Other birth injury 761	2,868	1,173	492	358	253	213	208	104	36	31
Postnatal asphyxia and atelectasis 762	7,769	2,392	1,777	1,289	911	603	463	220	86	28
Pneumonia of newborn 763	1,437	57	150	164	226	278	315	182	44	21
Diarrhea of newborn 764	197	1	13	26	34	45	47	25	5	1
Other infections of newborn 765-768	307	19	42	40	54	52	65	26	5	4
Neonatal disorders arising from maternal toxemia 769	407	112	64	61	56	39	41	19	10	5
Hemolytic disease of newborn: (erythroblastosis) 770	974	29	51	107	212	273	212	66	15	9
Hemorrhagic disease of newborn 771	235	21	27	29	35	44	35	28	11	5
Ill-defined diseases peculiar to early infancy including nutritional maladjustment 772, 773	2,891	979	661	487	365	183	139	58	16	3
Immaturity with mention of any other subsidiary condition 774	417	114	127	106	50	11	6	1	1	1
Immaturity unqualified 776	8,323	5,233	1,997	796	198	54	26	14	3	2
All other causes Residual	1,651	50	100	144	257	389	404	213	69	25
WHITE										
Both sexes										
All causes	60,773	16,166	11,124	9,064	7,341	6,253	6,016	3,328	1,036	445
Congenital malformations 750-759	8,651	192	518	950	1,502	1,853	2,079	1,146	303	108
Certain diseases of early infancy 760-776	49,450	15,909	10,506	7,896	5,430	3,780	3,267	1,761	605	296
Birth injuries 760, 761	8,251	2,361	1,353	1,260	953	755	790	465	202	112
Intracranial and spinal injury at birth 760	2,429	148	294	438	392	352	388	246	120	51
Other birth injury 761	5,822	2,213	1,059	822	561	403	402	219	82	61
Postnatal asphyxia and atelectasis 762	14,776	3,551	3,332	2,937	2,095	1,261	893	484	157	66
Pneumonia of newborn 763	2,300	71	220	293	329	433	496	319	97	42
Diarrhea of newborn 764	210	-	13	20	25	45	66	30	6	5
Other infections of newborn 765-768	510	19	55	64	79	83	124	63	14	9
Neonatal disorders arising from maternal toxemia 769	747	162	121	119	110	91	70	42	17	15
Hemolytic disease of newborn: (erythroblastosis) 770	1,949	57	89	199	394	517	444	180	50	19
Hemorrhagic disease of newborn 771	429	27	54	67	63	70	68	45	22	13
Ill-defined diseases peculiar to early infancy including nutritional maladjustment 772, 773	5,531	1,409	1,216	1,179	860	438	276	111	34	8
Immaturity with mention of any other subsidiary condition 774	764	183	235	195	118	21	8	2	1	1
Immaturity unqualified 776	13,983	8,069	3,818	1,563	404	66	32	20	5	6
All other causes Residual	2,672	65	100	218	409	620	670	421	128	41

Table 7. Neonatal deaths and risk of neonatal death, by color, sex, cause, and birth weight: United States live-birth cohort, 1960—Con.

Color, sex, and cause of death [Seventh Revision of the International Lists, 1955]	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
WHITE—Con.										
Male										
Number of neonatal deaths										
All causes	35,537	8,651	6,567	5,574	4,459	3,600	3,563	2,127	692	304
Congenital malformations 750-759	4,849	80	246	469	822	998	1,220	735	204	75
Certain diseases of early infancy 760-776	29,108	8,534	6,277	4,975	3,385	2,261	1,955	1,113	405	203
Birth injuries 760, 761	4,999	1,302	815	819	607	447	487	305	141	76
Intracranial and spinal injury at birth 760	1,560	78	167	303	252	222	244	169	87	38
Other birth injury 761	3,439	1,224	648	516	355	225	243	136	54	38
Postnatal asphyxia and atelectasis 762	8,864	1,905	1,958	1,887	1,333	778	554	310	95	44
Pneumonia of newborn 763	1,355	42	122	175	186	256	280	193	70	31
Diarrhea of newborn 764	119	-	7	8	13	25	41	17	4	4
Other infections of newborn 765-768	310	10	30	40	41	50	78	44	11	6
Neonatal disorders arising from maternal toxemia 769	437	80	69	69	67	63	40	29	10	10
Hemolytic disease of newborn (erythroblastosis) 770	1,026	29	41	96	198	256	244	117	35	10
Hemorrhagic disease of newborn 771	268	18	35	47	41	37	44	24	14	8
Ill-defined diseases peculiar to early infancy including nutritional maladjustment 772, 773	3,304	723	724	756	552	292	167	61	21	8
Immaturity with mention of any other subsidiary condition 774	462	106	147	117	76	12	3	1	-	-
Immaturity unqualified 776	7,964	4,319	2,329	961	271	45	17	12	4	6
All other causes Residual	1,580	37	44	130	252	341	388	279	83	26
Female										
All causes	25,236	7,515	4,557	3,490	2,882	2,653	2,453	1,201	344	141
Congenital malformations 750-759	3,802	112	272	481	680	855	859	411	99	33
Certain diseases of early infancy 760-776	20,342	7,375	4,229	2,921	2,045	1,519	1,312	648	200	93
Birth injuries 760, 761	3,252	1,059	538	441	346	308	303	160	61	36
Intracranial and spinal injury at birth 760	869	70	127	135	140	130	144	77	33	13
Other birth injury 761	2,383	989	411	306	206	178	159	83	28	23
Postnatal asphyxia and atelectasis 762	5,912	1,646	1,374	1,050	762	483	339	174	62	22
Pneumonia of newborn 763	945	29	98	118	143	177	216	126	27	11
Diarrhea of newborn 764	91	-	6	12	12	20	25	13	2	1
Other infections of newborn 765-768	200	9	25	24	38	33	46	19	3	3
Neonatal disorders arising from maternal toxemia 769	310	82	52	50	43	28	30	13	7	5
Hemolytic disease of newborn (erythroblastosis) 770	923	28	48	103	196	261	200	63	15	9
Hemorrhagic disease of newborn 771	161	9	19	20	22	33	24	21	8	5
Ill-defined diseases peculiar to early infancy including nutritional maladjustment 772, 773	2,227	686	492	423	308	146	109	50	13	-
Immaturity with mention of any other subsidiary condition 774	302	77	88	78	42	9	5	1	1	1
Immaturity unqualified 776	6,019	3,750	1,489	602	133	21	15	8	1	-
All other causes Residual	1,092	28	56	88	157	279	282	142	45	15

Table 7. Neonatal deaths and risk of neonatal death, by color, sex, cause, and birth weight: United States live-birth cohort, 1960—Con.

Color, sex, and cause of death [Seventh Revision of the International Lists, 1955]	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
ALL OTHER										
<u>Both sexes</u>										
Number of neonatal deaths										
All causes	17,557	6,036	3,350	2,115	1,669	1,564	1,565	821	305	132
Congenital malformations 750-759	1,170	46	77	143	228	265	231	133	36	11
Certain diseases of early infancy 760-776	15,065	5,935	3,181	1,852	1,223	1,021	1,042	518	201	92
Birth injuries 760, 761	1,756	504	291	209	157	174	220	121	50	30
Intracranial and spinal injury at birth . 760	700	110	122	93	62	92	120	65	25	11
Other birth injury 761	1,056	394	169	116	95	82	100	56	25	19
Postnatal asphyxia and atelectasis 762	4,252	1,564	978	626	368	270	265	105	57	19
Pneumonia of newborn 763	1,161	54	123	128	193	231	237	134	41	20
Diarrhea of newborn 764	239	3	15	25	42	54	58	32	8	2
Other infections of newborn 765-768	234	14	35	37	33	43	44	16	8	4
Neonatal disorders arising from maternal toxemia 769	219	51	27	31	32	26	27	11	10	4
Hemolytic disease of newborn (erythroblastosis) 770	146	4	11	11	37	28	30	21	3	1
Hemorrhagic disease of newborn 771	177	24	14	19	20	30	30	27	12	1
Ill-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	1,608	621	405	202	147	92	91	39	5	6
Immaturity with mention of any other subsidiary condition 774	259	71	96	62	23	6	1	-	-	-
Immaturity unqualified 776	5,014	3,025	1,186	502	171	67	39	12	7	5
All other causes Residual	1,322	55	92	120	218	278	292	170	68	29
<u>Male</u>										
All causes	9,905	3,115	1,922	1,286	944	901	941	515	199	82
Congenital malformations 750-759	699	25	41	80	117	163	152	90	24	7
Certain diseases of early infancy 760-776	8,443	3,057	1,833	1,142	709	570	619	326	131	56
Birth injuries 760, 761	1,001	267	161	124	85	94	137	80	37	16
Intracranial and spinal injury at birth . 760	430	57	73	60	37	47	86	45	20	5
Other birth injury 761	571	210	88	64	48	47	51	35	17	11
Postnatal asphyxia and atelectasis 762	2,395	818	575	387	219	150	141	59	33	13
Pneumonia of newborn 763	669	26	71	82	110	130	138	78	24	10
Diarrhea of newborn 764	133	2	8	11	20	29	36	20	5	2
Other infections of newborn 765-768	127	4	18	21	17	24	25	9	6	3
Neonatal disorders arising from maternal toxemia 769	122	21	15	20	19	15	16	5	7	4
Hemolytic disease of newborn (erythroblastosis) 770	95	3	8	7	21	16	18	18	3	1
Hemorrhagic disease of newborn 771	103	12	6	10	7	19	19	20	9	1
Ill-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	944	328	236	138	90	55	61	31	2	3
Immaturity with mention of any other subsidiary condition 774	144	34	57	34	15	4	-	-	-	-
Immaturity unqualified 776	2,710	1,542	678	308	106	34	28	6	5	3
All other causes Residual	763	33	48	64	118	168	170	99	44	19

Table 7. Neonatal deaths and risk of neonatal death, by color, sex, cause, and birth weight: United States live-birth cohort, 1960—Con.

Color, sex, and cause of death [Seventh Revision of the International Lists, 1955]	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
ALL OTHER—Con.										
<u>Female</u>										
Number of neonatal deaths										
All causes	7,652	2,921	1,428	829	725	663	624	306	106	50
Congenital malformations 750-759	471	21	36	63	111	102	79	43	12	4
Certain diseases of early infancy 760-776	6,622	2,878	1,348	710	514	451	423	192	70	36
Birth injuries 760, 761	755	237	130	85	72	80	83	41	13	14
Intracranial and spinal injury at birth . 760	270	53	49	33	25	45	34	20	5	6
Other birth injury 761	485	184	81	52	47	35	49	21	8	8
Postnatal asphyxia and atelectasis 762	1,857	746	403	239	149	120	124	46	24	6
Pneumonia of newborn 763	492	28	52	46	83	101	99	56	17	10
Diarrhea of newborn 764	106	1	7	14	22	25	22	12	3	-
Other infections of newborn 765-768	107	10	17	16	16	19	19	7	2	1
Neonatal disorders arising from maternal toxemia 769	97	30	12	11	13	11	11	6	3	-
Hemolytic disease of newborn (erythroblastosis) 770	51	1	3	4	16	12	12	3	-	-
Hemorrhagic disease of newborn 771	74	12	8	9	13	11	11	7	3	-
Ill-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	664	293	169	64	57	37	30	8	3	3
Immaturity with mention of any other subsidiary condition 774	115	37	39	28	8	2	1	-	-	-
Immaturity unqualified 776	2,304	1,483	508	194	65	33	11	6	2	2
All other causes Residual	559	22	44	56	100	110	122	71	24	10
<u>TOTAL</u>										
Rate per 100,000 live births										
All causes	1,839.7	91,279.9	52,147.3	18,058.3	4,143.7	993.2	469.0	364.3	421.9	874.3
Congenital malformations 750-759	230.7	978.5	2,143.7	1,765.6	795.6	269.1	142.9	112.3	106.7	180.3
Certain diseases of early infancy 760-776	1,515.2	89,808.0	49,311.9	15,746.7	3,059.8	610.0	266.6	200.1	253.6	587.9
Birth injuries 760, 761	235.0	11,779.0	5,923.0	2,373.0	510.5	118.0	62.5	51.4	79.3	215.2
Intracranial and spinal injury at birth . 760	73.5	1,060.7	1,498.8	857.8	208.8	56.4	31.4	27.3	45.6	93.9
Other birth injury 761	161.5	10,718.3	4,424.3	1,515.2	301.7	61.6	31.1	24.1	33.7	121.2
Postnatal asphyxia and atelectasis 762	446.9	21,029.5	15,528.2	5,755.6	1,132.7	194.5	71.6	51.7	67.3	128.8
Pneumonia of newborn 763	81.3	513.9	1,235.8	680.1	240.1	84.4	45.3	39.8	43.4	93.9
Diarrhea of newborn 764	10.5	*	100.9	72.7	30.8	12.6	7.7	5.4	*	*
Other infections of newborn 765-768	17.5	135.7	324.3	163.2	51.5	16.0	10.4	6.9	6.9	*
Neonatal disorders arising from maternal toxemia 769	22.7	875.7	533.2	242.3	65.3	14.9	6.0	4.7	8.5	*
Hemolytic disease of newborn (erythroblastosis) 770	49.2	250.8	360.3	339.2	198.2	69.2	29.3	17.6	16.7	30.3
Hemorrhagic disease of newborn 771	14.2	209.7	245.0	138.9	38.2	12.7	6.1	6.3	10.7	*
Ill-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	167.7	8,346.0	5,840.2	2,230.8	463.1	67.3	22.7	13.2	12.3	*
Immaturity with mention of any other subsidiary condition 774	24.0	1,044.3	1,192.5	415.2	64.8	3.4	*	*	*	*
Immaturity unqualified 776	446.2	45,611.1	18,028.5	3,335.8	264.4	16.9	4.4	2.8	*	*
All other causes Residual	93.8	493.4	691.7	546.0	288.4	114.1	59.5	51.9	61.7	106.1

Table 7. Neonatal deaths and risk of neonatal death, by color, sex, cause, and birth weight: United States live-birth cohort, 1960—Con.

Color, sex, and cause of death [Seventh Revision of the International Lists, 1955]	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
TOTAL—Con.										
Male										
		Rate per 100,000 live births								
All causes	2,084.8	92,960.4	58,569.1	22,626.8	5,503.7	1,308.6	569.5	410.6	443.1	861.3
Congenital malformations 750-759	254.5	829.6	1,980.1	1,810.8	956.5	337.5	173.5	128.2	113.4	183.0
Certain diseases of early infancy 760-776	1,722.8	91,577.8	55,954.2	20,176.1	4,170.3	823.1	325.5	223.7	266.6	577.9
Birth injuries 760, 761	275.3	12,396.3	6,733.8	3,110.4	704.9	157.3	78.9	59.8	88.5	205.3
Intracranial and spinal injury at birth 760	91.3	1,066.6	1,655.9	1,197.3	294.4	78.2	41.7	33.3	53.2	96.0
Other birth injury 761	184.0	11,329.7	5,078.0	1,913.1	410.5	79.1	37.2	26.6	35.3	109.3
Postnatal asphyxia and atelectasis 762	516.5	21,513.8	17,476.2	7,500.5	1,580.9	269.8	87.9	57.4	63.7	127.2
Pneumonia of newborn 763	92.9	537.3	1,331.6	847.7	301.5	112.2	52.9	42.1	46.7	91.5
Diarrhea of newborn 764	11.6	*	*	*	33.6	15.7	9.7	5.8	*	*
Other infections of newborn 765-768	20.0	*	331.2	201.2	59.1	21.5	13.0	8.2	*	*
Neonatal disorders arising from maternal toxemia 769	25.6	798.0	579.6	293.6	87.6	22.7	7.1	5.3	*	*
Hemolytic disease of newborn (erythroblastosis) 770	51.4	252.8	338.1	339.7	223.1	79.1	33.1	21.0	18.9	*
Hemorrhagic disease of newborn 771	17.0	237.0	282.9	188.0	48.9	16.3	8.0	6.8	11.4	*
Ill-defined diseases peculiar to early infancy including nutritional maladjustment 772, 773	194.9	8,303.7	6,623.4	2,948.7	654.0	100.9	28.8	14.3	11.4	*
Immaturity with mention of any other subsidiary condition 774	27.8	1,106.1	1,407.5	498.1	92.7	*	*	*	-	-
Immaturity unqualified 776	489.7	46,306.4	20,746.5	4,185.6	384.0	23.0	5.7	*	*	*
All other causes Residual	107.5	553.1	634.7	639.9	376.9	148.0	70.6	58.7	63.2	100.4
Female										
All causes	1,582.6	89,456.5	45,128.9	13,673.3	3,024.3	748.4	372.6	304.1	385.5	901.8
Congenital malformations 750-759	205.6	1,140.1	2,322.4	1,722.2	663.2	216.0	113.6	91.6	95.1	174.7
Certain diseases of early infancy 760-776	1,297.5	87,887.9	42,052.5	11,495.2	2,145.6	444.6	210.1	169.5	231.3	609.1
Birth injuries 760, 761	192.8	11,109.2	5,036.9	1,665.2	350.5	87.6	46.7	40.6	63.4	236.1
Intracranial and spinal injury at birth 760	54.8	1,054.3	1,327.1	531.9	138.3	39.5	21.6	19.6	32.6	*
Other birth injury 761	138.0	10,054.9	3,709.8	1,133.4	212.1	48.1	25.2	21.0	30.8	146.4
Postnatal asphyxia and atelectasis 762	373.8	20,504.0	13,399.2	4,080.8	763.8	136.1	56.1	44.4	73.7	132.2
Pneumonia of newborn 763	69.1	488.6	1,131.1	519.2	189.5	62.7	38.1	36.7	37.7	99.2
Diarrhea of newborn 764	9.5	*	*	82.3	28.5	10.2	5.7	5.0	*	*
Other infections of newborn 765-768	14.8	*	316.7	126.6	45.3	11.7	7.9	5.2	*	*
Neonatal disorders arising from maternal toxemia 769	19.6	960.1	482.6	193.1	47.0	8.8	5.0	*	*	*
Hemolytic disease of newborn (erythroblastosis) 770	46.9	248.6	384.6	338.7	177.8	61.6	25.7	13.3	*	*
Hemorrhagic disease of newborn 771	11.3	180.0	203.6	91.8	29.3	9.9	4.2	5.6	*	*
Ill-defined diseases peculiar to early infancy including nutritional maladjustment 772, 773	139.1	8,391.9	4,984.2	1,541.8	306.0	41.3	16.8	11.7	*	*
Immaturity with mention of any other subsidiary condition 774	20.1	977.2	957.6	335.6	41.9	*	*	*	*	*
Immaturity unqualified 776	400.5	44,856.8	15,058.1	2,520.0	166.0	12.2	3.1	*	*	*
All other causes Residual	79.4	428.6	754.0	455.9	215.5	87.8	48.9	43.0	59.1	118.0

Table 7. Neonatal deaths and risk of neonatal death, by color, sex, cause, and birth weight: United States live-birth cohort, 1960—Con.

Color, sex, and cause of death [Seventh Revision of the International Lists, 1955]	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
WHITE										
<u>Both sexes</u>										
Rate per 100,000 live births										
All causes	1,687.8	92,414.1	55,509.0	19,844.1	4,500.1	1,006.8	438.2	327.9	360.1	768.4
Congenital malformations 750-759	240.3	1,097.6	2,584.8	2,079.9	920.7	298.3	151.4	112.9	105.3	186.5
Certain diseases of early infancy 760-776	1,373.3	90,944.9	52,425.1	17,287.0	3,328.6	608.6	238.0	173.5	210.3	511.1
Birth injuries 760, 761	229.1	13,496.8	6,751.5	2,758.6	584.2	121.6	57.5	45.8	70.2	193.4
Intracranial and spinal injury at birth . 760	67.5	846.1	1,467.1	958.9	240.3	56.7	28.3	24.2	41.7	88.1
Other birth injury 761	161.7	12,650.8	5,284.4	1,799.6	343.9	64.9	29.3	21.6	28.5	105.3
Postnatal asphyxia and atelectasis 762	410.4	20,299.5	16,626.7	6,430.1	1,284.2	203.0	65.0	47.7	54.6	114.0
Pneumonia of newborn 763	63.9	405.9	1,097.8	641.5	201.7	69.7	36.1	31.4	33.7	72.5
Diarrhea of newborn 764	5.8	-	*	43.8	15.3	7.2	4.8	3.0	*	*
Other infections of newborn 765-768	14.2	*	274.5	140.1	48.4	13.4	9.0	6.2	*	*
Neonatal disorders arising from maternal toxemia 769	20.7	926.1	603.8	260.5	67.4	14.7	5.1	4.1	*	*
Hemolytic disease of newborn (erythroblastosis) 770	54.1	325.8	444.1	435.7	241.5	83.2	32.3	17.7	17.4	*
Hemorrhagic disease of newborn 771	11.9	154.3	269.5	146.7	38.6	11.3	5.0	4.4	7.6	*
Ill-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	153.6	8,054.7	6,067.9	2,581.2	527.2	70.5	20.1	10.9	11.8	*
Immaturity with mention of any other subsidiary condition 774	21.2	1,046.1	1,172.7	426.9	72.3	3.4	*	*	*	*
Immaturity unqualified 776	388.3	46,127.0	19,051.9	3,421.9	247.7	10.6	2.3	2.0	*	*
All other causes Residual	74.2	371.6	499.0	477.3	250.7	99.8	48.8	41.5	44.5	70.8
<u>Male</u>										
All causes	1,922.8	94,094.0	61,305.1	24,560.5	6,012.9	1,335.4	534.4	371.4	379.0	763.6
Congenital malformations 750-759	262.4	870.1	2,296.5	2,066.5	1,108.5	370.2	183.0	128.3	111.7	188.4
Certain diseases of early infancy 760-776	1,574.9	92,821.4	58,597.8	21,921.1	4,564.6	838.7	293.2	194.4	221.8	509.9
Birth injuries 760, 761	270.5	14,161.4	7,608.3	3,608.7	818.5	165.8	73.0	53.3	77.2	190.9
Intracranial and spinal injury at birth . 760	84.4	848.4	1,559.0	1,335.1	339.8	82.3	36.6	29.5	47.6	95.4
Other birth injury 761	186.1	13,313.0	6,049.3	2,273.6	478.7	83.5	36.4	23.7	29.6	95.4
Postnatal asphyxia and atelectasis 762	479.6	20,720.0	18,278.6	8,314.6	1,797.5	288.6	83.1	54.1	52.0	110.5
Pneumonia of newborn 763	73.3	456.8	1,138.9	771.1	250.8	95.0	42.0	33.7	38.3	77.9
Diarrhea of newborn 764	6.4	-	*	*	*	9.3	6.1	*	*	*
Other infections of newborn 765-768	16.8	*	280.1	176.3	55.3	18.5	11.7	7.7	*	*
Neonatal disorders arising from maternal toxemia 769	23.6	870.1	644.1	304.0	90.3	23.4	6.0	5.1	*	*
Hemolytic disease of newborn (erythroblastosis) 770	55.5	315.4	382.7	423.0	267.0	95.0	36.6	20.4	19.2	*
Hemorrhagic disease of newborn 771	14.5	*	326.7	207.1	55.3	13.7	6.6	4.2	*	*
Ill-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	178.8	7,863.8	6,758.8	3,331.1	744.4	108.3	25.0	10.7	11.5	*
Immaturity with mention of any other subsidiary condition 774	25.0	1,152.9	1,372.3	515.5	102.5	*	*	*	-	-
Immaturity unqualified 776	430.9	46,976.3	21,742.0	4,234.4	365.4	16.7	*	*	*	*
All other causes Residual	85.5	402.4	410.8	572.8	339.8	126.5	58.2	48.7	45.5	65.3

Table 7. Neonatal deaths and risk of neonatal death, by color, sex, cause, and birth weight: United States live-birth cohort, 1960—Con.

Color, sex, and cause of death [Seventh Revision of the International Lists, 1955]	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
WHITE—Con.										
Female										
Rate per 100,000 live births										
All causes	1,440.0	90,553.1	48,852.9	15,186.5	3,239.1	754.8	347.4	271.6	327.4	779.1
Congenital malformations 750-759	216.9	1,349.6	2,916.0	2,093.0	764.3	243.2	121.7	92.9	94.2	182.4
Certain diseases of early infancy 760-776	1,160.7	88,866.1	45,336.6	12,710.5	2,298.4	432.1	185.8	146.5	190.3	513.9
Birth injuries 760, 761	185.6	12,760.6	5,767.6	1,919.0	388.9	87.6	42.9	36.2	58.1	198.9
Intracranial and spinal injury at birth . 760	49.6	843.5	1,361.5	587.4	157.3	37.0	20.4	17.4	31.4	*
Other birth injury 761	136.0	11,917.1	4,406.1	1,331.5	231.5	50.6	22.5	18.8	26.6	127.1
Postnatal asphyxia and atelectasis 762	337.3	19,833.7	14,729.8	4,569.0	856.4	137.4	48.0	39.3	59.0	121.6
Pneumonia of newborn 763	53.9	349.4	1,050.6	513.5	160.7	50.4	30.6	28.5	25.7	*
Diarrhea of newborn 764	5.2	-	*	*	*	5.7	3.5	*	*	*
Other infections of newborn 765-768	11.4	*	268.0	104.4	42.7	9.4	6.5	*	*	*
Neonatal disorders arising from maternal toxemia 769	17.7	988.1	557.5	217.6	48.3	8.0	4.2	*	*	*
Hemolytic disease of newborn (erythroblastosis) 770	52.7	337.4	514.6	448.2	220.3	74.3	28.3	14.2	*	*
Hemorrhagic disease of newborn 771	9.2	*	*	87.0	24.7	9.4	3.4	4.7	*	*
Ill-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	127.1	8,266.1	5,274.4	1,840.7	346.2	41.5	15.4	11.3	*	-
Immaturity with mention of any other subsidiary condition 774	17.2	927.8	943.4	339.4	47.2	*	*	*	*	*
Immaturity unqualified 776	343.4	45,186.2	15,962.7	2,619.6	149.5	6.0	*	*	*	-
All other causes Residual	62.3	337.4	600.3	382.9	176.5	79.4	39.9	32.1	42.8	*
ALL OTHER										
Both sexes										
All causes	2,671.9	88,374.8	43,416.3	13,032.2	3,073.4	942.5	642.2	661.2	1,012.2	1,632.9
Congenital malformations 750-759	178.1	673.5	997.9	881.1	419.9	159.7	94.8	107.1	119.5	*
Certain diseases of early infancy 760-776	2,292.6	86,896.0	41,226.0	11,411.7	2,252.1	615.3	427.6	417.2	667.0	1,138.0
Birth injuries 760, 761	267.2	7,379.2	3,771.4	1,287.8	289.1	104.9	90.3	97.4	165.9	371.1
Intracranial and spinal injury at birth . 760	106.5	1,610.5	1,581.1	573.0	114.2	55.4	49.2	52.3	83.0	*
Other birth injury 761	160.7	5,768.7	2,190.3	714.8	174.9	49.4	41.0	45.1	83.0	*
Postnatal asphyxia and atelectasis 762	647.1	22,899.0	12,675.0	3,857.3	677.7	162.7	108.7	84.6	189.2	*
Pneumonia of newborn 763	176.7	790.6	1,594.1	788.7	355.4	139.2	97.3	107.9	136.1	247.4
Diarrhea of newborn 764	36.4	*	*	154.0	77.3	32.5	23.8	25.8	*	*
Other infections of newborn 765-768	35.6	*	453.6	228.0	60.8	25.9	18.1	*	*	*
Neonatal disorders arising from maternal toxemia 769	33.3	746.7	349.9	191.0	58.9	15.7	11.1	*	33.2	*
Hemolytic disease of newborn (erythroblastosis) 770	22.2	*	*	*	68.1	16.9	12.3	16.9	*	*
Hemorrhagic disease of newborn 771	26.9	351.4	*	*	36.8	18.1	12.3	21.7	*	*
Ill-defined diseases peculiar to early infancy including nutritional maladjustment . 772, 773	244.7	9,092.2	5,248.8	1,244.7	270.7	55.4	37.3	31.4	*	*
Immaturity with mention of any other subsidiary condition 774	39.4	1,039.5	1,244.2	382.0	42.4	*	*	-	-	-
Immaturity unqualified 776	763.0	44,289.9	15,370.7	3,093.2	314.9	40.4	16.0	*	*	*
All other causes Residual	201.2	805.3	1,192.3	739.4	401.4	167.5	119.8	136.9	225.7	358.7

Table 7. Neonatal deaths and risk of neonatal death, by color, sex, cause, and birth weight: United States live-birth cohort, 1960—Con.

Color, sex, and cause of death [Seventh Revision of the International Lists, 1955]	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
ALL OTHER—Con.										
Male										
Rate per 100,000 live births										
All causes	2,987.8	89,950.9	50,819.7	16,870.0	3,931.2	1,211.4	758.7	728.0	1,076.8	1,639.7
Congenital malformations 750-759	210.8	721.9	1,084.1	1,049.5	487.2	219.2	122.5	127.2	129.9	*
Certain diseases of early infancy 760-776	2,546.8	88,276.1	48,466.4	14,981.0	2,952.6	766.4	499.0	460.8	708.8	1,119.8
Birth injuries 760, 761	301.9	7,710.1	4,257.0	1,626.7	354.0	126.4	110.5	113.1	200.2	*
Intracranial and spinal injury at birth 760	129.7	1,646.0	1,930.2	787.1	154.1	63.2	69.3	63.6	108.2	*
Other birth injury 761	172.2	6,064.1	2,326.8	839.6	199.9	63.2	41.1	49.5	*	*
Postnatal asphyxia and atelectasis 762	722.4	23,621.1	15,203.6	5,076.7	912.0	201.7	113.7	83.4	178.6	*
Pneumonia of newborn 763	201.8	750.8	1,877.3	1,075.7	458.1	174.8	111.3	110.3	129.9	*
Diarrhea of newborn 764	40.1	*	*	*	83.3	39.0	29.0	28.3	*	*
Other infections of newborn 765-768	38.3	*	*	275.5	*	32.3	20.2	*	*	*
Neonatal disorders arising from maternal toxemia 769	36.8	606.4	*	262.4	*	*	*	*	*	*
Hemolytic disease of newborn (erythroblastosis) 770	28.7	*	*	*	87.5	*	*	*	*	*
Hemorrhagic disease of newborn 771	31.1	*	*	*	*	*	*	28.3	*	*
Ill-defined diseases peculiar to early infancy including nutritional maladjustment 772, 773	284.8	9,471.6	6,240.1	1,810.3	374.8	73.9	49.2	43.8	*	*
Immaturity with mention of any other subsidiary condition 774	43.4	981.8	1,507.1	446.0	*	*	-	-	-	-
Immaturity unqualified 776	817.5	44,527.9	17,927.0	4,040.4	441.4	45.7	22.6	*	*	*
All other causes Residual	230.2	952.9	1,269.2	839.6	491.4	225.9	137.1	139.9	238.1	*
Female										
All causes	2,350.2	86,753.8	36,298.9	9,632.8	2,393.4	724.0	521.5	572.7	909.7	1,621.8
Congenital malformations 750-759	144.7	623.7	915.1	732.0	366.4	111.4	66.0	80.5	*	*
Certain diseases of early infancy 760-776	2,033.8	85,476.7	34,265.4	8,250.1	1,696.8	492.5	353.5	359.4	600.8	1,167.7
Birth injuries 760, 761	231.9	7,038.9	3,304.5	987.7	237.7	87.4	69.4	76.7	*	*
Intracranial and spinal injury at birth 760	82.9	1,574.1	1,245.6	383.5	82.5	49.1	28.4	37.4	*	*
Other birth injury 761	149.0	5,464.8	2,059.0	604.2	155.2	38.2	41.0	39.3	*	*
Postnatal asphyxia and atelectasis 762	570.3	22,156.2	10,244.0	2,777.1	491.9	131.0	103.6	86.1	206.0	*
Pneumonia of newborn 763	151.1	831.6	1,321.8	534.5	274.0	110.3	82.7	104.8	*	*
Diarrhea of newborn 764	32.6	*	*	*	72.6	27.3	18.4	*	*	-
Other infections of newborn 765-768	32.9	*	*	*	*	*	*	*	*	*
Neonatal disorders arising from maternal toxemia 769	29.8	891.0	*	*	*	*	*	*	*	-
Hemolytic disease of newborn (erythroblastosis) 770	15.7	*	*	*	*	*	*	*	-	-
Hemorrhagic disease of newborn 771	22.7	*	*	*	*	*	*	*	*	-
Ill-defined diseases peculiar to early infancy including nutritional maladjustment 772, 773	203.9	8,702.1	4,295.9	743.7	188.2	40.4	25.1	*	*	*
Immaturity with mention of any other subsidiary condition 774	35.3	1,098.9	991.4	325.4	*	*	-	-	-	-
Immaturity unqualified 776	707.6	44,045.1	12,913.1	2,254.2	214.6	36.0	*	*	*	*
All other causes Residual	171.7	653.4	1,118.5	650.7	330.1	120.1	102.0	132.9	206.0	*

Table 8. Neonatal deaths and probability of death within the neonatal period, by color, sex, age at death, and birth weight: United States live-birth cohort, 1960

Color, sex, and age at death	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
TOTAL											
Both sexes											
Number of neonatal deaths											
All ages	78,330	22,202	14,474	11,179	9,010	7,817	7,581	4,149	1,341	416	161
Under 1 hour	7,811	3,495	989	716	660	643	699	374	148	53	34
1-23 hours	35,506	14,040	7,310	4,834	3,213	2,341	2,120	1,102	395	107	44
1 day	11,388	1,962	2,447	2,341	1,682	1,205	978	520	167	65	21
2 days	7,443	1,149	1,334	1,347	1,222	947	798	457	122	44	23
3-6 days	7,883	1,102	1,427	1,111	1,122	1,113	1,119	606	210	56	17
7-13 days	4,091	339	640	490	505	670	801	453	140	42	11
14-27 days	4,208	115	327	340	606	898	1,066	637	159	49	11
Male											
All ages	45,442	11,766	8,489	6,860	5,403	4,501	4,504	2,642	891	274	112
Under 1 hour	4,208	1,940	549	361	331	315	368	205	84	30	25
1-23 hours	20,720	7,643	4,448	3,036	2,001	1,343	1,225	665	250	78	31
1 day	6,754	950	1,409	1,462	1,064	724	630	341	120	38	16
2 days	4,483	547	742	853	775	609	513	320	82	28	14
3-6 days	4,602	504	818	698	673	642	662	411	146	37	11
7-13 days	2,265	130	350	270	256	366	479	287	91	29	7
14-27 days	2,410	52	173	180	303	502	627	413	118	34	8
Female											
All ages	32,888	10,436	5,985	4,319	3,607	3,316	3,077	1,507	450	142	49
Under 1 hour	3,603	1,555	440	355	329	328	331	169	64	23	9
1-23 hours	14,786	6,397	2,862	1,798	1,212	998	895	437	145	29	13
1 day	4,634	1,012	1,038	879	618	481	348	179	47	27	5
2 days	2,960	602	592	494	447	338	285	137	40	16	9
3-6 days	3,281	598	609	413	449	471	457	195	64	19	6
7-13 days	1,826	209	290	220	249	304	322	166	49	13	4
14-27 days	1,798	63	154	160	303	396	439	224	41	15	3
WHITE											
Both sexes											
All ages	60,773	16,166	11,124	9,064	7,341	6,253	6,016	3,328	1,036	327	118
Under 1 hour	6,241	2,721	780	596	551	540	560	310	116	42	25
1-23 hours	27,645	10,237	5,743	3,971	2,727	1,932	1,707	903	303	92	30
1 day	8,958	1,370	1,846	1,930	1,440	1,007	758	418	122	49	18
2 days	6,078	830	1,053	1,151	1,037	802	678	375	97	37	18
3-6 days	6,085	742	1,091	886	868	869	917	490	166	44	12
7-13 days	2,980	209	431	337	361	517	636	347	107	29	6
14-27 days	2,786	57	180	193	357	586	760	485	125	34	9
Male											
All ages	35,537	8,651	6,567	5,574	4,459	3,600	3,563	2,127	692	220	84
Under 1 hour	3,351	1,520	429	292	275	253	300	172	67	24	19
1-23 hours	16,286	5,620	3,524	2,507	1,711	1,122	975	543	196	68	20
1 day	5,344	658	1,070	1,201	907	611	490	277	87	29	14
2 days	3,687	399	584	725	671	518	437	258	61	24	10
3-6 days	3,557	340	624	551	519	493	539	335	117	30	9
7-13 days	1,686	88	238	195	192	282	377	221	68	20	5
14-27 days	1,626	26	98	103	184	321	445	321	96	25	7

Table 8. Neonatal deaths and probability of death within the neonatal period, by color, sex, age at death, and birth weight: United States live-birth cohort, 1960—Con.

Color, sex, and age at death	All weights	Birth weight									
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501-5,000 grams	5,001 grams or more
WHITE—Con.											
Female											
Number of neonatal deaths											
All ages	25,236	7,515	4,557	3,490	2,882	2,653	2,453	1,201	344	107	34
Under 1 hour	2,890	1,201	351	304	276	287	260	138	49	18	6
1-23 hours	11,359	4,617	2,219	1,464	1,016	810	732	360	107	24	10
1 day	3,614	712	776	729	533	396	268	141	35	20	4
2 days	2,391	431	469	426	366	284	241	117	36	13	8
3-6 days	2,528	402	467	335	349	376	378	155	49	14	3
7-13 days	1,294	121	193	142	169	235	259	126	39	9	1
14-27 days	1,160	31	82	90	173	265	315	164	29	9	2
ALL OTHER											
Both sexes											
All ages	17,557	6,036	3,350	2,115	1,669	1,564	1,565	821	305	89	43
Under 1 hour	1,570	774	209	120	109	103	139	64	32	11	9
1-23 hours	7,861	3,803	1,567	863	486	409	413	199	92	15	14
1 day	2,430	592	601	411	242	198	220	102	45	16	3
2 days	1,365	319	281	196	185	145	120	82	25	7	5
3-6 days	1,798	360	336	225	254	244	202	116	44	12	5
7-13 days	1,111	130	209	153	144	153	165	106	33	13	5
14-27 days	1,422	58	147	147	249	312	306	152	34	15	2
Male											
All ages	9,905	3,115	1,922	1,286	944	901	941	515	199	54	28
Under 1 hour	857	420	120	69	56	62	68	33	17	6	6
1-23 hours	4,434	2,023	924	529	290	221	250	122	54	10	11
1 day	1,410	292	339	261	157	113	140	64	33	9	2
2 days	796	148	158	128	104	91	76	62	21	4	4
3-6 days	1,045	164	194	147	154	149	123	76	29	7	2
7-13 days	579	42	112	75	64	84	102	66	23	9	2
14-27 days	784	26	75	77	119	181	182	92	22	9	1
Female											
All ages	7,652	2,921	1,428	829	725	663	624	306	106	35	15
Under 1 hour	713	354	89	51	53	41	71	31	15	5	3
1-23 hours	3,427	1,780	643	334	196	188	163	77	38	5	3
1 day	1,020	300	262	150	85	85	80	38	12	7	1
2 days	569	171	123	68	81	54	44	20	4	3	1
3-6 days	753	196	142	78	100	95	79	40	15	5	3
7-13 days	532	88	97	78	80	69	63	40	10	4	3
14-27 days	638	32	72	70	130	131	124	60	12	6	1

Table 8. Neonatal deaths and probability of death within the neonatal period, by color, sex, age at death, and birth weight: United States live-birth cohort, 1960—Con.

Color, sex, and age at death	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
TOTAL										
<u>Both sexes</u>										
Rate per 1,000 survivors ¹										
All ages	18.4	912.8	521.5	180.6	41.4	9.9	4.7	3.6	4.2	8.7
Under 1 hour	1.8	143.7	35.6	11.6	3.0	0.8	0.4	0.3	0.5	1.3
1-23 hours	8.4	674.1	273.1	79.0	14.8	3.0	1.3	1.0	1.2	2.3
1 day	2.7	289.0	125.8	41.5	7.9	1.5	0.6	0.5	0.5	1.3
2 days	1.8	238.1	78.4	24.9	5.8	1.2	0.5	0.4	0.4	1.0
3-6 days	1.9	299.7	91.0	21.1	5.3	1.4	0.7	0.5	0.7	1.1
7-13 days	1.0	131.7	44.9	9.5	2.4	0.9	0.5	0.4	0.4	0.8
14-27 days	1.0	51.4	24.0	6.7	2.9	1.2	0.7	0.6	0.5	0.9
<u>Male</u>										
All ages	20.8	929.6	585.7	226.3	55.0	13.1	5.7	4.1	4.4	8.6
Under 1 hour	1.9	153.3	37.9	11.9	3.4	0.9	0.5	0.3	0.4	1.2
1-23 hours	9.5	713.2	319.0	101.3	20.5	3.9	1.5	1.0	1.2	2.4
1 day	3.1	309.0	148.4	54.3	11.1	2.1	0.8	0.5	0.6	1.2
2 days	2.1	257.5	91.7	33.5	8.2	1.8	0.7	0.5	0.4	0.9
3-6 days	2.1	319.6	111.4	28.4	7.2	1.9	0.8	0.6	0.7	1.1
7-13 days	1.1	121.2	53.6	11.3	2.7	1.1	0.6	0.4	0.5	0.8
14-27 days	1.1	55.1	28.0	7.6	3.3	1.5	0.8	0.6	0.6	0.9
<u>Female</u>										
All ages	15.8	894.6	451.3	136.7	30.2	7.5	3.7	3.0	3.9	9.0
Under 1 hour	1.7	133.3	33.2	11.2	2.8	0.7	0.4	0.3	0.5	1.5
1-23 hours	7.1	632.7	223.2	57.6	10.2	2.3	1.1	0.9	1.2	2.0
1 day	2.2	272.5	104.2	29.9	5.2	1.1	0.4	0.4	0.4	1.5
2 days	1.4	222.8	66.4	17.3	3.8	0.8	0.3	0.3	0.3	1.2
3-6 days	1.6	284.8	73.1	14.7	3.8	1.1	0.6	0.4	0.5	1.2
7-13 days	0.9	139.1	37.6	8.0	2.1	0.7	0.4	0.3	0.4	*
14-27 days	0.9	48.7	20.7	5.8	2.6	0.9	0.5	0.5	0.4	*
<u>WHITE</u>										
<u>Both sexes</u>										
All ages	16.9	924.1	555.1	198.4	45.0	10.1	4.4	3.3	3.6	7.7
Under 1 hour	1.7	155.5	38.9	13.0	3.4	0.9	0.4	0.3	0.4	1.2
1-23 hours	7.7	693.0	298.2	88.1	16.8	3.1	1.2	0.9	1.1	2.1
1 day	2.5	302.1	136.6	46.9	9.0	1.6	0.6	0.4	0.4	1.2
2 days	1.7	262.2	90.2	29.4	6.5	1.3	0.5	0.4	0.3	1.0
3-6 days	1.7	317.8	102.8	23.3	5.5	1.4	0.7	0.5	0.6	1.0
7-13 days	0.8	131.2	45.2	9.1	2.3	0.8	0.5	0.3	0.4	0.6
14-27 days	0.8	41.2	19.8	5.2	2.3	1.0	0.6	0.5	0.4	0.7
<u>Male</u>										
All ages	19.2	940.9	613.1	245.6	60.1	13.4	5.3	3.7	3.8	7.6
Under 1 hour	1.8	165.3	40.0	12.9	3.7	0.9	0.4	0.3	0.4	1.1
1-23 hours	8.8	732.3	342.7	111.9	23.2	4.2	1.5	0.9	1.1	2.2
1 day	2.9	320.4	158.3	60.4	12.6	2.3	0.7	0.5	0.5	1.1
2 days	2.0	285.8	102.7	38.8	9.4	1.9	0.7	0.5	0.3	0.9
3-6 days	2.0	341.0	122.2	30.7	7.4	1.8	0.8	0.6	0.6	1.0
7-13 days	0.9	133.9	53.1	11.2	2.7	1.1	0.6	0.4	0.4	0.6
14-27 days	0.9	45.7	23.1	6.0	2.6	1.2	0.7	0.6	0.5	0.8

See footnote at end of table.

Table 8. Neonatal deaths and probability of death within the neonatal period, by color, sex, age at death, and birth weight: United States live-birth cohort, 1960—Con.

Color, sex, and age at death	All weights	Birth weight								
		1,000 grams or less	1,001-1,500 grams	1,501-2,000 grams	2,001-2,500 grams	2,501-3,000 grams	3,001-3,500 grams	3,501-4,000 grams	4,001-4,500 grams	4,501 grams or more
WHITE—Con.										
Female										
Rate per 1,000 survivors ¹										
All ages	14.4	905.5	488.5	151.9	32.4	7.5	3.5	2.7	3.3	7.8
Under 1 hour	1.6	144.7	37.6	13.2	3.1	0.8	0.4	0.3	0.5	1.3
1-23 hours	6.5	650.5	247.2	64.6	11.5	2.3	1.0	0.8	1.0	1.9
1 day	2.1	287.0	114.8	34.4	6.1	1.1	0.4	0.3	0.3	1.3
2 days	1.4	243.6	78.4	20.8	4.2	0.8	0.3	0.3	0.3	1.2
3-6 days	1.5	300.4	84.7	16.7	4.0	1.1	0.5	0.4	0.5	*
7-13 days	0.7	129.3	38.2	7.2	2.0	0.7	0.4	0.3	0.4	*
14-27 days	0.7	38.0	16.9	4.6	2.0	0.8	0.4	0.4	0.3	*
ALL OTHER										
Both sexes										
All ages	26.7	883.7	434.2	130.3	30.7	9.4	6.4	6.6	10.1	16.3
Under 1 hour	2.4	113.3	27.1	7.4	2.0	0.6	0.6	0.5	1.1	2.5
1-23 hours	12.0	628.0	208.7	53.6	9.0	2.5	1.7	1.6	3.1	3.6
1 day	3.8	262.8	101.2	27.0	4.5	1.2	0.9	0.8	1.5	*
2 days	2.1	192.1	52.6	13.2	3.5	0.9	0.5	0.7	0.8	*
3-6 days	2.8	268.3	66.4	15.4	4.8	1.5	0.8	0.9	1.5	*
7-13 days	1.7	132.4	44.3	10.6	2.7	0.9	0.7	0.9	1.1	*
14-27 days	2.2	68.1	32.6	10.3	4.7	1.9	1.3	1.2	1.1	*
Male										
All ages	29.9	899.5	508.2	168.7	39.3	12.1	7.6	7.3	10.8	16.4
Under 1 hour	2.6	121.3	31.7	9.1	2.3	0.8	0.5	0.5	*	*
1-23 hours	13.4	664.8	252.3	70.0	12.1	3.0	2.0	1.7	2.9	4.2
1 day	4.3	286.3	123.8	37.2	6.6	1.5	1.1	0.9	1.8	*
2 days	2.5	203.3	65.9	18.9	4.4	1.2	0.6	0.9	1.1	*
3-6 days	3.2	282.8	86.6	22.2	6.6	2.0	1.0	1.1	1.6	*
7-13 days	1.8	101.0	54.7	11.6	2.8	1.1	0.8	0.9	1.3	*
14-27 days	2.4	69.5	38.8	12.0	5.1	2.5	1.5	1.3	1.2	*
Female										
All ages	23.5	867.5	363.0	96.3	23.9	7.2	5.2	5.7	9.1	16.2
Under 1 hour	2.2	105.1	22.6	5.9	1.7	0.4	0.6	0.6	*	*
1-23 hours	10.5	590.8	167.2	39.0	6.5	2.1	1.4	1.4	3.3	*
1 day	3.2	243.3	81.8	18.2	2.8	0.9	0.7	0.7	*	*
2 days	1.8	183.3	41.8	8.4	2.7	0.6	0.4	0.4	*	*
3-6 days	2.4	257.2	50.4	9.7	3.3	1.0	0.7	0.8	*	*
7-13 days	1.7	155.5	36.3	9.8	2.7	0.8	0.5	0.8	*	*
14-27 days	2.0	66.9	27.9	8.9	4.4	1.4	1.0	1.1	*	*

¹ Survivors are those infants in each specified age group who were alive at the beginning of each age interval.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
ALL NEONATAL DEATHS									
<u>Total</u>		Number of deaths							
Both sexes, all ages	78,330	1,076	19,479	13,387	10,131	3,747	5,814	18,254	6,442
Under 1 hour	7,811	272	2,854	909	731	346	482	1,538	679
1-23 hours	35,506	750	12,323	6,829	4,397	1,307	1,856	5,102	2,942
1 day	11,388	32	1,935	2,352	2,064	671	871	2,540	923
2 days	7,443	13	1,002	1,244	1,214	457	777	2,078	658
3-6 days	7,883	7	901	1,234	994	464	848	2,793	642
7-13 days	4,091	2	324	554	424	249	438	1,792	308
14-27 days	4,208	-	140	265	307	253	542	2,411	290
Male, all ages	45,442	586	10,754	7,863	6,213	2,218	3,426	10,603	3,779
Under 1 hour	4,208	149	1,632	501	379	173	232	786	356
1-23 hours	20,720	414	6,915	4,152	2,747	780	1,066	2,887	1,759
1 day	6,754	16	1,025	1,380	1,282	428	529	1,543	551
2 days	4,483	3	504	723	774	290	493	1,286	410
3-6 days	4,602	4	450	685	628	280	527	1,664	364
7-13 days	2,265	-	146	287	237	133	253	1,041	168
14-27 days	2,410	-	82	135	166	134	326	1,396	171
Female, all ages	32,888	490	8,725	5,524	3,918	1,529	2,388	7,651	2,663
Under 1 hour	3,603	123	1,222	408	352	173	250	752	323
1-23 hours	14,786	336	5,408	2,677	1,650	527	790	2,215	1,183
1 day	4,634	16	910	972	782	243	342	997	372
2 days	2,960	10	498	521	440	167	284	792	248
3-6 days	3,281	3	451	549	366	184	321	1,129	278
7-13 days	1,826	2	178	267	187	116	185	751	140
14-27 days	1,798	-	58	130	141	119	216	1,015	119
<u>White</u>									
Both sexes, all ages	60,773	676	14,585	10,277	8,393	2,970	4,898	13,910	5,064
Under 1 hour	6,241	196	2,243	696	626	298	416	1,216	550
1-23 hours	27,645	460	9,220	5,396	3,630	1,070	1,594	3,977	2,298
1 day	8,958	15	1,420	1,788	1,767	544	741	1,938	745
2 days	6,078	3	756	973	1,052	386	684	1,669	555
3-6 days	6,085	1	657	909	807	350	714	2,152	495
7-13 days	2,980	1	202	379	316	161	358	1,332	231
14-27 days	2,786	-	87	136	195	161	391	1,626	190

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960-Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
ALL NEONATAL DEATHS-Con.									
White-Con.									
Number of deaths									
Male, all ages	35,537	370	8,166	6,096	5,172	1,757	2,886	8,086	3,004
Under 1 hour	3,351	114	1,287	375	314	147	193	627	294
1-23 hours	16,286	248	5,257	3,306	2,284	644	909	2,249	1,389
1 day	5,344	7	762	1,041	1,106	346	453	1,187	442
2 days	3,687	1	378	572	673	244	431	1,033	355
3-6 days	3,557	-	333	520	504	208	446	1,268	278
7-13 days	1,686	-	98	209	180	84	210	773	132
14-27 days	1,626	-	51	73	111	84	244	949	114
Female, all ages	25,236	306	6,419	4,181	3,221	1,213	2,012	5,824	2,060
Under 1 hour	2,890	82	956	321	312	151	223	589	256
1-23 hours	11,359	212	3,963	2,090	1,346	426	685	1,728	909
1 day	3,614	8	658	747	661	198	288	751	303
2 days	2,391	2	378	401	379	142	253	636	200
3-6 days	2,528	1	324	389	303	142	268	884	217
7-13 days	1,294	1	104	170	136	77	148	559	99
14-27 days	1,160	-	36	63	84	77	147	677	76
All other									
Both sexes, all ages	17,557	400	4,894	3,110	1,738	777	916	4,344	1,378
Under 1 hour	1,570	76	611	213	105	48	66	322	129
1-23 hours	7,861	290	3,103	1,433	767	237	262	1,125	644
1 day	2,430	17	515	564	297	127	130	602	178
2 days	1,365	10	246	271	162	71	93	409	103
3-6 days	1,798	6	244	325	187	114	134	641	147
7-13 days	1,111	1	122	175	108	88	80	460	77
14-27 days	1,422	-	53	129	112	92	151	785	100
Male, all ages	9,905	216	2,588	1,767	1,041	461	540	2,517	775
Under 1 hour	857	35	345	126	65	26	39	159	62
1-23 hours	4,434	166	1,658	846	463	136	157	638	370
1 day	1,410	9	263	339	176	82	76	356	109
2 days	796	2	126	151	101	46	62	253	55
3-6 days	1,045	4	117	165	124	72	81	396	86
7-13 days	579	-	48	78	57	49	43	268	36
14-27 days	784	-	31	62	55	50	82	447	57

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960—Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
ALL NEONATAL DEATHS—Con.									
<u>All other—Con.</u>									
Number of deaths									
Female, all ages	7,652	184	2,306	1,343	697	316	376	1,827	603
Under 1 hour	713	41	266	87	40	22	27	163	67
1-23 hours	3,427	124	1,445	587	304	101	105	487	274
1 day	1,020	8	252	225	121	45	54	246	69
2 days	569	8	120	120	61	25	31	156	48
3-6 days	753	2	127	160	63	42	53	245	61
7-13 days	532	1	74	97	51	39	37	192	41
14-27 days	638	-	22	67	57	42	69	338	43
NEONATAL DEATHS AMONG SINGLE BIRTHS									
<u>Total</u>									
Both sexes, all ages	69,613	923	16,452	11,260	8,777	3,368	5,461	17,611	5,761
Under 1 hour	6,923	224	2,330	798	672	330	459	1,486	624
1-23 hours	30,950	645	10,286	5,741	3,852	1,180	1,744	4,920	2,582
1 day	10,098	32	1,694	1,921	1,756	592	819	2,449	835
2 days	6,709	13	907	1,039	1,029	402	729	1,996	594
3-6 days	7,172	7	809	1,056	829	412	791	2,697	571
7-13 days	3,790	2	300	470	369	226	405	1,738	280
14-27 days	3,971	-	126	235	270	226	514	2,325	275
Male, all ages	40,609	512	9,150	6,674	5,440	1,992	3,222	10,239	3,380
Under 1 hour	3,730	132	1,351	435	353	162	219	764	314
1-23 hours	18,163	357	5,821	3,504	2,432	706	1,002	2,778	1,563
1 day	6,056	16	902	1,161	1,107	382	495	1,493	500
2 days	4,075	3	457	610	669	260	467	1,241	368
3-6 days	4,203	4	409	596	532	243	490	1,608	321
7-14 days	2,099	-	137	247	200	117	240	1,005	153
14-27 days	2,283	-	73	121	147	122	309	1,350	161
Female, all ages	29,004	411	7,302	4,586	3,337	1,376	2,239	7,372	2,381
Under 1 hour	3,193	92	979	363	319	168	240	722	310
1-23 hours	12,787	288	4,465	2,237	1,420	474	742	2,142	1,019
1 day	4,042	16	792	760	649	210	324	956	335
2 days	2,634	10	450	429	360	142	262	755	226
3-6 days	2,969	3	400	460	297	169	301	1,089	250
7-13 days	1,691	2	163	223	169	109	165	733	127
14-27 days	1,688	-	53	114	123	104	205	975	114

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960-Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
NEONATAL DEATHS AMONG SINGLE BIRTHS-Con.									
White									
Number of deaths									
Both sexes, all ages	54,109	571	12,278	8,621	7,279	2,672	4,625	13,518	4,545
Under 1 hour	5,548	160	1,823	619	581	287	400	1,173	505
1-23 hours	24,150	391	7,668	4,525	3,189	973	1,511	3,867	2,026
1 day	7,961	15	1,241	1,460	1,510	481	703	1,878	673
2 days	5,473	3	685	801	893	336	641	1,612	502
3-6 days	5,555	1	595	778	664	311	666	2,097	443
7-13 days	2,773	1	188	320	272	142	333	1,302	215
14-27 days	2,649	-	78	118	170	142	371	1,589	181
Male, all ages	31,792	321	6,933	5,152	4,519	1,574	2,730	7,870	2,693
Under 1 hour	2,979	99	1,064	330	294	140	185	610	257
1-23 hours	14,285	214	4,410	2,772	2,021	584	862	2,185	1,237
1 day	4,799	7	669	875	957	310	428	1,153	400
2 days	3,347	1	346	474	578	217	410	999	322
3-6 days	3,266	-	306	457	423	180	414	1,238	248
7-13 days	1,567	-	93	180	149	70	200	754	121
14-27 days	1,549	-	45	64	97	73	231	931	108
Female, all ages	22,317	250	5,345	3,469	2,760	1,098	1,895	5,648	1,852
Under 1 hour	2,569	61	759	289	287	147	215	563	248
1-23 hours	9,865	177	3,258	1,753	1,168	389	649	1,682	789
1 day	3,162	8	572	585	553	171	275	725	273
2 days	2,126	2	339	327	315	119	231	613	180
3-6 days	2,289	1	289	321	241	131	252	859	195
7-13 days	1,206	1	95	140	123	72	133	548	94
14-27 days	1,100	-	33	54	73	69	140	658	73
All other									
Both sexes, all ages	15,504	352	4,174	2,639	1,498	696	836	4,093	1,216
Under 1 hour	1,375	64	507	179	91	43	59	313	119
1-23 hours	6,800	254	2,618	1,216	663	207	233	1,053	556
1 day	2,137	17	453	461	246	111	116	571	162
2 days	1,236	10	222	238	136	66	88	384	92
3-6 days	1,617	6	214	278	165	101	125	600	128
7-13 days	1,017	1	112	150	97	84	72	436	65
14-27 days	1,322	-	48	117	100	84	143	736	94

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960—Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
NEONATAL DEATHS AMONG SINGLE BIRTHS—Con.									
All other—Con.									
		Number of deaths							
Male, all ages	8,817	191	2,217	1,522	921	418	492	2,369	687
Under 1 hour	751	33	287	105	59	22	34	154	57
1-23 hours	3,878	143	1,411	732	411	122	140	593	326
1 day	1,257	9	233	286	150	72	67	340	100
2 days	728	2	111	136	91	43	57	242	46
3-6 days	937	4	103	139	109	63	76	370	73
7-13 days	532	-	44	67	51	47	40	251	32
14-27 days	734	-	28	57	50	49	78	419	53
Female, all ages	6,687	161	1,957	1,117	577	278	344	1,724	529
Under 1 hour	624	31	220	74	32	21	25	159	62
1-23 hours	2,922	111	1,207	484	252	85	93	460	230
1 day	880	8	220	175	96	39	49	231	62
2 days	508	8	111	102	45	23	31	142	46
3-6 days	680	2	111	139	56	38	49	230	55
7-13 days	485	1	68	83	46	37	32	185	33
14-27 days	588	-	20	60	50	35	65	317	41
NEONATAL DEATHS AMONG PLURAL BIRTHS									
Total									
Both sexes, all ages	8,717	153	3,027	2,127	1,354	379	353	643	681
Under 1 hour	888	48	524	111	59	16	23	52	55
1-23 hours	4,556	105	2,037	1,088	545	127	112	182	360
1 day	1,290	-	241	431	308	79	52	91	88
2 days	734	-	95	205	185	55	48	82	64
3-6 days	711	-	92	178	165	52	57	96	71
7-13 days	301	-	24	84	55	23	33	54	28
14-27 days	237	-	14	30	37	27	28	86	15
Male, all ages	4,833	74	1,604	1,189	773	226	204	364	399
Under 1 hour	478	17	281	66	26	11	13	22	42
1-23 hours	2,557	57	1,094	648	315	74	64	109	196
1 day	698	-	123	219	175	46	34	50	51
2 days	408	-	47	113	105	30	26	45	42
3-6 days	399	-	41	89	96	37	37	56	43
7-13 days	166	-	9	40	37	16	13	36	15
14-27 days	127	-	9	14	19	12	17	46	10

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960—Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
NEONATAL DEATHS AMONG PLURAL BIRTHS—Con.									
Total—Con.		Number of deaths							
Female, all ages	3,884	79	1,423	938	581	153	149	279	282
Under 1 hour	410	31	243	45	33	5	10	30	13
1-23 hours	1,999	48	943	440	230	53	48	73	164
1 day	592	-	118	212	133	33	18	41	37
2 days	326	-	48	92	80	25	22	37	22
3-6 days	312	-	51	89	69	15	20	40	28
7-13 days	135	-	15	44	18	7	20	18	13
14-27 days	110	-	5	16	18	15	11	40	5
White									
Both sexes, all ages	6,664	105	2,307	1,656	1,114	298	273	392	519
Under 1 hour	693	36	420	77	45	11	16	43	45
1-23 hours	3,495	69	1,552	871	441	97	83	110	272
1 day	997	-	179	328	257	63	38	60	72
2 days	605	-	71	172	159	50	43	57	53
3-6 days	530	-	62	131	143	39	48	55	52
7-13 days	207	-	14	59	44	19	25	30	16
14-27 days	137	-	9	18	25	19	20	37	9
Male, all ages	3,745	49	1,233	944	653	183	156	216	311
Under 1 hour	372	15	223	45	20	7	8	17	37
1-23 hours	2,001	34	847	534	263	60	47	64	152
1 day	545	-	93	166	149	36	25	34	42
2 days	340	-	32	98	95	27	21	34	33
3-6 days	291	-	27	63	81	28	32	30	30
7-13 days	119	-	5	29	31	14	10	19	11
14-27 days	77	-	6	9	14	11	13	18	6
Female, all ages	2,919	56	1,074	712	461	115	117	176	208
Under 1 hour	321	21	197	32	25	4	8	26	8
1-23 hours	1,494	35	705	337	178	37	36	46	120
1 day	452	-	86	162	108	27	13	26	30
2 days	265	-	39	74	64	23	22	23	20
3-6 days	239	-	35	68	62	11	16	25	22
7-13 days	88	-	9	30	13	5	15	11	5
14-27 days	60	-	3	9	11	8	7	19	3

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960-Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
NEONATAL DEATHS AMONG PLURAL BIRTHS-Con.									
All other									
Number of deaths									
Both sexes, all ages	2,053	48	720	471	240	81	80	251	162
Under 1 hour	195	12	104	34	14	5	7	9	10
1-23 hours	1,061	36	485	217	104	30	29	72	88
1 day	293	-	62	103	51	16	14	31	16
2 days	129	-	24	33	26	5	5	25	11
3-6 days	181	-	30	47	22	13	9	41	19
7-13 days	94	-	10	25	11	4	8	24	12
14-27 days	100	-	5	12	12	8	8	49	6
Male, all ages	1,088	25	371	245	120	43	48	148	88
Under 1 hour	106	2	58	21	6	4	5	5	5
1-23 hours	556	23	247	114	52	14	17	45	44
1 day	153	-	30	53	26	10	9	16	9
2 days	68	-	15	15	10	3	5	11	9
3-6 days	108	-	14	26	15	9	5	26	13
7-13 days	47	-	4	11	6	2	3	17	4
14-27 days	50	-	3	5	5	1	4	28	4
Female, all ages	965	23	349	226	120	38	32	103	74
Under 1 hour	89	10	46	13	8	1	2	4	5
1-23 hours	505	13	238	103	52	16	12	27	44
1 day	140	-	32	50	25	6	5	15	7
2 days	61	-	9	18	16	2	-	14	2
3-6 days	73	-	16	21	7	4	4	15	6
7-13 days	47	-	6	14	5	2	5	7	8
14-27 days	50	-	2	7	7	7	4	21	2
ALL NEONATAL DEATHS									
Total									
Rate per 1,000 survivors ²									
Both sexes, all ages	18.4	649.8	806.5	391.3	108.1	28.3	9.1	5.9	26.4
Under 1 hour	1.8	164.3	118.2	26.6	7.8	2.6	0.8	0.5	2.8
1-23 hours	8.4	541.9	578.5	205.1	47.3	9.9	2.9	1.7	12.1
1 day	2.7	50.5	215.6	88.8	23.3	5.1	1.4	0.8	3.8
2 days	1.8	*	142.3	51.6	14.0	3.5	1.2	0.8	2.8
3-6 days	1.9	*	149.2	53.9	11.7	3.6	1.3	0.9	2.7
7-13 days	1.0	*	63.0	25.6	5.0	1.9	0.7	0.6	1.3
14-27 days	1.0	-	29.1	12.6	3.7	2.0	0.9	0.8	1.2

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960—Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
ALL NEONATAL DEATHS—Con.									
Total—Con.									
Rate per 1,000 survivors ²									
Male, all ages	20.8	672.0	819.2	430.9	124.4	32.5	10.3	6.7	30.0
Under 1 hour	1.9	170.9	124.3	27.5	7.6	2.5	0.7	0.5	2.8
1-23 hours	9.5	572.6	601.5	234.0	55.4	11.5	3.2	1.8	14.0
1 day	3.1	*	223.8	101.5	27.4	6.4	1.6	1.0	4.5
2 days	2.1	*	141.7	59.2	17.0	4.3	1.5	0.8	3.3
3-6 days	2.1	*	147.4	59.6	14.0	4.2	1.6	1.1	3.0
7-13 days	1.1	-	56.1	26.6	5.4	2.0	0.8	0.7	1.4
14-27 days	1.1	-	33.4	12.8	3.8	2.0	1.0	0.9	1.4
Female, all ages	15.8	625.0	791.3	346.0	89.5	23.8	7.7	5.0	22.6
Under 1 hour	1.7	156.9	110.8	25.6	8.0	2.7	0.8	0.5	2.7
1-23 hours	7.1	508.3	551.6	172.1	38.0	8.2	2.6	1.5	10.1
1 day	2.2	*	207.0	75.5	18.7	3.8	1.1	0.7	3.2
2 days	1.4	*	142.9	43.8	10.7	2.6	0.9	0.5	2.1
3-6 days	1.6	*	150.9	48.2	9.0	2.9	1.0	0.7	2.4
7-13 days	0.9	*	70.2	24.6	4.7	1.8	0.6	0.5	1.2
14-27 days	0.9	-	24.6	12.3	3.5	1.9	0.7	0.7	1.0
White									
Both sexes, all ages	16.9	640.2	836.7	426.4	117.6	29.8	8.9	5.3	23.2
Under 1 hour	1.7	185.6	128.7	28.9	8.8	3.0	0.8	0.5	2.5
1-23 hours	7.7	534.9	607.0	230.5	51.3	10.8	2.9	1.5	10.6
1 day	2.5	*	237.9	99.3	26.3	5.5	1.4	0.7	3.5
2 days	1.7	*	166.2	60.0	16.1	4.0	1.3	0.6	2.9
3-6 days	1.7	*	173.2	59.6	12.6	3.6	1.3	0.8	2.3
7-13 days	0.8	*	64.4	26.4	5.0	1.7	0.7	0.5	1.1
14-27 days	0.8	-	29.7	9.7	3.1	1.7	0.7	0.6	0.9
Male, all ages	19.2	649.1	845.2	462.7	133.9	33.8	10.1	6.1	26.7
Under 1 hour	1.8	200.0	133.2	28.5	8.1	2.8	0.7	0.5	2.6
1-23 hours	8.8	543.9	627.7	258.3	59.6	12.4	3.2	1.7	12.4
1 day	2.9	*	244.4	109.6	30.7	6.8	1.6	0.9	4.0
2 days	2.0	*	160.4	67.7	19.3	4.8	1.5	0.8	3.2
3-6 days	2.0	-	168.4	66.0	14.7	4.1	1.6	1.0	2.5
7-13 days	0.9	-	59.6	28.4	5.3	1.7	0.7	0.6	1.2
14-27 days	0.9	-	33.0	10.2	3.3	1.7	0.9	0.7	1.0

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960—Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
ALL NEONATAL DEATHS—Con.									
White—Con.									
Rate per 1,000 survivors ²									
Female, all ages	14.4	629.6	826.1	382.7	98.5	25.5	7.6	4.5	19.5
Under 1 hour	1.6	168.7	123.0	29.4	9.5	3.2	0.8	0.5	2.4
1-23 hours	6.5	524.8	581.6	197.1	41.6	9.0	2.6	1.3	8.6
1 day	2.1	*	230.8	87.7	21.3	4.2	1.1	0.6	2.9
2 days	1.4	*	172.4	51.6	12.5	3.0	1.0	0.5	1.9
3-6 days	1.5	*	178.5	52.8	10.1	3.0	1.0	0.7	2.1
7-13 days	0.7	*	69.8	24.4	4.6	1.7	0.6	0.4	1.0
14-27 days	0.7	-	26.0	9.3	2.8	1.7	0.6	0.5	0.7
All other									
Both sexes, all ages	26.7	666.7	728.1	307.7	77.6	23.6	10.1	9.3	54.2
Under 1 hour	2.4	126.7	90.9	21.1	4.7	1.5	0.7	0.7	5.1
1-23 hours	12.0	553.4	507.8	144.8	34.4	7.2	2.9	2.4	25.5
1 day	3.8	*	171.2	66.7	13.8	3.9	1.4	1.3	7.2
2 days	2.1	*	98.7	34.3	7.6	2.2	1.0	0.9	4.2
3-6 days	2.8	*	108.6	42.6	8.9	3.5	1.5	1.4	6.0
7-13 days	1.7	*	60.9	24.0	5.2	2.7	0.9	1.0	3.2
14-27 days	2.2	-	28.2	18.1	5.4	2.9	1.7	1.7	4.1
Male, all ages	29.9	715.2	746.7	348.5	92.2	28.4	11.8	10.7	58.9
Under 1 hour	2.6	115.9	99.5	24.9	5.8	1.6	0.9	0.7	4.7
1-23 hours	13.4	621.7	531.2	171.1	41.2	8.4	3.4	2.7	28.2
1 day	4.3	*	179.8	82.7	16.3	5.1	1.7	1.5	8.6
2 days	2.5	*	105.0	40.2	9.5	2.9	1.4	1.1	4.4
3-6 days	3.2	*	108.9	45.7	11.8	4.5	1.8	1.7	6.8
7-13 days	1.8	-	50.2	22.7	5.5	3.1	0.9	1.1	2.9
14-27 days	2.4	-	34.1	18.4	5.3	3.2	1.8	1.9	4.6
Female, all ages	23.5	617.4	708.2	266.6	62.8	19.0	8.3	7.9	49.2
Under 1 hour	2.2	137.6	81.7	17.3	3.6	1.3	0.6	0.7	5.5
1-23 hours	10.5	482.5	483.3	118.6	27.5	6.1	2.3	2.1	22.5
1 day	3.2	*	163.1	51.6	11.3	2.7	1.2	1.1	5.8
2 days	1.8	*	92.8	29.0	5.7	1.5	0.7	0.7	4.0
3-6 days	2.4	*	108.3	39.8	6.0	2.6	1.2	1.1	5.2
7-13 days	1.7	*	70.7	25.1	4.9	2.4	0.8	0.8	3.5
14-27 days	2.0	-	22.6	17.8	5.5	2.6	1.5	1.5	3.7

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960–Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
NEONATAL DEATHS AMONG SINGLE BIRTHS									
Total		Rate per 1,000 survivors²							
Both sexes, all ages	16.7	617.8	788.7	375.4	104.6	27.1	8.8	5.8	24.1
Under 1 hour	1.7	149.9	111.7	26.6	8.0	2.7	0.7	0.5	2.6
1-23 hours	7.4	507.9	555.1	526.6	46.3	9.5	2.8	1.6	10.8
1 day	2.4	51.2	205.5	81.9	22.1	4.8	1.3	0.8	3.5
2 days	1.6	*	138.5	48.3	13.3	3.3	1.2	0.7	2.5
3-6 days	1.7	*	143.4	51.5	10.8	3.4	1.3	0.9	2.4
7-13 days	0.9	*	62.1	24.2	4.9	1.9	0.7	0.6	1.2
14-27 days	1.0	-	27.8	12.4	3.6	1.9	0.8	0.8	1.2
Male, all ages	19.0	646.5	802.5	415.6	121.1	31.2	10.0	6.6	27.4
Under 1 hour	1.7	166.7	118.5	27.1	7.9	2.5	0.7	0.5	2.5
1-23 hours	8.5	540.9	579.1	224.3	54.6	11.1	3.1	1.8	12.7
1 day	2.9	*	213.2	95.8	26.3	6.1	1.5	1.0	4.1
2 days	1.9	*	137.3	55.7	16.3	4.1	1.5	0.8	3.0
3-6 days	2.0	*	142.5	57.6	13.2	3.9	1.5	1.0	2.7
7-13 days	1.0	-	55.6	25.3	5.0	1.9	0.8	0.7	1.3
14-27 days	1.9	-	31.4	12.7	3.7	2.0	1.0	0.9	1.3
Female, all ages	14.3	585.5	772.0	329.2	85.6	22.9	7.5	4.9	20.6
Under 1 hour	1.6	131.1	103.5	26.1	8.2	2.8	0.8	0.5	2.7
1-23 hours	6.3	472.1	526.6	164.9	36.7	7.9	2.5	1.4	8.8
1 day	2.0	*	197.3	67.1	17.4	3.5	1.1	0.6	2.9
2 days	1.3	*	139.7	40.6	9.8	2.4	0.9	0.5	2.0
3-6 days	1.5	*	144.3	45.4	8.2	2.9	1.0	0.7	2.2
7-13 days	0.8	*	68.7	23.0	4.7	1.8	0.6	0.5	1.1
14-27 days	0.8	-	24.0	12.1	3.4	1.8	0.7	0.7	1.0
White									
Both sexes, all ages	15.3	604.9	819.8	410.1	114.8	28.8	8.7	5.2	21.2
Under 1 hour	1.6	169.5	121.7	29.4	9.2	3.1	0.8	0.5	2.4
1-23 hours	6.8	498.7	583.0	221.8	50.8	10.5	2.8	1.5	9.5
1 day	2.3	*	226.3	92.0	25.3	5.3	1.3	0.7	3.2
2 days	1.6	*	161.4	55.6	15.4	3.7	1.2	0.6	2.4
3-6 days	1.6	*	167.2	57.1	11.6	3.4	1.3	0.8	2.1
7-13 days	0.8	*	63.4	24.9	4.8	1.6	0.6	0.5	1.0
14-27 days	0.8	-	28.1	9.4	3.0	1.6	0.7	0.6	0.9

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960—Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
NEONATAL DEATHS AMONG SINGLE BIRTHS—Con.									
White—Con.									
Rate per 1,000 survivors ²									
Male, all ages	17.5	619.7	830.1	445.7	130.9	32.5	9.8	6.0	24.4
Under 1 hour	1.6	191.1	127.4	28.5	8.5	2.9	0.7	0.5	2.3
1-23 hours	7.9	510.7	605.1	246.8	59.0	12.1	3.1	1.7	11.2
1 day	2.7	*	232.5	103.5	29.7	6.5	1.5	0.9	3.7
2 days	1.9	*	156.6	62.5	18.5	4.6	1.5	0.8	3.0
3-6 days	1.8	-	164.3	64.3	13.8	3.8	1.5	0.9	2.3
7-13 days	0.9	-	59.7	27.1	4.9	1.5	0.7	0.6	1.1
14-27 days	0.9	-	30.7	9.9	3.2	1.6	0.8	0.7	1.0
Female, all ages	13.0	586.9	806.9	366.7	95.6	24.8	7.4	4.4	17.9
Under 1 hour	1.5	143.2	114.6	30.5	9.9	3.3	0.8	0.4	2.4
1-23 hours	5.8	484.9	555.5	191.1	40.9	8.8	2.5	1.3	7.6
1 day	1.9	*	219.4	78.9	20.2	3.9	1.1	0.6	2.7
2 days	1.2	*	166.6	47.9	11.7	2.7	0.9	0.5	1.8
3-6 days	1.3	*	170.4	49.3	9.1	3.0	1.0	0.7	1.9
7-13 days	0.7	*	67.5	22.6	4.7	1.7	0.5	0.4	0.9
14-27 days	0.6	-	25.2	8.9	2.8	1.6	0.6	0.5	0.7
All other									
Both sexes, all ages	24.2	640.0	709.4	294.1	73.0	22.2	9.5	8.9	49.1
Under 1 hour	2.1	116.4	86.2	20.0	4.4	1.4	0.7	0.7	4.8
1-23 hours	10.7	522.6	486.9	138.3	32.5	6.6	2.6	2.3	22.6
1 day	3.4	*	164.2	60.8	12.5	3.6	1.3	1.2	6.7
2 days	2.0	*	96.3	33.4	7.0	2.1	1.0	0.8	3.8
3-6 days	2.6	*	102.7	40.4	8.5	3.3	1.4	1.3	5.4
7-13 days	1.6	*	59.9	22.7	5.0	2.7	0.8	1.0	2.7
14-27 days	2.1	-	27.3	18.1	5.2	2.7	1.6	1.6	4.0
Male, all ages	27.3	697.1	726.9	338.2	88.6	27.0	11.1	10.2	53.7
Under 1 hour	2.3	120.4	94.1	23.3	5.7	1.4	0.8	0.7	4.5
1-23 hours	12.0	593.4	510.7	166.6	39.8	7.9	3.2	2.6	25.6
1 day	3.9	*	172.3	78.1	15.1	4.7	1.5	1.5	8.1
2 days	2.3	*	99.2	40.3	9.3	2.8	1.3	1.0	3.7
3-6 days	3.0	*	102.2	42.9	11.3	4.1	1.7	1.6	6.0
7-13 days	1.7	-	48.6	21.6	5.3	3.1	0.9	1.1	2.6
14-27 days	2.3	-	32.5	18.8	5.3	3.2	1.8	1.8	4.4

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960—Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
NEONATAL DEATHS AMONG SINGLE BIRTHS—Con.		Rate per 1,000 survivors ²							
<u>All other—Con.</u>									
Female, all ages	21.1	583.3	690.5	249.8	57.0	17.6	7.9	7.6	44.2
Under 1 hour	2.0	112.3	77.6	16.5	3.2	1.3	0.6	0.7	5.2
1-23 hours	9.2	453.1	461.7	110.1	25.0	5.4	2.1	2.0	19.3
1 day	2.8	*	156.4	44.7	9.8	2.5	1.1	1.0	5.3
2 days	1.6	*	93.5	27.3	4.6	1.5	0.7	0.6	4.0
3-6 days	2.2	*	103.2	38.2	5.8	2.4	1.1	1.0	4.8
7-13 days	1.6	*	70.5	23.7	4.8	2.4	0.7	0.8	2.9
14-27 days	1.9	-	22.3	17.6	5.2	2.2	1.5	1.4	3.6
NEONATAL DEATHS AMONG PLURAL BIRTHS									
<u>Total</u>									
Both sexes, all ages	100.6	944.4	918.9	504.3	137.7	45.6	18.2	17.6	135.8
Under 1 hour	10.2	296.3	159.1	26.3	6.0	*	1.2	1.4	11.0
1-23 hours	53.1	921.1	735.4	264.9	55.8	15.3	5.8	5.0	72.6
1 day	15.9	-	328.8	142.8	33.4	9.7	2.7	2.5	19.1
2 days	9.2	-	193.1	79.2	20.7	6.8	2.5	2.3	14.2
3-6 days	9.0	-	231.7	74.7	18.9	6.5	3.0	2.7	16.0
7-13 days	3.8	-	78.7	38.1	6.4	2.9	1.7	1.5	6.4
14-27 days	3.0	-	*	14.1	4.3	3.4	1.5	2.4	*
Male, all ages	110.9	*	929.3	543.9	154.2	53.5	21.2	20.1	152.4
Under 1 hour	11.0	*	162.8	30.2	5.2	*	*	1.2	16.0
1-23 hours	59.3	*	757.1	305.7	63.2	17.6	6.7	6.0	76.1
1 day	17.2	-	350.4	148.8	37.4	11.1	3.6	2.8	21.4
2 days	10.2	-	206.1	90.2	23.3	7.3	2.7	2.5	18.0
3-6 days	10.1	-	226.5	78.1	21.9	9.1	3.9	3.1	18.8
7-13 days	4.3	-	*	38.1	8.6	*	*	2.0	*
14-27 days	3.3	-	*	*	*	*	*	2.6	*
Female, all ages	90.1	*	907.5	461.6	120.6	37.4	15.3	15.2	117.6
Under 1 hour	9.5	*	155.0	22.1	6.8	*	*	1.6	*
1-23 hours	46.8	*	711.7	221.4	48.1	13.0	4.9	4.0	68.8
1 day	14.6	-	308.9	137.0	29.2	8.2	*	2.2	16.7
2 days	8.1	-	181.8	68.9	18.1	6.3	2.3	2.0	10.1
3-6 days	7.8	-	236.1	71.6	15.9	*	2.1	2.2	13.0
7-13 days	3.4	-	*	38.1	*	*	2.1	*	*
14-27 days	2.8	-	*	*	*	*	*	2.2	*

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960—Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
NEONATAL DEATHS AMONG PLURAL BIRTHS—Con.									
White									
Rate per 1,000 survivors ²									
Both sexes, all ages	96.0	937.5	939.3	537.3	140.0	44.1	16.4	14.0	119.5
Under 1 hour	10.0	321.4	171.0	25.0	5.7	*	*	1.5	10.4
1-23 hours	50.9	*	762.3	289.9	55.7	14.4	5.0	3.9	63.3
1 day	15.3	-	369.8	153.7	34.4	9.5	2.3	2.2	17.9
2 days	9.4	-	232.8	95.2	22.0	7.6	2.6	2.0	13.4
3-6 days	8.3	-	265.0	80.2	20.3	6.0	2.9	2.0	13.3
7-13 days	3.3	-	*	39.3	6.4	*	1.5	1.1	*
14-27 days	2.2	-	*	*	3.6	*	1.2	1.3	*
Male, all ages	107.0	*	941.2	584.2	158.9	52.9	18.9	15.5	138.0
Under 1 hour	10.6	*	170.2	27.8	4.9	*	*	*	16.4
1-23 hours	57.8	*	779.2	339.9	64.3	17.4	5.7	4.6	68.6
1 day	16.7	-	387.5	160.1	38.9	10.6	3.1	2.5	20.3
2 days	10.6	-	217.7	112.5	25.8	8.0	2.6	2.5	16.3
3-6 days	9.2	-	234.8	81.5	22.6	8.4	3.9	2.2	15.1
7-13 days	3.8	-	*	40.8	8.9	*	*	*	*
14-27 days	2.5	-	*	*	*	*	*	*	*
Female, all ages	84.9	933.3	937.2	485.7	119.8	34.9	13.9	12.5	99.5
Under 1 hour	9.3	350.0	171.9	21.8	6.5	*	*	1.8	*
1-23 hours	43.8	897.4	742.9	235.0	46.6	11.2	4.3	3.3	57.6
1 day	13.9	-	352.5	147.7	29.6	8.3	*	1.9	15.3
2 days	8.2	-	246.8	79.1	18.1	7.1	2.6	1.6	10.4
3-6 days	7.5	-	294.1	79.0	17.9	*	*	1.8	11.5
7-13 days	2.8	-	*	37.8	*	*	*	*	*
14-27 days	1.9	-	*	*	*	*	*	*	*
All other									
Both sexes, all ages	118.7	960.0	859.2	414.6	128.1	52.1	29.6	29.6	241.1
Under 1 hour	11.3	*	124.1	29.9	*	*	*	*	*
1-23 hours	62.0	947.4	660.8	196.9	55.9	19.4	10.8	8.5	132.9
1 day	18.3	-	249.0	116.4	29.0	*	*	3.7	*
2 days	8.2	-	128.3	42.2	15.2	*	*	3.0	*
3-6 days	11.6	-	184.0	62.8	13.1	*	*	4.9	*
7-13 days	6.1	-	*	35.6	*	*	*	2.9	*
14-27 days	6.5	-	*	*	*	*	*	5.9	*

See footnotes at end of table.

Table 9. Neonatal deaths and probability of death within the neonatal period, by plurality, color, sex, age at death, and period of gestation: United States live-birth cohort, 1960—Con.

Plurality, color, sex, and age at death	All gestations	Period of gestation							
		Under 20 weeks	20-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-39 weeks	40 weeks and over	Not stated ¹
NEONATAL DEATHS AMONG PLURAL BIRTHS—Con.		Rate per 1,000 survivors ²							
All other—Con.									
Male, all ages	126.5	892.9	891.8	429.8	132.7	56.3	34.5	35.5	241.8
Under 1 hour	12.3	*	139.4	36.8	*	*	*	*	*
1-23 hours	65.4	884.6	689.9	207.7	57.9	*	*	10.8	122.6
1 day	19.3	-	270.3	121.8	30.7	*	*	*	*
2 days	8.7	-	*	*	*	*	*	*	*
3-6 days	14.0	-	*	70.8	*	*	*	6.4	*
7-13 days	6.2	-	*	*	*	*	*	*	*
14-27 days	6.6	-	*	*	*	*	*	6.9	*
Female, all ages	110.9	*	827.0	399.3	123.7	48.1	24.4	23.9	240.3
Under 1 hour	10.2	*	109.0	*	*	*	*	*	*
1-23 hours	58.7	*	633.0	186.3	54.1	*	*	6.3	145.2
1 day	17.3	-	231.9	111.1	27.5	*	*	*	*
2 days	7.7	-	*	*	*	*	-	*	*
3-6 days	9.2	-	*	55.0	*	*	*	*	*
7-13 days	6.0	-	*	*	*	*	*	*	*
14-27 days	6.4	-	*	*	*	*	*	5.0	*

¹ Includes Massachusetts and Maryland, except for Baltimore.

² Survivors are those infants in each specified age group who were alive at the beginning of each age interval.

APPENDIX I

STANDARD CERTIFICATE OF LIVE BIRTH

Form approved.
Budget Bureau No. 66-2374.9.

STATE OF		CERTIFICATE OF LIVE BIRTH			BIRTH NO.		
1. PLACE OF BIRTH <i>a. COUNTY</i>				2. USUAL RESIDENCE OF MOTHER (Where does mother live?) <i>a. STATE</i> <i>b. COUNTY</i>			
b. CITY, TOWN, OR LOCATION				c. CITY, TOWN, OR LOCATION			
c. NAME OF HOSPITAL OR INSTITUTION <i>(If not in hospital, give street address)</i>				d. STREET ADDRESS			
d. IS PLACE OF BIRTH INSIDE CITY LIMITS? YES <input type="checkbox"/> NO <input type="checkbox"/>				e. IS RESIDENCE INSIDE CITY LIMITS? YES <input type="checkbox"/> NO <input type="checkbox"/>		f. IS RESIDENCE ON A FARM? YES <input type="checkbox"/> NO <input type="checkbox"/>	
CHILD	3. NAME <i>(Type or print)</i> <i>First</i> <i>Middle</i> <i>Last</i>			5b. IF TWIN OR TRIPLET, WAS CHILD BORN 1st <input type="checkbox"/> 2d <input type="checkbox"/> 3d <input type="checkbox"/>		6. DATE OF BIRTH <i>Month</i> <i>Day</i> <i>Year</i>	
	4. SEX <i>5a. THIS BIRTH</i> SINGLE <input type="checkbox"/> TWIN <input type="checkbox"/> TRIPLET <input type="checkbox"/>						
FATHER	7. NAME <i>First</i> <i>Middle</i> <i>Last</i>			8. COLOR OR RACE			
	9. AGE (At time of this birth) YEARS		10. BIRTHPLACE (State or foreign country)		11a. USUAL OCCUPATION		11b. KIND OF BUSINESS OR INDUSTRY
MOTHER	12. MAIDEN NAME <i>First</i> <i>Middle</i> <i>Last</i>			13. COLOR OR RACE			
	14. AGE (At time of this birth) YEARS		15. BIRTHPLACE (State or foreign country)		16. PREVIOUS DELIVERIES TO MOTHER (Do NOT include this birth) <i>a. How many OTHER children are now living?</i> <i>b. How many OTHER children were born alive but are now dead?</i> <i>c. How many fetal deaths (fetuses born dead at ANY time after conception)?</i>		
17. INFORMANT							
18. MOTHER'S MAILING ADDRESS							
I hereby certify that this child was born alive on the date stated above.		18a. SIGNATURE			18b. ATTENDANT AT BIRTH M. D. <input type="checkbox"/> D. O. <input type="checkbox"/> MIDWIFE <input type="checkbox"/> OTHER (Specify)		
		18c. ADDRESS			18d. DATE SIGNED		
19. DATE RECD. BY LOCAL REG.		20. REGISTRAR'S SIGNATURE			21. DATE ON WHICH GIVEN NAME ADDED BY _____ (Registrar)		
FOR MEDICAL AND HEALTH USE ONLY (This section MUST be filled out)							
22a. LENGTH OF PREGNANCY COMPLETED WEEKS		22b. WEIGHT AT BIRTH LB. OZ.		23. LEGITIMATE YES <input type="checkbox"/> NO <input type="checkbox"/>			
(SPACE FOR ADDITION OF MEDICAL AND HEALTH ITEMS BY INDIVIDUAL STATES)							

1956 REVISION OF STANDARD CERTIFICATE

PHS-788 REV. 11-54

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE

APPENDIX II

STANDARD CERTIFICATE OF DEATH

CERTIFICATE OF DEATH

Form approved.
Budget Bureau No. 68-R376 2.

1956 REVISION OF STANDARD CERTIFICATE

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—PUBLIC HEALTH SERVICE

MEDICAL CERTIFICATION

REV. 11/54 PHS-798

BIRTH NO.		STATE OF		STATE FILE NO.	
1. PLACE OF DEATH a. COUNTY			2. USUAL RESIDENCE (Where deceased lived. If institution: Residence before admission) a. STATE		
b. CITY, TOWN, OR LOCATION		c. LENGTH OF STAY IN 1b	c. CITY, TOWN, OR LOCATION		
d. NAME OF HOSPITAL OR INSTITUTION (If not in hospital, give street address)			d. STREET ADDRESS		
e. IS PLACE OF DEATH INSIDE CITY LIMITS? YES <input type="checkbox"/> NO <input type="checkbox"/>		e. IS RESIDENCE INSIDE CITY LIMITS? YES <input type="checkbox"/> NO <input type="checkbox"/>		f. IS RESIDENCE ON A FARM? YES <input type="checkbox"/> NO <input type="checkbox"/>	
3. NAME OF DECEASED (Type or print) First Middle Last			4. DATE OF DEATH Month Day Year		
5. SEX	6. COLOR OR RACE	7. MARRIED <input type="checkbox"/> NEVER MARRIED <input type="checkbox"/> WIDOWED <input type="checkbox"/> DIVORCED <input type="checkbox"/>	8. DATE OF BIRTH	9. AGE (In years last birthday)	IF UNDER 1 YEAR Months Days Hours Min.
10a. USUAL OCCUPATION (Give kind of work done during most of working life, even if retired)		10b. KIND OF BUSINESS OR INDUSTRY	11. BIRTHPLACE (State or foreign country)		12. CITIZEN OF WHAT COUNTRY?
13. FATHER'S NAME			14. MOTHER'S MAIDEN NAME		
15. WAS DECEASED EVER IN U. S. ARMED FORCES? (Yes, no, or unknown) (If yes, give war or dates of service)		16. SOCIAL SECURITY NO.	17. INFORMANT Address		
18. CAUSE OF DEATH [Enter only one cause per line for (a), (b), and (c).] PART I. DEATH WAS CAUSED BY: IMMEDIATE CAUSE (a) _____ Conditions, if any, which gave rise to above cause (a), stating the underlying cause last. } DUE TO (b) _____ DUE TO (c) _____ PART II. OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO DEATH BUT NOT RELATED TO THE TERMINAL DISEASE CONDITION GIVEN IN PART I (a)					INTERVAL BETWEEN ONSET AND DEATH
20a. ACCIDENT <input type="checkbox"/> SUICIDE <input type="checkbox"/> HOMICIDE <input type="checkbox"/>		20b. DESCRIBE HOW INJURY OCCURRED (Enter nature of injury in Part I or Part II of item 18.)			
20c. TIME OF INJURY Hour a. m. p. m. Month, Day, Year					
20d. INJURY OCCURRED WHILE AT WORK <input type="checkbox"/> NOT WHILE AT WORK <input type="checkbox"/>		20e. PLACE OF INJURY (e. g., in or about home, farm, factory, street, office bldg., etc.)	20f. CITY, TOWN, OR LOCATION		COUNTY STATE
21. I attended the deceased from _____, to _____ and last saw her/him alive on _____ Death occurred at _____ m on the date stated above; and to the best of my knowledge, from the causes stated.					
22a. SIGNATURE (Degree or title)			22b. ADDRESS		22c. DATE SIGNED
23a. BURIAL, CREMATION, REMOVAL (Specify)		23b. DATE	23c. NAME OF CEMETERY OR CREMATORY		23d. LOCATION (City, town, or county) (State)
24. FUNERAL DIRECTOR ADDRESS		25. DATE RECD. BY LOCAL REG.		26. REGISTRAR'S SIGNATURE	

APPENDIX III

TECHNICAL NOTES

The data in this report are derived from two sources. Data referring to all live births in 1960 are taken from Volume I of *Vital Statistics of the United States, 1960*. Data on birth characteristics of infants in the 1960 live-birth cohort who died before reaching 28 days of age are derived from computer tapes prepared from a new set of punched cards which contained both birth and death information.

The punching instructions for detailed information in the new set of cards corresponded to the instructions for preparing cards for use in *Vital Statistics of the United States, 1960*. The classification and interpretation of certain important items is discussed in the following pages. The complete rules followed in the classification of geographic and personal items for births are set forth in *Vital Statistics Instruction Manual*.³²

Registration Completeness

Although every State has adopted a law requiring the registration of births, deaths, and fetal deaths, these laws are not uniformly observed. In most areas practically all births and deaths are registered. For some areas, however, there is enough underregistration to affect the use of the statistics for certain purposes.

Nationwide tests of completeness of birth registration were made in both 1940 and 1950.^{1,33} For the United States as a whole, these tests indicated that birth registration was, respectively, 92.5 and 97.9 percent complete. A detailed discussion of the results of these tests was given in chapter 6, Volume I, *Vital Statistics of the United States, 1950*. On the basis of results of the 1950 test, it is estimated by the

Division of Vital Statistics that in 1960 birth registration completeness was 98.9 percent for the country as a whole—99.3 for white and 96.4 for all other groups, respectively.

Classification by Occurrence and Residence

For the 1960 statistics by place of occurrence, events are classified according to the place where the birth occurred. Place of residence in birth statistics refers to the geographic area which constituted the mother's usual residence at time of the birth.

For residence statistics, all events occurring within the United States (i.e., 50 States and the District of Columbia) are allocated to a place of residence within the United States. For nonresident aliens, the place of residence is considered to be the same as the place of occurrence.

Age of Mother

The birth certificate asks for "Age (at time of this birth)." Some sources of minor errors in the age data have been noted. A small number of records are filed with age unspecified, and some births are not registered. Measures of variation of completeness of registration with age of mother are available from tests of completeness in 1950 and 1940.^{1,33} They show that registration completeness is approximately the same for all ages except for the oldest age group, where it is lower.

Color

The category "white" includes, in addition to persons reported as white, persons reported to

be Mexican or Puerto Rican and those with race not stated. The category "all other" consists of persons reported as Negro, American Indian, Chinese, and Japanese; persons of numerically small racial groups; and persons of mixed white and other races.

Completeness of birth registration in 1960 is estimated by the Division of Vital Statistics, National Center for Health Statistics, to be 99.3 percent for "white" births and 96.4 percent for "all other" births. The most recent figures for other groups are from the 1950 test which indicated registration completeness at that time to be 85.1 percent for American Indians and 97.4 percent for "other races," chiefly Chinese and Japanese. Both figures are probably higher for 1960, but later data are not available.

A comparison of the race designation in matched sets of birth certificates and infant cards from the 1950 registration completeness test indicates very high agreement for white and Negro infants. There were, however, substantially fewer American Indians recorded on birth records than on census records.³⁴

Hospital Delivery

Births are classified as occurring "in hospital or institution" on the basis of entries on the birth certificate. The classification is unrelated to the American Hospital Association (AHA) registered hospital listings.

Birth Weight

In practically all areas, birth weight is reported in terms of pounds and ounces rather than in grams. However, the metric system has been used in tabulating and presenting the statistics to facilitate comparison with data published by other groups in the United States.

Period of Gestation

In 1960, the live-birth record forms for the State of Massachusetts and that part of Maryland outside the city of Baltimore did not provide for information on the period of gestation. These areas account for about 60 percent of the records with gestation unspecified. Such records are distributed in the tables in the text of this report but not in the detailed tables.

An examination of the reported information on period of gestation suggests a substantial heaping at the interval "40 weeks and over." This bias probably results from the fact that gestation period is not carefully calculated, and instead the newborn infant of normal size is assumed to have a gestation period of 40 weeks. Such errors in reporting are minimized in areas where the birth certificate asks for the date of onset of last normal menstrual period. Places using this question (California, Baltimore City, the District of Columbia, and New York City) contributed about 14 percent of the live-birth records.

Control of Errors

The coding and punching of birth data for the live-birth records for 1960 were performed simultaneously, and the major portion of the work was verified using a partial sequential sample. This procedure was used in verifying the work of employees whose performance (as indicated by complete verification) was such as to produce consistently less than 4-percent error distributed among all the items. For any one item, less than 1-percent error would be expected under these procedures.

For this study, a new set of punched cards, using the same procedures, was prepared combining the necessary birth and death information into one card. However, to preserve the consistency of the death information, once the infant death was identified, the coded cause-of-death information from NCHS computer tapes for all deaths was used.

Published data for all live births taken from Volume I of *Vital Statistics of the United States, 1960*, were used. For live-birth characteristics of neonatal deaths, the newly created tapes were used. There are no estimates available of the degree of concordance between these two sources of information. Tabulating, computing, table preparation, and all other operations subsequent to the preparation of punched cards were verified.

Sampling of Birth Records

In this report, birth data for 1960 have been derived from a 50-percent systematic sample which consists of only even-numbered birth

records. Statistics for this year were obtained by multiplying the sample figures by 2.

The sample data represent estimates which differ somewhat from figures that would have been derived by processing all the records. However, the manner in which records are numbered greatly reduces the sampling variability of totals for geographic areas. With few exceptions, records are numbered in the State offices of vital statistics as they are received from the local offices. The assignment of the last digit in the number is not selective, and the systematic sample of even-numbered records may be assumed to be unbiased.

The extent to which residence figures for States derived from the sample differ from the totals that would have resulted from a complete

count depends on the amount of nonresident interchange. (This assumes virtually no error in the figures on a place-of-occurrence basis.) Since there is relatively little nonresident interchange of births among the States, the sampling errors for these geographic units are negligible.

The following table shows percent errors due to sampling in the published birth data by other than geographic characteristics. The chances are about 2 out of 3 that the percent difference due to sampling variability between the published figure based on the 50-percent sample and the result that would be obtained by a complete count is less than the appropriate percent error shown in the table. The chances are about 19 out of 20 that the percent difference is less than twice the percent error.

Number of births with a specified characteristic	Total births in area or to residents of area ¹							
	250	500	1,000	2,000	5,000	10,000	50,000	500,000
30	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
50	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1
100	7.7	8.9	9.5	9.7	9.9	9.9	10.0	10.0
250	0.0	4.5	5.5	5.9	6.2	6.2	6.3	6.3
500 .....	...	0.0	3.2	3.9	4.2	4.4	4.4	4.5
1,000 .....	...	...	0.0	2.2	2.8	3.0	3.1	3.2
2,000 .....	...	...	...	0.0	1.7	2.0	2.2	2.2
5,000 .....	...	...	...	...	0.0	1.0	1.3	1.4
10,000 .....	...	...	...	...	...	0.0	0.9	1.0
20,000 .....	...	...	...	...	...	...	0.5	0.7
50,000 .....	...	...	...	...	...	...	0.0	0.4

¹ An "area" is the smallest geographic unit to which the figure under consideration pertains. If the area is a city or county of residence where appreciable nonresident interchange occurs, the sampling error will be slightly larger.

Comparison of Rates

The January-March 1950 cohort study of infant mortality is based on the complete universe of births which occurred in that period. The 1960 cohort study of infant mortality used published data for live births which were estimated from a 50-percent systematic sample of live births, and infant deaths among the total live births. Because the 1960 live-birth records were sampled, it is appropriate to consider the possible effect of sampling on the statistical significance of differences between rates for the two studies. For 1960, the following frequencies were determined:

d = number of neonatal deaths in a specified category

b = estimated number of live births in the specified category

B = total number of live births

$\frac{1}{2}B$ = total number of live births in sample.

The neonatal mortality rate in the specified category can be expressed as:

$$M = (d/b) \times 1000.$$

The proportion of total live births in the specified category is:

$$p = b/B \text{ and } q = 1 - p.$$

If the expression

$$\frac{B - \frac{1}{2}B}{\frac{1}{2}B - 1} = \frac{2B - B}{B - 2} = \frac{B}{B - 2}$$

is essentially equal to 1, as is generally the case with these data, the variance and standard deviation of the neonatal mortality rate for the specified category are

$$\sigma_M^2 \doteq M^2 q/b$$

$$\sigma_M \doteq M\sqrt{q/b} \cdot$$

If the difference between two neonatal mortality rates is to be compared (i.e., $M_1 - M_2$), the standard error of the difference between the rates is

$$\text{S.E.}_{M_1 - M_2} = \sqrt{\sigma_{M_1}^2 + \sigma_{M_2}^2} \cdot$$

The differences between the rates is standardized by relating it to the standard error of the difference between the rates; i.e.,

$$\frac{M_1 - M_2}{\text{S.E.}_{M_1 - M_2}} \cdot$$

This statistic can be assessed by referring to a table of probabilities for the normal curve. If the absolute value of this ratio is 3 or more, the difference between the rates is said to be significant at the 1-percent level ($P < .01$). This means that a difference between two rates of the magnitude of $M_1 - M_2$ would be expected to arise from chance alone in less than 1 out of 100 pairs of samples of the specified sizes.

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