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## THE AGE FACTOR IN DISABLING MORBIDITY, 1940-44 EXPERIENCE IN A PUBLIC UTILITY COMPANY ${ }^{1}$

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The present report, the eleventh of the series (1-10), deals with the sickness absenteeism experience of the Boston Edison Company during the 5 years 1940-44, in terms essentially of the time and age changes in three basic morbidity rates. An examination of such changes is particularly indicated at the present time because of the unprecedented variation in the age composition of the employee population during the period under study.

The purpose of the report, therefore, is twofold, first to bring the series up to date with a presentation and an analysis of the appropriate data for recent years, and, second, which is perhaps of equal importance, to examine the effects on sickness absenteeism of the age factor.

The supporting absenteeism data, from company records, were reported periodically by the company to the Industrial Hygiene Division. These data represent absences due to sickness and injuries disabling for 1 calendar day or longer, and ending in the time period specified. In general, absences ended in the employee's recovery and return to work, although a small number of disabilities resulted in death or retirement. Less than 0.5 percent of all absences lasted longer than a year and these were arbitrarily terminated at 372 days.

The three basic morbidity rates comprise the frequency rate, or average annual number of absences per 1,000 persons; the disability rate, or average annual number of days of disability per person; and the severity rate, or average number of days per absence.

## MORBIDITY BY SEX AND AGE

Table 1 shows for each sex and year the number of absences and days of disability, together with the number of person-years of ex-

[^0]posure, for employees of all ages and those in five age groups. Table 2 is derived from table 1 and presents the pertinent morbidity rates.

Person-years of exposure.-The total number of person-years of exposure given in table 1 by sex and year is derived from periodic reports from the company listing the average number of males and

Table 1.-Number of absences lasting 1 calendar day or longer and number of days of disability due to sickness and injuries by sex, age, and year in which absence ended; experience of male and female émployees in a public utility, 1940-44, inclusive ${ }^{1}$

| Year in which absence ender | Males |  |  |  |  |  | Females |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\underset{\text { ages }}{\text { All }}$ | Age group |  |  |  |  | $\underset{\text { ages }}{\text { All }}$ | Age group |  |  |  |  |
|  |  | ${ }_{25}^{\text {Under }}$ | 25-34 | 35-44 | 45-54 | $\begin{gathered} 55 \text { and } \\ \text { over } \end{gathered}$ |  | $\left\lvert\, \begin{gathered} \text { Under } \\ -25 \end{gathered}\right.$ | 25-34 | 35-44 | 45-54 | $\begin{array}{\|c} 55 \text { and } \\ \text { over } \end{array}$ |
|  | Number of absences |  |  |  |  |  |  |  |  |  |  |  |
| 1940-44.-- | $\begin{array}{r} 13,720 \\ 2,324 \\ 2,422 \\ 2,671 \\ 3,051 \\ 3,252 \end{array}$ | 867 | 3,203 | 4,364 | 3,260 | 2,021 | 51, 281 | 1,804 | 1,392 | 1,471 | 856 | 397 |
| 1940 |  | 172 | 700 | 640 | 490 | 313 | 981 | 134 | 354 | 269 | 137 | 87 |
| 194 |  | 198 | 648 | 721 | 511 | 342 | 914 | 111 | 307 | 298 | 138 | 60 |
| 1942 |  | 221 | 675 | 780 | 614 | 378 | 940 | 250 | 240 | 244 | 139 | 66 |
| 1943. |  | 152 | 617 | 1,093 | 741 | 448 | 1,489 | 602 | 251 | 359 | 199 | 78 |
| 1941 |  | 124 | 563 | 1,121 | 904 | 540 | 1,597 | 707 | 240 | 301 | 243 | 106 |
| 1940-44--- | Number of days of disability |  |  |  |  |  |  |  |  |  |  |  |
|  | 123, 139 | 3,887 | 18, 117 | 34, 250 | 32, 213 | 34, 499 | 35, 219 | 6,027 | 7,331 | 9,082 | 8,309 | 4,432 |
| 1940. | 21,796 | 1,107 | 4,799 | 5,869 | 4, 696 | 5,325 | 6, 195 | 686 | 1,925 | 1,475 | 1,200 | 909 |
| 1912 | 24, 303 | 821 | 4,807 | 6, 458 | ${ }_{6}^{6,356}$ | 6, ${ }^{635}$ | 6, 313 | 14.00 | 2,063 | 1, 200 | 1, 346 | 1,009 |
| 1923 | 24, 497 | 880 | 2,608 | 6, 6 , 951 | 7,712 | 6, ${ }^{6,476}$ | 7,313 | 1,009 | 1,3910 | 2, 278 | 1, 197 | ${ }_{931}^{580}$ |
| 1944 | 20,081 | 427 | 2,352 | 8,506 | 7,985 | 9,741 | 8,284 | 2,004 | '912 | 1,461 | 2,874 | 1,003 |
| 1940-44.- | Number of person-years of exposure ${ }^{\text {3 }}$ |  |  |  |  |  |  |  |  |  |  |  |
|  | 12, 116 | 608 | 2,641 | 3,906 | 3,096 | 1,865 | 2,771 | 542 | 705 | 816 | 498 | 210 |
| 1940........... | 2,706 | 154 | 752 | 828 | 623 | 349 | 584 | 79 | 183 | 181 | 88 | 43 |
| 1941 | 2,702 | 157 | 697 | 843 | 648 | 357 | 572 | 78 | 171 | 184 | 95 | 44 |
| 1922. | 2,483 | 157 | 576 | 792 | 603 | 355 | 533 | 78 | 143 | 174 | 99 | 39 |
| 1943 | 2,147 | 88 | 361 | 728 | 590 | 382 | 548 | 146 | 110 | 141 | 108 | 43 |
| 1944.......... | 2,078 | 52 | 255 | 717 | 632 | 422 | 534 | 161 | 88 | 136 | 108 | 41 |

[^1]females on the pay roll during a month. The monthly figures are summed to obtain the person-months of exposure, and divided by 12 to give the number of person-years. Male and female age distributions, recently made available, permit the calculation and application of appropriate percentages to the annual number of male and female person-years of exposure, thus distributing the person-years according to age group. The calculated percentages used in determining
Table 2.-Morbidity rates by sex, age, and year in which absence ended; experience of male and female employees in a public utility, 1940-44, inclusive ${ }^{1}$ (based on table 1)

${ }^{2}$ Age-standardized according to estimates of male and female employment in the United
States for the week ending June 13, 1942 (11).
NOTE.-The number of person-years of exposure is given in table 1.
the age distributions of the person-years of exposure are shown in the accompanying table.

| Year (January 1) | Percent of public utility employees in specified age groups |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | All ages | Under 25 | 25-34 | 35-44 | 45-54 | 55 and over |
|  | Males |  |  |  |  |  |
| 1940... | 100.0 | 5.7 | 27.8 | 30.6 | 23.0 | 12.9 |
| 1941 | 100.0 | 5.8 | 25.8 | 31.2 | 24.0 | 13.2 |
| 1942 | 100.0 | 6. 3 | 23.2 | 31.9 | 24.3 | 14.3 |
| 1943 | 100.0 | 4.1 | 16.8 | 33.8 | 27.5 | 17.8 |
| 1944 (Dec. 1, 1943) |  | 2.5 | 12.3 | 34.5 | 30.4 | 20.3 |
|  | Females |  |  |  |  |  |
| 1940. | 100.0 | 13.5 | 33.1 | 31.0 | 15.0 | 7.4 |
| 1941 | 100.0 | 13.7 | 29.9 | 32.1 | 16.6 | 7.7 |
| 1942 | 100.0 | 14.7 | 26.8 | 32.6 | 18.6 | 7.3 |
| 1943-1.-.---19-1 | 100.0 | 26.6 | 20.1 | 25.8 | 19.7 | 7.8 |
| 1944 (Dec. 1, 1943) | 100.0 | 30.2 | 16.4 | 25.5 | 20.2 | 7.7 |

In 1940 approximately one-third of the male employees was under 35 years of age, one-third was 35 to 44 years, and the remaining third was 45 years and over. By 1944 the proportion under 35 had decreased to 15 percent while over half of the males was 45 and over, the proportion 55 years of age and over increasing from one-eighth to one-fifth.

The females, on the average, were appreciably younger than the males, with approximately 45 percent under 35 years of age throughput the period under stady. During the 5 years the proportion of females under 25 increased from 14 to 30 percent, but at the same time a decrease from 33 to 16 percent occurred in the proportion 25 to 34 years old.

The contribution made by each age group to the total number of person-years of exposure is shown graphically in figure 1 for each of the 5 years and for each sex. Particularly noteworthy is the decrease in the total number of male-years of exposure from 2,700 in 1940 and 1941 to less than 2,100 in 1944, reflecting primarily marked decreases in the male-years contributed by the 2 youngest age groups. It is of interest to observe in this connection that although the proportion of males in the 3 groups 35 years of age and over was increasing throughout the 5 -year period, the number of person-years of exposure resulting from the application of these proportions to the decreasing total exposure shows a relatively small amount of variation. In general it will be remembered that male workers under 35 years of age constituted the group principally affected by the demands of war, either by induction into the armed forces or by transfer to other jobs.

Time changes in rates.-Because of the changing age composition of the exposed population, male and female rates for each year were standardized according to the estimated age distribution of male and


Figure 1.-Time changes in number of person-years of exposure for different age groups, by sex; experience of male and female employees in a public utility, 1940-44, inclusive. (Each bar for a particular year represents the total number of person-years of exposure for the year and the contribution made to that number by a particular age group.)
female employees in the United States for the week ending June 13, 1942, the approximate midpoint of the 5 -year period (11). These rates are shown in table 2. The male and female distributions for the United States are presented in the accompanying table; it will be

observed that they include a larger proportion of younger persons than the public utility distributions. Differences in the crude and standardized rates therefore reflect the increased weight given to rates yielded by the public utility employees in the younger age groups.

The age-standardized frequency and disability rates for each sex are generally increasing over the 5 years, the severity rates tending to decrease. Among males the 1944 frequency of $1,795.9$ absences per 1,000 is 52 percent higher than the rate for 1940-44 ( $1,181.8$ ), and is almost twice the corresponding rate for 1940 (902.5). Among females the 1944 frequency of $3,109.2$ is 32 percent above the rate for 1940-44 (2,354.3), and 83 percent above the corresponding rate for 1940 (1,698.6).
Less spectacular increases are shown for the standardized disability rates, the average annual number of days lost per male in 1944 being 28 percent above the disability rate for 1940-44, while the corresponding percentage excess for the females is 17.
Age changes in rates.-Variation in the morbidity rates with age is presented graphically in figure 2 for each sex and year. In general


FIGURE 2.-Age changes in morbidity rates by sex and year in which absence ended; experience of male and female employees in a public utility, 1940-44, inclusive. (Logarithmic vertical scale.)
it will be observed that the frequency of 1-day or longer disabilities among both males and females tends to decrease with increasing age. For the 5-year period, 1940-44, the rates for males drop from 1,426.0 absences per 1,000 under 25 years of age to $1,053.0$ absences per 1,000 for males 45-54 years of age, rising slightly to $1,083.6$ for males in the oldest age group. Among females the rates for the 5 -year period decrease with age from $3,328.4$ absences per 1,000 females under 25 to $1,718.9$ absences per 1,000 females $45-54$ years of age, the female frequency also rising slightly in the oldest age group.

Although absence frequency tends to decrease with age, the average duration of absence, reflecting the severity of disability, rises sharply, and results in an upward trend with age in the number of days lost per person. For the 5 -year period the days lost per male increase from 6.4 for the group under 25 to 18.5 for the group 55 years of age and over, the average number of days per absence rising from 4.5 to 17.1; among females approximately 11 days were lost per female in each of the three youngest age groups, the rate increasing to 16.7 for females 45-54 years of age, and to 21.1 for those 55 and over, the average duration of absence rising steadily with increasing age from 3.3 to 11.2 days.

For the 5 -year period as a whole, the frequency" and"disability rates for males in each age group were consistently lower than the corresponding rates for females, the severity rates being higher among the males.

## MORBIDITY AMONG MALES BY AGE AND CAUSE

The data for males are sufficiently extensive to permit determination of frequency, disability, and severity rates by age group and year for three broad sickness groups. The rates are given in table 3, and are presented graphically in figure 3.

Time changes in rates.-Age-standardized rates given in table 3 disclose a generally increasing absence frequency for each broad sickness group throughout the 5 -year period, the disability rates for the respiratory and nonrespiratory-nondigestive diseases also tending to increase with time. Particularly notable is the 1944 frequency of respiratory diseases, representing, on the basis of the age distribution of employed males in the United States in 1942, an average for the year of one disabling respiratory illness per male.

It will be observed in figure 3 that in many instances the 1943 and 1944 frequency rates for males in specific age groups are also relatively high. While corresponding respiratory frequencies for the 2 years are not conspicuously different, the 1944 rates for the digestive and nonrespiratory-nondigestive groups of diseases are well above the corresponding rates for 1943. The 1944 frequency of nonrespira-tory-nondigesitve diseases for males under 25 years of age is unusually
Table 3.-Morbidity rates for three broad sickness groups by age and year in which absence ended; experience of male employees in a public utility, 1940-44, inclusive ${ }^{1}$

| Year in which absence ended | Respiratory diseases |  |  |  |  |  |  | Digestive diseases |  |  |  |  |  |  | Nonrespiratory-nondigestive diseases 2 |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | All ages ${ }^{3}$ |  | Age group |  |  |  |  | All ages ${ }^{3}$ |  | Age group |  |  |  |  | All ages ${ }^{\text {2 }}$ |  | Age group |  |  |  |  |
|  | Crude | Stand- | $\begin{aligned} & \text { Under } \\ & \hline 25 \end{aligned}$ | 25-34 | 35-44 | 45-54 | 55 and over | Crude | Stand- | ${ }^{\text {Under }}$ | 25-34 | 35-44 | 45-54 | ¢ $\begin{gathered}55 \\ \text { and } \\ \text { over }\end{gathered}$ | Crude | ( $\begin{gathered}\text { Stand- } \\ \text { ard- } \\ \text { ized }\end{gathered}$ | ${ }^{\text {Under }}$ | 25-34 | 35-44 | 45-54 | -85 |
|  | A verage annual number of absences per 1,000 males |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1940-44----- | 690.8 | 713.6 | 830.6 | 762.2 | 707.4 | 621.1 | 624.7 | 195.0 | 213.9 | 309.2 | 241.2 | 188.9 | 164.7 | 154.4 | 171.3 | 171.1 | 159.5 | 130.6 | 151.3 | 191.9 | 239.7 |
| 1940. | 477.4 | 500.9 | 649.4 | 525.3 | 445.7 | 447.8 | 426.9 | 154.1 | 168.4 | 246.8 | 182.2 | 143.7 | 110.8 | 154.7 | 165.6 | 165.7 | 110.4 | 137.0 | 137.7 | 187.8 | 277.9 |
| 1941 | 559.6 | 596.7 | 789.8 | 605.5 | 529.1 | 492.3 | 563.0 | 146. 2 | 163.4 | 261.1 | 160.7 | 147. 1 | 106.5 | 137.3 | 128.8 | 128.4 | 95.5 | ${ }^{96.1}$ | 116.3 | 143.5 | 207.3 |
| 1942 | 643.2 | 685.4 | 910.8 | 748.3 | 592.2 | 570.5 | 588.7 | 192.9 | 211.0 | 318.5 | 224.0 | 181.8 | 182.5 | 160.6 | 168.3 | 160.8 | 95.5 | 119.8 | 151.5 | 204.0 | 253.5 |
| 1943 | ${ }_{935.5}^{943.2}$ | 960.3 $1,003.4$ | - 9727.3 | 1, 149.6 | 1,057.9 | 793.2 811.7 | 753.9 753.6 | 204.9 303.7 | 239.5 377.2 | 352.3 538.5 | 329.6 549.0 | 203.9 283 |  | ${ }_{189.6}^{125.7}$ | 177.0 | 180.0 | 204.5 | 152.4 | 162.5 | 194.9 | 193.7 |
| 1944 | 935.5 | 1,003.4 | 1,000.0 | 1, 372.5 | 991.6 | 811.7 | 753.6 | 303.7 | 377.2 | 538.5 | 549.0 | 283.1 | 284.8 | 189.6 | 231.9 | 298.6 | 615.4 | 200.0 | 196.7 | 231.0 | 265.4 |


| 1940-44 | A verage annual number of days per male |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 3.557 | 3.498 | 2.808 | 2.835 | 3. 494 | 3. 290 | 5. 386 | 1.380 | 1.393 | 1. 498 | 1. 162 | 1.515 | 1. 229 | 1. 594 | 3.592 | 3.371 | 0.714 | 1.343 | 2.020 | 4.365 | 9.691 |
| 1940 | 2. 507 | 2. 489 | 2.409 | 2. 253 | 2. 585 | 2.759 | 2. 467 | 1. 484 | 1.670 | 2. 273 | 1.342 | 1.484 | . 990 | 2.444 | 2.865 | 2.972 | . 786 | 1.423 | 1.830 | 3. 265 | 8.630 |
| 1941 | 3. 279 | 3. 346 | 2. 682 | 2. 502 | 3. 225 | 2.941 | 5. 801 | 1. 059 | 1.097 | 1.280 | . 707 | 1. 450 | . 701 | 1.375 | 3. 071 | 3. 159 | . 548 | 1.275 | 1.849 | 3. 204 | 10.224 |
| 1942 | 3. 126 | 3.256 | 3. 051 | 2. 385 | 2.705 | 2.758 | 5.868 | 1.457 | 1.454 | 1.261 | 1.425 | 1.419 | 1.141 | 2.099 | 3.502 | 3.330 | . 401 | 1.174 | 1.912 | 5. 161 | 9.304 |
| 1943 | 4. 483 | 4.320 | 3. 148 | 4. 427 | 4.817 | 3. 364 | 5. 940 | 1.087 | 1. 049 | 1.114 | . 848 | 1.304 | 1.144 | . 806 | 3. 908 | 3.368 | . 920 | 1. 047 | 1.990 | 6. 317 | 7.725 |
| 1944 | 4.841 | 4.502 | 3.058 | 4.227 | 4.395 | 4. 608 | 6. 540 | 1.871 | 1.709 | 1. 231 | 1.722 | 2.006 | 2. 169 | 1.363 | 4.908 | 4.216 | 1.596 | 2. 094 | 2. 591 | 4.060 | 12. 223 |
| Average number of days per absence |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1940-44. | 5.15 | 4.90 | 3.38 | 3.72 | 4.94 | . 5.30 | 8.62 | 7.08 | 6.51 | 4.85 | 4.82 | 8.02 | 7.46 | 10.32 | 20.97 | 19.70 | 4.47 | 10.28 | 13.35 | 22.75 | 40.43 |
| 1940 | 5. 25 | 4. 97 | 3.71 | 4.29 | 5.80 | 6.16 | 5. 78 | 9.63 | 9.92 | 9.21 | 7.36 | 9.97 | 8.94 | 15.80 | 17.30 | 17.94 | 7.12 | 10.39 | 13.29 | 17.38 | 31.05 |
| 1941 | 5. 264.86 | 5. 614.75 | 3.40 | 4.13 | 6.10 | 5. 97 | 10.30 | 7.24 | 6.71 | 4.90 | 4.40 | 9.85 | 6. 58 | 10.02 | 23.84 | 24.60 | 5. 73 | 13.27 | 15.91 | 22.32 | 49.32 |
| 1942 |  |  | 3. 35 | 3.19 | 4. 57 | 4.83 | 9. 97 | 7.55 | 6.89 | 3.96 | 6.36 | 7.81 | 7.02 | 13.07 | 20.80 | 20.71 | 4. 20 | 9.80 | 12.62 | 25.30 | 38.70 |
| 1943 | $\begin{aligned} & 4.75 \\ & 5.17 \end{aligned}$ | $\begin{array}{r} 4.50 \\ 4.49 \end{array}$ | 3. 22 | 3.85 | 4. 55 | 4. 24 | 7.88 | 5.30 | 4.38 | 3.16 | 2.57 | 6.40 | 7.18 | 6.42 | 22.58 | 18.71 | 4. 50 | 6.87 | 12.25 | 32.41 | 39.88 |
| 1944 |  |  | 3.06 | 3.08 | 4.43 | 5.68 | 8.68 | 6. 16 | 4.53 | 2.29 | 3. 14 | 7.08 | 7.62 | 7. 19 | 21.16 | 14.12 | 2.59 | 10.47 | 13.18 | 17.58 | 46.05 |
| The number of days of disability is the number of calendar days from the date $\begin{aligned} & \text { A Age-standardized according to estimates of male employment in the United States } \\ & \text { fonce began to the date absence ended, or to the 372d day, inclusive. } \\ & \text { Includes filldefined and unknown causes. }\end{aligned}$ freek ending June 13, 1942 (11). |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



Figure 3.-Age changes in morbidity rates for three broad sickness groups by year in which absence ended; experience of male employees in a public utility, 1940-44, inclusive. (Logarithmic vertical scale.)
high since the absences yielding this rate include 18 attacks of malaria suffered by one individual.

Age changes in rates.-In spite of the yearly variation in the rates for a particular age and sickness group, figure 3 reveals, in general, certain clearly defined age trends. To facilitate a comparison of these trends, figure 4 presents the rates for the 5 years combined for each broad sickness group and for all causes. The following discussion is based primarily on figure 4, but the relationships are also valid for a number of the individual years.

Over half of the disabilities recorded for males in any age group is attributed to respiratory illness, the curve of the frequency rates paralleling the curve of the rates for all causes, and tending to decrease with increasing age. A decrease with age, but at a more rapid rate, is also shown in the frequency of digestive diseases. The behavior of the frequency of nonrespiratory-nondigestive diseases is unique in that the rate increases from 130.6 for males $25-34$ years of


Figury 4.-Age changes in morbidity rates for three broad sickness groups; experience of male employees in a public utility, 1940-44, inclusive. (Logarithmic vertical scale.)
age to 239.7 for males 55 and over. For males under 45 the digestive diseases ranked second to the respiratory in frequency, but for males in the two oldest age groups, the nonrespiratory-nondigestive diseases assumed second place.

The nonrespiratory-nondigestive disability rates reveal an even more striking change with age, rising from 0.7 day per male for the group under 25 years of age to 9.7 days per male for the group 55 and over. For the youngest age group these diseases caused less lost time than either of the other two sickness groups, accounting for less than 15 percent of the total time lost by males under 25 . For males 45 and over, on the other hand, the nonrespiratory-nondigestive diseases resulted in more days of disability than either of the other two sickness groups, accounting for more lost time among males 55 and over than all other causes of disability combined.

The severity rates for each sickness group tend to increase with age, the rates for the nonrespiratory-nondigestive diseases again exhibiting the most rapid rise. The respiratory group of diseases yielded the shortest average absence duration for males in each age group, while with the exception of the group under 25 the longest average duration of absence was recorded for the nonrespiratory-nondigestive diseases.

## MORBIDITY AMONG MALES BY AGE AND DURATION

A further investigation of age changes in frequency and duration of disability is made possible by the use of table 4 which presents for males the frequency of absences due to all causes disabling for 1 to 3 days, 4 to 7 days, and 8 days or longer. The rates are shown graphically in figures 5 and 6.

Table 4.-Prequency of absences due to sickness and injuries disabling for 1 to 3 calendar days, 4 to 7 calendar days, and 8 calendar days or longer, by age and year in which absence ended; experience of male employees in a public utility, 1940-44, inclusive

| Year in which abeence ended | A verage annual number of absences per 1,000 males |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | All ages ${ }^{\text {1 }}$ |  | Age group |  |  |  |  |
|  | Crude | $\begin{aligned} & \text { Standard- } \\ & \text { ized }^{2} \end{aligned}$ | Under 25 | 25-34 | 35-44 | 45-54 | 55 and over |
|  | Absences of 1-3 calendar days |  |  |  |  |  |  |
| 1040-44....... | 681.7 | 738.5 | 1,034. 5 | 810.7 | 667.4 | 608.3 | 539.4 |
| 1940 | 454.2 | 491.2 | 707.8 | 513.3 | 414.3 | 393.2 | 418.3 |
| 1941................ | 480.7 | 534.7 | 853.5 | 575.3 | 442.5 | 385.8 | 395.0 |
| 192. | 666.5 | 722.6 | 1,031.8 | 816.0 | 588.4 | 598.7 | 552.1 |
| 1943 | 870.1 | 975.8 | 1,386. 4 | 1,180.0 | 922.9 | 728.8 | 575.8 |
| 1944..--------...- | 1,063.1 | 1,318.8 | 1,961.6 | 1,796. 1 | 1,053.0 | 935.1 | 718.0 |
|  | Absences of 4-7 calendar days |  |  |  |  |  |  |
| 1940-44....-. | 267.9 | 266.2 | 253.3 | 272.2 | 276.0 | 250.3 | 278.3 |
| 1940...-.-.-.-.--- | 248.7 | 251.1 | 259.7 | 277.9 | 222.2 | 245.6 | 249.3 |
| 1941 | 258.0 | 284.3 | 299.3 | 248.2 | 269.3 | 239.2 | 286.1 |
| 1942 | 238.4 | 242.9 | 254.8 | 230.9 | 237.3 | 220.5 | 276.1 |
| 1943 | 341.9 | 317.7 | 181.8 | 376.7 | 374.6 | 308.5 | 335.1 |
| 1944. | 264.2 | 255.0 | 211.5 | 268.6 | 288.7 | 240.5 | 263.0 |
|  | Absences of 8 calendar days or longer |  |  |  |  |  |  |
| 1940-44.-...-- | 182.8 | 177.1 | 138.2 | 129.9 | 173.9 | 196.4 | 265.9 |
| 1940...---.-.-...- | 155.9 | 160.2 | 149.4 | 139.7 | 147.3 | 147.7 | 229.2 |
| 1941...............- | 157.7 | 158.4 | 108.3 | 106.2 | 143.5 | 163.6 | 296.9 |
| 1942.......---...-- | 170.8 | 164.8 | 121.0 | 125.0 | 159.1 | 199.0 | 236.6 |
| 1943 | 209.1 | 197.2 | 159.1 | 152.4 | 208.0 | 218.6 | 261.8 |
| 1944. | 237.7 | 222.1 | 211.5 | 145.1 | 2<1. 8 | 254.8 | 298.6 |

[^2]

FIGURE 5.-Age changes in frequency of absences due to sickness and injuries disabling for $\mathbf{1}$ to $\mathbf{3}$ calendar days, 4 to 7 calendar days, and 8 calend ${ }^{2}$ days or longer, by year in which absence ended; experiance of male employees in a public utility, 193034, inclusive. (Logarithmic vertical scale.)


Figure 6.-Age changes in frequency of absences due to sickness and injuries disabling for 1 to $\mathbf{3}$ calendar davs, 4 to 7 calendar days, and 8 calendar days or longer; experience of male employees in a public utility 1940-44, inclusive. (Logarithmic vertical scale.)

Time changes in rates.-Age-standardized frequency rates given in table 4 reveal that increases in the male rate previously observed for disabilities of 1 day or longer reflect primarily increases in the frequency of 1-3-day absences, the 1944 rate being over two and onehalf times the corresponding rate for 1940.

With the exception of the 1940 and 1941 rates for the two oldest age groups, the five annual age curves shown in figure 5 for absences of 1 to 3 days are distinct, each curve lying above the one for the preceding year. Attention is directed to the fact that the greatest relative increase with time is recorded for males in the two youngest age groups, while the smallest relative increase is shown for males 55 years of age and over.

Age changes in rates.-An examination of figures 5 and 6 discloses differing age trends for absences of each duration group. For absences of 1 to 3 days, denoting relatively slight severity of disability, the frequencies decrease with advancing age, the rate of decrease being
somewhat more rapid than the corresponding rate of decrease shown for absences of all durations. The frequency of absences of 4 to 7 days' duration, indicating disability of moderate severity, remains relatively level throughout the age span, while the frequency of more serious illness disabling for 8 days or longer tends to increase with age. These findings are in harmony with the results of an earlier study covering age changes in the disability experience of the company for the years 1922-24, inclusive (2).

It will be observed in figure 6 that although the order of the three frequencies is the same for each age group, the relative magnitude of the rates varies with changing age. For males under 25 years of age the frequency of absences of 1 to 3 days is approximately four times the rate for absences of 4 to 7 days, and over seven times the rate for 8 -day or longer absences. For males 55 years of age and over the rate for absences of 1 to 3 days is only twice the rate for either of the other two duration periods, the frequency of absences of 8 days or longer approaching in magnitude the frequency of absences of 4 to 7 days.

## COMMENT

An examination of the crude annual rates for all ages raises the question of the factors responsible for the relatively high frequency and disability rates experienced in recent years. In the absence of additional information reference might be made to a number of possible factors, such as a shift in the age distribution of the exposed population, or some other change in the wartime composition of the employed group. The availability of information on age permits the investigation of the operation of some of these factors.

Factors affecting male employees.-The five annual age distributions reveal notable changes occurring in the age composition of the exposed males, beginning principally in 1942. Between January 1 of that year and December 1 of the following year the company lost 20 percent of its male employees, the number on the payroll dropping from 2,682 to 2,155 . The number of males under 35 years of age decreased in the same period from 792 to 319 , representing a drop of 60 percent, while the number of males 35 and over changed from 1,890 to 1,836 , or a decrease of only 3 percent.

Nevertheless the changing age composition of the male employees does not appear to be responsible for the relatively high frequency rates experienced in 1943 and 1944. Among the public utility workers the frequency of 1 -day or longer absences due to sickness and injuries tended to decrease rather than to increase with age. If the absence frequency for males in each age group had remained constant over the 5 -year period, the increasing contribution of the older workers would have resulted in a total rate tending to decrease with time. Thus the agestandardized rate for each year, based on the summation of age-specific rates weighted according to the relatively younger distribution of employed males in the United States in 1942, is higher than the corresponding crude rate. Furthermore, for males in each age group the frequency of 1-day or longer absences was increasing over the 5 -year period, the 1944 rate being relatively more excessive for the younger males. The age-standardized rates, giving greater weight to the rates for younger males, show a relatively greater increase with time than do the corresponding crude rates. It appears therefore that some factor or factors apart from the age composition of the exposed population, and possibly originating in the war emergency effected the increased frequency rates for males in recent years.

It is of interest to speculate on the reasons for the greater susceptibility of the younger males to these adverse factors. It seems plausible that the 60 -percent decrease occurring in the number of males under 35 years of age during the war years may represent the loss of the more physically fit members of the group, the remaining men constituting an adverse selection from the standpoint of physical condition.

The time changes in the annual disability rates for males of all ages result principally from the increasing number of absences, since any increase in frequency tends to be accompanied by increases in the total time lost. In the instance of the male workers the percentage increase in the disability rates is less than the corresponding increase in frequency, since the rising absence frequency reflects primarily increases in absences of relatively short duration, namely, those of 1 to 3 days.

The age factor, however, cannot be disregarded in a consideration of time lost. Although absence frequency tended to decrease with advancing age, an upward trend was shown in the annual number of days lost per male. In recent years the shifting age composition of the exposed population gives greater weight to the rates yielded for the older males, and some part of the increase in the disability rate may be attributed to the increased contribution of the older group. Thus the 1944 disability rate, unadjusted for age, is 74 percent above the corresponding rate for 1940 , while the percentage excess for the age-standardized rates is 50 .

Factors affecting female employees.-The total number of females remained relatively stable ethroughout the 5 years, but a noteworthy reversal occurred in the proportions in the two groups under 35 years of age. The number of females under 25 doubled in the 2 years from January 1942 to December• 1943, a large increase occurring in the number under 20 years of age. The group of females 25 to 34 years of age, on the other hand, was decreasing throughout the 5-year period, the number on the pay roll in December 1943 being less than half the number on the pay roll in January 1940.

Among females in each age group the frequency of absences increased in recent years, possibly indicating the presence of adverse factors during the war. Nevertheless the unusually high rates among females under 25 years of age in 1942-44 may be affected to a great extent by the relatively large group of females under 20 years of age who entered the company in those years and being inexperienced found, perhaps, some difficulty in becoming adjusted to the routine of business life. In general for both males and females this factor of adjustment may be an effective one in determining the decrease with age in the frequency of minor disabilities.

## SUMMARY

An analysis is presented of the 1-day or longer disability experience of male and female employees of a public utility company for the 5 years 1940-44. Variation in three basic morbidity rates is examined in respect of a number of variables, particular attention being given to the age factor. The results may be briefly summarized as follows:
(1) During the 5 years the total number of male-years of exposure decreased from 2,700 in 1940 and 1941 to less than 2,100 in 1944, reflecting primarily marked decreases in the number of males under 35 years of age.
(2) Frequency and disability rates, standardized for age, were generally increasing over the 5 -year period for both males and females, the severity rates tending to decrease.
(3) Time-changes in the frequency rates were relatively greater than time-changes in the disability ratea since the increased absence frequencies reflect principally an increased number of absences of relatively short duration.
(4) In general, the frequency of 1-day or longer absences for both males and females decreased with advancing age, but the relative severity of disability, as indicated by absence duration, increased, resulting in an upward trend with age in the annual number of days lost per person.
(5) For the 5 -year period as a whole the frequency and disability rates for males in each age group were lower than the corresponding rates for females, the severity rates being higher among males.
(6) Over half of the disabilities recorded for males in any age group was accounted for by respiratory illness. For males under 45 the digestive diseases ranked second in frequency, while for males 45 and over the nonrespiratory-nondigestive diseases assumed second place.
(7) The nonrespiratory-nondigestive diseases constituted the only sickness group among males revealing an upward trend with age in absence frequency. Days lost per male from these causes showed a spectacular rise with age increasing from 0.7 day for the group under 25 years of age to 9.7 days for the group 55 and over.
(8) The severity rates for each sickness group tended to increase with age, the rates for the nonrespiratory-nondigestive diseases showing the most rapid rise.
(9) The respiratory group of diseases yielded the shortest average absence duration for males in each age group while, with the exception of the group under 25 years of age, the longest average duration was recorded for the nonrespiratory-nondigestive group of causes.
(10) Although the frequency of 1 -day or longer absences generally decreased with age, an upward trend was shown in the frequency of the more serious illnesses disabling for 8 calendar days or longer.

## ACKNOWLEDGMENTS

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## REFERENCES

(1) Brundage, D. K.: A 10 -year record of absences from work on account of sickness and accidents. Experience of employees of the Edison Electric Illuminating Company of Boston [Boston Edison Company], 1915 to 1924, inclusive. Pub. Health Rep., 42: 529-550 (Feb. 25, 1927). (Reprint No. 1142.)
(2) Brundage, D. K.: Sickness among persons in different occupations of a public utility. Pub. Health Rep., 43: 314-335 (Feb. 10, 1928). (Reprint No. 1207.)
(3) Brundage, D. K.: Trend of disabling sickness among employees of a public utility. Pub. Health Rep., 43: 1957-1984 (July 27, 1928). (Reprint No. 1239.)
(4) Gafafer, W. M., and Frasier, Elizabeth S.: Frequency and duration of disabilities causing absence from work among the employees of a public utility, 1933-1937. Pub. Health Rep., 53: 1273-1288 (July 29, 1938). (Reprint No. 1963.)
(5) Gafafer, W. M.: Time lost by industrial workers from disabling sickness and accidents during the early days of disability. Am. J. Pub. Health, 29: 359-370 (April 1939).
(6) Gafafer, W. M.: Frequency and duration of disabilities causing absence from work among the employees of a public utility, 1938-41. Pub. Health Rep., 57: 625-627 (Apr. 24, 1942). (Reprint No. 2373.)
(7) Gafafer, W. M., and Frasier, Elizabeth S.: Studies on the duration of disabling sickness. II. Duration of disability from sickness and nonindustrial injuries amóng male workers, disabilities lasting one calendar day or longer. Pub. Health Rep., 57:1378-1384 (Sept. 11, 1942). (Reprint No. 2404.)
(8) Gafafer, W. M.: Frequency and duration of disabilities causing absence from work among the employees of a public utility, 1938-42. Pub. Health Rep., 58: 1554-1560 (Óct. 15, 1943). (Reprint No. 2520.)
(9) Gafafer, W. M., and Sitgreaves, Rosedith: Studies on the duration of disabling sickness. V. Frequency of short-term absences and its relation to total frequency. Pub. Health Rep., 59: 1077-1085 (Aug. 18, 1944). (Reprint No. 2572.)
(10) Gafafer, W. M., and Sitgreaves, Rosedith: Studies on the duration of disabling sickness. VI. Time lost from short-term absences and its relation to total time lost. Pub. Health Rep., 59: 1311-1320 (Oct. 6, 1944). (Reprint No. 2579.)
(11) U. S. Department of Commerce, Bureau of the Census: The Labor Force Bulletin. LFB No. 6 (July 1945). (Processed.)

## DENTAL CARIES EXPERIENCE IN RELOCATED CHILDREN EXPOSED TO WATER CONTAINING FLUORINE ${ }^{1}$

## I. INCIDENCE OF NEW CARIES AFTER 2 YEARS OF EXPOSURE AMONG PREVIOUSLY CARIES-FREE PERMANENT TEETH

By Ienry Klein, Senior Dental Officer, United States Public Health Service

In the course of systematic dental examination of persons of Japanese ancestry residing in War Relocation Authority centers, two groups of children at two different centers were examined in the summer of 1943 and again in the summer of 1945.2 Early in 1942 both groups, because of their Japanese ancestry, had been transferred with

[^3]their parents from homes in Los Angeles and environs to an assembly center near Los Angeles. In the autumn of 1942 they were again transferred, 120 to a center in California and 196 to Arizona.

The children relocated to the California center consumed fluoridefree water originating from melted snows coming off a precipitous mountain rising to a height of more than 14,000 feet, less than 20 miles from the residence area. Analysis of this water revealed a fluorine content of 0.1 p. p. m., a value within the error of measurement. The children relocated to the Arizona center consumed water originating from two deep wells drilled through the desert floor to a depth of approximately 400 feet. .This water contained fluorine to the extent of 3 p. p. m. Water from the central source was piped to each family apartment in both centers.

Because of the relatively high fluorine content of the water in the Arizona center, an attempt was made by the Relocation Authority to remove the fluorides. Bone-meal filters were installed only at selected water outlets to which the population had to travel to obtain fluoridefree drinking water. After a trial of several months, treatment of the water in this manner was discontinued. Bottled fluorine-free waters were shipped into the center and sold to residents who reserved such water chiefly for the preparation of dietary formulae for infants. The children of school age obtained their drinking water from the nearest tap, which provided water containing fluorine (except during the 3month period mentioned above, when fluorine-free water could be obtained, if so desired, at several selected outlets).

In the early summer of 1943, the school children were examined with the aid of dental mirrors and explorers; the same children were reexamined 2 years later in the summer of 1945. All examinations were recorded by the methods previously utilized in the Hagerstown Dental Studies. ${ }^{3}$ During the 2-year interval, the children were restricted to their respective centers, since movement in and out was controlled by military authority. Their diets were quite similar and adequate.

Analysis of the dental findings obtained in 1943 and in 1945 reveals that a fluorine content of $3 \mathrm{p} . \mathrm{p} . \mathrm{m}$. in the drinking water is associated with a marked reduction in new caries in teeth present in the mouth and free of.caries at the beginning of exposure.

## FINDINGS

During the 2-year interval between 1943 and 1945, the 196 children were exposed to fluoride water in the Arizona Relocation Center and 120 consumed fluoride-free water in the California center. Distribution by sex and age is shown in table 1.

[^4]Tazw 1. -Number of pormanont teelh free of dental caries experience among 316 children examined in 1943 in \& relocation centers, by age and sex

| 60t | Wetar 1 | Ast in yeers, summer 1043 |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 8 | 9 | 10 | 11 | . 18 | 13 | 14 | All age |
| $\begin{aligned} & \text { Boys. } \\ & \text { Ciris. } \end{aligned}$ |  | Number of ehildran |  |  |  |  |  |  |  |
|  |  | 144177 | 1710169 | 2141410 | $\begin{array}{r} 12 \\ 10 \\ 9 \\ 7 \end{array}$ | 1282013 | 1261313 | 710139 | 961810168 |
|  |  |  |  |  |  |  |  |  |  |
|  |  | Nümber of carieoiree permanent teoth, 1043 |  |  |  |  |  |  |  |
| Boys <br> Girls | Fluoride group. Control group..... <br> $\left\{\begin{array}{l}\text { Thuortal group.... } \\ \text { Control group...- }\end{array}\right.$ | 49168828 | $\begin{gathered} 134 \\ { }_{00}^{136} \\ { }_{81}^{184} \end{gathered}$ | $\begin{gathered} 217 \\ 32 \\ 185 \\ 185 \end{gathered}$ | $\begin{aligned} & 180 \\ & 196 \\ & 137 \\ & \hline 87 \end{aligned}$ | $\begin{aligned} & 202 \\ & 131 \\ & 342 \\ & 2220 \end{aligned}$ | $\begin{aligned} & 243 \\ & 115 \\ & 244 \\ & 224 \end{aligned}$ | $\begin{aligned} & 153 \\ & 202 \\ & 208 \\ & 204 \end{aligned}$ | 1, 1581111,491,021 |
|  |  |  |  |  |  |  |  |  |  |
|  | (Finoride groap.-.- | Number of earies-tree permanent teeth per child, 1933 |  |  |  |  |  |  |  |
| Boys...--....-- |  | 3.5 | 7.9 6.9 | $\begin{array}{r} 10.3 \\ 8.0 \end{array}$ | $\begin{aligned} & 13.8 \\ & 12.8 \end{aligned}$ | 16.8 16.4 | 20.3 19.2 | ${ }_{22.2}^{21.9}$ |  |
| Girls. | \{Fiuoride groap.... | 5.2 3.6 | 8.2 9.0 | $\begin{aligned} & 11.1 \\ & 11.8 \end{aligned}$ | 15.2 12.4 | 17.1 | $\begin{aligned} & 21.1 \\ & 21.5 \end{aligned}$ | 24.9 22.7 | 214.7 214.1 |

${ }^{1}$ The water at the Arivona center contained $8 \mathrm{p} . \mathrm{p} . \mathrm{m}$. of fluorine; that at the California center was fluorine free.
${ }^{2}$ Arthmetic average of 7 agespecific rates to-14 years).
At the time of the first examination in 1943, the boys as well as the girls of the two areas were quite similar with regard to the number of caries-free permanent teeth present in the mouth. The boys and girls destined to reside in the fluoride area had an average of 13.4 and 14.7 caries-free permanent teeth, respectively, and the boys and girls in the control area, 12.8 and 14.1 (fig. 1).

After a 2 -year residence in their respective areas, the 2 groups of children showed a marked difference in the number of teeth newly attacked by caries (see table 2 and fig. 2). For example, in the fluoride area, boys who were 8 years old in 1943 developed about 22 new DMF (decayed, missing, or filled) teeth per 100 caries-free permanent teeth present in the mouth at the first examination in 1943. In contrast, boys of the same age in the control area developed about 44 new DMF teeth per 100 caries-free permanent teeth. The corresponding values for girls 8 years old in 1943 were: 15 DMF for the fluoride group, and 36 DMF for the control group.

As shown in figure 2, the absolute differences in incidence of new caries between the Glaoride and control groups tend to diminish with advancing age for both the girls and the boys. The differences became small and variable beginning at about 12 years of age in boys and at about 11 years of age in girls. In the fluoride area new caries was inhibited to a greater extent in the younger children-those 8 ,


Figure 1.
Table 2.-Number of permanent teeth free of dental caries experience in 1943 thät showed evidence of caries experiences in 1945 among 316 children in 2 relocation centers, by age and sex

| Sex | Water ${ }^{1}$ | Age in years, summer 1943 |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 8 | 9 | 10 | 8-10 | 11 | 12 | 13 | 14 | $\underset{\text { ages }}{\text { All }}$ |
|  |  | Number of caries-free permanent teeth, 1943 |  |  |  |  |  |  |  |  |
| Boys. | Fluoride group Control group | 49 16 | 134 69 | 217 32 | 400 117 | 160 126 | 202 131 | 243 115 | 153 222 | 1,158 |
| Girls. | $\left\{\begin{array}{l}\text { Fluoride group } \\ \text { Control group. }\end{array}\right.$ | 88 25 | 123 81 | 155 118 | 366 224 | 137 87 | 342 226 | 274 280 | 323 204 | 1,442 |
|  |  | Number of teeth unaffected 1943 but affected 1945 |  |  |  |  |  |  |  |  |
| Boys. | Fluoride group <br> Control group. | 11 7 | 18 23 | 25 12 | 54 42 | 14 28 | 20 8 | 18 | 31 <br> 28 | 137 119 |
| Girls. | Fluoride group Control group. | 13 9 | $\stackrel{20}{23}$ | $\stackrel{13}{32}$ | 46 64 |  | 42 30 | 25 49 | 35 43 | 168 198 |
|  |  | Number of teeth affected 1945 per 100 teeth unaffected 1943 |  |  |  |  |  |  |  |  |
| Boys.- | $\left\{\begin{array}{l}\text { Fluoride group } \\ \text { Control group }\end{array}\right.$ | 22.4 43.8 | 13.4 33.4 | 11.5 37.5 | 215.8 238.2 | 8.8 22.2 | 9.9 6.1 | 11.4 | 20.3 12.6 | $\begin{array}{ll} 3 & 13.4 \\ 3 & 23.8 \end{array}$ |
| Girls. | Fluoride group Control group. | $\begin{aligned} & 14.8 \\ & 36.0 \end{aligned}$ | 16.3 28.4 | 8.4 27.1 | 213.2 230.5 | 14.6 13.8 | $\begin{aligned} & 12.3 \\ & 13.3 \end{aligned}$ | 9.1 17.5 | 10.8 21.1 | $\begin{aligned} & \begin{array}{l} 3 \\ 322.3 \\ 32.5 \end{array} \end{aligned}$ |

[^5]9, and 10 years of age when first exposed to fluoride. In the fluoride group, boys 8 to 10 years of age at the time of the first examination developed in the subsequent 2 -year period an average of about 16


Fiqure 2.
new DMF teeth per 100 caries-free teeth present in 1943. Boys of similar age in the control group developed over twice as many new DMF teeth (38.2). Girls 8 to 10 years of age showed nearly the same results, averaging in the fluoride group about 13 new DMF teeth per 100 previously unaffected as compared with about 30 such teeth in the control group. Caries incidence in children who were over 11 years of age in 1943 was not affected significantly by either the presence or absence of fluorine in drinking water.

These findings lead to the conclusion that, among young children (ages 8 to 10 years) transferred to an area where the drinking water contained $3 \mathrm{p} . \mathrm{p} . \mathrm{m}$. of fluoride, the incidence of new caries experience in previously noncarious erupted teeth was reduced approximately 60 percent below that which would be expected on the basis of the incidence observed in the control group. The data are sufficient to indicate that exposure of the erupted permanent teeth of younger children to fluoride waters provides a larger measure of protection against caries than does the same exposure of the erupted teeth of older children. It follows therefore that, among teeth present in the mouth at the beginning of exposure to fluorine, those most recently erupted were those most protected against caries attack. ${ }^{4}$
The findings reported here are not intended to constitute an endorsement for addition of as much as $3 \mathrm{p} . \mathrm{p} . \mathrm{m}$. of fluorine to community water supplies for the purpose of reducing caries incidence. However, the data provide information showing that addition of

[^6]small amounts of fluorine to community water supplies deficient in this element effects a reduction in caries incidence in the erupted permanent teeth of residents of school age; and that such caries inhibition is most noticeable in the erupted teeth of the younger children.

## MALARIA

## Numbers of Cases Reported by State Health Officers, January-June, 1945, as Compared With Data for the Same Period 1939-44 ${ }^{1}$

In the accompanying table, an attempt has been made to record separately for the first 6 months of 1944 and 1945 cases of malaria in which the infection was acquired within and outside continental United States. At the time of publication of a similar report for the first 4 months of 1945 and certain prior yeans ${ }^{2}$ information regarding the origin of infection in cases for 1944 was not available. This has now been furnished for several States in the Annual Summaries, and the period has been extended to cover the first balf year. The figures for the years 1939 through 1942 may be considered as cases in the civilian population contracted within the United States; those for 1943 probably include a few cases in the military population, in which the infection was acquired outside the United States. For both 1944 and 1945, cases stated to be in the military are considered as having been contracted outside the United States. In less than one-tenth of 1 percent of the malaria cases reported among Army personnel in the United States during the first six months of 1945 the infection was stated to have been acquired in the United States.

In tabulating the data for the first 6 months of 1944, it was necessary to prorate the differential distribution for some States ${ }^{3}$ with respect to origin of the case on the basis of the totals for the year. The separation of most of the cases according to the origin of the infection was made in the annual reports for 1944 but not in the monthly reports on which this note is based, Therefore, while the distribution by origin for the first 6 months of 1944 is approximate in such instances, it is believed that the proportional figures may be considered reasonably accurate for all practical purposes. In cases where the information regarding the origin of infection was not furnished or was not determinable, by the above method of allocation the figures have been recorded in the column headed "Information not supplied."
For the first 6 months of 1945 most of the State health officers

[^7]$1468$


1 In the table published in the P Pbic Hzalut Reporrs for Aug. 31,1945 (p. 1020), the figures for 1044 were taken from the monthly reports, in which information regarding origin of
infection was not available. Tho figures used here are from the Annual Summaries for 1939, 1942, and 1944 ; for the other years, they are from the monthly reports, which, although provisional, will agree fairly closely with the final annual summaries in most instances.
have reported cases in their monthly reports either as requested (i. e., contracted within and contracted outside the United States), or have furnished the information separately for the military and civilian populations. The figures for cases in which the infection was reported to have been acquired outside the United States, or which were stated to have occurred in the military, may be compared with the confidential figures furnished by the Army; such a comparison indicates that some States are not receiving complete reports of such cases or are not reporting them to the Public Health Service.

No information is furnished in these reports as to the numbers of cases that are original infections and the numbers that are relapses. Probably many of the cases reported in the civilian population early in the year are relapses, while a larger proportion of those reported during the summer and fall are probably original infections. Also, in comparing the figures prior to 1942 with these for later years, consideration should be given to the possible effect, on reporting, of the withdrawal of large numbers of physicians for duty in the armed services. This may have resulted in proportionately fewer cases of malaria being seen and therefore reported by physicians during recent years.

The figures as reported by the State health officers indicate that there has been no increase in indigenous malaria in the United States during the first 6 months of 1945, even when the numbers of cases for which the origin is not stated are combined with those for cases reported as having acquired the infection in this country. Many of the States reported fewer such cases during the first half of 1945 than for the same period during the years 1939 to 1942, e. g., New York, Illinois, Kansas, Georgia, Florida, Tennessee, Alabama, Mississippi, Arkansas, Texas, Arizona, and California. A few States reported a slightly higher incidence during the first 6 months of 1945 than in earlier years, namely, Rhode Island, Connecticut, New Jersey, Louisiana, Kentucky, and Montana; but several of these States reported fewer than 10 cases during that period.

While these provisional figures for the first half of 1945 indicate a decrease for the country as a whole in malaria cases acquired in the United States as compared with the years 1939 to 1942, final conclusions with respect to the relative situation in the several States will have to await more nearly complete reports and possibly the consideration of changes in the composition of the population, as well as other factors.

It may be of interest to note that during the years 1939 to 1941, inclusive, approximately 70 percent of the cases of malaria were reported during the second half of the year. A report for the whole of 1945 will be prepared as soon after the end of the year as the monthly reports from the States are available.

## DEATHS DURING WEEK ENDED NOVEMBER 10, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

|  | Week ended <br> Nov. 10, 1945 | Corresponding week, 1944 |
| :---: | :---: | :---: |
| Data for 91 large cities of the United States: |  |  |
| Total deaths-........... | 8,888 88 8 | 8,531 |
| Total deaths, first 45 weeks of year | 399,302 | 400,404 |
| Deaths under 1 year of age. | 596 | 576 |
| Average for 3 prior years | 611 |  |
| Deaths under 1 year of age, first 45 weeks of year | 27,045 | 27,700 |
| Dats from industrial insurance companies: |  |  |
| Policies in force | $67,298,659$ 11,112 | 66, 882,764 |
| Death claims per 1,000 policies in force, annual rate | ${ }^{1} 8.6$ | 11.3 |
| Death claims per 1,000 policies, first 45 weeks of year, annual rate.... | 10.0 | 10.0 |

## PREVALENCE OF DISEASE

## No health department, State of local, can effectively prevent or control disease without khowledge of when, where, and under what conditions cases are occurring

## UNITED STATES

## REPORTS FROM STATES FOR WEEK ENDED NOVEMBER 17, 1945

## Summary

For the country as a whole the incidence of poliomyelitis declined during the week. A total of 255 cases was reported, as compared with 329 last week, 289 for the corresponding week last year, and 205 for the 5 -year (1940-44) median. Increases occurred in 6 of the 10 States reporting more than 7 cases each, as follows (last week's figures in parentheses): Increases-Massachusetts 18 (14), New Jersey 12 (9), Ohio 12 (7), Missouri 25 (5), Texas 10 (9), Washington 14 (13); decreases=New York 18 (34), Pennsylvania 5 (19), Wiscon$\sin 18$ (53), California 38 (44). The cumulative total is 12,926 , as compared with 18,491 for the corresponding period last year and a 5 -year median of 9,200 .

A total of 107 cases of meningococcus meningitis was reported, as compared with 104 last week and a 5 -year median of 64 . Of the current total, 46 cases occurred in 5 States, as follows: New York 10 Pennsylvania and Illinois 8 each, Texas 9, and California 11. The total to date is 7,314 , as compared with 14,985 for the corresponding period last year, and a 5 -year median of 3,103 .

Of the total of 4,146 cases of influenza, as compared with 2,837 last week, 1,863 for the corresponding week last year and 1,769 for the 5 -year median, 3,155 cases ( 76 percent of the total) were reported in 4 States, as follows (last week's figures in parentheses): Virginia 400 (159), South Carolina 842 (506), Alabama 278 (21), Texas 1,635 $(1,609)$. For the corresponding week last year these same States reported an aggregate of 1,529 cases, or 82 percent of the total.

Delayed information from Iowa reported 246 cases of undulant fever, dates of occurrence not stated. Total cases reported to date for the country as a whole, 4,457 as compared with 3,549 for the same period last year.

Two cases of anthrax were reported during the week, one each in New York and New Jersey.

Deaths recorded for the week in 93 large cities of the United States totaled 8,836 , as compared with 8,974 for the preceding week, 9,143 for the corresponding week last year, and a 3 -year (1942-44) average of 9,147 . The total to date is 411,700 as compared with 412,743 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended November 17, 1945, and comparison with corresponding week of 1944, and 5-year median
In these tables a zero indicates a definite report, while leaders imply that, although none was reported cases may have occurred.


[^8]Talegraphic morbidity reports from State health officers for the week ended November 17, 1945, and comparison with corresponding week of 1944 and 6-year median-Con.


[^9]Telegraphic morbidity reports from State health officers for the week ended April 14, 1945, and comparison with corresponding week of 1944 and 5 -year median-Con.

${ }^{2}$ Period ended earlier than Saturday.
4 5-year median, 1940-44.
*Exclusive of New Mexico figures for the current week; report not received.

## WEEKLY REPORTS FROM CITIES

City reporte for week ended November 10, 1945
This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

|  | Diphtheris cases |  | Influ <br> $\begin{array}{r}8 \\ 0 \\ \hline\end{array}$ |  | Measles cases |  |  | Poliomyelitis |  | Smallpox cases |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NEW ENGLAND |  |  |  |  |  |  |  |  |  |  |  |  |
| Maine: Portland | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 3 |
| New Hampshire: | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | , | 0 | 0 | 0 |
| Now Concord....-........- | 0 | 0 | ..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vermont: | 0 | 0 |  | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Massachusetts: |  |  |  |  |  |  |  |  |  |  |  |  |
| Boston....-. .-.......- | 2 | 0 | .....- | 0 | 7 | 0 | 11 | 4 | 22 | 0 | 2 | 30 |
| Fall River | 0 | 0 | ---- | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 13 |
| Springfield | 0 | 0 |  | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 0 | 0 |
| W orcester. | 0 | 0 |  | 0 | 22 | 0 | 7 | 0 | 9 | 0 | 0 | 4 |
| Rhode Island: <br> Providence | 0 | 0 |  | 0 | 0 | 0 | 5 | 0 | 4 | 0 | 0 | 19 |
| Conneeticut: | 0 |  |  |  |  |  | 5 |  |  |  | 0 | 10 |
| Bridgeport...-.-. .-. | 0 | 0 |  | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| New Haven. | 0 | 0 |  | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 6 |
| MIDDLE ATLANTIC |  |  |  |  |  |  |  |  |  |  |  |  |
| New York: Bnffalo | 0 | 0 |  | 1 | 4 | 0 | 0 | 0 | 7 | 0 | 0 | 15 |
| New York | 8 | 2 | $\cdots$ | 0 | 4 | 10 | 51 | 8 | 67 | 0 | 1 | 83 |
| Rochester. | 0 | 0 |  | 0 | 1 | 1 | 1 | 7 | 6 | 0 | 0 | 11 |
| Syracuse. | 0 | 0 |  | 0 | 13 | 0 | 0 | 0 | 17 | 0 | 0 | 11 |
| New Jersey: |  |  |  |  |  |  |  |  |  |  |  |  |
| Camden | 0 | 0 |  | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 8 |
|  | 0 | 0 |  | 0 | 3 | 0 | 5 | 0 | 5 | 0 | 0 | 29 |
| Trenton. | 0 | 0 |  | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Pennsylvania: | 2 | 0 | 3 | 0 | 11 | 2 | 21 | 0 | 34 | 0 | 1 | 60 |
| Pittsburgh..- | 0 | 0 | 3 | 2 | 11 | 4 | 6 | 3 | 15 | 0 | 0 | 6 |
| Reading ... | 0 | 0 |  | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 0 | 20 |
| EAST NOBTH CENTRAL |  |  |  |  |  |  |  |  |  |  |  |  |
| Ohio: |  |  |  |  |  |  |  |  |  |  |  |  |
| Cincinnati. | 4 | 0 | 2 | 0 | 0 | 1 | 5 | 0 | 5 | 0 | 0 | 12 |
| Cleveland | 0 | 0 | 8 | 0 | 2 | 2 | 7 | 1 | 15 | 0 | 1 | 44 |
| Columbus. | 1 | 0 | ...--- | 0 | 1 | 1 | 4 | 0 | 16 | 0 | 0 | 2 |
| Indiana: |  |  |  |  |  |  |  |  |  |  |  |  |
| Fort Wayne.-.-.----- | 0 | 0 |  | 1 | 0 | 0 | 2 | 0 | 0 |  | 0 | 0 |
| Indianapolis.........-- | 2 | 0 |  | 0 | 0 | 1 | 5 | 0 | 10 | 0 | 0 | 17 |
| South Bend. | 0 | 0 | .... | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 |
| Terre Haute........... | 0 | 0 | ...-- | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Illinois: |  |  |  |  |  |  |  |  |  |  |  |  |
| Chicago | 0 | 0 | -.-- | 0 | 116 | 7 | 18 | 5 | 49 | 0 | 0 | 77 |
| Springfield...---------- | 0 | 0 | -..-- | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| Michigan: |  |  | - |  |  |  |  |  |  |  |  |  |
| Detroit | 4 | 0 | --.- | 1 | 21 | 1 | 10 | 1 | 39 | 0 | 0 | 71 |
| Flint ----. | 0 | 0 |  | 0 | 6 | 0 | 5 | 0 | 1 | 0 | 0 | 0 |
| Grand Rapids. .-.---- | 0 | 0 | -.....- | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 3 |
| Wisconsin: |  |  |  |  |  |  |  |  |  |  |  |  |
| Kenosha | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Milwaukee. | 0 | 0 | ------ | 0 | 1 | 1 | 0 | 3 | 9 | 0 | 0 | 12 |
| Racine... | 0 | 0 |  | 0 | 2 | 0 | 0 | 0 | 5 | 0 | 0 | 8 |
| Superior-------------------- | 0 | 0 |  | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 3 |
| WEST NOBTH CENTRAL |  |  |  |  |  |  |  |  |  |  |  |  |
| Minnesota: |  |  |  |  |  |  |  |  |  |  |  |  |
| Duluth | 1 | 0 |  | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 1 |
| Minneapolis...-.-.--- | 4 | 0 |  | 0 | 2 | 0 | 4 | 2 | 8 | 0 | 0 | 5 |
| Missouri: |  |  |  |  |  | 0 |  |  |  |  |  |  |
| Kansas City | 1 | 0 |  | 1 | 1 | 0 | 4 | 0 | 14 | 0 | 0 | 1 |
| St. Joseph............. | 0 | 0 | $\cdots-$ | 0 | 6 | 0 | 0 | 0 | 10 | 0 | 0 | 0 |

City reports for week ended November 10, 1945-Continued

|  |  |  | $\begin{gathered} \text { Inflt } \\ \hline \\ 8 \\ \hline \% \end{gathered}$ |  | $\begin{aligned} & \% \\ & \% \\ & \text { \% } \\ & \text { \& } \\ & \text { Z } \\ & \text { E } \end{aligned}$ |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| WEST NORTH CENTRAL-continued |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Wichita | 0 | 0 | --- | 0 | 1 | 0 | 0 3 | 0 | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | 0 | 0 | 0 |
| SOUTH ATLANTIC |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Maryland: |  |  |  |  |  |  |  |  |  |  |  |  |
| Baitimore............- | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 3 |
| Frederick | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lynchburg -.........- | 0 | 0 |  | 0 | 0 | 0 | 1 | 0 | 7 6 | 0 | 0 | 5 |
| Roanoke... | 0 | 0 |  | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| North Carolina: |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Wilmington. | 1 | 0 |  | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Winston-Salem. | 1 | 0 |  | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 6 |
| South Carolina: |  |  |  |  |  |  |  |  |  |  |  |  |
| Georgia: |  |  |  |  |  |  |  |  |  |  |  | 0 |
| Attanta.-. | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 0 |  |
| Brunswick...........- | 0 | 0 |  | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Savannah..............-- | 0 | 0 |  | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Florida: <br> Tampa $\qquad$ | 0 | 0 |  | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| East south central |  |  |  |  |  |  |  |  |  |  |  |  |
| Tennessee: |  |  |  |  |  |  |  |  |  |  |  |  |
| Memphis Nashville | 0 3 | 0 | 4 | 0 | 0 | 0 | 9 1 | 1 | 5 2 | 0 | 0 | 5 |
| Alabama: |  |  |  |  |  |  |  |  |  |  |  |  |
| Birmingham | 1 3 | 0 | 4 | 0 | 0 | 0 | 2 0 | 1 | 7 | 0 | 1 | 0 |
| WEST SOUTH CENTRAL |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lovisiana: ${ }^{\text {New }}$ Orleans........- | 8 | 0 | 1 | 1 |  |  | 3 |  |  |  |  |  |
| Shreveport..........-.-- | 0 | 0 |  | 1 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| Texas: |  |  |  |  |  |  |  |  |  |  |  |  |
| Dallas......-.-.-.----- | 2 | 0 |  | 0 | 1 | 0 | 1 | 1 | 12 | 0 | 0 | 0 |
| Galveston....-.-.-.-. | 3 3 | 0 |  | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 3 | 0 |
| San Antonio-.........-- | 0 | 0 |  | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 2 |
| mountan |  |  |  |  |  |  |  |  |  |  |  |  |
| Montana: |  |  |  |  |  |  |  |  |  |  |  |  |
| Billings-...........-- | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Great Falls....-.-.-.- | 0 | 0 |  | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Helena--.-....-..- | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Idaho: |  |  |  |  |  |  |  |  |  |  |  |  |
| Idaho: <br> Boise $\qquad$ | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Colorado: --...-...- |  |  |  |  |  |  |  |  |  |  |  |  |
| Denver............--- | 1 | 0 | 6 | 0 | 5 | 0 | 5 | 0 | 13 | 0 | 0 | 8 |
| Pueblo-..-.-..........- | 2 | 0 | -- | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| , <br> Salt Lake City | 0 | 0 | .- | 0 | 2 | 0 | 1 | 0 | 6 | 0 | 0 | 0 |

City reports for woek ended November 10，1945－Continued

|  | $$ | 是䍖 | Infl | nzz |  | \|oぁ | $\underset{a}{a}$ | $\stackrel{\cong}{ \pm}$ | $$ | : | 品 | 㐌 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{array}{r} \text { 咠 } \\ \text { 䍐 } \\ \text { 呂 } \end{array}$ |  | $\begin{aligned} & \text { 毋 } \\ & \text { O } \\ & \hline \end{aligned}$ |  | $\begin{aligned} & \mathbb{8} \\ & \mathbf{y} \\ & \text { Z } \\ & \mathbb{Z} \\ & \mathbb{Z} \end{aligned}$ |  |  |  |  | $\begin{aligned} & \text { 花 } \\ & \text { 曾 } \\ & \text { 品 } \end{aligned}$ |  | 为象 |
| Pactipic |  |  |  |  |  |  |  |  |  |  |  |  |
| Washington： |  |  |  |  |  |  |  |  |  |  |  |  |
| Seattle．．． | 2 | 0 |  | 0 | 60 | 2 | 3 | 0 | 6 | 0 | 0 | 12 |
| Spokane | 0 | 0 |  | 0 | 1 | 0 | 3 | 1 | 6 | 0 | 0 | 11 |
| California： | 1 | 0 |  | 0 | 25 | 0 | 0 | 1 | 1 | 0 | 0 | 6 |
| Los Angeles． | 2 | 0 | 5 | 0 | 7 | 3 | 5 | 10 | 42 | 0 |  |  |
| Sacramento． | 1 | 0 |  | 0 | 3 | 0 | 1 | 0 | 3 | 0 | 0 | 2 |
| San Francisco． | 0 | 0 |  | 0 | 60 | 2 | 6 | 8 | 12 | 0 |  | 1 |
| Total | 75 | 3 | 60 | 12 | 462 | 45 | 278 | 80 | 600 | 0 | 18 | 703 |
| Corresponding week， 1944. | 81 |  |  | ${ }_{1} 26$ |  | ．．．．－ | 357 |  | 717 | 0 | 9 | 438 |
| Average，1940－44．－－－－－－－－ | 91 | －－－－－－ | 88 | ${ }^{125}$ | ${ }^{2} 560$ | －．．．－－ | ${ }^{1} 353$ | ．．．．．－ | 678 | 1 | 19 | 887 |

13－year average，1942－44．
2 5－year median， $1940-44$.
Dysentery，amebic．－Cases：Boston，3；New York，4；Los Angeles， 1.
Dysentery，bacillary．－Cases：New York，71：Chicago，1：Wilmington，Del．，1：Charleston，8．C．，6：Los Angeles，4；San Francisco， 1.
Dysentery，unspecified．－Cases：Cincinnati，1；Richmond， 1.
Tularemia．－Cases：Little Rock， 1.
Typhus ferer．－Cases：New York，3；Atlanta，8；Savannah，5；Tampa，3；Memphis，1；Birmingham，5； Mobile，4；Little Rock，1；New Orleans，14；Galveston， 1.

Rates（annual basis）per 100，000 population，by geographic groups，for the 87 cities in the preceding table（estimated population，1948， $38,863,900$ ）

|  |  |  | Influenza |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| New England | 5.7 | 0.0 | 0.0 | 0.0 | 95 | 0.0 | 88.8 | 11.5 | 146 | 0.0 | 5.7 | 218 |
| Middle Atlantic | 4.6 | 0.9 | 2.3 | 1.4 | 37 | 7.9 | 40.3 | 8.8 | 71 | 0.0 | 0.9 | 113 |
| East North Central | 6.7 | 0.0 | 6.1 | 1.2 | 92 | 8.5 | 35.9 | 6.1 | 98 | 0.0 | 1.8 | 152 |
| West North Central． | 17.8 | 2.2 | 4.5 | 4.5 | 42 | 2.2 | 46.8 | 33.4 | 111 | 0.0 | 0.0 | 31 |
| South Atlantic． | 23.4 | 0.0 | 35.2 | 1.7 | 10 | 5.0 | 48.6 | 5.0 | 85 | 0.0 | 0.0 | 94 |
| East South Central | 41.3 | 0.0 | 53.1 | 11.8 | 6 | 5.9 | 70.8 | 17.7 | 89 | 0.0 | 5.9 | 65 |
| West South Central． | 40.2 | 0.0 | 5.7 | 5.7 | 6 | 5.7 | 40.2 | 17.2 | 80 | 0.0 | 20.1 | 9 |
| Mountain． | 23.8 | 0.0 | 47.7 | 0.0 | 103 | 0.0 | 55.6 | 0.0 | 167 | 0.0 | 0.0 | 72 |
| Pacific | 9.5 | 0.0 | 7.9 | 0.0 | 247 | 11.1 | 28.5 | 31.6 | 111 | 0.0 | 4.7 | 63 |
| Total． | 11.6 | 0.5 | 9.3 | 1.9 | 71 | 6.9 | 42.9 | 12.4 | 93 | 0.0 | 2.8 | 109 |

## TERRITORIES AND POSSESSIONS

## Panama Canal Zone

Notifiable diseases-September 1945.-During the month of September 1945, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:


131 recurrent cases.
2 Reported in the Canal Zone only.

## Puerto Rico

Notifiable diseases-4 weeks ended November 3, 1945.-During the 4 weeks ended November 3, 1945, cases of certain notifiable diseases were reported in Puerto Rico as follows:

| Disease | Cases | Disease | Cases |
| :---: | :---: | :---: | :---: |
| Bilharziasis. | 6 | Ophthalmia neonatorum. | 2 |
| Chickenpox | 22 | Poliomyelitis....- | 1 |
| Diphtheria | 71 | Puerperal fever- | ${ }^{3}$ |
| Dysentery, unspecified | 7 | Syphilis.. | 385 |
| Erysipelas. | 1 | Tetanus.- | 3 |
| Filariasis....... | 4 | Tetanus, infantile...... | 1 |
| German measles | 14 | Tuberculosis (all forms) | 456 |
| Gonorrhea | 271 | Typhoid and paratyphoid | 20 |
| Influenza | ${ }_{236}^{236}$ | Typhus fever-.----.-. | 10 |
| Malaria | 636 | Undulant fever. | 1 |
| Measles | 39 | Whooping cough..... | 56 |
| Mumps. | 1 |  |  |

## FOREIGN REPORTS

## CANADA

Provinces-Communicable diseases-Week ended October 27, 1945.During the week ended October 27, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

| Disease | Prince Edward Island | Nova Scotia | New Brunswick | $\begin{aligned} & \text { Que- } \\ & \text { bec } \end{aligned}$ | Ontario | $\begin{aligned} & \text { Mani- } \\ & \text { toba } \end{aligned}$ | Sas-katchewan | $\underset{\text { berta }}{\text { Al- }}$ | British Colum bia | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Chickenpox. |  | 10 | 1 | 86 | 151 | 39 | 66 | 73 | 88 | 514 |
| Diphtheris |  | 12 | 3 | 32 | 21 | 6 |  | 2 |  | 76 |
| Dysentery, baciliary. |  |  |  | 3 | 13 | 4 | 1 | 3 | 6 | 4 |
| Influenza......... |  | 9 |  | 3 | 5 | 3 | 1 | 3 | 6 | 17 |
| Measies. |  | 1 | 1 | 103 | 204 | 4 | 4 | 2 | 123 | 442 |
| Meningitis, meningococcus |  | 1 |  |  | 1 | 1 |  |  |  | 4 |
| Mumps.-...... |  |  | 5 | 100 | 43 | 16 | 2 | 57 | 28 | 251 |
| Poliomyelitis |  |  |  |  | 1 |  |  |  |  | 1 |
| Scarlet fever | 1 | 9 | 22 | 70 | 89 | 25 | 9 | 19 | 15 | 259 |
| Tuberculosis (all forms).- |  | 10 | 16 | 110 | 54 | 26 |  | 29 | 34 | 279 |
| Typhoid and paratyphoid fever. |  |  | 1 | 11 | 1 |  |  | 1 |  | 14 |
| Undulant fever-... |  |  |  |  | 1 |  |  | 1 |  | 2 |
| Venereal diseases: |  |  |  |  |  |  |  |  |  |  |
| Gonorrhea |  | 29 |  | 144 | 193 | 59 | 29 | 40 | 53 | 552 |
| Whphilis................- |  | 9 3 | 3 | 128 | 150 | 11 | 10 | 11 | 32 | 354 |
| Whooping cough.---.---- |  | 35 |  | 163 | 75 | 4 |  | 4 | 1 | 282 |

## CHINA

Notifiable diseases-June 1945.-During the month of June 1945, certain notifiable diseases were reported by the Army Medical Administration, Health Department of the Board of Supplies and Transport, the Chinese Red Cross Medical Corps, and the National Health Administration of China, as follows:

| Disease | Cases | Deaths | Disease | Cases | Deaths |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Cerebrospinal meningitis. | 56 | 3 | Relapsing fever... | 1,099 | 28 |
| Cholera---..-...-.-. | 1,730 | 359 | Scarlet fever..... | 21 |  |
| Diphtheria. | 1,75 3.320 | 4 | Smallpox-... | 111 | ${ }_{39}^{13}$ |
| Dysentery | 3,320 | 53 | Typhoid fever | 624 | ${ }_{10}^{39}$ |
| Plague.. | 14 | 6 | Typhus fever. | 328 | 10 |

## NEW ZEALAND

Notifiable diseases-4 weeks ended October 6, 1945.--During the 4 weeks ended October 6, 1945, certain notifiable diseases were reported in New Zealand as follows:


## reports of cholera, plague, smallpox, typhus fever, and YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

Norz.-Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentionod discases, except yellow fever, during the current year. All reports of yellow fever are published currently.
A table showing the accumulated figures for these diseases for the year to date is published in the Pubinc Health Reports for the last Friday in each month.

## Plague

Argentina-Santiago del Estero Province-Estacion Lavelle.-During the month of September 1945, 1 death from plague was reported in Estacion Lavelle, Santiago del Estero Province, Argentina.

Portugal-Azores.-During the week ended October 20, 1945, 11 cases of plague with 2 deaths were reported in the Azores, Portugal.

## Smallpox

Angola.-For the month of August 1945, 118 cases of smallpox were reported in Angola.

Morocco (French).-For the period October 21-31, 1945, 178 cases of smallpox were reported in French Morocco, which includes cases reported by regions as follows: Agadir, 55; Casablanca, 40; Fez, 22; Marrakech, 22; Meknes, 10; Oujda, 7; Rabat, 22.

## Typhus Fever

Egypt.-During the week ended October 20, 1945, 21 cases of typhus fever were reported in all of Egypt.

Morocco (French).-For the period October 21-31, 1945, 113 cases of typhus fever were reported in French Morocco, including cases reported in the following regions: Agadir, 8; Casablanca, 84; Fez, 10; Marrakech, 1 ; Meknes, 9; Rabat, 1.


[^0]:    ${ }^{1}$ From the Industrial Hygiene Division, Bureau of State Services

[^1]:    1 The number of days of disability is the number of calendar days from the date absence began to the date absance ended, or to the 372d day, inclusive.
    Includes a negligible number of absent persons of unknown age.
    ${ }^{3}$ The age distributions applied to the total number of person-years of exposure for the years 1940-43 are as of Jan. 1 of each year; for the year 1944 the distribution is as of Dec. 1, 1943.

[^2]:    ${ }^{1}$ Includes a negligible number of absent persons of unknown age.
    ${ }^{2}$ Age-standardized according to estimates of male employment in the United States for the week ending June 13, 1942 (11).
    NOTE.-The number of person-years of exposure is given in table 1.

[^3]:    ${ }^{1}$ From the Division of Public Health Methods.
    ${ }^{2}$ The first examination findings in 1943 were collected in the control locality by Dr. 8. T. Ichiyasu and in the fluoride locality by Dr. T. T. Okuno; all second examinations in 1945 were collected by Dr. Toyohars Shimizu, dental offlcer, Office of Indian Affairs, U. S. Department of the Interior; to whom the author wishes to express his appreciation. Acknowledgment is also made to Dr. Elias Elvove, sanior chemist, U. S. Public Health Service, for the water analysis,

[^4]:    s see "A procedure for the recording and statistical processing of dental examination findings": Klein, Eenry, and Palmer. O. E.: J. Dent. Res, 19: 243 (1940).

[^5]:    ${ }^{1}$ The water at the Arizona center contained 3 p. p. m. of fluorine; that at the California center was fluorinefree.
    ${ }_{2}^{2}$ Arithmetic average of 3 age-specific rates (8-10 years).
    8 Arithmetic average of 7 age-specific rates (8-14 years).

[^6]:    4 Since the present report was prepared, a communication by R. Weaver [see Brit. Dent. J., 47: 185 (1944)] has become available. This worker has arrived at similar conclusions from prevalence observations on 800 English children who had immigrated luto an area where the drinking water contained 1.4 p. p. m. of flourine. The significance of these findings with regard to the individual (different) types of teeth will be discussed in the next paper in this series of reports.

[^7]:    ${ }^{1}$ Frpm the Division of Public Health Methods.
    ${ }^{2}$ Public Health Reports, August 31, 1945, pp. 1019-1021.
    ${ }^{2}$ New York, Ohio, South Carolina, Georgia, Florida, Kentucky, Mississippi, Texas, Arizoms, and Oallfornia.

[^8]:    ${ }^{1}$ New York City only.
    ${ }^{2}$ Period ended earlier than Saturday.
    *Exclusive of Nẹw Mexico figures for the çurrent week; report not received,

[^9]:    2 Period ended earlier than Saturday.
    ${ }^{3}$ Including paratyphoid fever reported separately, as follows: Vermont 1, Massachusetts 1, Indiana 1, Illinois 1, North Carolina 1, Georgia 3, Texas 1, Colorado 1, California 3.
    *Exclusive of New Mexico figures for the current week; report not received,

