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THE INCIDENCE OF CANCER IN PHILADELPHIA, PA., 1938¹

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This is the ninth in a series of studies of cancer incidence and prevalence in selected areas of the United States. The data collected in the first eight have already been analyzed and the findings have been published or are in the process of being published in the PUBLIC HEALTH REPORTS (1-8). The present paper reports on the survey conducted in Philadelphia, Pa. As in the other areas, reports on all patients treated or observed for cancer during a specified calendar year, in this case 1938, were requested of all hospitals and physicians. The information obtained permitted the identification of cases reported by more than one source, and the separation of resident and non-resident cases. For a complete discussion of the general purpose of these studies, the nature of the data sought, and the technique employed in collecting the data, reference should be made to the first of the papers (1).

The population of Philadelphia in 1938 was 1,937,864, of whom 1,719,740 were white and 218,124 colored.² Reports on cancer cases were received from all hospitals, 154 in Philadelphia, and from all but 66 of the 3,090 doctors in active practice. Since 196 doctors submitted joint reports with other doctors or with hospitals, the number of individual doctor's reports received was 2,828. Among those submitting reports, 1,114 doctors and 75 hospitals had seen or treated cancer patients in 1938. The total number of cancer cases reported was 12,484. Of these, 11,815 were white and 669 were colored; 8,488 were residents and 3,996 nonresidents.

The reported cases are presented in table 1 according to the nature and number of reporting sources. Comparison of the percentage of cases in Philadelphia which received medical care from hospitals, 77 percent, with corresponding percentages in the other study areas (1-8), reveals that Philadelphia ranks very high in this respect, being

¹ From the Division of Public Health Methods, National Institute of Health. The data for this study were collected under the supervision of Arthur J. McDowell. Miss Bess A. Cheney was in immediate charge of the tabulation of the data, which was done as a project, Number 65-2-23-356, of the Work Projects Administration. The entire survey was directed by Harold F. Dorn.

² The populations used in this paper were obtained by interpolation between the 1930 census figures and the preliminary count of the 1940 census.

exceeded only by New Orleans, with a percentage of 78. Other study areas where large proportions of the cases received hospital treatment were Detroit, 72 percent, and Chicago, 70 percent. In Philadelphia, as in the areas previously studied, a somewhat larger proportion of the male than of the female and a much larger proportion of the colored than of the white cases received hospital care.

TABLE 1.—Percentage of cancer cases reported by nature and number of reporting sources, sex, and color, Philadelphia, Pa., 1938

| Nature and number of reporting sources | Total | | | White | | | Colored | | |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Both sexes | Male | Female | Both sexes | Male | Female | Both sexes | Male | Female |
| Doctor(s) only..... | 22.6 | 20.8 | 73.9 | 23.5 | 21.3 | 25.0 | 7.3 | 6.0 | 7.9 |
| Hospital(s) only..... | 63.7 | 65.5 | 62.4 | 62.5 | 64.7 | 61.1 | 83.3 | 87.0 | 81.7 |
| Doctor(s) and hospital(s)..... | 13.7 | 13.7 | 13.7 | 14.0 | 14.0 | 13.9 | 9.4 | 7.0 | 10.4 |
| Total..... | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| One source only..... | 81.7 | 81.6 | 81.8 | 81.6 | 81.4 | 81.7 | 83.7 | 87.0 | 82.3 |
| Two sources..... | 14.8 | 14.9 | 14.8 | 14.8 | 15.1 | 14.7 | 14.2 | 10.0 | 16.0 |
| Three or more sources..... | 3.5 | 3.5 | 3.4 | 3.6 | 3.5 | 3.6 | 2.1 | 3.0 | 1.7 |
| Total..... | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Number of cases..... | 12,484 | 5,259 | 7,225 | 11,815 | 5,059 | 6,756 | 669 | 200 | 469 |

A much larger proportion of the cases reported by hospitals than of those reported only by physicians had microscopically confirmed diagnoses (table 2). This was true for cases of every primary site. As would be expected, those sites most easily accessible for biopsy purposes had the highest proportions of microscopically confirmed diagnoses.³

Death certificates listing cancer as a cause of death were filed for 2,797 residents of Philadelphia in 1938. Of these, 701 were for persons not reported in the survey by doctors or hospitals. These 701, added to the reported resident cases, make the total number of 9,189 resident cases of cancer.

As reported in this survey, there were 474 cases of cancer for every 100,000 residents of Philadelphia in 1938 (table 3). Only two other surveyed areas, San Francisco-Alameda, with a rate of 526 per 100,000, and Denver, with a rate of 518 per 100,000, exceeded Philadelphia in the magnitude of cancer prevalence. However, it should be noted that the cancer prevalence rate of an area is affected strongly by the age composition of the population,⁴ the primary site distribution of the cases, the availability of adequate medical facilities, the proportion of the cancer cases in the population which are brought to medical attention, and the completeness of follow-up after treatment has been

³ With the usual exception of skin cancers. See earlier papers for discussion.

⁴ At the time this article was prepared the 1940 census had not released population counts by age, so the precise influence of this factor in Philadelphia could not be determined.

concluded. Reference should be made to earlier papers (1-8) for full discussion of these factors.

There were large differences between the male and female and the white and colored cases in the frequency with which cancers of the

TABLE 2.—Percentage of cases of cancer with a microscopically confirmed diagnosis, by primary site and whether or not reported by a hospital, Philadelphia, Pa., 1938

| Primary site | Percentage of cases with microscopically confirmed diagnosis for— | | |
|------------------------------|---|-----------------------------|-----------------------------------|
| | All cases | Cases reported by hospitals | Cases reported only by physicians |
| Buccal cavity, pharynx..... | 71.4 | 75.0 | 57.4 |
| Lip..... | 65.9 | 71.7 | 42.0 |
| Tongue..... | 74.7 | 79.5 | 57.1 |
| Others..... | 74.3 | 76.0 | 68.4 |
| Digestive tract..... | 58.0 | 63.4 | 39.7 |
| Esophagus..... | 73.3 | 76.7 | 57.7 |
| Stomach, duodenum..... | 38.9 | 45.5 | 21.7 |
| Intestines..... | 62.3 | 66.8 | 47.2 |
| Rectum, anus..... | 74.7 | 77.8 | 61.8 |
| Liver, biliary passages..... | 56.8 | 66.3 | 29.4 |
| Others..... | 47.6 | 52.5 | 22.6 |
| Respiratory system..... | 73.4 | 73.9 | 71.3 |
| Larynx..... | 86.5 | 85.6 | 89.6 |
| Lungs, pleura..... | 59.6 | 62.5 | 42.6 |
| Others..... | 95.8 | 94.7 | 100.0 |
| Genitourinary system..... | 73.6 | 75.7 | 64.3 |
| Uterus..... | 82.3 | 84.2 | 74.0 |
| Prostate..... | 44.0 | 47.0 | 27.3 |
| Others..... | 68.9 | 71.4 | 58.8 |
| Breast..... | 75.3 | 77.6 | 68.9 |
| Skin..... | 57.8 | 67.8 | 35.8 |
| Brain..... | 86.5 | 89.2 | 64.7 |
| Bones (except jaw)..... | 60.8 | 62.0 | 55.2 |
| All others..... | 66.7 | 69.4 | 55.4 |
| All cases..... | 67.9 | 72.0 | 53.9 |

TABLE 3.—The number of reported cases of and recorded deaths from cancer, residents only, by sex and color, and the cancer prevalence and death rates, Philadelphia Pa., 1938

| | Total | | | White | | | Colored | | |
|---|------------|-------|--------|------------|-------|--------|------------|-------|--------|
| | Both sexes | Male | Female | Both sexes | Male | Female | Both sexes | Male | Female |
| Number of resident cases... | 8,488 | 3,526 | 4,962 | 7,886 | 3,347 | 4,539 | 602 | 179 | 423 |
| Deaths of residents not reported as a case..... | 701 | 288 | 413 | 660 | 273 | 387 | 41 | 15 | 26 |
| Total resident cases ¹ | 9,189 | 3,814 | 5,375 | 8,546 | 3,620 | 4,926 | 643 | 194 | 449 |
| Total resident deaths..... | 2,787 | 1,333 | 1,454 | 2,565 | 1,242 | 1,323 | 232 | 91 | 141 |
| Ratio of resident cases to deaths..... | 3.3 | 2.9 | 3.7 | 3.3 | 2.9 | 3.7 | 2.8 | 2.1 | 3.2 |
| Prevalence rate per 100,000 population..... | 474.2 | 376.9 | 550.1 | 496.9 | 424.3 | 568.4 | 294.8 | 180.0 | 406.8 |
| Cancer death rate per 100,000 population..... | 144.3 | 138.7 | 149.8 | 149.2 | 145.6 | 152.7 | 106.4 | 84.5 | 127.8 |

¹ Reported resident cases plus recorded deaths of residents not reported as a case.

various primary sites occurred (table 4). Of the total male cases, 27.3 percent were primary in the digestive tract, 19.2 percent in the skin, 17.5 percent in the genitourinary system, and 15.1 percent in the buccal cavity. Among females, the sites most frequently attacked by cancer were the genitourinary system, 33.8 percent, and the breast, 29.3 percent. The chief difference between the primary site compositions of the white and colored cases lay in the relative frequency with which skin cancer occurred among them. Only 2.2 percent of the colored cases were primary in the skin, as compared with 14.6 percent of the white cases. Genitourinary cancers formed a larger part of the colored cases (44.2 percent) than of the white (26.0 percent).

TABLE 4.—Percentage distribution of reported cancer cases, by primary site, sex, and color, Philadelphia, Pa., 1938

| Primary site | White | | | Colored | | |
|-----------------------------|------------|-------|--------|------------|-------|--------|
| | Both sexes | Male | Female | Both sexes | Male | Female |
| Buccal cavity, pharynx..... | 7.9 | 15.3 | 2.4 | 5.5 | 8.5 | 4.3 |
| Lip..... | 3.0 | 6.1 | .6 | .3 | 1.0 | ..... |
| Tongue..... | 1.3 | 2.5 | .4 | 1.5 | 3.5 | .6 |
| Others..... | 3.7 | 6.7 | 1.4 | 3.7 | 4.0 | 3.7 |
| Digestive tract..... | 20.7 | 26.9 | 16.0 | 21.5 | 37.5 | 14.7 |
| Esophagus..... | 1.2 | 2.0 | .6 | 1.3 | 3.5 | .4 |
| Stomach, duodenum..... | 5.8 | 8.5 | 3.8 | 9.1 | 18.5 | 4.9 |
| Intestines..... | 5.8 | 6.2 | 5.5 | 3.4 | 4.5 | 3.0 |
| Rectum, anus..... | 5.4 | 7.2 | 4.0 | 3.9 | 5.5 | 3.2 |
| Liver, biliary passage..... | 1.1 | 1.0 | 1.1 | 1.0 | 2.5 | .4 |
| Others..... | 1.5 | 2.0 | 1.0 | 2.8 | 3.0 | 2.8 |
| Respiratory system..... | 5.9 | 11.7 | 1.7 | 3.6 | 9.0 | 1.3 |
| Larynx..... | 2.8 | 6.0 | .5 | .7 | 2.5 | ..... |
| Lungs, pleura..... | 2.9 | 5.4 | 1.1 | 2.9 | 6.5 | 1.3 |
| Others..... | .2 | .3 | .1 | ..... | ..... | ..... |
| Genitourinary system..... | 26.0 | 16.9 | 32.7 | 44.2 | 31.5 | 49.6 |
| Uterus..... | 14.0 | ..... | 24.4 | 29.5 | ..... | 42.1 |
| Prostate..... | 2.8 | 6.4 | ..... | 4.6 | 15.5 | ..... |
| Others..... | 9.2 | 10.5 | 8.3 | 10.1 | 16.0 | 7.5 |
| Breast..... | 17.2 | .3 | 29.9 | 15.6 | 1.0 | 21.7 |
| Skin..... | 14.6 | 19.8 | 10.7 | 2.2 | 3.0 | 1.9 |
| Brain..... | 1.3 | 1.8 | .8 | .9 | 2.0 | .4 |
| Bones (except jaw)..... | 1.3 | 1.9 | .9 | 1.0 | 2.0 | .6 |
| All others..... | 5.1 | 5.4 | 4.9 | 5.5 | 5.5 | 5.5 |
| All cases..... | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

The age distribution of the reported cases (tables 5 and 6) shows that, although cancer is most commonly a disease of late adult life, it also occurs at younger ages.

Approximately 29 percent of the male and 43 percent of the female cases occurred in the middle period of life, the ages from 25 to 55. That a greater proportion of female than of male cases developed during this age period is due to the fact that breast and uterus cases, which in Philadelphia accounted for 55 percent of the total reported female cases, most frequently develop at these ages.

Although 88 percent of the total male cases were reported for persons aged 45 and over, there were two sites where large proportions of the cases developed at early ages. In these sites, the brain and skeletal system, 66 and 39 percent respectively, were reported for persons younger than 45 years of age.

TABLE 5.—Percentage distribution of reported male cancer cases of known age, by primary site and age, Philadelphia, Pa., 1938

| Primary site | Age | | | | | | | Total | Number of cases of known age |
|------------------------------|----------|-------|-------|-------|-------|-------|-------------|-------|------------------------------|
| | Under 25 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75 and over | | |
| Buccal cavity, pharynx... | 0.9 | 1.8 | 5.3 | 16.3 | 25.1 | 33.5 | 17.1 | 100.0 | 778 |
| Lip..... | .3 | 1.0 | 6.5 | 20.6 | 22.9 | 29.4 | 19.3 | 100.0 | 306 |
| Tongue..... | ..... | 1.5 | 4.6 | 13.8 | 30.8 | 28.5 | 20.8 | 100.0 | 130 |
| Others..... | 1.8 | 2.6 | 4.4 | 13.4 | 24.9 | 39.2 | 13.7 | 100.0 | 342 |
| Digestive tract..... | 1.0 | 1.6 | 6.3 | 21.5 | 30.0 | 29.0 | 10.6 | 100.0 | 1,402 |
| Esophagus..... | ..... | 1.9 | .9 | 21.0 | 32.4 | 31.4 | 12.4 | 100.0 | 105 |
| Stomach, duodenum..... | .4 | .7 | 5.9 | 21.2 | 32.6 | 28.7 | 10.5 | 100.0 | 457 |
| Intestines..... | 1.0 | 1.9 | 6.1 | 23.7 | 27.6 | 30.4 | 9.3 | 100.0 | 312 |
| Rectum, anus..... | 1.4 | 2.4 | 8.4 | 20.4 | 30.4 | 26.4 | 10.6 | 100.0 | 368 |
| Liver, biliary passages..... | 1.8 | 1.8 | 5.4 | 19.6 | 16.1 | 32.1 | 23.2 | 100.0 | 56 |
| Other..... | 2.9 | 1.9 | 7.7 | 21.2 | 28.8 | 30.8 | 6.7 | 100.0 | 104 |
| Respiratory system..... | .7 | 2.2 | 9.8 | 28.4 | 35.0 | 19.2 | 4.7 | 100.0 | 599 |
| Larynx..... | ..... | 1.6 | 7.2 | 25.2 | 37.1 | 23.0 | 5.9 | 100.0 | 305 |
| Lungs, pleura..... | 1.1 | 2.5 | 12.5 | 30.8 | 34.1 | 15.8 | 3.2 | 100.0 | 279 |
| Others..... | 6.7 | 6.7 | 13.3 | 46.6 | 13.3 | 6.7 | 6.7 | 100.0 | 15 |
| Genitourinary system..... | 1.6 | 3.3 | 6.3 | 14.0 | 24.9 | 33.5 | 16.4 | 100.0 | 886 |
| Prostate..... | ..... | .3 | .6 | 4.9 | 25.9 | 44.8 | 23.5 | 100.0 | 344 |
| Others..... | 2.6 | 5.2 | 10.0 | 19.7 | 24.4 | 26.3 | 11.8 | 100.0 | 542 |
| Breast..... | ..... | ..... | ..... | 11.8 | 29.4 | 52.9 | 5.9 | 100.0 | 17 |
| Skin..... | .8 | 2.1 | 5.8 | 15.2 | 24.5 | 30.7 | 20.9 | 100.0 | 948 |
| Brain..... | 34.0 | 11.7 | 20.2 | 20.2 | 12.8 | 1.1 | ..... | 100.0 | 94 |
| Brain (except jaw)..... | 20.4 | 7.5 | 10.8 | 24.7 | 22.6 | 10.8 | 3.2 | 100.0 | 85 |
| All others..... | 11.8 | 7.2 | 12.9 | 22.2 | 18.3 | 20.1 | 7.5 | 100.0 | 279 |
| All cases..... | 2.6 | 2.7 | 7.2 | 19.1 | 26.8 | 28.3 | 13.3 | 100.0 | 5,096 |

Two sites, the digestive tract and the respiratory system, showed great concentration of male cases in the 45 to 64-year age group; 52 percent of the digestive tract cases and 63 percent of the respiratory system cases occurred at these ages. More than 50 percent of the male cases of the buccal cavity, genitourinary system, and skin, and 68 percent of the prostate cases occurred among males aged 65 and over.

Cancer generally develops at earlier ages among females than among males. In the present study, this held true for every one of the broad site classifications (table 6). Among females, 74 percent of the brain and 55 percent of the bone cases occurred at ages under 45. Approximately 50 percent of the cases of the digestive tract, genitourinary system, breast, and respiratory system were found in females aged 45 to 64. There was only one site among females where more than half the cases occurred at ages 65 and over; 51 percent of the skin cancers were found at these ages.

Tables 5 and 6 indicate the ages at which the different organs or parts of the body developed cancer. Of course, since cancers of some sites occur more frequently than others, these tables do not show the relative importance of the various sites at each age. The relative frequency by age for certain broad groups of sites is presented in figure 1.

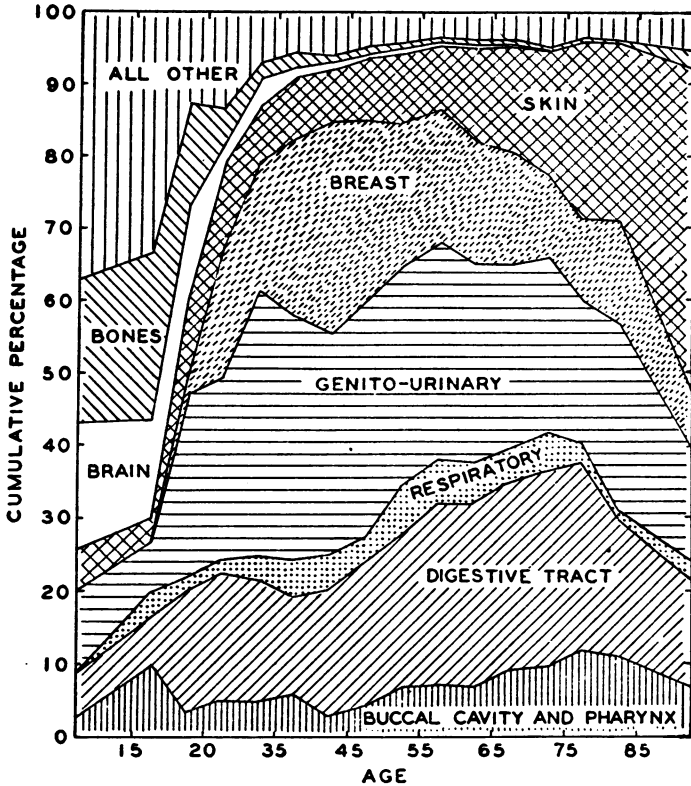


FIGURE 1.—Percentage distribution of resident cases of cancer by age and primary site, Philadelphia, Pa., 1938.

The brain, bones, and “all other” group,⁵ the most common sites of cancer among children and adolescents, were relatively less prominent among the cases in the older age groups. Among adults under 75 years of age, the digestive tract, genitourinary system, and breast were the most frequent sites of cancer. Skin cancer was the most frequent site encountered in persons aged 75 and over.

Prevalence rates by primary site, sex, and color are presented in table 7. These rates are based on all resident cases seen or treated for cancer in Philadelphia in 1938. For cancer of each site, white male rates were higher than the corresponding rates for colored males, and, with certain exceptions, the rates for white females exceeded

⁵ The “all other” group consists of cases located in glands or designated by vague or ill-defined sites.

TABLE 6.—Percentage distribution of reported female cancer cases of known age, by primary site and age, Philadelphia, Pa., 1938

| Primary site | Age | | | | | | | | Number of cases of known age |
|------------------------------|----------|-------|-------|-------|-------|-------|-------------|-------|------------------------------|
| | Under 25 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75 and over | Total | |
| Buccal cavity, pharynx... | 5.2 | 5.2 | 10.9 | 20.0 | 23.6 | 23.6 | 11.5 | 100.0 | 174 |
| Lip..... | | 2.6 | 15.4 | 20.5 | 17.9 | 23.1 | 20.5 | 100.0 | 39 |
| Tongue..... | | | | 23.3 | 30.1 | 33.3 | 13.3 | 100.0 | 30 |
| Others..... | 8.6 | 7.6 | 12.4 | 19.0 | 23.8 | 21.0 | 7.6 | 100.0 | 105 |
| Digestive tract..... | .6 | 3.4 | 8.7 | 20.1 | 31.0 | 25.7 | 10.5 | 100.0 | 1,116 |
| Esophagus..... | | 5.1 | 2.6 | 15.4 | 33.3 | 38.5 | 5.1 | 100.0 | 39 |
| Stomach, duodenum..... | | 1.9 | 6.7 | 14.2 | 35.2 | 29.2 | 12.4 | 100.0 | 267 |
| Intestines..... | .5 | 3.5 | 9.6 | 24.2 | 27.1 | 25.0 | 10.1 | 100.0 | 376 |
| Rectum, anus..... | | 5.0 | 11.5 | 22.7 | 29.8 | 21.6 | 9.4 | 100.0 | 278 |
| Liver, biliary passages..... | | 4.0 | 5.3 | 20.0 | 30.7 | 32.0 | 8.0 | 100.0 | 75 |
| Others..... | 4.9 | 1.2 | 7.4 | 13.6 | 38.3 | 19.8 | 14.8 | 100.0 | 81 |
| Respiratory system..... | 2.6 | 6.8 | 14.5 | 18.8 | 28.2 | 26.5 | 2.6 | 100.0 | 117 |
| Larynx..... | 3.0 | 12.1 | 15.2 | 12.1 | 39.4 | 18.2 | | 100.0 | 33 |
| Lungs, pleura..... | 1.3 | 5.3 | 14.5 | 21.1 | 22.4 | 31.5 | 3.9 | 100.0 | 76 |
| Others..... | 12.5 | | 12.5 | 25.0 | 37.5 | 12.5 | | 100.0 | 8 |
| Genitourinary system..... | .8 | 4.8 | 15.9 | 28.6 | 28.4 | 16.7 | 4.8 | 100.0 | 2,396 |
| Uterus..... | .4 | 4.8 | 17.4 | 30.0 | 28.4 | 15.6 | 3.4 | 100.0 | 1,810 |
| Others..... | 2.0 | 4.6 | 11.4 | 24.3 | 28.4 | 20.3 | 9.0 | 100.0 | 586 |
| Breast..... | .1 | 3.4 | 16.6 | 27.9 | 26.8 | 18.0 | 7.2 | 100.0 | 2,050 |
| Skin..... | 1.0 | 2.0 | 6.3 | 16.0 | 23.2 | 29.3 | 22.2 | 100.0 | 686 |
| Brain..... | 26.3 | 26.3 | 21.1 | 15.8 | 8.8 | 1.7 | | 100.0 | 57 |
| Bones (except jaw)..... | 30.8 | 12.3 | 12.3 | 9.2 | 7.7 | 18.5 | 9.2 | 100.0 | 65 |
| All others..... | 7.7 | 6.5 | 13.0 | 17.4 | 28.2 | 19.5 | 7.7 | 100.0 | 339 |
| All cases..... | 1.6 | 4.3 | 13.8 | 24.5 | 27.3 | 20.1 | 8.4 | 100.0 | 7,000 |

those of colored females. These exceptions were the buccal cavity and the genitourinary system. While the relative excess of colored female cases of the genitourinary system is consistent with the well-known high incidence of cancer of the uterus among colored females, it is unusual to find a higher buccal cavity rate for the colored females. However, it should be noted that among the colored female buccal cavity cases there were 16 cases of the tongue and other buccal cavity sites, and no cases of lip cancer.

The sites with the highest prevalence rates among males were the digestive tract, with a rate of 126.3 per 100,000 persons, the genitourinary system, 79.7 per 100,000, and the skin, 67.2 per 100,000. For females, the most common sites were the genitourinary system, 175.2 per 100,000, the breast, 157.4 per 100,000, and the digestive tract, 108.9 per 100,000. In table 7, it is evident that the male rate for every site except the genitourinary system and the breast was higher than the corresponding female rate, but that, due to the extremely high female rate for these two sites, the female rate for all cases was considerably higher than the male.

TABLE 7.—Number of resident cancer cases per 100,000 persons, by primary site, sex, and color, Philadelphia, Pa., 1938

| Primary site | White | | | Colored | | |
|-------------------------------------|------------|-------|--------|------------|-------|--------|
| | Both sexes | Male | Female | Both sexes | Male | Female |
| Buccal cavity, pharynx | 35.4 | 59.8 | 11.2 | 12.8 | 11.1 | 14.5 |
| Lip..... | 12.7 | 22.6 | 3.0 | .4 | .9 | ----- |
| Tongue..... | 6.2 | 10.4 | 2.0 | 4.1 | 5.6 | 2.7 |
| Others..... | 16.5 | 26.8 | 6.2 | 8.3 | 4.6 | 11.8 |
| Digestive tract | 123.7 | 133.1 | 114.6 | 68.8 | 73.3 | 64.3 |
| Esophagus..... | 5.2 | 8.0 | 2.5 | 4.1 | 6.5 | 1.9 |
| Stomach, duodenum..... | 38.6 | 45.4 | 32.2 | 29.3 | 37.2 | 21.7 |
| Intestines..... | 33.7 | 30.6 | 36.8 | 11.5 | 9.3 | 13.6 |
| Rectum, anus..... | 27.7 | 31.2 | 24.2 | 12.4 | 11.1 | 13.6 |
| Liver, biliary passages..... | 9.1 | 6.8 | 11.3 | 3.2 | 4.6 | 1.8 |
| Others..... | 9.4 | 11.1 | 7.6 | 8.3 | 4.6 | 11.8 |
| Respiratory system | 22.9 | 37.8 | 8.2 | 11.0 | 16.7 | 5.4 |
| Larynx..... | 8.5 | 15.9 | 1.3 | 1.8 | 3.7 | ----- |
| Lungs, pleura..... | 13.4 | 20.6 | 6.2 | 8.7 | 12.1 | 5.4 |
| Others..... | 1.0 | 1.3 | .7 | .5 | .9 | ----- |
| Genitourinary system | 127.9 | 82.8 | 172.4 | 127.4 | 55.7 | 197.5 |
| Uterus..... | 61.9 | ----- | 122.9 | 83.4 | ----- | 164.9 |
| Prostate..... | 16.7 | 33.8 | ----- | 13.3 | 26.9 | ----- |
| Others..... | 49.3 | 49.0 | 49.5 | 30.7 | 28.8 | 32.6 |
| Breast | 84.4 | 1.5 | 165.9 | 46.8 | 1.9 | 90.6 |
| Skin | 67.5 | 75.1 | 60.0 | 6.0 | 4.6 | 7.2 |
| Brain | 3.3 | 3.8 | 2.9 | 2.7 | 3.7 | 1.8 |
| Bones (except jaw) | 6.1 | 6.8 | 5.4 | 2.3 | 1.9 | 2.7 |
| All others | 25.7 | 23.6 | 27.8 | 17.0 | 11.1 | 22.8 |
| All cases..... | 496.9 | 424.3 | 568.4 | 294.8 | 180.0 | 406.8 |

Malignancies of different organs of the body do not respond equally well to treatment. As a result, the proportion of reported cases which have been cured and are under observation only varies from site to site. Of the reported cases of buccal cavity and skin cancer in Philadelphia, 25.6 and 25.3 percent, respectively, were under observation only and had received no treatment during 1938. Only 7.8 and 9.5 percent of the digestive tract and brain cases were in that

TABLE 8.—Percentage of total reported resident cases of cancer that were under observation only during 1938, and percentage that were first diagnosed during 1938, by primary site, Philadelphia, Pa., 1938

| Primary site | Percentage | | Primary site | Percentage | |
|-------------------------------------|--|-----------------------------------|---------------------------------|--|-----------------------------------|
| | Under observation only during study year | First diagnosis during study year | | Under observation only during study year | First diagnosis during study year |
| Buccal cavity, pharynx | 25.6 | 43.2 | Brain | 9.5 | 66.7 |
| Digestive tract | 7.8 | 69.8 | Bones (except jaw) | 16.0 | 47.0 |
| Respiratory system | 10.3 | 66.1 | All others | 17.6 | 58.2 |
| Genitourinary system | 20.5 | 49.4 | | | |
| Breast | 20.6 | 44.1 | All cases..... | 17.9 | 53.4 |
| Skin | 25.3 | 45.0 | | | |

class (table 8), indicating that relatively few cancers of these sites had been arrested.

It should be borne in mind that the possibility of recurrence is not considered to be the same for the various types of cancer, so that an arrested case of cancer of the uterus is usually kept under observation for a much longer period of time than an arrested case of cancer of the skin. For this reason, the proportion of skin cancers reported as under observation only probably does not reflect accurately the true number of cured cases in the population.

Incidence rates for Philadelphia, based upon cases first diagnosed in 1938, are presented in table 9. These rates exclude all cases seen prior to the study year, even though such cases may still have been receiving treatment or medical observation during that year. Thus the incidence rates are not affected by the varying fatality of the different sites, or by the varying thoroughness with which cured cases of different sites are followed up. That these differences in fatality and in period of observation are considerable is demonstrated by the fact that while only 44 percent of the breast cases in Philadelphia in 1938 were new cases, first diagnosed during 1938, 70 percent of the digestive tract cases were of that class (table 8).

The incidence rates and the corresponding prevalence rates for each of the broad primary sites are compared in figure 2. As indicated in table 8, the difference between the two rates is relatively greater for those sites which yield most readily to treatment.

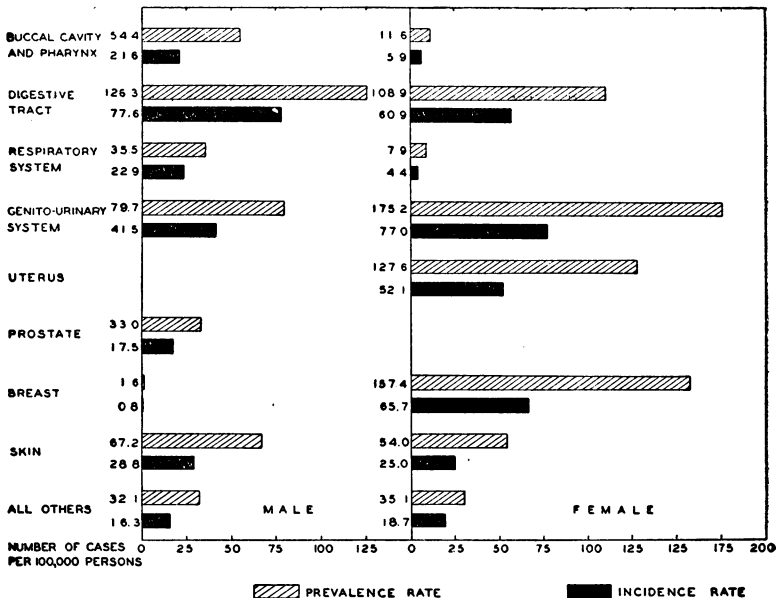


FIGURE 2.—Cancer prevalence and incidence rates per 100,000 persons, Philadelphia, Pa., 1938.

TABLE 9.—Number of resident cancer cases first diagnosed in 1938 per 100,000 persons, by primary site, sex, and color, Philadelphia, Pa., 1938

| | White | | | Colored | | |
|------------------------------|------------|-------|--------|------------|-------|--------|
| | Both sexes | Male | Female | Both sexes | Male | Female |
| Buccal cavity, pharynx..... | 14.6 | 23.8 | 5.7 | 5.5 | 3.7 | 7.2 |
| Lip..... | 4.9 | 8.2 | 1.7 | | | |
| Tongue..... | 3.0 | 5.0 | 1.0 | 2.3 | 2.8 | 1.8 |
| Others..... | 6.7 | 10.6 | 3.0 | 3.2 | .9 | 5.4 |
| Digestive tract..... | 72.1 | 80.6 | 63.8 | 45.9 | 53.8 | 38.1 |
| Esophagus..... | 3.5 | 5.2 | 1.8 | 4.1 | 6.5 | 1.8 |
| Stomach, duodenum..... | 21.9 | 27.9 | 16.0 | 19.3 | 27.0 | 11.9 |
| Intestines..... | 21.0 | 18.5 | 23.5 | 6.9 | 6.5 | 7.2 |
| Rectum, anus..... | 15.2 | 18.5 | 11.9 | 6.4 | 4.6 | 8.2 |
| Liver, biliary passages..... | 4.4 | 3.3 | 5.5 | 3.2 | 4.6 | 1.8 |
| Others..... | 6.1 | 7.2 | 5.1 | 6.0 | 4.6 | 7.2 |
| Respiratory system..... | 14.5 | 24.4 | 4.6 | 6.9 | 11.2 | 2.7 |
| Larynx..... | 4.1 | 7.7 | .5 | .9 | 1.9 | |
| Lungs, pleura..... | 9.9 | 16.0 | 3.9 | 6.0 | 9.3 | 2.7 |
| Others..... | .5 | .7 | .2 | | | |
| Genitourinary system..... | 59.0 | 42.1 | 75.6 | 62.8 | 37.1 | 87.9 |
| Uterus..... | 24.8 | | 49.2 | 38.1 | | 75.2 |
| Prostate..... | 8.5 | 17.2 | | 9.6 | 19.5 | |
| Others..... | 25.7 | 24.9 | 26.4 | 15.1 | 17.6 | 12.7 |
| Breast..... | 35.1 | .9 | 68.7 | 21.5 | | 42.6 |
| Skin..... | 30.1 | 32.2 | 28.0 | 1.4 | 1.9 | .9 |
| Brain..... | 2.3 | 2.6 | 2.1 | .9 | 1.9 | |
| Bones (except jaw)..... | 2.6 | 2.8 | 2.4 | .9 | .9 | .9 |
| All others..... | 13.3 | 11.7 | 14.8 | 10.5 | 7.4 | 13.6 |
| All cases..... | 243.6 | 221.1 | 265.7 | 156.3 | 117.9 | 193.9 |

Although a quarter of the reported resident cases in Philadelphia were cancers of the digestive tract, cancer of this site was responsible for 43 percent of the recorded cancer deaths (table 10). It is apparent that the patient suffering from cancer of the genitourinary system had a much better chance of survival, for these cases, although approximately equal in number to the digestive tract cases, resulted in only 24.0 percent of the recorded deaths. Very slight mortality was indicated for skin cancers, which made up 13 percent of the reported cases, but only 2 percent of the recorded deaths.

TABLE 10.—Percentage distribution of resident recorded deaths and reported cases, by primary site, Philadelphia, Pa., 1938

| Primary site | Percentage distribution | | Primary site | Percentage distribution | |
|-----------------------------|-------------------------|----------------|-------------------------|-------------------------|----------------|
| | Recorded deaths | Reported cases | | Recorded deaths | Reported cases |
| Buccal cavity, pharynx..... | 4.9 | 6.5 | Bones (except jaw)..... | 1.2 | 1.2 |
| Digestive tract..... | 43.5 | 24.8 | All others..... | 7.7 | 5.8 |
| Respiratory system..... | 6.5 | 4.5 | | | |
| Genitourinary system..... | 24.0 | 26.8 | All cases..... | 100.0 | 100.0 |
| Breast..... | 10.5 | 16.9 | Number of cases..... | 2,797 | 9,189 |
| Skin..... | 1.6 | 12.8 | | | |
| Brain..... | .1 | .7 | | | |

A comparison of the durations of cases alive at the end of the study year and cases dead at the end of the study year is made in table 11.⁶ More than half of the cases reported as having died sometime during the study year had lived for less than 6 months after first diagnosis. Only 27 percent of the living cases had had such short duration. Over half of the living cases had durations of more than a year, as against a corresponding figure of 27 percent for the dead cases.

TABLE 11.—*Number and percentage of cases which were diagnosed for less than a certain specified number of months, classified by reported vital status at end of study year, Philadelphia, Pa., 1938*

| Duration since first diagnosis of less than | Number | | | Percent | | |
|---|------------------------|-------|-------|-----------|-------|-------|
| | All cases ¹ | Alive | Dead | All cases | Alive | Dead |
| 6 months..... | 4,329 | 2,467 | 1,784 | 34.0 | 27.0 | 56.2 |
| 12 months..... | 7,081 | 4,625 | 2,327 | 56.7 | 50.7 | 73.3 |
| 18 months..... | 8,262 | 5,529 | 2,591 | 66.2 | 60.6 | 81.6 |
| 24 months..... | 9,030 | 6,138 | 2,743 | 72.3 | 67.3 | 86.4 |
| 30 months..... | 9,570 | 6,563 | 2,851 | 76.7 | 71.9 | 89.8 |
| 36 months..... | 10,004 | 6,924 | 2,917 | 80.1 | 75.9 | 91.9 |
| 42 months..... | 10,348 | 7,211 | 2,970 | 83.0 | 79.0 | 93.6 |
| 48 months..... | 10,650 | 7,477 | 3,004 | 85.3 | 81.9 | 94.6 |
| 54 months..... | 10,903 | 7,700 | 3,033 | 87.3 | 84.4 | 95.6 |
| 60 months..... | 11,081 | 7,861 | 3,050 | 88.8 | 86.2 | 96.1 |
| Total..... | 12,484 | 9,124 | 3,174 | 100.0 | 100.0 | 100.0 |

¹ Contains 186 cases of unknown vital status.

To a considerable degree, the differences in duration of the two groups of cases are a reflection of their primary site compositions. The dead cases consisted to a much greater extent of cancers of sites more difficult to treat (table 10). However, the factor of primary site does not appear to be the sole determinant of the different durations of the living and dead cases. As indicated in table 12, the

TABLE 12.—*Percentage of cases which were diagnosed for less than a certain specified number of months, classified by primary site and vital status at end of study year, Philadelphia, Pa., 1938*

| Duration since first diagnosis of less than | Buccal cavity | | Digestive tract | | Respiratory system | | Genitourinary system | | Breast | |
|---|---------------|------|-----------------|-------|--------------------|------|----------------------|------|--------|------|
| | Alive | Dead | Alive | Dead | Alive | Dead | Alive | Dead | Alive | Dead |
| 6 months..... | 23.1 | 27.6 | 39.4 | 72.1 | 37.6 | 66.4 | 23.3 | 47.1 | 24.1 | 34.3 |
| 12 months..... | 42.8 | 61.8 | 67.4 | 87.0 | 61.8 | 81.2 | 47.8 | 67.6 | 45.7 | 48.8 |
| 18 months..... | 52.3 | 75.4 | 76.7 | 92.3 | 71.4 | 86.8 | 57.7 | 78.1 | 55.3 | 62.5 |
| 24 months..... | 60.7 | 83.4 | 81.3 | 94.4 | 77.8 | 89.2 | 64.8 | 84.5 | 61.7 | 71.5 |
| 30 months..... | 65.5 | 87.9 | 84.7 | 95.9 | 81.8 | 91.6 | 69.2 | 88.7 | 67.2 | 79.9 |
| 36 months..... | 69.6 | 88.9 | 86.8 | 97.1 | 83.3 | 92.4 | 73.4 | 91.3 | 72.0 | 83.9 |
| 42 months..... | 72.7 | 91.0 | 88.7 | 97.6 | 86.4 | 93.6 | 76.7 | 93.1 | 75.9 | 88.4 |
| 48 months..... | 76.7 | 92.5 | 90.3 | 98.1 | 87.9 | 94.8 | 79.7 | 94.5 | 79.4 | 90.2 |
| 54 months..... | 79.3 | 94.5 | 91.7 | 98.5 | 91.6 | 95.6 | 81.9 | 95.6 | 82.5 | 91.6 |
| 60 months..... | 82.7 | 95.5 | 92.4 | 98.7 | 92.5 | 95.6 | 83.6 | 95.9 | 84.5 | 93.1 |
| Number of cases. | 759 | 199 | 1,357 | 1,188 | 455 | 250 | 2,536 | 780 | 1,732 | 379 |

⁶ For living cases, duration was computed from the data of first diagnosis to the end of the study year, and for dead cases, from the date of first diagnosis to the reported date of death.

dead cases of each site had shorter durations than the living. The longer duration of the living cases of a particular site must have arisen from more successful treatment, probably due to earlier diagnosis.

SUMMARY

The number of cancer cases under medical care in Philadelphia, Pa., in 1938, was 12,484. Of these, 11,815 were white and 669 were colored; 8,488 were residents and 3,996 were nonresidents. Death certificates listing cancer as a cause of death were filed for 2,797 residents, 701 of whom were not reported by doctors or hospitals in the survey. These 701, added to the reported cases, make a total number of 9,189 resident cases of cancer.

There were 474 cases of cancer per 100,000 residents. This is the third highest rate among the ten surveyed areas. The two highest rates were: San Francisco and Alameda Counties, Calif., 526 per 100,000; Denver, Colo., 518 per 100,000.

Large differences existed between the male and female and the white and colored cases in the frequency with which cancers of the various primary sites were reported. The primary sites of most frequent occurrence among males were the digestive tract and skin; among females, the genitourinary system and the breast. A relatively small proportion of the colored cases, as compared with the white, were primary in the skin.

For each site, the frequency of occurrence of cancer varied with age. Large proportions of the brain and bone cases occurred at ages under 45 years; digestive tract, respiratory system, uterus, and breast cases occurred most frequently at ages 45 to 64; and prostate and skin cases were most common at ages 65 and over.

The male prevalence rate for every site except the genitourinary system and the breast was higher than the corresponding female rate, but due to the extremely high female rate for these two sites, the female rate for all cases was considerably higher than the male. The rate for females was 550 per 100,000; for males, 397.

Malignancies of different organs of the body do not respond equally well to treatment. Among the reported cases of the various primary sites, there was considerable variation in the proportions which were under observation only, and had received no treatment during 1938.

Of the reported cases, 34 percent had durations of less than 6 months from date of first diagnosis to date of death or the end of the study year, and 57 percent had durations of under a year.

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Appendix

The appendix tables, which present the absolute numbers of cases, are serialized so as to correspond with the tables in the text which are based upon them.

TABLE 2.—Number of cancer cases with and without a microscopically confirmed diagnosis, by primary site and whether or not reported by a hospital, Philadelphia, Pa., 1938

| Primary site | Number of cases | | | |
|------------------------------|--|---|--|---|
| | Reported by hospitals | | Reported only by physicians | |
| | With microscopically confirmed diagnosis | Without microscopically confirmed diagnosis | With microscopically confirmed diagnosis | Without microscopically confirmed diagnosis |
| Buccal cavity, pharynx..... | 579 | 193 | 116 | 86 |
| Lip..... | 203 | 80 | 29 | 40 |
| Tongue..... | 101 | 26 | 20 | 15 |
| Others..... | 275 | 87 | 67 | 31 |
| Digestive tract..... | 1,265 | 730 | 235 | 357 |
| Esophagus..... | 92 | 28 | 15 | 11 |
| Stomach, duodenum..... | 245 | 294 | 45 | 162 |
| Intestines..... | 365 | 181 | 77 | 86 |
| Rectum, anus..... | 414 | 118 | 81 | 50 |
| Liver, biliary passages..... | 65 | 33 | 10 | 24 |
| Others..... | 84 | 76 | 7 | 24 |
| Respiratory system..... | 435 | 154 | 97 | 39 |
| Larynx..... | 225 | 38 | 69 | 8 |
| Lungs, pleura..... | 192 | 115 | 23 | 31 |
| Others..... | 18 | 1 | 5 | ----- |
| Genitourinary system..... | 2,074 | 665 | 400 | 222 |
| Uterus..... | 1,269 | 239 | 251 | 88 |
| Prostate..... | 142 | 160 | 15 | 40 |
| Others..... | 663 | 266 | 134 | 94 |
| Breast..... | 1,223 | 354 | 385 | 174 |
| Skin..... | 810 | 385 | 195 | 349 |
| Brain..... | 124 | 15 | 11 | 6 |
| Bones (except jaw)..... | 85 | 52 | 16 | 13 |
| All others..... | 360 | 159 | 67 | 54 |
| All cases..... | 6,955 | 2,707 | 1,522 | 1,300 |

TABLE 4.—Number of cases of cancer reported, by primary site, sex, and color, Philadelphia, Pa., 1938

| Primary site | White | | | Colored | | |
|------------------------------|------------|-------|--------|------------|------|--------|
| | Both sexes | Male | Female | Both sexes | Male | Female |
| Buccal cavity, pharynx..... | 937 | 776 | 161 | 37 | 17 | 20 |
| Lip..... | 350 | 310 | 40 | 2 | 2 | — |
| Tongue..... | 182 | 125 | 27 | 10 | 7 | 3 |
| Others..... | 435 | 341 | 94 | 25 | 8 | 17 |
| Digestive tract..... | 2,443 | 1,362 | 1,081 | 144 | 75 | 69 |
| Esophagus..... | 137 | 99 | 38 | 9 | 7 | 2 |
| Stomach, duodenum..... | 686 | 432 | 254 | 60 | 37 | 23 |
| Intestines..... | 696 | 312 | 374 | 23 | 9 | 14 |
| Rectum, anus..... | 637 | 306 | 271 | 26 | 11 | 15 |
| Liver, biliary passages..... | 125 | 52 | 73 | 7 | 5 | 2 |
| Others..... | 172 | 101 | 71 | 19 | 6 | 13 |
| Respiratory system..... | 701 | 588 | 113 | 24 | 18 | 6 |
| Larynx..... | 335 | 302 | 33 | 5 | 5 | — |
| Lungs, pleura..... | 342 | 271 | 71 | 19 | 13 | 6 |
| Others..... | 24 | 15 | 9 | — | — | — |
| Genitourinary system..... | 3,066 | 855 | 2,211 | 295 | 63 | 232 |
| Uterus..... | 1,650 | — | 1,650 | 197 | — | 197 |
| Prostate..... | 326 | 326 | — | 31 | 31 | — |
| Others..... | 1,090 | 529 | 561 | 67 | 32 | 35 |
| Breast..... | 2,032 | 16 | 2,016 | 104 | 2 | 102 |
| Skin..... | 1,724 | 1,000 | 724 | 15 | 6 | 9 |
| Brain..... | 150 | 93 | 57 | 6 | 4 | 2 |
| Bones (except jaw)..... | 159 | 95 | 64 | 7 | 4 | 3 |
| All others..... | 603 | 274 | 329 | 37 | 11 | 26 |
| All cases..... | 11,815 | 5,059 | 6,756 | 669 | 200 | 469 |

TABLE 7.—Number of resident cases of cancer,¹ by primary site, sex, and color, Philadelphia, Pa., 1938

| Primary site | White | | | Colored | | |
|------------------------------|------------|-------|--------|------------|------|--------|
| | Both sexes | Male | Female | Both sexes | Male | Female |
| Buccal cavity, pharynx..... | 608 | 511 | 97 | 28 | 12 | 16 |
| Lip..... | 219 | 193 | 26 | 1 | 1 | — |
| Tongue..... | 106 | 89 | 17 | 9 | 6 | 3 |
| Others..... | 283 | 229 | 54 | 18 | 5 | 13 |
| Digestive tract..... | 2,128 | 1,135 | 993 | 150 | 79 | 71 |
| Esophagus..... | 90 | 68 | 22 | 9 | 7 | 2 |
| Stomach, duodenum..... | 666 | 387 | 279 | 64 | 40 | 24 |
| Intestines..... | 579 | 261 | 318 | 25 | 10 | 15 |
| Rectum, anus..... | 476 | 266 | 210 | 27 | 12 | 15 |
| Liver, biliary passages..... | 156 | 58 | 98 | 7 | 5 | 2 |
| Others..... | 161 | 95 | 66 | 18 | 5 | 13 |
| Respiratory system..... | 394 | 323 | 71 | 24 | 18 | 6 |
| Larynx..... | 147 | 136 | 11 | 4 | 4 | — |
| Lungs, pleura..... | 230 | 176 | 54 | 19 | 13 | 6 |
| Others..... | 17 | 11 | 6 | 1 | 1 | — |
| Genitourinary system..... | 2,200 | 706 | 1,494 | 278 | 60 | 218 |
| Uterus..... | 1,065 | — | 1,065 | 182 | — | 182 |
| Prostate..... | 288 | 288 | — | 29 | 29 | — |
| Others..... | 847 | 418 | 429 | 67 | 31 | 36 |
| Breast..... | 1,451 | 13 | 1,438 | 102 | 2 | 100 |
| Skin..... | 1,161 | 641 | 520 | 13 | 5 | 8 |
| Brain..... | 57 | 32 | 25 | 6 | 4 | 2 |
| Bones (except jaw)..... | 105 | 58 | 47 | 5 | 2 | 3 |
| All others..... | 442 | 201 | 241 | 37 | 12 | 25 |
| All cases..... | 8,546 | 3,620 | 4,926 | 643 | 194 | 449 |

¹ Includes 701 cases not reported by doctors or hospitals, but recorded as resident deaths of cancer in 1938.

TABLE 8.—Number of resident cancer cases reported, number under observation only, and number first diagnosed during 1938, Philadelphia, Pa.

| Primary site | Number of resident cases reported | | |
|-----------------------------|-----------------------------------|------------------------------------|-----------------------------|
| | Total | Under observation only during 1938 | First diagnosed during 1938 |
| Buccal cavity, pharynx..... | 613 | 157 | 265 |
| Digestive tract..... | 1,919 | 150 | 1,340 |
| Respiratory system..... | 398 | 41 | 263 |
| Genitourinary system..... | 2,332 | 478 | 1,151 |
| Breast..... | 1,473 | 303 | 650 |
| Skin..... | 1,159 | 293 | 621 |
| Brain..... | 63 | 6 | 42 |
| Bones (except jaw)..... | 100 | 16 | 47 |
| All others..... | 431 | 76 | 251 |
| All cases..... | 8,488 | 1,520 | 4,530 |

TABLE 9.—Number of resident cancer cases first diagnosed in 1938, by primary site, sex, and color, Philadelphia, Pa.

| Primary site | White | | | Colored | | |
|------------------------------|------------|-------|--------|------------|-------|--------|
| | Both sexes | Male | Female | Both sexes | Male | Female |
| Buccal cavity, pharynx..... | 253 | 203 | 50 | 12 | 4 | 8 |
| Lip..... | 85 | 70 | 15 | ----- | ----- | ----- |
| Tongue..... | 52 | 43 | 9 | 5 | 3 | 2 |
| Others..... | 116 | 90 | 26 | 7 | 1 | 6 |
| Digestive tract..... | 1,240 | 687 | 553 | 100 | 58 | 42 |
| Esophagus..... | 60 | 44 | 16 | 9 | 7 | 2 |
| Stomach, duodenum..... | 377 | 238 | 139 | 42 | 29 | 13 |
| Intestines..... | 361 | 158 | 203 | 15 | 7 | 8 |
| Rectum, anus..... | 261 | 158 | 103 | 14 | 5 | 9 |
| Liver, biliary passages..... | 76 | 28 | 48 | 7 | 5 | 2 |
| Others..... | 105 | 61 | 44 | 13 | 5 | 8 |
| Respiratory system..... | 248 | 208 | 40 | 15 | 12 | 3 |
| Larynx..... | 70 | 66 | 4 | 2 | 2 | ----- |
| Lungs, pleura..... | 170 | 136 | 34 | 13 | 10 | 3 |
| Others..... | 8 | 6 | 2 | ----- | ----- | ----- |
| Genitourinary system..... | 1,014 | 359 | 655 | 137 | 40 | 97 |
| Uterus..... | 426 | ----- | 426 | 83 | ----- | 83 |
| Prostate..... | 147 | 147 | ----- | 21 | 21 | ----- |
| Others..... | 441 | 212 | 229 | 33 | 19 | 14 |
| Breast..... | 603 | 8 | 595 | 47 | ----- | 47 |
| Skin..... | 518 | 275 | 243 | 3 | 2 | 1 |
| Brain..... | 40 | 22 | 18 | 2 | 2 | ----- |
| Bones (except jaw)..... | 45 | 24 | 21 | 2 | 1 | 1 |
| All others..... | 228 | 100 | 128 | 23 | 8 | 15 |
| All cases..... | 4,189 | 1,886 | 2,303 | 341 | 127 | 214 |

CHANGES IN MORTALITY RATES, 1930 TO 1940¹

By HAROLD F. DORN, *United States Public Health Service*

The decade 1930 to 1940 is the first for which mortality records have been available for the entire country. It is true that the death registration area did not include each State until Texas was admitted in 1933 but insofar as the analysis of the trend in mortality rates is concerned the proportion of the total population included in the death registration area in 1930 was sufficiently large to justify considering the death rates of that area as representative of the entire country. In addition to the fact that data for every State are available, the past decade is notable for the prolonged economic depression which lasted throughout practically the entire period. An attempt can now be made to discover the effect, if any, of this depression upon the trend in mortality rates.

CHANGES IN EXPECTATION OF LIFE

Total population.—Between 1930 and 1940 the expectation of life at birth of the total population increased from 59.0 to 63.3 years, an increase of 4.3 years or 7 percent (table 1). Increases occurred throughout the entire life span, the average increase being about 5 percent. At the beginning of the century, 40 years previously, the expectation of life at birth for the population of the original registration States was 49.2 years; the corresponding figure in 1939, 63.3 years, represents an increase of 14.1 years, or 29 percent.

TABLE 1.—*Expectation of life at selected ages, total population of the United States, 1900-02, 1929-31, and 1939, and percentage change 1900-02 to 1939 and 1929-31 to 1939*

| Age | Original registration States, 1900-02 ¹ | Registration States, 1929-31 | United States, 1939 | Percentage increase | |
|---------|--|------------------------------|---------------------|---------------------|-----------------|
| | | | | 1900-02 to 1939 | 1929-31 to 1939 |
| 0..... | 49.2 | 59.0 | 63.3 | 29 | 7 |
| 5..... | 55.0 | 59.2 | 62.4 | 13 | 5 |
| 10..... | 51.1 | 54.8 | 57.7 | 13 | 5 |
| 15..... | 46.8 | 50.2 | 53.0 | 13 | 6 |
| 20..... | 42.8 | 45.9 | 48.5 | 13 | 6 |
| 30..... | 35.5 | 37.7 | 39.6 | 12 | 5 |
| 40..... | 28.3 | 29.6 | 31.0 | 10 | 5 |
| 50..... | 21.3 | 22.0 | 23.0 | 8 | 5 |
| 60..... | 14.8 | 15.1 | 15.9 | 7 | 5 |
| 70..... | 9.3 | 9.5 | 10.0 | 8 | 5 |
| 80..... | 5.3 | 5.5 | 5.6 | 6 | 2 |

¹ From United States Life Tables, 1890, 1901, 1910, and 1901-10.

Changes in white and nonwhite populations.—During the past decade the percentage increase in expectation of life was more than twice as large in the Negro as in the white population (tables 2, 3, 4). The

¹ From the Division of Public Health Methods, National Institute of Health.

TABLE 2.—*Expectation of life at selected ages, white male population of the United States, 1900-02, 1929-31, and 1939-40, and the percentage change 1900-02 to 1939-40 and 1929-31 to 1939-40*

| Age | Original registration States, 1900-02 ¹ | Registration States, 1929-31 ² | United States, 1939-40 | Percentage increase | |
|---------|--|---|------------------------|---------------------|--------------------|
| | | | | 1900-02 to 1939-40 | 1929-31 to 1939-40 |
| 0..... | 48.2 | 59.1 | 62.6 | 30 | 6 |
| 5..... | 54.4 | 59.4 | 61.6 | 13 | 4 |
| 10..... | 50.6 | 55.0 | 56.9 | 12 | 3 |
| 15..... | 46.3 | 50.4 | 52.3 | 13 | 4 |
| 20..... | 42.2 | 46.0 | 47.7 | 13 | 4 |
| 30..... | 34.9 | 37.5 | 38.7 | 11 | 3 |
| 40..... | 27.7 | 29.2 | 30.0 | 8 | 3 |
| 50..... | 20.8 | 21.5 | 21.9 | 5 | 2 |
| 60..... | 14.4 | 14.7 | 15.0 | 4 | 2 |
| 70..... | 9.0 | 9.2 | 9.4 | 4 | 2 |
| 80..... | 5.1 | 5.3 | 5.1 | 0 | -4 |

¹ From United States Life Tables, 1890, 1901, 1910, and 1901-10.

² From United States Life Tables, 1930.

average increase was between 3 and 4 percent for white males and 5 percent for white females compared with increases of about 9 and 11 percent for Negro males and females. Not only was the relative increase in expectation of life greater for Negroes than for whites but the absolute numerical increase was also greater. The expectation of life at birth increased 3.5 years for white males but 4.4 years for Negro males; the increase for females was 4.3 and 5.7 years, respectively. One reason for the smaller increase in life expectancy in the white population is the fact that this population is much closer to the maximum expectation of life attainable with present knowledge than is the Negro population. The large percentage increases in expectation of life of Negroes at ages 70 and 80 are probably due in part to an overstatement of age by Negroes when enumerated for the Census of 1940.

TABLE 3.—*Expectation of life at selected ages, white female population of the United States, 1900-02, 1929-31, 1939-40, and the percentage change 1900-1902 to 1939-40 and 1929-31 to 1939-40*

| Age | Original registration States, 1900-02 ¹ | Registration States, 1929-31 ² | United States, 1939-40 | Percentage change | |
|---------|--|---|------------------------|--------------------|--------------------|
| | | | | 1900-02 to 1939-40 | 1929-31 to 1939-40 |
| 0..... | 51.1 | 62.7 | 67.0 | 31 | 7 |
| 5..... | 56.0 | 62.2 | 65.3 | 17 | 5 |
| 10..... | 52.2 | 57.7 | 60.6 | 16 | 5 |
| 15..... | 47.8 | 53.0 | 55.9 | 17 | 5 |
| 20..... | 43.8 | 48.5 | 51.2 | 17 | 6 |
| 30..... | 36.4 | 40.0 | 42.1 | 16 | 5 |
| 40..... | 29.2 | 31.5 | 33.1 | 13 | 5 |
| 50..... | 21.9 | 23.0 | 24.6 | 12 | 5 |
| 60..... | 15.2 | 16.1 | 16.9 | 11 | 5 |
| 70..... | 9.6 | 10.0 | 10.4 | 8 | 4 |
| 80..... | 5.5 | 5.6 | 5.8 | 5 | 4 |

¹ From United States Life Tables, 1890, 1901, 1910, and 1901-10.

² From United States Life Tables, 1930.

TABLE 4.—*Expectation of life at selected ages, Negro population of the United States, 1929-31 and 1939-40, by sex, and the percentage change 1929-31 to 1939-40*

| Age | Males | | Females | | Percentage change 1929-31 to 1939-40 | |
|---------|---|------------------------------|---|------------------------------|---|--------|
| | Registration States, 1929-31 ¹ | United States, 1939-40 | Registration States, 1929-31 ¹ | United States, 1939-40 | Male | Female |
| 0..... | 47.6 | 52.0 | 49.5 | 55.2 | 9 | 12 |
| 5..... | 48.7 | 52.8 | 49.8 | 55.1 | 8 | 11 |
| 10..... | 44.3 | 48.1 | 45.3 | 50.4 | 9 | 11 |
| 15..... | 39.8 | 43.6 | 40.9 | 45.8 | 10 | 12 |
| 20..... | 36.0 | 39.3 | 37.2 | 41.7 | 9 | 12 |
| 30..... | 29.5 | 31.9 | 30.7 | 34.2 | 8 | 11 |
| 40..... | 23.4 | 24.9 | 24.3 | 26.9 | 6 | 11 |
| 50..... | 17.9 | 18.8 | 18.3 | 20.7 | 5 | 13 |
| 60..... | 13.2 | 13.7 | 14.2 | 15.6 | 4 | 10 |
| 70..... | 8.8 | 9.8 | 10.4 | 11.6 | 11 | 12 |
| 80..... | 5.4 | 6.7 | 6.9 | 8.2 | 24 | 19 |

¹ From United States Life Tables, 1930.

In spite of its greater absolute as well as relative increase in expectation of life during the past decade, the Negro population, except at birth and 60 years and over for females and at birth and 70 years and over for males, has a lower expectation of life at the present time than did the white population 40 years ago. On the basis of the mortality rates of 1939-40, white male infants could expect to live 10.6 years longer than Negro male infants and white female infants could expect to live 11.8 years longer than Negro female infants.

Perhaps a clearer appreciation of the effect of the higher mortality rates in the Negro population can be obtained by comparing the proportion of persons who would still be alive at given ages if continually subject to the mortality rates prevailing during 1939-40 from birth until the end of life. Out of 100 newborn white babies and 100 newborn Negro babies, 93 and 88, respectively, would be alive at the beginning of adult life, age 20; 83 and 63, respectively, would live until age 50; while 39 and 20 would reach 75 years of age. Although one-half of the white infants would still be alive at 71 years of age, one-half of the nonwhite infants would die before their fifty-eighth birthday.

Special interest attaches to the proportion of the population which would live to age 65 if continually subject to specified mortality rates since persons who reach this age may qualify for Social Security benefits provided they meet certain other requirements. If exposed throughout their life to the mortality rates existing in 1900 only 39 out of each 100 white male infants would reach age 65 compared with 58 which would reach this age if exposed to the mortality rates of 1939-40 (table 5).

During 1940 about 1,060,000 white male births were registered in the United States. If always exposed to current mortality rates,

TABLE 5.—Percentage of newborn white and Negro male infants who would live until age 65 if subject throughout their lifetime to specified mortality

| Mortality rates | White | Negro |
|--|-------|-------|
| United States, 1939-40..... | 58 | 37 |
| United States, 1929-31..... | 53 | 29 |
| Registration States of 1920, 1919-21..... | 51 | 34 |
| Original registration States, 1900-02..... | 39 | 19 |

about 614,000 would reach age 65; if exposed to the mortality rates of 40 years ago, about 413,000 would reach age 65. Thus the improvement in mortality during the past 40 years is sufficient to increase the annual number of white males reaching age 65 by about 200,000 or 1,000,000 every 5 years. This 5-year increase is nearly equivalent to the number of white male infants born in 1940. Of course neither the number of births nor the mortality rates remain fixed, but nevertheless these figures reveal the general effect of a decline in the death rate upon the potential number of claimants for old age benefits.

CHANGES IN MORTALITY RATES

All causes.—Age specific death rates more directly show the change in mortality at individual ages than does the expectation of life since the latter reflects the relative number of deaths not only at a given age but also at all older ages. Such rates for the white and Negro populations, by sex, are presented in tables 6 and 7 for the total United States for 1929-31 and 1939-40.

TABLE 6.—Number of deaths per 1,000 population 1929-31 and 1939-40 and the percentage decrease 1929-31 to 1939-40 for white males and females

| Age | Males | | Females | | Percentage decrease 1929-31 to 1939-40 | |
|--------------------|---------|---------|---------|---------|--|---------|
| | 1929-31 | 1939-40 | 1929-31 | 1939-40 | Males | Females |
| 0-4..... | 17.2 | 13.2 | 13.8 | 10.4 | 23.3 | 24.6 |
| 5-9..... | 1.9 | 1.2 | 1.6 | 0.9 | 36.8 | 43.8 |
| 10-14..... | 1.5 | 1.1 | 1.2 | 0.8 | 26.7 | 33.3 |
| 15-19..... | 2.5 | 1.7 | 2.0 | 1.2 | 32.0 | 40.0 |
| 20-24..... | 3.3 | 2.3 | 3.0 | 1.7 | 30.3 | 43.3 |
| 25-29..... | 3.7 | 2.5 | 3.3 | 2.0 | 32.4 | 39.4 |
| 30-34..... | 4.3 | 3.1 | 3.8 | 2.5 | 27.9 | 34.2 |
| 35-39..... | 5.5 | 4.2 | 4.5 | 3.2 | 23.6 | 28.9 |
| 40-44..... | 7.5 | 6.1 | 5.7 | 4.3 | 18.7 | 24.6 |
| 45-49..... | 10.2 | 9.2 | 7.7 | 6.2 | 9.8 | 19.5 |
| 50-54..... | 14.2 | 13.7 | 10.7 | 9.1 | 3.5 | 15.0 |
| 55-59..... | 20.6 | 20.5 | 15.8 | 13.6 | 0.5 | 13.9 |
| 60-64..... | 29.9 | 29.8 | 23.8 | 20.8 | 0.3 | 12.6 |
| 65-69..... | 44.6 | 43.9 | 36.7 | 32.6 | 1.6 | 11.2 |
| 70-74..... | 66.3 | 65.8 | 57.1 | 52.8 | 0.8 | 7.5 |
| 75-79..... | 100.8 | 100.6 | 89.8 | 86.5 | 0.2 | 3.7 |
| 80-84..... | 150.4 | 162.0 | 138.8 | 138.8 | +7.7 | 0 |
| 85-89..... | 216.2 | 220.6 | 201.5 | 192.4 | +2.0 | 4.5 |
| 90 and over..... | 306.7 | 313.3 | 294.7 | 287.0 | +2.2 | 2.6 |
| All ages: | | | | | | |
| Crude..... | 11.3 | 11.5 | 9.6 | 9.1 | +1.8 | 5.2 |
| Standardized*..... | 12.4 | 11.4 | 10.4 | 8.7 | 8.0 | 16.3 |

* Total population of United States 1940 used as standard.

TABLE 7.—Number of deaths per 1,000 population 1929-31 and 1939-40 and the percentage decrease 1929-31 to 1939-40 for Negro males and females

| Age | Males | | Females | | Percentage decrease 1929-31 to 1939-40 | |
|----------------|---------|---------|---------|---------|---|---------|
| | 1929-31 | 1939-40 | 1929-31 | 1939-40 | Males | Females |
| 0 - 4 | 30.5 | 22.5 | 24.8 | 17.5 | 26.2 | 29.3 |
| 5 - 9 | 2.6 | 1.6 | 2.4 | 1.3 | 38.9 | 44.9 |
| 10-14 | 2.6 | 1.8 | 2.5 | 1.5 | 30.8 | 40.2 |
| 15-19 | 6.0 | 3.7 | 6.9 | 4.3 | 37.9 | 37.9 |
| 20-24 | 10.1 | 6.5 | 9.5 | 5.9 | 35.6 | 37.8 |
| 25-29 | 11.5 | 7.9 | 10.7 | 6.9 | 31.1 | 35.6 |
| 30-34 | 14.0 | 9.8 | 12.4 | 8.3 | 29.9 | 33.3 |
| 35-39 | 15.7 | 11.7 | 13.9 | 10.0 | 25.3 | 27.8 |
| 40-44 | 20.6 | 15.7 | 18.2 | 13.9 | 23.7 | 23.5 |
| 45-49 | 23.8 | 20.7 | 21.6 | 17.6 | 13.1 | 18.5 |
| 50-54 | 30.0 | 25.1 | 30.4 | 22.2 | 16.4 | 27.1 |
| 55-59 | 37.7 | 35.9 | 39.1 | 33.7 | 4.8 | 13.7 |
| 60-64 | 45.7 | 39.2 | 45.8 | 37.4 | +14.1 | 18.3 |
| 65-69 | 59.8 | 70.6 | 50.1 | 53.4 | +18.2 | 4.8 |
| 70-74 | 80.5 | 80.8 | 68.6 | 59.4 | +0.4 | 13.4 |
| 75-79 | 108.0 | 94.3 | 84.5 | 74.7 | 12.7 | 11.6 |
| 80-84 | 153.8 | 118.3 | 113.5 | 83.8 | 23.1 | 26.2 |
| 85-89 | 204.7 | 156.9 | 150.3 | 138.3 | 23.3 | 8.0 |
| 90 and over | 278.0 | 245.1 | 230.8 | 192.6 | 11.8 | 16.5 |
| All ages: | | | | | | |
| Crude | 17.5 | 15.0 | 15.3 | 12.5 | 14.4 | 18.3 |
| Standardized * | 21.4 | 17.9 | 19.5 | 15.1 | 16.4 | 22.6 |

* Total population of United States 1940 used as standard.

The Negro population 50-74 years of age in 1940 was redistributed by 5-year age groups within this range because of the obvious concentration of population in the group 65-69 years in the enumerated population.

During the past decade the death rate of Negroes declined more rapidly than the rate of whites; for males the respective decreases were 16.4 and 8.0 percent and for females the corresponding figures were 22.6 and 16.3 percent after adjustment for differences in age composition. Nevertheless the death rate for Negro males is still 57 percent higher than the rate for white males while the rate for Negro females is 74 percent higher than the rate for white females.

The largest relative decrease in mortality rates occurred among persons less than 45 years of age. For each sex and race the rates for children, youths, and adults under 45 years of age decreased by one-fourth to one-third during the decade. After age 45 the changes were rather irregular, but in general some decrease was recorded except for white males. Beginning with the age group 55-59 years the decrease in the mortality rate of white males was insignificant, and after age 80 some increase even occurred. Although the relative decrease became smaller with advancing age, the age specific death rates of white females were lower in 1940 than in 1930 for every age group except 80-84.

The figures in table 7 undoubtedly exaggerate the improvement in the health of elderly Negroes. Presumably with the expectation that their chances of obtaining old age benefits would be increased, Negroes, especially females, reported themselves, during the enumeration of the population in 1940, as being older than they actually were. Persons as young as age 50 apparently reported their ages as 65 or more.

So many Negro females chose to report their ages as being between 65 and 70 that the death rate for that age group when computed from the reported population is actually lower than the rate for the preceding group, 60-64 years. The misstatement of age of Negro males, although not so widespread, was also clearly evident. Before the mortality rates in table 7 were computed the 1940 Negro population between 50 and 75 years of age was redistributed by 5-year age groups in an attempt to eliminate the obvious errors in the reporting of age.

When rates computed in this way are compared with the corresponding rates for 1930, the death rate for Negro males aged 65-69 in 1940 is 18.2 percent higher than the rate in 1930 and the rate for those aged 70-74 is also slightly higher in 1940 than in 1930. An investigation of the number of deaths recorded each year during the past decade revealed that the number of deaths of Negro males aged 65-69 increased sharply during 1936 and 1937 following the enactment of the Social Security Act in 1935. Prior to that time the largest number of deaths of Negro males occurred in the age group 50-54 after which the number of deaths decreased. Beginning in 1936 there have been two peaks in the distribution of deaths by age, one at 50-54 years and another at 65-69 years. There is some evidence of a corresponding misstatement of the age at death of Negro females but the error is much smaller.

It is interesting that there is a sex difference in the manner of reporting erroneous ages. The misstatement of age of Negro males has been more prevalent upon death certificates than it was at the enumeration of the population in 1940. But for Negro females the concentration of ages in the group 65-69 was much greater in the census of population than it has been upon death certificates. Since a large proportion of the ages at death of Negro males undoubtedly is reported by female members of the household, the evidence indicates that women falsify ages more readily than men. Possibly they have more to gain by so doing.

The change in the age specific death rates during the past decade is in striking contrast to the change from 1920 to 1930 (figs. 1 and 2). During the latter decade the death rates for white males aged 45 years or more and for white females aged 60 years or more actually increased. For the colored population increases in mortality rates were recorded for males 25 or more years of age and for females 35 or more years of age.

But during the past decade no definite increases in mortality were recorded except for white males more than 80 years old although the increases were insignificant for white males 55 or more years of age. For both races and for each sex during the past decade health, as measured by mortality rates, improved throughout the entire life span when compared with the preceding decade, 1920 to 1930. Death

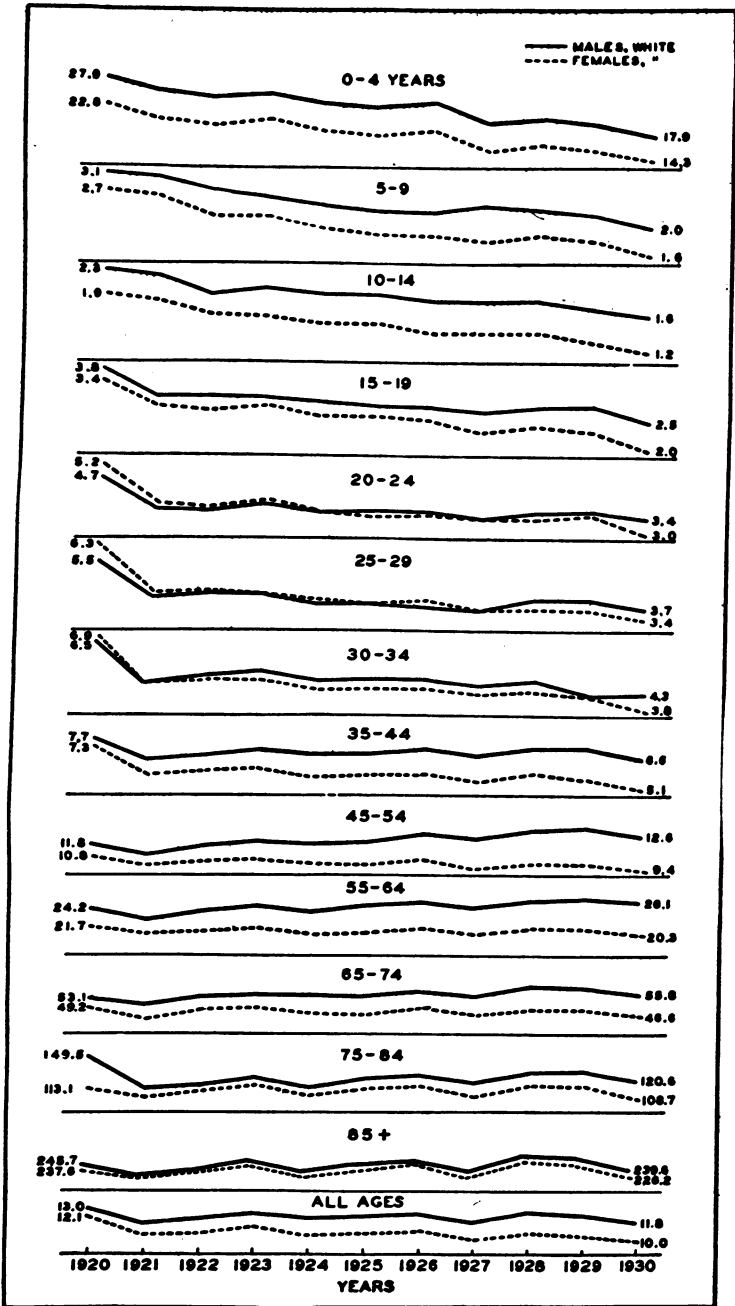


FIGURE 1.—Number of deaths per 1,000 white population by age and sex for the death registration States of 1920 from 1920 to 1930. (Semilogarithmic scale; the figures at the ends of the lines are the death rates in 1920 and 1930, respectively.)

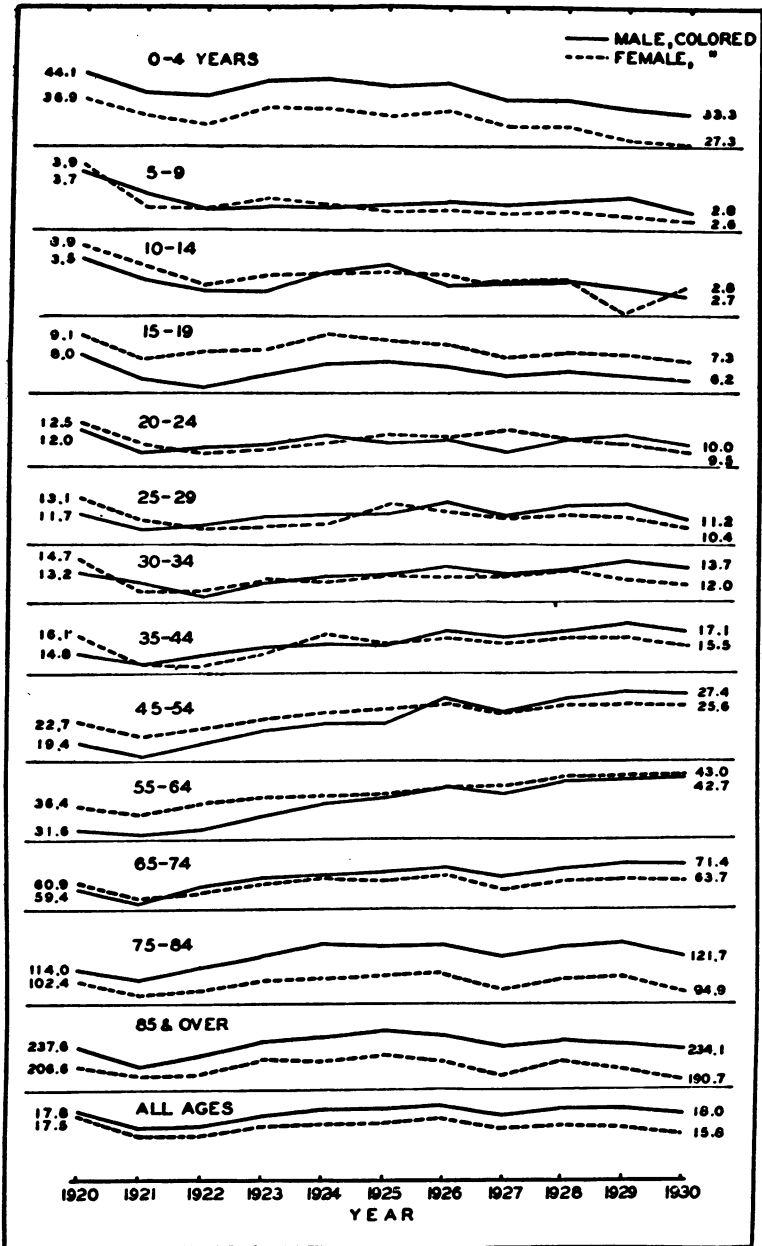


FIGURE 2.—Number of deaths per 1,000 colored population by age and sex for the death registration States of 1920 from 1920 to 1930. (Semilogarithmic scale; the figures at the ends of the lines are the death rates in 1920 and 1930, respectively.)

rates of persons in late adult life which had increased from 1920 to 1930 either decreased or, for white males over 80 years of age, increased less from 1930 to 1940. Does this mean that mortality rates of persons in late adult life have now begun to decrease although previous records indicate that, if anything, there has been some increase in such rates during the past generation?

The statement that the death rates of persons in late adult life decreased from 1930 to 1940 is just as true as the statement that the corresponding rates increased from 1920 to 1930. But will this reported decrease be more permanent than the increase which was previously reported? Although there are reasons for expecting some improvement in the health of persons in late adult life because of the marked decrease in mortality from tuberculosis and pneumonia during the past decade, it will be necessary to await the record of the present decade before definite conclusions can be established. Unfortunately the record of the present decade may be influenced by the effects of the war so that the answer to the question of whether there has been a real decline in the death rates of old persons may be postponed.

It may be desirable to point out that although the misstatement of age by persons around 65 years does affect the mortality rates at specific ages, it does not account for the reported decrease in mortality rates. Even if the 5-year age groups are combined into broader groups, the death rates still are lower in 1940 than in 1930.

The decrease in the age specific mortality rates of the population of the entire country is supported by the trend in mortality rates among industrial policyholders of the Metropolitan Life Insurance Company (table 8). In contrast to the change between 1920 and 1930, mortality rates during the past decade declined sharply at each age even in the colored group. The agreement in the trend of mortality of these urban wage earners with that of the general population gives added support to the belief that a real improvement in the health of persons in late adult life occurred between 1930 and 1940.

TABLE 8.—Percentage decrease in the number of deaths per 1,000 population by age, sex, and color, Industrial Department, Metropolitan Life Insurance Company, 1929-31 to 1940¹

| Age | Percentage decrease 1929-31 to 1940 | | | | Age | Percentage decrease 1929-31 to 1940 | | | |
|---------|-------------------------------------|--------|---------|--------|---------|-------------------------------------|--------|---------|--------|
| | White | | Colored | | | White | | Colored | |
| | Male | Female | Male | Female | | Male | Female | Male | Female |
| 10..... | 47 | 39 | 66 | 57 | 50..... | 22 | 25 | 22 | 24 |
| 20..... | 40 | 54 | 47 | 44 | 60..... | 13 | 20 | 16 | 15 |
| 30..... | 38 | 48 | 44 | 49 | 70..... | 9 | 11 | 9 | 7 |
| 40..... | 29 | 34 | 35 | 34 | | | | | |

¹ Computed from data in: Louis I. Dublin and Alfred J. Lotka, "Length of Life," p. 301, and Statistical Bulletin of the Metropolitan Life Insurance Co., June 1941.

Specific causes of death.—Significant decreases in mortality rates were recorded for each of the important causes of death except heart disease, cancer, and diabetes (table 9). The largest relative increase was in the death rate for diabetes which was 12 percent higher in the white and 24 percent higher in the nonwhite population in 1939 as compared with 1929–31. Smaller increases took place in the mortality rates of heart disease and cancer; the rate of the former actually decreased in the nonwhite population. The reasons for the observed increase in the death rates from cancer, heart disease, and diabetes are difficult to determine. More accurate diagnosis, a change in methods of entering the cause of death on the death certificate, and perhaps a real increase in the disease itself may all have contributed to the higher death rate.

TABLE 9.—Number of deaths per 100,000 population from selected causes, by color, United States, 1929–31, 1939, and the percentage change 1929–31 to 1939 (rates are standardized on the total United States population 1940)

| Cause of death | White | | Nonwhite | | Percentage change 1929-31 to 1939 | |
|-----------------------------|---------|---------|----------|---------|-----------------------------------|----------|
| | 1929-31 | 1939 | 1929-31 | 1939 | White | Nonwhite |
| Influenza..... | 32.7 | 14.5 | 75.2 | 37.5 | -56 | -50 |
| Pellagra..... | 2.6 | 1.2 | 36.9 | 9.6 | -54 | -74 |
| Diarrhea and enteritis..... | 19.1 | 10.4 | 37.7 | 19.7 | -46 | -48 |
| Homicide..... | 5.6 | 3.2 | 40.0 | 34.2 | -43 | -15 |
| Tuberculosis..... | 60.1 | 37.0 | 205.8 | 133.2 | -39 | -35 |
| Pneumonia..... | 76.3 | 54.3 | 269.6 | 106.8 | -29 | -60 |
| Cerebral hemorrhage..... | 99.5 | 72.7 | 161.5 | 137.1 | -27 | -15 |
| Nephritis..... | 97.5 | 76.7 | 208.1 | 164.6 | -21 | -21 |
| Accidents..... | 83.5 | 69.8 | 95.7 | 78.1 | -17 | -16 |
| Syphilis..... | 5.4 | 4.5 | 43.7 | 40.3 | -17 | -8 |
| All causes..... | 1,144.5 | 1,006.5 | 2,018.8 | 1,603.3 | -12 | -21 |
| Suicide..... | 16.7 | 14.9 | 6.2 | 4.6 | -11 | -26 |
| Cancer..... | 113.9 | 118.4 | 86.0 | 97.1 | 4 | 13 |
| Heart disease..... | 244.3 | 273.7 | 333.0 | 308.8 | 12 | -7 |
| Diabetes..... | 22.7 | 25.4 | 18.8 | 23.3 | 12 | 24 |

Large decreases were recorded in the death rates from the principal respiratory causes of death: influenza, pneumonia, and tuberculosis. The decline in the death rate from tuberculosis is a continuation of the trend observed during recent decades. The lower rate from pneumonia undoubtedly was the result, in part at least, of an increasingly widespread use of serum and drugs in the treatment of this disease. It should be noted, however, that the death rate from influenza also decreased very sharply during the past decade. Part of this decrease may be attributed to the fact that although the number of cases of influenza was higher than the average during 1939, the disease was not especially fatal so that the death rate remained relatively low.

One of the most gratifying features of the past decade was the uninterrupted decline in the maternal mortality rate which previous to 1930 had shown no decline since the birth registration area was

established in 1915. During the past decade this rate declined 48 percent among white mothers and 34 percent among nonwhite mothers. In 1940 the two rates were 3.2 and 7.7 per 1,000 live births, respectively.

The number of infant deaths dropped below 5 percent of the number of live births for the first time during the past decade. The relative decrease, 28 percent, was the same for both whites and nonwhites but the rate for the latter is still much higher than that for white infants, 74 per 1,000 live births compared with 43 per 1,000 live births.

Taken as a whole the mortality record of the past decade is one of the most favorable in the history of death registration in this country.

SUMMARY

Between 1930 and 1940 the expectation of life at birth for the total population increased from 59.0 to 63.3 years, or 7 percent. Increases occurred at each age, the average being about 5 percent.

The relative increase in life expectancy was nearly twice as great for nonwhites as for whites. The expectation of life at birth increased 3.5 and 4.3 years for white males and females but 4.4 and 5.7 years for Negro males and females. However, the life expectancy for white persons is still appreciably greater than that for nonwhite persons. The expectation of life at birth is 63 years for white males and 67 years for white females, compared with 52 years for Negro males and 55 years for Negro females.

After adjustment for changes in age distribution the death rate from all causes in 1939-40 was about 12 percent lower than the rate in 1929-31 for whites and about 20 percent lower for Negroes.

The largest relative decreases occurred in the death rates of children and young adults but significant decreases were recorded throughout the entire life span even among persons in the older age groups.

With the exception of the death rates from heart disease, cancer, and diabetes, the mortality rate for each of the important causes of death was lower in 1939 than in 1930.

For the first time in the history of the registration area, the maternal mortality rate declined uninterruptedly throughout the entire decade. The relative decrease was 48 percent among white mothers and 34 percent among nonwhite mothers.

By the end of the decade the mortality of white infants had dropped to 4 percent while that of nonwhite infants had dropped to 7 percent.

***IXODES BAERGI*, A NEW SPECIES OF TICK FROM ARKANSAS
(ACARINA: IXODIDAE)¹**

By R. A. COOLEY, *Senior Entomologist*, and GLEN M. KOHLS, *Associate Entomologist, United States Public Health Service*

Ixodes baergi n. sp.

Capitulum, scutum, legs, and coxae in both sexes only moderately sclerotized; color yellow.

FEMALE

Body.—(Described from well-engorged specimens.) Slightly panuriform because of lateral constrictions at the spiracular plates. Size from 6.5 mm. by 4.0 mm. to 7.5 mm. by 4.5 mm.

Capitulum.—Length (measured from posterior margin of basis capituli to tip of hypostome), 0.495 mm.; width, 0.45 mm. Basis capituli rounded at the sides, posterior margin straight or undulate; cornua absent. Porose areas large, nearly circular, depressed, reaching nearly to the posterior margin, separated by about the diameter of one. Palpi short, broad, tumescent dorsally and with a few fine hairs; article 1 simple. Basis, ventrally, narrower behind, lacking definite constrictions at the sides and limited behind by a faint, posteriorly directed, curved ridge. Auriculae suggested by faint, short, curved ridges.

Hypostome.—Short, broad, rounded apically; denticles 3/3 except near the base where they are 2/2. Length about 0.21 mm.

Scutum.—Longer than wide, widest before the middle, broadly rounded posteriorly. Scapulae short, blunt. Cervical grooves moderately deep, broad, little curved, and nearly parallel. Lateral carinae faint or absent. Surface impunctate; irregular, especially in the antero-lateral areas. Hairs few, small; absent in many specimens. Size range in 6 specimens, 0.84 mm. by 0.72 mm. to 0.96 mm. by 0.90 mm.

Legs.—Moderate in length and size and with a few short hairs. All tarsi with mild, subterminal humps. Length of tarsus I, 0.51 mm.; metatarsus, 0.45 mm. Length of tarsus IV, 0.54 mm.; metatarsus, 0.465 mm.

Coxae.—Without spurs, smooth, impunctate, with a few faint hairs.

Spiracular plate.—Elliptical, with the longer axis directed dorso-ventrally. Macula a little eccentric on the anterior side. Goblets moderate in number. Greatest length, 0.27 mm.

Sexual opening.—Placed slightly posterior to coxae II.

¹ From the Rocky Mountain Laboratory (Hamilton, Montana), Division of Infectious Diseases, National Institute of Health.

MALE

Body.—Oval, a little narrower in front. Length, excluding capitulum, 2.37 mm., width, 1.56 mm.

Capitulum.—Length (from posterior margin of basis capituli to tip of hypostome), 0.36 mm.; width (posterior portion of basis), 0.225 mm. Basis distinctly elevated over the level of the mouth parts. Posterior margin straight or a little curved, salient; sides curved. Cornua absent. Surface irregular, finely punctate (some specimens show only very faint punctations). Palpi short, broad, tumescent, and with a few hairs; surface irregular. Palpal article 1 simple. Length of articles 2 and 3 combined, 0.18 mm., width, 0.12 mm. Basis, ventrally, merges into the "neck" without a ventral ridge, though there are a few faint, transverse wrinkles. Auriculae absent.

Hypostome.—Short, broad, and cleft apically. Denticles arranged 3/3, those of the lateral files pointed, those of the median files rounded. Length about 0.15 mm.

Scutum.—Cervical grooves broad, shallow, straight, divergent, about as long as the interval of the emargination. Two faintly depressed areas of irregular shape, one on each side posterior to the cervical groove. Scapulae moderate in length, blunt. Surface, especially pseudoscutal area, shining, faintly shagreened. Punctations numerous, small, about equal in size throughout or tending to be a little larger near the lateral margins. Hairs few and small.

Legs and coxae.—Essentially as in the female. Length of tarsus I, 0.42 mm.; metatarsus, 0.36 mm. Length of tarsus IV, 0.45 mm.; metatarsus, 0.315 mm.

Plates.—Median plate longer than the anal plate. Sutural line between median and adanal plates indistinct. All plates with fine punctations and with a few fine hairs.

Spiracular plate.—Subcircular with the macula placed a little eccentric on antero-ventral side. Surface level. Greatest length, 0.225 mm.

Sexual opening.—Placed at the level of the intervals between coxae II and III.

Nymphs and larvae unknown.

Described from numerous females and males from cliffs inhabited by a colony of cliff swallows, Washington County, Ark., June 21, 1941, A. P. 19248, collected by Dr. W. J. Baerg.

Holotype.—Female.

Allotype.—Male.

Paratypes.—12 females, 12 males.

Holotype and allotype preserved in the collections of the Rocky Mountain Laboratory. One pair of paratypes has been sent to each of the following: United States National Museum, Washington, D. C.;

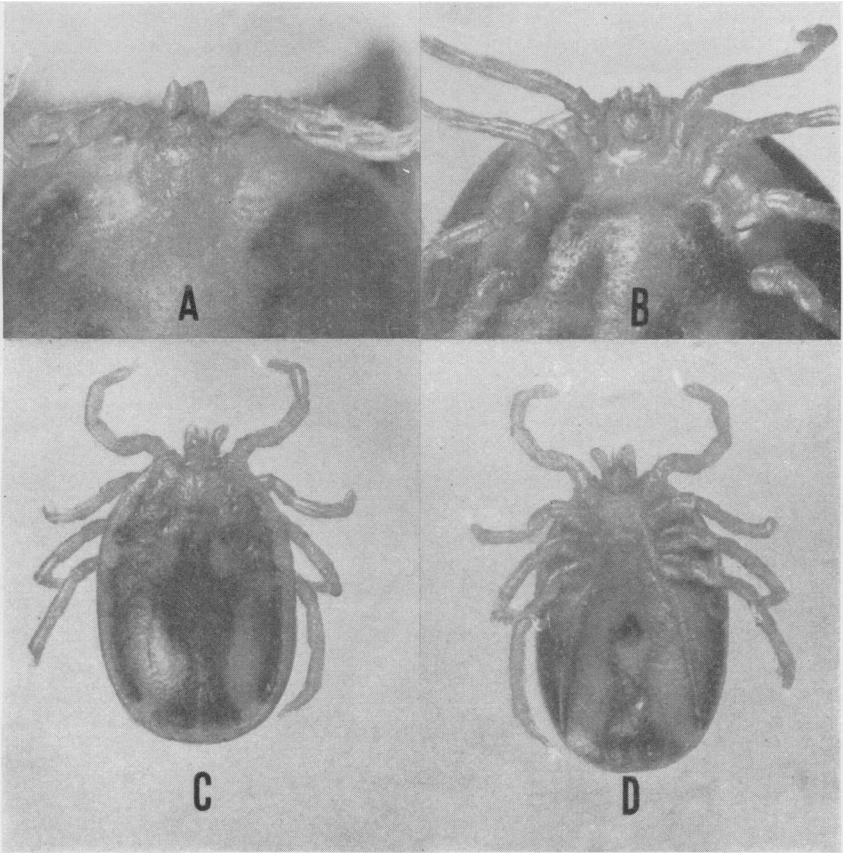


FIGURE 1.—*Ixodes buergeri* n. sp. A. Dorsal view of anterior end of engorged female. B. Same in ventral view. C. Male, dorsal view. D. Male, ventral view.

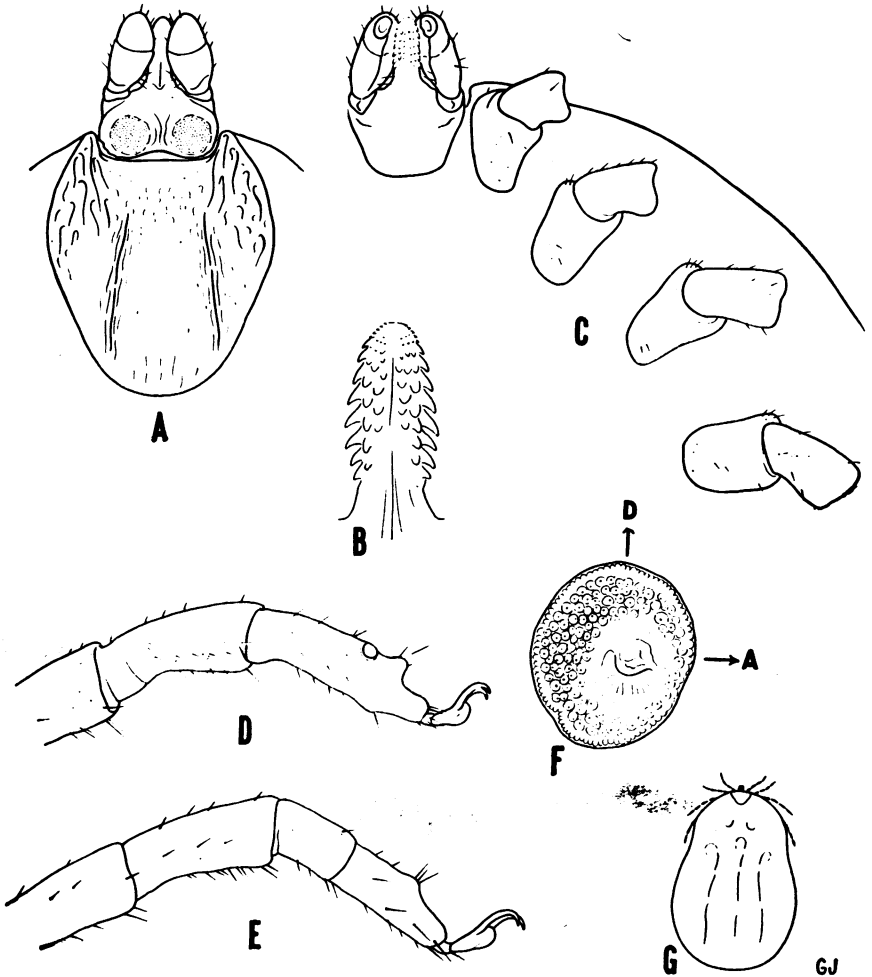


FIGURE 2.—*Ixodes baergi* n. sp., female. A. Capitulum and scutum. B. Hypostome. C. Capitulum and coxae. D. Tarsus and metatarsus of leg I. E. Tarsus and metatarsus of leg IV. F. Spiracular plate. G. Engorged specimen.

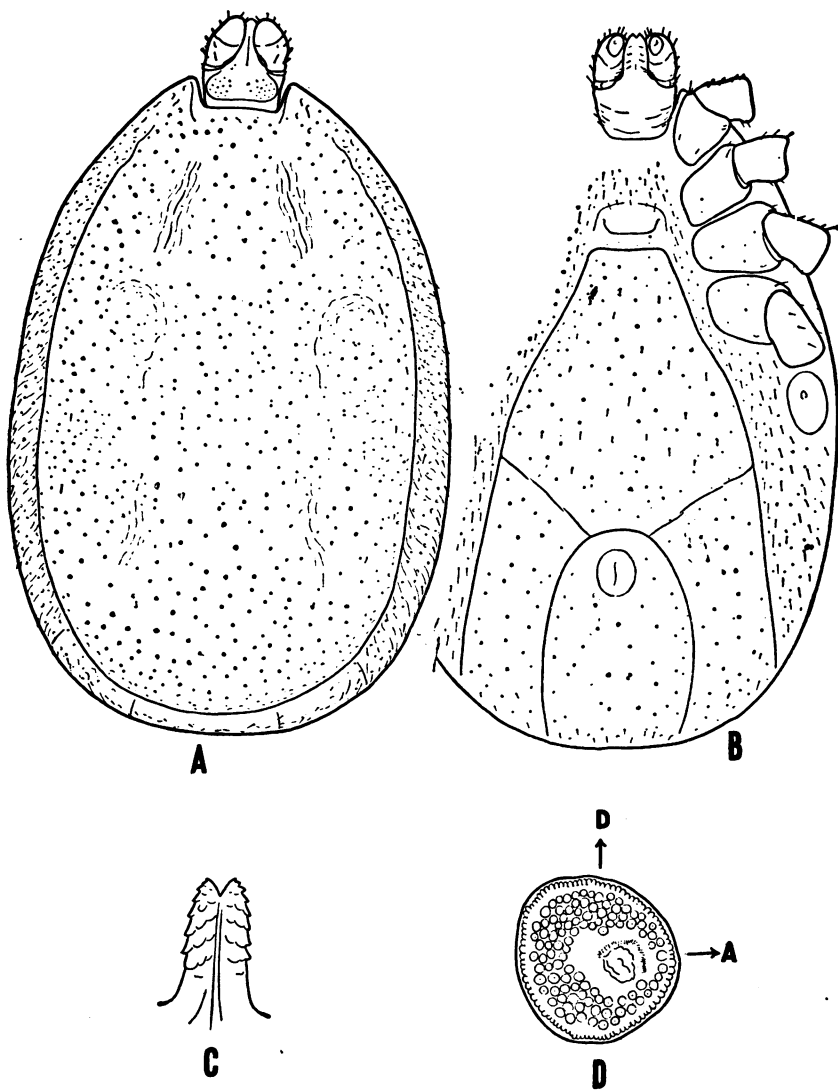


FIGURE 3.—*Izodes baergi* n. sp., Male. A. Capitulum and scutum. B. Capitulum, coxae and plates. C. Hypostome. D. Spiracular plate.

Bureau of Entomology and Plant Quarantine, Washington, D. C.; Zoological Division, Bureau of Animal Industry, Washington, D. C.; Department of Entomology, College of Agriculture, Fayetteville, Ark.; Museum of Comparative Zoology, Harvard University, Cambridge, Mass.; Division of Entomology and Parasitology, University of California, Berkeley, Calif.; Division of Entomology and Economic Zoology, University of Minnesota, Minneapolis, Minn.; Department of Entomology, Cornell University, Ithaca, N. Y.

This new species resembles *canisuga* Johnston, an Old World tick occurring on dog and various other hosts, including "sand martin." It differs from *canisuga* by several characters, including the following: In the new species the surface of the scutum of the female is impunctate, irregular with faint wrinkles or rugae, while in *canisuga* it is smooth, punctate, bright and shining. In *baergi* the porose areas are large, concave and shallow, while in *canisuga* they are smaller and deeper. In *baergi* the female hypostome measures 0.21 mm., while in *canisuga* it is more than 50 percent longer, measuring 0.36 mm. Descriptions of the *canisuga* male do not reveal distinct differences between it and *baergi*.

The new species also resembles *marxi* Banks, an American tick fairly common on *Sciurus*. In *baergi* the scutum of the female is smaller than in *marxi*. In *baergi* porose areas are large, circular, and shallow while in *marxi* they are small, irregular, and deep. The males of *marxi* are proportionately narrower than those of *baergi* and have the scutum coarsely punctate.

DEATHS DURING WEEK ENDED NOVEMBER 21, 1942

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

| | Week ended Nov. 21, 1942 | Corre- sponding week 1941 |
|---|--------------------------------|---------------------------------|
| Data from 88 large cities of the United States: | | |
| Total deaths..... | 9, 115 | 8, 354 |
| Average for 3 prior years..... | 8, 137 | |
| Total deaths, first 46 weeks of year..... | 384, 785 | 383, 150 |
| Deaths per 1,000 population, first 46 weeks of year, annual rate..... | 11.7 | 11.6 |
| Deaths under 1 year of age..... | 587 | 528 |
| Average for 3 prior years..... | 506 | |
| Deaths under 1 year of age, first 46 weeks of year..... | 26, 567 | 24, 293 |
| Data from industrial insurance companies: | | |
| Policies in force..... | 65, 252, 281 | 64, 655, 900 |
| Number of death claims..... | 12, 092 | 10, 168 |
| Death claims per 1,000 policies in force, annual rate..... | 9.7 | 8.2 |
| Death claims per 1,000 policies, first 46 weeks of year, annual rate..... | 9.1 | 9.4 |

PREVALENCE OF DISEASE

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

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED NOVEMBER 28, 1942

Summary

The incidence of meningococcus meningitis increased during the week from 64 to 93 cases, the largest number reported for the corresponding week of any other year since 1936 (94 cases). The total number of cases (3,196) reported to date is above that recorded for the corresponding period of any other year since 1937, when 4,998 cases had been reported. The largest numbers of cases were reported in the Middle Atlantic (22 cases), South Atlantic (19), and New England States (15), and the highest incidence rates are shown for the New England and South Atlantic areas. The other cases are fairly well distributed geographically. The following named States reported the largest numbers of cases: New York 9, California 8, New Jersey 7, Pennsylvania and Maryland 6 each.

A total of 69 cases of poliomyelitis was reported, as compared with 100 for the preceding week. Texas reported 17 cases and California 13. No other State reported more than 4 cases.

The incidence of influenza increased slightly—from 1,769 last week to 1,854 for the current week. Of these, Texas reported 539, South Carolina 435, and Virginia 344, or 71 percent of the total in these three States. The current incidence for the country as a whole, however, is below that for the corresponding week of any prior year since 1938.

Of the 9 important communicable diseases included in the following table, and for which comparable weekly reports are available for prior years, the current incidence of only one, meningococcus meningitis, is above the 5-year (1937-41) median expectancy.

Other reports for the week include 1 case of anthrax (in Massachusetts), 10 scattering cases of infectious encephalitis, 1 case of

Rocky Mountain spotted fever (in Indiana), 12 cases of smallpox (8 of which were in the East North Central States), 18 cases of tularemia (12 in the East North Central area), and 63 cases of endemic typhus fever (26 in Georgia and 14 in Texas).

Report of 1 human case of plague in California was received during the week.¹

The death rate for the current week for 88 large cities in the United States is 11.9 per 1,000 population, as compared with 12.7 last week and a 3-year (1939-41) average of 11.8. The accumulated rate to date is 11.7 as compared with 11.6 for the corresponding period in 1941.

¹ See p. 1879.

The family lived about 5 miles from Yreka and owned numerous dogs and cats. Examination of four other children revealed no evidence of flea bites. Evidence of mice infestation was found in the home. There were no visible signs of the presence of ground squirrels, but the ground was covered with snow and the weather was cold. It was reported that ground squirrels were in evidence until the weather changed about a week prior to the onset of the disease. For two weeks prior to the child's illness, the father of the patient had been hauling hay from a known rodent plague area and the patient had played in this hay. The father stated that pack rats frequented the barn.

Two fatal cases of plague in human beings occurred in Siskiyou County in 1941, both in children.¹ One was in a 10-year-old boy living near Montague; the other in a 5-year-old boy living 1 mile northwest of Mount Shasta City, about 50 miles from the locality in which the first case occurred. Subsequently, plague infection was found in several pools of fleas taken from ground squirrels in various localities in Siskiyou County.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—During the week ended November 14, 1942, 26 rats found in Paauhau area, Hamakua District, Island of Hawaii, T. H., have been proved positive for plague.

Panama Canal Zone

Notifiable diseases.—August 1942.—During the month of August 1942, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

| Disease | Panama | | Colon | | Canal Zone | | Outside the Zone and terminal cities | | Total | |
|--------------------------------|--------|--------|-------|--------|------------|--------|--------------------------------------|--------|-------|--------|
| | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths |
| Chickenpox..... | 15 | | 6 | | 8 | | 2 | | 31 | |
| Diphtheria..... | 12 | 2 | 4 | | 2 | | 3 | 1 | 21 | 3 |
| Dysentery (amebic)..... | 5 | | 3 | | 5 | | 4 | | 17 | |
| Dysentery (bacillary)..... | | | | | | | 1 | 2 | 1 | 2 |
| Leprosy..... | 1 | | | | | | 1 | 1 | 1 | 1 |
| Malaria ¹ | 11 | 1 | 8 | | 739 | 2 | 221 | 6 | 979 | 9 |
| Measles..... | 2 | | 2 | | 42 | | 11 | | 57 | |
| Meningitis, meningococcus..... | | | 1 | | 2 | | | | 3 | |
| Mumps..... | 2 | | | | 5 | | | | 7 | |
| Paratyphoid fever..... | | | | | 2 | | | | 2 | |
| Pneumonia..... | | 14 | | 13 | 88 | | | 4 | 88 | 31 |
| Relapsing fever..... | 1 | | | | | | 1 | | 2 | |
| Tuberculosis..... | | 17 | | 6 | 3 | 2 | | 2 | 3 | 27 |
| Typhoid fever..... | 1 | | | | | | 3 | | 4 | |
| Whooping cough..... | | | | | 10 | | | | 10 | |

¹ Includes 213 recurrent cases.

² Cases reported in the Canal Zone only.

¹ Pub. Health Rep., 57: 903 (1942).

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 31, 1942.—During the week ended October 31, 1942, 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 | Quebec | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia | Total |
|-------------------------------|----------------------|-------------|---------------|--------|---------|----------|--------------|---------|------------------|-------|
| Cerebrospinal meningitis | | 1 | | 3 | 2 | | | | 1 | 7 |
| Chickenpox | | 4 | | 156 | 199 | 77 | 40 | 42 | 63 | 581 |
| Diphtheria | 9 | 18 | 4 | 57 | 1 | 9 | | | 2 | 100 |
| Dysentery | | | | 52 | | 2 | | | | 54 |
| Encephalomyelitis | | | | | | | 1 | | | 1 |
| German measles | | 2 | | 29 | 8 | | 3 | 1 | 6 | 49 |
| Influenza | | 2 | | | 11 | | | | 45 | 58 |
| Measles | | | | 165 | 33 | 7 | 16 | 2 | | 223 |
| Mumps | | 14 | | 118 | 164 | 23 | 82 | 25 | 194 | 620 |
| Pneumonia | | 2 | | | 17 | | | | 33 | 52 |
| Poliomyelitis | | 1 | | 3 | 1 | | 1 | | 3 | 9 |
| Scarlet fever | | 7 | 8 | 103 | 101 | 25 | 19 | 25 | 36 | 324 |
| Smallpox | | | | | | | 1 | | | 1 |
| Tuberculosis | 5 | 18 | 9 | 150 | 43 | 16 | 2 | 29 | 29 | 301 |
| Typhoid and paratyphoid fever | | | 3 | 16 | 1 | | | | | 20 |
| Undulant fever | | | | | 1 | | | | 1 | 2 |
| Whooping cough | | 4 | 1 | 179 | 96 | 17 | 4 | 8 | 18 | 327 |
| Other communicable diseases | | 1 | | 5 | 210 | 31 | 4 | | 9 | 260 |

FRANCE

Vital statistics—Years 1939, 1940, and 1941.—The following table shows the numbers of births, deaths, and marriages in France, exclusive of Alsace-Lorraine, for the years 1939, 1940, and 1941, as given in the May issue of the monthly statistical bulletin of the League of Nations and the June issue of the *Droit Social*:

| | 1939 | 1940 | 1941 |
|---------------------------------|---------|---------|---------|
| Number of marriages | 277,300 | 169,800 | 217,200 |
| Marriages per 1,000 inhabitants | 6.2 | 4.2 | |
| Number of births | 620,000 | 534,900 | 493,500 |
| Births per 1,000 inhabitants | 14.6 | 13.3 | |
| Number of deaths | 622,000 | 734,900 | 660,600 |

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual prevalence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A cumulative table showing the reported prevalence of these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

New Caledonia—Noumea (vicinity of).—On November 10, 1942, 1 death from bubonic plague was reported as having occurred about 15 miles north of Noumea, New Caledonia.

Palestine—Jaffa.—During the week ended November 14, 1942, 1 fatal case of plague was reported in Jaffa, Palestine. All possible precautions are being taken against the spread of the disease.

Typhus Fever

Irish Free State—Galway County—Galway.—Typhus fever has been reported in Galway, Galway County, Irish Free State as follows: week ended October 24, 1942, 1 case; week ended October 31, 1942, 3 cases.

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