

CONNECTICUT RESIDENT HOSPITALIZATIONS 1998

Prepared by:

Jon C. Olson and Carol E. Bower



CONNECTICUT DEPARTMENT OF PUBLIC HEALTH
OFFICE OF POLICY, PLANNING, AND EVALUATION
DIVISION OF POLICY, PLANNING, AND ANALYSIS

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CONNECTICUT DEPARTMENT OF PUBLIC HEALTH
410 CAPITOL AVENUE
P.O. BOX 340308
HARTFORD, CT 06134-0308

www.dph/state.ct.us

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INTRODUCTION

Hospitalization refers to any discharge from a non-federal, short-stay, acute-care, general hospital in Connecticut. Hospitalizations are expressed as numbers of discharges, not as unduplicated patients; a single patient with multiple hospitalizations can thus be counted more than once. Hospital discharges are recorded in the state's hospital discharge abstract and billing database, which is maintained by the Connecticut Office of Health Care Access.

Hospitalization data for males and females were presented as a single table in the 1997 Connecticut *Registration Report*. For 1998, hospitalization data have been expanded to seven tables. The number of diagnosis groups has been increased, and they are arranged into major categories and subgroups, according to a hierarchy similar to that used in the *National Hospital Discharge Survey Annual Summary* [1]. Hospitalizations for these selected categories are presented by age and sex (Table H-1) and by age and race/ethnicity (H-2). The number of age groups in these tables was increased to highlight hospitalization patterns during youth and young adulthood. In addition to the selected diagnosis groupings, hospitalizations for injuries, broken out by intent and mechanism (external codes), are presented separately by sex (Table H-3) and by race/ethnicity (Table H-4). Leading causes of hospitalization are ranked by sex in Table H-5 and by race/ethnicity in Table H-2. Finally, the relative risk of hospitalization between the sexes and among the racial ethnic groups is given for selected diagnostic categories (Table H-6) and for injuries by intent and mechanism (Table H-7).

Hospitalizations are reported by number, rate, median length of stay, and median charges. Rates for individual age groups are age specific, whereas those for "all ages" were age-adjusted to the U.S. 2000 standard population (see Appendix III of the *Registration Report*). *Charges* refers to the amount associated with a patient's entire hospitalization, including, but not limited to, treatment associated with the primary reason for admission, and reflecting charges by the hospital only. Physician fees are not included. Charges are not the same as the actual cost of the treatment or the actual payment received by the hospital.

Causes of hospitalization were coded according to the ninth revision of the *International Classification of Diseases, Clinical Modification* or *ICD-9-CM* [2]. There is no standard method of grouping diagnosis codes for reporting and ranking causes of hospitalization, whereas standard cause-of-death categories are used nationally. The system adopted here differs from that used for mortality, as some conditions, such as mental disorders, result in many hospitalizations but relatively few deaths. A comparison of the diagnosis codes used in this report and by other sources is given in the Appendix.

Limitations of Hospitalization Data

Hospital discharge data are sometimes used as a proxy for disease incidence, when incidence data are not available. There are several limitations to such use. First, hospital discharges, not individual patients, are recorded; a single individual may thus have multiple hospitalizations. Second, hospitalization rates may reflect a complex interaction of factors beyond merely disease rates (see “Rates of Illness-Related Hospitalizations” below). Third, hospitalizations may be a poor measure of certain conditions, such as injuries, because they include only the most severe cases. Most injuries are treated on an outpatient basis. For example, the 1998 Connecticut inpatient hospitalization rate for injuries (all mechanisms and intents) was 636 per 100,000 population (Table H-3). Although rates of emergency department (outpatient) visits are not available for Connecticut residents, they should be similar to national rates. The 1997-98 U.S. rate of hospital emergency department visits for all injuries was 13,446 per 100,000 [3], or more than 20 times the Connecticut inpatient hospitalization rate. Similarly, it has been estimated that less than 3% of all playground injuries result in hospitalization [4].

RATES OF ILLNESS-RELATED HOSPITALIZATIONS

The discussion of hospitalizations in this report excludes those related to pregnancy and childbirth. These conditions are discussed at length in the 1998 *Registration Report*.

In 1998, there were 268,662 hospitalizations of Connecticut residents in short-stay hospitals in the state, 53% of which were of females (Table H-1). The crude hospitalization rate for all causes and ages was 8,206 per 100,000 population, and was higher among females than males [9], reflecting the larger number of females than males 65+ years of age. In contrast, the age-adjusted hospitalization rate was 7,726 per 100,000, and was higher among males than females. Age-specific hospitalization rates increased with age.

Compared to 1996 hospitalizations [5], the crude rate for 1998 decreased 2.5% among males, 0.6% among females, and 1.5% overall; the age-adjusted rate declined 4.0% among males, 2.1% among females, and 2.9% overall [9]. Compared to 1998 national rates [1], 1998 Connecticut hospitalization rates were either the same or lower for the same conditions and ages. Low hospitalization rates are related to many factors, including high socioeconomic status (income, education), low prevalence of risk factors, and high access to primary care. Connecticut residents are wealthier and better educated than the U.S. population, ranking second in the nation in 2000 for median household income and third for population with college degrees [14]. Connecticut also ranks high among the states for health insurance coverage and low prevalence of many risk factors for disease [15].

Hospitalization rates are also influenced by a trend to shift medical services out of hospitals, and may be directly related to the number of hospital beds per 1,000 population

[6]. Connecticut had a lower number of acute care hospital beds per 1,000 residents than the national average in 1993, after adjusting for age and sex of the local population [7]. In 1998, Connecticut had 2.1 hospital beds per 1,000 civilians—the third lowest ratio in the nation—whereas the national average was 3.1 beds per 1,000 [3].

LEADING CAUSES OF HOSPITALIZATION BY AGE AND SEX

Categories of leading causes of hospitalization (shown in boldface in Tables H-1 and H-2) are based on the largest disease and injury headings of the ICD-9-CM [2]; they are identical to the highest level of the multi-level Clinical Classification Software diagnosis labels [8], except that “diseases of the circulatory system” are further divided into “diseases of the heart” and “cerebrovascular disease” (stroke).

The leading causes of hospitalization among Connecticut residents differed by age and by sex in some age groups (Table H-5). Respiratory diseases were the leading cause of hospitalization before 5 years of age. Mental disorders were the leading cause of hospitalization between 5 and 44 years of age. Beyond 44 years of age, heart disease was the leading cause of hospitalization in males. In females, neoplasms resulted in the most hospitalizations between ages 45 and 64, and heart disease after age 65. For all ages, heart disease was the leading cause of hospitalization for both males and females.

MEDIAN LENGTH OF STAY

The median length of stay (LOS) for all ages and conditions was 4.0 days and was similar for males and females. Median LOS increased with age, from 2.0 days before 5 years of age to 4.0 days after 64 years of age. Among major categories of disease, the greatest median lengths of stay were for mental disorders and for infectious and parasitic diseases (5.0 days). Among sub-categories, the greatest median lengths of stay were for Alzheimer’s disease (9.5 days), and meningitis, diabetes with amputation, and leukemia (each 8.0 days).

MEDIAN CHARGES

The median charge for hospitalizations (all ages and conditions) was \$8,587 and was similar for males and females. Median charge increased with age from \$3,879 before 5 years of age to \$10,005 after 64 years of age. The highest median charges were for leukemia (\$21,735), nonfatal spinal cord injury (\$20,340), diseases of the arteries, arterioles, and capillaries (\$18,153), and osteoarthritis (\$18,048); the latter was the diagnosis for most joint replacement operations.

SEX DIFFERENCES IN HOSPITALIZATIONS

Relative Risk

Excluding hospitalizations for sex-specific conditions like breast and prostate cancers, the relative risk of hospitalization (calculated as a ratio between the hospitalization rates among males and females for the same conditions) was greater by 50% or more among males than among females for 35 categories of disease and injury, including heart disease, alcohol-related mental disorders, heart disease, four types of malignant neoplasms, and 17 types of injuries (Tables H-6 and H-7). Relative risk of hospitalization was greater among females than males for seven categories, including benign and *in situ* neoplasms, asthma, and hip fracture.

Median Length of Stay

The median LOS for cholelithiasis was 2 days longer for males than for females (81% of cholecystectomies in females were laparoscopic, versus 62% in males [9]). The median LOS for *in situ* neoplasms was three times (4 days) longer for males than for females; most *in situ* neoplasms in females were of the breast or cervix [9]. The median LOS for meningitis was 3 days longer for females than for males. This difference may have been due in part to more frequent meningitis among Connecticut females from gram-negative bacteria, which required longer stays, in 1998 [9].

The health of Connecticut women is discussed in greater detail in the report, *Connecticut Women's Health* [13].

HOSPITALIZATIONS BY RACE AND ETHNICITY

White non-Hispanic, Black non-Hispanic, and Hispanic

Race and ethnicity in hospital discharge data were determined by hospital staff, not patient self-report. Race was often not specified with patients of Hispanic ethnicity, a problem overcome here by grouping all Hispanic patients together, and comparing them to those of non-Hispanic white and black race. Race/ethnicity categories are thus mutually exclusive.

Compared to non-Hispanic whites, the overall age-adjusted hospitalization rate for non-Hispanic blacks was higher, and the rate for Hispanics was almost the same (Table H-2). This is consistent with all-cause mortality relationships between blacks and whites (see discussion of deaths in the 1998 *Registration Report*). The paradox of low socioeconomic status but better-than-expected health among Hispanics has been noted for some 20 years [10]. Possible under-reporting of Hispanic ethnicity, lower levels of certain risk factors for disease among Hispanics, and a healthy migrant effect may contribute to, but do not completely explain the paradox.

The top three leading causes of hospitalization among white non-Hispanics were diseases of the heart, digestive diseases, and respiratory diseases. Among black non-Hispanics, the

order was respiratory, heart, and digestive diseases. Among Hispanics, respiratory diseases, digestive diseases, and mental disorders resulted in the most hospitalizations.

The relative risk of hospitalization among non-Hispanic blacks exceeded that for non-Hispanic whites by 50% or more in 41 categories of disease and injury (Tables H-6 and H-7), including all causes of hospitalization, HIV/AIDS, pancreatic cancer, diabetes, alcohol and drug abuse, Alzheimer's disease, congestive heart failure, stroke, pneumonia, asthma, renal failure, and 13 categories of injury. The relative risk of hospitalization for white non-Hispanics exceeded that for black non-Hispanics by 50% or more for seven categories, including leukemia, appendicitis, and hip fractures. Relative risk among Hispanics was 1.5 or more times greater compared to non-Hispanic whites for 22 conditions, including HIV/AIDS, diabetes, Alzheimer's disease, asthma, and 11 categories of injury.

High hospitalization rates have been reported nationally among whites for bladder cancer, ischemic heart disease, kidney stones, and hip fracture, and among blacks for benign uterine neoplasms, diabetes, asthma, and renal failure/nephritis [11]. Health disparities among racial and ethnic groups in Connecticut are discussed in greater detail in the report, *Multicultural Health: The Health Status of Minority Groups in Connecticut* [12].

INJURIES BY INTENT, MECHANISM, AND PLACE OF OCCURRENCE

Intent and Mechanism

The majority of injuries resulting in hospitalization were unintentional (Tables H-3 and H-7). The main mechanisms of unintentional injury were falls (10,234; 64% females) and motor vehicle traffic (2,734; 62% males). Intentional self-inflicted injuries resulted in 1,784 hospitalizations, 62% of which were of females. Intentional injuries by others resulted in 853 hospitalizations, 81% of which were of males. The relative risk of hospitalization for all injuries of all intents related to firearms (including those due to legal intervention or undetermined intent) was nearly 15 times greater for males than for females.

Compared to non-Hispanic whites, the relative risk of hospitalization related to firearms and intentional injury by another person were, respectively, 20 times and 8 times higher for non-Hispanic blacks and 5 to 6 times greater for Hispanics. Hospitalizations for falls were more likely among non-Hispanic whites, whereas motor-vehicle-related hospitalizations were more likely among non-Hispanic blacks and Hispanics.

Place of Occurrence

Place of occurrence was coded for 56% of total injury hospitalizations and 34% of total poisoning hospitalizations. Of these, 60% of injuries (including 91% of hip fractures) occurred in a place of residence (one's home or a residential institution such as hospital, jail, or home for the aged), as did 95% of poisonings (including 100% of lead poisonings). In

contrast, 63% of non-fatal head injuries occurred outside a place of residence, including 49% in the street.

Of intentional injuries coded for mechanism and place of occurrence, 96% of self-inflicted injuries, including 85% of self-inflicted cuts/pierces and 97% of self-inflicted poisonings, occurred at home or in a residential institution. In contrast, only 38% of assaults occurred in residential settings, with the balance occurring outside the home (including 34% in the street and 10% in public buildings). Of intentional firearms injuries inflicted by others, 63% occurred in the street.

Of unintentional injuries coded for mechanism and place of occurrence, 93% of poisonings, 92% of suffocations, 85% of falls, 79% of fire-related injuries, and 74% of overexertion injuries occurred in a place of residence.

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