
Where People Die

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THE WHO, HOW, AND WHY OF DEATH are traditionally included in analyses of mortality statistics, but not the WHERE. The place where people die is neglected. Knowledge of which health facilities dying patients use most could help in the planning of health care for a region, as well as possibly showing deficiencies in the present health care system. Yet some of the most frequently cited national data on where people die are for 1958 (1). We present the results of an examination of the location of deaths in 1977 in upstate New York by their cause and by decedent's age, sex, marital status, and race.

Methods and Materials

The Office of Biostatistics of the New York State Department of Health maintains the vital records registration system for upstate New York (New York State exclusive of New York City). As part of this system, all certificates for deaths occurring in upstate New York are forwarded to the State health department for processing. Information from these certificates is entered on magnetic tapes, which served as the data source for our study.

The various locations of death are grouped into six categories: no institution, hospital, Veterans Administration (VA) facility, nursing home, other institution, and unknown. The nursing home group included both deaths in nursing homes and deaths in homes for the aged. The "Other institution" category included State

facilities administered by the department of mental hygiene, tuberculosis hospitals, and institutions for which no specific code exists. The noninstitutional category consisted of all deaths occurring outside an institution, including those of persons dead on arrival (DOA) at a hospital.

Location of Deaths

Table 1 shows that the majority (59.3 percent) of upstate New York deaths in 1977 occurred in hospitals. Only 26.7 percent of the deaths were in the noninstitutional category. The analogous 1958 national figures reported by Lerner (1) are 47.6 percent in hospitals and 39.1 percent outside institutions. His New York City data show an increase in institutional deaths from 65.9 percent in 1955 to 73.1 percent in 1967, and his Maryland State data show an increase from 64.4 percent in 1957 to 71.8 percent in 1966. Table 1 shows that 72.9 percent of the 1977 deaths in upstate New York occurred in institutions. Assuming that these different populations show similar trends, one can conclude that most of the increase in institutional deaths occurred in the first half of the past 20 years and that the institutional percentage has remained relatively stable over the past decade. Carpenter and Wylie (2) contend that "advances in technology, the concentration of modern, complex medical equipment in major hospitals, and the wide variety of specialists . . . are among the factors that have increased the proportion of deaths occurring within institutional walls." Whether the impact of these factors has leveled off during the past 10 years would be a crucial test of their significance.

Nursing home deaths have exhibited a dramatic increase over the 6.0 percent level observed for the United States in 1958 (1). In upstate New York, 11.3 percent of the deaths in 1977 occurred in nursing

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homes, nearly double the 1958 mark. Deaths in State-operated hospitals, which accounted for 3.5 percent of the total deaths in 1958 (1), no longer accounted for a significant percentage of the deaths in 1977. In table 1, these deaths are included in the 0.1 percent that makes up the "Other institution" category.

Location by age and sex. Figure 1 depicts the percentage of deaths in upstate New York in 1977 by location and sex for each specified age group. The level of the percentages for males and females combined (not shown), generally followed the male percentage, reflecting the higher number of male deaths in most age groups. Noninstitutional deaths reached a peak at ages 15–24 (59.9 percent of total deaths) and also accounted for more than half of the deaths between ages 25 and 34. Except for a slight decrease in the 10–14 age group, the percentage of noninstitutional deaths increased until the ages 15–24, decreasing thereafter. For the age groups less than 1 year and more than 85 years, noninstitutional deaths comprised less than one-fifth of the total deaths.

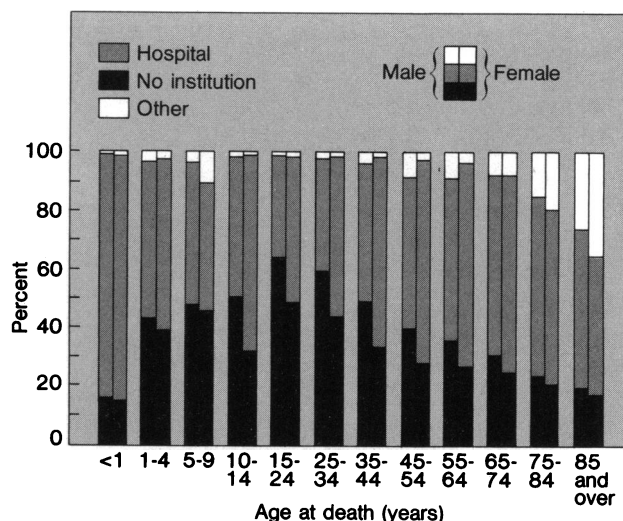
Table 1. 1977 upstate New York deaths by location

Location of deaths	Number of deaths	Percent (N = 93,094)
No Institution	24,899	26.7
Dead on arrival	9,741	10.5
Home and public places	15,158	16.3
Institution	67,836	72.9
Hospital	55,217	59.3
Veterans Administration facilities	2,049	2.2
Nursing home	10,514	11.3
Other institution	56	0.1
Unknown	359	0.4

Hospital deaths accounted for more than half of the deaths in all but the 5–9 and 15–34 age groups. Carpenter and Wylie (3) attribute part of the high percentage of deaths in hospitals to the system of insurance benefits, which tends to cover only hospital care, and to the scarcity of home health care services. Among infants dying before their first birthday, 84.2 percent died in a hospital. Of those in this age group dying, 40.2 percent died on their first day of life and another 21.2 percent between 1 and 6 days. Almost all of these infants died in a hospital, having never left it after birth.

Figure 1 reveals a higher percentage of noninstitutional deaths among males than females for every age group. Females generally have a greater percentage of hospital deaths until age 75. After that age females

Figure 1. Percentage distribution of the locations of death among age groups, by sex, upstate New York, 1977



continue to have a higher percentage of institutional deaths because they account for a larger proportion of nursing home deaths (fig. 2). This phenomenon reflects the fact that "older women also appear to be at greater risk of institutionalization" (2).

Figure 2 presents the percentages of deaths occurring in nursing homes and Veterans Administration facilities among the age groups 35 years and over. In this figure, the "Other" category of figure 1 is broken down into its two principal components. The percentage of nursing home deaths increased with age for both males and females, whereas VA deaths reached a peak among males in the 45-64 age groups. Among males, the combined percentage of VA and nursing home deaths exceeded the nursing home percentage for females until age 65. For ages 65-74, the corresponding percentages for both sexes were essentially the same; thereafter the female percentage of nursing home deaths exceeded the combined VA and nursing home percentage of male deaths.

Nursing homes accounted for only 2.4 percent of the total deaths of persons between 55 and 64 years. However, this percentage more than doubled with each succeeding age group up to 85 and over; at ages 85 and over, nursing homes accounted for 29.7 percent of deaths. This large proportion of nursing home deaths seems a natural consequence of the pattern of life of the elderly. In 1977, only 13 percent of persons in the United States 65 years and over were in the labor force—either working or actively seeking work (3), as compared with two-thirds a century ago. Carpenter and Wylie (2) point out that this lack of work participation leads to feelings of isolation and unproductiveness which, combined with the deaths of friends and rela-

tives and limited financial resources, forces many elderly people into nursing homes.

Location by age, sex, and marital status. Married people always have the smallest percentage of deaths in nursing homes regardless of sex or age. Among people in our study aged 75 and over, for example, the percentage of deaths occurring in nursing homes among single, widowed, and divorced persons was approximately double that among married persons. This relationship continued to hold if the combined VA and nursing home percentage among males was also considered (table 2). These data indicate that fewer of the elderly married were in institutions than their unattached counterparts. This conclusion is consistent with findings from the 1970 U.S. Census that nursing home rates for unmarried males and females aged 75 and over were nearly twice as high as those for married persons (personal communication in 1978 from L. M. Verbrugge, assistant professor, department of biostatistics, University of Michigan School of Public Health). Since Veterans Administration facilities tend to care for many patients over longer periods than regular hospitals and elderly males may use these facilities more as nursing homes than hospitals, it seems natural that married men tend to account for the smallest percentage of deaths in these facilities.

When VA and nursing home deaths of males were combined, a great male-female similarity was seen within each marital status. The largest difference between the sexes in institutional deaths was found among persons 85 and over who were widowed or divorced.

Figure 2. Percentage distribution of the locations (nursing homes or Veterans Administration facilities) of deaths among age groups 35 years and over, by sex, upstate New York, 1977

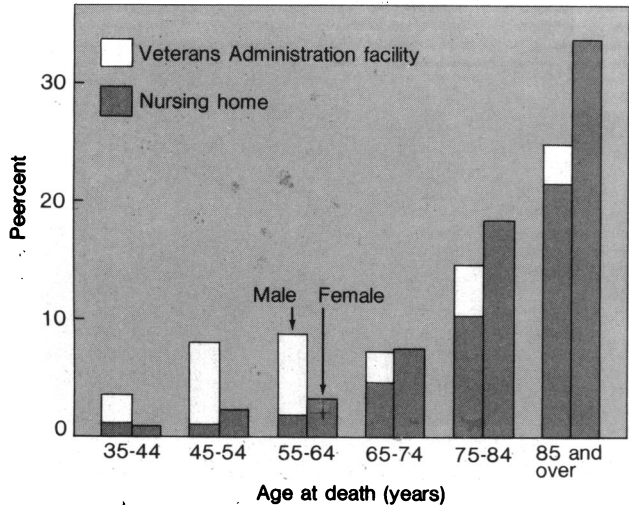


Table 2. Percentage of deaths of persons 75 years and over occurring in long-term-care institutions, by marital status, sex, and age group, upstate New York, 1977

Decedent's marital status	Male deaths in—		Female deaths in nursing homes
	Nursing homes	VA ¹ facilities and nursing homes	
Age group 75–84 years			
Single	17.0	23.4	23.8
Married	6.7	10.2	10.9
Widowed	15.2	19.6	19.5
Divorced	17.4	26.7	24.4
Age group 85 years and over			
Single	28.3	36.3	37.4
Married	13.8	17.3	20.1
Widowed	25.6	27.8	34.4
Divorced	26.0	39.7	35.4

VA = Veterans Administration.

Widows over 85 had a 6.6 percent higher level of deaths in long-term care institutions than widowers over 85. Divorced men over 85, on the other hand, had a 4.3 percent greater proportion of deaths than divorced women over 85. Children's attitudes may be a factor here. Because the custody of children is usually granted to the mother, she may have a closer relationship with them and, as a consequence, be cared for in old age.

The relationship between marital status and place of death was less obvious for the age groups under 75. The age groups between 45 and 64 exhibited the usual smaller percentage of nursing home deaths among married people. Between the ages of 25 and 44, a large percentage of noninstitutional deaths was noted among divorced persons. Single males 25 to 34 years old had a high percentage of institutional deaths.

Location by age, sex, and race. Except for males under 1 year, white males had a greater percentage of noninstitutional deaths than nonwhite males. Both male and female nonwhite infants had a greater proportion of noninstitutional deaths than white infants. Whether this difference indicates poorer postnatal care among nonwhites deserves further study. Among females, the proportion of noninstitutional deaths was similar for both races for ages over 35.

Table 3 shows that after age 65, white women experienced a larger percentage of nursing home deaths than nonwhite women. Conversely, nonwhite men over 65 had a larger percentage of deaths in the combination nursing home and VA group than white men. Non-

white female deaths occurred least frequently in institutions. Deaths of nonwhite males between 65 and

Table 3. Percentage of deaths of persons 65 years and over occurring in long-term-care institutions, by race, sex, and age group, upstate New York, 1977

<i>Decedent's race and sex</i>	<i>VA¹ facilities and nursing homes</i>	<i>Rank within age group</i>
Age group 65-74 years		
Whites:		
Males	7.3	3
Females	7.7	2
Nonwhites:		
Males	11.4	1
Females	6.6	4
Age group 75-84 years		
Whites:		
Males	14.5	3
Females	18.7	2
Nonwhites:		
Males	21.1	1
Females	13.1	4
Age group 85 years and over		
Whites:		
Males	24.9	3
Females	34.2	1
Nonwhites:		
Males	27.3	2
Females	20.0	4

¹ Veterans Administration.

Table 4. Location of deaths due to various causes, upstate New York, 1977

<i>Cause and ICDA No.¹</i>	<i>Cause as percent of all deaths²</i>	<i>Total deaths from cause</i>	<i>Percent³ of deaths that occurred in—</i>			
			<i>No institution</i>	<i>Hospitals</i>	<i>VA⁴ facilities</i>	<i>Nursing homes</i>
Accident (800-949)	4.1	3,805	55.4	42.1	0.8	1.3
Homicide (960-978, 990-999)	0.4	359	70.8	27.8	0.0	0.3
Suicide (950-959)	1.1	1,031	87.2	11.3	0.1	0.2
Diseases of infancy (760-769.2, 769.4-772, 774-778)	0.9	836	0.5	99.3	0.0	0.2
Congenital anomalies (740-759)	0.5	507	15.0	80.9	0.6	2.4
Malignant neoplasms (140-209)	22.2	20,770	15.2	72.6	3.3	8.6
Cirrhosis of the liver (571)	1.7	1,540	14.7	76.9	6.2	1.7
Emphysema (492)	0.9	878	23.6	65.7	4.7	5.8
Myocardial infarction (410)	17.3	16,070	44.1	48.1	1.3	6.2
Diseases of the heart (390-398, 400-404, 411-429)	24.4	22,682	32.1	49.7	1.2	16.3
Diabetes mellitus (250)	1.9	1,790	20.8	63.3	1.1	14.2
Influenza and pneumonia (470-474, 480-486)	2.7	2,493	7.7	65.7	5.9	19.9
Cerebrovascular disease (430-438)	8.2	8,385	12.2	64.2	1.8	21.2
Arteriosclerosis (440)	1.3	1,177	17.9	44.6	1.6	34.9

¹ International Classification of Diseases, Adapted, Eighth Revision.

² Percentages are based on total deaths, including causes not listed here, and therefore do not sum to 100.

³ Percentages do not sum to 100 for every cause, since "Other institution" and "Location unknown" are not included.

⁴ Veterans Administration.

85 occurred the most frequently in institutions, but they ranked second to deaths of white females in the over 85 age group. A large part of these nonwhite male deaths in institutions occurred in VA facilities. Even at the younger ages (25–64), the percentage of non-white deaths in VA facilities was greater than the percentage of white deaths.

Causes of Death

Table 4, which shows the causes of death by location, could be helpful in explaining many of the patterns observed in the location of deaths. Deaths in other institutions and at unknown locations have been omitted. The first three entries concern violent deaths, of which a high percentage occurred outside of institutions, as did the deaths of persons 15–44 years old, the age group most highly represented by deaths from these causes. The next two entries, diseases of infancy and congenital anomalies, were major causes of death for the very young, and a high percentage of the deaths from these causes occurred in hospitals. The sixth entry, malignant neoplasms, is a disease of long duration, as are cirrhosis and emphysema. For all three, the percentages of hospital deaths were high, and comparatively large percentages occurred in VA facilities. Because of the usual suddenness of onset of acute myocardial infarction, 44.1 percent of the deaths attributable to it occurred outside institutions. Other diseases of the heart are usually less sudden than acute myocardial infarction and accounted for smaller percentages of noninstitutional deaths and larger percentages of nursing home deaths. The distribution by location of diabetes mellitus deaths was similar to that for total deaths, a result reflecting the varied nature of the disease. Influenza and pneumonia cause deaths mainly among the old, the terminally ill, and the very young. Consequently, the percentage of noninstitutional deaths from these causes was smaller than for any other disease, and the percentage of nursing home deaths was large. The last two causes in table 4, cerebrovascular disease and arteriosclerosis, are degenerative diseases of the old, and therefore larger percentages of the deaths attributable to them occurred in nursing homes than for any other cause.

The distribution of diseases in the various population groups helps explain the peaks and dips of figures 1 and 2, but it would be unwise to assume that this distribution is the complete explanation of the locations of the attributable deaths. We have not examined the validity of the assumption that a victim of a certain cause of death has the same probability of dying in a certain location regardless of his or her age, sex, or race.

In a survey of deaths from cancer in Connecticut between 1969 and 1971, Ryder and Ross (4) reported that although two-thirds of the patients had wished to die at home, only those in the upper and lower socioeconomic levels were successful in achieving this goal. Those in the upper class managed to do so by using money and influence; the lower class did so through Medicaid. No matter how this goal was achieved, the place where patients died was not solely dependent on the cause of death.

Myers (5) investigated whether the availability of Medicare funds increased the proportion of deaths occurring in short-term hospitals and skilled nursing facilities. Although he found no evidence to indicate an increasing trend in the use of these facilities over the period 1966 to 1974, he cautioned that continued study of this question was desirable because of the possible impact that increased use of these facilities would have on health care costs.

Simpson (6) reported that in London more than physical condition determines what emergency room treatment a person will receive. "Age, social class, appearance and sobriety," he stated, all help to determine if a person will be dead on arrival and thus in the noninstitutional death group, or if resuscitation will be attempted that will lead to survival or to subsequent classification of the demise as a hospital death. This type of difference in health care may not be limited to the classifications cited by Simpson or to the emergency room, but may affect all health areas and, ultimately, the place of death.

Table 5. Percentage of deaths occurring in institutions, by cause, upstate New York, 1958, and United States, 1977

Cause	Upstate New York, 1977	United States, 1958 ¹
Diseases of infancy	99.5	94.5
Influenza and pneumonia . . .	92.3	68.6
Cirrhosis of the liver	85.3	79.3
Congenital anomalies	85.0	86.5
Malignant neoplasm	84.8	67.7
Arteriosclerosis	82.1	61.8
Diabetes mellitus	79.2	68.6
Diseases of the heart	50.4
Without myocardial		
infarction	67.9	...
Acute myocardial infarction.	55.9	...
Accidents	44.6	47.6
Homicide	29.2	34.1
Suicide	12.8	18.5

¹ Reference 1.

We can trace time trends in institutional deaths in upstate New York for some causes by comparing the percentages of deaths from each cause for upstate New York and the entire nation (assuming that there is a similarity between the two). Table 5 shows the percentages of deaths in upstate New York in 1977 and in the United States in 1958 for 11 causes. For diseases, the percentages of deaths in institutions have risen. Only for accidents, homicides, suicides, and congenital anomalies, have the percentages of institutional deaths declined.

The change to more treatment in institutions, and especially in nursing homes, is a trend that may be contrary to the wishes of the public. Ryder and Ross (4) expressed the belief that "The most desired goal for patients . . . is home care. . . . The familiar surroundings and faces help to relieve the psychological suffering encountered in the dying process." They reported that although 67 percent of the Connecticut cancer patients referred to earlier had wished to die at home, only 20 percent actually did. The loneliness and isolation of a long-term-care institution, so disliked by many patients, could probably be avoided in many cases if home care services were made more comprehensive and easier to obtain.

Implications of Study

Our study revealed an increasing trend toward institutionalized health care, particularly among the elderly. Cassell (7) attributed this trend to the "success of modern medicine in combating death." Recent medical advances have made death more and more a phenomenon of old age. With fewer early (premature) deaths, more of the elderly are prone to

the degenerative diseases and require institutionalization. Bok (8) noted that the increase in deaths in institutions can be partly attributed to the increase in urbanization of the population and the higher proportion of the elderly living alone. Whatever the reasons, the changes noted create situations that require careful consideration by the medical profession. Morrison (9) summarized the situation by noting that changing technologies force us to consider changes in our value systems. As medical advancements are made which, as Cassell states, will "combat death" (7), our attitudes toward dying will continue to evolve.

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SYNOPSIS

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Death certificates for 1977 filed with the New York State Department of Health were studied to determine where people died. Data were examined by the location and cause of death and by the age, sex, race, and marital status of the decedent. Comparisons were made with a similar study in which U.S. data were used for 1958 events.

Approximately 60 percent of all the 1977 deaths in upstate New York occurred in hospitals; only 27 percent occurred outside an institution. The location of death varied by all the factors studied. Within all age categories, males had a higher percentage of hospital deaths. In those age categories in which nursing home deaths comprised a significant proportion of total deaths, females had a higher percentage of such deaths than males. Differences in the location of death according to its cause reflect the nature of the cause of death, for example, whether it was of sudden onset or the result of chronic disease.

Most people do not consider in advance where they might die. The idea that age, sex, and marital status, as well as the more obvious cause, all play a part in the location may seem surprising. Yet all these factors were found to be associated with the location of deaths in upstate New York, and there is no reason to believe that this association does not hold true for the entire nation. More research, however, needs to be done based on more years and other geographic areas. Trends in the location of death by decedent's age, sex, race, and marital status may be instructive as to the present state of health resources.