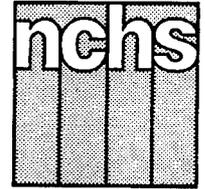


Advance Data



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An Overview of Home Health and Hospice Care Patients: 1994 National Home and Hospice Care Survey

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Introduction

This report is the third in a series of reports on home health care and hospice agencies, their staff, and the people they serve. The first two reports presented data from the 1992 and 1993 National Home and Hospice Care Surveys (NHHCS) (1,2). The data presented in this report are based on the 1994 NHHCS. They represent an estimated 2.0 million current patients and 5.6 million discharges from approximately 10,900 home and hospice care agencies in the United States. The NHHCS, which is a segment of the long-term care component of the National Health Care Survey (3), is an annual survey of home health agencies and hospices—their current patients and discharges. The National Center for Health Statistics instituted this nationwide sample survey in 1992 in response to the rapid growth in the number of these agencies throughout the United States. This growth led to a need for information on the availability and utilization of services offered by home health and hospice agencies.

The efforts to control health care cost can be seen as one reason for the massive growth in the home health care industry. The average cost of a home care visit is considerably less than a day

in a hospital or a day in a skilled long-term care facility (4). The steady increase in the elderly Medicare population of approximately 1.9 percent annually over the past decade is also a major factor in the growth of the home care industry (5). The preference of the majority of the ever increasing elderly population to recover from illnesses at home rather than in a hospital or nursing home is probably the major reason for this record growth.

The majority of the 1,510 agencies included in the 1994 survey had been classified by the 1991 National Health Provider Inventory (NHPI) as agencies providing home health and hospice care and were used in previous years of the NHHCS. About 100 additional agencies were added to the 1994 sample after the universe was updated with the Agency Reporting System (ARS) (6). The additions to the file in the 1994 survey and the lack of such an update for the 1993 survey may have contributed to the seemingly large increases in the estimates of patients and discharges for this 1-year period. This increase should probably be spread over the 2-year period, 1992–94. As a result, data from 1994 are compared with data from 1992. Data collection for the 1994 NHHCS was conducted between September and

December 1994. Detailed information on sample design, data collection procedures, and sampling errors is included in the technical notes and also in the Series 1 report, “Development of the National Home and Hospice Care Survey” (7).

Home health agencies and hospices are usually defined in terms of the type of care they provide. Home health care is provided to individuals and families in their place of residence to promote, maintain, or restore health or to maximize the level of independence while minimizing the effects of disability and illness, including terminal illness. These agencies are often referred to today as “hospitals without walls” because advances in technology allow dozens of complex illnesses, once treated almost exclusively in the hospital, to be treated at home. Hospice care is defined as a program of palliative and supportive care services that provides physical, psychological, social, and spiritual care for dying persons, their families, and other loved ones. Hospice services are available in both the home and inpatient settings.

The focus of this report is on characteristics of patients who receive care from agencies that provide home health and hospice services. For these



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two types of agencies, estimates are presented for current patients on the rolls of the agency as of midnight on the day immediately prior to the day of the survey, and for discharged patients who had been removed from the rolls of the agency (including those whose episode of care ended because of death) during a designated month that was randomly selected for that agency. These estimates are presented by agency, demographic, and diagnostic characteristics.

The growth in the number of home health and hospice care agencies and in the utilization of services that has been observed since 1992 is also discussed for selected data items. However, it is important to note that changes in methodology and data collection procedures between 1992 and 1994, such as those noted in the Technical notes, may lead to fluctuations in the estimates that are unrelated to true or actual growth or decline.

Agency characteristics

The 1994 estimate of 10,900 home care agencies (home health and hospice) represents a 30-percent increase in the number of agencies since 1992(8). The percent of home health agencies that are privately owned or owned by nonprofit organizations was 44 and 37 percent, respectively. Estimates in table 1 show that most (90 percent) of the hospices were owned by voluntary nonprofit organizations. About 7 percent of the hospices were privately owned, representing an increase of more than 100 percent in the number of privately owned hospices since 1992. The remaining 20 percent of the home health agencies and 2 percent of the hospices were owned by government agencies.

This continuing growth began in 1965 with the enactment of the Medicare law, which authorized payment for certain home health services. This made them more available to the elderly. The growth was further enhanced in 1973 when certain disabled younger Americans also qualified as Medicaid recipients of this type of care. According to the estimates in table 1, approximately 81 percent of the estimated 9,800 home health agencies were Medicare- or Medicaid-certified.

Table 1. Number, percent distribution, and percent of home health care agencies and hospices by type of agency, ownership, geographic region, and certification: United States, 1994

Selected characteristic	Total	Type of agency	
		Home health care	Hospice
		Number	
All agencies	10,900	9,800	1,100
		Percent distribution	
Total	100.0	100.0	100.0
Ownership			
Proprietary	40.2	43.8	*7.3
Voluntary nonprofit	42.0	36.8	90.4
Government and other	17.8	19.5	*
Region			
Northeast	18.0	18.1	16.9
Midwest	26.8	26.8	27.0
South	41.1	41.7	35.9
West	14.0	13.3	20.3
Certification			
Certified by Medicare	79.9	80.6	73.7
Certified by Medicaid	79.5	81.0	65.5
Not certified	20.5	19.0	34.5

* Figure does not meet standard of reliability or precision.

NOTE: Figures may not add to totals because of rounding.

Medicare added hospice benefits to their coverage in 1983 and within 10 years the number of hospices increased by several hundred percent (9). In 1994, 74 percent of the estimated 1,100 hospices were Medicare-certified and 66 percent were Medicaid-certified. This marks a 9-percent increase in the number of hospices certified since 1992 by Medicare and/or Medicaid.

According to data in table 1, most hospices and home health agencies were located in the south (42 percent) and in the midwest (27 percent). Home health agencies in the other two regions (Northeast and West) made up the remaining 31 percent of the agencies. Hospices were also primarily located in the south and the midwest. Approximately 36 percent of these agencies were located in the south and 27 percent were located in the midwest, with the remaining 37 percent located in the west and northeast.

Patients by agency characteristics

The majority of patients (both current and discharged) received home and hospice care from voluntary

nonprofit agencies (tables 2 and 3). In 1994, 59 percent of home health and 86 percent of all current hospice patients were being cared for by nonprofit agencies (table 2). In addition, nonprofit home health agencies delivered care to 65 percent of all home health patients and 87 percent of all hospice patients who had been discharged (table 3).

Approximately 88 percent of all current patients receiving home health care received that care from home health agencies certified by Medicare or Medicaid (table 2). For discharges, the percent of home health care patients served by agencies certified for Medicare or Medicaid was 95 and 92 percent, respectively. Hospices certified by Medicare and Medicaid continue to serve at least 90 percent of the hospice patients (both current and discharged) (tables 2 and 3).

According to the 1994 survey, two-thirds of the 2 million current home health and hospice care patients were in the southern (34 percent) and northeastern (33 percent) states (table 2).

Demographic characteristics of patients

As in 1992 and 1993, the 1994 estimates show that the 1.9 million

Table 2. Number, percent distribution, and percent of current patients receiving home health and hospice care by type of agency, according to ownership, geographic region, and certification: United States, 1994

Selected characteristic	Total	Type of agency	
		Home health care	Hospice
All agencies	1,950,300	1,889,400	61,000
Ownership			
Proprietary	579,300	572,600	6,700
Voluntary nonprofit	1,166,600	1,114,000	52,600
Government and other	204,400	202,700	1,700
Region			
Northeast	651,900	636,500	15,400
Midwest	380,500	366,200	14,300
South	662,900	642,100	20,800
West	255,000	244,500	10,500
Certification			
Certified by Medicare	1,718,400	1,661,800	56,600
Certified by Medicaid	1,719,900	1,665,000	54,900
Percent distribution			
Total	100.0	100.0	100.0
Ownership			
Proprietary	29.7	30.3	11.0
Voluntary nonprofit	59.8	59.0	86.3
Government and other	10.5	10.7	2.7
Region			
Northeast	33.4	33.7	25.2
Midwest	19.5	19.4	23.4
South	34.0	34.0	34.2
West	13.1	12.9	17.2
Percent			
Certification			
Certified by Medicare	88.1	88.0	92.8
Certified by Medicaid	88.2	88.1	90.0

NOTE: Figures may not add to totals because of rounding.

current patients receiving home health care were predominately elderly, female, white, and married or widowed. As shown in table 4, 72 percent of all current home health patients were 65 years of age or older at the time they began using services, and approximately 20 percent were 85 years or older.

The likelihood of using home health services increases with age because functional status declines with age (10). Discharges from home health care who were 65–69 years of age used these services at a rate of 36.1 per 1,000 civilian non-institutionalized population. People in the 75 and older age group used home health care at the rate of 135.1 per 1,000. In 1992, persons 65

years of age and over made up 76 percent of all current home health patients and those 85 years and over comprised 17 percent of the current patient pool. These estimates compare with 72 percent and 19 percent, respectively, for these same two groups in 1994. Neither the slight increase in the percent of patients in the oldest age group (85 years and over) or the slight decrease in the 65 and over age group was significant between 1992 and 1994.

A majority of current patients were female (67 percent), largely because women have higher rates of home health utilization than men, and they are disproportionately represented in the older age groups where utilization is

highest. Married and widowed patients receiving home health care accounted for 67 percent of all patients (31 percent and 36 percent, respectively). An additional 21 percent were divorced, separated, single, or never married. The marital status of the remaining 12 percent was unknown (table 4). The distribution of 5.3 million home health discharges shown in table 5 by age, sex, race and marital status was similar to that of current patients.

The 1,100 hospices represented in the survey were serving 61,000 patients at the time of the 1994 survey. As with home health patients, hospice patients currently receiving care were predominately elderly. Sixty-nine percent had turned sixty-five years of age or older by the time they began using these services (table 4). In contrast to home health patients, however, hospice patients were more equitably distributed according to sex (45 percent male and 55 percent female). Finally, a majority of current hospice patients were white and nearly half were married. The 328,000 hospice patients discharged from care (usually because they died) had demographic characteristics similar to current patients, as shown in table 5.

Patient diagnoses

Information on the primary and other diagnoses at the time of admission was collected from the medical records for each home health and hospice patient in the 1994 survey. Diagnoses were coded according to the *International Classification of Diseases, Clinical Modification, 9th Revision (ICD-9-CM) (11)*. The first-listed diagnosis at admission for home health and hospice patients currently receiving care is shown in table 6. They are grouped by ICD-9-CM chapter.

Approximately 27 percent of the 2.0 million home health patients had conditions listed in the ICD-9-CM chapter, "Diseases of the circulatory system" group (390–459). Persons with heart disease, including congestive heart failure, made up over half (53 percent) of all patients in this condition group. Stroke and hypertension were also frequent admission diagnoses for current

Table 3. Number, percent distribution, and percent of discharges who received home health and hospice care by type of agency according to ownership, geographic region, and certification: United States, 1994

Selected characteristic	Total	Type of agency	
		Home health care	Hospice
		Number	
All agencies	5,600,200	5,272,200	328,000
Ownership			
Proprietary	1,507,900	1,474,500	33,300
Voluntary nonprofit	3,731,400	3,446,000	285,300
Government and other	361,000	351,600	9,300
Region			
Northeast	2,065,100	1,955,300	109,800
Midwest	1,140,900	1,067,300	73,600
South	1,503,200	1,405,400	97,900
West	891,000	844,200	46,800
Certification			
Certified by Medicare	5,320,500	5,015,800	304,700
Certified by Medicaid	5,130,500	4,832,300	298,300
		Percent distribution	
Total	100.0	100.0	100.0
Ownership			
Proprietary	26.9	28.0	10.2
Voluntary nonprofit	66.6	65.4	87.0
Government and other	6.4	6.7	2.8
Region			
Northeast	36.9	37.1	33.5
Midwest	20.4	20.2	22.4
South	26.8	26.7	29.8
West	15.9	16.0	14.3
Percent			
Certified by Medicare	95.0	95.1	92.9
Certified by Medicaid	91.6	91.7	90.9

NOTE: Figures may not add to totals because of rounding.

home health patients in this condition group. Diabetes, in the chapter Endocrine, Nutritional and Metabolic Diseases, and Immunity Disorders, accounted for 8 percent of the first-listed admission diagnoses for all home health care patients.

Most hospice patients (59 percent) had a first-listed diagnosis of neoplasms (140–239). Cancer of the lungs, breast, colon, and prostate were among the malignant neoplasms that accounted for nearly all the neoplasms. The second largest diagnostic category for hospice patients was diseases of the circulatory system (13 percent). Heart disease, including congestive heart failure, accounted for 72 percent of the admission diagnoses for this group. HIV

diagnosis one of several possible diagnoses in the ICD–9–CM chapter on infectious and parasitic diseases. Patients with HIV accounted for 3 percent of all people receiving hospice care in 1994.

These conditions of the hospice patients contrast with the less severe diagnoses of home health patients. Because hospice care is provided to patients in the terminal stages of their illness, it is expected that these patients would have first-listed admission diagnoses of serious illnesses.

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Table 4. Number and percent distribution of current patients receiving home health and hospice care by age, sex, race, and marital status, according to type of care received: United States, 1994

Selected patient characteristic	Current patients	Percent distribution	Home health care		Hospice care	
			Number of patients	Percent distribution	Number of patients	Percent distribution
Total	1,950,300	100.0	1,889,400	100.0	61,000	100.0
Age						
Under 45 years	241,200	12.4	236,000	12.5	5,200	8.6
45–54 years	90,400	4.6	86,300	4.6	4,100	6.8
55–64 years	196,800	10.1	187,300	9.9	9,500	15.6
65 years and over	1,409,800	72.3	1,367,900	72.4	41,900	68.8
65–69 years	181,800	9.3	176,000	9.3	5,800	9.5
70–74 years	246,200	12.6	237,800	12.6	8,400	13.8
75–79 years	291,200	14.9	283,700	15.0	7,500	12.3
80–84 years	310,000	15.9	299,900	15.9	10,000	16.5
85 years and over	380,700	19.5	370,600	19.6	10,100	16.6
Unknown	*12,000	*0.6	*11,900	*0.6	*	*
Sex						
Male	640,600	32.8	613,400	32.5	27,200	44.7
Female	1,309,700	67.2	1,276,000	67.5	33,700	55.3
Race						
White	1,245,200	63.8	1,196,000	63.3	49,300	80.8
Black	304,000	15.6	299,600	15.9	4,400	7.2
Other or unknown	401,100	20.6	393,800	20.8	7,300	12.0
Marital status at admission						
Married	608,500	31.2	579,000	30.6	29,500	48.4
Widowed	703,100	36.0	684,400	36.2	18,600	30.6
Divorced or separated	92,800	4.8	89,100	4.7	3,700	6.0
Single or never married	322,100	16.5	315,100	16.7	6,900	11.4
Unknown	223,900	11.5	221,700	11.7	2,300	3.7

* Figure does not meet standard of reliability or precision.

NOTE: Numbers may not add to totals because of rounding.

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Table 5. Number and percent distribution of discharges by selected patient characteristics, according to type of care received: United States, 1994

Selected patient characteristic	Total	Percent distribution	Home health care		Hospice care	
			Number of discharges	Percent distribution	Number of discharges	Percent distribution
All discharges	5,600,200	100.0	5,272,200	100.0	328,000	100.0
Age						
Under 45 years	687,200	12.3	668,700	12.7	18,600	5.7
45–54 years	412,300	7.4	388,000	7.4	24,300	7.4
55–64 years	434,600	7.8	389,100	7.4	45,500	13.9
65 years and over	4,017,400	71.7	3,778,300	71.7	239,100	72.9
65–69 years	525,100	9.4	487,100	9.2	38,000	11.6
70–74 years	817,400	14.6	764,200	14.5	53,200	16.2
75–79 years	920,500	16.4	869,800	16.5	50,700	15.5
80–84 years	1,014,500	18.1	973,800	18.5	40,700	12.4
85 years and over	740,000	13.2	683,400	13.0	56,500	17.2
Unknown	152,300	2.7	151,300	2.9	*	*
Sex						
Male	2,296,200	41.0	2,124,700	40.3	171,500	52.3
Female	3,304,100	59.0	3,147,500	59.7	156,500	47.7
Race						
White	3,739,000	66.8	3,478,600	66.0	260,400	79.4
Black	479,200	8.6	455,300	8.6	24,000	7.3
Other or unknown	1,382,000	24.7	1,338,300	25.4	43,700	13.3
Marital status at admission						
Married	2,146,400	38.3	1,986,100	37.7	160,300	48.9
Widowed	1,713,500	30.6	1,616,200	30.7	97,300	29.7
Divorced or separated	261,000	4.7	242,800	4.6	18,200	5.5
Never married or single	833,200	14.9	803,100	15.2	30,100	9.2
Unknown	646,200	11.5	624,000	11.8	22,200	6.8

* Figure does not meet standard of reliability or precision.

NOTE: Numbers may not add to totals because of rounding.

Table 6. Number and percent distribution of current home health and hospice patients by first-listed diagnoses at admission, according to type of care received: United States, 1994

Primary admission diagnosis and ICD-9-CM Code	Total	Percent distribution	Home health care		Hospice care	
			Number of patients	Percent distribution	Number of patients	Percent distribution
All current patients	1,950,300	100.0	1,889,400	100.0	61,000	100.0
Infectious and parasitic diseases 001–139	29,500	1.5	27,700	1.5	1,900	3.1
Neoplasms 140–239	150,900	7.7	115,100	6.1	35,800	58.7
Endocrine, nutritional and metabolic and immunity disorders 240–279	179,200	9.2	178,100	9.4	*	*
Diseases of the blood and blood-forming organs 280–289	41,200	2.1	41,100	2.2	*	*
Mental disorders 290–319	53,500	2.7	53,200	2.8	*	*
Diseases of the nervous system and sense organs 320–389	152,000	7.8	147,900	7.8	4,100	6.7
Diseases of the circulatory system 390–459	510,700	26.2	502,900	26.6	7,800	12.8
Diseases of the respiratory system 460–519	117,200	6.0	113,200	6.0	4,000	6.6
Disease of the digestive system 520–579	55,500	2.8	54,100	2.9	*	*
Diseases of the genitourinary system 580–629	44,800	2.3	44,000	2.3	*	*
Diseases of the skin and subcutaneous tissue 680–709	67,100	3.4	66,600	3.5	*	*
Diseases of the musculoskeletal system and connective tissue 710–739	155,400	8.0	154,400	8.2	*	*
Congenital anomalies 740–759	14,100	0.7	*	*	*	*
Symptoms, signs, and ill-defined conditions 780–799	118,100	6.1	116,700	6.2	*	*
Injuries and poisonings 800–999	150,600	7.7	150,500	8.0	*	*
All other or unknown	110,500	5.7	110,200	5.8	*	*

* Figure does not meet standard of reliability or precision.

NOTE: Numbers may not add to totals because of rounding.

Technical notes

Source of data

The sample for the 1994 NHHCS was the same basic one used in the 1992 and 1993 surveys. The original 1992 sample was taken from a frame consisting of all home health agencies and hospices identified in the 1991 National Health Provider Inventory (NHPI) and all agencies that opened for business between 1991 and June 30, 1992, as identified through the Agency Reporting System (6). The NHPI is a comprehensive census of nursing and related care homes, residential care homes, home health agencies, and hospices conducted periodically by the National Center for Health Statistics (12). The 1992 sample contained 1,500 agencies. These places were revisited during the 1993 survey. The exception was 42 agencies that had either merged with other agencies in the sample, were determined to be duplicates of other agencies in the sample, or were considered out of scope for the survey. The 1993 survey was conducted with a sample of 1,458 agencies. At the conclusion of the 1993 survey, another 48 agencies were removed from the sample because they had merged with other agencies or were otherwise determined to be out of scope for the survey. Between June 1992 and December 1993, another effort was made to identify agencies that were not in operation or were missed when the universe was first compiled for sample selection in 1992. As a result of this effort, a universe of 2,700 "new" places was identified and used to select 100 agencies to add to the 1994 sample. Thus, the 1994 sample included 1,510 home health and hospice care agencies.

Sample design

The sample design for the 1994 NHHCS is a stratified three-stage probability design. Primary Sampling Units (PSU's) are selected at the first stage, agencies are selected at the second stage, and current residents and discharges are selected at the third stage.

The first stage utilized the selection procedures that obtained the 198 PSU's used for the National Health Interview

Survey (NHIS), a survey of the civilian noninstitutionalized population of the United States (13). The PSU's are counties, groups of counties, county equivalents (such as parishes or independent cities), or towns and townships (for some PSU's in New England). Home health agencies and hospices were selected within the same PSU's included in the NHIS to minimize data collection costs and to establish linkage between the two surveys. This allows future research on availability and use of services (12).

The second stage involved the selection of agencies within six primary strata of agencies. These strata were formed in the 1992 sampling frame on the basis of type of agency (hospices versus home health agencies and mixed agencies (providing both types of care or unknown)), and type of PSU (self-representing versus nonself-representing, and within nonself-representing PSU's: Metropolitan Statistical Area (MSA) versus non-MSA). (MSA is a metropolitan statistical area defined by the U.S. Office of Management and Budget on the basis of the 1990 Census.) Within these sampling stratum, agencies were arrayed by four regions, five types of ownership, two types of certification status, and by the number of patients currently being served by the agency. The number of agencies selected from each sampling stratum was based primarily on results of research that was conducted to determine the optimum sample design for the 1992 NHHCS. Hospices in the nonself-representing PSU's and home health agencies and mixed agencies in the non-MSA, nonself-representing PSU's were selected with certainty. Hospices in the self-representing PSU's and home health agencies and mixed agencies in the MSA, nonself-representing PSU's and the self-representing PSU's were selected with probability proportional to the current patient size (as reported in the NHPI sampling frame). A total sample of 1,500 agencies was selected; 384 were hospices and the balance comprised of home health agencies or mixed agencies (14). For 1993, the number of agencies in the sample was 1,458. With two exceptions, the 1994

sample included all agencies surveyed in 1993. These exceptions were the 48 agencies previously mentioned as being excluded and a sample of 100 additional agencies identified when the 1992 universe was updated in 1994. The 100 additional agencies were selected within the same six primary strata as the original 1992 sample.

The final stage involved a random selection of 6 patients who were currently being served by the agency and 6 patients who had been discharged from care during a designated month between October 1993 and September 1994. A designated month within this 12-month period was randomly selected for each agency.

Data collection procedures

As in the two previous surveys, data collection for the 1994 NHHCS began with a letter sent to all sampled agencies informing the administrator of the authorizing legislation, the purpose, and the content of the survey. Within a week to 10 days after the letter was mailed, the interviewer assigned to conduct the survey for a particular agency made telephone contact to discuss the survey and to arrange an appointment with the administrator or person designated by the administrator.

Three questionnaires and two sampling lists were used to collect the data. The Agency Questionnaire was completed with the administrator or designee. The interviewer then completed the Current Patient Sampling List (CPSL) and Discharged Patient Sampling List (DPSL). On the CPSL, the interviewer listed all patients on the register of the agency on the evening prior to the day of the survey. The DPSL was used to list all discharges from the agency for their designated month. The "designated month" concept was adopted in the 1993 and 1994 surveys primarily to help reduce respondent burden. In 1992, the sample of discharges was taken from a list of all discharges from the agency during the 12 full months prior to the month of the survey. Sampling of current patients and discharges within agencies was accomplished by using tables showing sets of sample line numbers for each

possible count of current patients and discharges in the agency. The interviewer drew a sample of up to six current patients and up to six discharges.

After the samples had been selected, the Current Patient Questionnaires and the Discharged Patient Questionnaires were completed for each sampled person by interviewing the staff member most familiar with the care provided to the patient. The respondent was requested to refer to medical or other records whenever necessary.

Sampling errors

Because the statistics presented in this report are based on a sample, they will differ somewhat from figures that would have been obtained if a complete census had been taken using the same schedules, instructions, and procedures. The standard error is primarily a measure of the variability that occurs by chance because only a sample, rather than the entire universe, is surveyed. In 95 of 100 samples drawn, the estimates obtained will be within two standard errors of the value obtained from a complete census. However standard errors typically underestimate the true errors of the statistics because they reflect only errors due to sampling.

The standard errors used in this report were approximated using SUDAAN software. SUDAAN computes standard errors by using a first-order Taylor approximation of the deviation of estimates from their

Table I. Parameters used to compute relative standard errors by type of estimate

Type of estimate	Parameters	
	A	B
Home health care agencies		
Facility	0.013011	4.098206
Current patient	0.003225	568.355553
Discharges.	0.007651	1809.184763
Hospice		
Facility	0.001362	1.094834
Current patient	0.009611	26.195620
Discharges.	0.007581	208.593103

expected values. A description of the software and the approach it uses has been published (15). Exact standard error estimates were used in tests of significance in this report. Standard errors for all estimates presented in this report may be calculated using the following general formula, where X is the aggregate of interest in thousands, and A and B are the appropriate coefficients from table I:

$$RSE(X) = A + \frac{B}{X}$$

Similarly, standard errors for percents $100p$ ($0 < p < 1$) may be calculated using the following general formula, where $100p$ is the percent of interest, X is the denominator of the percent, and B is the parameter B in the formula for approximating the $RSE(X)$. The values for B are given in table I.

$$RSE(p) = \frac{B(1-p)}{(pX)}$$

The tests of significance are based on the Bonferroni multiple comparisons using the Z -test with an overall 0.05 level of significance to test all comparisons mentioned in this report. The critical value of the Z for each test was determined by the number of variables being compared. Not all observed differences were tested, so lack of comment in the text does not mean the difference was not statistically significant.

Presentation of estimates

Publication of estimates for the NHHCS is based on the relative standard error of the estimate and the number of sample records on which the estimate is based (referred to as the sample size). Estimates are not presented in NCHS reports unless a reasonable assumption regarding the probability distribution of the sampling error is possible.

Because of the complex sample design of the NHHCS, the following guidelines are used for presenting the estimates:

If the sample size is less than 30, the value of the estimate is not reported.

If the sample size is 30–59, the value of the estimate is reported but should not be assumed reliable. If the sample size is 60 or more and the relative standard error is less than 30 percent, the estimate is reported.

If the sample size is 60 or more but the relative standard error is over 30 percent, the estimate is reported, but should not be assumed reliable.

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