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Use of Computerized Medical Records in Home Health and Hospice Agencies: United States, 2000



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics

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Data From the National Health Care
Survey

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics

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Abstract

Objective

The use of information technology (IT), such as computerized medical records (CMR), has been proposed as a method for increasing the efficiency of delivered services, raising the level of the quality of care provided, and decreasing the number of medical errors. Research on IT and CMRs in health care has focused primarily on hospitals and physicians' offices, and there currently exists no nationally representative information for home health and hospice agencies. This report provides the first nationally representative estimates of the prevalence of CMR use in home health and hospice agencies in the United States in 2000.

Methods

Data are from the 2000 National Home and Hospice Care Survey. Data presented include estimates of home health and hospice agencies that are currently using or planning to use a CMR in the next year. CMR use is also presented by agency characteristics.

Results and Conclusions

Approximately 32% of all agencies were using a CMR. Nearly one-third of home health agencies (32.1%), one-fifth of hospice agencies (18.6%), and two-fifths of mixed-type agencies (offering both services) (40.3%) reported using a CMR.

Number of current active patients and provision of "high technology" services (e.g., respiratory, intravenous, or enterostomal therapy) were significantly associated with use of CMRs. While 23.0% of agencies with 50 or fewer patients reported use of a CMR, the proportion almost doubled to 44.8%, among agencies with 100 or more patients. Over one-third (34.8%) of agencies that provided high technology services reported using a CMR, compared with one-fifth (20.8%) of agencies that did not provide high technology services. No other agency characteristics were found to have a significant relationship with CMR use.

Keywords: *National Home and Hospice Care Survey • Home Health Agencies • Hospice Agencies • information technology • computerized medical records*

Use of Computerized Medical Records in Home Health and Hospice Agencies: United States, 2000

by William S. Pearson, Ph.D., M.H.A., and Anita R. Bercovitz, Ph.D., M.P.H., Division of Health Care Statistics

Introduction

In 2004, President George W. Bush signed Executive Order 13335, which stated that within 10 years, most Americans should be covered by an interoperable (ability of health information systems to work together across organizational boundaries) health record. This executive order created the position of National Health Information Technology Coordinator within the Office of the Secretary of Health and Human Services, with the charge of developing a strategic plan that would "guide the nationwide implementation of interoperable health information technology in both the public and private health care sectors that will reduce medical errors, improve quality, and produce greater value for health care expenditures" (1).

Executive Order 13335 arrived on the heels of two reports published by the Institute of Medicine (IOM) discussing patient safety concerns in the U.S. health care system and how information technology (IT) could help increase levels of safety. The first report, referred to as "Crossing the Quality Chasm" (2), described how the use of information technology could ameliorate many of the quality problems currently facing the U.S. health care system. The second IOM report, "Key Capabilities of an Electronic Health Record" (3), further outlined several key capabilities of an electronic health record system that

would be necessary to address many of the quality issues found in health care. These key capabilities include the ability to collect health information and data, results management, order entry and management, decision support, electronic communication and support, patient support, administration support, and population health reporting.

In 2000, it was estimated that nearly 1.5 million patients were receiving home health or hospice care in the United States (4). The nature of care provided in the home and to hospice patients is different from many other types of health care provided in other settings. From the perspective of the provider, patients are not centralized and service coordination among different providers may require a level of planning that is not usually seen in other care settings. Therefore, the capability to communicate across health disciplines and numerous health care providers offered by a computerized medical record (CMR) is particularly important in the home health and hospice care setting to reduce errors and increase quality and efficiency.

This report presents the first nationally representative data that examines the extent of CMR use in the home health and hospice care industry. It summarizes the use of CMRs in the home health and hospice industry in 2000 and identifies several agency characteristics that are associated with the use and adoption of information technology in the form of a CMR.

Highlights

- Approximately one-third of agencies providing home health or hospice services reported using a CMR in 2000. Of those that were not currently using CMRs, nearly one-quarter stated that they had plans to do so within the next year.
- CMR use varied by whether an agency provided both home health and hospice services or only one type of service. Approximately two-fifths (40.3%) of mixed-type agencies, 32.1% of home health care agencies, and 18.6% of hospice agencies reported using a CMR in 2000.
- In addition to differences in CMR use among types of agencies, the number of current active patients served by the agency and agency provision of high technology services, such as respiratory, intravenous, or enterostomal therapy, were also significantly associated with use of CMRs. Although 23.0% of agencies with 50 or fewer patients reported use of a CMR, the proportion almost doubled (to 44.8%) among agencies with more than 100 patients. Just over 30 percent (30.7%) of agencies with 50–100 patients reported use of a CMR. Slightly over one-third (34.8%) of agencies that provided high technology services reported using a CMR compared with one-fifth (20.8%) of agencies that did not provide high technology services. Other agency characteristics, including census region, metropolitan statistical area (MSA) location, ownership, and agency affiliations, were not associated with use of CMRs.
- Among agencies providing home health services (excluding hospice only), the number of current active patients served by the agency and those providing high technology services were the only significant characteristics associated with CMR use.

Methods

Data used for this report were taken from the agency component of the 2000 National Home and Hospice Care Survey. In 2000, the sampling frame for this survey consisted of 15,451 agencies. From this sampling frame, 1,800 agencies were selected for the survey, and 1,425 of those agencies were identified as currently providing care to patients at the time of the survey and in scope (eligible) for participation. This sample of 1,425 agencies represents 11,400 agencies across the United States in 2000. For further information on the sample selection and survey design, see the survey methodology for the 2000 National Home Health and Hospice Care Survey, which is available from: <http://www.cdc.gov/nchs/nhhcs.htm> (5).

This report describes agency use of CMRs. Two questions—1) “Are the medical records of this agency computerized?” and 2) “Does this agency plan to computerize its records within the next year?”—were used in this analysis. The first question was asked of all 1,425 agencies. The second question was asked of all facilities that did not provide an affirmative response to the first question. However, due to small numbers of agencies responding affirmatively to the second question, it was not possible to examine the responses to this question by various agency characteristics. Therefore, only the overall results for the response to the second question are provided.

The use of a CMR was analyzed by characteristics that may have an impact on the delivery of care and might affect the use of a CMR. The first characteristic was agency type. Agencies were classified as home health providers only; hospice care providers only; or a provider of both types of care, which was termed “mixed.”

Other agency characteristics describing organizational structure and operations included ownership status; affiliation with a hospital, a group of agencies, or a chain; size of the agency based on patient load; total number of

services offered; specialty services offered; and geographic location of the agency. Estimates of CMR use were made for each of these characteristics.

Ownership status and organizational control was characterized as proprietary, nonprofit, or government ownership. Agencies were also identified as whether they were operated by a hospital and whether they were operated by a larger group or belonged to a chain of agencies.

Size of the agency was measured by patient load and number of services provided. The number of patients currently being cared for by the agency was categorized into three levels: 0–50 patients, 51–100 patients, and 101–500 patients. The total number of services provided by the agency was also categorized into three levels: 1–10 services, 11–20 services, and 21 or more services.

The use of high technology services by the agency was defined as providing any of the following: respiratory therapy, intravenous therapy, enterostomal therapy, and an affirmative response to a question in the survey regarding “other high technology services.” The use of high technology services was considered as a predictor of CMR use for two reasons. First, these types of services require care from specialty-trained providers and therapists and coordination of this level of care could possibly be enhanced through CMR management. Second, use of high technology services could potentially be an indicator of an agency’s willingness to adopt newer technology.

Agency location was defined by geographic location. This included Northeast, Midwest, South, and West. Metropolitan statistical area (MSA) status was defined as metropolitan or nonmetropolitan.

The relationship between use of a CMR and agency characteristics was also examined for agencies providing home health services and excluded hospice only providers. Agencies providing hospice care only were excluded for two reasons. The total number of agencies providing hospice care only was small, and further

stratification of these agencies would have provided unstable estimates. Also, hospice care only providers could potentially operate in a different environment from agencies that provide home health services. Agencies providing only hospice care may be providing their services in an inpatient setting, which keeps all patients on service in a close, centralized setting when compared with patients receiving care in their homes. This operational structure may affect the choice of an agency to use an electronic medical record and may dilute the results of the analysis.

When limiting the analyses to agencies providing home health services and excluding hospice only providers, estimates using the same independent variables as defined previously would not have produced robust results. Therefore, two of the agency characteristics were dichotomized. Ownership status was categorized into either “proprietary” or “nonprofit, government, or other” and number of services was categorized into either “1–10 services” or “11 or more services.”

Estimates are reported for each of the agency types and agency characteristics. Estimates are not presented in NCHS reports unless a reasonable assumption regarding the probability distribution of the sampling error is possible. Estimates whose standard error represents less than 30 percent of the estimate, but whose sample sizes are between 30 and 60 have a single asterisk (*) to indicate that they should be considered with caution. Estimates whose standard error represents more than 30 percent of the estimate and have a sample size of less than 30 have a double asterisk (**) to indicate that they do not meet the reliability standard set by NCHS. A more detailed description of the reliability of the estimates can be found in [Appendix I](#). In one instance of this analysis, an estimate had a sample size of 29. This sample size is less than the NCHS-required sample size of 30–59 and is indicated with a dagger (†).

The association between agency characteristics and use of a CMR were tested for significance using bivariate

statistical tests. Chi-square tests were used to test for significant differences among the different levels of the independent variables and between the outcome responses. Significance levels were set at an $\alpha=.05$. For these tests, responses of blank, invalid, or unknown were not included in the analyses. These categories represented less than 5% of the responses. All analyses were conducted using SAS callable SUDAAN (6) so as to take into account the complex sampling design of the survey.

Results

Overall Use of CMRs

Approximately one-third (32%) of all home health and hospice agencies in the United States were using CMRs in 2000. Of those that were not currently using CMRs, 22% stated that they had plans to do so within the next year ([Figure 1](#)).

Looking more specifically at agency type, nearly one-third of home health agencies (32.1%) reported using a CMR in 2000 compared with nearly one-fifth of all hospice agencies (18.6%) and just over two-fifths of all mixed-type agencies (40.3%) ([Table 1](#)).

Characteristics of All Agencies

Agencies with larger patient volume had a higher percentage using

a CMR ($p<.05$). Agencies reporting the provision of high technology services also had a higher percentage reporting use of a CMR ($p<.05$) ([Table 2](#)).

No significant differences were seen when comparing agency use of a CMR by ownership, affiliation with a hospital, number of services provided by the agency, or on the geographic location of the agency ([Table 2](#)).

Characteristics of Home Health Service Agencies

When limiting the analyses to only those agencies that provided home health services, two characteristics—the number of patients being treated and the offering of high technology services—were significantly related to the agency’s likelihood of using a CMR. Agencies serving more than 100 patients were significantly more likely to be using a CMR than agencies treating fewer patients ($p<.05$). A significant difference between agencies providing high technology services and those not providing high technology services was noted in the analysis ($p<.05$); the same as in the previous analysis. However, the estimate should be considered with caution due to the small sample size of agencies indicating that they did not provide high technology services ([Table 3](#)). This sample size is less than the NCHS-required sample size of 30–59.

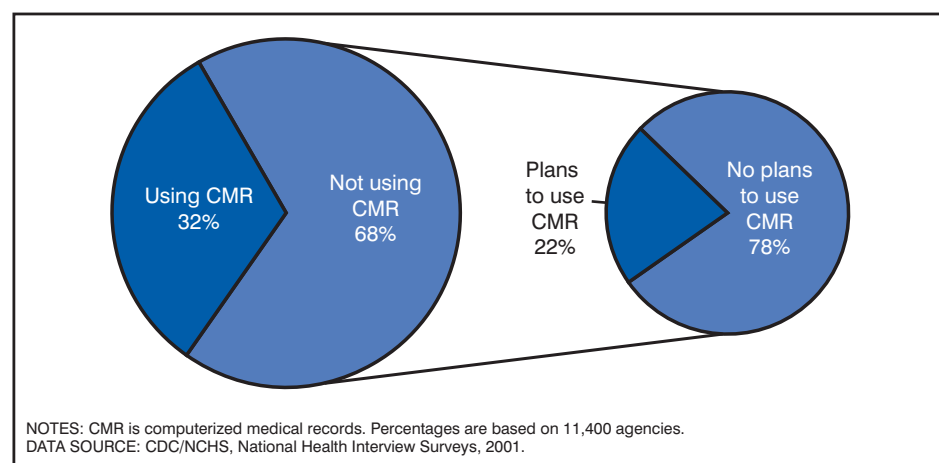


Figure 1. Percent distribution of home health and hospice agencies currently using, or planning to use within the next year, computerized medical records: United States, 2001

Summary and Discussion

In this first nationally representative study of CMR use in the home health and hospice industry, three important characteristics were identified as being related to an agency's use of a CMR. First, agencies that provide home health services only or mixed services are more likely than hospice only providers to report currently using a CMR. Second, agencies providing high technology services had a greater proportion of CMR users than those agencies not offering high technology services. Third, agencies that provided services to large numbers of patients were more likely to be users of CMR technology compared with agencies providing services to fewer patients. No other characteristics were related to use of a CMR.

Two prominent factors contribute to the idea that home health agencies would be identified as prime adopters of this technology. First, the nature of home health care (providing services in multiple locations) requires coordination among providers and provider sites. Home health agencies provide services to clients who are medically complex, who often transition between modes of care, who are served by multiple providers and provider types, and who are often geographically separated from each other and the clients (7,8). In contrast, hospice agencies are less likely to transition between modes of care and many times provide care in a centralized setting such as an inpatient hospice care facility. Additionally, it was considered that agencies with more patients, those that offered more services, and those that offered more high technology services may have more resources available to invest in a computerized medical record system.

The second prominent factor considered was that in 1999 the Centers for Medicare and Medicaid Services (CMS) required home health agencies to electronically submit patient assessments to retain Medicare certification. These assessments are collected in the Outcome and Assessment Information

Set (OASIS) (9). This requirement provided a federally mandated impetus for home health agencies to acquire the necessary infrastructure to electronically record and transmit medical information on their patients.

Other factors exist that may simultaneously have negative affects on the adoption of this technology. In general, costs of acquiring and implementing a CMR may be one reason for the low proportion of agencies using CMRs. This study examined use of CMRs in 2000, which was 2 years after implementation of the interim payment system and 1 year after implementation of the prospective payment system (PPS) for home health agencies. The changes in payment methodology decreased home health agencies' reimbursement (10) and may also have decreased the discretionary funds available for purchase and implementation of CMRs.

Another factor that may affect the adoption of CMRs in home health and hospice agencies is the availability of specialized products directed specifically for home health care. An example of this technology is referred to as point of care (POC) technology, which automates nurses' notes during the provision of care in the home environment (11). However, even with this new technology advancement, a survey of health care IT vendors found that although three-quarters of respondents had developed Electronic Medical Record (EMR) or Electronic Health Record (EHR) products for physician offices or ambulatory clinics, fewer than one-third had developed products targeted at home health care (12). In 2000 and in previous years, electronic health record technologies may not have been as well marketed to the home health industry as they were to physician offices and ambulatory clinics.

There were several limitations to this study. One limitation is that the surveyed agencies stated whether they currently used a computerized medical record, but did not elaborate on the specific uses or characteristics of the CMR. In most cases, an electronic health record is used in coordinating care among the different health

modalities and recording the treatment of the patient. More detailed questions on the uses of the electronic medical record are being developed for future National Home and Hospice Care (NHHCS) surveys. These new questions take into account the functionality and interconnectivity standards set by Health Level 7 (HL-7) (13) and also the "Key Capabilities" of an electronic medical record identified by the IOM.

A second limitation of this study is that the data collected is cross-sectional. It is not possible to determine if current agency characteristics are the same as those that existed when the CMR was implemented. It is only possible to determine a cross-sectional relationship between CMR use and agency characteristics.

A third limitation of this study was the small sample size. Larger numbers of the three types of agencies (home health only, hospice only, and mixed) would have made it possible to further examine the relationship between different types and modes of care (including hospice only providers) and CMR use.

It should be noted in this study that fundamental differences exist in the way that home health and hospice care are delivered, and these differences may explain why home health agencies have a higher percentage of CMR use when compared with hospice only agencies. There is relatively little literature published on the use of an electronic health record solely in the hospice care setting. These differences should be explored more fully in future research. Therefore, this report, as well as future home health and hospice care surveys, will help to open the door on IT research in long-term care and more specifically in home health and hospice care settings.

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Table 1. Weighted number and percent of agencies using a computerized medical record (with standard error), by agency type: United States, 2000

Agency type	Total number of agencies	Number using CMR ¹	Percent using CMR ¹
Home health agency	7,600 (300)	2,400 (200)	32.1 (2.4)
Hospice agency	1,300 (100)	200 (30)	18.6 (2.1)
Mixed agency	1,800 (200)	700 (100)	40.3 (4.6)
Total ²	11,400 (300)	3,700 (200)	32.3 (1.9)

¹CMR is computerized medical record.²Includes unknown type.**Table 2. Percent distribution of agencies using a computerized medical record (with standard error), by selected agency characteristics: United States, 2000**

Selected characteristic	Total	Percent using a CMR ¹ (n=3,700)	Percent not using a CMR ¹ (n=7,700)
Ownership			
Proprietary	100.0	32.2 (3.0)	67.5 (3.0)
Nonprofit	100.0	31.7 (2.9)	68.2 (2.9)
Government	100.0	*33.2 (5.9)	66.8 (5.9)
Operated by hospital			
Yes	100.0	35.7 (3.5)	64.3 (3.5)
No	100.0	31.0 (2.3)	68.8 (2.3)
Affiliated with group or chain			
Yes	100.0	34.2 (2.5)	65.6 (2.5)
No, or affiliation unknown	100.0	28.7 (3.1)	70.9 (3.1)
Number of patients²			
0–50	100.0	23.0 (2.7)	77.0 (2.7)
51–100	100.0	30.7 (3.8)	68.6 (3.8)
101–500	100.0	44.8 (3.7)	54.9 (3.7)
Number of services provided			
1–10	100.0	32.4 (2.9)	67.2 (2.9)
11–20	100.0	33.0 (2.6)	66.7 (2.6)
21 or more	100.0	*26.1 (7.5)	73.8 (7.5)
High technology services provided²			
Yes	100.0	34.8 (2.1)	64.9 (2.1)
No	100.0	20.8 (4.4)	78.6 (4.4)
Location			
Northeast	100.0	29.5 (4.3)	70.3 (4.3)
Midwest	100.0	30.6 (3.2)	69.1 (3.2)
South	100.0	33.2 (3.3)	66.5 (3.3)
West	100.0	35.0 (4.3)	64.0 (4.3)
MSA status³			
MSA	100.0	33.8 (2.4)	65.8 (2.4)
Not MSA	100.0	29.3 (3.1)	70.3 (3.1)

* Figure does not meet standard of reliability or precision and should be considered with caution.

¹CMR is computerized medical record.²Chi-square test of association was significant at $\alpha \leq .05$.³MSA is metropolitan statistical area.

NOTE: Percentages may not add to 100 due to rounding.

Table 3. Percent distribution of agencies delivering home health services that use a computerized medical record (with standard error), by selected agency characteristics: United States, 2000

Selected characteristic	Total	Percent using CMR ¹ (n=3,500)	Percent not using CMR ¹ (n=6,100)
Ownership			
Proprietary	100.0	35.1 (3.8)	64.8 (3.8)
Nonprofit, government, other	100.0	33.2 (2.7)	66.8 (2.7)
Operated by hospital			
Yes	100.0	31.8 (3.2)	68.1 (3.2)
No	100.0	35.3 (3.0)	64.6 (3.0)
Affiliated with group or chain			
Yes	100.0	32.3 (3.3)	67.6 (3.3)
Not affiliated or affiliation unknown.	100.0	35.2 (2.9)	64.7 (2.9)
Number of patients²			
0–50	100.0	24.5 (3.4)	75.4 (3.4)
51–100	100.0	32.6 (4.3)	67.3 (4.3)
101–500	100.0	45.5 (3.9)	54.4 (3.9)
Number of services provided			
1–10	100.0	32.4 (3.0)	67.5 (3.0)
11 or more	100.0	35.2 (3.1)	64.7 (3.1)
High technology services provided²			
Yes	100.0	37.0 (2.4)	62.9 (2.4)
No	100.0	†19.1 (4.3)	80.8 (4.2)
Location			
Northeast	100.0	*28.5 (4.7)	71.4 (4.7)
Midwest	100.0	31.9 (3.7)	68.0 (3.7)
South	100.0	34.9 (3.8)	65.0 (3.8)
West	100.0	*38.2 (5.1)	61.7 (5.1)
MSA status³			
MSA	100.0	36.1 (2.8)	63.8 (2.8)
Not in MSA	100.0	29.6 (3.5)	70.3 (3.5)

† NCHS standard of reliability is normally based on a sample size of at least 30 cases. This estimate is based on 29 cases and should be considered with caution.

* Figure does not meet standard of reliability and should be considered with caution.

¹CMR is computerized medical record.

²Chi-square test of association is significant at $\alpha < .05$.

³MSA is metropolitan statistical area.

NOTES: Percentages may not add to 100 due to rounding. Percentages include home health and mixed type agencies. Agencies providing hospice services only were excluded.

Appendix I

Technical Notes

Data in this report are from the 2000 National Home and Hospice Care Survey (NHHCS), the sixth in a series of surveys that was first conducted by the National Center for Health Statistics (NCHS) in 1992 (14). Other surveys were conducted in 1993, 1994, 1996, and 1998. NHHCS, a segment of the long-term care component of the National Health Care Survey (15), collects information about agencies that provide home health and hospice care services, their current patients, and their discharges.

Scope of the Survey

The sampling frame for NHHCS consists of agencies classified as providing home health or hospice care. These agencies were originally identified through the 1991 National Health Provider Inventory (NHPI). NHPI is a comprehensive census of nursing and related care homes, residential care homes, home health agencies, and hospices and has been periodically conducted by NCHS (16,17). For the 1992, 1994, and 1998 surveys, NHPI was updated using the Agency Reporting System. This system consisted primarily of lists of directories of facilities from state agencies, federal agencies, and national voluntary organizations (17–19).

Starting with the 1998 NHHCS, the universe of home health agencies and hospices was obtained from various national organizations and other sources. The sampling frame for the 2000 NHHCS consisted of 15,451 agencies and was obtained from two sources, the SMG Home Healthcare Market Database and the mailing list of members of the National Hospice and Palliative Care Organization (20,21). The methodology used to create the SMG file was similar to that used for NHPI (obtaining lists of agencies directly from states). The SMG file may include agencies that provide both home health and hospice care, but does not include agencies that provide only hospice care. The agencies within these

two sources were unduplicated prior to the sample selection. The sample consisted of 1,800 agencies selected from this frame.

Sample Design

The sample design for the 2000 NHHCS was a two-stage probability design (22). The first stage consisted of the selection of a stratified sample of agencies. Each agency was placed into 1 of 24 strata based on type of agency (home health, hospice, and mixed), metropolitan statistical area (MSA), and region (Northeast, Midwest, South, and West). MSA is defined by the U.S. Office of Management and Budget on the basis of the 1980 census. Within these sampling strata, agencies were arrayed by four types of ownership (for profit, nonprofit, government, and unknown), three types of certification status (Medicare or Medicaid, not certified, and unknown), state, MSA code, county, ZIP code, and size (number of current patients).

The second stage of sample selection, sampling of six current patients and six discharges within each agency, was done using a sample selection table to obtain systematic probability samples of current patients and discharges. The patients and discharges were selected from lists constructed for each agency at the time of interview. Current patients were defined as those patients who were on the roll of the agency as of midnight on the day immediately before the date of the survey. Discharges referred to those patients who were discharged from care by the home health agency or hospice during a designated month between October 1999 and September 2000. Discharges that occurred because of the patient's death were included.

Data Collection and Processing

Data collection for the 2000 NHHCS began with a letter sent to all sampled agencies informing the administrator of the authorizing legislation, purpose, and content of the survey. Each agency was then contacted by an interviewer to discuss the survey and to arrange an appointment with the

administrator. Three questionnaires and two sampling lists were used to collect the data. The Agency Questionnaire was completed with the administrator or a person designated by the administrator. The interviewer then constructed the Current Patient Sampling List and the Discharged Patient Sampling List. These lists were used to select the sample patients and discharges. Sampling was accomplished by using tables showing sets of sample line numbers for each possible count of current patients and discharges in the agency. Up to six current patients and six discharges were selected.

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 referred to patient medical and other records as necessary. No patient was interviewed directly. After the data had been collected, they were converted into machine-readable form. Extensive editing was then conducted by computer to ensure that all responses were accurate, consistent, logical, and complete. The medical information recorded on the patient questionnaires was coded according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (23). Up to 12 diagnostic codes (a maximum of six at admission and six at the time of survey or discharge) and up to two procedure codes were assigned for each sample patient or discharge.

Estimation Procedure

Statistics presented in this report were derived by a multistage estimation procedure (24) that produces essentially unbiased national estimates and has the following three principal components: (a) inflation by the reciprocals of the probabilities of sample selection, (b) adjustment for nonresponse, and (c) ratio adjustment to fixed totals.

Inflation by the reciprocals of the probabilities of sample selection—There is a probability for each stage of sampling: (a) the probability of selecting

the agency, and (b) the probability for selecting the patient or discharge within each agency. For example, the probability of selecting a discharge within an agency is the number of discharges selected divided by the total number of discharges from the agency within the designated month. The overall probability of selection is the product of the probabilities at each stage. This component is the inverse of the overall selection probability and is the basic inflation weight.

Adjustment for nonresponse—NHHCS data were adjusted for three types of nonresponse. The first type occurred when an in-scope (NHHCS eligible) sample agency did not respond, the second type occurred when an agency did not complete the sampling lists used to select the patient or discharge samples, and the third type occurred when the agency did not complete the questionnaire for a sample patient or discharge. The nonresponse adjustment brings estimates based only on the responding cases up to the level that would have been achieved if all eligible agencies had responded.

Ratio adjustment to fixed totals—Adjustments were made within each of four groups defined by region to adjust for over- or under-sampling of agencies reported in the sampling frame. This adjustment is a multiplicative factor whose numerator was the number of agencies in the sampling frame within each region and whose denominator was the estimated number of agencies for that same group.

Reliability of Estimates

Because the statistics presented in this report are based on a sample, they differ somewhat from values that would have been obtained if a complete census had been taken using the same schedules, instructions, and procedures. As in any sample survey, the results are subject to both sampling and nonsampling errors. Whenever possible, the latter types of errors are kept to a minimum by methods built into the survey procedures. Because survey results are subject to both sampling and nonsampling errors, the total error is

larger than errors from sampling variability alone.

The standard error (SE) is primarily a measure of the variability that occurs by chance because a sample, rather than the entire universe, is surveyed. The SE also reflects part of the measurement error, but it does not measure any systematic biases in the data. The chances are about 95 in 100 that an estimate from the sample differs from the value that would be obtained from a complete census by less than twice the SE. However, SEs typically underestimate the true errors of the statistics because they reflect only errors resulting from sampling.

Standard errors in this report were approximated using SUDAAN software. SUDAAN computes SEs by a first-order Taylor approximation of the deviation of estimates from their expected values. A description of the software and the approach it uses has been published (6).

Presentation of Estimates

NCHS bases publication of estimates for NHHCS on the relative standard error (RSE) of the estimate and the number of sample records on which the estimate is based (referred to as the sample size). RSE is another measure of the variability and is calculated by dividing the SE of an estimate by the estimate itself. The result is then converted into a percentage by multiplying it by 100. 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 NHHCS, the following guidelines are used:

- If the sample size is 60 or more and the RSE is less than 30 percent, the estimate is reported and considered reliable.
- If the sample size is 30–59 or if the sample is 60 or more and the RSE is 30 percent or more, the estimate is reported, but should not be assumed reliable. This is indicated with single asterisk (*) following the figure in the table.
- If the sample is less than 30, the value of the estimate is not reported.

This is indicated with a double asterisk (**).

Appendix II

Agency Questionnaire

FORM HHCS-1 (3-23-2000) U.S. DEPARTMENT OF COMMERCE Economics and Statistics Administration U.S. CENSUS BUREAU ACTING AS COLLECTING AGENT FOR THE DEPARTMENT OF HEALTH AND HUMAN SERVICES U.S. PUBLIC HEALTH SERVICE CENTERS FOR DISEASE CONTROL AND PREVENTION NATIONAL CENTER FOR HEALTH STATISTICS		OMB No. 0920-0298; Approval Expires 03/31/2001	
AGENCY QUESTIONNAIRE 2000 NATIONAL HOME AND HOSPICE CARE SURVEY		NOTICE – Public reporting burden for this collection of information is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of to this collection of information, including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer; Paperwork Reduction Project (0920-0298) 1600 Clifton Road, MSD-24, Atlanta, GA 30333. Information contained on this form which would permit identification of any individual or establishment has been collected with a guarantee that it will be held in strict confidence, will be used for purposes stated for this study, and will not be disclosed or released to others without the consent of the individual or establishment in accordance with Section 308(d) of the Public Health Service Act (42 USC 242m).	
Section A – AGENCY INFORMATION			
1. Telephone number(s)	a. Agency	c. Alternate	d. FAX number
2a. Administrator name	b. Respondent name		
Section B – RECORD OF CONTACTS			
Day (a)	Date (b)	Time (c)	Notes (d)
		a.m.	
		p.m.	
		a.m.	
		p.m.	
		a.m.	
		p.m.	
		a.m.	
		p.m.	
		a.m.	
		p.m.	
		a.m.	
		p.m.	
		a.m.	
		p.m.	
Section C – RECORD OF INTERVIEW			
1. STATUS OF INTERVIEW – Mark (X) appropriate box.		2. Date of interview	
01 ☐ Complete interview 02 ☐ Partial interview 03 ☐ Refusal 04 ☐ Unable to locate 05 ☐ Not a Home Health Agency/ Home Care Agency/Hospice 06 ☐ Temporarily closed 07 ☐ Not yet in operation 08 ☐ No longer operating	09 ☐ Merged with (Control No.) 10 ☐ Duplicate (Control No. of duplicate) 11 ☐ Other noninterview	Month Day Year	
NOTE – Document reason for status 04–11 in NOTES section.		3. Field Representative name FR Code	
NOTES/COMMENTS 01 ☐ Mark (X) this box if comments are written in this section or any other place on this questionnaire.			

Section D – ARRANGING THE ADMINISTRATOR APPOINTMENT

1. INTRODUCTION

Good morning (afternoon). My name is . . . I'm from the Census Bureau. We are currently conducting the National Home and Hospice Care Survey for the National Center for Health Statistics which is part of the Centers for Disease Control and Prevention. We are studying home health agencies, home care agencies, hospices, and their patients. You should have received a letter from Edward J. Sondik, the Director of the National Center for Health Statistics, which describes this project. Have you received this letter?

- ☐ Yes – Skip to Item 3, NAME VERIFICATION.
☐ No – Continue with Item 2, SURVEY EXPLANATION.

2. SURVEY EXPLANATION

If administrator wants a copy of the letter, explain that you will bring a copy when you visit the agency.

I'm sorry that you did not receive the letter. Let me briefly outline its contents.

The National Home and Hospice Care Survey is authorized under Section 306 of the Public Health Service Act to collect information about home and hospice care agencies, their services, and patients. The survey is endorsed by the National Association for Home Care and the National Hospice Organization. The statistics compiled from the data are used to support research for effective treatment of long-term health problems and to study utilization of hospice and home care agencies and the efficient use of the Nation's health care resources.

I want to emphasize that the information you and your staff supply will be used solely for statistical and reporting purposes. In accordance with Section 308(d) of the Public Health Service Act, no information collected in this survey may be used for any purpose other than the purpose for which it was collected. Such information may not be published or released in any form if the individual or establishment is identifiable unless the individual or establishment has consented to such release.

The survey includes a small sample of home and hospice care agencies. Although your participation is voluntary and there are no penalties for refusing to answer any questions, it is essential that we obtain data from all sample agencies.

READ IF NECESSARY:

We are asking participants for a list of current patients and a list of discharges during a designated one-month period. We will draw a sample of 6 current patients and a sample of 6 discharges from the lists and complete a questionnaire for each of the 12 sampled patients.

Continue with Item 3, NAME VERIFICATION.

3. NAME VERIFICATION

I would like to verify some information from my records. Is (Name of agency on label) the correct name of your agency?

- ☐ Yes – Go to Item 4, ADDRESS VERIFICATION
☐ No – Enter correct agency name below. ☒

4. ADDRESS VERIFICATION

Is (Address of agency on label) the correct address?

- ☐ Yes – Go to Item 5 – SET APPOINTMENT
☐ No – Enter correct agency address below. ☒

Number	Street	P.O. Box, Route, etc.
City or town		
State		ZIP Code

5. SET APPOINTMENT

I would like to arrange a morning appointment at your convenience to conduct the survey. What would be a convenient date and time to visit your agency?

Day	Date	Time	a.m. p.m.
Day	Date	Time	a.m. p.m.

READ IF NECESSARY —

6. Could you give me directions to your agency from some easy to identify starting point? (Record directions in number 7 below.)

Thank you very much for your time. I will see you at (Time) on (Date). Good-bye.

7. DIRECTIONS TO AGENCY

NOTES

Section E - QUESTIONS ABOUT THE AGENCY

Before I begin the interview, I'd like to take a moment to explain the purpose of the survey. I believe you (received/did not receive) the letter from the National Center for Health Statistics.

If administrator did not receive the letter, hand him/her a copy. Allow him/her to briefly read it through.

As it says in the letter, the purpose of the National Home and Hospice Care Survey is to collect information about home and hospice care agencies such as yours. The information you provide is strictly confidential and will be used only by persons involved in the survey and only for the purposes of the survey.

HAND FLASHCARD 1

1a. What is the type of ownership of this agency as shown on this card?

Mark (X) only ONE box.

- 01 ☐ Proprietary
 02 ☐ Nonprofit
 03 ☐ State or local government
 04 ☐ Federal Government
 05 ☐ Other - Specify

b. Does this agency operate under the general authority of a hospital?

- 01 ☐ Yes
 02 ☐ No

c. Does this agency operate under the general authority of a nursing home?

- 01 ☐ Yes
 02 ☐ No

d. Is (Name of agency) a member of a group of agencies operating under one corporate authority or corporate ownership?

- 01 ☐ Yes
 02 ☐ No

2. Does this agency operate under the authority of a Health Maintenance Organization (HMO)?

- 01 ☐ Yes
 02 ☐ No

3a. Is this agency certified under Medicare as a Home Health Agency?

- 01 ☐ Yes
 02 ☐ No
 03 ☐ Certification pending

b. Is this agency certified under Medicare as a Hospice?

- 01 ☐ Yes
 02 ☐ No
 03 ☐ Certification pending

4a. Is this agency certified under Medicaid as a Home Health Agency?

- 01 ☐ Yes
 02 ☐ No
 03 ☐ Certification pending

b. Is this agency certified under Medicaid as a Hospice?

- 01 ☐ Yes
 02 ☐ No
 03 ☐ Certification pending

5a. Are the medical records of this agency computerized?

- 01 ☐ Yes - Skip to item 6
 02 ☐ No

b. Does this agency plan to computerize its medical records within the next year?

- 01 ☐ Yes
 02 ☐ No

NOTES

Section E – QUESTIONS ABOUT THE AGENCY – Continued

HAND FLASHCARD 2

6. Does this agency provide any of the following services?

Mark (X) all that apply.

Probe: **Any other services?**

- 00 ☐ None
- 01 ☐ Bereavement care
- 02 ☐ Companion services
- 03 ☐ Continuous home care
- 04 ☐ Counseling
- 05 ☐ Dental treatment services
- 06 ☐ Dietary and nutritional services
- 07 ☒ Durable medical equipment and supplies
- 08 ☐ Enterostomal therapy
- 09 ☒ Homemaker/Household services
- 10 ☐ IV therapy
- 11 ☐ Meals on Wheels
- 12 ☐ Medications
- 13 ☐ Occupational therapy
- 14 ☐ Pastoral care
- 15 ☐ Personal care
- 16 ☐ Physical therapy
- 17 ☐ Physician services
- 18 ☐ Psychological services
- 19 ☐ Referral services
- 20 ☐ Respiratory therapy
- 21 ☐ Respite care
- 22 ☐ Skilled nursing services
- 23 ☐ Social services
- 24 ☐ Speech therapy/Audiology
- 25 ☐ Spiritual care
- 26 ☐ Transportation
- 27 ☐ Vocational therapy
- 28 ☐ Volunteers
- 29 ☐ Other high tech care (e.g., enteral nutrition, renal dialysis)
- 30 ☐ Other services – Specify ☒

7a. Does this agency currently have any active patients?

- 01 ☐ Yes – GO to item 7b
- 02 ☐ No – THANK THE RESPONDENT, END THE INTERVIEW, AND MARK CODE 11 IN SECTION C ON THE COVER PAGE.

b. What is the number of your current active patients?

Number of patients

99999 ☐ Don't know

8. What is the number of home health care, home care, and hospice care patients currently being served by this agency?

Number of home health care patients

99999 ☐ Don't know

Number of home care patients

99999 ☐ Don't know

Number of hospice care patients

99999 ☐ Don't know

Section E – QUESTIONS ABOUT THE AGENCY – Continued**READ**

To complete this survey, I will need a list of all current home health, home care, and hospice patients, and a list of all home health, home care, and hospice discharges for the month of (Insert discharge sample month and year).

From these lists, I will draw a sample of up to 6 current patients and up to 6 discharges.

9a. From whom shall I obtain the list of current patients?

Name

Title

I will need these patients' medical records and the cooperation of a staff member best acquainted with these patients in order to obtain the information on this questionnaire.

Hand the administrator a copy of the current patient questionnaire. Allow him/her to examine it briefly. Retrieve the questionnaire and continue reading.

I will not be contacting or interviewing the patients in any way. I will depend on your staff to consult the medical records.

01 ☐ Yes – GO to item 10a02 ☐ No – Determine which staff member would have this knowledge and enter the name and title below. ☒

Name

Title

b. Would (person named in item 9a) know which staff member I should interview for those patients selected for the sample?

10a. From whom shall I obtain the list of discharges?

☐ Same as 9a

Name

Title

I will need the help of a staff person familiar with the discharge records to aid me in completing the information requested in this questionnaire.

Hand the administrator a copy of the discharged patient questionnaire. Allow him/her to examine it briefly. Retrieve the questionnaire and continue reading.

01 ☐ Yes – GO to item 11 below02 ☐ No – Determine which staff member would have this knowledge and enter the name and title below. ☒

Name

Title

b. Would (person named in item 10a) know which staff member I should interview for those discharges that fall into the sample?

11. Thank you for your time. I will be checking with you before I leave to say good-bye.

At this time, could you introduce me to (Names of person(s) listed in items 9a, 9b, 10a, and 10b).

NOTES

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