



Electronic Medical Record Use by Office-Based Physicians: United States, 2005

by Catharine W. Burt, Ed.D.; Esther Hing, M.P.H.; and David Woodwell, B.A., Division of Health Care Statistics

The latest data from the National Ambulatory Medical Care Survey (NAMCS) indicate that one-quarter of office-based physicians report using fully or partially electronic medical record systems (EMR) in 2005, a 31% increase from the 18.2 percent reported in the 2001 survey (1). To better understand physicians' use of EMRs, the 2005 NAMCS included questions about EMR system features that health information technology experts consider to be the minimal requirements of a complete EMR, such as computerized orders for prescriptions, computerized orders for tests, reporting of test results, and physician notes. Based on these requirements, only one in ten of the physicians surveyed is considered to be using EMRs. This report presents estimates of EMR use by physician, practice, and location characteristics of office-based physicians.

Methods

NAMCS is an annual probability survey of nonfederal, office-based physicians providing direct patient care who practice in the 50 states or the District of Columbia, excluding radiologists, anesthesiologists, and pathologists. The survey is conducted by CDC's National Center for Health Statistics. A sample of 3,000 office-based physicians who report that they are in direct patient care was taken from the masterfiles of the American Medical Association and the American Osteopathic Association. The sample design includes 112 geographic primary sampling units (PSUs). Within those PSUs, physicians are stratified by specialty, and a sample of physicians was selected. Physicians are randomly assigned to 1 of 52 reporting weeks throughout the year. Of the 3,000 sample physicians, 1,936 responded that they were eligible to participate in the survey. Eligible physicians must see patients in an office setting. In 2005, responses were obtained from 1,281 eligible sample physicians who saw patients during their sample week and those who did not for an unweighted response rate of 66.2 percent (67.4 percent - weighted). For more information about NAMCS see the [Ambulatory Health Care Data website](#).


During the face-to-face induction interview for NAMCS, sample physicians were asked to respond to questions about the scope and size of their office-based practice, including whether or not they used full or partial (part paper, part electronic) EMRs. If they responded "yes" to either full or partial electronic records, they were then asked seven additional questions about the features of their EMR system. Estimates of EMR use were calculated in two ways: physicians were considered to use EMR if they reported "yes" to the general question on EMR use, or if they gave a "yes" response to all four features deemed minimally necessary for a complete EMR system. The four features required of an EMR system are: computerized orders for prescriptions, computerized orders for tests, test results, and physician notes (2).





Data on general use of EMRs were missing for less than 5 percent of physicians; for this analysis, cases missing data were considered as not having EMRs. Assuming missing cases were randomly distributed, this approach may under estimate the incidence of EMR adoption.

To address that NAMCS is based on a multi-stage sample of physicians, compound sampling weights were applied to make sure national estimates of EMR use and corresponding estimates of sampling error that were also presented take into account the complex sample design (3). Statements of differences in estimates are based on statistical tests (e.g., chi-square tests of independence, students-t, or weighted linear regression) with significance at the 0.05 level. Additional information about the county in which each physician's practice was located was obtained from the Area Resource File (ARF) (4).

Results

- In 2005, approximately 23.9 percent of physicians (95% confidence interval: 21.1-27.0) reported using full (11.2 percent) or partial (12.7 percent) EMRs in their office-based practice. This represents a 32% increase since 2001 (Figure 1). EMR

use did not vary by physician age, gender, or specialty type ([Table 1](#)  [\[PDF - 25 KB\]](#)).

- EMR use was related to several practice characteristics including number of physicians in the practice, scope of services as measured by single- or multi-specialty practices, ownership, number of managed care contracts, and percentage of practice revenue from Medicaid ([Table 1](#)  [\[PDF - 25 KB\]](#)). However, the only linear relation observed was for practice size ([Figure 2](#)).
- Physicians in the Midwest (26.9 percent) and West (33.4 percent) were more likely to use EMRs than were those in the Northeast (14.4 percent) ([Table 2](#)  [\[PDF - 25 KB\]](#)). Physicians in metropolitan statistical areas (24.8 percent) were more likely to use EMRs than were those in non-metropolitan statistical areas (16.9 percent).
- A practice's EMR use was not related to county characteristics such as the percentage of the county that is non-Hispanic white, or per capita income for the county in which the practice is located.
- The last column in [Tables 1 and 2](#)  [\[PDF - 25 KB\]](#) presents the percentage of physicians who had all four of the specific features deemed minimally necessary for a complete EMR system. Only 9.3 percent of physicians (95% CI: 7.4-11.7) reported having all four of those features in their EMR system. The relationships observed between this measure of EMR use and practice, physician, and county characteristics were the same as those found for full or partial use of EMRs.
- [Tables 3](#)  [\[PDF - 25 KB\]](#) presents responses to the seven items concerning the specific features of the EMR system used by the physician. Percentages are provided for all physicians reporting any use of EMRs, as well as physicians reporting that their medical record system is fully or partially electronic. Although 21.4 percent of physicians have electronic patient demographics, only 5.4 percent report having electronic public health reporting capabilities. Those claiming to have a fully-electronic system were more likely to report having computerized orders for both prescriptions and tests, electronic nurses' notes, clinical reminders, and public health reporting compared with those claiming to have partially-electronic systems ($p < .05$).

Comment

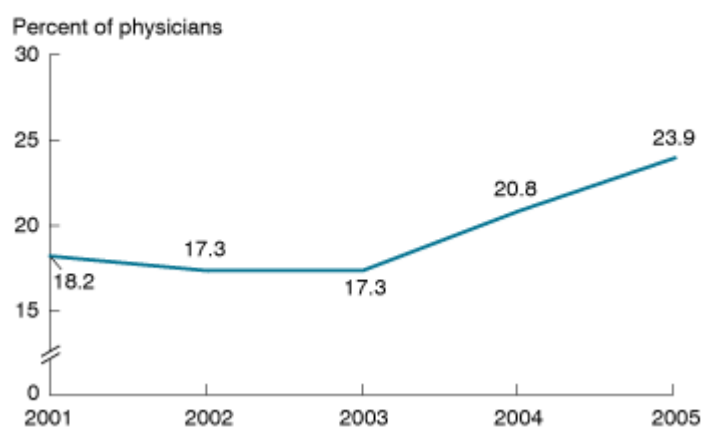
Although these estimates show that progress has been made toward the goal of universal electronic health records, there is still a long way to go. Solo practitioners are the least likely to use EMRs, whether measured generally or for an EMR system with four specific features. Although solo practitioners make up about one-third of physicians, they comprise about two-thirds of medical practices (5). Additionally, the features of EMRs vary widely; clinical reminders and public health reporting lag behind the other features of systems in current use.

References

1. Cherry DK, Burt CW, Woodwell, DA. National Ambulatory Medical Care Survey: 2001 summary. Advance data from vital and health statistics; no 337. Hyattsville, Maryland: National Center for Health Statistics. 2003.
2. The HIT Adoption Initiative: Expert Consensus panel meeting. held on April 5, 2006, in Washington DC at the George Washington University Hospital. Deliverable from contract HHSP23320045013XI (Measuring the adoption of electronic health records) funded by the Office of the National Coordinator, Department of Health and Human Services.
3. Research Triangle Institute (2004). SUDAAN User's Manual, Release 9.0. Research Triangle Park, NC: Research Triangle Institute.
4. HRSA. User Documentation for the Area Resource File (ARF): February 2005 release. Health Services and Resources Administration.
5. The number of group practices (three physicians or more) is estimated as 34,490 based on data from the Medical Group Management Association. Adding the number of solo and partner practices, as measured from the NAMCS, adds another 111,410 solo and 18,361 partner practices for a total of 164,261 office-based practices. Therefore, solo physicians account for 67.8 percent of all practices (111,410 divided by 164,261). Estimates of group practices are from: Gans D, Kralewski J, Hammons T, Dowd B. Medical groups' adoption of electronic health records and information systems. *Health Aff* 24(5):1323-33. 2005.

Figures

Figure 1. Percentage of office-based physicians who report using electronic medical records: United States, 2001–05



NOTES: Trend is significant ($p < .05$). Includes nonfederal, office-based physicians who see patients in an office setting. Excludes radiologists, anesthesiologists, and pathologists.
SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2001–05

Figure 2. Percentage of physicians using electronic medical records and using electronic medical record system by practice size: United States, 2005

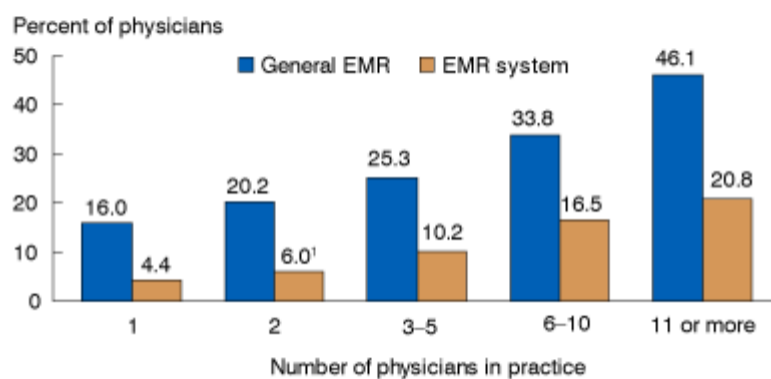


Figure does not meet standard of reliability or precision.
NOTES: Both trends are significant ($p < .05$). EMR is electronic medical record. General EMR is positive response to single question on full or partial EMR use. EMR system is a positive response to four minimal features: computerized orders for prescriptions, computerized orders for tests, test results, and physician notes. Includes nonfederal, office-based physicians who see patients in an office setting. Excludes radiologists, anesthesiologists, and pathologists.
SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2005.

Page last reviewed: November 6, 2015