

# Use and Characteristics of Electronic Health Record Systems Among Office-based Physician Practices: United States, 2001–2012

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## Key findings

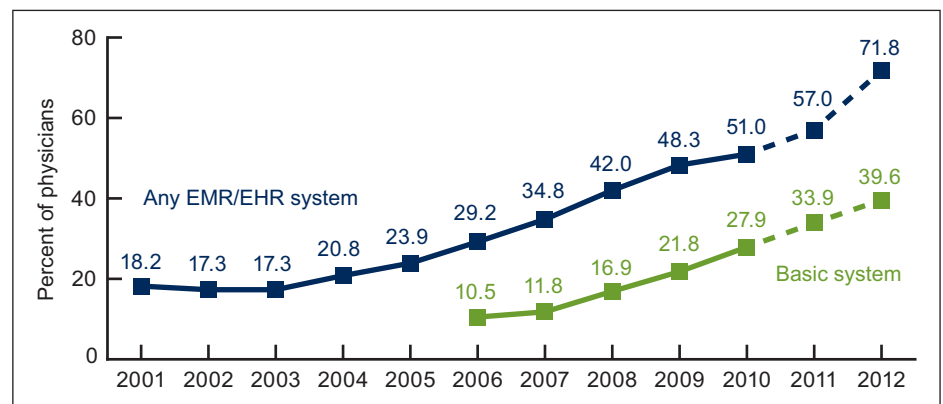
- In 2012, 72% of office-based physicians used electronic medical record or electronic health record (EMR/EHR) systems, up from 48% in 2009. EMR/EHR use ranged from 54% in New Jersey to 89% in Massachusetts.
- About 40% of office-based physicians reported having a system that met the criteria for a basic system, up from 22% in 2009. The percentage of physicians with these systems ranged from 22% in the District of Columbia to 71% in Wisconsin.
- In 2012, 66% of office-based physicians reported that they planned to apply, or already had applied, for “meaningful use” incentives.
- In 2012, 27% of office-based physicians who planned to apply or already had applied for meaningful use incentives had computerized systems with capabilities to support 13 of the Stage 1 Core Set objectives for meaningful use.

The 2009 Health Information Technology for Economic and Clinical Health Act, also known as the HITECH Act, authorized incentive payments through the Medicare and Medicaid programs to increase physician adoption of electronic health record (EHR) systems (1,2). To receive an EHR incentive payment, physicians must show that they are “meaningfully using” certified EHRs by meeting certain objectives (3,4). This report describes trends in adoption of electronic medical record or electronic health record (EMR/EHR) systems from 2001 to 2012, as well as physicians’ intent to participate in the EHR Incentive Programs and their readiness to meet 13 of the Stage 1 Core Set objectives for “meaningful use” in 2012, the second year of the incentive programs. Data are reported from the 2012 mail survey of physicians in the National Ambulatory Medical Care Survey (NAMCS) and earlier years of NAMCS.

*Keywords: health information technology • National Ambulatory Medical Care Survey*

## Adoption of EMR/EHR systems by office-based physicians has increased.

Figure 1. Percentage of office-based physicians with EMR/EHR systems: United States, 2001–2010 and preliminary 2011–2012



NOTES: EMR/EHR is electronic medical record/electronic health record. “Any EMR/EHR system” is a medical or health record system that is all or partially electronic (excluding systems solely for billing). Data for 2001–2007 are from in-person National Ambulatory Medical Care Survey (NAMCS) interviews. Data for 2008–2010 are from combined files (in-person NAMCS and mail survey). Data for 2011–2012 are preliminary estimates (dashed lines) based on the mail survey only. Estimates of basic systems prior to 2006 could not be computed because some items were not collected in the survey. Data include nonfederal office-based physicians and exclude radiologists, anesthesiologists, and pathologists. SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2001–2012.



- EMR/EHR system use among office-based physicians increased from 18% in 2001 to 72% in the preliminary 2012 estimates, a 26% increase over the 2011 estimate (57%) (Figure 1).
- About 40% of physicians reported having a system that met the criteria for a basic system, a 17% increase over the 2011 estimate (34%).

**Adoption of EMR/EHR systems by office-based physicians varied by state.**

- In 2012, the percentage of physicians using any EMR/EHR system varied by state, ranging from 54% in New Jersey to 89% in Massachusetts (Table 1).

Table 1. Percentage of office-based physicians using any EMR/EHR system and percentage of physicians with basic systems, by state: United States, preliminary 2012

State	Any system	Basic system	State	Any system	Basic system
Percent			Percent		
United States	71.8	39.6	Missouri	75.8	48.8
Alabama	66.4	35.2	Montana	65.8	36.2
Alaska	72.7	36.1	Nebraska	71.4	33.0
Arizona	†82.4	47.8	Nevada	74.5	33.8
Arkansas	69.9	46.1	New Hampshire	74.9	44.9
California	80.3	36.8	New Jersey	§53.8	§26.9
Colorado	72.8	39.6	New Mexico	71.5	42.8
Connecticut	§56.5	§26.9	New York	71.7	43.5
Delaware	†83.2	53.2	North Carolina	†80.7	48.3
District of Columbia	65.8	§22.4	North Dakota	†87.0	†63.2
Florida	66.1	41.7	Ohio	69.1	34.3
Georgia	74.1	§28.3	Oklahoma	67.8	40.3
Hawaii	†86.3	36.6	Oregon	76.7	38.4
Idaho	72.8	41.6	Pennsylvania	71.0	35.1
Illinois	§54.1	36.1	Rhode Island	71.2	37.1
Indiana	74.0	39.3	South Carolina	65.5	29.7
Iowa	†85.0	†54.9	South Dakota	†84.9	†53.2
Kansas	74.8	36.6	Tennessee	70.9	40.7
Kentucky	64.9	§27.2	Texas	66.8	33.3
Louisiana	§58.3	§25.0	Utah	†83.8	†60.8
Maine	70.1	37.8	Vermont	77.4	36.1
Maryland	66.5	§27.4	Virginia	68.9	30.2
Massachusetts	†89.2	†61.8	Washington	78.3	48.7
Michigan	66.6	37.5	West Virginia	70.3	39.1
Minnesota	†85.1	†66.7	Wisconsin	†82.9	†70.6
Mississippi	64.1	32.5	Wyoming	70.0	33.5

† Significantly higher than national average ( $p < 0.05$ ).

§ Significantly lower than national average ( $p < 0.05$ ).

NOTES: EMR/EHR is electronic medical record/electronic health record. Data for states include the District of Columbia.

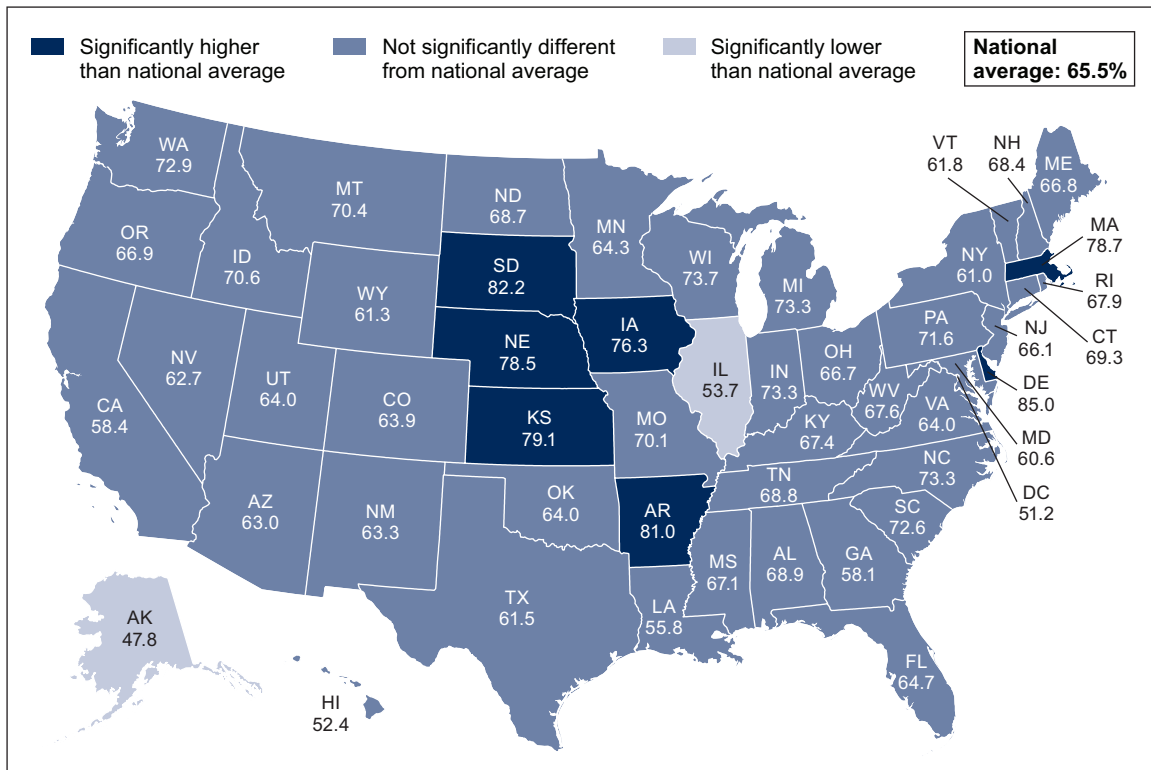
SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2012.

- Compared with the national average (72%), the percentage of physicians using any EMR/EHR system was lower in 4 states (Connecticut, Illinois, Louisiana, and New Jersey) and higher in 11 states (Arizona, Delaware, Hawaii, Iowa, Massachusetts, Minnesota, North Carolina, North Dakota, South Dakota, Utah, and Wisconsin).
- The percentage of physicians who had systems meeting the criteria for a basic system, by state and the District of Columbia, ranged from 22% in the District of Columbia to 71% in Wisconsin.
- The percentage of physicians who had systems meeting the criteria for a basic system was lower in the District of Columbia and six states (Connecticut, Georgia, Kentucky, Louisiana, Maryland, and New Jersey) and higher in seven states (Iowa, Massachusetts, Minnesota, North Dakota, South Dakota, Utah, and Wisconsin) compared with the national average (40%).

**About two-thirds of physicians intended to participate in the Medicare or Medicaid EHR Incentive Programs as of 2012.**

- In 2012, 66% of physicians intended to participate [i.e., already applied (41%) or intended to apply (25%)] in the Medicare or Medicaid incentive program (Figure 2).

Figure 2. Percentage of office-based physicians intending to participate in meaningful use incentive programs, by state: United States, preliminary 2012



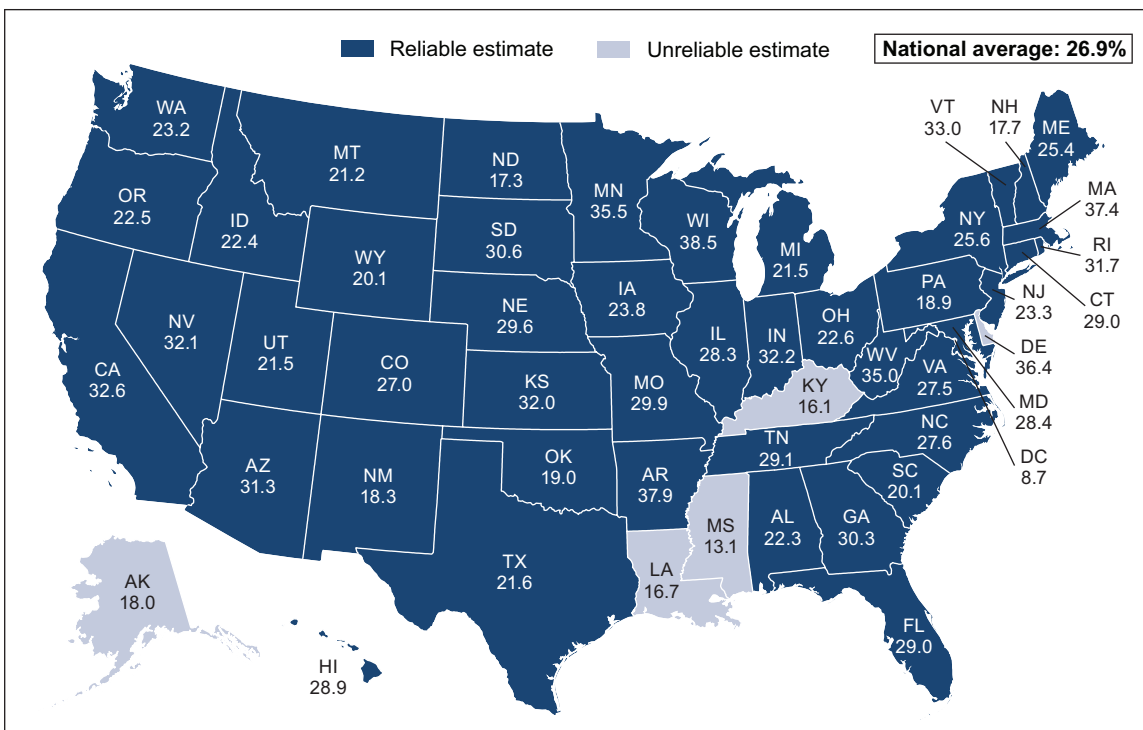
NOTES: Intent to participate in meaningful use incentive program was obtained from responses to the question, "Medicare and Medicaid offer incentives to practices that demonstrate 'meaningful use of health IT.' At this practice, are there plans to apply for these incentive payments?" Intent to participate includes "already applied" (40.5%) and "intend to apply" (25.0%). In 2012, 22.4% of physicians were uncertain about participating and 12.1% did not plan to participate. Estimates exclude missing data on the question.  
 SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2012.

- Intent to participate in the incentive programs ranged from 48% in Alaska to 85% in Delaware.
- The percentage of physicians intending to participate in the incentive programs was lower than the national average (66%) in two states (Alaska and Illinois) and higher in seven states (Arkansas, Delaware, Iowa, Kansas, Massachusetts, Nebraska, and South Dakota).
- The proportion of physicians intending to participate rose from 52% in 2011 (5) to 66% in 2012.

**In 2012, about one-quarter of physicians intending to participate in the EHR Incentive Programs had computerized systems with capabilities to support 13 of the Stage 1 Core Set objectives for meaningful use.**

- Among physicians intending to participate in the EHR Incentive Programs, 27% had computerized systems capable of supporting 13 Stage 1 Core Set objectives (Figure 3, Table 2).
- The percentage of physicians intending to participate in the EHR Incentive Programs who had computerized systems able to support 13 of the Stage 1 core objectives for meaningful use varied by state—from 17% in North Dakota to 39% in Wisconsin. Five states (Alaska, Delaware, Kentucky, Louisiana, and Mississippi) and the District of Columbia were excluded due to unreliable estimates. Although percentages varied by state, no state was statistically different from the national average.

Figure 3. Percentage of physicians intending to participate in Medicare and Medicaid EHR Incentive Programs who had EHRs capable of supporting 13 Stage 1 Core Set objectives, by state: United States, preliminary 2012



NOTES: EHR is electronic health record. See Table 2 for Stage 1 Core Set meaningful use objectives and corresponding survey item.  
SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2012.

Table 2. Meaningful use Core Set objectives and corresponding NAMCS survey items

2011–2012 Meaningful use Core Set objective	Corresponding 2012 NAMCS survey items on computerized functions
Computerized provider order entry for medications	Prescription order entry
Drug-drug and drug-allergy interaction checks	Drug interaction or contraindication warnings
Generate and transmit permissible prescriptions electronically	Sending prescription orders electronically to the pharmacy
Record patient demographics	Patient history and demographic information
Maintain up-to-date problem list of current and active diagnoses	Patient problem list
Maintain active medication list	Clinical notes include a list of patient's medications and allergies
Maintain active medication allergy list	(Combined in preceding item)
Vital signs	Recording and charting vital signs
Smoking status	Recording patient smoking status
Implement one clinical decision support rule and ability to track compliance with rule	Reminders for guideline-based interventions or screening tests AND warnings of drug interactions or contraindications provided
Calculate and transmit Centers for Medicare & Medicaid Services (CMS) quality measure	Reporting clinical quality measures to federal or state agencies (such as CMS or Medicaid)
Electronic copy of health information	Providing patients with electronic copy of their health information
Clinical summaries	Providing patients with clinical summaries for each visit
Exchange key clinical information	...
Privacy/security	...

... Data not available.

NOTES: NAMCS is National Ambulatory Medical Care Survey. In August 2012, CMS announced a final rule to govern Stage 2 of the EHR Incentive Programs with updates to Stage 1 objectives (see reference 4). Because the changes to Stage 1 objectives are not effective until 2013 or 2014, the original Stage 1 objectives were used rather than the updated version to provide a snapshot of physicians' readiness to meet Stage 1 meaningful use measures as of 2012.

## Summary

EMR/EHR use among office-based physicians has increased from 2001 through 2012. In 2012, the NAMCS mail survey showed that about 72% of office-based physicians used any EMR/EHR system, a 26% increase from the 2011 estimate (57%). From 2011 to 2012, the percentage of physicians who reported having a system that met the criteria for a basic system increased from 34% to 40%.

Adoption of EMR/EHR systems varied greatly by state. In 2012, the percentage of physicians using any EMR/EHR system ranged from 54% in New Jersey to 89% in Massachusetts. The percentage of physicians having a system that met the criteria for a basic system had a wider range of adoption by state (from 22% in the District of Columbia to 71% in Wisconsin).

In 2012, 66% of physicians reported intending to participate (having already applied or intending to apply) in the Medicare or Medicaid EHR Incentive Programs. Intent to participate among physicians also varied by state. Compared with the national average, two states had a significantly lower percentage of physicians intending to participate, and seven states had a significantly higher percentage.

To qualify for Stage 1 meaningful use incentive payments as of 2012, eligible physicians must meet all 15 of the Stage 1 core objectives for meaningful use, and 5 of 10 Menu Set objectives,

using certified EHR systems (4). In this report, estimates of physicians' readiness to meet meaningful use measures were limited to data collected on the capabilities of EHRs to support 13 of the Stage 1 objectives. In the present study, among physicians who had already applied or intended to apply for incentives, 27% had EHR systems capable of supporting 13 of the Stage 1 core objectives for meaningful use, which is an overestimate of the percentage meeting the 2012 requirements. Some physicians with systems supporting the 13 core objectives examined in this report may not have a system that supports the remaining 2 objectives, as well as 5 of the 10 Menu Set objectives required for payment.

## Definitions

Physician office: A place where nonfederally employed physicians provide direct patient care in the 50 states and the District of Columbia; excludes radiologists, anesthesiologists, and pathologists.

Any EMR/EHR system: Obtained from "yes" responses to the question, "Does this practice use electronic medical records or electronic health records (not including billing records)?"

Basic EMR/EHR system: A system that has all of the following functionalities: patient history and demographics, patient problem lists, physician clinical notes, comprehensive list of patients' medications and allergies, computerized orders for prescriptions, and ability to view laboratory and imaging results electronically (6). Having a comprehensive list of patients' medications and allergies was asked as two separate questions in 2010 (one about medications and the other about allergies), but the questions were collapsed into one question in 2011 and 2012 (5).

Intent to apply for Medicare or Medicaid EHR Incentive Programs: Obtained from "yes, we already applied" and "yes, we intend to apply" responses to the question, "Medicare and Medicaid offer incentives to practices that demonstrate 'meaningful use of health IT.' At this practice, are there plans to apply for these incentive payments?"

Demonstrating meaningful use: The Medicare and Medicaid EHR Incentive Programs provide incentive payments to physicians as they demonstrate meaningful use of certified EHR technology. The Centers for Medicare & Medicaid Services has established the objectives for meaningful use in three stages that physicians must meet in order to receive an incentive payment. In 2011 and 2012, physicians could receive incentive payments if they demonstrated 15 of the Stage 1 core objectives for meaningful use, and 5 of 10 Menu Set objectives, using certified EHR systems. Physicians demonstrate meaningful use objectives through associated measures or by attesting to an objective (1). For example, physicians with computerized provider order entry (CPOE) demonstrate the CPOE objective for medication orders with a measure indicating that at least 30% of their patients had one or more medications ordered through CPOE (1). On the other hand, physicians who have drug-drug and drug-allergy interaction checks meet this objective by attesting that the functionality was enabled (1). The full list of Stage 1 objectives and measures is published (1,2).

The 2012 estimate of physicians' readiness to meet Stage 1 objectives is not comparable with previously reported estimates (5,7) because more information on Stage 1 core functionalities was collected in 2012 (13 of 15) than in 2011 (10 of 15) or 2010 (8 of 15). Table 2 presents Stage 1 meaningful use Core Set objectives and corresponding 2012 NAMCS survey items on EHR system functions.

## Data source and methods

NAMCS, conducted by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS), is an annual, nationally representative survey of office-based physicians that collects information on the adoption and use of EMR/EHR systems. The target universe of NAMCS physicians comprises those classified as providing direct patient care in office-based practices, including additional clinicians in community health centers. Radiologists, anesthesiologists, and pathologists are excluded.

Since 2008, a supplemental mail survey on EMR/EHR systems has been conducted in addition to the core NAMCS, which is an in-person survey. In 2008 and 2009, samples of physicians in the core, in-person NAMCS and the supplemental mail survey, stratified by specialty, were chosen from selected geographic areas. Starting in 2010, the mail survey sample size was increased fivefold to allow for state-level estimates. Survey questions added in 2010 and continued in 2012 ask a physician's intent to apply for meaningful use incentive payments. In 2012, the survey also included more detailed questions on health information exchange.

The 2012 estimates are from the NAMCS mail surveys with a sample of 10,302 physicians. Nonrespondents to the mail survey received follow-up telephone calls. The 2012 mail survey was conducted from February through mid-July 2012. The unweighted response rates of the 2012 mail surveys were 67% (65% weighted). A copy of the 2012 survey is available from the NCHS website at [http://www.cdc.gov/nchs/ahcd/ahcd\\_survey\\_instruments.htm#namcs](http://www.cdc.gov/nchs/ahcd/ahcd_survey_instruments.htm#namcs).

Physicians' updated practice location information was used to generate state-level estimates. Estimates of intent to apply for incentives exclude about 1.6% of cases with missing information. Estimates of physician readiness to meet Stage 1 objectives were obtained by calculating EHRs that had all of the following features: recording patient demographic information, current problems, vital signs, smoking status, medications, and patient allergies; having computerized provider order entry for medications; sending prescriptions electronically to the pharmacy; providing drug-drug and drug-allergy alerts; having at least one clinical decision support rule implemented; reporting clinical quality measures to federal or state agencies; and providing patients with an electronic copy of their health information and with clinical summaries for each visit.

Statements of differences in estimates are based on statistical tests with significance at the  $p < 0.05$  level. Terms relating to differences, such as "increased" or "decreased," indicate that the differences are statistically significant. A lack of comment regarding the difference does not mean that the difference was tested and found to be not significant.

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