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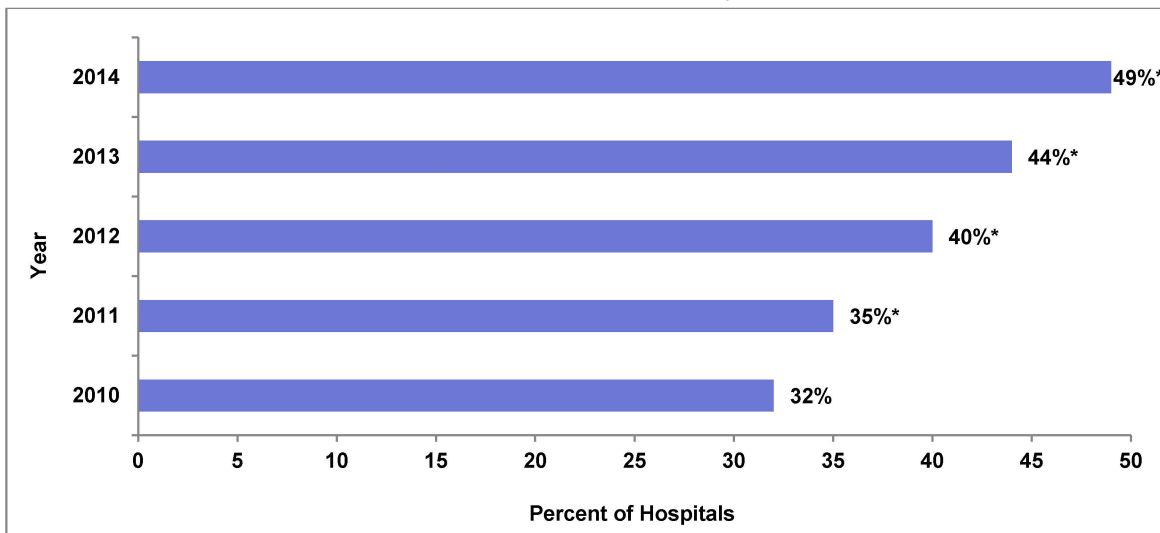
## State and National Trends of Two-Factor Authentication for Non-Federal Acute Care Hospitals

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As electronic health information becomes more widely available, proper security measures must be implemented to ensure the information is only accessible to those with the rights to access it. The Health Insurance Portability and Accountability Act (HIPAA) requires covered entities to verify that a person seeking access to electronic protected health information (ePHI) has authorization (1). Two-factor authentication can satisfy this HIPAA requirement. Two-factor authentication is technology that requires users to provide at least one additional form of identification beyond user name and password to gain electronic access to ePHI. Examples include requiring users to answer security questions or enter a randomly generated number sent to their personal mobile device. This brief will report, for the first time, national and state trends in two-factor authentication capability among non-federal acute care hospitals in the United States from 2010 to 2014.

### Half of hospitals have the capability for two-factor authentication.

Figure 1: Percent of non-Federal acute care hospitals with the capability for two-factor authentication: 2010-2014.



SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Supplement; 2010-2014

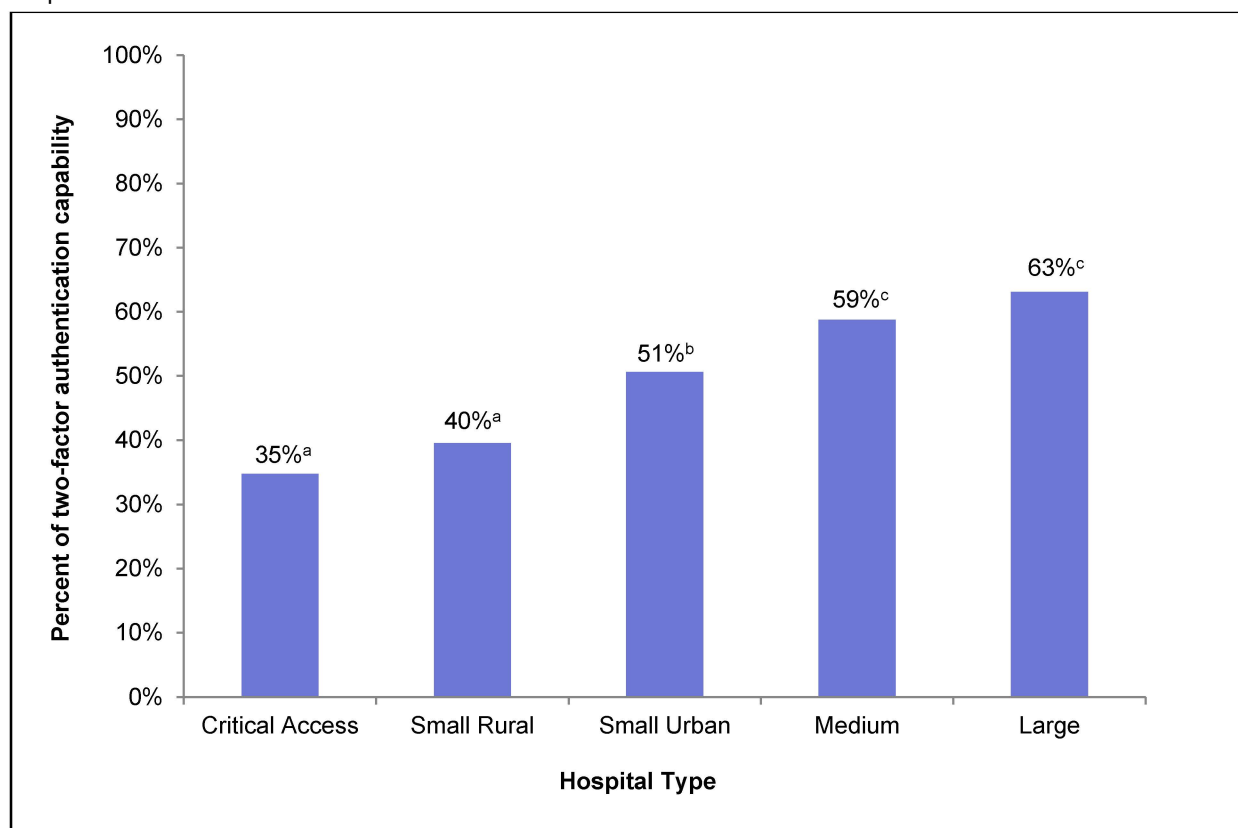
NOTES: \* Denotes significantly different from previous year.

- ★ As of 2014, half (49%) of hospitals reported their IT department supports an infrastructure for two-factor authentication, representing a 53% increase since 2010.
- ★ Since 2010, non-federal acute care hospitals increased their capability for two-factor authentication by an average rate of 11% every year.



## Two-factor authentication varies significantly by hospital type.

Figure 2: Percentage of reported two-factor authentication capability among types of non-Federal acute care hospitals: 2014.



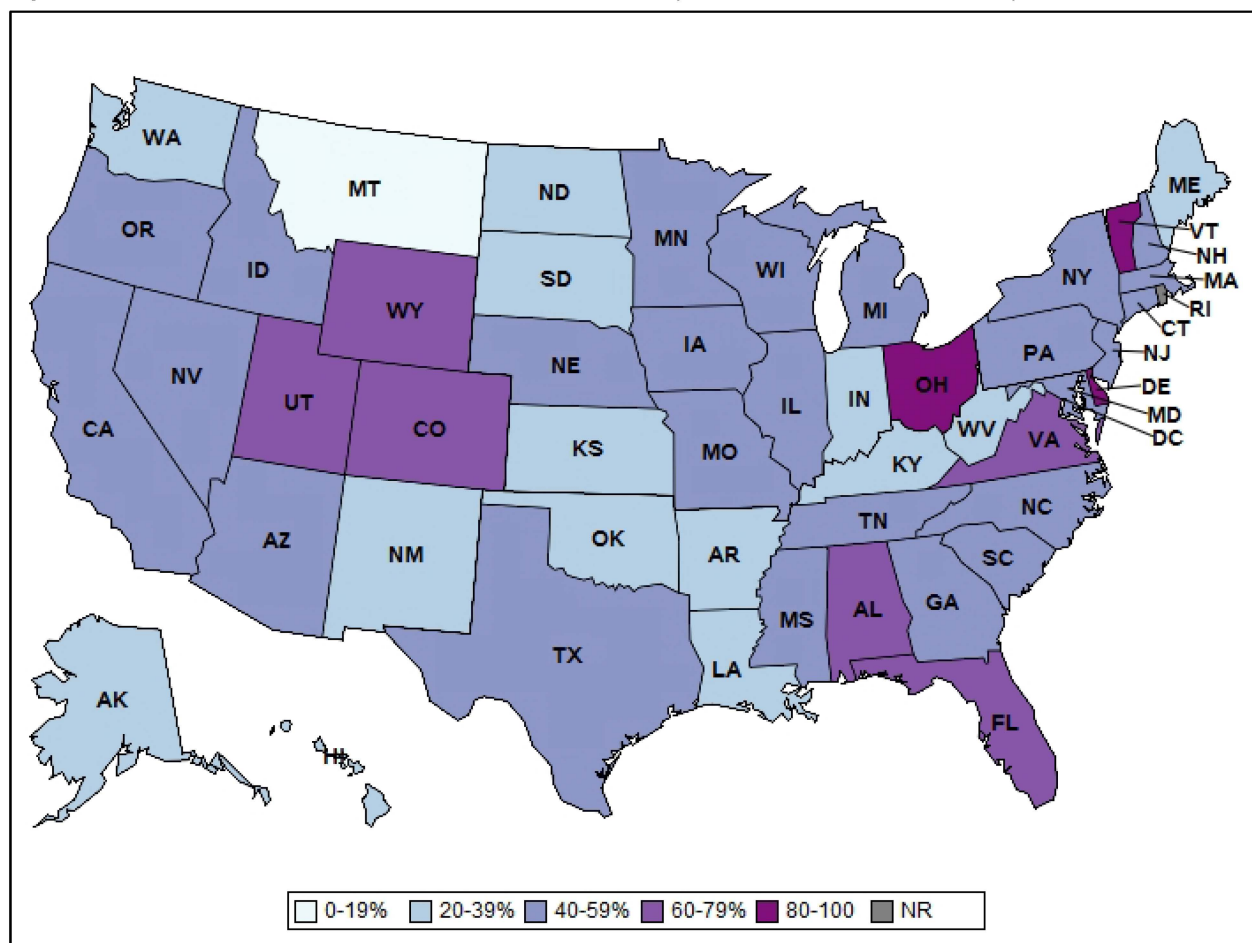
SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Survey, 2014

NOTES: Hospital types with different letters (a, b, or c) are significantly different from each other. Hospital size is based on the number of beds: large=400 or more; medium=between 399 and 100; and small=less than 100. Rural/urban status determined by U.S. Census Bureau. Type: urban=metropolitan or division; and rural=micropolitan or rural. Critical access hospital is a special designation by the Centers of Medicare & Medicaid Services.

- ★ Fewer critical access (35%) and small rural (40%) hospitals report having the two-factor authentication capability.
- ★ Half (51%) of small urban hospitals have the capability for two-factor authentication.
- ★ Six in ten medium (59%) and large (63%) hospitals have the capability for two-factor authentication.
- ★ Reporting of two-factor authentication is significantly higher in medium and large hospitals than other hospital types.

## The percent of hospitals with capability for two-factor authentication varied significantly by state.

Figure 3: Percent of non-Federal acute care hospitals' capability for two-factor authentication by state: 2014.



SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Survey, 2014

Notes: One state, Rhode Island did not meet the standards for reliability. Rhode Island is shaded gray because it did not meet the standards for reliability (NR = Not Reliable). See [Table A](#) for a complete list of hospital two-factor authentication capabilities by state.

- ★ In 2014, 20 states had over half of their hospitals with the capability for two-factor authentication.
- ★ States ranged from 19% to 93% of hospitals with the capability.
- ★ The states with the highest percentage of hospitals with the capability were Ohio (93%), Vermont (83%), and Delaware (81%).
- ★ The states with the lowest percentage of hospital with the capability were Montana (19%), North Dakota (23%), and Maine (26%).



## Summary

Adoption of two-factor authentication by non-federal acute care hospitals has steadily increased since 2010. In 2010, a third (32%) of hospitals had the capability. However, in 2014, nearly half (49%) had the support for two-factor authentication, representing a 53% increase since 2010.

Despite the growth in two-factor authentication, the percent of hospitals reporting this capability varies significantly by hospital type. Critical access (35%) and small rural (40%) hospitals have reported the lowest levels of capability for two-factor authentication. However, half (51%) of small urban hospitals have the capability for two-factor authentication. Reporting of two-factor authentication is significantly higher in medium (59%) and large (63%) hospitals than other hospitals types.

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HIPAA offers two-factor authentication as a possible method to provide security to ePHI. In addition, two-factor authentication is an essential capability for providers who e-prescribe controlled substances. In 2010, the Drug Enforcement Administration (DEA) added the requirement of two-factor authentication for electronic prescribing to the interim final rule, Electronic Prescription for Controlled Substances (2). This rule gives practitioners the option to electronically prescribe prescriptions with several options for obtaining authentication credential. Additionally, the increased use of two-factor authentication by practitioners may help support the Secretary's initiative to decrease opioid related deaths and morbidity (3).



## Definitions

Electronic health record: A collection of electronic health information that is capable of being shared across different health care settings. Electronic health records (EHRs) may include patient demographics, medical history, medications, allergies, immunization status, laboratory test results, radiology images, and vital signs.

Two-factor Authentication: Two-factor authentication provides identification of EHR users by means of the combination of two different components. These components may be something that the user knows, something that the user possesses, or something that is inseparable from the user. The use of two-factor authentication to prove one's identity is based on the premise that an unauthorized actor is unlikely to be able to supply both factors required for access. The authentication factors of a two-factor authentication scheme may include 1) a physical object in the possession of the user, such as a token or key; 2) a secret known to the user such as a password or PIN; 3) a biometric marker, such as a fingerprint or voice recognition (4).

Table: Survey question assessing hospitals' capability for two-factor authentication.

Does your IT Department currently support an infrastructure for two-factor authentication (e.g. tokens or biometrics)?	
Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
Do Not Know	<input type="checkbox"/>



## Data Source and Methods

Data are from the American Hospital Association (AHA) Information Technology (IT) Supplement to the AHA Annual Survey. Since 2008, ONC has partnered with the AHA to measure the adoption and use of health IT in U.S. hospitals.

The chief executive officer of each U.S. hospital was invited to participate in the survey regardless of AHA membership status. The person most knowledgeable about the hospital's health IT (typically the chief information officer) was requested to provide the information via a mail survey or secure online site. Non-respondents received follow-up mailings and phone calls to encourage response.

This analysis consisted of non-federal, acute care hospitals, including children's and cancer hospitals. Estimates considered unreliable had a relative standard error adjusted for finite populations greater than 0.49. Responses with missing values were assigned zero values. Significant differences were tested using  $p < 0.05$  as the threshold.

## References

1. HIPAA Security Rule, 45 CFR § 164 (2007).
2. Electronic Prescribing of Controlled Substances. Drug Enforcement Administration, Department of Justice, Office of Diversion Control website.  
[http://www.deadiversion.usdoj.gov/ecom/e\\_rx/](http://www.deadiversion.usdoj.gov/ecom/e_rx/).
3. Health and Human Services, Office of the Secretary. (2015). HHS takes strong steps to address opioid-drug related overdose, death and dependence [press release]. Retrieved from <http://www.hhs.gov/news/press/2015pres/03/20150326a.html>.
4. National Institute of Standards and Technology, Computer Security Division, Information Technology Laboratory. (2013). Electronic Authentication Guideline. Natl. Inst. Stand. Technol. Spec. Publ. 800-63-2.

## About the Authors

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## Appendix

Table A: Percent of non-federal acute care hospitals that report capability for two-factor authentication by state: 2014.

State	%	n(N)	State	%	N(N)
United States	60%	<b>2682 (4472)</b>	Missouri	49%	111 (90)
Alabama	37%	35 (19)	Montana	19%§	27 (54)
Alaska	55%	7 (90)	Nebraska	46%	48 (108)
Arizona	39%	31 (71)	Nevada	40%	13 (42)
Arkansas	55%†	35 (60)	New Hampshire	48%	17 (84)
California	68%†	170 (328)	New Jersey	48%	44 (26)
Colorado	41%	50 (71)	New Mexico	38%	18 (64)
Connecticut	81%†	22 (29)	New York	46%	110 (31)
Delaware	67%	5 (8)	North Carolina	48%	60 (29)
District of Columbia	69%†	6 (6)	North Dakota	23%§	14 (171)
Florida	54%	119 (184)	Ohio	93%†	100 (158)
Georgia	38%	66 (134)	Oklahoma	28%§	47 (107)
Hawaii	54%	12 (20)	Oregon	52%	36 (59)
Idaho	50%	19 (117)	Pennsylvania	51%	107 (154)
Illinois	36%§	126 (38)	Rhode Island	NR	6 (10)
Indiana	42%§	61 (38)	South Carolina	43%	26 (58)
Iowa	26%§	85 (107)	South Dakota	30%§	22 (50)
Kansas	36%§	92 (125)	Tennessee	54%	52 (115)
Kentucky	39%	60 (97)	Texas	48%	231 (343)
Louisiana	26%§	42 (100)	Utah	63%	21 (44)
Maine	42%	19 (62)	Vermont	83%†	5 (81)
Maryland	57%	33 (45)	Virginia	72%†	51 (14)
Massachusetts	42%§	36 (36)	Washington	30%§	32 (88)
Michigan	55%†	83 (128)	West Virginia	35%§	24 (125)
Minnesota	43%	124 (129)	Wisconsin	43%§	82 (49)
Mississippi	60%	25 (112)	Wyoming	61%	15 (24)

NOTES: n = survey respondents; (N) = hospitals surveyed. NR = estimate does not meet standards for reliability (not reliable). †Significantly higher than national average ( $p < 0.05$ )

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

SOURCE: ONC/American Hospital Association (AHA), AHA Annual Survey Information Technology Supplement, 2014