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State Focus on Healthcare–Associated Infection Prevention in Nursing Homes

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Abstract

Background—Despite increased focus on healthcare-associated infections (HAI), between 1.6 and 3.8 million HAI occur annually among the vulnerable population residing in U.S. nursing homes (NH). This study characterized state department of health (DOH) activities and policies intended to improve quality and reduce HAI in NH.

Methods—We created a 17-item standardized data collection tool informed by 20 state DOH websites, reviewed by experts in the field and piloted by two independent reviewers (Cohen's Kappa .45–.73). The tool and corresponding protocol were used to systematically evaluate state DOH websites and related links.

Results—Three categories of data were abstracted: 1) consumer-directed information intended to increase accountability of and competition between NH, including mandatory HAI reporting and NH inspection reports, 2) surveyor training for federally-mandated NH inspections and 3) guidance for NH providers to prevent HAI and monitor incidence. Only five states included HAI reporting in NH with differing HAI types and reporting requirements.

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Conclusions—State DOH information and activities focused on NH quality and reducing HAI was inconsistent. Systematically characterizing state DOH efforts to reduce HAI in NH is important to interpret the effects of these activities.

Introduction

Healthcare-associated infections (HAI) are a major public health issue. Due to the high cost of this largely preventable problem, there is much attention and investment in the reduction of HAI (1). Infections represent the leading cause of morbidity and mortality among the vulnerable elderly population residing in U.S. nursing homes (NH) (2). An estimated 1.6 to 3.8 million infections occur in U.S. NH each year, resulting in approximately 388,000 deaths (3) with estimated costs of \$38-\$137 million for antimicrobial therapy and \$637 million-\$2 billion for hospitalizations (4). Morbidity, mortality and the financial burden associated with HAI in NH is likely to increase as the population of residents is expected to grow from the current 1.7 million (2) to approximately 5.3 million in 2030 (5). Given that Umscheid, et. al. (2011) found that approximately 55–70% of HAI are avoidable in other settings, effective infection control and prevention resources as well as public policies aimed at NH, are likely critical in reducing infections in NH (6).

In 2009, the U.S. Department of Health and Human Services (HHS) published its first National Action Plan to Prevent Health Care-Associated Infections, which identified preventing HAI in hospitals as the phase I priority; fortunately, some HAI rates have improved (7). These improvements are likely a result of a myriad of interventions at the federal, state and institutional level. For example, many states have mandated public reporting of some types of HAI (8). In order to receive preventive health services block funds from the Centers for Disease Control and Prevention (CDC), states were required to submit HAI prevention plans to the HHS in 2010. As a result, each state now has an HAI coordinator who oversees implementation of HAI reduction infrastructure and associated activities as well as raises awareness of HAI in the state (9). The 2013 updated HHS plan identifies long-term care as the next priority setting in which to reduce HAI (7).

There are a number of ways in which a state department of health (DOH) may attempt to improve the quality of care in NH and focus efforts aimed at decreasing HAI. These efforts may be broadly characterized as actions and information targeted at consumers, providers, and surveyors, which may or may not be formally articulated in the state HAI prevention plan.

Consumer-directed information regarding NH quality may allow potential residents and their families to ensure that they select a high quality facility that meets and continues to meet the potential residents' needs (10, 11). In this way, information regarding NH quality, including infection rates, can foster competition and accountability among NH. Theoretically, NH may wish to attract clients through appealing public quality measures, such as lowering rates of urinary tract infections in particular and adapting clinical practice to achieve better quality measures in general (12). Information that may be useful to inform consumer decisions includes: 1) a checklist and/or guidance materials developed for consumers when choosing a NH, 2) a venue to file complaints (i.e., ombudsman) and 3)

inspection report data, which may be compiled in a facility report card. Given the theoretical link between quality indicator availability and state DOH focus on NH, it is plausible that consumer information may indicate a focus by state DOH on infection reduction as a component of overall NH quality.

Providers, which include NH clinicians, infection preventionists and administrators, may benefit from state-provided trainings, guidelines and collaboratives that directly address techniques to monitor and reduce HAI in NH. For example, Maryland's Department of Health and Mental Hygiene offered a 3-day basic training course regarding infection control in non-hospital settings (13). Although infection preventionists may also seek information from other websites that specialize in infection control and prevention, such as the CDC's website, the information shown on a state DOH website may be beneficial to raise awareness of resource availability.

State DOH may offer training and other resources to NH surveyors beyond that provided by Centers for Medicare and Medicaid (CMS). Given that these surveyors perform onsite inspections of NH in accordance with CMS regulations, additional training or materials may increase the efficiency and consistency of the annual inspection process, which includes evaluation of infection control and prevention policies and practices (14).

Considering the current high levels of HAI rates in NH settings, it is likely that activities, information and public policies regarding infection control and prevention in NHs can be improved (15). Therefore, the aim of this study was to survey state DOH websites with regard to information, resources and quality indicators regarding HAI prevention in NH. Previous researchers have evaluated whether availability of Medicare's Nursing Home Compare website is associated with infection rates (16, 17). However, our study includes a much broader array of quality indicators, directed at different audiences. Furthermore, although previous researchers have reviewed internet-based NH quality indicators (10, 18) and infection control and prevention resources that may affect clinical practices in NHs (19), to our knowledge, no investigator has described the diversity of state DOH activities and information focused on reducing HAI in NH across states (10, 18, 19). Such information could be useful to infection preventionists, especially those working as infection prevention coordinators in NH, to effectively use these resources. Furthermore, this information may be useful to state DOH HAI advisory board members and DOH staff in state HAI programs, both of which include infection preventionists.

Methods

This original investigation was conducted as part of Prevention of Nosocomial Infections and Cost Effectiveness in Nursing Homes (PNICE-NH) study (National Institutes of Nursing Research, NINR, R01NR013687), which was previously approved by The Institutional Review Board of Columbia University Medical Center.

Tool Development

We created a standardized data collection tool, which was informed by review of 20 state DOH websites, to determine the types and breadth of infection control and prevention

activities directed at NH. To assure content validity, the tool was reviewed by experts in the field, each with extensive publications regarding geriatric care and/or infection control. The initial tool was refined through an iterative piloting process by two independent raters. Pilot testing was conducted with 5 state DOH websites. The final 17-item tool had fair to excellent reliability (Cohen's Kappa coefficients of 0.45–0.73).

A data collection protocol was created to ensure consistent abstraction of data from state DOH websites and interpretation of the tool items by data abstractors. The protocol contained operational definitions of state activities, information and policies related to HAI focus. The protocol also provided an outline for navigating state DOH websites and documenting abstracted information.

Tool Items

Items were organized by target audience of activities that focus on NH quality: consumers, providers, and surveyors. The tool also included a section regarding state policies specific to HAI in NH. Consumer information included checklists and guidance materials used to choose a NH, a venue for complaints against facilities (ombudsman), and inspection data, i.e., inspection reports, report cards and links to Medicare's Nursing Home Compare. We noted the format in which NH quality indicators were presented, i.e., on a report card or in another format.

Provider-directed information included data or descriptions of collaboratives or advisory boards focused on HAI reduction in NH and training or guidance materials for appropriate infection control and prevention practices in this setting. Surveyor-focused information contained training materials to complete NH inspections. Public policy items identified HAI reporting laws in NH and determined whether the state HAI prevention plan addressed long-term care.

Data Collection

Data were systematically abstracted from 50 state and District of Columbia DOH websites. If a first reviewer found it difficult to identify activities and information related to state DOH focus on NH, for example, when links of interest had low visibility within the DOH website, when these links were organized with unrelated information or finding them required multiple keyword searches within the website, a second reviewer also independently abstracted data from the website ($n = 11$). In cases of disagreement, website content was reviewed and discussed to reach consensus. Establishing whether states required HAI reporting in NH and distinguishing between state mandatory reporting and notifiable conditions was particularly difficult. For example, state HAI reporting forms for providers available on the DOH website may list the conditions of interest and request case information without explicitly stating the type of reporting for which the form should be used. Hence, state HAI coordinators in 23 states were contacted by phone and email to provide clarification. All data were collected and compiled between November 2012 and January 2013.

Data Analysis

Descriptive statistics and Cohen's Kappa coefficients were computed using SAS 9.2 (20).

Results

Consumer-Directed Information

Table 1 provides an overview of the information on state DOH websites to help potential residents and their caregivers assess NH quality and choose a NH. For consumers choosing a NH, 74.5% of states provided at least one link to a NH checklist. Of the states with checklists, 39% had created them and 55.3% used the list provided by Medicare (<http://www.medicare.gov/Pubs/pdf/02174.pdf>, data not shown). Four other state DOH provided a checklist from either AARP (http://assets.aarp.org/www.aarp.org/_promotions/text/life/NursingHomeChecklist.pdf), or Aging Parents and Eldercare (http://www.aging-parents-and-elder-care.com/Pages/Checklists/Nursing_Home.html). The source of one NH checklist could not be determined. All states and the District of Columbia provided a link to an ombudsman and 84.3% provided guidance materials for choosing a NH.

With the exception of one state, all states provided at least one link to Medicare's Nursing Home Compare website (<http://www.medicare.gov/nursinghomecompare>). Most states also provided CMS inspection report data (70.6%). In some cases, websites included facility characteristics that indicated quality that were not captured through CMS inspections (31.4%), such as patient, family or employee satisfaction rates. Approximately one-third of the states compiled facility-level information in report cards.

Table 2 presents the types of quality indicators found in the report cards or in other formats. State DOH websites that did not offer report cards presented a variety of information indicating nursing home quality (n = 25). The most common type of information not in a report card format available among state DOH websites was deficiency citations identified during CMS inspections (96%). Complaints made against a facility were usually identified (84%) often in the context of whether they were substantiated through facility inspection. The majority of states also indicated whether citations required penalty enforcement due to their scope or severity, i.e., a violation (60.8%). However, few states offered information regarding indicators of excellent quality, as opposed to indicators of poor quality, such as best practice awards. While state DOH also offered quality indicators beyond citations, such as complaints, violations and follow-up reports on these items, it was generally more common to offer these data in report card formats.

Types of information provided on report cards also varied. The most common quality indicators appearing on report cards were citations/deficiencies (86.7%), violations (80%), and complaints (73.3%). Quality indicators only appearing on report cards included administration quality/satisfaction rating, resident satisfaction, and quality rating compared to other local NH.

Provider and Surveyor-Directed Information

Table 3 provides an overview of the information regarding infection control and prevention provided to NH providers and surveyors. Almost one-third ($n = 15$) of state DOH websites mentioned an advisory council, working group or collaborative that addressed HAI incidence in NH. The majority of states ($n = 44$, 86.3%) had infection control and prevention training or guidance for NH personnel, often through links to CDC materials for long-term care facilities or on the state DOH website directly. Roughly half of state DOH (52.9%) offered training or guidance materials for conducting NH inspections.

State HAI Prevention Plans

State HAI prevention plans included similar language adapted from a template, but plans varied as to whether NH were included in the outlined activities. State HAI prevention plans in 82.4% of states indicated the intention to establish a statewide advisory council to lead HAI rate reduction efforts in “long-term care facilities” or “nursing homes”. Only six states (11.8%) indicated the intention to establish standards and evaluate complaints regarding infection control and prevention practices in this setting through collaboration with professional licensing organizations (Indiana, Massachusetts, Michigan, New Mexico, Tennessee and Texas). The majority of state HAI plans (60.8%) indicated intention to establish infection prevention collaboratives in non-hospital settings, specifically NH, to reduce HAI. No updates to any of the state plans were apparent to reviewers since the initial January 1st, 2010 deadline when states were required to submit HAI prevention plans to HHS in order to receive preventive health services block grant funds from the CDC (9).

HAI Reporting

Five states had HAI reporting in NH; among those states, infections that were reported varied (Table 4). Only two states (Pennsylvania and Oregon) had mandatory HAI reporting laws applicable to NH. Pennsylvania was the first state to establish HAI reporting in NH, beginning in 2008, and appeared to have the most extensive requirements. Additionally, contacting state DOH representatives of HAI control and prevention programs revealed that three states (Georgia, Vermont and Iowa) had recently initiated voluntary reporting of HAIs in NH.

Discussion

This study demonstrates high variability in state activities and policies focused on NH and reducing HAI incidence in NH. The vast majority of states provided consumer-directed information for assessing NH quality intended to help consumers make informed decisions when considering residence in one of these facilities. Overall, Florida, Maryland, Massachusetts, Minnesota, Ohio, and Rhode Island provided the greatest number of consumer-directed activities and venues of information. These states also provided the most quality indicators of individual NH facilities, though the types of indicators were different between the states. Our findings are consistent with previous literature describing variation across states in the availability, content, data aggregation level and quality indicators provided on NH report cards (10). While many states provided some information concerning provider and surveyor activities and resources indicative of state focus on HAI, websites

from Delaware, Kentucky, North Carolina, Michigan, Oregon, West Virginia and Wisconsin included the largest amount of information or activities provided by state DOH in this category. Pennsylvania not only included NH in multiple aspects of the state HAI prevention plan, but also had extensive HAI mandatory reporting requirements for NH. Pennsylvania's public policy focus on HAI in NH was followed closely by Georgia, Indiana, Iowa, Massachusetts, Michigan, New Mexico, Oregon, Tennessee, and Texas. Because no states were clearly outpacing others along all indicators, our data may represent different approaches to HAI reduction in NH across states rather than absolute presence or absence of state focus on HAI in NHs.

Our findings that information and policies vary between states are not surprising considering that federal focus to reduce HAI, driven by the Department of Health and Human Services, has delegated planning and implementation to the state DOH. Although states hoping to receive CDC preventative services block grant funds had to devise their own HAI prevention plan, there was no direct funding provided for HAI prevention activities. States had to find and allocate their own resources to pursue the plan. The American Reinvestment and Recovery Act (ARRA) ultimately increased funding for, and oversight of, HAI reduction activities at the state level, but provided limited guidance towards achieving HAI reduction in NH (9). Therefore, it is not surprising that each state DOH devised divergent approaches to HAI prevention in NH as demonstrated in this work. Our data highlight the variation in state DOH activities, information and policies which should be considered in future work comparing HAI rates in NH across states.

Using websites to collect these data presented challenges relevant for future studies that might also use online data abstraction, especially regarding state DOH activities, information and public policy. As most state DOH websites were unexpectedly difficult to navigate and understand, it was often challenging to find and interpret NH HAI-related information. As noted in the Methods section, a second reviewer was needed to confirm the absence of specific data of interest and/or double-check data abstraction accuracy for approximately 10 states. Additionally, we communicated directly with state DOH HAI prevention program representatives from 23 states. This lack of clarity was reflected in the somewhat lower Kappa statistics for our data collection tool; even with highly skilled reviewers with advanced degrees in the health professions, agreement could not always be reached. It is likely that many consumers would also have difficulty navigating the websites.

Considering that most consumers need to choose a NH imminently (11), the current difficulty using many state DOH websites to access information about NH indicates a distinct need for improvement. Furthermore, the absence of information regarding state DOH activities does not mean it was not available. Although it is possible that relevant information on state DOH websites was missed by both data abstractors, information may be communicated through other means to the relevant stakeholders and was therefore not on the website. However, purposeful public availability of this information on the DOH website presumably indicates some defined focus on NH across the state.

A strength of this study is that methodology included contacting state HAI coordinators to abstract data regarding HAI mandatory reporting. We contacted 23 state HAI coordinators

where laws were unclear and/or HAI reporting was indistinguishable from notifiable conditions. Based on these responses, we determined that only 2 states had mandatory reporting and an additional 3 states had voluntary reporting. Using a review of public health laws, the Association for Professionals in Infection Control and Epidemiology, Inc. (APIC) found that reporting of HAI in NH is required by 4 states (21). States' enforcement of HAI-related policies may explain the difference between results of this study and of APIC's previous work. Given the timing and methodology of our study, we are confident that our data represent the most accurate information about current reporting of HAI in NH.

Of note, this research did not address lists of notifiable conditions in each state, only mandatory and voluntary HAI reporting laws. In completing the data collection tool, reviewers noted that these lists varied between states and included some HAI. Identifying HAI reporting through notifiable conditions lists is a valuable area for future research.

The data described here provide characterization of state focus on NH quality and HAI reduction, allowing for the comparison of health policy, information and activities between states. Understanding ways in which state DOH attempt to reduce HAI in NH can inform work of infection preventionists, as well as health policy researchers, geriatricians and other NH healthcare workers. Continuation of this work should include study of how the target audiences of state DOH information and activities (i.e., consumers, providers and surveyors) use them, if at all, to determine the impact of state DOH efforts to improve NH quality and reduce HAI in NH.

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Table 1

Consumer resources.

DOH Consumer Resource N = 51	n (%)	States
Checklist for choosing a NH	38 (74.5)	AK, AL, AR, AZ, CA, CO, CT, DC, DE, FL, GA, HI, ID, IL, IN, KS, LA, MA, MD, MI, MN, MO, MS, NE, NH, NV, NY, OR, PA, RI, SD, TX, UT, VA, VT, WI, WV, WY
Guidance material for choosing a NH	43 (84.3)	AK, AL, AR, AZ, CO, CT, DC, DE, FL, IA, ID, IL, IN, KS, KY, LA, MA, MD, MI, MN, MO, MS, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OR, PA, RI, SD, TX, UT, VA, VT, WA, WI, WV, WY
Link to ombudsman	51 (100.0)	All
Link to Medicare's NH compare	50 (98.0)	All except SD
Inspection report data	36 (70.6)	AL, AZ, CA, CO, DC, DE, FL, IA, ID, IL, IN, KS, KY, LA, MA, MD, MI, MN, MO, MS, NC, ND, NJ, NM, NV, NY, OH, OK, PA, RI, SD, TN, TX, VT, WI, WY
Non-CMS inspection report information	16 (31.4)	AZ, CA, CO, GA, IA, KY, MD, MN, NC, NJ, OH, OR, RI, TN, VA, WI
Report card	15 (29.4)	CA, FL, IA, IN, LA, MA, MD, MI, MN, NJ, NY, OH, RI, TX, WI

Note: NH, Nursing home; DOH, department of health; CMS, Centers for Medicare and Medicaid Services.

Table 2

Presentation of nursing home quality information.

Quality Indicator	Indicator Present N = 51 n (%)	Report Card Format*	Other Format
		n = 15 n (%)	n = 25 n (%)
Citations/deficiencies	37 (73)	13 (87)	24 (96)
Complaints	32 (63)	11 (73)	21 (84)
Violations	31 (61)	12 (80)	19 (76)
Facility follow-up reports	23 (45)	7 (47)	16 (64)
Performance ranking or measure	8 (16)	7 (47)	1 (4)
Quality of care	8 (16)	7 (47)	1 (4)
Staffing	7 (14)	5 (33)	2 (8)
Administration quality/satisfaction rating	6 (12)	6 (40)	0 (0)
Best practice awards/distinction	6 (12)	2 (13)	4 (16)
Resident satisfaction	5 (10)	5 (33)	0 (0)
Quality of life	5 (10)	4 (27)	1 (4)
Relative rating in area	4 (8)	4 (27)	0 (0)
Health indications	4 (8)	2 (13)	2 (8)
Finances	2 (4)	1 (7)	1 (4)

Note: NH, Nursing home; DOH, department of health.

* Of the 51 states and District of Columbia, 40 states provided NH quality indicator information. Of these 40 states, 15 states provided a report card containing the quality indicators, and 25 states provided the quality indicators in a format that was not a report card.

Table 3

Provider and surveyor-directed information.

DOH Resource* N = 51	Total State DOH Offering Resource n (%)	States With Resource
Provider group addressing HAI	15 (29.4)	AZ, CT, DE, FL, GA, IL, KY, MI, NC, OR, PA, VA, WI, WV, WY
Provider HAI prevention training or guidance	44 (86.3)	AK, AL, AR, AZ, CA, CO, CT, DE, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MT, NC, ND, NE, NM, NV, NY, OH, OR, PA, RI, SC, SD, TX, UT, VA, VT, WA, WI, WV
Surveyor training or guidance for inspections	27 (52.9)	CO, DC, DE, IA, ID, IN, KS, KY, LA, ME, MI, MN, MT, NC, NE, NM, OH, OK, OR, RI, SC, TN, UT, WA, WI, WV, WY

Note: HAI, Healthcare-associated infection; DOH, department of health.

* States and District of Columbia may offer more than one of these resources (i.e., these categories are not mutually exclusive).

Table 4

States with HAI reporting in NH.

HAI Reporting	State	HAI	Implementation Date
Mandatory			
	PA	<i>C. difficile</i> , symptomatic urinary tract infection, symptomatic catheter-associated urinary tract infection, central line-associated blood stream infection, primary blood stream infection, ventilator-associated pneumonia, lower respiratory infection, influenza/influenza-like illness bronchitis/tracheobronchitis, surgical site infection, cellulitis, burns, vascular and diabetic ulcer, device-associated soft-tissue/wound infection, gastrointestinal infection (viral, bacterial, other), peritonitis/deep abscess, meningitis, decubitus ulcer infection, viral hepatitis, osteomyelitis	2008
	OR	Urinary tract infection	2010
Voluntary			
	IA	<i>C. difficile</i>	2012
	GA	Catheter associated urinary tract infection	2013
	VT	Multi-drug resistant organism, <i>C. difficile</i>	2013

Note: HAI, Healthcare-associated infection.

Appendix A

State DOH Websites

State	Website	Access Date* (mm/dd/yy)
Alabama	http://www.adph.org/	01/09/13
Alaska	http://dhss.alaska.gov/Pages/default.aspx	01/28/13
Arizona	http://www.azdhs.gov/	01/07/13
Arkansas	http://www.healthy.arkansas.gov/Pages/default.aspx	01/28/13
California	http://www.dhcs.ca.gov/Pages/default.aspx	01/08/13
Colorado	http://www.colorado.gov/cs/Satellite/CDPHE-Main/CBON/1251583470000	01/09/13
Connecticut	http://www.ct.gov/dph/site/default.asp	01/04/13
Delaware	http://dhss.delaware.gov/dhss/	01/03/13
District of Columbia	http://doh.dc.gov/	01/10/13
Florida	http://www.doh.state.fl.us/	01/04/13
Georgia	http://health.state.ga.us/	01/08/13
Hawaii	http://hawaii.gov/health/	01/02/13
Idaho	http://www.healthandwelfare.idaho.gov/	01/07/13
Illinois	http://www.idph.state.il.us/	01/10/13
Indiana	http://www.state.in.us/isdh/	01/16/13
Iowa	http://www.idph.state.ia.us/	01/17/13
Kansas	http://www.kdheks.gov/	12/27/12
Kentucky	http://ehfs.ky.gov/dph/	01/14/13
Louisiana	http://www.dhh.louisiana.gov/	01/03/13
Maine	http://www.maine.gov/dhhs/	01/03/13
Maryland	http://dohm.maryland.gov/SitePages/Home.aspx	01/07/13
Massachusetts	http://www.mass.gov/eohhs/gov/departments/dph/	01/05/13
Michigan	http://www.michigan.gov/mdch	01/07/13
Minnesota	http://www.dhs.state.mn.us/main/ideplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatesReleased&dDocName=health_care	01/03/13
Mississippi	http://www.msdh.state.ms.us/	11/24/12

State	Website	Access Date* (mm/dd/yy)
Missouri	http://health.mo.gov/index.php	01/15/13
Montana	http://www.dphhs.mt.gov/	01/03/13
Nebraska	http://dhhs.ne.gov/Pages/default.aspx	01/15/13
Nevada	http://dhhs.nv.gov/	12/06/13
New Hampshire	http://www.dhhs.nh.gov/	01/16/13
New Jersey	http://nj.gov/health/	01/02/13
New Mexico	http://www.health.state.nm.us/	01/08/13
New York	http://www.health.ny.gov/	01/13/13
North Carolina	http://www.ncdhhs.gov/	01/08/13
North Dakota	http://www.ndhealth.gov/	01/15/13
Ohio	http://www.odh.ohio.gov/	11/24/12
Oklahoma	http://www.ok.gov/health/	01/10/13
Oregon	http://www.oregon.gov/DHS/Pages/index.aspx	12/26/12
Pennsylvania	http://www.portal.health.state.pa.us/portal/server.pt/community/department_of_health_home/17457	01/16/13
Rhode Island	http://www.health.ri.gov/	01/10/13
South Carolina	http://www.scdhec.gov/	01/14/13
South Dakota	http://doh.sd.gov/	01/10/13
Tennessee	http://health.state.tn.us/	01/17/13
Texas	http://www.dshs.state.tx.us/	01/10/13
Utah	http://health.utah.gov/	01/03/13
Vermont	http://healthvermont.gov/	01/07/13
Virginia	http://www.vdh.state.va.us/	01/17/13
Washington	http://www.doh.wa.gov/	01/17/13
West Virginia	http://www.wvdhhr.org/	01/08/13
Wisconsin	http://www.dhs.wisconsin.gov/	01/08/13
Wyoming	http://www.health.wyo.gov/default.aspx	01/08/13

* Last date of internet-based data abstraction.