Findings from the Council of State and Territorial Epidemiologists' 2008 Assessment of State Reportable and Nationally Notifiable Conditions in the United States and Considerations for the Future

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Context: The State Reportable Conditions Assessment (SRCA) is an annual assessment of reporting requirements for reportable public health conditions. The Council of State and Territorial Epidemiologists (CSTE) and the Centers for Disease Control and Prevention have gained valuable experience in developing a centralized repository of information about reportable conditions across US states and territories. **Objective:** This study examines the reporting status in states of nationally notifiable conditions used to inform public health and national surveillance initiatives. **Design:** Conditions included in SRCA are updated annually by using a Web-based tool created by the CSTE. **Setting:** SRCA information for 2008 was reported from all US states, 2 cities, and 4 territories. **Participants:** Respondents included state or territorial epidemiologists (or designees) for reporting jurisdictions. **Main Outcome Measure:** Conditions were classified as *explicitly reportable*, *implicitly reportable*, or *not reportable*. Results were tabulated to determine reporting statistics for the conditions nationwide. **Results:** The SRCA included 101 conditions recommended for national notification: 93 (92%) were infectious conditions, and 8 (8%) were other (noninfectious or crosscutting) conditions. Of nationally notifiable infectious conditions, 61 (66%) were explicitly reportable in 90% or more jurisdictions; only 2 (25%) noninfectious or crosscutting nationally notifiable conditions were explicitly reportable in 90% or more jurisdictions. Furthermore, 3 nationally notifiable infectious conditions were explicitly reportable in less than 70% of jurisdictions. **Conclusions:** Although most nationally notifiable conditions were explicitly reportable, we found that many of these conditions have implicit reporting authority in states. As notifiable condition surveillance moves toward an informatics-driven approach, automated electronic case-detection systems will need explicit information about what conditions are reportable. Future work should address the feasibility of standardizing the format of reportable disease lists and nomenclature used to facilitate data aggregation and interpretation across states.

KEY WORDS: assessment, case reporting, National Notifiable Diseases Surveillance System, nationally notifiable conditions, public health surveillance, reportable conditions, reporting requirements

Disease reporting in the United States is mandated by legislation or regulation only at local, state, or territorial levels.[1-4] States and territories determine which conditions to include on reportable condition lists, who

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is required to report, what information should be reported, and how quickly disease information must be reported to public health authorities. The list of reportable conditions varies across states and from year to year. The term *case reporting* refers to the actions taken by health care entities to report information about a reportable disease or condition to a local, county, or state public health agency.

Some reportable conditions are designated by the Council of State and Territorial Epidemiologists (CSTE) as being *nationally notifiable*. The CSTE recommends that all states and territories enact laws or regulations making these diseases or conditions reportable in their jurisdictions.[5] Currently, states and territories voluntarily report data (without direct personal identifiers) about nationally notifiable conditions (NNCs) that are reportable in their respective jurisdictions to the federal Centers for Disease Control and Prevention (CDC). Not all NNCs are reportable for each state or territory. Each year, when the NNC list is revised, CSTE considers the goals, purpose, and objectives of surveillance data needed at the national level. When proposing revisions, the CSTE also considers the severity, incidence, communicability, and preventability of a disease or condition. In June 2008, the criteria for inclusion of conditions on the CSTE's official NNC list were published.[5-8] Public health surveillance of NNCs and reportable conditions among states helps public health authorities monitor the effect of important public health conditions, measure disease trends, assess the effectiveness of control and prevention measures, identify high-risk populations or geographical areas, allocate resources appropriately, formulate prevention and control strategies, and develop public health policies.[9,10] The term *case notification* refers to actions taken by a US state or territorial health department to recognize a case of public health significance at the federal level (conditions on the NNC list, for example) and to notify the CDC. Case notification protocols vary across NNC and by whether a standard or immediate notification protocol has been assigned to the condition. Electronic data are usually submitted in a standardized format to the CDC to facilitate data aggregation and analysis across reporting jurisdictions.

Before 2009, the CDC considered conditions to be nationally notifiable on the basis of separate CSTE-approved condition-specific position statements calling for the use of standardized reporting mechanisms for national surveillance; beginning in 2009, CSTE published an official NNC list.[8] States also consider CSTE position statements and state-specific health priorities when establishing or modifying their laws or regulations for reportable conditions. The CDC's National Notifiable Diseases Surveillance System (NNDSS) maintains two online lists: "Nationally Notifiable Infectious Conditions" and "Nationally Notifiable Non-Infectious Conditions." Each condition on the lists is linked to its respective surveillance case definition.[11,12] The lists change annually as new pathogens emerge or as public health priorities change (eg, incidence for a condition declines).

The CDC uses data from the State Reportable Conditions Assessment (SRCA) to identify which NNCs are reportable for states or territories. This information is used to calculate national incidence rates for NNCs reported to the NNDSS. The SRCA information enables readers of NNDSS data tables (published in the CDC's *Morbidity & Mortality Weekly Report* [*MMWR*]) to distinguish between when no notification of cases for reportable conditions has occurred and when no notification occurred because a condition was not reportable for a state or territory.[9,13]

In 2007, the Population Health and Clinical Care Connections Workgroup of the American Health Information Community (AHIC), a federal advisory committee to the Department of Health and Human Services, proposed that the CSTE and the CDC develop procedures "to implement the informational tools and business operation to support real-time nationwide public health event monitoring and rapid response management."[14] The AHIC also proposed that "CSTE, in collaboration with CDC, should define an ongoing process to be used in establishing a common list of nationally notifiable conditions to be reported to all levels of public health."[14] To support this AHIC recommendation and to fill an information gap, the CSTE and the CDC collaborated to develop the SRCA. As a result, the SRCA has gathered more complete data about public health reporting requirements than those data gathered independently by the CSTE or the CDC, and assessment results are now distributed through a Web-based data query system.[15]

The "Meaningful Use" regulation for electronic health records includes a public health objective related to hospitals submitting electronic data on reportable laboratory results to public health agencies.[16,17] This objective is intended to promote the use of electronic information systems to meet public health reporting requirements. As the use of electronic health records and reportable laboratory results becomes widespread, a centralized repository of information about what is reportable in which jurisdictions may help to decrease the burden placed on health care entities to collect and regularly update this information. The repository can have particular value for those responsible for keeping track of reporting requirements for multiple jurisdictions, such as a health care entity with a catchment area or business operations that cross jurisdictional boundaries. The SRCA project provides an experience base for CDC and CSTE informatics and subject-matter experts

who collect and aggregate information about reportable conditions across states and territories.

Methods

For 2008, CSTE requested SRCA information about reportable conditions from 57 jurisdictions that report data to the CDC's NNDSS. Jurisdictions included 50 US states along with New York City; Washington, District of Columbia; and 5 US territories. The list of SRCA conditions was compiled from (1) prior data collection surveys conducted by NNDSS and CSTE staff about reportable conditions and (2) a review of online reportable condition lists or governing regulations for each state.[18] A condition was included in the SRCA if it was nationally notifiable during the previous year, if it was reportable by most jurisdictions (as determined by CDC and CSTE SRCA teams), or if it was thought to be of special interest to CSTE or CDC for initiatives or surveillance efforts. The 2008 SRCA had 270 conditions organized into 3 categories: 181 infectious, 64 noninfectious, and 25 crosscutting ("general") conditions. Information was collected for each of the following reporter types: clinicians, laboratories, hospitals, and "other" public health reporters. For each reporter type, we collected information about the legal authority governing reporting practices. Responses for legal authority were *explicitly reportable*, *implicitly reportable*, and *not reportable*. *Explicitly reportable* was defined as a condition listed specifically as a disease (eg, Ebola virus disease) or category of diseases (eg, viral hemorrhagic fever) on reportable disease lists (Table 1). *Implicitly reportable* was defined as a condition, such as Ebola virus disease, which, instead of being listed explicitly on a reportable disease, was considered by the respondent state epidemiologist to be reportable under a broad nonspecific category such as "rare diseases of public health importance" (Table 1). A condition was defined as *not reportable* if it was not designated as reportable in the explicit or implicit categories. Respondents were instructed to indicate that a condition was reportable only if their reporting requirements had been in effect for at least 6 months of the calendar year of the assessment.

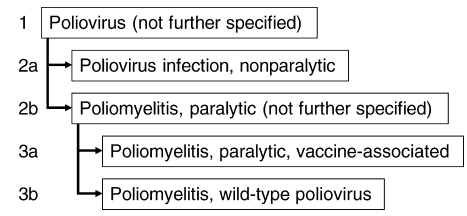
The CSTE developed a multiuser, secure, online assessment tool for SRCA data collection. Before launching SRCA, CSTE collaborated with staff from 11 states and CDC to conduct usability and pilot tests. Each state epidemiologist was given 2 weeks to conduct an assessment and verify the accuracy of the results. The state epidemiologist could delegate sections of the SRCA to disease-specific subject-matter experts in the state. States that had not initiated the SRCA by the end of the 2-week deadline for completion of the assessment were termed *late responders*. CSTE staff called 9 late responders to remind them of the SRCA deadline and respond to questions about the SRCA instructions. The CSTE team compiled each state's responses in a database, and then CDC's NNDSS team analyzed the data.

Related conditions in the SRCA were grouped into hierarchies. In each hierarchy, a "parent" category row could include several subset "child" conditions (see the Figure). The CDC's analysis consisted of 2 steps. In the first step, a rule was applied to each condition hierarchy comprised of a parent category and subsets; this rule specified that if the condition in the parent row was "explicitly reportable," then the "child" or subset conditions must also be explicitly reportable. When NNCs were embedded within a condition hierarchy, responses to all conditions related to the NNC were analyzed to determine whether the NNC was reportable. In the second step of the analysis, for each condition, rules were applied across the responses for each reporter type to determine whether the condition was found to be explicitly reportable, implicitly reportable, or not reportable (Table 2). These rules are summarized as follows: (1) The condition was determined to be explicitly reportable if the condition was designated as

TABLE 1 Different Ways Ebola Virus Disease May Be Listed on a State Reportable Condition List and Expected Response According to How State Reportable Conditions Assessment Instructions Indicate Reporting Authority Should Be Recorded.

State Reportable Disease List Entry	Expected Authority Response
Ebola virus disease	Explicit
Viral hemorrhagic fever	Explicit
Rare disease of public health importance	Implicit

FIGURE A condition hierarchy in the 2008 State Reportable Conditions Assessment for poliovirus. The condition listed in row 1 is a parent of conditions listed in rows 2a and 2b. The condition listed in row 2b is a parent of rows 3a and 3b as well as a child of row 1. The conditions listed in rows 2a and 2b are nationally notifiable conditions.



explicitly reportable by at least 1 reporter type, (2) the condition was determined to be implicitly reportable if the condition was designated as implicitly reportable by at least 1 reporter type and *not* designated as explicitly reportable by any reporter type, and (3) the condition was determined to be not reportable if it was designated as not reportable by all reporter types. Not all conditions were included in a condition hierarchy; in those instances, only the second step of the analysis was used.

The CDC's NNDSS team also conducted a quality assessment of the 2008 SRCA nationally notifiable infectious conditions (NNICs) by systematically scanning for discrepancies in reporting authority for conditions included within a condition hierarchy, and by comparing 2008 findings for each condition with findings from prior assessments and with published reportable condition lists and laws. Possible data entry errors affecting the outcome of the reporting authority for NNICs in a jurisdiction were reviewed and accepted or remediated by the state epidemiologist.

This study did not need review by a CDC institutional review board because it involves surveillance of conditions considered reportable for public health practice and does not involve research that used human subjects.

Results

The 2008 SRCA received final verified responses by state epidemiologists in 50 US states; New York City; Washington, DC; and 4 of 5 US territories. The response rate for states and cities was 100%. The overall response rate was 98%, including territories. The results presented in this article include data from the 52 state and city jurisdictions (collectively referred to as states).

Table 2 shows totals and percentages of the reporting authority responses in the 2008 SRCA for 101 conditions recommended for national notification in 52 jurisdictions. Of the 101 conditions, 93 (92%) were infectious and 8 (8%) were noninfectious or crosscutting conditions. Infectious conditions were grouped into 8 smaller categories.

Infectious conditions

Comparing the legal regulatory authority of each NNIC (ie, explicit, implicit, or not reportable), 39 (42%) of the 93 infectious conditions were explicitly reportable in all states, 61 (66%) infectious conditions were explicitly reportable in at least 90% of states, 77 (83%) infectious conditions were explicitly reportable in at least 80% of states, and 90 (97%) infectious conditions were explicitly reportable in at least 70% of states. Only 3 (3%) infectious conditions were explicitly reportable in fewer than 70% of states; these conditions were coccidioidomycosis, vancomycin-intermediate resistance *Staphylococcus aureus* infection, and vibriosis. In addition, 49 (53%) NNICs were implicitly reportable in some states, and 48 (52%) of the 93 infectious conditions were not designated reportable in some states.

The number and percent of conditions that were explicitly reportable in at least 90% of states included 10 (63%) of the 16 vaccine-preventable diseases (VPDs), 3 (60%) of the 5 respiratory conditions, 7 (88%) of the 8 blood-borne conditions, 10 (91%) of the 11 sexually transmitted diseases (STDs), 2 (20%) of the 10 systemic conditions, 17 (59%) of the 29 zoonotic and vector-borne conditions, 9 (82%) of the 11 enteric diseases, and all 3 (100%) neurologic and toxin-mediated conditions.

The number and percent of NNICs that had implicit reporting authority for some states included 7 (44%) of the 16 VPDs, 3 (60%) of the 5 respiratory conditions, 3 (38%) of the 8 blood-borne conditions, 1 (9%) of the 11 STDs, 8 (80%) of the 10 systemic conditions, 22 (76%) of the 29 zoonotic and vector-borne conditions, 4 (36%) of the 11 enteric conditions, and 1 (33%) of the 3 neurologic or toxin-mediated conditions.

The number and percent of NNICs that were not designated as reportable for some states included 7 (44%) of the 16 VPDs, 3 (60%) of the 5 respiratory conditions, 2 (25%) of the blood-borne conditions, 1 (9%) of the STDs, 9 (90%) of the systemic conditions, 22 (76%) of the 29 zoonotic and vector-borne conditions, 4 (36%) of the 11 enteric conditions, and none of the neurologic or toxin-mediated conditions.

Noninfectious and crosscutting conditions

None of the 8 nationally notifiable noninfectious or crosscutting ("general") conditions shown in Table 2 were explicitly reportable in all states. Two (25%) conditions were reportable by more than 90% of states. Five (63%) conditions were explicitly reportable in more than 50% of states. The other 3 (38%) conditions were explicitly reportable in 35% or less states.

Seven (88%) noninfectious and general NNCs were implicitly reportable in certain states, whereas one condition (lead blood levels from laboratory test results) was not implicitly reportable in any states. Of the 8 noninfectious NNCs, "hazardous substances emergency event" had the highest percentage of states (40%), indicating that this condition was implicitly reportable.

Of the 8 noninfectious and general conditions, 7 (88%) were considered not reportable in certain states, and 7 (88%) were considered implicitly reportable in certain states.

TABLE 2 ● Number and Percentage of Jurisdictions by Legal or Regulatory Authority Category for Nationally Notifiable Conditions in 50 US States, New York City, and Washington, DC—CSTE 2008 State Reportable Conditions Assessment[a]

	Explicit		Implicit		Not Reportable	
Condition	**No.**	**%**	**No.**	**%**	**No.**	**%**
Vaccine preventable conditions						
Diphtheria	52	100	0	0	0	0
Haemophilus influenzae, invasive disease	47	90	1	2	4	8
Influenza A virus infections, novel	37	71	11	21	4	8
Influenza-associated pediatric mortality	39	75	8	15	5	10
Measles	52	100	0	0	0	0
Meningococcal disease	52	100	0	0	0	0
Mumps	52	100	0	0	0	0
Pertussis (*Bordetella pertussis*)	52	100	0	0	0	0
Poliomyelitis, paralytic	52	100	0	0	0	0
Poliovirus infection, nonparalytic	40	77	9	17	3	6
Rubella (German measles)	52	100	0	0	0	0
Rubella, congenital syndrome	51	98	0	0	1	2
Smallpox	46	88	6	12	0	0
Tetanus	52	100	0	0	0	0
Varicella morbidity	38	73	8	15	6	12
Varicella mortality	38	73	8	15	6	12
Respiratory conditions						
Coccidioidomycosis	16	31	13	25	23	44
Legionellosis	52	100	0	0	0	0
Psittacosis	50	96	1	2	1	2
SARS (severe acute respiratory syndrome)	43	83	7	13	2	4
Tuberculosis (*Mycobacterium tuberculosis)*	52	100	0	0	0	0
Blood-borne conditions						
Acquired immunodeficiency syndrome (AIDS)	52	100	0	0	0	0
Hepatitis B virus, acute perinatal infection	51	98	1	2	0	0
Hepatitis B, acute	52	100	0	0	0	0
Hepatitis B, chronic	47	90	0	0	5	10
Hepatitis C, acute	51	98	1	2	0	0
Hepatitis C virus infection (past or present)	45	87	4	8	3	6
HIV infection, adult ($\geq$13 years)	52	100	0	0	0	0
HIV infection, pediatric ($<$13 years)	52	100	0	0	0	0
Sexually transmitted diseases						
Chancroid	46	88	1	2	5	10
Chlamydia trachomatis, genital infections	52	100	0	0	0	0
Gonorrhea	52	100	0	0	0	0
Neurosyphilis	52	100	0	0	0	0
Syphilis, congenital	52	100	0	0	0	0
Syphilis, early latent	52	100	0	0	0	0
Syphilis, late latent	52	100	0	0	0	0
Syphilis, late, nonneurological	52	100	0	0	0	0
Syphilis, latent unknown duration	52	100	0	0	0	0
Syphilis, primary	52	100	0	0	0	0
Syphilis, secondary	52	100	0	0	0	0
Systemic conditions						
Cryptosporidiosis	52	100	0	0	0	0
Hansen disease (leprosy)	44	85	2	4	6	12

(*continues*)

TABLE 2 ● Number and Percentage of Jurisdictions by Legal or Regulatory Authority Category for Nationally Notifiable Conditions in 50 US States, New York City, and Washington, DC—CSTE 2008 State Reportable Conditions Assessment[a] (*Continued*)

	Explicit		Implicit		Not Reportable	
Condition	No.	%	No.	%	No.	%
Hemolytic uremic syndrome, postdiarrheal	48	92	3	6	1	2
Staphylococcus aureus, vancomycin-intermediate (VISA)	36	69	7	13	9	17
Staphylococcus aureus, vancomycin-resistant (VRSA)	39	75	5	10	8	15
Streptococcal disease, invasive, group A (GAS)	46	88	0	0	6	12
Streptococcal toxic-shock syndrome (STSS)	42	81	3	6	7	13
Streptococcus pneumoniae, invasive, drug resistant (DRSP)	42	81	2	4	8	15
Streptococcus pneumoniae, invasive pneumococcal disease, nondrug resistant (<5 years)	42	81	3	6	7	13
Toxic-shock syndrome (other than streptococcal)	40	77	2	4	10	19
Zoonotic and vector-borne conditions						
Anaplasma phagocytophilum infection	41	79	5	10	6	12
Anthrax	52	100	0	0	0	0
Arboviral disease, neuroinvasive, California serogroup virus	46	88	5	10	1	2
Arboviral disease, neuroinvasive, Eastern equine encephalitis virus	46	88	5	10	1	2
Arboviral disease, neuroinvasive, Powassan virus	43	83	8	15	1	2
Arboviral disease, neuroinvasive, St. Louis encephalitis virus	47	90	4	8	1	2
Arboviral disease, neuroinvasive, West Nile virus	49	94	3	6	0	0
Arboviral disease, neuroinvasive, Western equine encephalitis virus	47	90	4	8	1	2
Arboviral disease, nonneuroinvasive, California serogroup virus	43	83	4	8	5	10
Arboviral disease, nonneuroinvasive, Eastern equine encephalitis virus	43	83	4	8	5	10
Arboviral disease, nonneuroinvasive, Powassan virus	40	77	7	13	5	10
Arboviral disease, nonneuroinvasive, St. Louis encephalitis virus	44	85	3	6	5	10
Arboviral disease, nonneuroinvasive, West Nile virus	48	92	3	6	1	2
Arboviral disease, nonneuroinvasive, Western equine encephalitis virus	44	85	3	6	5	10
Brucellosis	52	100	0	0	0	0
Ehrlichia chaffeensis infection	41	79	5	10	6	12
Ehrlichia ewingii infection	40	77	6	12	6	12
Ehrlichiosis/anaplasmosis, undetermined infection	37	71	8	15	7	13
Hantavirus pulmonary syndrome	49	94	1	2	2	4
Lyme disease	51	98	0	0	1	2
Malaria	52	100	0	0	0	0
Plague	51	98	1	2	0	0
Q fever, acute	48	92	2	4	2	4
Q fever, chronic	48	92	2	4	2	4
Rabies in an animal	49	94	1	2	2	4
Rabies in a human	52	100	0	0	0	0
Rocky Mountain spotted fever (RMSF)	50	96	0	0	2	4
Tularemia	52	100	0	0	0	0
Yellow fever	48	92	2	4	2	4
Enteric diseases						
Cholera (*Vibrio cholerae*)	52	100	0	0	0	0
Cyclosporiasis	41	79	4	8	7	13
Escherichia coli (STEC), shiga toxin-producing	52	100	0	0	0	0
Giardiasis	47	90	3	6	2	4
Hepatitis A, acute	52	100	0	0	0	0

(*continues*)

TABLE 2 ● Number and Percentage of Jurisdictions by Legal or Regulatory Authority Category for Nationally Notifiable Conditions in 50 US States, New York City, and Washington, DC—CSTE 2008 State Reportable Conditions Assessment[a] (*Continued*)

	Explicit		Implicit		Not Reportable	
Condition	No.	%	No.	%	No.	%
Listeriosis	52	100	0	0	0	0
Salmonellosis	52	100	0	0	0	0
Shigellosis	52	100	0	0	0	0
Trichinellosis (Trichinosis)	49	94	1	2	2	4
Typhoid fever (*Salmonella typhi*)	52	100	0	0	0	0
Vibriosis	36	69	7	13	9	17
Neurologic and toxin-mediated conditions						
Botulism, foodborne	52	100	0	0	0	0
Botulism, infant	52	100	0	0	0	0
Botulism, other (wound and unspecified)	50	96	2	4	0	0
Noninfectious and general conditions						
Cancer (not further specified)	48	92	2	4	2	4
Disease or outbreak of suspected foodborne origin	43	83	9	17	0	0
Disease or outbreak of suspected waterborne origin	38	73	13	25	1	2
Hazardous substances emergency event	12	23	21	40	19	37
Immunization-related adverse reaction	18	35	12	23	22	42
Lead, blood level laboratory-test results (not further specified)	50	96	0	0	2	4
Poisoning, pesticide	30	58	7	13	15	29
Silicosis	18	35	5	10	29	56

Abbreviation: CSTE, Council of State and Territorial Epidemiologists.
[a]State Reportable Conditions Assessment, 2008 data.

● Limitations

This study has at least 3 limitations. First, we have no assurances that all respondents in each state understood the instructions for the assessment and completed the assessment in a consistent manner. CSTE provided educational outreach (eg, webinars, instructions embedded within the SRCA tool, and phone calls with respondents) and definitions for SRCA concepts; nonetheless, errors were found during the data quality assessment. Data providers determined whether a correction of the data entered into the SRCA was needed. However, in some instances, the state epidemiologists may not have corrected their responses because the analyzed results indicating whether a condition was reportable or not for use in the *MMWR* NNDSS tables were consistent with state policy, even if each individual response in the assessment was not. (Results showing whether a condition is reportable in a state for the purposes of the *MMWR* NNDSS publications will not mirror results distributed through the SRCA Web query page[15] because *MMWR* uses results analyzed across the condition hierarchies and across all reporting entities, whereas CSTE's SRCA Web query provides results for each condition and reporter type, enabling users to conduct state-specific ad hoc analyses.) Also, because the process of data quality assurance was limited to the NNICs, uncorrected errors are more likely to exist in data collected for nationally notifiable noninfectious conditions.

A second limitation was that authority for conditions was possibly misclassified in some states. Some respondents were confused by the concept of *explicit* versus *implicit* authority for reportable conditions. Furthermore, some state lists were unavailable online during data quality assurance checks, and other lists lacked updated approval dates, making it difficult to determine the relevance of the source being used as a standard for reporting requirements. Sometimes, the conditions found on the lists and laws did not match. This incongruity affected the ability to perform quality checks of the SRCA data when a discrepancy was found. Ultimately, the state epidemiologists made the final determination for a condition's reporting status in the SRCA.

A third limitation is that, although SRCA supports information needs for surveillance, this assessment does not support the real-time needs of reporting entities. SRCA information is collected annually, typically during the fourth quarter, and does not reflect changes made to a state's reportable condition list after midyear.

The 2008 SRCA results show only whether a specific condition was reportable in a jurisdiction for most of the 2008 calendar year. In addition, results from the 2008 SRCA were not posted to the CSTE Web site until mid-2009.

Discussion

The SRCA is a useful tool for collecting and aggregating information about public health reporting rules and mandates across reporting jurisdictions and is also used to inform national public health initiatives. For example, the revised 2005 International Health Regulations, for which the United States became legally responsible for responding to beginning July 2007, required member countries to notify the World Health Organization about all cases of new subtypes of influenza.[19,20] In 2007, CSTE and CDC moved quickly to make infections from the novel influenza A virus (synonymous with new subtypes of influenza) nationally notifiable. The CSTE Executive Committee adopted in January 2007 an interim position statement that was approved in June 2007 by the full membership. The CDC subsequently added the condition to the online list of conditions and case definitions for notification to the CDC.[21-23] A lag always exists between the time when CSTE calls for a condition to be under national surveillance and the multiple points in time when individual states take legal or regulatory action to make the condition reportable in their jurisdictions. SRCA was helpful in indicating that by 2008, this condition was explicitly reportable in 37 states and was implicitly reportable in 11 states. Because no US federal law requires states to identify conditions of public health importance and to notify federal agencies such as the CDC, the United States depends on the legal or regulatory authority of states to be able to detect conditions affecting human health and to share that information voluntarily with other jurisdictions and with the CDC to help contain and control disease spread. The SRCA helps the United States, which is organized as a federation of states, assess its capacity to fulfill its national and international legal obligations.

The SRCA also helps the United States assess its capacity to identify and respond to national public health surveillance priorities and initiatives. For example, the SRCA can be a useful source of information on diseases and conditions that are important for public health in the United States. The initial geographic localization of a disease may change because of migratory patterns of vectors, travel by infected persons, or other factors. If a disease spreads and is recognized by state public health departments as a cause for concern and surveillance, the SRCA is a source of information about state public health practice changes that affect national health and surveillance priorities.

We found challenges with aggregating data on reportable conditions across states. States develop their reportable condition lists and the terminology to describe what is reportable differently, and each state may make different subsets of a specific condition reportable. Also, NNCs may lack a one-to-one correspondence and comparability with related conditions on state reportable disease lists. When we became aware of these differences during the SRCA development process, we used a condition hierarchy to capture information on related conditions. (For example, the Figure displays different nomenclature used for polio.) Condition hierarchies add complexity to SRCA data because of the need to consider all conditions on states' reportable disease lists and to assess whether those conditions correspond to NNCs before an NNC can be determined to be reportable in a state. Although a state's reportable condition list may seem to have a straightforward interpretation, our experience with the SRCA suggests that different people may interpret the same list differently. Interpretation differences can depend upon how knowledgeable the person doing the interpretation is about a state's reportable disease laws and regulations. Because of these differences, the state epidemiologist had the final approval for submission of SRCA results. Some differences in interpretation may occur when a category of specific diseases is used without a specific list delineating which conditions are included in the category or when a broad nonspecific category of conditions is listed. For example, if "arboviral diseases" is listed as a reportable category on a state list without additional specific information, the question arises of whether this category indicates that every arboviral condition (ie, any arthropod-borne viral disease) listed on the national list is also state reportable (Table 2). The SRCA experience suggests that additional knowledge about state policy and practice would be needed to make an accurate determination. It is not obvious how differently this category can be interpreted by a clinician or hospital required to report cases to the state for public health purposes, and research into this question could be informative.

Although most NNCs were explicitly reportable, we found that many NNCs have implicit state reporting authority. The CSTE Surveillance Coordination Subcommittee decided that any conditions designated with *implicit* legal or regulatory authority should not be considered reportable for national surveillance (ie, NNDSS) because the reporters could arrive at different interpretations. Data might be incomplete and inaccurately reflect the incidence of disease. In addition, as public health workers move toward an informatics-driven approach to notifiable condition

surveillance,[24-30] automated electronic case-detection and case-reporting systems will need specific (explicit) information about what is reportable and where conditions are reportable so that programming code can be written to extract data needed by public health from electronic clinical medical and laboratory information systems. A state may wish to review its reportable condition list to determine whether conditions currently considered implicitly reportable should be stated more explicitly to clarify interpretation. Because broad general categories will always be needed to capture emerging diseases, states may need to develop expanded lists of explicitly reportable conditions to be used specifically for automated case-detection and case-reporting systems. An informatics-driven approach to notifiable disease surveillance may help to improve accuracy, timeliness, and completeness of surveillance data, compared with information gathered by traditional passive surveillance systems based on paper- or Web-based reporting initiated by a health care entity.[24-26,29,30] Information about which conditions are reportable for specific jurisdictions in the United States is especially needed by health care entities involved in the health care of patients from multiple states (eg, regional hospitals and national, commercial, or reference laboratories). Having a centralized resource for information about what is reportable across the United States and where the condition is reportable decreases the burden for reporting entities to collect reporting requirements themselves.

Doyle et al[31] described the purpose and usefulness of developing a "knowledgebase" of reportable conditions. A dynamic, continually updated knowledgebase can serve as a centralized, Web-based repository of authoritative information about current public health reporting requirements. Reporting entities could query a knowledgebase for the latest reporting requirements for all states in one location, thereby reducing the burden imposed on reporting entities to stay updated on reporting requirements. Clinical and laboratory information systems could establish real-time connections to the knowledgebase, allowing immediate updates to reporting practices whenever reporting requirements change. Although SRCA is not itself a knowledgebase, it has provided CSTE and CDC experience in developing a centralized repository of information about reportable conditions across states. This experience will be helpful if a knowledgebase of reporting requirements is developed for national implementation.

At present, SRCA is not an authoritative repository of information about all reporting requirements. It does not provide timely information for health care entities and does not include all reportable conditions in all jurisdictions (including reporting jurisdictions below the state level). Also, SRCA does not capture some information needed by a health care entity to report a case, including the time frame in which a condition must be reported (eg, immediately, within 24 hours, within a week) and the manner in which a condition is reported (eg, required forms or specimen submission required by public health or data elements in the initial case report or laboratory result report). Enhancements to SRCA are being planned that will capture additional details about reporting requirements that health care entities need. In addition, an SRCA team is working with the Association of Public Health Laboratories and other laboratory experts to plan ways to obtain more specific information about laboratory reporting requirements. The success of SRCA will largely depend on its usefulness in meeting the needs of local and state public health officials, whether the public health and medical community perceive a need for a centralized repository of reporting requirements, and whether resources are available to transition from SRCA to a knowledgebase.

Future work should address the feasibility and benefit of developing a template for listing state reportable diseases. A template may help to standardize the format of the reportable condition lists and move toward standardized nomenclature to facilitate interpretation and enable greater ease in aggregating data about reporting requirements across states. In addition, future work should address SRCA's capacity to capture specifics about reportable laboratory results and capture specific subsets of reportable conditions that can vary across states, such as varicella in children younger than 18 years or Streptococcal group B infection in infants younger than 90 days. These customizations should help SRCA data more accurately reflect information about what is reportable in each state.

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