

Regional Prevention Efforts for Carbapenem-Resistant Enterobacteriaceae

Background

Many multi-drug resistant organism (MDRO) control efforts have been facility-based, with little coordination between facilities in the same area. However, some states have early experience in implementing regional prevention efforts, extending beyond hospitals to include long-term care and other facilities working together to reduce inter-facility transmission of MDROs. State health agencies are responsible for protecting patients across the healthcare system and serve as a bridge between healthcare and the community. Due to their broad partnerships, state health agencies are well positioned to convene regional prevention efforts.

To learn more about MDRO prevention efforts, ASTHO, in partnership with CDC, engaged five states (Georgia, Illinois, Oregon, Utah, and Wisconsin) to collect qualitative information on regional prevention efforts for the MDRO carbapenem-resistant Enterobacteriaceae (CRE). ASTHO held phone discussions with each state in December 2014 to February 2015 and gathered information about historical and contextual factors, composition and scope of efforts, lessons learned, and plans for the future. The experiences collected from the five states will help others as they scale up CRE prevention. Additionally, information collected from the discussions informed a nationwide online survey, which was fielded in May 2015 to state health agencies, about interest in and readiness for future CRE regional prevention efforts.¹

The strategies presented below, illustrated by findings, examples, and tips from the discussions and survey, can help states position their CRE regional prevention efforts and improve healthcare-associated infections (HAI) programs.

State Capacity

- ✓ Establish a clear definition for CRE and outline steps to take if a case is detected.

State example—Oregon: The Oregon Health Authority (OHA) developed a [CRE Toolkit](#), which includes a definition for CRE and infection prevention and control recommendations for various healthcare settings.

➤ **State tip—Oregon:** *“Developing a formal structure to address CRE can lead to a cohesive and workable response plan.”*

◆ **Survey finding—**Most state epidemiologist respondents reported that their state health agency has dedicated staff to coordinate efforts to address CRE (45% some staff capacity and

¹ ASTHO surveyed senior deputies (second in command to the state health officials) and state epidemiologists from 50 states, Washington, D.C., and Puerto Rico. The response rate was 44.2% for senior deputies and 80.7% for state epidemiologists. The responses from both groups were relatively consistent given their different roles in the agency, however, only state epidemiologist data are presented, as that group had a higher response rate (42 respondents), which might be more nationally representative. ASTHO will use the information from senior deputies (23 respondents) to reflect the leadership perspective for future program planning.

14% substantial staff capacity) or identify and investigate clusters or outbreaks of CRE (55% some and 14% substantial).² Several respondents noted that their health agency staff capacity to address CRE is limited; staff that address CRE fill multiple roles and are also responsible for other HAI issues.

◆ **Survey finding**—Seventy-nine percent of state epidemiologist respondents reported that their state health agency is very interested in developing internal capacity to address CRE, and another 17 percent are somewhat interested, but only 40 percent have any funding specific to CRE (31% have some funding and 10% have substantial funding).

- ✓ Develop a response plan that engages and educates key partners.

State example—Oregon: When the state identifies a carbapenemase-producing CRE case, OHA calls the facility with the case, and provides an individual consultation, offers onsite support, and performs cultures. To prevent further spread, this active response is done in collaboration with local health authorities.

➤ **State tip—Oregon:** *“Using the education plan, [Oregon Alliance Working for Antibiotic Resistance Education](#), is important to get buy-in from facilities and increase awareness. When facilities don’t have any CRE cases, the issue is not normally on their radar; however, the health authority has a role to educate up front.”*

➤ **State tip—Wisconsin:** *“Check to see what partnerships you have – do any exist, or do you need to cultivate relationships?”*

◆ **Survey finding**—Most state epidemiologist respondents reported that their state health agency has subject matter expertise on CRE available either internally or externally, e.g., university-based specialist (60% have some expertise and 26% have substantial expertise).

◆ **Survey finding**—Most (67%) respondents indicated that their health agencies have some skilled staff to provide technical assistance for CRE control and prevention to acute and long-term care facilities. Some health agencies have substantial capacity to provide technical assistance to acute care (17%) and long-term care (12%) facilities.

- ✓ Ensure data are available to inform prevention efforts and increase engagement among stakeholders.

Examples:

- CRE reporting policy (i.e., state law or regulation)
- National Healthcare Safety Network (NHSN), an HAI surveillance system
- Emerging Infections Programs (e.g., Multi-Site Gram-Negative Bacilli Surveillance Initiative)
- Laboratory Response Network
- CDC Prevention Epicenters research
- Surveys
- Retrospective studies
- Data from clusters and outbreaks

² For the purposes of this survey, substantial capacity/resources is defined as "agency possesses the level of organizational, human, financial, and other resources listed that enables the agency to consistently provide high quality services and/or achieve desired outcomes".

► **State tip—Illinois:** *“It’s important to note that desired outcomes may not be observed for a while. Other states called us and asked: ‘will our rates go down?’ They won’t, not at first— if you invest in improved detection you may see rates go up. It may be a while before we see the outcomes we want to see.”*

◆ **Survey finding—**Most state epidemiologist respondents indicated that their state health agency has data to describe CRE incidence in the state (57% have some data and 14% have substantial data); additionally, many have methods to report facility-specific CRE incidence in state healthcare facilities (48% have some capacity and 10% have substantial capacity). In accompanying comments, a few respondents mentioned that the CRE data available to their health agency was limited, from a few facilities rather than statewide, and voluntarily obtained from facilities and laboratories. Fifteen states (38% of state epidemiologist respondents) report CRE incidence back to healthcare facilities.

Surveillance

- ✓ Establish reporting infrastructure to drive prevention efforts.

State examples—[Illinois](#), [Oregon](#), [Utah](#), and [Wisconsin](#) have state CRE reporting requirements (e.g., law, rule) which have helped generate buy in and support.

State example—Utah: There is electronic lab reporting directly into the National Electronic Disease Surveillance System. Utah is also working to get patient transfer forms into the electronic medical record systems of the state’s major hospital corporations.

► **State tip—Wisconsin:** *“Through the HAI program, the Wisconsin Department of Health Services (WIDHS) had invested time to get people up and running on NHSN (training, data use agreements, etc.) and capitalized on that infrastructure for CRE surveillance.”*

◆ **Survey finding—**Twenty states (49% of state epidemiologist respondents) indicated that CRE is reportable in their state.

- ✓ Identify gaps in capacity to detect and report carbapenemase-producing CRE.

State example—Illinois: Lab testing capabilities vary across the state and the state laboratory is unable to conduct confirmatory testing for all isolates. Many parts of the state do not have sophisticated testing techniques, so there may be under-detection of cases in several areas.

► **State tip—Georgia:** *“Because lab reports can suppress data, the Georgia Department of Health (GADPH) worked with the labs to make sure the facilities were getting the data they needed.”*

◆ **Survey finding—**Along with lacking a standardized case definition, state epidemiologist respondents named gaps in laboratory and informatics capacity and the lack of standardization in laboratory testing procedures and reporting as other challenges for CRE surveillance. Resistance mechanism testing to identify carbapenemase-producing CRE may be limited, and the complex case definition may present issues for electronic laboratory reporting.

- ✓ Use data for action.

State example—Illinois: The Illinois Department of Public Health (ILDPH) set up an [XDRO registry](#), starting with CRE reporting, to use as a tool for sharing important clinical data and informing facilities when patients with MDROs are transferred.

► **State tip—Wisconsin:** *“Developing a surveillance system is important – it helps the health department get a feel for what is going on in the state and then they can go to partners to articulate the rationale for the intervention. It doesn’t have to be a complete picture, but it helps determine where to direct resources before going statewide.”*

Partnerships

- ✓ Identify diverse stakeholders at the outset and solicit their advice to prioritize limited time and resources.

Examples:

- Subject matter experts (e.g., infectious disease physicians)
- Acute care facilities
- Long-term care facilities
- Academic medical institutions
- Healthcare systems and corporations
- Hospital associations
- Association for Professionals in Infection Control and Epidemiology state chapters
- Patient safety commission
- Quality Innovation Network-Quality Improvement Organization
- Emergency medical services (EMS)
- Local health departments
- Licensing and regulatory authorities
- Regulators
- Other states
- CDC

State example—Illinois: ILDPH expanded Chicago’s CRE task force statewide.

State example—Oregon: OHA built on their existing relationships from the HAI advisory committee and Emerging Infections Program.

State example—Utah: The state works with the [Utah Healthcare Infection Prevention Governance Committee](#), which includes stakeholders from diverse disciplines (e.g., public health, patient safety, infection control, infectious disease, and state legislature).

► **State tip—Georgia:** *“Long-term care needs to be included in a regional approach and working on CRE is our ‘branch’ to be able to work with long-term care on HAI.”*

► **State tip—Oregon:** *“Understand who the players are and what the complexities are from the start and map those relationships out. Players could include state and local health departments, regulatory bodies, various types of facilities, and others. This provides an opportunity to bring folks together with those they may not have worked with before and leads to better*

communication between healthcare facilities beyond CRE. This is an opportunity to encourage a wider discussion.”

► **State tip—Utah:** “Because of the CRE collaborative, facilities were more aware of who to contact and what to do, and were reporting right away and reaching out to public health. One of the better outcomes is the communication between facilities and getting them used to using the patient transfer form, which can be quite difficult in practice and takes a lot of reinforcement.”

◆ **Survey finding—**Thirty-one states (76% of state epidemiologist respondents) indicated that their state health agency has a group or task force that engages in efforts to address CRE. In some states, CRE is addressed along with other MDRO issues by the broader HAI advisory committee. Other states include efforts to address CRE through specialized sub-committees or workgroups looking at issues of antibiotic resistance and stewardship.

- ✓ Engage facility leadership and use data to establish the urgency of addressing CRE.

State example—Illinois: Illinois formalized buy-in from the “C-suite” by asking an authorized executive (such as the medical director, CEO, or director of nursing) to [sign on to the CRE Detect and Protect Campaign](#) and providing targeted [webinars](#) to hospital and long-term care facility leadership on their role in CRE prevention.

► **State tip—Georgia:** “From the organizational culture standpoint, we established why CRE was important. We shared information (e.g., mortality data) with facility staff and empowered them to make a difference. Facility leaders can demonstrate support by signing [letters of participation](#).”

► **State tip—Wisconsin:** “CRE seems like a blip on the radar – providers were asking why the health department was working on the issue when there were others to worry about. One way to sell the rationale is to say that the health department wants to catch it before it becomes a bigger problem later.”

◆ **Survey finding—**More than half of state epidemiologist respondents indicated that their health agencies are engaging healthcare facility leadership to participate in efforts addressing CRE transmission (49% to some degree and 10% to a substantial degree). About half of state epidemiologist respondents indicated that their health agency educates (41% to some degree and 12% to a substantial degree) and recruits (37% to some degree and 10% to a substantial degree) healthcare facilities to support a regional approach to address CRE. Several states utilize existing HAI prevention partnerships to engage facilities around CRE. Respondents indicated that limited staffing and funding are barriers to further engaging facilities.

- ✓ Coordinate related initiatives to maintain momentum and interest.

► **State tip—Georgia:** “This is CRE work, but moving forward, it needs to be framed as work that touches all standards of care within the facility (e.g., environmental services, case management), especially as it relates to hand hygiene, stewardship, etc. This makes the facility feel like they’re addressing more than one need.”

► **State tip—Oregon:** “Integrating these efforts with other things going on (e.g., *C. difficile*) makes a lot of sense to ‘sell’ the intervention and make the continued work successful.”

◆ **Survey finding**—Most state health agencies have relevant initiatives into which CRE efforts could be incorporated, such as those related to general HAI or antimicrobial stewardship. Seventy-one percent of respondents indicated that these initiatives in their states are available but could be strengthened, and 17 percent indicated they are fully available.

- ✓ Learn the varied needs and capabilities of stakeholders.

State example—Oregon: The state conducted three statewide needs assessments to inform work with long-term care, microbiologists, and acute care infection preventionists. OHA plans to repeat the assessments to see how things have changed.

➤ **State tip—Illinois:** *“There can be a steep learning curve when determining who the players are, who is empowered, and how to reach out to them. We started with known partners on the HAI Advisory Council and asked for their recommendations on whom to add to the CRE Taskforce. We then leveraged the CRE Taskforce to reach out to other key players in the state.”*

- Local health departments

State example—Oregon: OHA encountered a range of public health authorities across the state and needed to define roles for local public health in the CRE response. To address this need, OHA developed [investigative guidelines](#) and educational campaigns. OHA recommends mapping out long-term care and other facilities and engaging the corresponding local health departments before the work starts.

State example—Utah: Local health departments can help engage healthcare facilities since they communicate often with facility infection preventionists.

State example—Wisconsin: Because they had experience responding to CRE cases, local health departments in the state’s “hot spot” were very interested in serving on the advisory panel, which has been instrumental to the efforts.

- Long-term care facilities

State example—Utah: When implementing a new [patient transfer form](#), the Utah Department of Health worked with long-term care facilities’ existing systems, such as patient wrist bands, helping ensure that staff get the information they need.

State example—Wisconsin: WIDHS worked with established long-term care community partners, such as state regulators and the Directors of Nursing Council, who can recognize barriers (e.g. lack of computers and infection preventionists). To better understand prevalence in these facilities, the health department is working through these barriers to enroll them in NHSN.

➤ **State tip—Georgia:** *“Understand that information about MDRO’s may be new information for long-term care facilities, but they bring expertise on gerontology – learn from them how these patients are managed and help acute care implement some of these best practices.”*

➤ **State tip—Oregon:** *“OHA was lucky to collaborate with the Oregon Patient Safety Commission, which lends infection control expertise when visiting long-term care facilities. CRE was the ticket through the door because it was a grave issue, but then we*

identified other issues (e.g., realized facilities did not have capacity to detect influenza-like illness)."

- Communities of Practice
State example—Georgia: GADPH convened two community of practice groups, aligning hospitals with their primary patient transfer partners. Originally, the state planned to develop a facility transfer form, but received feedback that making changes to facility forms is very difficult because long-term care facilities need corporate approval. Instead, they audited existing transfer forms and identified what they would like to see on admission and how to better operationalize core measures.

◆ **Survey finding—**Almost three quarters (71%) of state epidemiologist respondents agreed or strongly agreed that it is the state health agency's role to lead interventions to control the spread of targeted MDROs (e.g., CRE). Fourteen states (35% of state epidemiologist respondents) indicated that their health agency currently participates in programs or collaboratives that involve multiple facilities and are designed specifically to decrease the incidence of CRE. These include regional and statewide efforts and some address MDROs more broadly as well as CRE.

Education and Training

- ✓ Convene "kick-off" and leadership meetings to elevate knowledge and buy-in.

State example—Georgia: Before conducting learning sessions with infection preventionists, GADPH held a [leadership meeting](#) to educate facility leadership that this was a regional approach, rather than facility-specific, because the continuum of care is so important for CRE.

State example—Utah: Their kick-off meeting included subject matter experts (e.g., CDC) and major stakeholders, such as the main healthcare corporations in the state, the major EMS provider who does facility transfers, and the three long-term acute care facilities in the state.

- ✓ Conduct trainings and develop toolkits to improve skills for CRE response.

State example—Illinois: ILDPH offered several [webinars](#) for acute and long-term care facilities, laboratories, and local health departments. The feedback was very positive because the webinars addressed CRE, but also helped with training gaps in infection control more broadly.

➤ **State tip—Georgia:** *"The investment in CRE training has paid off. After the [training on interpreting lab reports](#), one collaborative member worked with a lab to improve the report. Because this lab serves much of the state, it has improved communications for many facilities."*

➤ **State tip—Wisconsin:** *"We gathered an expert panel to create a [Wisconsin CRE toolkit](#), drawing from CDC's toolkit. The panel discussed how to operationalize the toolkit across the state, and developed sample policies and practical tools (e.g., scripts for use in communicating with patients and residents). This is one of the benefits of getting people in the trenches and front line together. We have received good feedback on the toolkit because of its ease of use."*

◆ **Survey finding**—About three quarters of state epidemiologist respondents indicated that skills to conduct trainings to address CRE are available in their state health agency; 68 percent indicated skills are available but could be strengthened, and 10 percent indicated they are fully available. Less than half of states have toolkits or protocols with state-specific information to address CRE; in 37 percent, these resources are available but could be strengthened, and in seven percent they are fully available. In accompanying comments, some respondents reported using CDC CRE resources, while others have or want to develop a state-specific or regional toolkit to guide investigations and reporting. Many state health agencies lack appropriate funding and staffing to further develop CRE resources.

Resources

State Capacity

OHA's Guidance for Control of CRE 2013 Toolkit:

http://public.health.oregon.gov/DiseasesConditions/DiseasesAZ/CRE/Documents/cre_toolkit.pdf

Oregon—Alliance Working for Antibiotic Resistance Education:

<http://public.health.oregon.gov/PreventionWellness/SafeLiving/AntibioticResistance/Pages/provider.aspx>

Surveillance

State CRE reporting requirements:

- Illinois—http://www.idph.state.il.us/patientsafety/cre/documents/IDPH_MEMO_XDRO_Registry_090413.pdf
- Utah—http://health.utah.gov/epi/phdepts/a_z.html
- Wisconsin—<https://www.dhs.wisconsin.gov/hai/surveillance-cre-using-nhsn.pdf>

Illinois—XDRO registry: <https://www.xdro.org/>

Partnerships

Utah—Healthcare Infection Prevention Governance Committee:

<http://health.utah.gov/epi/diseases/HAI/UHIP/>

Illinois—CRE Detect and Protect Campaign: https://www.xdro.org/img/CRE-campaign-Participant-memo-and-form_Final.pdf

Illinois—webinars for facility leadership: <http://www.idph.state.il.us/patientsafety/cre/webinars.htm>

Georgia—facility leadership letter of participation:

[https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/Final CRE Collaborative Provider Agreement.pdf](https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/Final_CRE_Collaborative_Provider_Agreement.pdf)

Oregon—investigative guidelines:

http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/ReportingCommunicableDisease/ReportingGuidelines/Documents/CRE_Iguide.pdf

Information Scan



Utah—patient transfer form: http://health.utah.gov/epi/diseases/HAI/resources/IC_transfer_form.pdf

Education and Training

Georgia—leadership meeting materials:

[https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/Leadership Meeting Combined Materials.pdf](https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/Leadership_Meeting_Combined_Materials.pdf)

Illinois—webinars for facilities, laboratories, and local health departments:

<http://www.idph.state.il.us/patientsafety/cre/webinars.htm>

Georgia—training on interpreting lab reports:

[https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/Dr. Stone Interacting with your laboratory colleagues.pdf](https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/Dr._Stone_Interacting_with_your_laboratory_colleagues.pdf)

Wisconsin—CRE toolkit: <https://www.dhs.wisconsin.gov/publications/p0/p00532a.pdf>