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Major Article

Forming a successful public health collaborative: A qualitative study

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Background: Coordinated approaches are needed to optimally control the spread of resistant organisms across facilities that share patients. Our goal was to understand social tensions that may inhibit public health–led community partnerships and to identify factors for success.

Methods: A collaborative to control transmission of multidrug-resistant organisms (MDROs) was formed in Utah following a regional outbreak, with members from public health, hospitals, laboratories, and transport services. We conducted and qualitatively analyzed 3 focus groups among collaborative stakeholders to discuss their experiences.

Results: Via 3 focus groups and additional interviews, we found the collaborative made institutional tensions between stakeholders explicit. We identified 4 factors that facilitated the ability to overcome institutional tensions: public health leadership to establish a safe space, creation of cross-institutional group identity with mutual respect and support, standardized communication, and group cohesiveness through shared mental models of interdependencies.

Discussion: Stakeholders' concerns regarding being blamed for MDRO transmission versus contributing to shared health care community MDRO control efforts resembled a "prisoner's dilemma." Four social components mitigated tensions and facilitated cooperation in this public health–led collaborative.

Conclusions: This study identified strategies that public health-led coordinated approaches can use to facilitate cooperation.

Antibiotic resistance is a significant and growing public health issue. Multidrug-resistant organisms (MDROs) can travel widely across the health care continuum as patients move from 1 health care setting to another.[1] Regional coordinated approaches may be the best method for preventing the spread of resistant organisms across facilities.[2] Although most collaboratives focus on reducing infections and championing best practices *within* facilities, public health–led collaboratives to prevent regional MDRO transmission must engage and implement best practices *across* facilities.

Studies of state- and country-led collaboratives to prevent pathogen transmission have been published, and their methods have varied.[3-5] Israel successfully controlled the spread of carbapenem-resistant Enterobacteriaceae (CRE) with a national "top-down" approach mandating robust infection control and surveillance.[4,5] The spread of CRE across Indiana and Illinois in 2008 was identified through molecular epidemiology and social network analysis.[1] Others have used a modified network analysis to promote coordinated efforts by facilities and public health.[5] Rural settings in South Dakota fostered transparent hospital and public health relationships to curb CRE transmission in 2012 with surveillance, communication, and antimicrobial stewardship.[6]

Despite successes in reducing community MDRO transmission, there has been little focus on the factors that mediate the success of collaborations that include different and competing health care stakeholders. In the context of controlling the transmission of MDROs across health care systems, individual health care facilities face many unique conflicts, from sharing limited resources to potential reputational risks to loss of business from referring facilities. Such tensions between the short-term interests of individual actors and the long-term public

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good—sometimes referred to as "social dilemmas"—require careful institution-building to address.[7,8]

Our objective was to conduct a qualitative study to explore how an effective public health–led collaborative to reduce regional MDRO transmission overcame challenges.

METHODS

The methods are presented here in 3 parts: (1) the context and creation of the Utah Collaborative for Regional MDRO Prevention (hereafter referred to as the Collaborative), (2) the tools developed as part of the Collaborative, and (3) the qualitative methods and procedures for the evaluation.

Context and overview of the Collaborative

In 2009, Utah experienced a multifacility outbreak of carbapenem-resistant *Acinetobacter* (CRA) that highlighted the importance of communicating information about resistant organisms to public health and transfer facilities. Regional transmission of CRA led to the creation of the Collaborative (Fig 1). Prior to this, public health and the wider health care community might only learn about the spread of select MDROs such as CRA via voluntary disclosure by individual facilities, as there was no mandate to report. The goals of the Collaborative were to establish standardized communication regarding the infectious status of shared patients at facility transfer and regional situational awareness of CRE/CRA. In 2012, the Utah Department of Health (UDOH) sought and received funding to compensate facilities—from acute to long-term care—to engage in a multidisciplinary group with public health, transport services, and laboratories for regional MDRO control. This article reports their experience.

Tools developed during the Collaborative

After mandated CRA/CRE reporting was added as a legislative rule in 2013 at the request of infection preventionists,[9] data elements for a transfer form (which can be viewed at http://health.utah.gov/epi/diseases/HAI/resources/Interfacility_Transfer_Form.pdf) were agreed upon to standardize communication. Health care personnel with a role in communicating standardized information regarding infectious status during patient transfer—such as medical transport personnel—were identified. Infection prevention practices that included risk considerations across different institutional care processes were also disseminated. To increase shared awareness and improve detection of aberrations, informatics tools were used to create exposure network graphs that could alert public health officials to potential outbreaks[1] (Fig 2).

Qualitative evaluation of the Collaborative

The experience of participants through the CRA outbreak and the Collaborative experience from 2009-2014 were evaluated using focus groups and semi-structured interviews.

Study design and participants

We conducted 3 focus groups between September-December 2016 with the goal of identifying effective public health and community partnership strategies. Fourteen Collaborative members (out of the original 45 members) agreed to participate and gave informed consent. Participants included state and local public health epidemiologists, infection preventionists, nurses, physicians, administrators, a housekeeping services manager, an emergency medical transport supervisor, a laboratory director, and health–care facility stakeholders from both acute and long-term acute care (LTAC) hospitals. Each focus group was constructed with the goal of maximizing diversity. Follow-up single-subject interviews were conducted by phone using a semi-structured approach (n = 5). These interviews served to extend and validate the results from the focus groups. Institutional review boards approved all procedures. No direct compensation was offered, but participation included a light meal.

Procedures and data collection

Focus groups were facilitated by an experienced investigator and an assistant using the following rules for conducting focus groups: (1) clear statement of purpose and use of a script; (2) minimization of status differences; (3) moderating processes that minimize argument or cross-talk; (4) frequent reminders to participants that their contribution is important; (5) strategies to encourage equal participation, such as "go-arounds"; and (6) periodic summarization of content to confirm contributors' points.[10,11] After an introduction to the group, a conversation to break the ice was held and the purpose of the study explained. A script was developed by the author group and included questions to elicit information about stakeholders' experiences, perceptions, and beliefs regarding the functioning of the Collaborative. Focus groups lasted 75 minutes in total and were recorded and transcribed with identifying information removed.

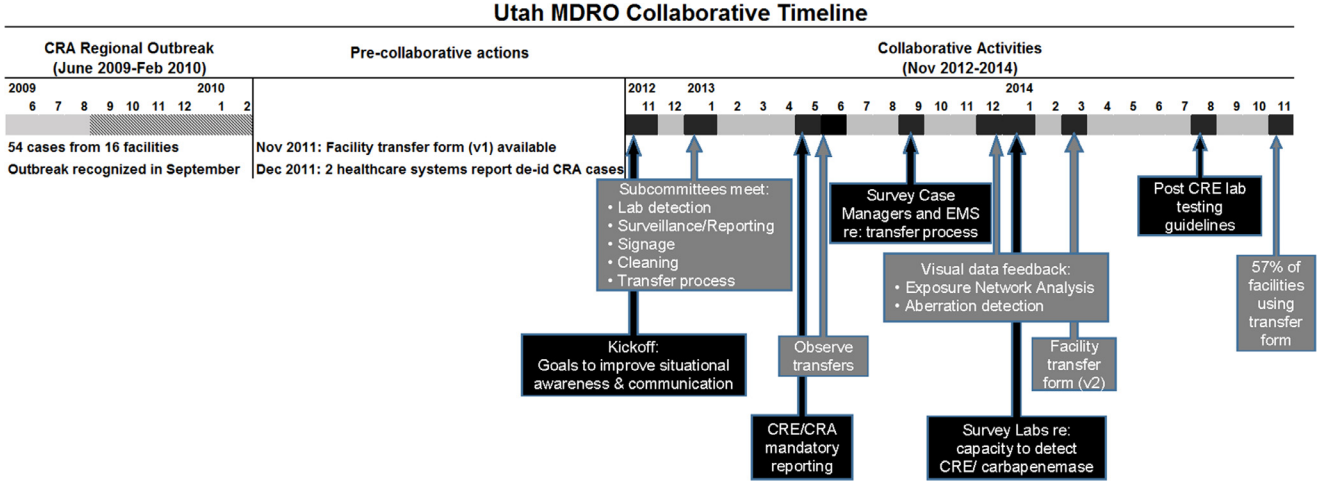

Fig 1. Timeline of the Utah MDRO Collaborative, including the impetus from the initial outbreak. *CRA*, carbapenem-resistant *Acinetobacter*; *CRE*, carbapenem-resistant Enterobacteriaceae; de-id; de-identified; *EMS*, emergency medical services; *MDRO*, multidrug-resistant organism.

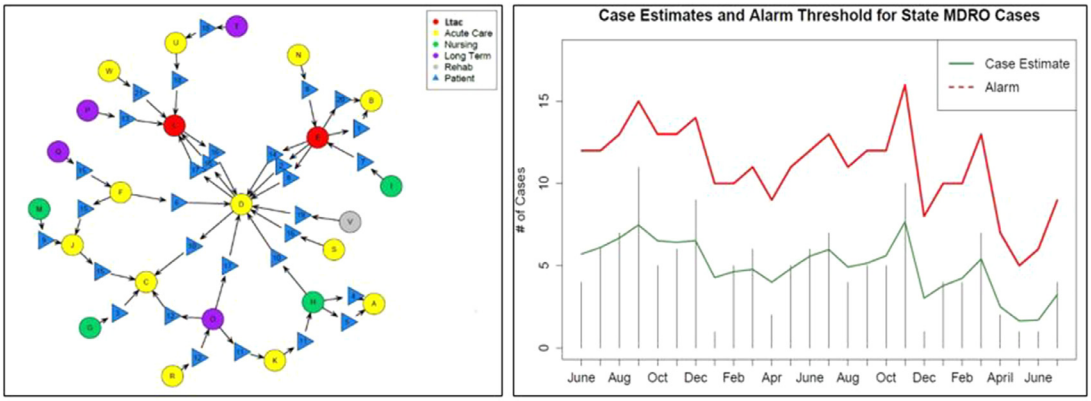

Fig 2. Data visualization tools created during the Collaborative. *CRA*, carbapenem-resistant *Acinetobacter*; *LTAC*, long-term acute care; *MDRO*, multidrug-resistant organism; *rehab*, rehabilitation.

Data analysis

Qualitative analysis used a modified version of grounded theory with the goal of identifying emergent constructs.[12] Initially, multiple reviewers independently reviewed the text, identifying key concepts using "precodes." The precodes were iteratively discussed across many meetings until agreement was achieved on constructs. The constructs and their associated quotations were again reviewed through discussion to identify emergent themes. Further aggregation and analysis with discussion supported the emergence of salient themes.[13,14]

RESULTS

Five themes from the qualitative analysis are discussed below.

Theme 1: The Collaborative made interinstitutional tensions in regional MDRO coordination explicit

Participants identified 2 forms of tension pertaining to coordinating regional control of MDRO transmission. The first was the tension between the transparency to report infections for the larger public good and the potential risk to the reputation of their own institutions. It was clear that individual health care facilities felt blamed for MDRO outbreaks and had negative financial and reputational consequences. According to 1 LTAC epidemiologist, "The LTAC situation is so challenging and political. They depend on referral and feeder systems, so if [an acute-care facility] stands up and says, 'We don't like you, you're sending us all the patients [with MDRO],' the LTAC will wither away and die because it will choke them … Any of the hospitals know that." In addition, this LTAC epidemiologist went on to say, "Every hospital had their own set of patients with MDROs, and there was transmission going on at some level in their own hospitals. And so, when 3, 4 hospitals send patients to the LTAC, then the LTAC becomes 4X rather than 1X … At that point, people started openly blaming [the LTAC] to be the place where the transmission [took place]."

Second, participation in the Collaborative itself was a source of tension for infection preventionists, as they experienced conflicts juggling their normal duties with the extra Collaborative work. Some felt they were shortchanging their institutions, which led them to question their loyalties, and some resented the encroachment on their personal time. The conflict between allegiance to the facility and contributing to the overall community good was amplified if institution administrators failed to appreciate the additional resources needed for success. According to hospital infection control, "Every time I was involved with the Collaborative, it came at the expense of the hospital and my personal free time . . . That's my time with my family or hobbies, so I'm becoming more protective, and it comes out of years of doing all this extra stuff." In addition, "We haven't, even with all this work and all this history and all this collaboration we've done for many years, it hasn't translated into more help . . . You feel the passion, and then you have to start saying, 'I can't.'"

Theme 2: Public health leadership created a safe space by serving as a trusted broker to the Collaborative members

Although stakeholders shared a common goal of preventing the spread of infections, competition and logistical challenges persisted. Public health helped by reaching out to Collaborative members as a neutral, nonjudgmental partner and trusted broker. Because the health department convened meetings and aggregated data in a nonaccusatory manner, they created a structure for listening to all stakeholders' challenges and requests. As a result, individual facilities became increasingly transparent, with less fear of being "scapegoated." According to 1 LTAC MD, "What helped us [is] the state became sort of an honest broker and a mediator [others agree]—because you know there's competition among the systems . . ." As stated by UDOH, "At the health department, we're sort of a convener that's trying to get everyone to collaborate, so I think we're sort of the glue in a way that tries to put things in a neutral setting . . . And to sort of smooth out that competitive aspect—in other words to get people to work together for the common good. We see that as our role."

Theme 3: A cross-institutional group identity emerged with high levels of mutual empathy and support

Participants from different health care roles and systems reported a camaraderie and sense of "groupiness," with less finger-pointing and more transparency and empathy. Members remarked that ongoing face-to-face meetings were important for maintaining a personal connection. According to hospital infection control, "One of the most important things that the Collaborative did was it really put everybody on the same team . . . It's a very blameless culture . . . It's a place to get help, not to be worried about what others know about what's going on in your facility." In addition, "We want to help each other . . . [Acute care facility E] tried to have some relationships with some long-term care facilities, but … [the long-term care] staff was

changing so fast, lots of times they didn't have infection control at all." As stated by the local health department, "From my perspective, the facilities, seeing the challenges they run into has been really helpful for me because I'm not working in those types of settings and I don't see those types of challenges. I think it's been helpful to develop that bond."

A sense of mutual responsibility was a necessary component of "groupiness," and led infection preventionists from large health care systems to feel it was their duty to assist smaller rural and long-term care facilities.

Theme 4: Standardizing communication was challenging but necessary for drawing attention to the infectious status of patients as they moved across health care facilities

Members reported breakdowns in communicating infectious status of patients transferred across sites. Participants noted key information was often not available, especially if access to the sending facility's medical record system was limited. Staff and providers did not always recognize the key data to share, and there were testing delays or differences in defining resistant organisms. Facilities sharing patients often had different electronic record systems with obstacles to communication, and printed information got lost during a transfer. According to hospital infection control, "If you are receiving a patient from maybe a skilled facility that doesn't have electronic documentation . . . you're not given the whole back picture." In addition, according to the local health department, "It may be several days before we're notified of a patient's actual culture with resistance results . . . then ensuring that facilities are notified and are aware and are taking precautions."

Members standardized information flow by developing a transfer form and by encouraging transporters to ask for and pass on infection data. The form reinforced the information important to exchange, such as MDRO status, symptoms, and precautions. Members noted that information exchange posed a differential burden across institutions, and although the form was promoted, its use was not mandated, and implementation varied across facilities. As stated by UDOH, "Every facility is sort of different in the way that they do things, and it's hard to add one more form to that and get people to use it regularly. I mean it's not that it's a difficult form, but to get all the people to use it the right way . . . It's complicated . . . We have to figure out other ways to notify facilities of these people that's [*sic*] easier for workflow."

Theme 5: Group cohesiveness required a shared mental model of stakeholders' mutual dependencies

At the outset, even though it was recognized that cooperation was necessary and beneficial for all, participants acknowledged they sometimes had a "hunkered down" attitude. Stakeholders admitted they blamed—and even feared—other facilities for the resistance problem. This changed when the state health department created exposure network diagrams illustrating the multiple facility connections with regional transmission of resistant bacteria (Fig 1). These graphics gave stakeholders a visual "big picture" of the extent to which MDRO patients were shared across all types of facilities. Participants recalled their "eureka" moment when they realized their previous approach to preventing infections was so limited. According to hospital infection control, "A lot of people were actually surprised. I was, when I looked at the diagram, of the number of interfacility transfers that went from [facility D] to the care center . . . to [facility H] back to the care center . . . I don't think we realized the extent of the movement because we always think, well, certain care centers only accepted patients from certain hospitals, when, in fact, it was all over the place." In addition, "The openness of flow of information takes the stigma away from facilities struggling with an issue; they are free to ask for help and guidance."

DISCUSSION

Our study identified the complexity of how collaboratives develop and what mechanisms may be important when creating a regional public health–led collaborative. First, stakeholders confirmed that they faced a social dilemma regarding information-sharing about their facility's role in MDRO outbreaks. We found that interfacility support, formation of a group identity, standardizing methods to communicate, shared mental models, and leadership by an impartial trusted broker were key to mitigating interinstitutional tensions and creating a successful public health–led collaborative.

Prior to the Collaborative, the regional community of health care systems resembled a complex version of the "prisoner's dilemma."[15] Mutual cooperation via information sharing would have facilitated optimal regional MDRO control, but transparency on the part of individual actors carried no guarantee of reciprocity from others in the health care system and came with reputational and financial risks. Mutual noncooperation constituted a "middle path" that avoided the consequences of being identified as a source of MDRO transmission while also forgoing the benefits of information-sharing.

The Utah Collaborative's experiences are congruent with classic arguments in the social dilemma literature.[2,16,17] Some research in this area has found that the most effective and cooperative institution-building emerges from the bottom up rather than the top down.[16-18] This matches the Collaborative participants' expressed attitudes of collegiality and desire to work together to limit infection transmission, which only increased over time as members got to personally know and trust each other. Significantly, participants still found value in the Collaborative despite an increase in workload without an appropriate corresponding increase in resources from their institutions or external funding for MDRO-related activities. In addition, the literature also suggests that punishment for violating norms can improve collaboration.[19] Mandatory reporting of health care–associated infections not only requires that institutions report to avoid financial and compliance penalties but may also motivate participation in collaboratives to improve high infection rates.

Communication is crucial for fostering trust and for ensuring that collaboratives operate effectively.[7,20,21] Knowledge sharing is key to the success of collaboratives in general. The incentive to share information varies as a function of social motivation (pro-self vs pro-community).[22] Pro-community social motivation is enhanced through accountability and an increased emphasis on shared outcomes. The work of the Collaborative evolved to emphasize accountability through transparent mandatory reporting and by showing all facility stakeholders the extensive movement of patients across systems, as illustrated in the exposure network graphs. The result was an increased awareness of shared outcomes. This effect of shared information is also supported by research in the area of motivated information process in groups, which identifies 2 categories of group motivation that are present in every group interaction: social interaction and knowledge sharing.[23] Effective group processing involves addressing both social motivation (social group processing and bonding) and information needs to improve group decision-making.[23,24]

"Meta-information" regarding what others know, who is responsible, and where resources are delivered is a vital component of group knowledge. Such knowledge allows members to minimize effort: they do not have to know everything themselves, but instead simply remember who knows how to perform a specific task.[25] This kind of knowledge emerges as groups

become more cohesive and mature, a process evident in the development of the Utah Collaborative.

Public health leadership was critical to the success of the Collaborative. The willingness of public health to learn about and experience challenges faced by health care personnel encouraged transparency from community partners. In addition to acquiring funding, important functions performed by public health included sharing of MDRO information across facilities in a nonadversarial manner, providing targeted education on feasible infection prevention practices in the appropriate health care setting, and creating social network graphics to visually describe collective MDRO transmission. In these activities, the health department served as an important knowledge source and a neutral, supportive facilitator.

CONCLUSIONS

The success of health care system–wide MDRO management can be threatened by the variety of social dilemmas faced by individual facilities, each of which must weigh the benefits of cooperation against the reputational and financial costs of full transparency about outbreaks. Enhancing participants' social motivation and knowledge sharing needs is important for resolving these social tensions. Public health agencies play a critical role in providing a safe space for community stakeholders to collaborate and in creating strong information environments (eg, provision of data to stakeholders). Other crucial components that should be considered when establishing a public health–led collaborative include acting to create a group identity, standardizing communication strategies, and encouraging group cohesiveness with shared mental models of stakeholder interdependencies.

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