Qualitative Assessment of a State Partner-Facilitated Health Care–Associated Infection Prevention National Collaborative

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Background: The Centers for Disease Control and Prevention (CDC) funded a 3-year national collaborative focused on facilitating relationships between health care–associated infection (HAI) prevention stakeholders within states and improving HAI prevention activities within hospitals. This program—STRIVE (States Targeting Reduction in Infections via Engagement)—targeted hospitals with elevated rates of common HAI's.

Objective: To use qualitative methods to better understand STRIVE’s effect on state partner relationships and HAI prevention efforts by hospitals.

Design: Qualitative case study, by U.S. state.

Setting: 7 of 22 eligible STRIVE state partnerships.

Participants: Representatives from state hospital associations, state health departments, and other participating organizations (for example, Quality Innovation Networks–Quality Improvement Organizations), referred to as “state partners.”

Measurements: Phone interviews (n = 17) with each organization were conducted, recorded, and transcribed.

Results: State partners reported that relationships with each other and with participating hospitals improved through STRIVE participation. The partners saw improvements in hospital-level HAI prevention activities, such as improved auditing and feedback practices and inclusion of environmental services in prevention efforts; however, some noted those improvements may not be reflected in HAI rates. Many partners outlined plans to sustain their partner relationships by working on future state-level initiatives, such as opioid abuse prevention and antimicrobial stewardship.

Limitation: Only 7 participating states were included; direct feedback from participating hospitals was not available.

Conclusion: Although there were no substantial changes in aggregate HAI rates, STRIVE achieved its goal of improving state partner relationships and coordination. This improved collaboration may lead to a more streamlined response to future HAI outbreaks and public health emergencies.

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See also:
Web-Only Supplement


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findings—as were found in STRIVE—and provide insight that can be used to enhance future initiatives (6). Therefore, in this study, we conducted a qualitative evaluation to better understand how STRIVE affected state-level partnerships and collaborative efforts; the effect of STRIVE at the hospital level; and plans for sustainability of STRIVE, including possible effects on future HAI prevention and other public health efforts.

**Methods**

**STRIVE Overview and Interventions**

The Health Research & Educational Trust (the research arm of the American Hospital Association) was the national coordinator of the STRIVE initiative, collaborating with subject-matter experts to provide education and support to participating states. The SHAs were recruited as the leads for STRIVE activities in their states. The SHAs were asked to create, develop, or enhance any current partnerships with their SHD and, if applicable, other organizations. Some states had 3 partners participate in STRIVE: the SHA, an SHD, and a QIN-QIO. However, in 2016, CMS refocused the work of the QIN-QIOs, and they were no longer as involved in infection prevention activities (7). As a result, the majority of SHAs collaborated primarily with their SHD.

These state partners worked with participating acute care hospitals, critical access hospitals, and long-term acute care hospitals with elevated HAIs to improve implementation of infection prevention and control practices. Hospitals could focus on any of the 4 targeted HAIs during the STRIVE program. The organization and specific interventions promoted through STRIVE are outlined in Appendix Figure 1 (available at Annals.org) and described in detail elsewhere (1, 8–12). A key component of STRIVE was the use of gap assessment tools, such as the Infection Control Assessment and Response (ICAR) (13) and Practice Change Assessment (PCA), to help hospitals focus their improvement activities. The PCA is a shortened version of the ICAR and was developed specifically for use in STRIVE. See part I of the Supplement (available at Annals.org) for further description of the ICAR and PCA.

**Study Design**

We conducted this qualitative case study analysis to provide context to and supplement the quantitative findings of STRIVE. Within-case and cross-case analyses (14) were conducted to answer 3 research questions:

1. How did state partners describe the alignment and coordination of their HAI efforts under the STRIVE program?
2. From the point of view of state partners, what effect did this program have on hospital efforts to improve HAI prevention? And why?
3. What actions were the state partners taking toward sustainment of STRIVE and for other future initiatives?

One multistate hospital group participated in the STRIVE program but was excluded from this evaluation because of differences in partnership structure. We used purposeful sampling to select 7 of the remaining 22 eligible states from cohorts 2, 3, and 4 in an attempt to include 1) high-, neutral-, and low-performing states on the basis of HAI data, and 2) states with varied types of participating facilities (acute care hospitals, long-term acute care hospitals, and critical access hospitals). To determine state HAI performance level, C difficile infection rates available at the time of selection in April 2018 were reviewed because C difficile was an improvement target for most STRIVE hospitals. However, this variability in performance was no longer present once the full 12 months of outcome data were collected. This analysis focused on states in cohorts 3 and 4 of STRIVE because they had completed or would complete the project closest to the time of evaluation. The subjects of this evaluation were the state partners.

**Data Collection and Analysis**

State partner representatives from the 7 selected states were recruited to participate in the interviews via email invitation and phone call. These representatives, typically organization leads in HAI prevention, were responsible for implementing STRIVE and interacted directly with the participating hospitals. Of 19 state partners contacted, 18 agreed to participate and completed a one-time telephone interview between April and June 2018. Because of technical difficulties, only 17 of the interviews were transcribed and included in this analysis. Each state partner organization was interviewed separately, and some interviews included more than 1 representative from each organization (for example, 2 SHD representatives). Semistructured interviews were used to elicit interviewees’ narratives in their own words while covering specified topics (15). The interview guide was developed by the research team based on the research questions and was pilot-tested with 2 state partners from cohort 2 (part II of the Supplement). Each interview was conducted by 2 of 4 coauthors (K.F., J.F., J.A., D.B.), was 45 to 60 minutes long, and was recorded and transcribed verbatim. Interview participants were informed that the interviewers were independent program evaluators and that they could speak freely and would not be identified in any reports on the project. Three of the 4 interviewers had training and experience with qualitative methods and had no prior contact with the interviewees. The fourth interviewer communicated with the state partners during the recruitment and scheduling process.

We used a qualitative content analysis approach with both deductive and inductive coding (16). A codebook (part III of the Supplement) was created a priori from the interview guide categories by 3 team members (K.F., J.F., J.A.), who met regularly to refine the codes and create new codes through inductive analysis. At least 2 team members coded each transcript and then compared codes and addressed any discrepancies. NVivo 12 (QSR International) software was used to organize the data and create code reports. Once all transcripts were coded, preliminary themes were generated. Using code reports, 2 of 3 team members (K.F., J.F., J.A.) wrote a summary report for each state, organ-
nized by selected codes. These state summaries were then used to create a matrix summarizing main findings by state and code (17). This matrix was then reviewed by 4 team members (K.F., J.F., J.A., J.M.) to identify the main findings from this evaluation.

Other data sources, such as state partner quarterly self-report responses and general hospital characteristics, were used to compare the selected states to those that were not interviewed.

These interviews were conducted as part of a quality improvement project reviewed by the University of Michigan Medical School Institutional Review Board and were determined to not meet the definition of human subjects research.

**Role of the Funding Source**

This study was funded by the CDC via a contract that specified the program objectives, deliverables, and general project oversight. The CDC had no role in the design, writing, or analysis of this article.

**RESULTS**

The Table summarizes the U.S. census region, interviews performed, and hospital types for the 7 states included in this evaluation. The states selected to participate were similar to those not selected, on the basis of quarterly self-report responses and participating hospital types within each state. Because final quantitative results showed that all but 1 state had no change in *C. difficile* infection rates pre- to post-STRIVE, we did not analyze differences between states with varying HAI performance level. The STRIVE state partner roles identified during interviews are shown in Appendix Figure 2 (available at Annals.org). The main findings were grouped into 3 main categories based on the research questions we were attempting to answer: the effect of STRIVE on state partner alignment in HAI prevention; STRIVE partnership influence on hospitals’ HAI efforts; and the sustainment of STRIVE and its effect on future state-level HAI efforts and other public health initiatives. See part IV of the Supplement for a list of themes and supporting quotes.

**Effect of STRIVE on State Partner Alignment in HAI Prevention**

State partners largely described successes regarding state partner alignment in HAI prevention but also noted some challenges. The most prominent success was STRIVE’s role in strengthening relationships among state partners. Although state partners’ relationships before STRIVE were varied—some strong and longstanding, others tenuous and, in 1 state, strained—most reported that STRIVE resulted in increased communication and improvement in their relationships that had real effects on their work with participating hospitals. In particular, STRIVE facilitated improvement in coordination among partners, enhancing their understanding of each other’s expertise and resources. For example, before STRIVE, many SHAs were not familiar with the SHD’s use of the CDC’s Targeted Assessment for Prevention (TAP) strategy to assist hospitals with HAI prevention (19). Improved understanding allowed partners to provide coordinated support to hospitals and reduce duplicated effort. One partner reported, “When we can all work together, it’s just a more united effort, more resources, more brains. You don’t have to know everything, just know somebody who knows how to do it” (SHD, state 6).

Conducting STRIVE hospital site visits provided an opportunity for sustained in-person interaction among state partners. However, there was variability across states in how many partners attended these site visits. States that were able to conduct site visits as a team noted that the site visits not only enhanced their work with hospitals, but also enhanced the partners’ relationship. One interviewee put it this way: “[The site visits were] a good opportunity for us because anywhere you go, any of the hospitals here, it’s a long drive. It’s a chance for you to talk, get to know each other, and find out more about other programs that are going on that we might have in common” (SHA, state 4). Because of logistical difficulties, some states sent only 1 partner on most of their site visits and did not achieve the same benefit as those that conducted them jointly.

The main challenges to state partner alignment were barriers to data sharing among partners, competing priorities, and limited QIN–QIO involvement. In states with legal restrictions on data sharing to protect hospitals from public release of the ICAR reports, partners were stymied and frustrated. Much time and effort was spent to find work-arounds so that the ICAR report could be shared with the partners. One state noted,

**Table.** Characteristics of States Selected for State Partner Interviews

<table>
<thead>
<tr>
<th>State</th>
<th>U.S. Census Regions*</th>
<th>Interviews, n</th>
<th>Participating Hospital Types, n</th>
<th>Total Hospitals, n</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Acute Care</td>
<td>Critical Access</td>
</tr>
<tr>
<td>1</td>
<td>South</td>
<td>3</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>South</td>
<td>2</td>
<td>36</td>
<td>1</td>
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<td>3</td>
<td>South</td>
<td>3</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>South</td>
<td>2</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>Midwest</td>
<td>2</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>West</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Midwest</td>
<td>3</td>
<td>14</td>
<td>0</td>
</tr>
</tbody>
</table>

* Regions as defined by the U.S. Census Bureau (18).
“We thought very creatively on how to share data, but also not violate state law” (SHD, state 1).

Competing priorities directly affected how closely state partners worked together as a team. For example, some SHDs did not have the time to participate in site visits: “So, you can imagine the time difficulties when we were investigating outbreaks and on call and all those other things, too” (SHD, state 5).

Participation of QIN-QIOs as full partners was hampered in a few states by funding difficulties. In these states, QIN-QIOs either did not participate or participated as consultants or subcontractors to 1 of the other partners, thus limiting their contributions. Lamenting limited QIN-QIO involvement, an SHD representative described the resulting gap it left in the project, “Having the [QIN-QIO] have the ability to join us on ICAR visits as well would’ve been extremely helpful, because of their wealth of knowledge about infection control and then as well how that affects their meeting CMS guidelines” (SHD, state 5).

STRIVE Partnership Influence on Hospitals’ HAI Efforts

The state partners reported improvements in their relationship with hospitals and in hospital infection prevention practices that they believed may not be represented in aggregate infection rates. Partners mentioned individual successes at hospitals, such as including environmental services and contractors in their infection prevention efforts, where they had previously been excluded. Interviewees also noted that some hospitals made improvements with auditing and feedback for HAI prevention.

State partners reported that STRIVE in-person activities—site visits and annual state meetings—and the identification of gaps using the ICAR or PCA tools were beneficial to participating hospitals. The site visits, which typically focused on either conducting or providing feedback from the ICAR or PCA, were consistently praised. Simply being on site, face to face with hospital staff and leadership, helped build relationships. During joint visits, partners with differing expertise were on hand to answer questions, and hospitals began to see all of the partners, including the SHD, as a resource. Many partners noted that before STRIVE, the SHD was commonly viewed as a purely regulatory agency, which created fear and reluctance for hospitals to work with them. One SHD representative commented, “It’s gone from them being afraid of having the state [SHD] come in to look at their processes and their procedures to them calling and asking us, ‘When can you come back? We need you to look at this’” (SHD, state 4).

The ICAR and PCA were viewed as key resources for the hospitals, which aided in identifying gaps and creating plans for each facility to address. One partner said of using the PCA, “So, with STRIVE, I loved it, I loved it. It was an opportunity to get back into the hospitals and work with these folks. Help them identify their strengths and help identify their weaknesses” (SHA, state 3). Many states prepared binders or sent links to STRIVE educational materials based on the gaps identified during the ICAR/PCA assessments. Interactions during the site visits with hospital leadership and staff, and the ICAR/PCA results helped hospitals obtain support for the program. A few partners even mentioned that some facilities hired additional employees on the basis of participation in STRIVE and the ICAR/PCA feedback reports. For example, an SHD said, “That feedback report was a very condensed and simple way to identify what resources were needed for that facility. So, it didn’t just help the people on the facility side, but I think it was very well geared to sharing with corporate” (SHD, state 1).

In-person group meetings with hospitals were also viewed as beneficial. Many states held a meeting toward the end of the program where hospitals could share lessons learned and build relationships; and STRIVE subject-matter experts could provide education on key topics. One partner said, “I would have liked to see more in-person meetings . . . because I felt that it just created a really great environment of sharing and information” (SHD, state 6).

In general, partners reported that facilities where infection prevention was everyone’s responsibility were more successful. One partner put it this way: “Infection prevention is everybody’s job, not just the [infection preventionist]. The [infection preventionist] is just the leader of these activities, but it’s all our jobs to make sure that this is done every day. When they have that backup and that support, we saw that they were most effective” (SHD, state 6).

The state partners cited many common barriers that individual hospitals faced that affected the impact of the STRIVE program, including lack of leadership support, lack of champions, and competing priorities. One SHA representative described hospital barriers as follows: “Competing priorities, administrative support, not having a physician champion, and the [infection preventionists] sometimes [felt] that they needed to do everything. They didn’t really know how to engage support staff from the units, because they felt they were overwhelmed too, so I think those were some of the . . . challenges that the hospitals had” (SHA, state 6).

Sustainment of STRIVE and Its Effect on Future State-Level HAI Efforts and Other Public Health Initiatives

Many state partners said they would continue to work jointly on HAI and other efforts, such as opioid abuse prevention, antimicrobial stewardship, and promotion of the TAP strategy. Many mentioned they either had or would invite the other partners to future meetings on HAI topics. The partners felt much more prepared for any future quality challenges after participating in STRIVE. One SHA member said, “[STRIVE] really has inspired us to work more closely together. We have these separate programs going on, especially right now, opioid issues. We’ll definitely be moving forward together on this and other things” (SHA, state 4). The SHD in the same state also felt that STRIVE had better prepared them to deal with future issues: “. . . Simply having a contact in the hospital association
who is ready and willing to work with us without any trouble is a huge asset for collaboration” (SHD, state 4).

The partners also felt that the connections made with individual hospitals better prepared the state to deal with future HAI prevention activities. As an example, 1 SHD representative noted they were already seeing the benefits of STRIVE: “We actually had to go out to 1 facility with an outbreak. And so, we were familiar with their administrative team. They were very welcoming to us and anything that we needed, anything that we wanted to see, even being open about issues that they were aware of” (SHD, state 6).

**DISCUSSION**

Our qualitative data suggest that STRIVE helped strengthen relationships among the state partners. Partners reported that administration of the ICAR and PCA, especially as part of in-person site visits, was effective in identifying gaps and improving state partner–hospital relationships. In particular, STRIVE appears to have helped shift hospitals’ perception of SHDs as a regulatory body to a resource. Partners indicated that certain hospital barriers (for example, competing priorities) were difficult to address in the time frame of the program. However, state partners felt that there were improvements made in relationships with hospitals and in hospital HAI practices that may not be reflected in infection rates. The improved relationships among state partners and between the partners and individual hospitals potentially lays a stronger foundation for future HAI prevention and other public health initiatives.

Working on quality improvement projects is not new for the state partner organizations. Previous HAI quality improvement collaboratives have used a structure similar to STRIVE (20, 21), but improving partnerships was not a priority. Other initiatives have shown some benefit by including multiple state-level stakeholders, such as a 4-state initiative to reduce avoidable hospital readmissions (22). The Institute for Healthcare Improvement launched the “100,000 Lives Campaign” in 2004, followed by the “5 Million Lives Campaign” in 2006, which included multiple state stakeholders to promote the rapid spread of effective health care interventions in U.S. hospitals (23, 24). Similar to our findings, they noted that regular communication and assignment of clear roles and responsibilities was beneficial, whereas overcoming complex relationships and competing interests of the participating organizations was a challenge (23). The STRIVE initiative attempted to address these challenges by focusing on enhancing the state partners’ relationship and coordination.

The STRIVE state partners credited face-to-face interactions with both the partners and the participating hospitals as a strength of the program. Similarly, Sell and colleagues (25) found through key informant interviews with emergency preparedness stakeholders that strong coordination and communication between state stakeholders and hospitals was vital, and that face-to-face interactions helped develop trusted relationships.

Barriers were encountered at both the state and hospital levels within STRIVE. For example, varying interpretation of confidentiality requirements was one important barrier that limited the SHDs’ ability to share ICAR findings with the other state partners. Because the ICAR aims to identify gaps, there was concern that release of the data could put hospitals at risk, as these are not intended to be publicly reported. The ICAR was a popular and effective tool in identifying gaps and building relationships with hospitals, but additional work is needed on how to share the data among appropriate parties to maximize its benefit, while minimizing the risk for public disclosure.

Well-known hospital-level barriers, such as time and resource limitations, competing priorities, lack of leadership support, and staff turnover (26, 27), probably contributed to the lack of improvement in HAI rates. However, partners reported that HAI prevention efforts improved at participating hospitals, even if those improvements did not result in substantial changes in infection rates during the program period.

Our study has limitations. We interviewed external facilitators of the program but were unable to talk with those directly responsible for implementing HAI prevention practices at the participating hospitals (Appendix Figure 1). Because of resource constraints, our qualitative analysis included 7 of the 22 eligible states that participated in STRIVE cohorts 2, 3, and 4. However, individual interviews with multiple state partners in each state provided multiple, independent perspectives. Although our analysis yielded robust findings suggesting data saturation, inclusion of more states may have yielded additional themes and subthemes. Finally, interview participants’ responses may have been influenced by social desirability bias. However, we mitigated this risk through nonleading, open-ended questions; explicit elicitation of problems and resource limitations, competing priorities, lack of leadership support, and staff turnover (26, 27), probably contributed to the lack of improvement in HAI rates. However, partners reported that HAI prevention efforts improved at participating hospitals, even if those improvements did not result in substantial changes in infection rates during the program period.

In conclusion, STRIVE successfully strengthened infrastructure to support HAI prevention and meet future public health challenges. Through STRIVE, state partners increased knowledge of each other’s expertise, decreased duplication of effort, and streamlined use of resources. Hospitals’ relationships with state partners—especially SHDs—were improved, which may help future collaboration and readiness for public health emergencies.

Affiliations, disclaimer, acknowledgment, financial support, disclosures, reproducible research statement, and author information are available at Annals.org.

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STRIVE Qualitative Evaluation

Disclaimer: The findings and conclusions in this report are those of the authors and do not represent the official position of the CDC, the American Hospital Association, or the Department of Veterans Affairs.

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Appendix Figure 1. STRIVE implementation design and intervention components.

Appendix Figure 2. STRIVE state partner roles identified in interviews.

ICAR = Infection Control Assessment and Response; LAF = Learning Action Forum; PCA = Practice Change Assessment; QIN-QIO = Quality Innovation Network-Quality Improvement Organization; SHA = state hospital association; SHD = state health department; STRIVE = States Targeting Reduction in Infections via Engagement.