

## Problem & PURPOSE

- Healthcare-associated infections (HAIs) are a leading cause of morbidity and mortality.
  - 1 of the top 3 adverse events that a patient may encounter in the U.S. health system (Haque et al., 2018).
- Inadequate hand hygiene (HH) compliance contributes to increased rates of HAIs leading to increased costs and poor patient outcomes (Mouajou et al., 2022).
  - Average HH rates:
    - 20% in low-income countries.
    - 40% in high-income countries including the U.S (Lotfinejad et al., 2021).
- PURPOSE:** Implement evidence-based strategies to increase hand hygiene compliance of healthcare workers in a rural critical access hospital in the Midwest region of the United States to reduce healthcare-associated infections.



## Available Knowledge & Rationale

- Multimodal Interventions:** Combining strategies such as staff education, visual/verbal reminders, alcohol-based hand rub (ABHR) availability, and performance feedback improves compliance and reduces HAIs (Gould et al., 2017; Han et al., 2021; Von Lengerke et al., 2017).
  - Sustainable Impact:** Multimodal approaches tailored with behavioral models led to significant reductions in HAIs including MRSA and VRE (Von Lengerke et al., 2019).
- Performance Feedback:** Both group and individual feedback methods significantly improved compliance, with simple email feedback increasing rates by 15% (From-Hansen et al., 2024), and goal-setting enhancing outcomes further (Diefenbacher et al., 2019).
- Nudge Theory Applications:** Visual prompts (e.g., posters), strategic placement of reminders, scents, and lights near hand hygiene stations increased compliance, highlighting the power of subtle behavioral cues (Elia et al., 2022; Podvratnik et al., 2024).
- Overall Effectiveness:** All studied interventions demonstrated improved hand hygiene compliance and some degree of HAI reduction, though cost and scalability vary by setting.

## Methods

### Context:

- Setting: 25-bed, rural critical access hospital in the Midwest Region of the U.S.
- Participants: Nursing (RN, LPN, NA) and Non-nursing (Providers, PT, OT, RT)
- HH compliance rates in 2024: 27% to 73%

**Intervention:** Multimodal intervention utilizing in-person education or staff and a poster campaign as a visual reminder in patient rooms.



## Methods Continued

### Study of Intervention:

- Study site charge nurses received in-person training on covert, direct observation of HH and use of paper documentation form.
  - Inter-rater reliability was assessed through controlled training opportunities.
- Observations were collected for 30 days prior and 30 days post-study intervention implementation.
  - 3 times per week observe 5 hand hygiene opportunities on both day and night shift during each 30-day period.

### Measures:

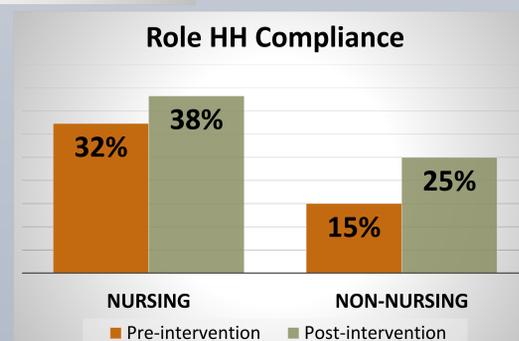
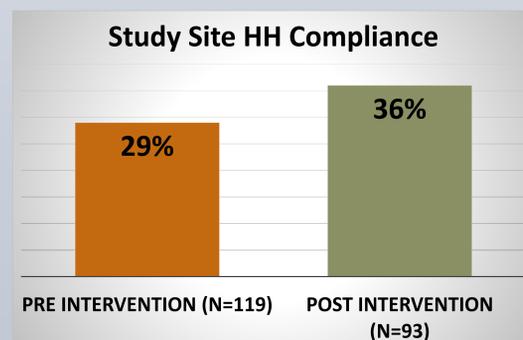
- Staff were measured as compliant if they performed HH both entering and exiting a patient room.
  - Data collected: date, shift (day or night), role of healthcare worker (nursing or non nursing), and HH compliance (yes or no)
- Study site Infection Preventionist performed chart reviews for total HAI numbers for CAUTI, MRSA, and *C. difficile* during the same 30 days prior and 30 days post-study intervention implementation.

## Data Analysis

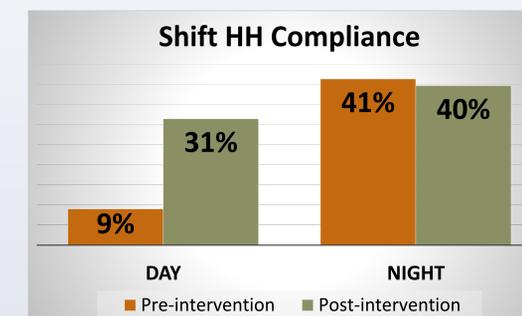
- Descriptive statistics to determine compliance rates among groups (study site, role, and shift)
- Inferential statistics to determine probability of compliance among groups
  - Logistic regression

## Results

Zero HAIs occurred during pre- and post-intervention periods of monitoring



## Results Continued



- Logistic regression showed significant effects for:
  - Intervention ( $p = .017$ )
  - Shift ( $p < .001$ )
  - Intervention  $\times$  Shift interaction ( $p = .029$ )
- Effectiveness of intervention differed by shift:
  - Day shift: Odds ratio of non-compliance decreased from 10 to 2
  - Night shift: Odds ratio of non-compliance remained similar (1.4 to 1.5)
- Findings highlight reduced effectiveness of the intervention during night shifts.

## Discussion

- Intervention was effective in changing behavior during the day shift.
- Visual reminders and education sessions were key drivers of behavior change, consistent with research emphasizing cues, intention, and goal-setting as effective strategies.
- No HAIs were reported during the project, which may reflect a maintained baseline of patient safety, but limits conclusions about HAI reduction.
- The low-resource, high-feasibility design (<\$100 in material costs) supports literature findings on cost-effective HAI prevention strategies.

### Key Limitations:

- Small sample size, short monitoring duration, and limited observer availability—common challenges in critical access hospitals.

## Conclusions

- A low-cost, multi-modal intervention led to measurable improvements in hand hygiene compliance with minimal resources.
- Day shift staff responded more positively, highlighting the need for shift-specific strategies.
- Visual reminders and brief, in-shift education effectively supported behavior change.
- Leadership support and ongoing feedback are key to sustaining compliance improvements.

**Impact of Project:** Promotion of a culture of safety, supporting better patient outcomes and reduced infection risk for patients, families, and staff.

## References

