Individual monitoring increases hand-hygiene compliance in multicenter registry utilizing badge-based locating technology

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Introduction/Background

- Healthcare-associated Infections (HAIs) are the most frequently reported hospital adverse event worldwide[1] and 1 in 25 patients develops an HAI during their stay in the hospital.[2]
- HAIs decrease patient safety, increase hospital costs, and can result in death.
- Caregivers hands are the most common source of transmitting HAI-causing pathogens[1] and evidence shows that an increase in hand-hygiene is associated with a decrease in HAIs.[3-8]
- Historically, Direct Observation has been the gold standard to monitor hospital hand-hygiene compliance rates but is subject to inaccuracies due to low number of events captured and the Hawthorne effect.
- Electronic badge-based hand-hygiene monitoring systems offer continuous monitoring of caregiver compliance and can provide real-time HH compliance reporting to caregivers and their managers.

Objectives

- Compare direct observation HH compliance rates to baseline rates using an electronic HH monitoring system.
- Evaluate impact of feedback method (Group Reporting or Individual Reporting) on caregiver HH compliance rates using an electronic monitoring system at multiple sites.
- Evaluate the impact of Group and Individual Reporting as a function of caregiver role overall and at room entry and exit.

Methods

- Ongoing registry style study with over 80 months of real-world HH compliance data from 3 hospitals collected using a badge-based electronic HH monitoring system that captures HH compliance at room entry and exit.
- To date, 3.8 million HH events and ~ 5 million HH opportunities have been recorded and analyzed.
- Baseline HH rates collected with the automated system (system recording but no feedback or education provided) were compared to rates determined by direct observation prior to system install.
- HH compliance feedback was first provided at the group level by caregiver function before transitioning to individual feedback.
- Method of feedback and dates of transition to Group and to Individual Reporting were determined by the sites and documented for the purposes of the study.
- Change management process, leadership, and culture change were championed by the sites and unique to each unit on the study.

TABLE 1.	Site 1	Site 2	Site 3
Types of Units	Medical-Surgery Unit Critical Care Unit	Medical-Surgery Unit	Medical-Surgery Unit Progressive Care Unit
HH System 'Rules'	• 30 sec 'wash in' (entry) • 30 sec 'wash out' (exit)	• 30 sec 'wash in' (entry) • 30 sec 'wash out' (exit)	• 45 sec 'wash in' (entry) • 45 sec 'wash out' (exit)
Direct Observation Method	• Hospital staff/light duty employees observed HH opportunities for variable # hours/month	• Hospital staff observed HH opportunities for ~ 2 hours/ month	• Hospital staff observed 50 HH opportunities/month
Group Reporting Method	• Caregiver function • Posted in employee area or presented at staff meetings	• Caregiver function • Posted in employee area monthly • Verbally presented at team meetings every other month	• Caregiver function • Posted in employee area weekly • Verbally presented at meetings and shift change huddles weekly
Individual Reporting Method	• Emailed to staff daily or weekly • Posted in employee area weekly • 1 on 1 coaching to low performers by leadership	• Emailed to staff weekly • 1 on 1 coaching to < 70% compliant staff by leadership	• Emailed to staff weekly • Posted in employee area weekly

Results

Direct Observation Data Not Representative of BL Compliance

TABLE 2. BASELINE % HH COMPLIANCE RATES: AUTOMATED SYSTEM COMPARED TO DIRECT OBSERVATION

	Site 1	Site 2	Site 3
Baseline with Automated system*	47.8%	50.5%	67.5%
Direct Observation^	88%	87%	92%

**HH solution system recording but no education or compliance feedback provided to caregivers.*
^ Mean rate 6 months prior to system install.

Baseline HH compliance rates (electronic HH system recording but no training or education provided to caregivers for 30 days) were compared to rates determined by direct observation (averaged across 6 months prior to HH system install). Each site demonstrated a large difference between the rates determined by the automated system and those reported by direct observation.

Individual Reporting Improves HH Compliance Over Group Reporting

GRAPH 1. PERCENT HH COMPLIANCE PER MONTH OVER TIME

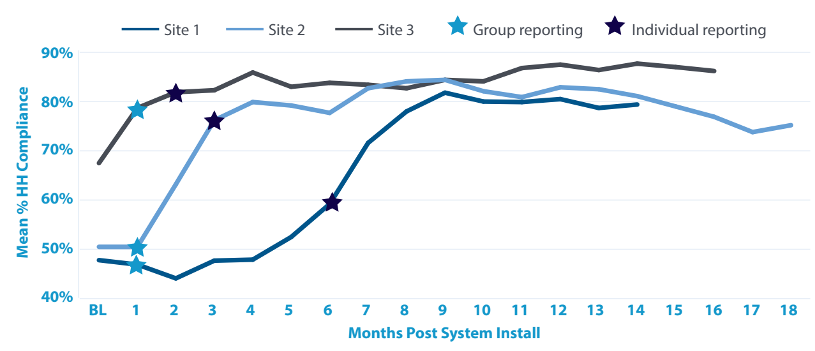


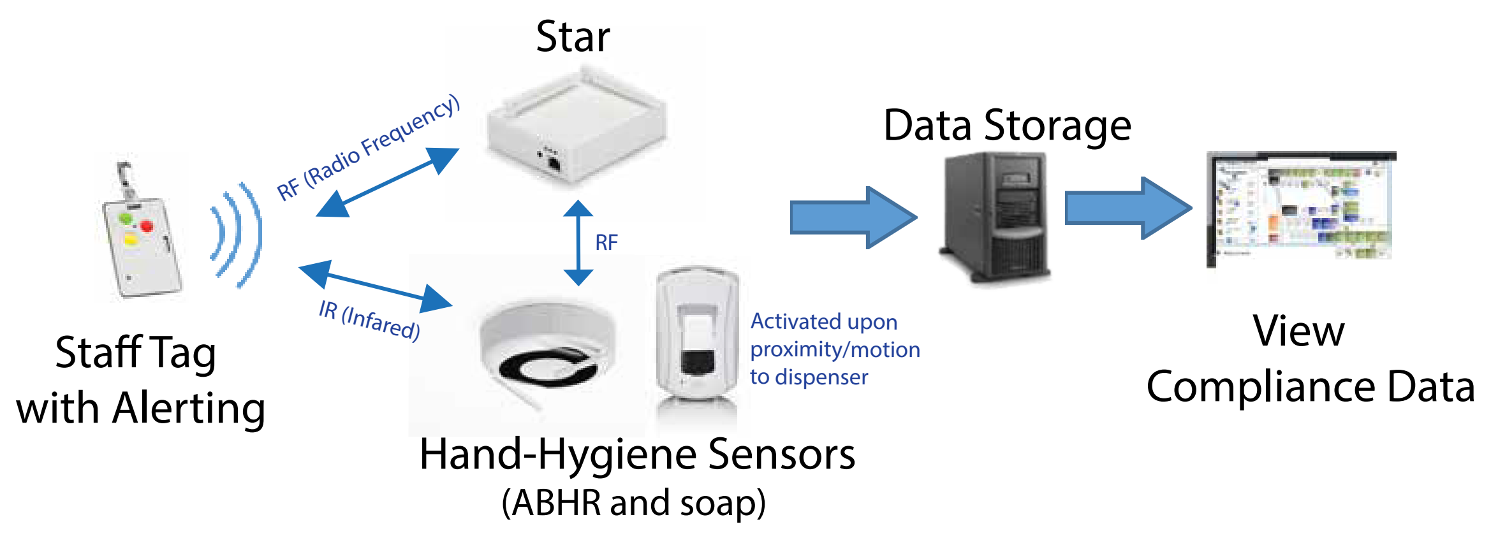
TABLE 3. AVERAGE HH COMPLIANCE PER REPORTING PERIOD

	Mean % HH Compliance
Baseline	57.4%
Group Reporting	60.1%
Individual Reporting	82.9%

**Aggregated across all three sites.*

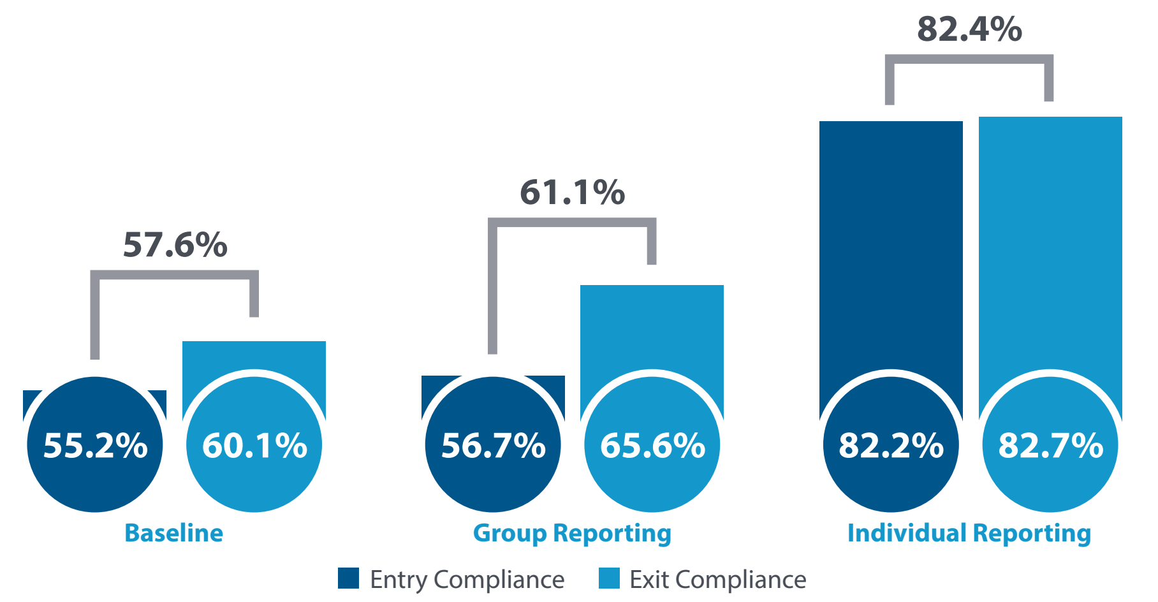
Individual Reporting shows greater improvement in caregiver HH compliance compared to Group Reporting. Graph 1 shows mean % HH compliance per month at each site following HH Solution system install. The Bright Blue star indicates when the site transitioned into Group Reporting (by caregiver functional role) and the Dark Blue star indicates when the site transitioned into Individual Reporting. Table 3 displays aggregated mean % HH compliance for each reporting period: Baseline, Group Reporting, and Individual Reporting.

FIGURE 1. ELECTRONIC MONITORING SYSTEM OVERVIEW



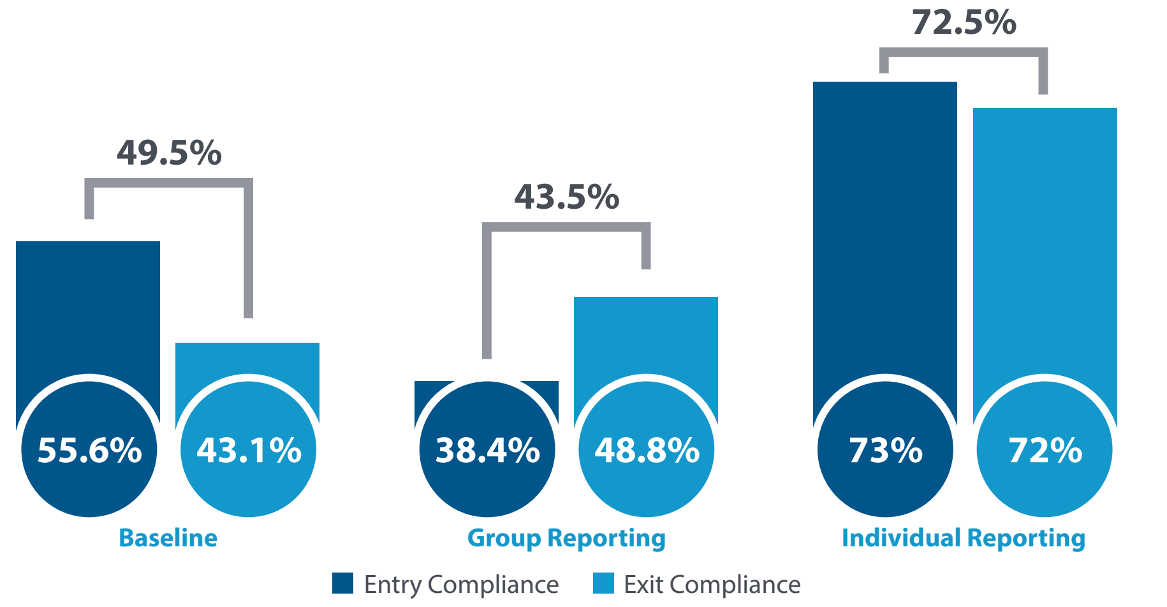
Individual Reporting Improves Nurse, Allied Health, and Other Patient Services HH Compliance at Room Entry and Exit

Nurse Compliance at Room Entry and Exit



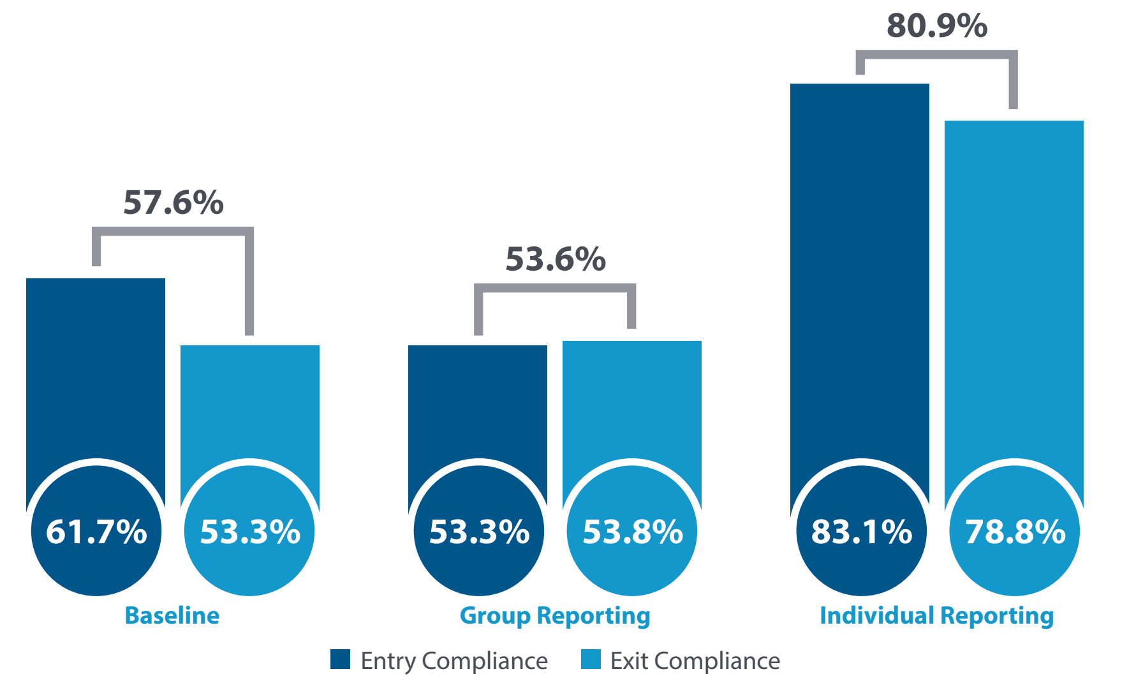
Mean % HH compliance for all Nurses. Individual Reporting resulted in the greatest increase in overall HH compliance (numbers in gray) and equalized room entry (dark blue) and exit (bright blue) compliance > 80% thus providing better protection overall and prior to care.

Allied Health Compliance at Room Entry and Exit



Mean % HH compliance for Allied Health (Respiratory/Occupational/Physical/Speech Therapist/ Radiology). Individual Reporting resulted in the greatest increase in overall HH compliance (numbers in gray) and better equalized room entry (dark blue) and exit (bright blue) compliance above 70%. With Individual Reporting, this category of caregivers demonstrated > 65% improvement in compliance compared to Group Reporting.

Other Patient Services Compliance at Room Entry and Exit

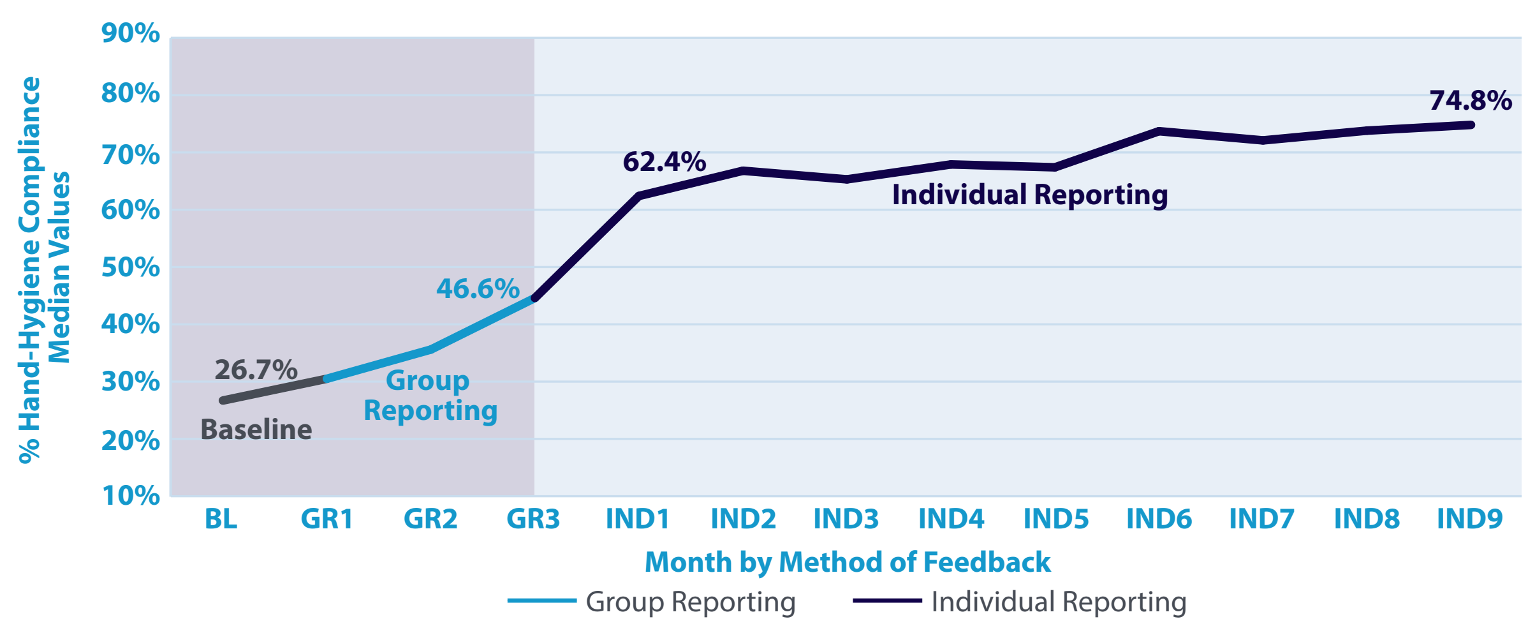


Mean % HH compliance for Other Patient Services (EVS Tech, HUC, USA, Transport, Surgical Services, Unit Secretary). Individual Reporting resulted in the greatest increase in overall HH compliance (numbers in gray) with overall compliance averaging over 80%.

Individual Reporting Targets the Lowest Compliant Caregivers

> 180% improvement over BL in the lowest compliant group with Individual Reporting.

Analysis of Caregivers with < 40% Compliance at Baseline*

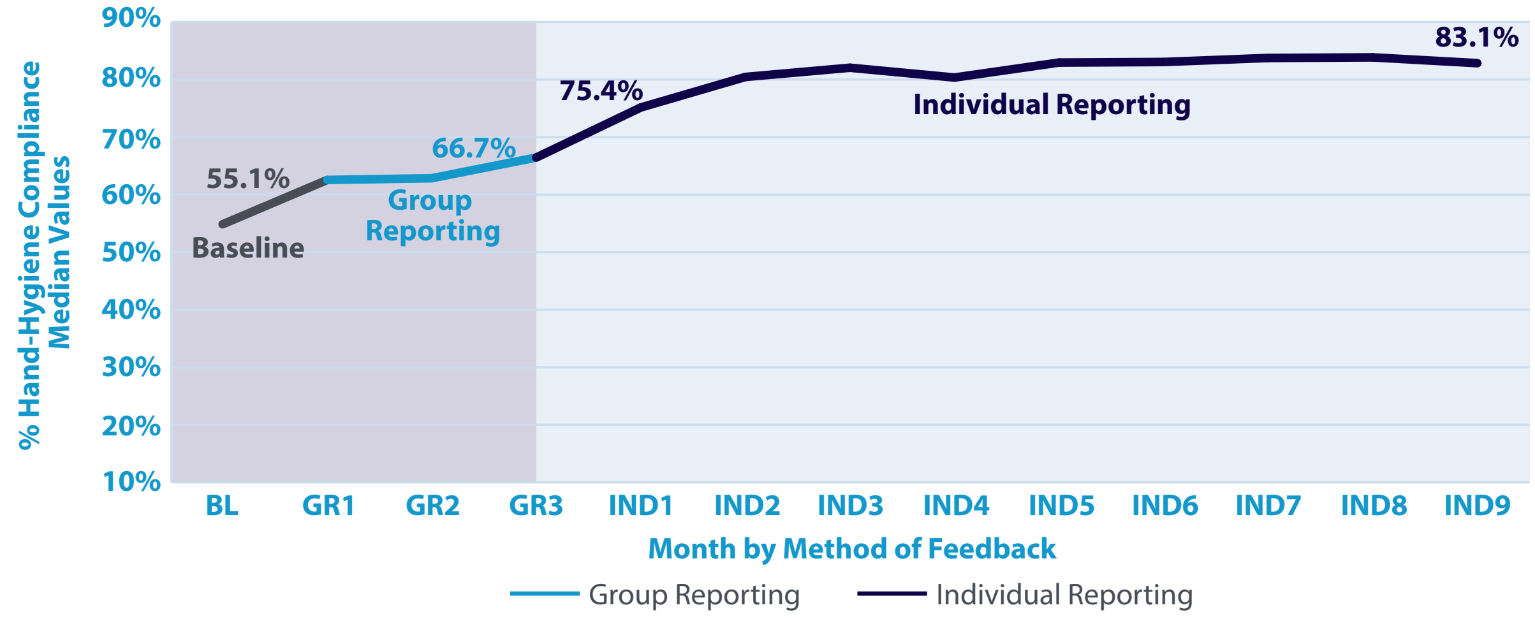


**Almost 1/3 of all caregivers were reporting below 40% at baseline.*

Individual Reporting Targets the Middle Compliant Caregivers

> 50% improvement over BL with Individual Reporting.

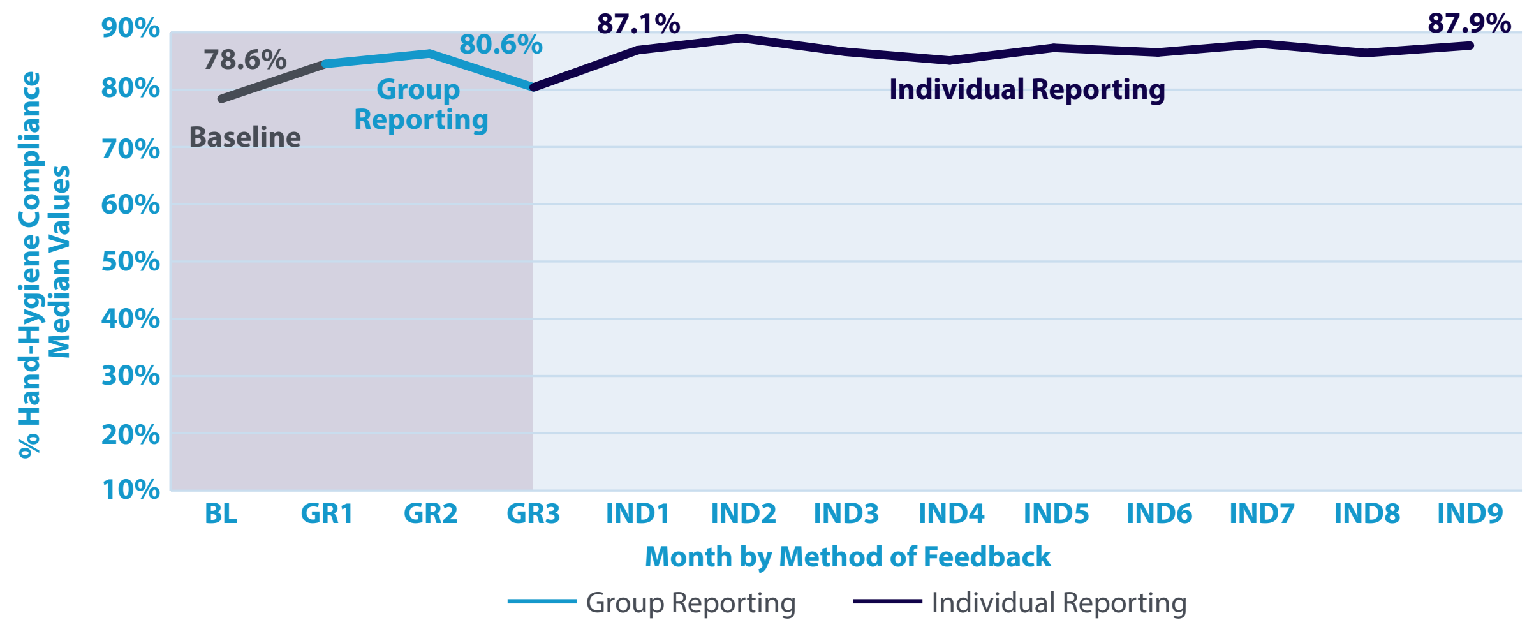
Analysis of Caregivers with > 40% but < 70% Compliance at Baseline



Individual Reporting Sustains the High Compliant Caregivers

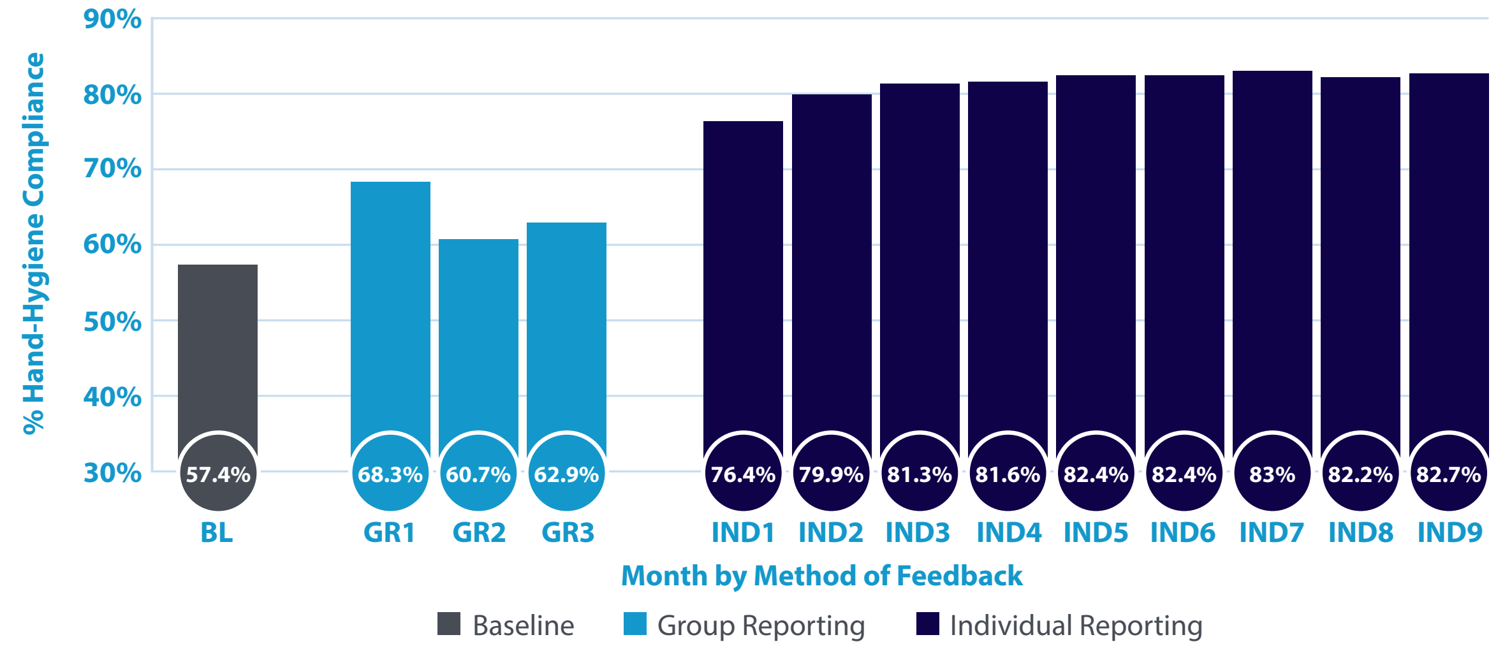
This group **improved and sustained > 80%** with both Group and Individual Reporting.

Analysis of Caregivers with > 70% Compliance at Baseline



HH Improvements Have Been Sustained Above 80% Since Month 3 of Individual Reporting

Hand-Hygiene Compliance by Reporting Period
Averaged Across All Sites



Conclusions

- HH compliance rates provided by Direct Observation did not accurately reflect BL rates.
- Caregivers provided feedback at the individual level demonstrated greater improvements in HH compliance compared to group feedback.
- Individual Reporting improved and equalized room entry and exit compliance providing better protection to patients compared to Group Reporting.
- Individual Reporting best targeted the lowest compliant caregivers (< 40% at baseline) and improved compliance > 180% over BL.
- Individual Reporting best targeted the mid compliant caregivers (> 40 but < 70%) and improved compliance > 50% over BL.
- Individual Reporting has increased and sustained HH compliance > 80%.

References

1. World Health Organization. WHO guidelines on hand hygiene in health care. Geneva, Switzerland: World Health Organization, 2009. OR http://www.who.int/gpsc/country_work/gpsc_ccisc_fact_sheet_en.pdf.
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7. Ancona RJ, Boehler R, Chapman LA. Sustained hand hygiene initiative reduces MRSA transmission. JCOM 2009;16(4):167-170.
8. Grayson ML, Jarvie LJ, Martin R, et al. Significant reductions in methicillin-resistant Staphylococcus aureus bacteraemia and clinical isolates associated with a multisite, hand hygiene culture-change program and subsequent successful statewide roll-out. MJA 2008;188:633-640.

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Site 3 joined the registry following APIC abstract submission and approved inclusion of their data into this poster.

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