

LEANing in to Manage Infection Risk: Applying LEAN Concepts to Reduce Contamination Events in Central Sterile Services

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Purpose

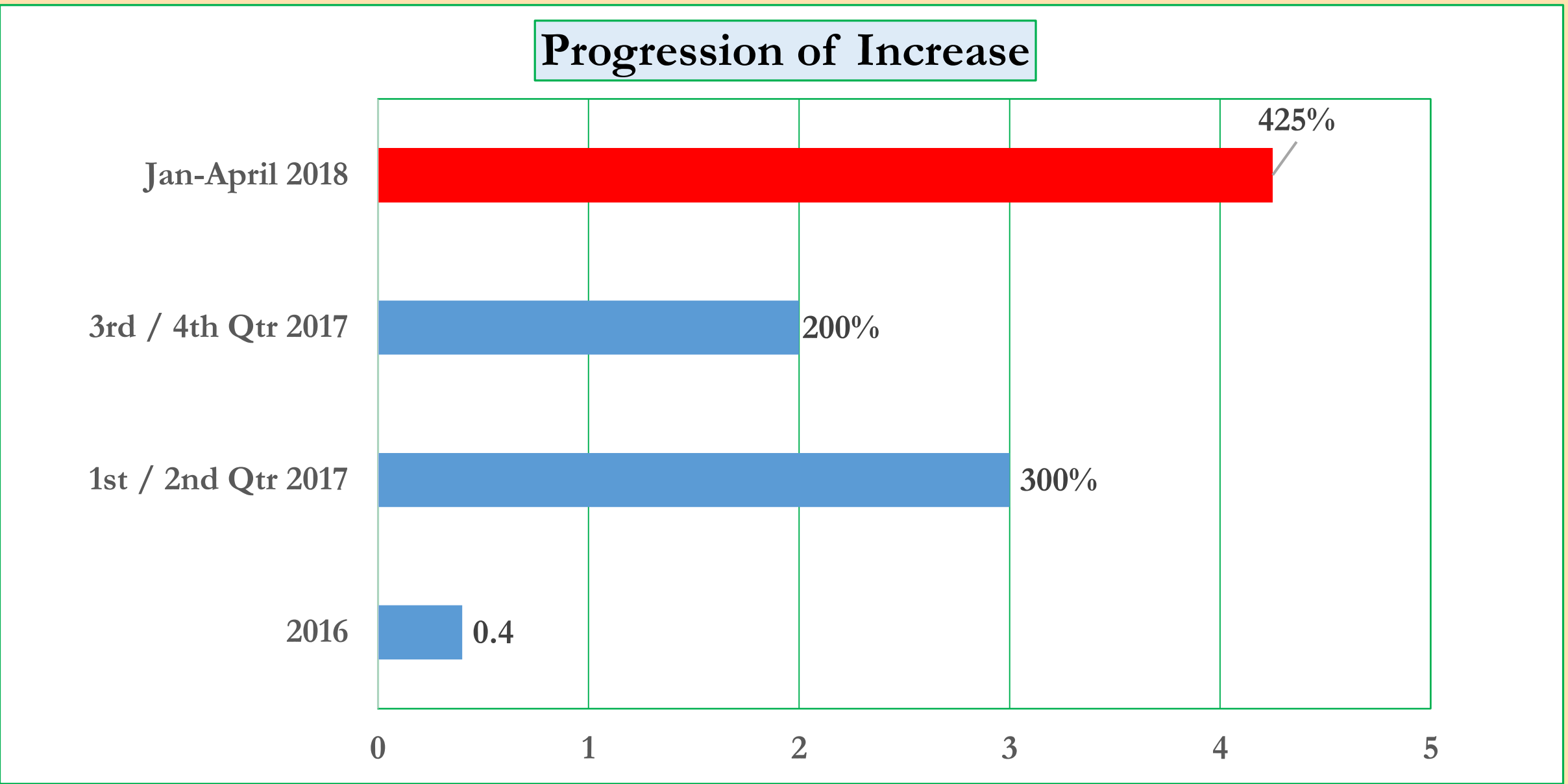
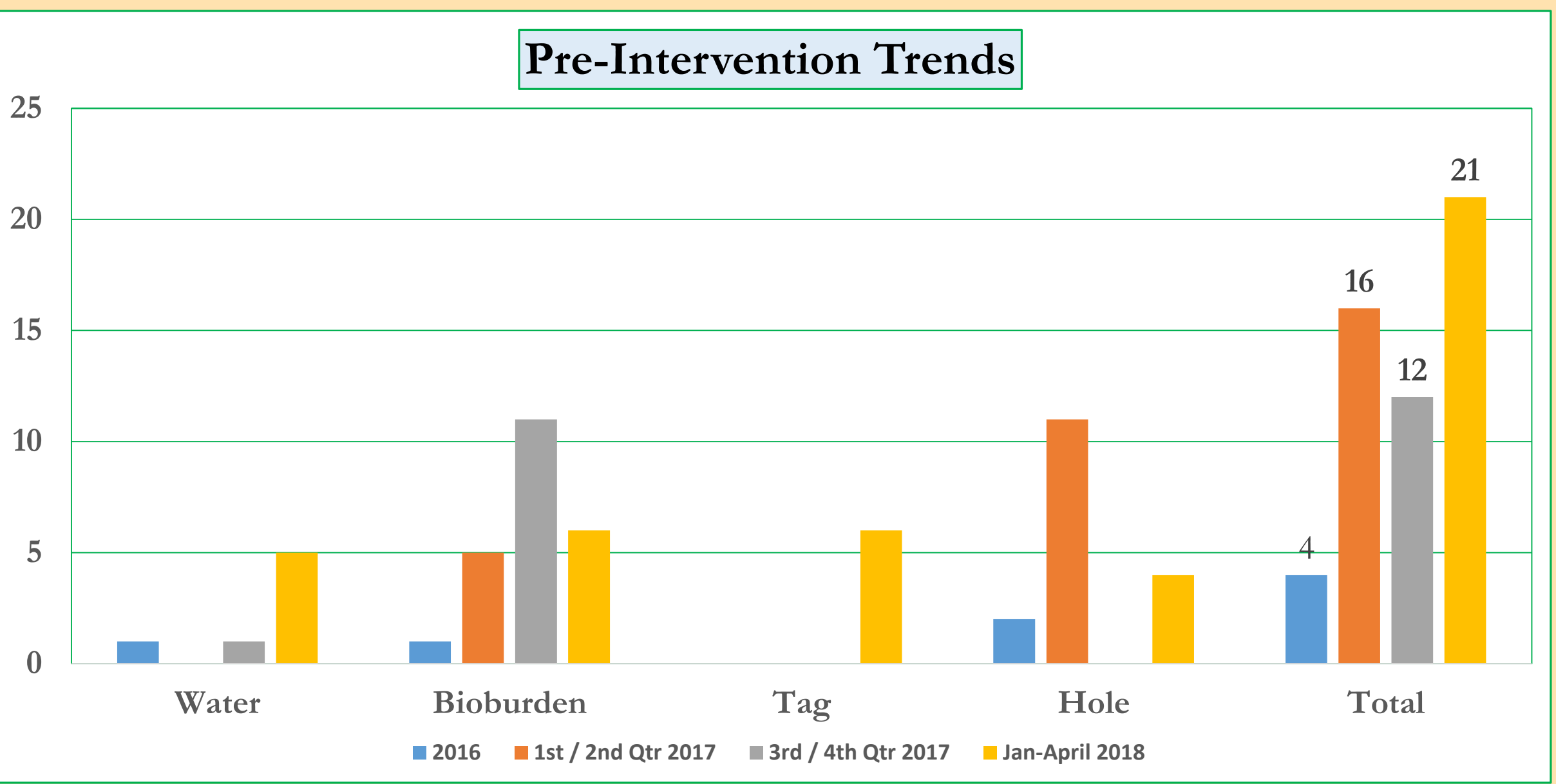
An increase in contaminated surgical trays raised concern for potential infection risk. LEAN principles were used to identify gaps, improve processes and eliminate waste in central sterile services (CSS), to decrease the risk of infection related to contaminated surgical equipment.

Background

- Sentara Leigh Hospital (SLH) is a 250-bed facility recognized by DNV with the certification for Managing Infection Risk.
- SLH performs over 15,000 surgeries annually with nearly 10,000 instruments processed by CSS each month.
- Early 2017, SLH saw increased reporting of contamination events in CSS.
- With concerns for infection risk, Quality staff began trending occurrences via the STARS reporting tool.
- Data was collected over 2017 which validated concerns for infection risk and identified key problem areas contributing to contamination events.
- A LEAN process improvement strategy was initiated to identify opportunities to improve processes and increase quality of service (value) by decreasing risk (waste).

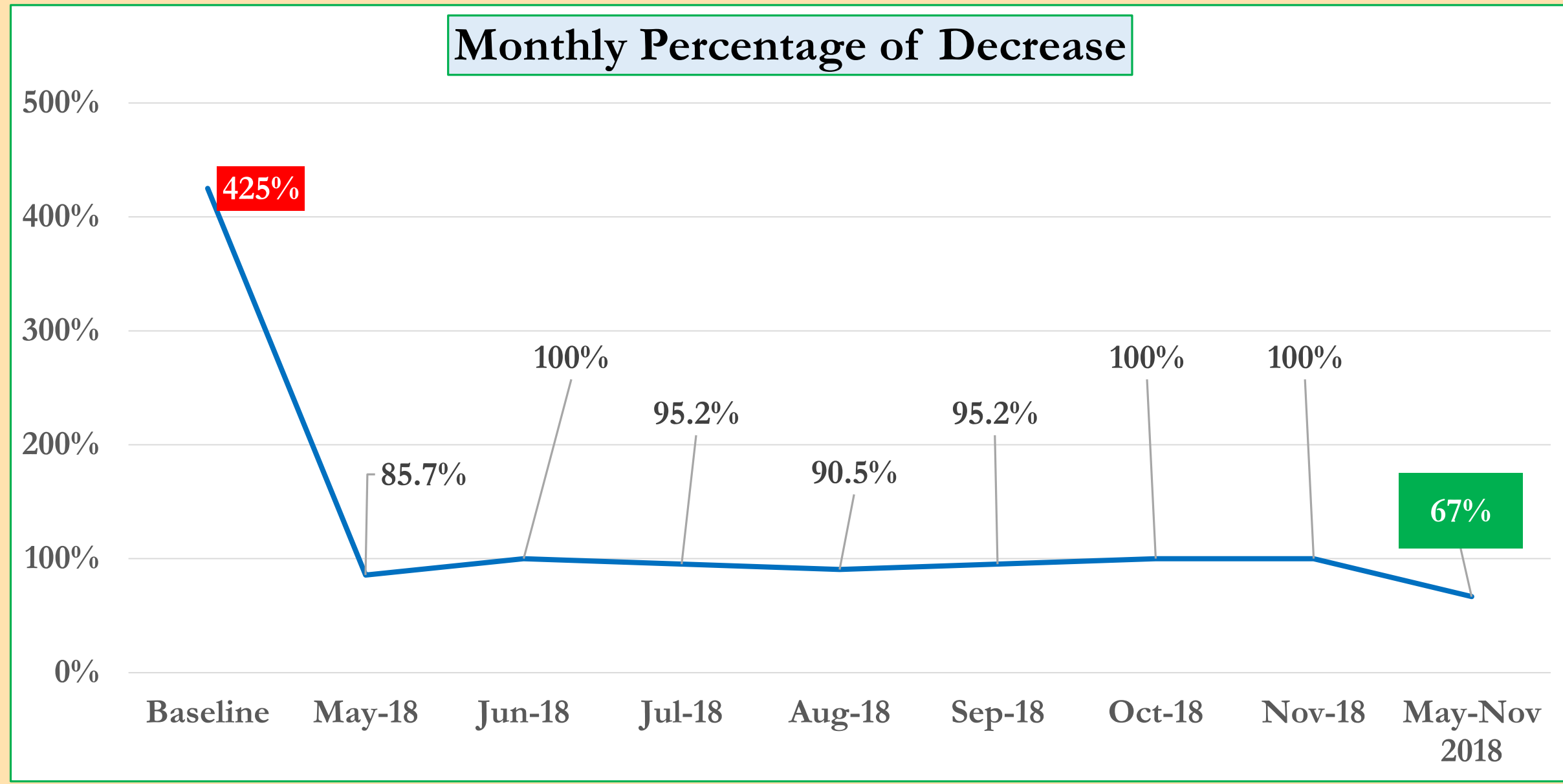
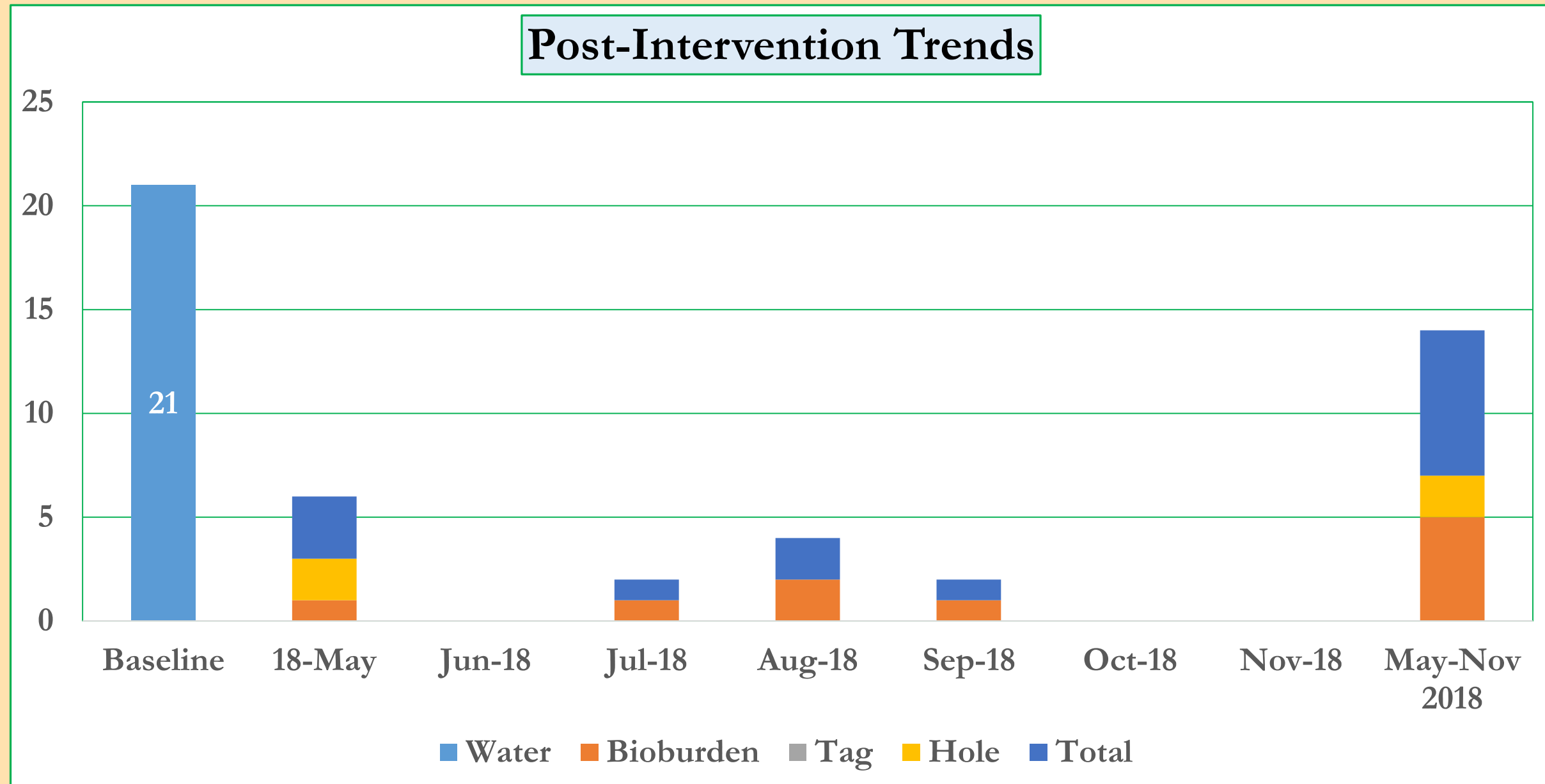
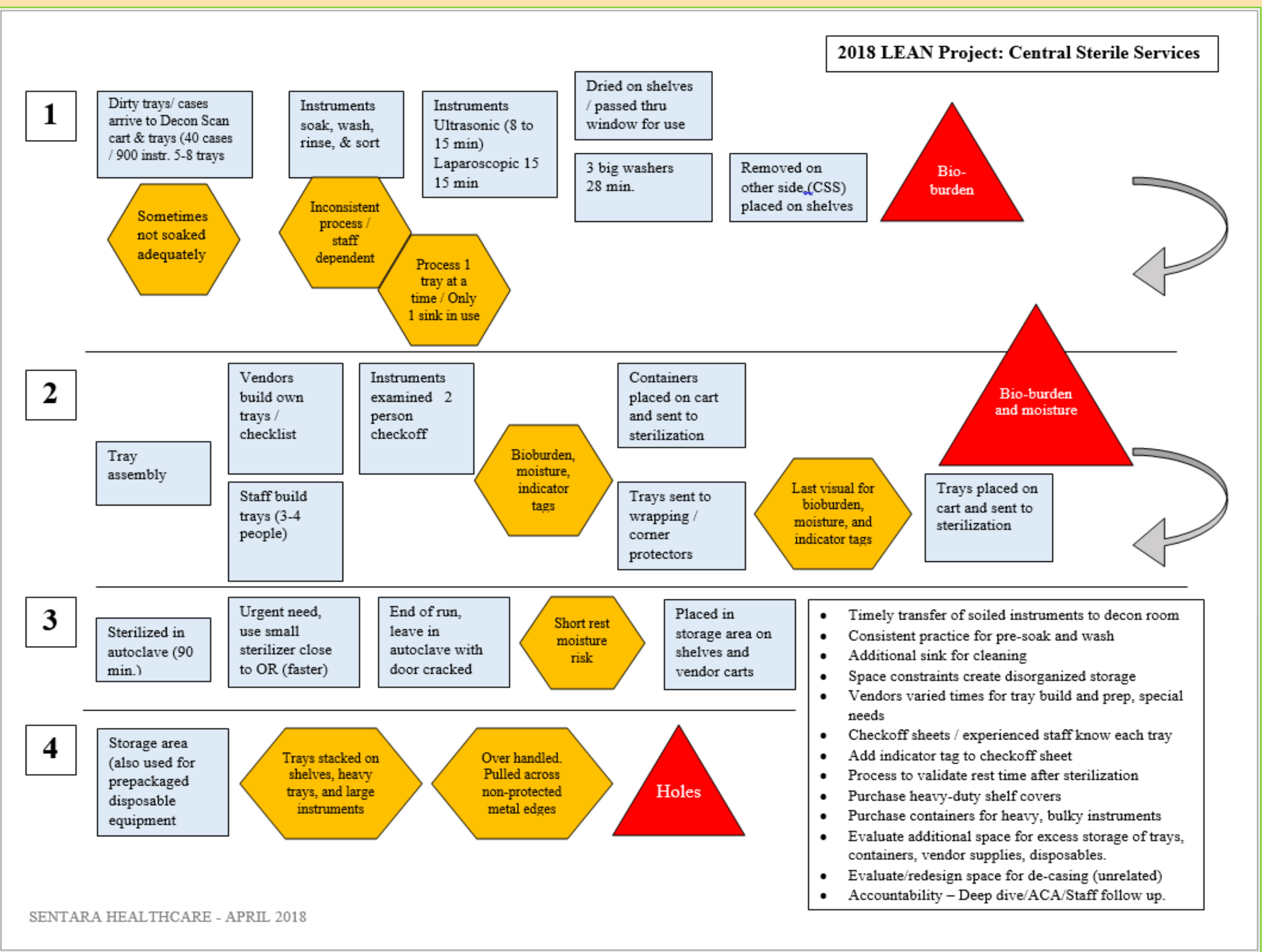
Methods

- Throughout 2017, manual review of STARS was completed to isolate the events which revealed repetitive causal patterns (moisture, bioburden/debris, wrap integrity (holes), and missing indicator tags).
- Baseline data was collected via a manual retrospective review of STARS for the 2016 timeframe.
- December 2017, the QI staff, assisted by members from Accreditation, Regulatory, & Safety (ARS), Infection Prevention and Control and the CSS team, began this project by applying LEAN concepts and completed the first of several *Gemba* walks to map processes throughout CSS.
- Using the common LEAN acronym, D.M.A.I.C., as a guide, the team defined, measured, analyzed data and identified opportunities to improve and control the recurrence of events.



Intervention

- The surgical team implemented a detailed action plan from May to June 2018 to address variances and create a more productive workspace.
- Actions included a 5-S approach to inventory all surgical trays, reorganize clean instrument storage, relocate prepackaged stock, purchase durable shelf liners and frequently used instruments and a second sink was added in the decontamination area.
- A safety “stand down” and mandatory staff training were also completed.



Pre-intervention Results

- Retrospective review found only 4 incidents reported in 2016.
- 1st and 2nd quarters of 2017 showed a 300% increase over 2016 with 16 incidents.
- 3rd and 4th quarters of 2017 showed a 200% increase with 12 incidents.
- January-April 2018 events increased by 425% over 2016 with 21 incidents. Almost double the previous 2 quarters or 75% of the entire 2017 benchmark.
- In April 2018, another LEAN tool, the process map, was created and used to present findings to leadership along with recommendations for improvement.

Significance

- Poor decontamination and sterilization can fail to remove debris from instruments, including biological material (ECRI Institute, 2012) which increases the risk of infection in surgical patients.
- Surgical patients have up to 5% risk of developing a surgical site infection (SSI) with 20% of hospital-acquired infections directly linked to SSIs (Anderson, et al., 2014).

Implications

- Decreasing contamination of surgical instruments reduces risk of SSI's.
- Reduction in surgical delays due to reprocessing instruments.
- Reduction of time patients are under anesthesia due to delays.
- Consistent processes improve worker productivity and accountability.
- Reduction of financial penalties tied to value-based reimbursement programs.
- Decrease in immediate use steam sterilization by improved inventory control.
- Team involvement in the LEAN improvement process increased staff engagement and satisfaction.

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- Jeanne Rousch, MBA, Infection Preventionist

References

- ECRI Institute. (2012, August 1). Sterile Processing Department's Role in Patient Safety. Retrieved from ECRI Institute Web site: <https://www.ecri.org>
- Anderson, D., Posgorny, K., Berrios-Torres, S., Bratzler, D. D., Greene, L., & Kaye, K. (2014). Strategies to Prevent Surgical Site Infection in Acute Care Hospitals: 2014 Update. Infection Control and Hospital Epidemiology, 35(6), 605-627. doi:10.1086/676022

Post-intervention Results

- In May of 2018, while interventions were ongoing, CSS experienced a dramatic decrease by 85% with only 3 events reported.
- Positive trends were sustained throughout the 7 month post-intervention period with zero events reported in June, October, and November.
- Overall, contamination events decreased by 67% over the 7 months post-intervention, with 7 total events compared with 21 events that occurred between January-April 2018.
- Immediate use steam sterilization rates decreased from 3% to 0.12% by October 2018.