A multi-level Bayesian logistic regression model was run in R version 3.5.1. Through 2017 and for which complete information was reported were used for the Legionella nationwide. Our goal was to understand when, where and why variations in the United States. We modeled the variability in potable water samples, for its 170 medical facilities (stations) distributed across Friday, October 4, 2019: 12:15 PM Washington, DC, Temple, Texas; Gary Shantini D. Chetan Veterans Health Administration (VHA) Medical Facilities Cincinnati V A Medical Center, Cincinnati, OH Methods. Data from quarterly water samples from sinks and showers from 2015 were the least effective, but were still able to improve on traditional surveillance (Figure 3). Overall, charts using network baselines) prevented by SPC, and corresponding deaths avoided and cost savings (Figure 1). Detection. We then used these values to estimate the number of SSIs that could have been prevented by SPC, and corresponding deaths avoided and cost savings (Figure 1). Among 138,553 samples, there was little seasonal effect (SD: 0.32) in Legionella positivity based on the quarter in which they were sampled. The largest variability in Legionella positivity occurred at the station level (SD: 2.38), with substantial variation at the building level also (SD: 1.85). The 5% of stations most likely to be positive for Legionella represented only 7.5% of total samples but accounted for 39.7% of all positive samples. The 5% of stations least likely to be positive for Legionella represented 10.4% of total samples, but only had 2 positive samples. Conclusion. Buildings with the highest probability for Legionella positivity are clustered together within stations. We saw no major seasonal variations in Legionella positivity across facilities. We were able to better predict stations with higher positivity as well as lower overall positivity for Legionella water sampling. The observed dominant station-level effects could be due to overarching influences such as a single water source and suggests approaches at this level can impact Legionella control. These results demonstrate a mechanism for understanding the distribution and probability of Legionella and can inform prevention practices and future policy. Disclosures. All authors: No reported disclosures.

1231. Legionella Variability From Routine Environmental Testing Across All Veterans Health Administration (VHA) Medical Facilities Chetan Ijadatha, MD, MPH1; John David. Coppin, MPH1; Shantini D. Gamage, PhD, MPH2,3; Stephen Krakovic, MD, MPH2,3,4; Gary Roselle, MD, FACP; FIDSA2,3,4; Central Texas Veterans Health Care System, Temple, Texas; National Infectious Diseases Service, Department of Veterans Affairs, Washington, DC; University of Cincinnati College of Medicine, Cincinnati, Ohio; Cincinnati VA Medical Center, Cincinnati, OH Session: 146. HAI: Environment Friday, October 4, 2019: 12:15 PM Background. VHA Legionella prevention policy requires quarterly testing of potable water samples, for its 170 medical facilities (“stations”) distributed across the United States. We modeled the variability in Legionella positivity rates by location structure and by time to understand Legionella prevalence and distribution across VHA nationwide. Our goal was to understand when, where and why variations in Legionella positivity happens across VHA facilities. Methods. Data from quarterly water samples from sinks and showers from 2015 through 2017 and for which complete information was reported were used for the model. A multi-level Bayesian logistic regression model was run in R version 3.5.1. The hierarchical location group levels consisted of room nested within floor, within building, within station, within region. The time group-level effects included quarter nested within year. Variabilities within groups were estimated as standard deviation (SD) on the log-odds scale. Results. Among 138,553 samples, there was little seasonal effect (SD: 0.32) in Legionella positivity based on the quarter in which they were sampled. The largest variability in Legionella positivity occurred at the station level (SD: 2.38), with substantial variation at the building level also (SD: 1.85). The 5% of stations most likely to be positive for Legionella represented only 7.5% of total samples but accounted for 39.7% of all positive samples. The 5% of stations least likely to be positive for Legionella represented 10.4% of total samples, but only had 2 positive samples. Conclusion. Buildings with the highest probability for Legionella positivity are clustered together within stations. We saw no major seasonal variations in Legionella positivity across facilities. We were able to better predict stations with higher positivity as well as lower overall positivity for Legionella water sampling. The observed dominant station-level effects could be due to overarching influences such as a single water source and suggests approaches at this level can impact Legionella control. These results demonstrate a mechanism for understanding the distribution and probability of Legionella and can inform prevention practices and future policy. Disclosures. All authors: No reported disclosures.

1232. Potential Health and Cost Outcomes of Optimized Statistical Process Control Use for Surgical Site Infection Surveillance Nicole Nehls, BS2; Julian Ileys, PhD3; James C. Benneyan, PhD3; Arthur W. Baker, MD, MPH1,2; Deverick J. Anderson, MD, MPH1,4; Northeastern University, Boston, Massachusetts; Duke University School of Medicine; Duke Center for Antimicrobial Stewardship and Infection Prevention, Durham, North Carolina Session: 147. HAI: Surgical Site Infections Friday, October 4, 2019: 12:15 PM Background. Surgical site infections (SSIs) are common (160,000-300,000 per year in the United States) and costly ($6,000–$25,500 per event) healthcare-associated infections with potentially lethal outcomes (2.1%–6.7% mortality rate). A prior analysis by our group suggested that statistical process control (SPC) can detect SSI outbreaks earlier than traditional epidemiological surveillance methods. This study aimed to quantify the potential impact of SPC surveillance on patient outcomes (prevented SSIs and deaths) and healthcare costs. Methods. We retrospectively analyzed 30 SSI outbreaks over a period of 8 years in a network of 50 community hospitals from the Southeastern United States. We applied 24 control chart variations, including 2 optimized for SSI surveillance, 6 with expert-defined pre-outbreak baselines (used in our pilot study), 4 with lagged rolling baselines (used in our pilot study), and 12 common practice ones (using rolling baselines with no lag or fixed baselines). The charts used procedure-specific data from either the outbreak hospital or the entire network to compute baseline SSI rates. We calculated the average SSI rates during, before and after the outbreaks, and the months elapsed between SPC and traditional detection. We then used these values to estimate the number of SSIs that could have been prevented by SPC, and corresponding deaths avoided and cost savings (Figure 1). Results. Optimized charts detected 96% of the outbreaks earlier than traditional surveillance. While pilot study and common practice charts did so only 65% (58%) of the time (Figure 2). Optimized charts could potentially prevent 15.2 SSIs, 0.64 deaths, and save $226,000 in excess care costs per outbreak. Overall, charts using network baselines performed better than those relying on local hospital data. Commonly used variations were the least effective, but were still able to improve on traditional surveillance (Figure 3). Conclusion. SPC methods provide a great opportunity to prevent infections and deaths and generate cost savings, ultimately improving patient safety and care quality. While common practice SPC charts can also speed up outbreak detection, optimized SPC methods have a significantly higher potential to prevent SSIs and reduce healthcare costs.

Figure 1. Example calculation of prevented SSI and related estimates for one hospital. Left graph shows the SSI rate over time (blue). Overall horizontal lines represent the average SSI rate before (orange), during (green), and after (yellow) the outbreak. SPC and traditional surveillance detection charts are depicted as dashed lines while solid lines are represented by dot (black area). Right graph shows the equations used to estimate prevented SSI cases (using average pre- and post-outbreak SSI rates), savings (using SSI mortality rate of 7.6%); and cost savings (using average cost per SSI of $12,725).

Figure 2. Outbreak-specific SPC and traditional detection relative to network mean (months). For each outbreak, depicted above are the month difference between outbreak detection by optimized (dashed line) and traditional (solid line) charts relative to the estimated outbreak onset date. Negative values indicate detection prior to the outbreak onset, and positive values represent the converse. Also shown are the number of months between outbreak onset and traditional detection data (months).