

Using the “Control Chart” Tool as an Unconventional Approach to Identify System Noise Trends and Patterns at JHAH

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Introduction and background: Control Chart is a well-known performance improvement tool that assists in identifying special cause variations within a process. Johns Hopkins Aramco Healthcare Company (JHAH), Dhahran-Saudi Arabia, has recently adopted this tool in order to identify any special patterns or trends in the adverse events reported through JHAH Incident Reporting System (IRS). This initiative supports the concept that risks do not exist or behave in “isolation” but can be identified, grouped, and cataloged in risk domains.

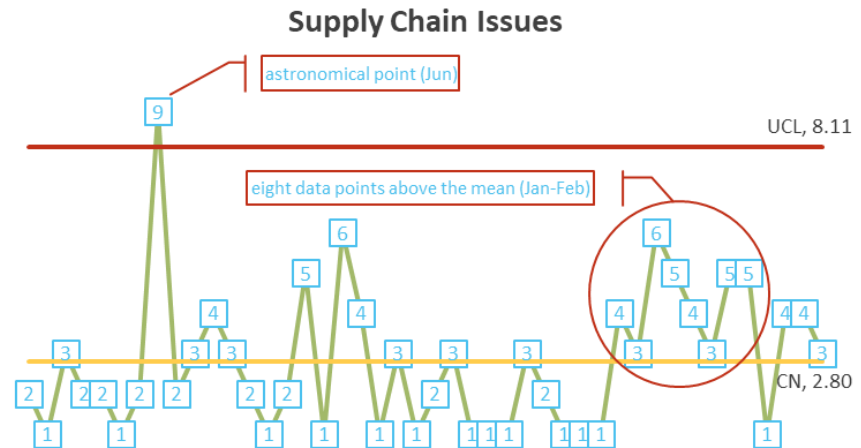
Aim: This study aims at identifying the potential benefits that could be attained through using the Control Chart tool signals to identify special patterns or trends in the behavior of reported adverse events during 2022, which might mandate the appropriate intervention. Other objectives include developing a constant flow of information and knowledge for identified trends to drive the mitigation of risk, launch process improvement initiatives at the level of organization rather than unit-level initiatives, strengthen processes through incident trending analysis to allow learning systems, and create an integrated patient safety model.

Methodology: The Risk Management Division at JHAH, which designed a new methodology to monitor trends within the Datix system (IRS) “categories” & “subcategories”, implemented a before-and-after study during 2022. This methodology depends on the established rules for identifying outliers in the control charts (e.g., one point beyond the 3 σ control limit, eight or more points on one side of the centerline without crossing, etc.). Once an outlier (i.e., a special-cause variation) is identified in the control chart of a specific Datix category/subcategory, this triggers deep dive understanding of the reason/s behind this outlier and possible process analysis, with subsequent potential process redesign to reduce risk, as indicated.

References:

1. MSP-31: JHAH Risk Management and Patient Safety Program
2. [Quality Improvement Essentials Toolkit | IHI - Institute for Healthcare Improvement](#)

Graph (Sample Control Chart):



Results: Following the implementation of this unconventional control charts-guided methodology, 24 Datix events categories/sub-categories fitted into the control charts outliers criteria and accordingly the analyzed data could generate 24 opportunities for potential system fixes during 2022. Control charts enables the timely identification of any system errors, and hence the timely interventions, in addition to the post-intervention follow-up/monitoring.

Conclusions: Our results support that fact that the “control charts” performance improvement tool can be effectively used as an additional approach to identify potential or actual opportunities to do fixes in the system/processes through analyzing data of the reported adverse events in the IRS. This would strengthen the process of identifying risks and latent errors across JHAH, connect silos, and redesign healthcare systems and processes to make them error-proof, which will eventually improve patient outcomes. One added advantage of the “control chart” tool is that it would allow the correlation of the identified negative trend/pattern with a specific timeframe and hence in focused retrospective or concurrent review, possible effective and timely interventions, and post-interventional monitoring of change effectiveness.