Applying Lean Principles to Long-Term Care Settings

by

Sara Robasky

Bachelor of Science in Biology, Duquesne University, 2020

Submitted to the Graduate Faculty of the

Department Health Policy and Management

School of Public Health in partial fulfillment

of the requirements for the degree of

Master of Health Administration

University of Pittsburgh

2023

UNIVERSITY OF PITTSBURGH

SCHOOL OF PUBLIC HEALTH

This essay is submitted

by

Sara Robasky

on

March 28, 2023

and approved by

Essay Advisor: Laura Griffin, MHA, Adjunct Faculty, Department of Health Policy and Management, School of Public Health, University of Pittsburgh

Essay Reader: Elizabeth Mulvaney, MSW, Clinical Assistant Professor, School of Social Work, University of Pittsburgh

Essay Reader: Lisa Malosh, MHA/MBA, Senior Director for Organizational Improvement at Presbyterian SeniorCare Network

Copyright © by Sara Robasky

2023

Applying Lean Principles to Long-Term Care Settings

Sara Robasky, MHA

University of Pittsburgh, 2023

Abstract

While rising healthcare expenditures, staffing shortages, and issues relating to quality and patient outcomes are not exclusive to long-term care, this sector faces unique challenges due to the gaps in funding and lack of proper resources in the space. With a growing aging population and an increasing need for long-term support services, it is of high public health significance that the organizations providing these services think about how they plan to adequately support this demand despite the barriers they are currently facing. These organizations may benefit from applying management theories like Lean which focuses on increasing value while decreasing costs and waste within a system. By changing the culture to support continuous improvement, long-term care organizations can begin to achieve more desired outcomes despite the issues at hand. This essay focuses on my experience with Presbyterian SeniorCare Network's application of Lean during my Administrative Residency. The Lean projects I completed during my time focus on areas such as staffing, billing, and safety.

Table of Contents

1.0 Introduction and Background 1

1.1 Project 1: Agency Staffing Grid 3

1.1.1 Problem Statement 3

1.1.2 Purpose Statement 4

1.1.3 Introduction and Background 4

1.1.4 Methods 5

1.1.5 Results and Discussion 6

1.1.6 Recommendations 7

1.1.7 Competency Development 9

1.2 Project 2: Envisage Process Redesign 10

1.2.1 Problem Statement 10

1.2.2 Purpose Statement 10

1.2.3 Introduction and Background 10

1.2.4 Methods 12

1.2.5 Results and Discussion 13

1.2.6 Recommendations 15

1.2.7 Competency Development 15

1.3 Project 3: Safety Data Visualization 16

1.3.1 Problem Statement 16

1.3.2 Purpose Statement 16

1.3.3 Introduction and Background 16

1.3.4 Methods **18**

1.3.5 Results and Discussion **19**

1.3.6 Recommendations **19**

1.3.7 Competency Development **20**

1.4 Conclusion **20**

2.0 Figures and Tables **23**

2.1 Figures: Project Two **23**

2.1.1 Figure 1 ..... **23**

2.1.2 Figure 2 ..... **24**

2.1.3 Figure 3 ..... **25**

2.1.4 Figure 4 ..... **26**

2.2 Figures Project Three **27**

2.2.1 Figure 5 ..... **27**

2.2.2 Figure 6 ..... **28**

2.2.3 Figure 7 ..... **29**

2.2.4 Figure 8 ..... **30**

2.3 Tables: Project One **31**

2.3.1 Table 1 ..... **31**

2.3.2 Table 2 ..... **32**

Bibliography **33**

List of Tables

Table 1: Agencies Used to Fill Open Shifts | April 2022 31

Table 2: Agency Cost Grid 32

List of Figures

Figure 1: First Process Map of Envisage Invoicing Process 23

Figure 2: Updated Envisage Process to Feature Shared Folder System..... 24

Figure 3: Snapshot of Shared Folder System 25

Figure 4: Envisage Invoicing Process Standards 26

Figure 5: Total Incidents at Each PSCN Campus 27

Figure 6: Total Incidents at PSCN (Annual)..... 28

Figure 7: PSCN DART Rate (Includes Oakmont, Washington, and Company Wide Rates) 29

Figure 8: ASN Totals (Annual)..... 30

1.0 Introduction and Background

Lean methodology, also referred to in this essay as Lean, is a management approach that aims to create the most value for the customer while using less resources and creating minimal waste.[1] It originated from the Toyota Production System and was adapted for various industries. In healthcare specifically, Lean can help to improve patient flow and avoid non-value added activities such as duplicate tests and wait time, thereby improving patient satisfaction and quality of care provided.[2] Because quality is often correlated with reimbursement and revenues, an organization providing high quality services will see more financial reward for doing so.[3] These benefits outline *why* it is that Lean is and can be successfully implemented in a healthcare setting, but it is also important to understand *how* Lean is implemented. Lean requires an organizational culture that supports and participates in continuous improvement in order to experience its benefits. An organization attempting to become "Lean" solely by performing sporadic rapid improvement efforts, or "Kaizen events", will not necessarily become a Lean organization. While these events are beneficial, they focus on one singular outcome over a short period of time.[4] Without a culture change to support this way of thinking, these events may be far and few in between, potentially leading to slow adoption of Lean and stagnation in organizational improvement.

Long-term care settings serve as an example of a sector of healthcare that has been slow to adopt Lean despite its many success in other healthcare settings. This sector of healthcare provides wide range of long-term support services (LTSS) are offered across the continuum, ranging from home and community-based services (HCBS) to skilled nursing facilities. These services are provided to older adults and people with disabilities for the remainder of their lives and are often

provided by organizations or individuals who have limited funding and labor resources compared to other healthcare settings. Out of the annual $475.1B spent on LTSS annually in the United States, 72% of that spend is funded by public payors like Medicaid and Medicare.[5] In contrast, about 68% hospital revenues come from private insurance.[6] Because Medicare and Medicaid tend to reimburse less than private insurers, this creates gaps in funding for LTSS due to the fact that these are most highly utilized forms of payment in this sector. In this case, it can be difficult to want to experiment with change when the basic needs of an organization are not being met. In situations like this, front-line staff look to their leadership for guidance and answers to addressing these gaps and barriers to providing high-quality care.

Many long-term care facilities continue to operate under traditional top-down management systems which often focus on the expectations from Leadership for their organization to hit benchmarks by any means necessary, leaving little room for collaboration amongst front-line staff or improvement efforts. However, due to these limited funds, a dwindling workforce, and a rapidly growing aging population, this management method will not be sustainable in the future. One organization, Presbyterian SeniorCare Network, has realized this and is committed to driving change in the long-term care space.

Presbyterian SeniorCare Network (PSCN) is a non-profit organization that provides senior living and healthcare services in Western Pennsylvania. Founded in 1902, Presbyterian SeniorCare Network has a long history of serving seniors and is one of the largest providers of senior services in the state.[7] The organization offers a range of services including independent living, assisted living, memory support, skilled nursing care, rehabilitation, and home health and hospice services. PSCN's mission is to enrich the aging experience through person-centered service and living

options.[7] To continue the trajectory of their mission, an innovative approach to organizational culture needed to be taken.

As pioneers in their field, PSCN realized the potential success and revitalization that incorporating Lean into their culture would have on their organization and on the long-term care industry. Their strategic plans share a common theme of becoming an efficient, outcome-driven Network that is sought after as a guide and partner, while using their care management strategy to maintain their position to be able to take risks, evolve, and adapt to meet unmet needs.[7] Through the strategic plan, Lean ideas are incorporated into workplace culture by collectively focusing on safety and work redesign in order to strengthen the relationship between residents and their caregivers.[7] The LEAN*forward* team, headed by Lisa Malosh, was implemented to help facilitate this initiative. The projects completed over the course of my Residency as part of the LEAN*forward* team support these strategic initiatives through process redesign of PSCN's home-based care coordination service, analysis of agency staffing patterns and costs, and tracking and visualization of the Network's safety data.

1.1 Project 1: Agency Staffing Grid

1.1.1 Problem Statement

Presbyterian SeniorCare Network was utilizing several Nursing Agencies to fill staffing holes. These agencies had variable rates and variable staff which caused the organization to struggle with cost containment and quality control. The organization was not able to budget for

the large volume of agency staff used, but no clear comparison between the different vendors was readily available.

1.1.2 Purpose Statement

By examining and organizing Presbyterian SeniorCare Network's contractual agreements across the network, I was able to place them into an organized matrix which allowed for better cost comparison, cost reduction, and a decrease in agency usage overall. This project was a part of a larger overall Lean project to redesign staffing and scheduling processes across the network creating greater efficiencies. Uncovering the current state of PSCN's agency usage will influence subsequent staffing decisions which affect the Network's overall ability to provide efficient, high-quality care for the residents PSCN serves.

1.1.3 Introduction and Background

Historically, long-term care facilities have received lower reimbursement than acute care settings because the payer mix for long-term care facilities is primarily Medicaid and Medicare, in contrast to acute care settings, where a higher ratio of employer-sponsored and private insurance exists. With Medicare and Medicaid reimbursement rates remaining mostly stagnant despite the rising costs of care, many long-term care facilities are currently operating in a -4.8% margin on average.[8] These margins have made it difficult for long-term care facilities to compete with hospitals for resources. Because of their more robust resources in comparison to LTSS, hospitals are often able to offer higher salaries and more comprehensive benefits packages, which can make them a more attractive option for potential employees. As a result, long-term care facilities often

struggle to attract and retain qualified staff members to provide high-quality care to residents. This challenge was only exacerbated by the Pandemic and many long-term care facilities put in a position to use Nursing Agencies to maintain adequate staff levels. Agency staff may be able to fill the holes temporarily, but it is not a permanent solution, as overuse will quickly deplete already low funds and has the potential to create animosity amongst the organization's staff and may perpetuate the issue of high turnover among the workforce.

At the start of my project, PSCN was using several different agencies across all locations. Many of which had contracts that were formed during Covid-19. During the pandemic, the organization was in crisis mode and did not tightly monitor or regulate its agency use or contractual agreements. Post-pandemic, it became evident that agency staff were being overused, and the organization's budget could no longer support the breadth of agency contracts it once had used. By creating this agency contract grid, PSCN could bring light to the actual cost of their agency usage and use it as a driver to support network-wide efforts to reduce costs overall and to inspire other ways to fill staffing holes.

1.1.4 Methods

I created a matrix of all known agencies used at all facilities in the Network. For this matrix, I also developed a color-coded system to delineate whether any given agency was currently in use, not used, or if the contract was individual-only. I began tracking all current contracts from all campuses across the network, saved and renamed them, and organized them in a file. From there, I input the signing date and campuses currently using agency into the contract matrix. Next, I extracted the pay rates by position type. I placed them into the cost comparison grid, along with

other pertinent information, such as holiday rates and miscellaneous positions that may be mentioned in a contract.

To assess PSCN's agency usage, I first looked back at one 30-day schedule period dated April 3-April 30, 2022, for one 193-bed SNF (Skilled Nursing Facility) at PSCN. Since this site is a skilled facility, it requires more nurses and CNAs (Certified Nursing Assistant) per patient and therefore has a higher agency usage. I quantified the number of shifts filled with agency staff throughout the period and denoted to which agency the staff member belonged. This data was put into a Pivot Table in Excel and was used to help assess agency costs.

Once the contract matrix and cost comparison grid were complete, I passed this information to PSCN leadership and the lead Network scheduler. They evaluated the information presented to them and used it in future staffing decisions. After several months, I quantified the number of agency shifts/agencies that the SNF was using July's schedule period to determine how the data had changed.

1.1.5 Results and Discussion

From the initial schedule period, I found that the SNF used an agency to fill 863 open shifts. Of these 863 shifts, most of them were filled by Agency A, Agency B, and Agency C. This information was kept in mind when comparing the costs of each agency (See Table 1). From the cost comparison grid (See Table 2), I determined that the least expensive agency was agency C, while the costliest agency was agency A. All other agencies fell between these two price ranges. On average, the rate for an agency staff was anywhere from 50%-150% more expensive than PSCN rates for any given shift, not including markup price. In addition to the rates outlined in the contracts, many of the agencies also required that PSCN pay the agency for four hours of work if

PSCN was not able to cancel agency staff two hours prior to their shift if they were no longer needed. This is another layer of costs that PSCN would sometimes pay due to being unable to e\ visualize and closely manage their staffing needs.

During staffing meetings, the LEAN*forward* team discussed with nursing management how well staff from various agencies were performing. While a few agency staff went above and beyond for the organization and proved to be a valuable resource, many were prone to call-offs, no-call-no-shows, or behavioral issues. nursing management and the LEAN*forward* determined that one agency, agency A, could produce the most staff, but this agency was also one of the most expensive. It was also highly correlated with call-offs and poor behavior. Decisions needed to be made regarding whether it was cost-effective to continue to fill holes with this agency and run the risk of call-offs and behavioral issues or to find other ways to fill the shifts. After analyzing labor hours, cost, and work ethic produced by various agency team members, leadership decided that it would be best to decrease usage of agency A and attempt to decrease agency usage overall. The hope was that this decision would not only reduce costs but would improve the work environment for other staff and would allow for a better and more consistent team to care for those residents.

The number of agency shifts in the July schedule period was 243. This is a sizable decrease from the original 863 shifts in the April schedule period. Additionally, Agency A was now only being used for 2% of shifts. This 72% decrease in agency usage overall is significant because the SNF needed to find ways that the

1.1.6 Recommendations

If Presbyterian SeniorCare Network still utilizes agency contracts, leadership and staffing schedulers should refer to the cost comparison grid to make cost and quality conscious staffing

decisions. Using the agency grid when renegotiating contracts with vendors ensures that the organization pays a standard amount for all positions across all locations. PSCN should continue to identify open shifts and needs as far in advance as possible to exhaust all other options before filling holes with the agency. While comparing costs and understanding the utilization of agency resources helped decrease usage, it did not eliminate it. PSCN might benefit from creating their own internal agency for greater flexibility in using their own staff with lower costs than an external agency.

During the LEAN*forward* team's time in the scheduling role, it became clear early on that a new automated scheduling system needed to be implemented to reduce human scheduling errors and allow the schedulers to see live scheduling needs to make quick and accurate staffing decisions and potentially avoid agency usage even further. An automated system would also decrease the need for a scheduler at every campus and would instead allow for one head scheduler to handle the scheduling across all campuses. The remaining schedulers could move into other positions of greater need. Kronos had been trialed but was not sustained due to lack of user-friendly features and an inability to meet the organization's need for a quickly updated and easy-to-read daily schedule that is conducive to the staffing patterns of a SNF. More scheduling systems specifically tailored to long-term care should be researched and trialed as they could prove to be a beneficial investment. Even more, the organization will need to get creative when developing new recruitment and retention strategies to attract more staff without having to consider a substantial increase in compensation.

If Presbyterian SeniorCare Network still utilizes agency contracts, leadership and staffing schedulers should refer to the cost comparison grid to make cost and quality conscious staffing decisions. Using the agency grid when renegotiating contracts with vendors ensures that the

organization pays a standard amount for all positions across all locations. PSCN should continue to identify open shifts and needs as far in advance as possible to exhaust all other options before filling holes with the agency. While comparing costs and understanding the utilization of agency resources helped decrease usage, it did not eliminate it. PSCN might benefit from creating their own internal agency for greater flexibility in using their own staff with lower costs than an external agency.

1.1.7 Competency Development

Over the course of this project, I developed organizational awareness with regard to the dynamics between clinical staff, scheduling staff, and management and what each party expects from one another in order to operate as one cohesive unit, and where the points of contingency lie with successfully staffing a SNF on a day-to-day basis. Because this project was centered around using electronic scheduling systems and scheduling data, I was also able to further develop my competency of information technology management. Finally, by understanding the large role that staffing agencies play in staffing PSCN's facilities, and what is considered when entering into a contract with these agencies, I was able solidify my competency of PSCN's position within the community with respect to other organizations that PSCN interacts with.

1.2 Project 2: Envisage Process Redesign

1.2.1 Problem Statement

PSCN's Envisage service line had an invoicing process held together by people and personal relationships rather than one based on standards and needs. Errors have occurred because the process was sometimes unclear and not standardized; the process was time-consuming and opportunistic for error.

1.2.2 Purpose Statement

With the intent to streamline the Envisage's invoicing process, I mapped the process and identified and quantified the number of issues at various points. From this, the Envisage team was then able to determine which areas they wanted to target for intervention.

1.2.3 Introduction and Background

. One of the main ideas of Lean is that processes should be standardized to eliminate waste and variability and to ensure consistent, high-quality outcomes. The standardization of processes is achieved by using best practices, which are derived from data and analysis rather than exclusively using personal experience or relationships to create processes. By establishing transparent, replicable processes, organizations can reduce the risk of errors, improve efficiency, and facilitate continuous improvement.

To facilitate this analysis, Lean organizations use a “Gemba” approach. The "Gemba" approach refers to going to the place where value is created to understand and improve processes.[9] The idea behind "Gemba” is that the best way to understand a process is to observe it firsthand and gather data on its current performance. This allows individuals to identify waste and inefficiencies and to make improvements based on empirical evidence rather than assumptions or firsthand experiences and relationships. Standard, evidence-based processes are essential to the integrity and stability of an organization in the long-term. This can be seen in the process redesign project I completed with PSCN’s Envisage team.

Envisage is a home-based community care coordination program part of Presbyterian SeniorCare Network. This program is a long-term planning and care coordination option servicing adults 60 or older in Western Pennsylvania. The main goal of Envisage is to help older adults live independently at home for as long as possible while providing care coverage and coordination for a monthly membership fee.[10] Currently. Envisage serves about 350 members who utilize their various membership plans. Because Envisage members pay Envisage to coordinate their healthcare needs, they receive invoices from several service lines and are responsible for paying these invoices on behalf of the member. Most of these invoices typically come from home care agencies, doctors’ offices, hospitals, and sometimes Assisted Living, Personal, or SNF facilities. This invoicing process posed challenges for the members and those needed to be addressed in order to provide a more seamless experience for the Envisage’s members and team. I was able to help achieve better outcomes by utilizing the Lean principles mentioned above to improve the invoicing processes.

1.2.4 Methods

I initially met with both the previous and incoming Executive Directors of Envisage in June of 2022 to learn more about Envisage and understand LEAN*forward*'s role in the forthcoming project to redesign Envisage's invoicing process. I gained some background information about what Envisage was and who they provided service for and received a general overview of how the current billing process worked. To solidify my understanding, I spent several weeks performing the invoice capturing portion of the process to gain a true understanding of the work. During this time, I also performed a time study to better understand each step and the level of value-added vs non-value-added time associated with it. From there, I was then able to map out this part of the process and determine what other people and departments were involved. Next, the new director of Envisage and I met with Envisage's care coordinators to gain an understanding of their role in processing the invoices. After these meetings, the care coordination services were then incorporated into the process map. The last individual to touch the invoices before they were paid was Envisage's Director of Finance. I met with her to discuss her role in processing the invoices from the Accounts Payable/Accounts Receivable portion of the process. After this meeting, I was able to map the final portion of the process.

After the process was mapped, I went over my own notes and the notes given to me by everyone else involved in the process, and began to quantify and map the issues seen at various steps. Once this was completed, I reconvened with the Director of Envisage to present my findings. From there, we agreed on where the first round of improvement efforts could be made with our current resources. Next, I remapped the process to include the targeted changes, and highlighted how many of the current problems in these areas could be resolved if the changes were made. I facilitated weekly meetings with the Envisage team to develop systems and standards needed for

the proposed process changes. After the systems were in place and standards were readily available, we decided on a date to trail the new process. During the trial, data was collected regarding the initial time study performed and team members' feedback to determine if the problems were resolved with the proposed solution. After the trial was done, I followed up with the Envisage team to determine their next steps to facilitate full scale change.

1.2.5 Results and Discussion

From my initial time study and observation, it was determined that there was a considerable amount of time spent on non-value-added activities. Much of the process involved a lot of transcribing, hand sorting, and other duplicative activities that left room for human error. One of these activities included opening each invoice to print it. Each invoice was already available to me in Envisages invoices inbox, so this was a duplicative step. On the day that the study was performed, I received 44 invoices. Printing all the invoices took me about 64 minutes. The invoices were to be printed because by the current process design, I was to stamp and code each invoice by hand. Coding the invoices took me 38 minutes. Once I coded all the invoices, they were to be sorted by which care coordinator oversaw that person's care and then scanned and sent to said coordinator for them to review. Sorting and scanning the invoices back to the coordinators took me 19 minutes to complete. After scanning them, I was required to place the hard copy invoices in a folder while waiting for the Care Coordinator's responses, and also check the Envisage invoice inbox for responses to old invoices and updating the hard copy invoices to push them along in the process. This took about 11 minutes. A major area of time lost occurred while waiting for Care Coordinator's to review and send back the invoice. This was because there was no standard

schedule or procedure for when the Care Coordinators were to review the invoices, so the time varied from hours to days. This sometimes resulted in late or lost invoices, resulting in extra fees paid out by Envisage. Once I received responses, the comments made by care coordinators were then handwritten onto the hard-copy invoice, signed off by the Executive Director, and then sent to the director of finance for further processing.

After I mapped the complete process, I identified 14 issues that would need to be addressed (See Figure 1). These issues shared common themes of human error, lack of standardization, time, and wasteful or repetitive activities. I shared these findings with the Envisage team. It was determined that many of the problems could be eliminated by standardizing the process and finding a way to manage the invoices completely electronically. At that time, envisage was long awaiting a new EHR (Electronic Health Record) system and had limited ability to invest in an electronic document management system. We decided that the best solution in the interim might be to create an electronic shared folder system and develop standards around that process until the new EHR becomes available. I mapped the process with our proposed changes in the interim state prior to any EHR enhancements (See Figure 2). It was hypothesized that the new process would eliminate eight of the original 14 problems seen in the process.

After creating the shared folder system and granting access to the appropriate individuals (See Figure 3), we created standards for the new process. These standards walked through what each person is to do in each step of the process and denoted a standard time for invoice capture, and turnaround times for care coordinators. (See Figure 4).

The new process eliminated the need for invoices to be printed and hand coded and transcribed. Instead, administration was able to check the invoice inbox and rename the files and sort them into the appropriate care coordinators folder. Care coordinators were also able to

comment directly onto the invoice electronically rather than sending comments back to the administrator to be hand-written. The care coordinators then moved their completed invoices to the proper folder where the Executive Director would then review and electronically sign. The invoices then went into a new folder for the Director of Finance to process. Once the invoice was processed, it was moved into a completed folder sorted by month and year for historical purposes. These changes decreased the overall processing time by an estimated 85%.

1.2.6 Recommendations

Maintaining the standard process for invoicing until the new EHR is available will save time and, potentially, reduce errors. Once the new EHR is available, Envisage should reconvene with the LEAN*forward* team to determine how the current process will change given the shift from a shared folder system to an EHR based document management system. While this process addressed eight issues with the previous process, it did not address all of them. As old issues resurface or new ones arise, rapid improvement cycles should be performed by the Envisage team to address them.

1.2.7 Competency Development

One of the main competencies satisfied by this process redesign project was analytical thinking. I was able to spend time analyzing a process using the “Gemba” approach and come up with workable solutions to improve efficiency. In conjunction with analytical thinking is process management. This project allowed me to map out a complex and nuanced process in order to understand how to decrease waste and improve efficiency. By the end of the project, I was able to

create work standards with the Envisage team on handling invoices when there were none previously. This project also held me accountable, as it was one of the first projects that I oversaw almost entirely on my own, and required me to communicate with the Envisage team frequently to ensure the success of the implementation of the process changes and work standards.

1.3 Project 3: Safety Data Visualization

1.3.1 Problem Statement

The recorded safety and worker's compensation data was not useful to PSCN in its current state because it was not visualized in a way that allowed leadership to make quick inferences and adjustments to processes to improve safety across the Network rapidly.

1.3.2 Purpose Statement

By tracking and quantifying safety data across the Network and visualizing it in a way that can be easily understood, PSCN's core team can quickly address safety issues and reduce them over time. This aids in the overall effort of PSCN as a Lean organization to establish safety as a non-arguable value-based goal.

1.3.3 Introduction and Background

When considering safety in LTSS, resident safety is often what comes to mind. While this will always remain an important facet when creating a safe environment, employee safety is also

top priority, as they are the ones providing care to the residents. To track and measure safety performance for employees, facilities may use metrics such as the DART (Days Away, Restricted, or Transferred) rate, which measures the number of serious workplace injuries and illnesses per 100 full-time workers, as well as ASN (Accident Severity Number) totals. These metrics help facilities understand the impact of accidents and track their safety performance over time.

An organization using Lean methodology prioritizes safety by incorporating it into all aspects of continuous improvement. Safety is viewed as a non-negotiable precondition to Lean management and is integrated into every stage of the process, from design to delivery. The principal place that safety is discussed in a Lean organization is in tiered huddles. A tiered huddle system is a method of conducting daily stand-up meetings at multiple levels of an organization, from the front line to the executive level.[11] The purpose of these huddles is to facilitate communication and improve collaboration, ensuring that everyone is aligned on the priorities, goals, and issues of the day, including safety. The tiered huddle structure allows for information to flow up and down the organizational hierarchy so that problems can be addressed quickly, and progress can be tracked and celebrated. This approach helps to promote a continuous improvement culture by encouraging transparency and accountability at all levels of the organization. Lean also empowers workers to actively identify and address potential safety hazards and continuously seek ways to improve safety in their work processes. When Presbyterian SeniorCare Network discusses safety in their tiered huddles, all staff are encouraged to bring up problems and safety concerns so that root cause analysis can be completed, and solutions and prevention efforts can be put into place as soon as possible. For the sake of transparency, visual information regarding safety is displayed in the tiered huddles daily for everyone to see. This facilitated goal setting and reminded workers of the importance of safety standards and procedures. By creating safety visuals for Tier

3 and 4 Huddles, I was able to help PSCN's core team prioritize and manage safety on a network-wide level.

1.3.4 Methods

In June of 2022, I began tracking PSCN's safety data. I received the monthly data from the Network's Labor Relations Specialist and quantified it in terms of Total Incidents, Recordable Incidents, Lost Time, ASN totals, and DART rate calculations. I tracked these metrics for all campuses across PSCN. I followed Lost Time and Total, Reportable, and Non-Reportable Incidents monthly and tracked ASN totals and DART rates retro-annually for 2019-2021. In addition to the campus-specific dart rates that had been calculated previously, I also attained the company-wide DART rates

I created several graphs in excel (See Figures 5,6,7,8 for reference) for each data metric and updated them monthly as I received the data each month. Many of the graphs include data points for each individual campus and reflect them against the data points for the Network totals. Each graph is customizable in that any of the campuses can be selected and unselected to get a closer view of specific locations. I shared these visuals with the Senior Director for Organizational Improvement, who would share the visuals during tiered huddle meetings as the data was updated to brief leadership on how the organization has been handling Safety matters over the last several months and comparing it to previous

1.3.5 Results and Discussion

The network has seen a decrease in recordable incidents compared to previous years, as well as ASN and DART rate calculations. This can be attributed to PSCN's effort to put safety at the forefront of their culture and strategic plan. Visualizing this safety data helped make quick inferences about which campuses during which months had higher incidents. For example, even though there was an overall decrease in total incidents overall since 2019, there was a spike in October of 2022 that was higher than the last two years (See Figure 6). This sparked inquiries in November about what happened the month prior. Leadership was then able to look at October's data more closely to identify any patterns. The high-level overview that these visuals provided were able to be matched to the daily safety reports occurring within the tiered huddles. By tracking and visualizing this data, it holds each campus accountable and lets them know when and where Safety efforts should be ramped up to contribute to successfully reducing safety related incidents across the network.

1.3.6 Recommendations

Once the complete data becomes available, PSCN should measure the 2022 DART rate and ASN total and benchmark them to national averages and compare it to previous years. Based on results, PSCN will be able to address their performance and determine where to focus their efforts to reduce harm and promote safety moving forward. The organization should continue to use lean methodology to prioritize safety. While any visual tool is going to be beneficial in the analysis of data, working with Excel as my sole resource was limiting in some ways as the data range became larger. More robust data visualization tools with greater capabilities may be more

helpful than Excel alone (Power BI, Tableau) may be worth the investment for Presbyterian SeniorCare Network if they want to continue to push toward data driven improvements.

1.3.7 Competency Development

Measuring performance was part of the purpose of this data visualization project. By taking data and transforming it into visuals that are easy to understand, measuring PSCN's safety performance was simplified. Because safety is considered a non-negotiable requirement in Lean, and Lean is part of PSCN's strategic plan, this project assisted in the development of my competency of strategic orientation. My communication skills were targeted with this project, as I had to get comfortable reaching out to unfamiliar members of the organization to obtain data, while also being able to visualize the data in a way that allows for easy understanding and seamless flow of communication between leadership and the rest of the organization.

1.4 Conclusion

While Presbyterian SeniorCare Network implemented the LEAN*forward* program a few years ago, it is still in the early stages of adoption across the Network. Change takes time, PSCN is making a conscious effort to change their culture in order to support these continuous improvement efforts. One theme that transcends all of the projects that I completed and assisted with during my time with PSCN is psychological safety. If the culture does not encourage

individuals to bring up and solve problems on their own then it is hard for the philosophy to flourish.

As exemplified through PSCN, getting comfortable with doing this on a smaller scale on a regular basis can help inspire and drive change. By utilizing data visualization, process mapping and analysis, I was able to assist the LEAN*forward* team in fostering an efficient, patient-centered environment for a number of service lines across PSCN. The cost comparison grid allowed PSCN to identify which agencies were most cost-effective, and the contract matrix helped to streamline the process of managing and renewing contracts. The project provided valuable insights into how long-term care facilities can better manage their staffing resources and decrease cost-related waste. By using the Gemba approach and process mapping, I was able to map out the current invoicing process of Envisage and identify potential issues and were able to create a newly mapped intervention. With the new intervention in place and an introduction to Lean, the Envisage team now has a foundation for continuous improvement, which will ultimately result in a more seamless experience for their members. By tracking and visualizing the company's employee-based safety data, I reinforced the organization's commitment to safety in all aspects and helped to provide tools for rapid analysis and improvement.

By beginning to incorporate Lean into their company culture and strategic plan, PSCN is setting a precedent for other long-term care facilities to feel comfortable to do the same. Since Lean calls ongoing improvement and desire to grow and change, sporadic improvement initiatives focused on short-term results may not produce lasting benefits. That being said, small improvements are still improvements. Establishing a foundation of psychological safety and mutual respect for one another can potentially spark excitement and empowerment toward

discussing and solving problems regardless of other material resources available to an organization.

2.0 Figures and Tables

2.1 Figures: Project Two

2.1.1 Figure 1

Figure 1: First Process Map of Envisage Invoicing Process

2.1.2 Figure 2

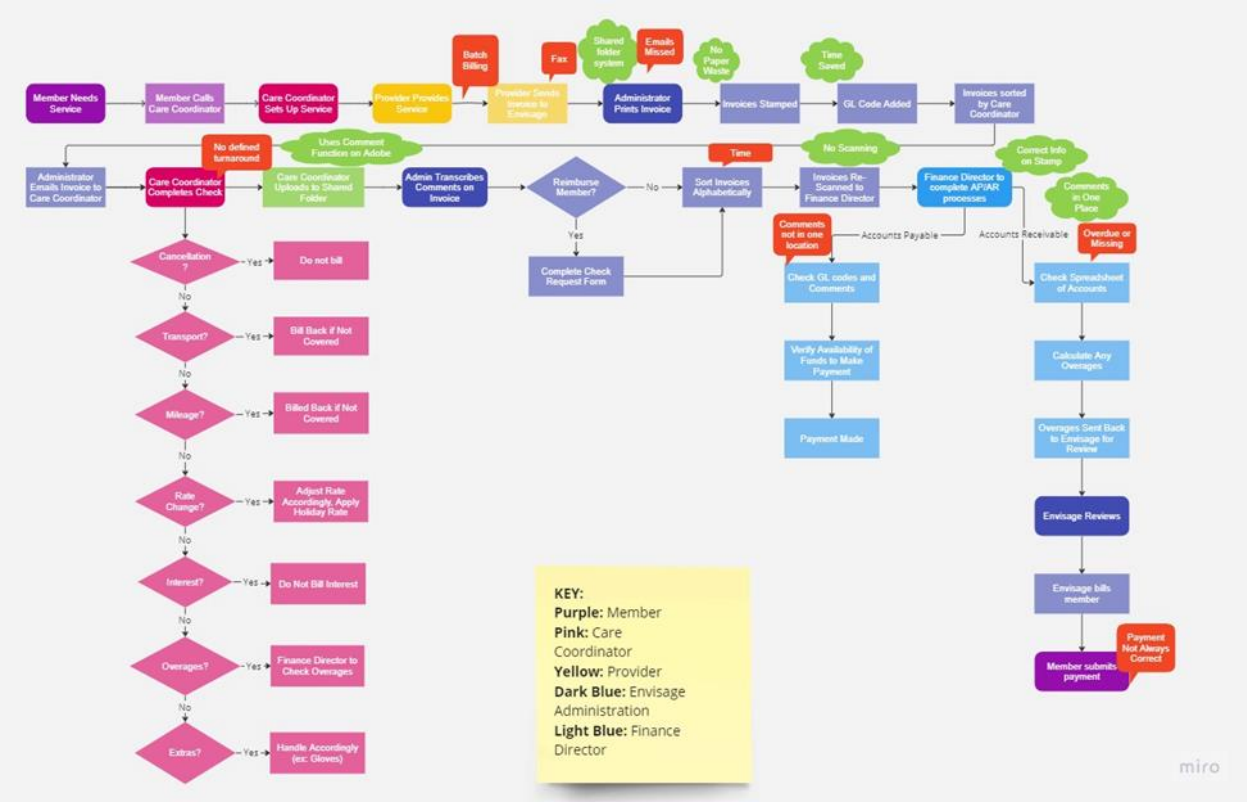

Figure 2: Updated Envisage Process to Feature Shared Folder System

2.1.3 Figure 3

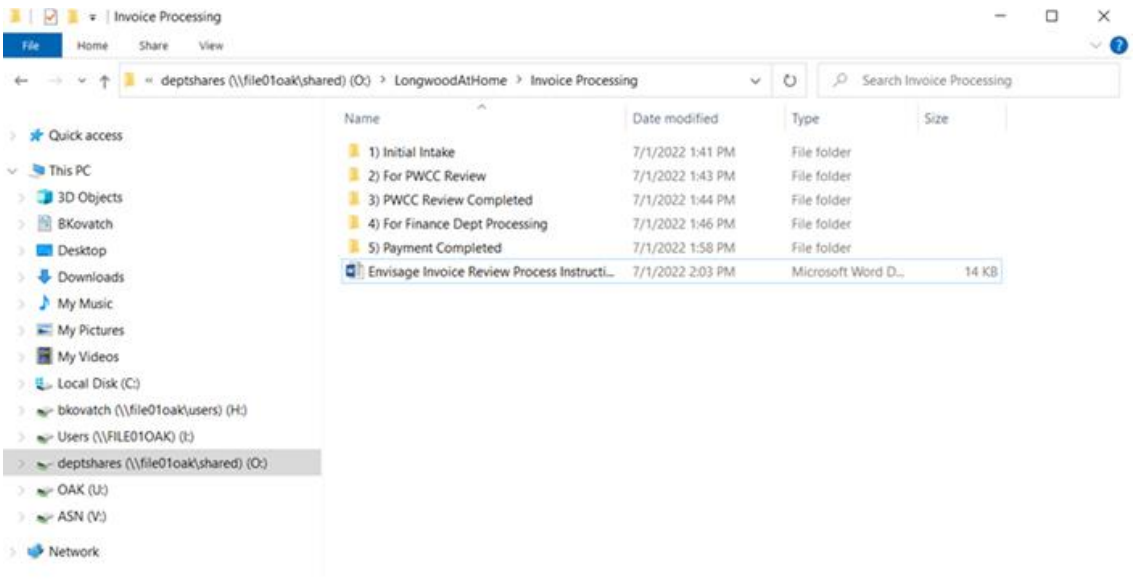

Figure 3: Snapshot of Shared Folder System

2.1.4 Figure 4

Envisage Invoice Review Process Instructions

1) Admin Asst. receives email (or fax / US mail) invoice from vendor
   a) For invoices received via email: Admin Asst. saves attachment to folder "1) Initial Intake" and renames invoice according the convention:
      i) MemberLastName_VendorName_InvoiceDate (mm-dd-yyyy)
   b) For invoices received via fax or US mail: Admin Asst. scan and saves to folder "1) Initial Intake" and names file as above
2) Admin Asst. affixes electronic stamp to invoice file and codes appropriately
3) Admin Asst. moves file to appropriate PWCC folder: subfolder in folder "2) For PWCC Review"
4) PWCC reviews invoice and adds comments electronically to .pdf via *sticky note* function
5) PWCC moves reviewed invoice to folder "3) PWCC Review Completed"
6) Exec Dir reviews invoice and affixes electronic signature
7) Exec Dir moves invoice to folder "4) For Finance Dept Processing"
8) Finance Dept (AP/AR) completes final review and payment functions
9) Finance Dept (AP/AR) moves invoice to folder "5) Payment Completed"

All folders above are located at:

O:\LongwoodAtHome\Invoice Processing

Figure 4: Envisage Invoicing Process Standards

2.2 Figures Project Three

2.2.1 Figure 5

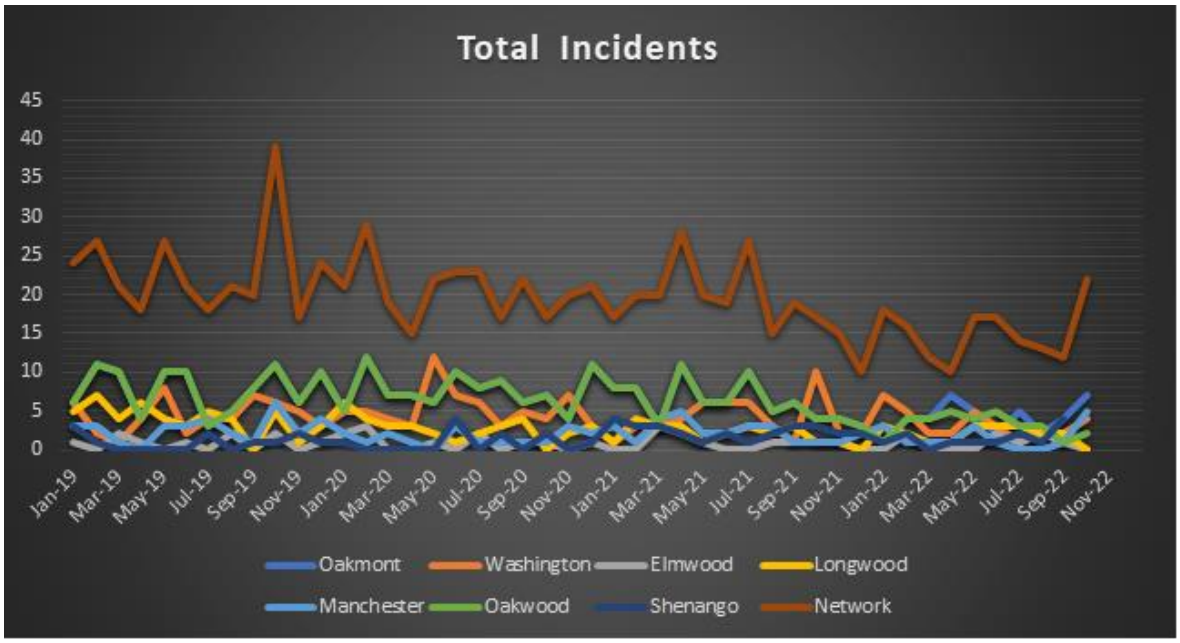

Figure 5: Total Incidents at Each PSCN Campus

2.2.2 Figure 6

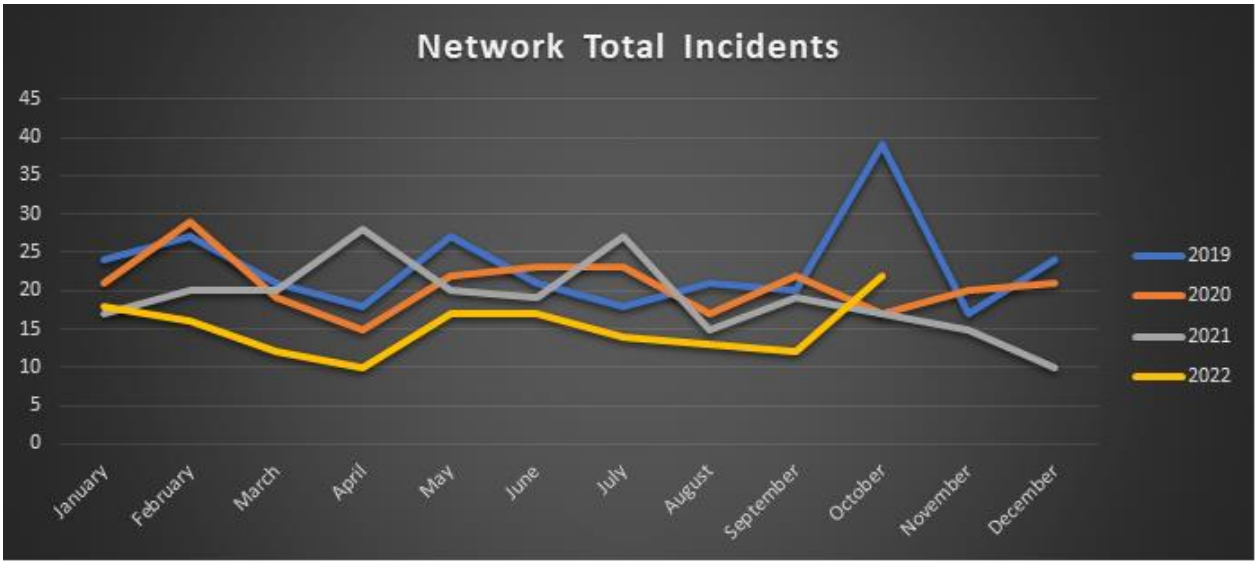

Figure 6: Total Incidents at PSCN (Annual)

2.2.3 Figure 7

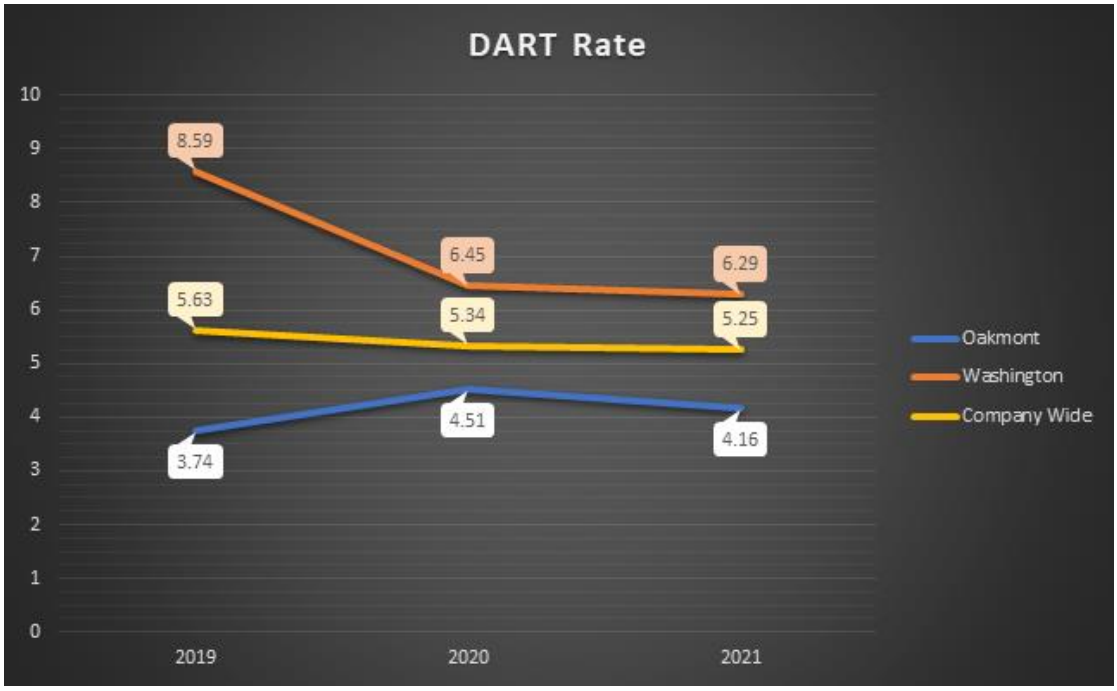

Figure 7: PSCN DART Rate (Includes Oakmont, Washington, and Company Wide Rates)

2.2.4 Figure 8

Figure 8: ASN Totals (Annual)

2.3 Tables: Project One

2.3.1 Table 1

Table 1: Agencies Used to Fill Open Shifts | April 2022

Agency	No. of Shifts	Percent of Agency Shifts
A	316	36.62%
B	257	29.78%
C	118	13.67%
D	61	7.07%
E	60	6.95%
F	31	3.59%
G	10	1.16%
H	7	0.81%
I	3	0.35%
Total	**863**	**100.00%**

2.3.2 Table 2

Table 2: Agency Cost Grid

PER DIEM RATES	Agency A	Agency B	Agency C
Non- Cert Aides	$38.00/$41.00	X	$26.00
CNA	$42.00/$45.00	$36.00	$28.00
LPN	$62.00/$65.00	$55.00	$43.00
RN	$75.00/$78.00	$69.00	$53.00
RN Specialty	$79.00/$82.00	X	X
CONTRACTED RATES			
CNA	$52.00/$55.00	X	X
LPN	$72.00/$75.00	X	X
RN	$85.00/$88.00	X	X
RN Specialty	$89.00/$92.00	X	X
OTHER			
		BUY OUT RATE $8,000	
		SPVSR ADDITIONAL $14/hr	

Bibliography

1. "What Is Lean?: Lean Thinking." Lean Enterprise Institute, January 27, 2023. https://www.lean.org/explore-lean/what-is-lean/.

2. Souza, Davenilcio Luiz, André Luis Korzenowski, Michelle McGaha Alvarado, João Henrique Sperafico, Andres Eberhard Friedl Ackermann, Taciana Mareth, and Annibal José Scavarda. "A Systematic Review on Lean Applications' in Emergency Departments." Healthcare (Basel, Switzerland). U.S. National Library of Medicine, June 19, 2021. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8235665/.

3. "Quality Payment Program Overview." QPP. CMS, 2022. https://qpp.cms.gov/about/qpp-overview.

4. Rubrich, Larry. "Lean Is a System, Not an Event." Reliable Plant. Noria Corporation, June 23, 2009. https://www.reliableplant.com/Read/18388/lean-is-a-system,-not-an-event.

5. Colello, Kirsten J. "Who Pays for Long-Term Services and Supports? - Congress." Congressional Research Service. Accessed April 29, 2023. https://crsreports.congress.gov/product/pdf/IF/IF10343.

6. "Breaking down U.S. Hospital Payor Mixes." Definitive Healthcare, February 2022.

7. "Our Mission, Vision and Values." Presbyterian Senior Care Network, 2023. https://www.srcare.org/presbyterian-seniorcare-pittsburgh-pa/.

8. "State of the Nursing Home Industry - AHCA/NCAL," 2022. https://www.ahcancal.org/News-and-Communications/Fact-Sheets/FactSheets/SNF-Survey-June2022.pdf.

9. "Gemba - What Does It Mean?" Lean Enterprise Institute, May 19, 2022. https://www.lean.org/lexicon-terms/gemba/.

10. "What Is Envisage?" Envisage, November 29, 2022. https://www.envisage.org/what-is-envisage/.

11. Editor, Nursing. "Tiered Huddles Improve Quality across the System." Consult QD. Consult QD, November 20, 2018. https://consultqd.clevelandclinic.org/tiered-huddles-improve-quality-across-the-system/.