

Improving Infection Control Rates in a Long-Term Care Facility

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According to Doctors Without Borders ([MSF], 2020), nearly 1,000 residents of long-term care (LTC) facilities in the United States die daily because of a preventable infection. Never was this fact more prevalent than during the pandemic of Coronavirus Disease 2019 (COVID-19), when residents of LTC facilities were considered most vulnerable to, and more likely to die from, complications related to COVID-19 (Eckardt et al., 2020). It is crucial, therefore, to understand why and how these communicable diseases can enter these facilities in the first place, and thereby encourage a more proactive, rather than reactive, approach to curb the spread in a timely manner with any future outbreaks that may occur.

This paper will discuss the rollout of a comprehensive, evidence-based infection control program in an LTC in Detroit, in the hopes that other LTCs may use this as a template for improving their own IC programs based on the individual facility's culture, resources, and environment. A Logic Model approach was taken to plan the rollout (Appendix A).

Background and Significance

COVID-19, as devastating as it was to LTC residents at its peak, continues to be only one form of communicable disease threat to this population. LTC residents are uniquely predisposed to succumbing to communicable disease infection due to several factors, including multiple comorbidities, poor oral hygiene, increased age, and dementia (Eckardt et al., 2020). Though the residents themselves may serve as an effective means of transmission of communicable disease within a facility, research shows these infections tend to originate with staff, who bring the disease into the LTC from the outside. This is evidenced by the fact that there is a strong link between community burden of a disease and rates within a facility of that disease (White et al., 2020).

There are several reasons why LTC staff serve as a source of infection, most of which are the result of being an overworked, underpaid workforce which leads staff to come into work while sick, maintain concurrent employment at multiple facilities, and general risk of low health quality at the individual level (Eckardt et al., 2020). An additional health concern among LTC

staff is the high rates of vaccine hesitancy, due to heavy suspicion with pharmaceutical companies and the government, rampant misinformation on social media, and general mistrust in mainstream healthcare (Berry et al., 2021). Indeed, only about 37% of LTC staff in the United States has had at least one dose of COVID-19 vaccine (Berry et al., 2021) and about 68% were vaccinated against influenza (flu), compared to 95% of healthcare workers in hospitals (CDC, 2020).

Staff health notwithstanding, the LTC sector also tends to be chronically underfunded, causing outdated resources and protocols (MSF, 2020). This fact, coupled with generally high rates of staff turnover, fosters an environment where there is low staff accountability to IC protocols and poor adherence to high-quality, culturally relevant, evidence-based IC education programs (Eckardt et al., 2020).

It is therefore crucial that each LTC facility have a simple, evidence-based IC program that is customized to an individual facility's culture, resources, and environment so facilities may maintain the basics of proper IC procedure even when outbreaks are not occurring. This will ensure they are better prepared to manage an outbreak when it does occur, regardless of the perpetrating pathogen.

Because disease burden in a surrounding community is a significant indicator of risk of communicable disease in an LTC, it is important to note that the national trends of poor vaccination rates among LTC staff as well as increasing rates of COVID-19 disease are reflected locally, as well. Starting July 1, 2021, the beginning date of data collection for this project, Wayne County was experiencing about 50 cases per day of COVID-19, and it has been steadily increasing since then. Data from November 17, 2021 shows 570 daily cases of COVID-19 in Wayne County—a 1040% increase. Michigan currently has the highest rate of new COVID-19 cases in the country (Michigan Department of Health & Human Services [MDHHS], 2021).

Similarly disappointing is vaccination rates for both COVID-19 and flu among healthcare workers in Michigan. Only about 50% of LTC facilities in Michigan report their staff COVID-19 vaccination rates, and of those, about 62% of staff are vaccinated (MDHHS, 2021). Additionally, the flu vaccine uptake rate in Detroit City proper continues to remain very low, at only about 9% as of November 13, 2021 (MDHHS, 2021). Indeed, as of November 13, 2021, the state of Michigan has only achieved about 56% of its goal of vaccinating 4 million residents this flu season, a rate that is greatly trailing behind that of previous flu seasons, despite experts expecting flu disease activity to resume normal patterns this season (MDHHS, 2021).

Riverview North has not historically collected or reported data for neither COVID-19 nor flu staff vaccination rates within the facility, so a proper comparison to local numbers cannot be made. However, beginning this season, the Director of Nursing (DON) has begun requiring that all staff report the date of their flu vaccine or sign a declination form created by the APHN (Appendix B). This facility does not mandate the flu vaccine and reporting vaccination status to the DON or signing the declination form is voluntary though strongly encouraged.

Furthermore, the federal government has mandated that all eligible staff in healthcare facilities participating in Medicare or Medicaid programs be vaccinated for COVID-19, in which the deadline for all staff to begin the first dose of the series is December 6, 2021 (Centers for Medicare & Medicaid Services [CMS], 2021). This change required an update to this author's goals and objectives, as discussed later.

Project Description

In March 2020, during the height of COVID-19, MSF paid visits to LTCs in the metro Detroit area to assist with providing IC support and education to staff as more and more information about the novel virus became available. The idea was to help alleviate staff fears and increase staff education by providing real-time updates on the new virus, as well as acting as a resource for basic infection control knowledge.

In September 2020, Advanced Public Health Nursing (APHN) students from Wayne State University (WSU) followed up with these facilities to see if any of the teachings from MSF were sustained, and to determine what, if any, barriers were in place for staff to continue properly carrying out the teachings. To achieve this, a community assessment was conducted by the APHN nurse during the fall of 2020 in Riverview North Health & Rehab. The assessment included staff interviews, surveys handed out during all-staff in-services, and direct observation on units to discern adherence to current best-practice IC protocols, as set forth by the Centers for Disease Control and Prevention (CDC) LTC Infection Preventionist Training Course (CDC, 2021).

Interviewees included unit managers, direct care staff (such as Certified Nursing Assistants [CNA] and nurses), and administrators. Survey responses were collected from all staff, which also included staff from dietary, environmental, and social departments. Indeed, all staff have a role in infection control in an LTC, so it was important to represent non-clinical staff in the community assessment as well (MSF, 2020).

Finally, the assessment also included gathering data from previous months about the facility-acquired infectious disease rates to determine which disease was to be addressed during the duration of this project. Disease data collection in the facility began July 1, 2021, as the facility changed their methods for reporting disease numbers at that time, so earlier data were excluded to ensure consistency of data for this project.

Two goals were formulated as a result of this data collection and community assessment. The first being “note a 25% decrease in resident communicable disease cases among residents from July 2021-March, 2022.” The second goal being “note a 25% increase in knowledge among staff related to infection control strategies to reduce communicable disease in residents from August 2021-March, 2022 as measured by assessment of pre- and post-test scores during staff in-services.” It was important that the APHNs increase this knowledge among staff, because by and large staff reported in the community assessment interviews that a

consistent, high-quality, evidence-based education program was key for them to perform their jobs well and alleviate fears during a high-stress time such as a pandemic. Indeed, it is important to note that goals and objectives can be ever evolving to meet the needs of a facility, particularly in the case here where this author's original goal was to increase uptake of COVID vaccines among staff. Once the federal government mandated the vaccine, this goal became obsolete.

One of the barriers that was often mentioned by staff for continuing to carry out the teachings from the MSF visits was that there was little follow-up and the information was not tailored enough to meet the needs of their individual facility. Also, staff stated that the teachings were not reinforced often enough during the high-stress time, so the information was often forgotten, discarded in favor of reverting back to previous practices with which they were more comfortable, or not disseminated to all staff. It is key, therefore, that the basics of IC policy and procedure be reinforced frequently, in case future outbreaks occur, staff already has basic knowledge at their disposal. Indeed, research has shown that staff's ability to carry out high-quality care is affected by their fears and misconceptions about handling of blood and bodily fluids they perceive to be dangerous (Chan et al., 2002).

Evidence-Based Practice

To address this need, the APHN referred to modules from the CDC's IC Preventionist Course (CDC, 2021) as a reference for collecting the most up-to-date information regarding IC procedure. Then, using concepts from Knowles' Adult Education Theory, the APHN designed in-services, pre- and post-tests, questionnaires, and printable posters (Appendix C) to encourage proper IC technique to control disease, gather information on knowledge gain and demographics, measure effectiveness of teachings, measure changes in willingness to receive flu vaccine, and receive staff input on educational needs and wants for future teaching topics. Knowles's theory is useful in this environment because it stresses the importance of building trust (promoted by culture of co-learning) between the educator and the adult learner and

promoting the “why” behind the educational topic to be adopted. This helps promote a true, sustainable behavior change rather than just increasing general knowledge (Mathai et al., 2010).

Because managing communicable diseases in an LTC is also affected by staff vaccination rates for flu, a third goal emerged to note a “10% increase in intent to receive flu vaccine among unvaccinated staff as determined by responses from pre and post-tests during infection control in-services conducted from August through November, 2021”. This timeframe was selected because it is peak flu season vaccination time.

This goal arose out of reviewing survey responses during a flu in-service, in which 55% of respondents indicated they do not receive their flu vaccine annually (N=11). Thus, flu disease and vaccine information came to be incorporated into in-services and posters as well (Appendix D). The 10% increase in willingness to accept the flu vaccine was modeled after the results of the Borgey et al. (2019) randomized, controlled trial of similar interventions of posters and in-services in LTCs. These interventions, as well as promoting a declination (also known as “opt-out” or “nudge-based”) system, is also supported in an intervention from Lorini et al. (2020). Thus, the APHN created a declination form modeled after the “Declination of Influenza Vaccination” form from the CDC’s Immunization Action Coalition (IAC) (IAC, 2021). It is particularly important that LTC staff remain consistent in receiving their flu vaccine annually as a secondary layer of protection against flu in a resident population that may not respond as well to vaccination, themselves, due to immunosenescence (Moretti et al., 2020). The flu is one of many respiratory diseases that can cause lower-respiratory infection (LRI) in LTC residents, so ideally if flu vaccination rates increase among staff it will decrease LRI rates as well. (LRI is what is tracked on the monthly infection control reports provided by the facility, and what is most closely linked to influenza for the purposes of this project.)

This approach of gathering staff input to guide educational topics, based on verified adult learning theory, as well as incorporating an evidence-based method for improving willingness to

uptake the flu vaccine should be an effective basis for a successful project in improving LRI rates in an LTC. This is because the trainings, hand-outs, posters and other educational materials are modelled after the World Health Organization's (WHO) "3-Cs" (complacency, convenience, confidence) framework for addressing vaccine hesitancy (Moretti et al., 2020). Using all these methods, the APHN can build trust, and thereby effectively disseminate information among LTC staff who are historically mistrusting to outsiders who try and enter the facility to perform teachings without first building that trust (MSF, 2020). Indeed, the community assessment piece served as the jumping off point for introducing APHNs to staff and beginning the process of building trust.

Results of the Program Implementation

Building trust is crucial to encourage staff to attend in-services and be receptive to education, particularly from "outsiders", that is, educators who do not work in the facility. One of the largest barriers was getting proper attendance to in-services, because LTCs are often understaffed, and it is difficult for staff to step away from duties for long periods of time. To combat this issue, learn more about the demographics of the staff, and gain a general idea of the staff's infection control knowledge base, mandatory clinical skills check-off days were held for all direct-care staff and surveys were distributed to all attendees, with questions taken from the CDC's IC Preventionist Training Course (CDC, 2021). During this event, it was learned that most staff answered questions incorrectly about personal protective equipment (PPE) use, despite most of them having worked there for ten-plus years (Table 1). When asked how future events can be improved, the only response was staff would like them more often. (Note: demographic questions were added to the surveys on CNA skills day, which occurred after nurse skills day, after conversation with academic advisor.)

This information helped guide the creation of future events, and subsequent in-services were performed from August 2021 to November 2021 to address the poor performance on PPE questions, as well as to address the growing numbers of LRI cases and vaccine hesitancy in the

facility. Results from the demographic surveys assisted in creating in-services that were appropriate to the general age and educational background of staff (Table 1).

The intervention of a tailored educational program specific to the needs of this facility was effective. Every in-service demonstrated an average test score increase from pre- to post-test, with the exception of the nurse baseline skills in-service, in which average test scores remained constant (Table 2). The most dramatic increase of test scores was for the COVID-19 vaccine in-service, in which average score escalated from 3.4 to 4.7—a 38% increase, meeting the 25% knowledge gain goal regarding strategies to reduce communicable disease (Table 4).

The in-services addressing flu vaccine hesitancy were successful as well. To address flu vaccine hesitancy, staff was asked if they receive the flu shot annually, and if they do not, how likely are they to receive it this year. 55% of respondents stated they do not receive the vaccine annually, and of those, the average feeling was that they were “probably not” (or score 2 on a Likert scale) going to receive the vaccine, prior to listening to the in-service. After the in-service, when asked about willingness to uptake the flu vaccine, there was a marked difference in scores from the pre- to the post-survey, in which the scores became much less polarized at the extreme ends of the Likert scale, and more evenly distributed toward the middle, suggesting that those who were “unsure” or “somewhat unlikely” to get the vaccine were trending more toward neutral by the end of the in-service (Tables 5 and 6). Note: incomplete surveys were removed from the final analysis, which is why the number of respondents is different from pre- to post-survey.

The final goal of improving communicable disease rates in the facility was also shown to be successful. This is particularly exemplified by LRI cases in the facility. The peak of LRI cases in the facility was in August 2021, with two cases of facility acquired LRI (Table 3). In September 2021 the number of cases were zero again. Then, in January, 2022, the DON noted an increasing trend in LRI cases occurring. She then performed a unit audit and addressed the issue immediately utilizing knowledge gained from the CDC’s Infection Preventionist Training

Course. By February, the number of LRI cases was back down to zero in the facility. The hope is the trajectory will continue with the DON or IC nurse monitoring cases and addressing them in real-time based on true evidence-based practice. Utilizing print materials for reminders for proper IC technique for outside agency staff could be useful as well, as it could be difficult to monitor agency staff education.

Lessons were learned upon evaluation of the data and reflection on the project. The most impactful is how important it is that trust be built between educators and staff so effective and meaningful education can be imparted. Staff input is crucial for developing a fully comprehensive education program and collecting demographic information on in-service attendees can be useful in guiding the development of appropriate educational materials and learning who is attending the in-services and who tends to be skipping them. (For example: baseline results from the CNAs show an overall older staff, who may not be as responsive to technology-based teaching tools [Table 1].) Because even though valuable resources such as the CDC IC Preventionist Training modules exist, they may not be appropriate to the culture and environment to the general staff of a specific facility. It is important that an IC “champion”, such as an administrator or an IC nurse, utilize those high-level tools to trickle down education of and hold staff accountable to the most important key points.

The champion must maintain this baseline IC education with staff so, if an outbreak were to occur again, staff already feels empowered to adhere to proper policy and procedure. It is important to meet staff where they are in terms of culture, background, and education level so all staff remain engaged during trainings and thereby impart true behavior change to better protect their vulnerable residents.

Establishing an IC champion will be beneficial for the sustainability of the program, as well. At this time, the original IC nurse has been promoted to DON, and a new hire was put in the staff development position. It may also be useful to begin a facility-wide IC dashboard that is visible to all staff at any given time, which displays communicable disease rates as well as staff

vaccination data. Having this real-time information at their disposal might encourage staff to take greater care in their IC procedure if they notice case numbers increasing. They may also be more willing to get vaccinated if they see other coworkers are getting vaccinated, too.

To ease the transition of the new staff development nurse to the role, the APHN has sorted all printed documents into folders for ease of future copying, as well as provided the DON with a flash drive containing electronic templates of all in-services, flyers, and education materials so they may be used again, or updated, as needed. Additionally, the APHN created an electronic training tracking spreadsheet so the staff development manager can easily track staff education topics and hours. The electronic-based nature of the materials means little input from the facility terms of resources, other than time from staff and potentially paper and ink for printed materials.

Conclusions

Lessons learned through community assessment in an LTC in Detroit after the MSF visit at the height of COVID-19 demonstrate the importance of truly engaging with staff to better provide effective education to a population that is often overworked and underpaid. Building trust during the community assessment phase is key in encouraging staff to provide input on their educational needs and wants. Having an IC champion refer to evidence-based, high-level tools such as the CDC's IC Preventionist Course and creating an education program that is specifically tailored to the culture, environment, and resources of the facility is shown to increase staff knowledge and decrease apprehensions (such as toward vaccines), thereby improving communicable disease rates among residents of the facility, regardless of the pathogen.

In this way, the program is set up to be sustainable and malleable to fit the education needs of a sector that is known for high turnover and low resources. Having an IC champion in the facility is the best way to encourage sustainability for this education program, because that point person can serve as a single source for the most up-to-date, evidence-based information.

This promotes consistency in messaging and continuity of education. Having these resources at their disposal can help empower staff to adhere to proper IC procedure and alleviate fears, particularly during the time of the novel COVID-19 disease, and for any other future outbreak that may occur in the facility.

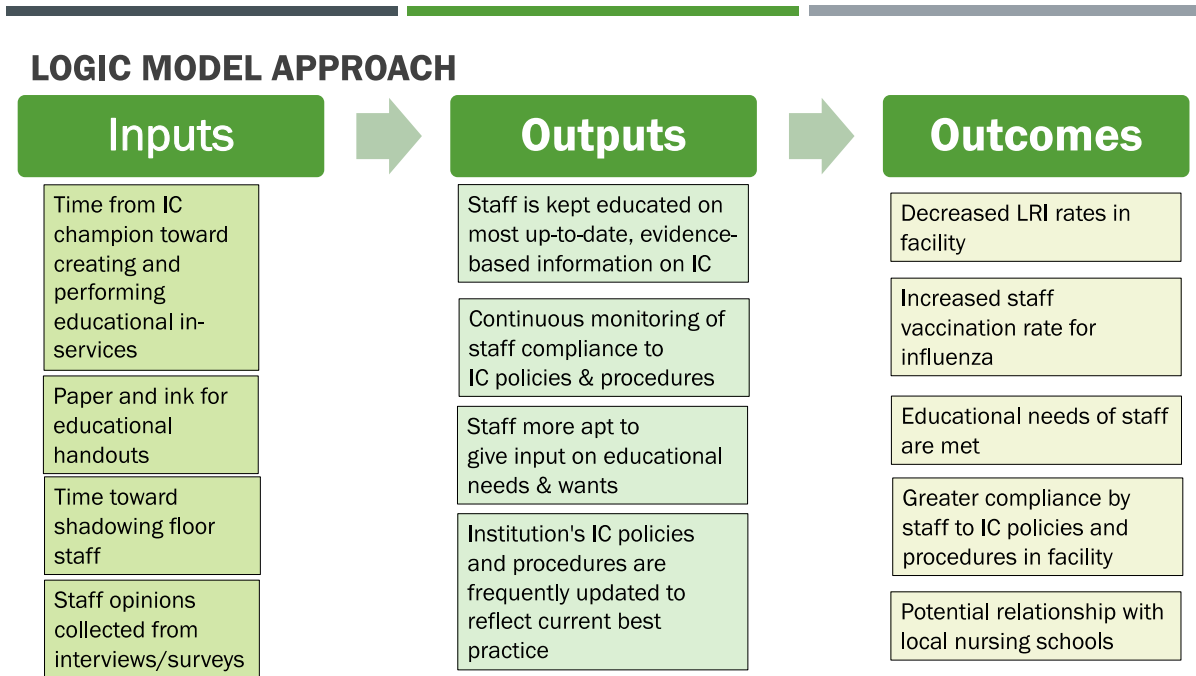
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Appendix A. Logic Model approach to program planning.



Appendix B. Influenza vaccine declination form utilized by facility for flu season 2021-2022.*2021-2022 Influenza Vaccine Declination Form
Riverview North Health & Rehab*

I understand that, as an unvaccinated individual, my physical presence as well as participation and utilization of facilities, services, and programs at this facility may carry heightened risks that cannot be eliminated regardless of the care and reasonable efforts taken to avoid and mitigate those risks.

I understand I can choose to be vaccinated for influenza at any time during this influenza season, and this declination will thereby be revoked.

I understand that although Riverview North Health & Rehab holds the health and safety of its community as paramount, there is no guarantee that I will not be exposed to or infected with *Influenza*.

I understand the consequences of my refusal to be vaccinated could have life-threatening consequences for my health and the health of everyone with whom I have contact, including my coworkers and all patients in this healthcare facility.

Despite these risks, I choose not to be vaccinated. I have read and fully understand my obligations as described above and request this exemption related to *influenza* vaccine.

(Signature)

(Date)

(Print name)

Appendix C. Handwashing flyer



Only 19% of
people wash
their hands
after using
the toilet



Appendix D. Influenza vaccine poster to promote staff vaccination.

You Are Essential

Protect yourself, your family, and your patients this flu season



Clean
your
hands



Cover your
cough



Get your flu
shot every
year

Everyone aged 6 months and older should get their flu shot every year.

Table 1. Results from CNA baseline demographic survey.

Education level, n (%)	
Less than high school	1 (4.7)
High school diploma/GED	18 (85)
Licensed Practical Nurse	0
Associate Degree	1 (4.7)
Bachelor's degree	0
Master's Degree or above	0
Age, n (%)	
18-25	2 (9.5)
26-35	3 (14.3)
36-45	5 (23.8)
46 and older	10 (47.6)
Race, n (%)	
Asian	0
American Indian/Alaskan Native	0
Black/African-American	21 (100)
Latino/a/Hispanic	0
Hawaiian/Pacific Islander	0
White/Caucasian	0
Years in current role, n (%)	
1-3	3 (14)
4-6	1 (4.7)
7-10	3 (14.3)
10 or more	13 (61.9)

Table 2. Results from baseline direct care staff infection control knowledge assessment.

CNA Questionnaire		Pre-Test % Correct	Post-Test %Correct	% Change
1.	What is the recommended length of time you should wash your hands to ensure the most possible germs are washed away?	90	85	-5.6
2.	True or false: Personal prescription glasses can be used instead of goggles for eye protection	62	85	37
3.	Which of the following statements is true about using gloves	100	100	0
4.	You should wash your hands after which activity	100	100	0
5.	Respiratory germs (such as flu and COVID-19) can be spread through the air when a sick person (choose correct answer)	90	90	0
	Average score.	84	92	9.5
Nurse Questionnaire		Pre-Test	Post-Test	% Change
1.	What is the recommended length of time you should wash your hands to ensure the most possible germs are washed away?	100	100	0
2.	True or false: Personal prescription glasses can be used instead of goggles for eye protection	80	91	13.8
3.	Which of the following statements is true about using gloves	100	100	0
4.	You should wash your hands after which activity	100	100	0
5.	Respiratory germs (such as flu and COVID-19) can be spread through the air when a sick person (choose correct answer)	100	100	0
	Average score.	100	98	-2

Table 3. Cases of facility-acquired LRI by month, July 2021-Mar 2022.

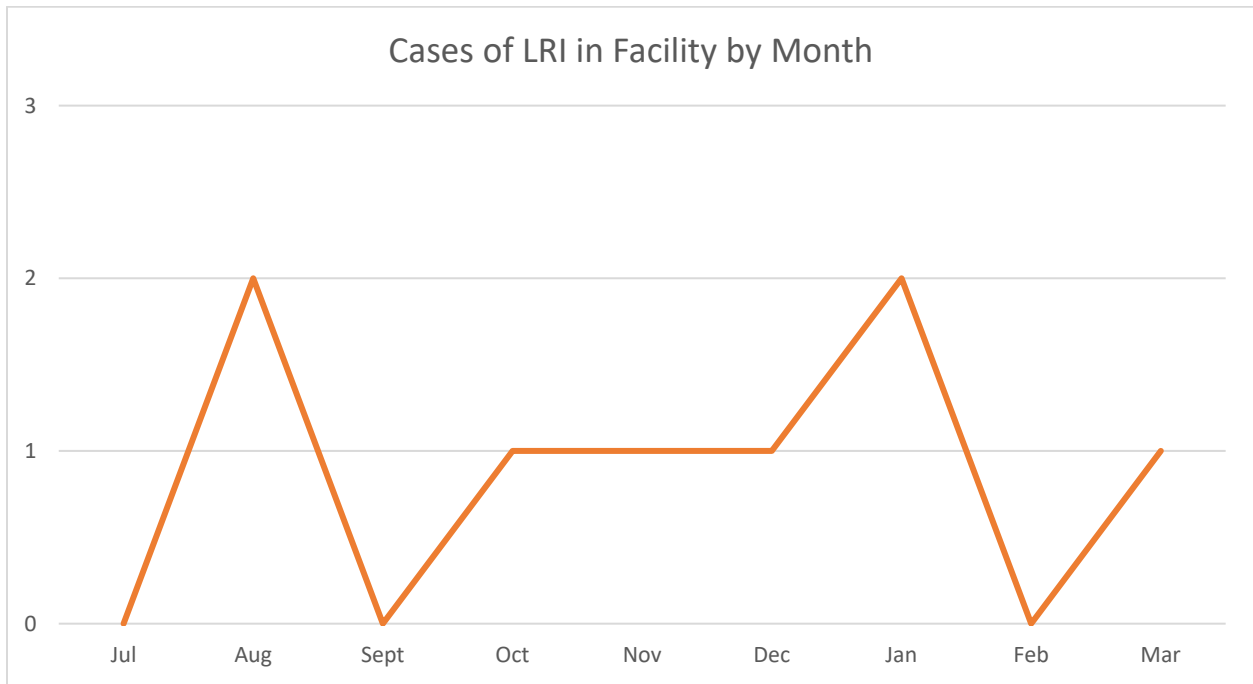


Table 4. Results from COVID-19 vaccine in-service knowledge gain assessment.

Questionnaire	% Correct Pre-Test	% Correct Post-Test	% Change
1. COVID-19 is spread when an infected person (choose answer).	85.8	85.8	0
2. True or false: you can spread COVID-19 to Others before you know you're sick.	100	100	0
3. COVID-19 spreads more easily than flu and causes more serious illness cases.	100	85.8	-14.2
4. Serious complications caused by COVID-19 Include (choose answer)	71	85.8	20.9
5. People over the age of 65 are at higher risk For severe complications of COVID-19.	57	100	75.4
Average score	68	94	38.2

Table 5. Attitudes toward flu vaccine uptake: Pre-in-service

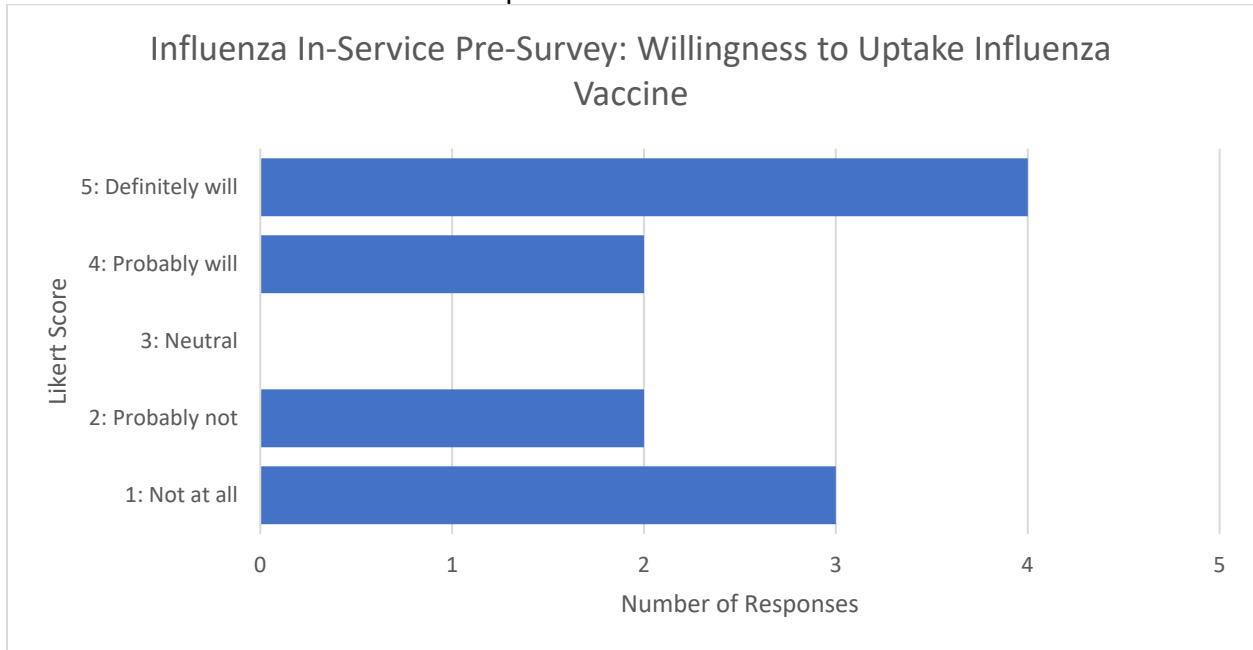


Table 6. Attitudes toward flu vaccine uptake: Post-in-service

