Surveillance of COVID-19 Vaccination in Nursing Homes, United States, December 2020–July 2021

Andrew I. Geller, MD1,2; Daniel S. Budnitz, MD, MPH1,2; Heather Dubendris, MSPH1,3; Radhika Gharpure, DVM, MPH1; Minn Soe, MBBS, MPH1; Hsiu Wu, MD1; Elizabeth J. Kalayil, MPH1,2; Andrea L. Benin, MD1; Suchita A. Patel, DO, MPH1; Megan C. Lindley, MPH1; and Ruth Link-Gelles, PhD, MPH1,2

Abstract
Monitoring COVID-19 vaccination coverage among nursing home residents and staff is important to ensure high coverage rates and guide patient-safety policies. With the termination of the federal Pharmacy Partnership for Long-Term Care Program, another source of facility-based vaccination data is needed. We compared numbers of COVID-19 vaccinations administered to nursing home residents and staff reported by pharmacies participating in the temporary federal Pharmacy Partnership for Long-Term Care Program with the numbers of COVID-19 vaccinations reported by nursing homes participating in new COVID-19 vaccination modules of the Centers for Disease Control and Prevention’s National Healthcare Safety Network (NHSN). Pearson correlation coefficients comparing the number vaccinated between the 2 approaches were 0.89, 0.96, and 0.97 for residents and 0.74, 0.90, and 0.90 for staff, in the weeks ending January 3, 10, and 17, 2021, respectively. Based on subsequent NHSN reporting, vaccination coverage with ≥1 vaccine dose reached 73.7% for residents and 47.6% for staff the week ending January 31 and increased incrementally through July 2021. Continued monitoring of COVID-19 vaccination coverage is important as new nursing home residents are admitted, new staff are hired, and additional doses of vaccine are recommended.

Keywords
COVID-19, vaccination, nursing home, surveillance

 Residents and staff of nursing homes are at increased risk for SARS-CoV-2 infection,1,2 and nursing home residents are at risk for severe complications of COVID-19.1,4-7 To help protect this disproportionately affected population, in December 2020, the Centers for Disease Control and Prevention (CDC) launched the Pharmacy Partnership for Long-Term Care Program, facilitating on-site COVID-19 vaccination of nursing home residents and staff.8 Of the approximately 11,000 nursing homes that had at least 1 on-site vaccination clinic in the first month of the program, an estimated three-quarters of residents (77.8%) and one-third of staff (37.5%) were vaccinated with ≥1 dose of a COVID-19 vaccine.9

 CDC’s National Healthcare Safety Network (NHSN) is the nation’s web-based surveillance program for monitoring health care–associated adverse events, annual health care staff influenza vaccinations, and other patient-safety practices. In December 2020, NHSN released COVID-19 reporting modules for tracking vaccination coverage among residents and staff of long-term care facilities.10 These modules allow for voluntary weekly reporting by facilities and are designed to collect data on the number of current residents and staff eligible for vaccination and the number who have been vaccinated.10

 The Pharmacy Partnership for Long-Term Care Program was designed as a time-limited initiative to facilitate a limited number of vaccination clinics at each participating facility. With the conclusion of the program, pharmacy
reporting of facility-level resident and staff COVID-19 vaccine administration data to CDC ceased, but the need for a national data source for monitoring COVID-19 vaccination in nursing homes remains. As such, the Centers for Medicare & Medicaid Services (CMS) began to require nursing home reporting through NHSN on May 21, 2021. The objectives of this analysis were to (1) assess the comparability of numbers of COVID-19 vaccinations administered to nursing home residents and staff in January 2021 reported through the Pharmacy Partnership for Long-Term Care Program and through the NHSN COVID-19 vaccination coverage module among CMS-certified nursing homes that participated in both programs and (2) report weekly COVID-19 vaccination coverage for residents and staff among CMS-certified nursing homes voluntarily reporting through NHSN from December 2020 through July 2021.

Methods

Comparability of COVID-19 Vaccination Administration Reporting

We used facility NHSN organization identification and CMS certification numbers to identify nursing homes that had their first Pharmacy Partnership for Long-Term Care Program vaccination clinic in the weeks ending January 3, 10, and 17, 2021, and reported vaccination coverage data through NHSN, as the number of doses administered and reported should closely match for this period. If the total number of doses administered according to Pharmacy Partnership for Long-Term Care Program reporting exceeded the total number of residents or staff eligible to be vaccinated as reported to NHSN, we set the total vaccinated to the total number of residents or staff reported to NHSN. We calculated Pearson correlation coefficients to assess strength of association and paired t tests for mean difference to quantify comparability between vaccination data reported to NHSN and vaccine administration data from the Pharmacy Partnership for Long-Term Care Program, and we considered P < .05 to be significant. We accessed these data on February 22, 2021.

COVID-19 Vaccination Coverage in Facilities Reporting to NHSN

Among all CMS-certified nursing homes reporting vaccination data through NHSN, we calculated the numbers and proportions of residents and staff who received doses of COVID-19 vaccine among facilities reporting each week from the week ending December 20, 2020, through the week ending July 25, 2021. This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy (see eg, 45 CFR part 46; 21 CFR part 56; 42 USC §241(d); 5 USC §552a; 44 USC §3501 et seq).

Results

Comparability of COVID-19 Vaccination Administration Reporting

During the 3 consecutive 1-week periods, resident and staff vaccination data from 1028 and 818 CMS-certified nursing homes, respectively, were reported to both the Pharmacy Partnership for Long-Term Care Program and NHSN. Pearson correlation coefficients for numbers of COVID-19 vaccinations administered to nursing home residents and staff as reported by the Pharmacy Partnership for Long-Term Care Program and the NHSN COVID-19 vaccination coverage modules were 0.89, 0.96, and 0.97 for nursing home residents and 0.74, 0.90, and 0.90 for nursing home staff, in the weeks ending January 3, 10, and 17, 2021, respectively (P < .001 for all correlations). The number of administered vaccine doses reported by pharmacies to the Pharmacy Partnership for Long-Term Care Program exceeded the total number of eligible residents as reported to NHSN by a median of 17 additional doses for 148 of 1028 (14.4%) nursing homes, and exceeded the total number of eligible staff reported to NHSN by a median of 9 additional doses for 27 of 818 (3.3%) nursing homes. Excluding these facilities, the mean difference in number of vaccinations across all weeks was 0.1 (95% CI, –0.6 to 0.8) more vaccinations given for residents and –0.8 (95% CI, –2.1 to 0.6) fewer vaccinations reported to NHSN for staff than to the Pharmacy Partnership for Long-Term Care Program.

COVID-19 Vaccination Coverage in Facilities Reporting to NHSN

A total of 15,292 CMS-certified nursing homes reported resident COVID-19 vaccination coverage and 15,290 CMS-certified nursing homes reported staff COVID-19 vaccination coverage for ≥1 week from the week ending December 20, 2020, through the week ending July 25, 2021. Among CMS-certified nursing homes reporting to NHSN, coverage with ≥1 dose of COVID-19 vaccine rose rapidly and reached 73.7% (85,456 of 115,972) for residents (Figure 1) and 47.7% (80,650 of 168,944) for staff (Figure 2) during the week ending January 31, 2021. Coverage with ≥1 dose of COVID-19 vaccine then increased incrementally for both nursing home residents and nursing home staff through July 2021. By the week ending January 31, 2021, 44.2% (51,225 of 115,972) of residents and 28.1% (47,397 of 168,944) of staff had received a complete primary series of COVID-19 vaccine, and the proportion of residents and staff who had received a complete primary series continued to increase through July 2021.

In the week ending July 25, 2021, 90.1% (14,873 of 16,505) of CMS-certified nursing homes reported resident vaccinations, and 90.2% (14,894 of 16,505) of CMS-certified
nursing homes reported staff vaccinations. These nursing homes reported 84.8% (990,642 of 1,173,259) of residents and 62.6% (1,105,254 of 1,765,845) of staff received at least partial vaccination; 82.3% (961,731 of 1,167,987) of residents and 60.8% (1,073,250 of 1,765,845) of staff received a complete vaccination series.

Discussion

High correlation between vaccine administration reported by the Pharmacy Partnership for Long-Term Care Program and NHSN COVID-19 vaccination reporting modules suggests NHSN can be used with confidence to track COVID-19 vaccination in nursing homes. With the completion of the Pharmacy Partnership for Long-Term Care Program, a public health need remains to track COVID-19 vaccination coverage in nursing homes, where residents remain at elevated risk for morbidity and mortality, and both residents and staff are at high risk for SARS-CoV-2 acquisition and transmission.

Continued tracking of COVID-19 vaccination coverage in nursing homes is important for several reasons. First, vaccination coverage of staff members has plateaued, suggesting that further efforts are needed to increase coverage among these health care personnel. Historically, high staff turnover rates at nursing homes—approximating 100% annually—warrant ongoing COVID-19 vaccination efforts. In addition, addressing vaccine hesitancy among nursing home staff and improving vaccine acceptance are needed. Ongoing weekly surveillance from NHSN can track the impact of such efforts. Second, although currently plateaued at a rate higher than among staff members, vaccination coverage among nursing home residents should continue to be monitored to track national vaccination efforts, as new residents are admitted to facilities on a daily basis. Third, jurisdictions can use weekly coverage rates to target intervention resources to facilities with greatest need of vaccination uptake. Fourth, nursing homes may use facility vaccination rates to guide infection control policies, such as those pertaining to indoor visitation with nursing home residents.

Figure 1. COVID-19 vaccination coverage of nursing home residents among facilities reporting to the National Healthcare Safety Network each week, United States, December 2020–July 2021. “Partial vaccination” refers to receipt of only the first dose of a 2-dose COVID-19 primary vaccine series. “Complete vaccination” refers to completion of a COVID-19 primary vaccine series (receipt of the second dose of a 2-dose mRNA vaccine or a single dose of Janssen [Johnson & Johnson] vaccine). Data are current as of August 2, 2021.
Limitations

This study had several limitations. First, the correlation between data from the Pharmacy Partnership for Long-Term Care Program and NHSN is not expected to be exact. Pharmacy Partnership for Long-Term Care Program data include only people vaccinated on-site, whereas NHSN counts people vaccinated on-site or elsewhere. Second, we found instances in which the total number of doses administered to residents or staff according to Pharmacy Partnership for Long-Term Care Program reporting exceeded the total number of current residents or staff reported to NHSN. One explanation is that the number of vaccine doses brought to a facility exceeded the number of residents and staff who decided to be vaccinated and, to avoid wastage, other people (eg, health care workers from other facilities) were vaccinated and recorded as facility residents or staff. Another possible explanation is that the number of residents or staff were underreported to NHSN. Third, facilities reporting NHSN COVID-19 vaccination coverage may not have been representative of all nursing homes before the CMS requirement to report in May 2021; however, the January vaccination coverage rates reported by NHSN and the Pharmacy Partnership for Long-Term Care Program were similar for residents (73.7% vs 77.8%) and staff (47.6% vs 37.5%), and the vaccination coverage trends reported since the CMS requirement are consistent with previous trends.

Because the Pharmacy Partnership for Long-Term Care Program was replaced with direct federal allocations of COVID-19 vaccine to long-term care pharmacies, which have traditionally provided vaccines to nursing homes, NHSN is now the single national source of facility-level resident and staff COVID-19 vaccination data to monitor vaccination progress, target vaccination support programs, and help inform infection control policies. Continued monitoring of COVID-19 vaccination coverage is important as new nursing home residents are admitted, new staff are hired, and additional doses of vaccine are recommended.

Figure 2. COVID-19 vaccination coverage of nursing home staff among facilities reporting to the National Healthcare Safety Network each week, December 2020–July 2021. “Partial vaccination” refers to receipt of only the first dose of a 2-dose COVID-19 primary vaccine series. “Complete vaccination” refers to completion of a COVID-19 primary vaccine series (receipt of the second dose of a 2-dose mRNA vaccine or a single dose of Janssen [Johnson & Johnson] vaccine). Data are current as of August 2, 2021.
References

1. US Department of Health and Human Services, Centers for Medicare & Medicaid Services. COVID-19 nursing home data. 2021. Accessed April 13, 2021. https://data.cms.gov/stories/s/COVID-19-Nursing-Home-Data/bkwz-xpvg

2. Ryskina KL, Yun H, Wang H, Chen AT, Jung HY. Characteristics of nursing homes by COVID-19 cases among staff: March to August 2020. J Am Med Dir Assoc. 2021;22(5):960-965.e1. doi:10.1016/j.jamda.2021.02.004

3. Hughes MM, Groenewold MR, Lessem SE, et al. Update: characteristics of health care personnel with COVID-19—United States, February 12–July 16, 2020. MMWR Morb Mortal Wkly Rep. 2020;69(38):1364-1368. doi:10.15585/mmwr.mm6938a3

4. Bagchi S, Mak J, Li Q, et al. Rates of COVID-19 among residents and staff members in nursing homes—United States, May 25–November 22, 2020. MMWR Morb Mortal Wkly Rep. 2021;70(2):52-55. doi:10.15585/mmwr.mm7002e2

5. McMichael TM, Clark S, Pogosjans S, et al. COVID-19 in a long-term care facility—King County, Washington, February 27–March 9, 2020. MMWR Morb Mortal Wkly Rep. 2020;69(12):339-342. doi:10.15585/mmwr.mm6912e1

6. COVID-19 Response Team. Severe outcomes among patients with coronavirus disease 2019 (COVID-19)—United States, February 12–March 16, 2020. MMWR Morb Mortal Wkly Rep. 2020;69(12):343-346. doi:10.15585/mmwr.mm6912e2

7. Wortham JM, Lee JT, Althomson S, et al. Characteristics of persons who died with COVID-19—United States, February 12–May 18, 2020. MMWR Morb Mortal Wkly Rep. 2020;69(28):923-929. doi:10.15585/mmwr.mm6928e1

8. US Department of Health and Human Services, Centers for Disease Control and Prevention. Reporting COVID-19 vaccination data for long-term care facilities. 2021. Accessed November 5, 2021. https://www.cdc.gov/coronavirus/2019-ncov/vaccines/distributing/long-term-care-facility-vaccination-data.html

9. Gharpure R, Guo A, Bishnoi CK, et al. Early COVID-19 first-dose vaccination coverage among residents and staff members of skilled nursing facilities participating in the Pharmacy Partnership for Long-Term Care Program—United States, December 2020–January 2021. MMWR Morb Mortal Wkly Rep. 2021;70(5):178-182. doi:10.15585/mmwr.mm7005e2

10. Centers for Disease Control and Prevention. National Healthcare Safety Network (NHSN) long-term care facility component—HCP & resident COVID-19 vaccination. 2021. Accessed March 27, 2021. https://www.cdc.gov/nhsn/ltc/weekly-covid-vac/index.html

11. US Department of Health and Human Services, Centers for Medicare & Medicaid Services. CMS expanding efforts to grow COVID-19 vaccine confidence and uptake amongst nation’s most vulnerable. 2021. Accessed May 11, 2021. https://www.cms.gov/newsroom/press-releases/cms-expanding-efforts-grow-covid-19-vaccine-confidence-and-uptake-amongst-nations-most-vulnerable

12. Gandhi A, Yu H, Grabowski DC. High nursing staff turnover in nursing homes offers important quality information. Health Aff (Millwood). 2021;40(3):384-391. doi:10.1377/hlthaff.2020.00957

13. Berry SD, Johnson KS, Myles L, et al. Lessons learned from frontline skilled nursing facility staff regarding COVID-19 vaccine hesitancy. J Am Geriatr Soc. 2021;69(5):1140-1146. doi:10.1111/jgs.17136

14. Unroe KT, Evans R, Weaver L, Rusyniak D, Blackburn J. Willingness of long-term care staff to receive a COVID-19 vaccine: a single state survey. J Am Geriatr Soc. 2021;69(3):593-599. doi:10.1111/jgs.17022

15. Harrison J, Berry S, Mor V, Gifford D. “Somebody like me”: understanding COVID-19 vaccine hesitancy among staff in skilled nursing facilities. J Am Med Dir Assoc. 2021;22(6):1133-1137. doi:10.1016/j.jamda.2021.03.012

16. Feifer RA, Bethea L, White EM. Racial disparities in COVID-19 vaccine acceptance: building trust to protect nursing home staff and residents. J Am Med Dir Assoc. 2021;22(9):1853-1855.e1. doi:10.1016/j.jamda.2021.07.006

17. US Department of Health and Human Services, Centers for Disease Control and Prevention. NHSN group users—NHSN users resources. 2021. Accessed April 16, 2021. https://www.cdc.gov/nhsn/group-users/index.html

18. US Department of Health and Human Services, Centers for Medicare & Medicaid Services. CMS updates nursing home guidance with revised visitation recommendations. March 10, 2021. Accessed March 11, 2021. https://www.cms.gov/newsroom/press-releases/cms-updates-nursing-home-guidance-with-revised-visitation-recommendations

19. US Department of Health and Human Services, Centers for Disease Control and Prevention. The federal retail pharmacy program for COVID-19 vaccination. 2021. Accessed November 5, 2021. https://www.cdc.gov/nhsn/group-users/index.html