


**Table 1.** Vaccination Rates of Hospital Employees

Variable	Vaccinated, No. (%)	Unvaccinated, No. (%)	Odds Ratio	95% Confidence Interval	P Value
Total employees	2,425 (71)	976 (29)			
<b>Age, years</b>			1.85	1.53–2.24	<.01
≥50	657 (80)	163 (20)			
<50	1,768 (69)	813 (31)			
<b>Sex</b>			1.12	0.94–1.35	.10
Male	558 (73)	205 (27)			
Female	1,867 (71)	771 (29)			
<b>Department</b>			1.19	1.01–1.42	.02
Clinical	1,857 (72)	715 (28)			
Nonclinical	568 (69)	261 (31)			
<b>Race</b>			4.55	3.74–5.52	<.01
White	1,022 (83)	203 (17)			
Black or African American	536 (53)	484 (47)			

## References

- Slaoui M, Hepburn M. Developing safe and effective covid vaccines—operation warp speed's strategy and approach. *N Engl J Med* 2020;383:1701–1703.
- Hamel L, Sparks G, Brodie M. KFF COVID-19 vaccine monitor: experiences with vaccine access and information needs. Kaiser Family Foundation website. <https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-experiences-vaccine-access-information-needs/>. Published 2021. Accessed March 25, 2021.
- Sallam M. COVID-19 vaccine hesitancy worldwide: a concise systematic review of vaccine acceptance rates. *Vaccines (Basel)* 2021;9:160.
- Summers J. Little difference in vaccine hesitancy among white and black Americans, poll finds. Nation Public Radio website. <https://www.npr.org/sections/coronavirus-live-updates/2021/03/12/976172586/little-difference-in-vaccine-hesitancy-among-white-and-black-americans-poll-find>. Published 2021. Accessed March 21, 2021.
- Opel D, Lo B, Peek M. Addressing mistrust about COVID-19 vaccines among patients of color. *Ann Intern Med* 2021. doi: 10.7326/m21-0055.
- Coronavirus disease (COVID-19): herd immunity, lockdowns and COVID-19. World Health Organization website. <https://www.who.int/news-room/q-a-detail/herd-immunity-lockdowns-and-covid-19>. Published 2021. Accessed March 25, 2021.
- Powell A. Anthony Fauci offers a timeline for ending COVID-19 pandemic. *Harvard Gazette* website. <https://news.harvard.edu/gazette/story/2020/12/anthony-fauci-offers-a-timeline-for-ending-covid-19-pandemic/>. Published 2021. Accessed March 25, 2021.
- Modak R, Parris S, Dilisi J, Premkumar A. 2012. Increasing influenza vaccination rates among hospital employees without a mandatory policy. *Infect Control Hosp Epidemiol* 2012;33:1288–1289.

# An assessment of the impact of the vaccination program on coronavirus disease 2019 (COVID-19) outbreaks in care homes in Northern Ireland—A pilot study

Mark McConaghy MSc<sup>1</sup>, Muhammad Sartaj FFPH<sup>1</sup>, Barbara R. Conway PhD<sup>2,3</sup> and Mamoon A. Aldeyab PhD<sup>2</sup> 

<sup>1</sup>Public Health Agency, Belfast, Northern Ireland, <sup>2</sup>Department of Pharmacy, School of Applied Sciences, University of Huddersfield, Huddersfield, United Kingdom and <sup>3</sup>Institute of Skin Integrity and Infection Prevention, University of Huddersfield, Huddersfield, UK.

*To the Editor*—The emergence of the coronavirus disease 2019 (COVID-19) pandemic has had significant impact on people living and working in care homes.<sup>1,2</sup> Care-home residents are more vulnerable to infection because they have an increased likelihood of risk factors including age, frailty, disability, and multiple

long-term conditions.<sup>3,4</sup> Vaccines have become the hope for a better life after the COVID-19 pandemic.<sup>5,6</sup> Successful implementation of a vaccine program is dependent on adequate levels of uptake. Across Northern Ireland, vaccination of care-home residents and staff began on December 8, 2020. The Pfizer vaccine (Pfizer, New York, NY) was deployed, and the dose interval was 21 days, except in cases in which the vaccination team could not visit due to an outbreak. COVID-19 outbreaks in closed settings, such as care homes, provide an opportunity to assess vaccine impact on the scale and magnitude of the outbreaks.

**Author for correspondence:** Dr Mamoon Aldeyab, E-mail: [m.aldeyab@hud.ac.uk](mailto:m.aldeyab@hud.ac.uk)

**Cite this article:** McConaghy M, *et al.* (2022). An assessment of the impact of the vaccination program on coronavirus disease 2019 (COVID-19) outbreaks in care homes in Northern Ireland—A pilot study. *Infection Control & Hospital Epidemiology*, 43: 1094–1096, <https://doi.org/10.1017/ice.2021.169>

**Table 1.** Vaccination Status of Residents and Staff and COVID-19 Test Result in Care Homes at Outbreak

Terms	Positive, No. (%)	Negative, No. (%)	Unknown, No. (%)	Total, No.
<b>Residents</b>				
All residents sampled	35 (22.3)	119 (75.8)	3 (1.9)	157
Dose 1 >21 d and dose 2 ≥7 d	20 (26.3) <sup>a</sup>	56 (73.7)	0	76
Dose 1 received >21 d and dose 2 <7 d	5 (83.3) <sup>b</sup>	1 (16.7)	0	6
Dose 1 received >9 d	5 (10.2)	44 (89.8)	0	49
Dose 1 received ≤9 d	0	0	0	0
No vaccine recorded as given	4 (19.0)	16 (76.2)	1 (4.8)	21
Missing resident vaccination history	1 (20.0)	2 (40.0)	2 (40.0)	5
<b>Staff</b>				
All staff sampled	26 (12.4)	166 (79.0)	18 (8.6)	210
Dose 1 > 21 d and dose 2 ≥7 d <sup>a</sup>	1 (1.7)	57 (98.3)	0	58
Dose 1 received > 21 d and dose 2 <7 d <sup>b</sup>	8 (26.7)	22 (73.3)	0	30
Dose 1 received > 9 d	2 (4.2)	46 (95.8)	0	48
Dose 1 received ≤9 d	2 (40.0)	3 (60.0)	0	5
No vaccine recorded as given	13 (21.7)	35 (58.3)	12 (20.0)	60
Missing staff vaccination history	0	3 (33.3)	6 (66.7)	9

<sup>a</sup>Equates to probable post vaccine infection, ie, a laboratory-confirmed diagnosis of COVID-19 in an individual >7 d following the receipt of the second dose of COVID-19 vaccine. <sup>b</sup>Possible postvaccine infection, ie, an individual who died >21 d after the receipt of the first dose of COVID-19 vaccine for whom COVID-19 was mentioned on the death certificate (either as a confirmed or suspected cause of death), either had not received a second dose or within 7 d of the second dose, but had not had a confirmatory SARS-CoV-2 test.

In this pilot study, we evaluated the impact of the vaccination program on current COVID-19 outbreaks in care homes with at least 2 test confirmed cases that have occurred since the vaccination program commenced. A convenience sample of 4 care homes was selected for this evaluation by the Public Health Agency (PHA) on the basis of outbreak notification date. We conducted this evaluation with the following specific objectives: (1) to determine the vaccine uptake rate and reasons for nonvaccination in care homes among residents and staff for the first and second doses and (2) to describe the vaccination status of residents and staff at the outbreak and severe acute respiratory coronavirus virus 2 (SARS-CoV-2) test results. Data collection instruments included a facility questionnaire and staff and resident questionnaires. Care homes were screened to identify those in which an outbreak had been declared >9 days since the date of first COVID-19 vaccination in the facility. This period was selected so that individuals identified with potential vaccine failure would have had sufficient time for the vaccine to take effect.<sup>7</sup> Descriptive statistics were used for analysis of data.

In total, 4 care homes participated in this study; the average number of residents was 39 (range, 21–54), and the average number of staff (care and support) was 64 (range, 54–91). For residents, the overall vaccine uptake was 84.6% for the first dose. The following reasons were reported for declining vaccination: resident unwell, history of allergies or allergic reaction, resident positive for SARS-CoV-2 (or within 28 days of symptom onset and/or positive test), refused, and new admission to home. For residents, data for the second dose showed a slightly lower vaccine uptake percentage of 80.8%. The following reasons were reported for declining vaccination: no longer in home or died, allergies, and refusal of second dose. Vaccine uptake rates among staff were generally lower. For the first dose, the average was 68.3%. The following reasons were given for declining vaccination: did not wish to receive vaccine, allergic reactions, pregnancy, and symptomatic or unwell. Uptake for second dose, among staff, was 65.9%.

The reasons for declining vaccination were similar to those reported for the first dose.

Data were collected at the individual resident level from each of the 4 care homes. This covered all 157 residents (100%) identified in the facilities at the time of outbreak. Overall, 76 (48.4%) of 157 residents had received a second dose >7 days before the outbreak and SARS-CoV-2 testing, and for 21 (13.4%) of these 157 residents, there was no indication of a vaccine having been received (Table 1). The overall proportion that tested positive was 22.3% (35 of 157). Of the latter proportion, 23 (65.7%) were symptomatic and 12 (34.3%) were asymptomatic. The following outcomes were recorded for residents who tested positive for SARS-CoV-2: 23 (65.7%) made a full recovery without hospitalization, 7 (20%) required hospitalization of whom 2 (5.7%) died, and 5 (14.3%) died in the care facility. Analysis of the risk factors determined for each resident showed that the largest proportion had incontinence (86.6%, 136 of 157) and dementia (69.4%, 109 of 157). Of those who tested positive, higher proportions were associated with neurological conditions (62.8%, 22 of 35) and dementia (91.4%, 32 of 35).

Data were also collected at the individual staff level from each of the 4 care homes. These data included 210 (82.0%) staff identified in the facilities at the time of outbreak. Overall, 58 (27.6%) of 210 staff had received a second dose >7 days before the COVID-19 outbreak and testing, and for 60 (28.6%) of these 210 staff, there was no indication of a vaccine having been received (Table 1). The overall proportion who tested positive was 12.4% (26 of 210). Of these, 14 (53.8%) were symptomatic and 12 (46.2%) were asymptomatic. Where reported, all members of staff made a full recovery (n = 25).

The results of this pilot study provide insight regarding vaccination programs in care homes followed by a subsequent COVID-19 outbreak. The proportion of residents who had received a second dose >7 days before outbreak and SARS-CoV-2 testing, and who tested negative in the outbreak, was 73.7%. The comparable figure for staff was 98.3%. These

percentages equate to a clinical success in protecting vulnerable residents and staff against COVID-19 in this environment. The findings of this pilot study show variations in vaccine uptake for dose 1 and dose 2 among residents and staff, with different reasons for nonvaccination at each dose. The study would have benefited from a larger sample size and adjustment for patient-level risk factors

(eg, comorbidities) and organizational factors (eg, infection control practices), and we intend to include these in future studies. Understanding the barriers related to lower levels of vaccination uptake is important to inform current and future COVID-19 vaccination programs policies in care homes in Northern Ireland.

**Acknowledgments.** The authors are grateful to colleagues at Four Seasons Care who collected and coded the data in this study and for colleagues who made helpful comments on how the work should be undertaken, including Dr Sarah Milligan and Heather Reid.

**Financial support.** This study was carried out as part of our routine work.

**Conflict of interest.** All authors report no conflicts of interest relevant to this article.

## References

1. Comas-Herrera A, Zalakaín J, Lemmon E, *et al*. Mortality associated with COVID-19 in care homes: international evidence. LTCcovid.org website.

<https://lccovid.org/wp-content/uploads/2020/04/Mortality-associated-with-COVID-26-April-1.pdf>. Published February 1, 2021. Accessed March 25, 2021.

- Gordon AL, Goodman C, Achterberg W, *et al*. Commentary: COVID in care homes—challenges and dilemmas in healthcare delivery. *Age Ageing* 2020;49:701–705.
- Gordon AL, Franklin M, Bradshaw L, *et al*. Health status of UK care home residents: a cohort study. *Age Ageing* 2014;43:97–103.
- Atkins JL, Masoli JAH, Delgado J, *et al*. Preexisting comorbidities predicting COVID-19 and mortality in the UK biobank community cohort. *J Gerontol A Biol Sci Med Sci* 2020;75:2224–2230.
- Polack FP, Thomas SJ, Kitchin N, *et al*. Safety and efficacy of the BNT162b2 mRNA COVID-19 vaccine. *N Engl J Med* 2020;383:2603–2615.
- Voysey M, Costa Clemens SA, Madhi SA, *et al*. Single-dose administration and the influence of the timing of the booster dose on immunogenicity and efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine: a pooled analysis of four randomised trials. *Lancet* 2021;397:881–891.
- Reporting to the enhancing surveillance of COVID-19 cases in vaccinated individuals. Public Health England website. <https://www.gov.uk/government/publications/covid-19-enhanced-surveillance-of-cases-in-vaccinated-individuals/reporting-to-the-enhanced-surveillance-of-covid-19-cases-in-vaccinated-individuals#collection-of-patient-data>. Updated January 27, 2021. Accessed March 25, 2021.

# The impacts of coronavirus disease 2019 (COVID-19) preventive and control interventions on other infectious diseases in China

XJ Meng MD, X Huang MD, F Zhou BS, YW Wang MS, CH Li MD and AH Wu MD

Infection Control Center, Xiangya Hospital, Central South University, Changsha, China

*To the Editor*—Beginning in December 2019, a novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has caused respiratory illness in infected persons, and the resultant disease was termed coronavirus disease 2019 (COVID-19).<sup>1</sup> By February 15, 2020, COVID-19 had rapidly spread throughout China and across the world, leading to a pandemic announced by the World Health Organization (WHO) on March 11, 2020.<sup>2</sup> According to the WHO, as of November 14, 2020, there have been 53,164,803 confirmed cases of COVID-19, resulting in 1,300,576 COVID-19-related deaths.<sup>3</sup>

With >50 million confirmed COVID-19 cases worldwide, China's contribution of <100,000 cases, which were mainly identified in Wuhan province, seems low considering the country's large population size.<sup>4</sup> With a series of effective interventions implemented in China, the spread of the virus was constrained within a short period.<sup>5</sup> Interestingly, these interventions also effectively blocked the transmission of other

infectious diseases, such as influenza, tuberculosis, mumps, rubella, measles, and hand-foot-and-mouth disease (HFMD).<sup>6</sup> According to the Chinese Center for Disease Control and Prevention, both the peak incidences and the numbers of cases of measles, rubella, mumps, and HFMD were significantly lower in 2020 compared with those in 2019. Also, compared with those in 2019, the incidences of influenza and tuberculosis in 2020 were lower. However, the incidence of HFMD increased after September 2020. The incidences of these 6 diseases in 2019 and 2020 in China are shown in Figure 1.

Given that China's response to COVID-19 did not include additional interventions against these infectious diseases, why the incidences of these diseases were also reduced during 2020 is an interesting question. The characteristics of the transmission of SARS-CoV-2 and the role of community in China's response to COVID-19 are possible explanations. COVID-19 is an infectious respiratory disease transmitted mainly by respiratory droplets and close contact, and some studies have found that SARS-CoV-2 can be detected in fecal and urine samples of COVID-19 patients.<sup>7</sup> Because influenza, mumps, rubella, HFMD, and measles share similar routes of transmission, the following prevention and control measures against COVID-19 had played an important role in controlling their spread: (1) Local communities had strictly implemented the firmest

**Author for correspondence:** AH Wu, E-mail: [xywuanhua@csu.edu.cn](mailto:xywuanhua@csu.edu.cn); or CH Li E-mail: [lichunhui@csu.edu.cn](mailto:lichunhui@csu.edu.cn)

**Cite this article:** Meng XJ, *et al*. (2022). The impacts of coronavirus disease 2019 (COVID-19) preventive and control interventions on other infectious diseases in China. *Infection Control & Hospital Epidemiology*, 43: 1096–1098, <https://doi.org/10.1017/ice.2021.204>