RAPID RISK ASSESSMENT

COVID-19 outbreaks in long-term care facilities in the EU/EEA in the context of current vaccine coverage

22 July 2021

Summary

Despite high COVID-19 vaccination coverage in long-term care facility (LTCF) residents, breakthrough infections among elderly and vulnerable populations are expected due to aging of the immune system and potentially waning immunity in individuals with multiple comorbidities.

Low COVID-19 vaccination uptake in LTCF staff and visitors or caretakers can contribute to the occurrence of breakthrough infections among vulnerable individuals in closed settings with high vaccination coverage such as LTCF, especially in areas where the circulation of variants of concern (VOCs) associated with reduced vaccine effectiveness (VE) is on the rise.

Risk assessed in this update

The assessment of the risk currently posed by SARS-CoV-2 to LTCF residents takes into account the epidemiological situation in the different EU/EEA countries and the vaccination status of LTCF residents (fully vaccinated *versus* incompletely vaccinated or unvaccinated), assuming that healthcare workers (HCWs) and other LTCF staff have a full-course vaccination uptake of less than 80%.

In countries with an epidemiological situation classified as of very low or low concern, the risk posed by SARS-CoV-2 is assessed as low for fully vaccinated LTCF residents and moderate-to-high for partially vaccinated or unvaccinated LTCF residents.

In countries with an epidemiological situation classified as of moderate or high concern, the risk posed by SARS-CoV-2 is assessed as low-to-moderate for fully vaccinated LTCF residents and high-to-very high for partially vaccinated or unvaccinated LTCF residents.

Suggested citation: European Centre for Disease Prevention and Control. COVID-19 outbreaks in long-term care facilities in the EU/EEA in the context of current vaccine coverage, 22 July 2021. ECDC: Stockholm; 2021.

Options for response

The early identification of cases of COVID-19 is essential for the introduction of control measures and the prevention of outbreaks. Therefore, testing, contact tracing and investigation of LTCF COVID-19 cases and outbreaks should remain a priority for public health authorities.

Sequencing of SARS-CoV-2 samples from outbreaks in LTCFs should also be prioritised.

In the current epidemiological context in the EU/EEA, meticulous compliance with non-pharmaceutical interventions (NPIs) should be maintained in LTCFs, particularly if there are unvaccinated members of the staff, caretakers or visitors.

It is important to maximise protection from SARS-CoV-2 circulating in the community, through control of the circulation of the virus in the community and increasing vaccination coverage of people in contact with LTCF residents. COVID-19 vaccine uptake needs to be further promoted in healthcare personnel and other staff working in LTCFs, through specific activities targeting vaccine acceptance and barriers to uptake.

Event background

Starting in February 2021, several European Union and European Economic Area (EU/EEA) countries have detected COVID-19 outbreaks in long-term care facilities (LTCFs), often affecting both LTCF residents and staff. Some of these outbreaks have resulted in hospitalisations and/or deaths of fully vaccinated LTCF residents.

Generally, in the EU/EEA, LTCFs are closed settings with high vaccination coverage. High vaccination coverage among LTCF residents was confirmed in all reported outbreaks. Information on the vaccination status of staff working in the affected LTCFs was not available for all outbreaks. However, based on the available reported data, the vaccination coverage among LTCF staff often was sub-optimal. In several of these outbreaks, unvaccinated or partially vaccinated LTCF staff may have contributed to the introduction and spread of SARS-CoV-2 into the LTCFs.

Although the effectiveness of COVID-19 vaccines authorised in the EU/EEA is generally very high, no vaccine is 100% effective. SARS-CoV-2 infections amongst fully vaccinated persons (i.e. 'breakthrough infections') are therefore expected. These may include severe and fatal cases, particularly among the elderly and those with pre-existing medical conditions.

Variants of concern (VOCs) associated with higher transmissibility have been implicated in most of the outbreaks of breakthrough infections. It is expected that similar outbreaks will occur in LTCFs as the circulation of the B.1.617.2 (Delta) VOC and/or of other VOCs increases in the community.

Epidemiological situation

Overall situation in the EU/EEA (week 26, 2021)

As of week 26 (ending 4 July 2021), the overall 14-day COVID-19 case notification rate in the EU/EEA was moderate (51.6 per 100 000 population) and had increased compared to the previous week (38.6 during week 25). The death notification rate was low (9.4 per million population) and stable (11.3 during week 25).

Notification rates among persons aged 65 years and over were lower than those among the general population (17 per 100 000 population) and stable. However, notification rates among the elderly were ≥50 per 100 000 population in three countries (xxx) and increasing trends were reported in four countries (xxx).

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The epidemiological situation in the EU/EEA during week 26 was categorised overall as of low concern (compared to very low concern during week 25). One country was categorised as of high concern (Cyprus), two as of moderate concern (Portugal and Spain), seven as of low concern and 20 as of very low concern [1].

Situation in LTCFs in the EU/EEA (week 26)

ECDC collects aggregated surveillance data from LTCFs through the European Surveillance System (TESSy) on a weekly basis, with the primary aims to monitor national-level trends in the number/proportion of COVID-19-affected LTCFs and to monitor trends in the national incidence of cases and fatal cases of COVID-19 amongst LTCF residents [2].

Five countries (Austria, Belgium, Lithuania, the Netherlands and Slovenia) reported data for week 26. Among these countries, the pooled incidence of COVID-19 cases among LTCF residents was 8.1 per 100 000 LTCF beds, the pooled incidence of fatal COVID-19 cases was 0.8 per 100 000 LTCF beds, and 0.4% of reporting LTCFs reported one or more new COVID-19 cases among their residents.

Comparing week 26 to weeks 22-25:

- trends in the incidence of confirmed COVID-19 cases decreased in four out of five countries (Austria, Belgium, Lithuania and Slovenia) and the fifth country had a stable trend';
- trends in fatal COVID-19 cases decreased in four out of five countries (Belgium, Lithuania, Netherlands and Slovenia) and one country (Austria) reported an increase;
- no country reported an increase in the proportion of LTCFs that reported one or more new COVID-19 cases in week 26 and three countries (Lithuania, the Netherlands and Slovenia) reported a decrease.

Variants of concern (VOCs) in the EU/EEA

During weeks 24-25 (14 June to 27 June 2021), 15 countries reported an adequate average weekly sequencing volume. Among these countries, the median (range) of the top three VOCs reported in all samples sequenced was: B.1.1.7 (Alpha), 51.7% (15.5-95.0%); B.1.617.2 (Delta), 30.1% (0.7-83.2%); and P.1 (Gamma), 0.7% (0.0-13.5%). There has been a rapid increase in the prevalence of the Delta VOC in sequenced samples in the majority of reporting countries and, out of the countries with adequate weekly reported sequence volume, this VOC is now dominant in Portugal (83%), and close to dominant in Spain (45%), Germany (41%), and Belgium (38%).

The increasing spread of the Delta VOC will likely lead to an increase in COVID-19 incidence in the EU/EEA in the coming weeks and months due to increased transmissibility and reduced VE against infection and symptomatic COVID-19 [3]. There is, however, a strong possibility that the impact will be more limited for hospitalisations and especially for deaths due to high vaccination uptakes in the vulnerable populations and vaccines still being highly effective against severe disease [4]. For detailed scenarios, refer to the ECDC Threat Assessment Brief on "Implications for the EU/EEA on the spread of the SARS-CoV-2 Delta VOC" [5].

Vaccination coverage in the EU/EEA overall and in LTCFs

The scope of COVID-19 vaccination campaigns is unprecedented. Groups primarily prioritised for COVID-19 vaccination in the EU/EEA include elderly people, with various age cut-offs across countries; residents and staff in LTCFs; healthcare workers (HCWs); social care personnel; and people with health conditions that make them vulnerable to severe disease.

As of 14 July 2021, the estimated COVID-19 vaccine uptake of full vaccination among adults (aged 18 years and above) varied between xx.x% and xx.x% (median xx.x%) in 30 EU/EEA countries. The estimated uptake of full vaccination (two doses) among adults aged 80+ years varied between xx.x% and 100% (median xx.x%) in 27 reporting countries. The estimated uptake of full vaccination course among HCWs varied between xx.x% and 100% (median xx.x%) in 17 reporting countries.

Twelve EU/EEA countries (Bulgaria, Czechia, Denmark, Estonia, Greece, Hungary, Iceland, Ireland, Latvia, Luxembourg, Spain, Sweden) are reporting data on COVID-19 vaccine uptake in LTCF residents (Table 1). As of 14 July 2021, the median vaccine uptake among LTCF residents in the EU/EEA was 80.5% (country range: 37.5–100%) for at least one dose and 73.4% (country range: 32.3-100%) for the full vaccination course, with four countries reporting a full vaccination coverage of more than 80%.

Seventeen EU/EEA countries (Belgium, Bulgaria, Croatia, Czechia, Denmark, Estonia, Greece, Hungary, Iceland, Ireland, Latvia, Luxembourg, Malta, Romania, Slovenia, Spain, Sweden) are reporting data on COVID-19 vaccine uptake in HCWs. Overall, the median vaccine uptake was 83.2% (country range: 22.1-100%) for at least one dose and 73.9% (country range: 21-100%) for the full vaccination course, with seven countries reporting a full vaccination coverage of more than 80%.

Detailed information on COVID-19 vaccine uptake in LTCF residents and in HCWs can be found on the ECDC COVID-19 Vaccine Tracker.

This reported data on COVID-19 vaccine uptake has significant limitations. As regards HCWs, there is significant variability in the definition of HCWs depending on the country, and there is no specific category for LTCF staff. It is therefore advisable to avoid inferring the same high vaccine uptake in HCWs to specifically LTCF staff, which by definition is diverse, and usually includes limited numbers of HCWs and large numbers of auxiliary staff. For example, while Greece reports overall COVID-19 full vaccination coverage for HCWs at 73%, the Greek Ministry of Labour and Social Care announced on 13 July that COVID-19 vaccine coverage of staff in private and state-owned LTCFs is only 65% and 45% respectively [6].

Outbreaks associated with breakthrough infections in LTCFs

Seven countries (Austria, Belgium, Finland, Germany, Luxembourg, Norway and Portugal) reported data to ECDC on a total of nineteen outbreaks of SARS-CoV-2 associated with breakthrough infections in LTCFs, either through the Early Warning and Response System (EWRS) or through other official communication channels (Table 1). One additional country (Spain) also reported having detected outbreaks associated with breakthrough infections in LTCFs, but no data on these events is currently available to ECDC.

Out of the nineteen outbreaks, sixteen included cases being detected among both LTCF residents and LTCF staff, with COVID-19 being detected among partially vaccinated or unvaccinated LTCF staff in fourteen of these outbreaks. Data on the vaccination status of LTCF residents at the time of the outbreak was available for sixteen of these outbreaks. In one

Commented [redacted]: Data from the National surveillance system is available for epidemiological week 25 reaching 15% of all randomlly sequenced samples. We consider this figure underestimated due to delay on notification.

Using the specific PCR on random samples, the distribution of delta is unequal in different regions: some are around 80-90% and some <10%.

Weekly updated information is available: https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/20210608-EER pdf

Commented [redacted]: To be updated when the new weekly report on vaccine rollout in EU/EEA will be published!

Commented [redacted]: According to our national definition a single case in a residence is an outbreak. Spain is sending aggregate data weekly about cases and mortality in LTCF, so all the information is already recorded in TeSSy.

In order to perform on-depth study of outbreaks at the LTCFs, we have organized another network with representatives from the regional governments. The operational meeting will be held at 21 July and the data collected will be sent to ECDC as soon as they are available at national level"

outbreak, all LTCF residents had only received one dose of vaccine. In the remaining fifteen outbreaks, full vaccination coverage ranged between 70.7% and 100%. Among the nine outbreaks for which the vaccination status of LTCF staff at the time of the outbreak is known, full vaccination coverage ranged between 30.8% and 100%.

In seventeen outbreaks, COVID-19 cases were detected among fully vaccinated LTCF residents. Attack rates among fully vaccinated residents ranged between 7.9% and 93.3%, while attack rates among partially vaccinated or unvaccinated residents ranged between 9.5% and 66.7%. Hospitalisations of LTCF residents following SARS-CoV-2 infection were recorded in sixteen outbreaks, with hospitalisation among fully vaccinated LTCF residents being recorded in eleven of these outbreaks. The percentage of vaccinated cases that were hospitalised ranged from 3.7% to 25%, while the percentage of partially vaccinated or unvaccinated cases that were hospitalised ranged from 16.7% to 50%. Deaths of LTCF residents following SARS-CoV-2 infection were recorded in fourteen outbreaks, with deaths among fully vaccinated LTCF residents being recorded in ten of these outbreaks.

The Alpha VOC was detected in five outbreaks, the Beta VOC was detected in three outbreaks, the Gamma VOC was detected in one outbreak, the Delta VOC was detected in two outbreaks, the Alpha and Beta VOC together were detected in two outbreaks and the Alpha and Delta VOCs together were detected in one outbreak. Sequencing information was not available or is currently underway for the remaining five outbreaks.

Table 1. Outbreaks associated with breakthrough infections in LTCFs in EU/EEA reported to ECDC from seven countries (Austria [AT], Belgium [BE], Finland [FI], Germany [DE], Luxembourg [LU], Norway [NO] and Portugal [PT])

Country (ISO – progressive number)		FI 1	FI 2	LU 1	LU 2	NO 1	DE 1	NO 2
Type of VOC		Alpha	Beta	Alpha Beta	Alpha Beta	Beta	Alpha	Beta
First case detected (date) (dd/mm 2021)		08/02	27/02	05/03	09/03	26/03	27/03	03/04
Residents								
Total residents	N	22	19	92	276	16	45	19
Vaccination status*								
Fully vaccinated	N (%)	0	na	65 (70.7)	255 (92.4)	16 (100)	40 (88.9)	18 (94.7)
Partially vaccinated or unvaccinated	N (%)	22 (100)	na	23 (25.0)	21 (7.6)	0	5 (11.1)	1 (5.3)
Cases**		6	9	28	43	7	19	8
Among fully vaccinated residents	N (%)	0	9 (na)	19 (29.2)	41 (16.1)	7 (43.6)	18 (45.0)	8 (44.4)
Among partially vaccinated and unvaccinated residents	N (%)	6 (27.3)	0	9 (39.1)	2 (9.5)	0	1 (20.0)	0
Hospitalisations***		1	na	2	4	1	4	2
Among fully vaccinated cases	N (%)	0	na	0	3 (7.3)	1 (14.3)	4 (22.2)	2 (25 0)
Among partially vaccinated and unvaccinated cases	N (%)	1 (16.7)	na	2 (22.2)	1 (50.0)	0	0	0
Deaths***		2	2	5	4	2	7	1
Among fully vaccinated cases	N (%)	0	2 (22.2)	2 (10.5)	2 (4.9)	2 (28.6)	7 (38.9)	1 (12 5)
Among partially vaccinated and unvaccinated cases	N (%)	2 (33.3)	0	3 (33.3)	2 (100)	0	0	0
Staff								
Total staff	N	31	30	82	325	na	54	>20
Vaccination status*								
Fully vaccinated	N (%)	na	na	na	na	na	40 (74.1)	na
Partially vaccinated or unvaccinated	N (%)	na	na	na	na	na	14 (25.9)	na
Cases**		7	6	11	13	5	7	9
Among fully vaccinated staff	N (%)	na	1 (na)	0 (na)	2 (na)	0 (na)	4 (10.0)	4 (na)
Among partially vaccinated and unvaccinated staff	N (%)	na	5 (na)	11 (na)	11 (na)	5 (na)	3 (21.4)	5 (na)

na: not available

*: percentages are calculated by dividing the number of vaccinated residents/staff by the total number of residents/staff, or by dividing the number of partially vaccinated or unvaccinated residents/staff by the total number of residents/staff.

**: percentages are calculated by dividing the number of cases among vaccinated residents/staff by the number of vaccinated residents/staff, or by dividing the number of cases among partially vaccinated or unvaccinated residents/staff by the number of partially vaccinated or unvaccinated residents/staff.

***: percentages are calculated by dividing the number of hospitalisations/death among vaccinated residents by the number of cases among vaccinated residents, or by dividing the number of hospitalisations/death among partially vaccinated or unvaccinated residents by the number of cases among partially vaccinated or unvaccinated residents.

Table 1 (continued). Outbreaks associated with breakthrough infections in LTCFs in EU/EEA reported to ECDC from seven countries (Austria [AT], Belgium [BE], Finland [FI], Germany [DE], Luxembourg [LU], Norway [NO] and Portugal [PT])

Country (ISO – progressive number)		LU 3	LU 4	DE 2	BE 1	BE 2	PT 1
Type of VOC		Alpha	Alpha	Alpha	Alpha, Delta	Gamma	Delta
First case detected (date) (dd/mm 2021)		16/04	02/05	08/05	17/05	20/05	09/06
Residents							
Total residents	N	94	70	53	119	29	21
Vaccination status*							
Fully vaccinated	N (%)	87 (92.6)	63 (90.0)	38 (71.7)	115 (96.6)	26 (89.7)	20 (95.2)
Partially vaccinated or unvaccinated	N (%)	7 (7.4)	7 (10.0)	15 (28.3)	4(3.4)	3 (10.3)	1 (4.8)
Cases**		22	5	29	73	23	16
Among fully vaccinated residents	N (%)	18 (20.7)	3 (7.9)	23 (60.5)	na	21 (80.8)	16 (80.0)
Among partially vaccinated and unvaccinated residents	N (%)	4 (57.1)	2 (28.6)	6 (40 0)	na	2 (66.7)	0
Hospitalisations***		0	1	8	14	3	4
Among fully vaccinated cases	N (%)	0	0	5 (21.7)	na	3 (14.3)	4 (25.0)
Among partially vaccinated and unvaccinated cases	N (%)	0	1 (50.0)	3 (50 0)	na	0	0
Deaths***		2	1	5	14	7	4
Among fully vaccinated cases	N (%)	2 (11.1)	0	2 (8.7)	na	7 (33.3)	4 (25.0)
Among partially vaccinated and unvaccinated cases	N (%)	0	1 (50.0)	3 (50 0)	na	0	0
Staff							
Total staff	N	166	119	40	138	17	13
Vaccination status*							
Fully vaccinated	N (%)	na	na	28 (70.0)	107 (77.5)	10 (58.8)	4 (30.8)
Partially vaccinated or unvaccinated	N (%)	na	na	12 (30.0)	31 (22.5)	7 (41.2)	9 (69.2)
Cases**		12	2	11	27	0	6
Among fully vaccinated staff	N (%)	3 (na)	1 (na)	4 (14 3)	16 (15.0)	0	2 (50.0)
Among partially vaccinated and unvaccinated staff	N (%)	9 (na)	1 (na)	7 (58 3)	11 (35.5)	0	4 (44.4)

na: not available

*: percentages are calculated by dividing the number of vaccinated residents/staff by the total number of residents/staff, or by dividing the number of partially vaccinated or unvaccinated residents/staff by the total number of residents/staff.

**: percentages are calculated by dividing the number of cases among vaccinated residents/staff by the number of vaccinated residents/staff, or by dividing the number of cases among partially vaccinated or unvaccinated residents/staff by the number of partially vaccinated or unvaccinated residents/staff.

***: percentages are calculated by dividing the number of hospitalisations/death among vaccinated residents by the number of cases among vaccinated residents, or by dividing the number of hospitalisations/death among partially vaccinated or unvaccinated residents by the number of cases among partially vaccinated or unvaccinated residents.

Table 1 (continued). Outbreaks associated with breakthrough infections in LTCFs in EU/EEA reported to ECDC from seven countries (Austria [AT], Belgium [BE], Finland [FI], Germany [DE], Luxembourg [LU], Norway [NO] and Portugal [PT])

Country (ISO – progressive number)		PT 2	PT 3	PT 4	PT 5	PT 6	AT
Type of VOC		Delta	na	na	na	na	na
First case detected (date) (dd/mm 2021)		12/06	28/06	02/07	02/07	05/07	na
Residents							
Total residents	N	54	47	13	60	15	na
Vaccination status*							
Fully vaccinated	N (%)	43 (79.6)	47 (100)	13 (100)	na	15 (100)	na
Partially vaccinated or unvaccinated	N (%)	11 (20.4)	0	0	na	0	na
Cases**		20	19	11	27	14	25
Among fully vaccinated residents	N (%)	15 (34.9)	19 (40.4)	11 (84.6)	27 (na)	14 (93.3)	17 (na)
Among partially vaccinated and unvaccinated residents	N (%)	5 (45.5)	0	0	0	0	8 (na)
Hospitalisations***		2	0	2	1	1	3
Among fully vaccinated cases	N (%)	1 (6.7)	0	2 (18 2)	1 (3.7)	1 (7.1)	na
Among partially vaccinated and unvaccinated cases	N (%)	1 (20.0)	0	0	0	0	na
Deaths***		1	0	0	0	0	na
Among fully vaccinated cases	N (%)	0	0	0	0	0	na
Among partially vaccinated and unvaccinated cases	N (%)	1 (20.0)	0	0	0	0	na
Staff							
Total staff	N	33	37	5	75	8	na
Vaccination status*							
Fully vaccinated	N (%)	20 (60.6)	28 (75.7)	3 (60 0)	na	8 (100)	na
Partially vaccinated or unvaccinated	N (%)	13 (39.4)	9 (24.3)	2 (40 0)	na	0	na
Cases**		10	9	0	14	3	na
Among fully vaccinated staff	N (%)	4 (20.0)	2 (7.1)	0	11 (na)	3 (37.5)	na
Among partially vaccinated and unvaccinated staff	N (%)	6 (46.2)	1 (11.1)	0	2 (na)	0	na

na: not available

*: percentages are calculated by dividing the number of vaccinated residents/staff by the total number of residents/staff, or by dividing the number of partially vaccinated or unvaccinated residents/staff by the total number of residents/staff.

**: percentages are calculated by dividing the number of cases among vaccinated residents/staff by the number of vaccinated residents/staff, or by dividing the number of cases among partially vaccinated or unvaccinated residents/staff by the number of partially vaccinated or unvaccinated residents/staff.

***: percentages are calculated by dividing the number of hospitalisations/death among vaccinated residents by the number of cases among vaccinated residents, or by dividing the number of hospitalisations/death among partially vaccinated or unvaccinated residents by the number of cases among partially vaccinated or unvaccinated residents.

Disease background

For information on the latest scientific evidence relating to COVID-19, SARS-CoV-2, virus transmission, diagnostic testing, infection, clinical characteristics, risk factors and risk groups, immunity, treatment and vaccines please visit ECDC's website: https://www.ecdc.europa.eu/en/covid-19/latest-evidence.

COVID-19 in LTCFs

Please refer to the latest ECDC Rapid Risk Assessment "Assessing SARS-CoV-2 circulation variants of concern, non-pharmaceutical interventions and vaccine rollout in the EU/EEA - 15th update" [7] for the ECDC assessment of the epidemiological situation in the EU/EEA and the Threat Assessment Brief "Implications for the EU/EEA on the spread of the SARS-CoV-2 Delta (B.1.617.2) variant of concern" [5] for the assessment of disease severity and the potential for immune escape of the particular VOC.

LTCF residents were disproportionately impacted by COVID-19 in morbidity and mortality during the first waves of the pandemic [8]. A review of LTCF outbreaks in the first two waves of COVID-19 in Ireland (March-November 2020) showed that factors associated with the occurrence of an outbreak include: size of a care home (aOR = 1.14 per 10 beds, 95%

CI: 1.02-1.25, p = 0.012), local community incidence of COVID-19 (aOR = 1.03 per 10 cases per 100 000, 95% CI: 1.02-1.04, p < 0.001), and being in close proximity (within 5 km) of another LTCF (aOR = 1.05, 95% CI 1.00-1.10, p = 0.038) [9]. A similar review of risk factors for mortality among 167 LTCFs in Catalonia, Spain identified that the risk of COVID-19 related deaths was higher in LTCFs with increased number of complex comorbidities (incidence rate ratio IRR 1.07, 95% CI 1.04-1.11), and in areas with high COVID-19 incidence (IRR 2.39; 95%CI 1.95-2.93 per 100 unit increase of COVID-19 14-day incidence rate per 100 000 population) [10].

Commented [redacted]: Official information is available on the Ministry of Social wel are:
Incidence:
https://www.imserso.es/imserso_01/mas_informacion/serv_soc/sem_cr/index.htm

Mortality:
https://www.imserso.es/imserso_01/documentacion/estadisticas/info_d/covid19_dep/index htm

Due to the limited availability of COVID-19 vaccines at the start of vaccination campaigns, most EU/EEA countries opted to prioritise vaccination for those individuals most at risk of severe disease, including LTCF residents, as well as for HCWs. As a consequence, the cumulative vaccine uptake is higher in those target groups that have been prioritised since the beginning of the vaccine rollout than in other groups.

Vaccine effectiveness in LTCF residents

Randomised controlled trials have not provided evidence on the VE specifically in LTCF residents. Following market authorization of the vaccines and the ongoing vaccination roll-out, studies are investigating the effect of COVID-19 vaccines, including also this target group. A cohort study in LTCF residents from the United Kingdom reported a vaccine effectiveness of 56% (95% CI: 19-76) against SARS-CoV-2 infection at 28-34 days and of 62% (95% CI: 23-81) at 35-48 days, respectively, after the first dose of either Comirnaty (BNT162b2) developed by BioNTech/Pfizer or of Vaxzevria (AZD1222) previously COVID-19 Vaccine AstraZeneca [11]. A Danish cohort study reported a vaccine effectiveness after two doses of Comirnaty against SARS-CoV-2 infection of 64% (95% CI: 14-84) among LTCF residents compared to 90% (95% CI: 82-95) in HCWs [12]. Among LTCF residents, the study showed a VE against COVID-19 related hospitalisation of 75% (95% CI: 46-89) and against COVID-19 related death of 89% (95% CI: 81-93) [13]. Estimates from a Spanish study in LTCF residents fully vaccinated with Comirnaty or with Spikevax (mRNA-1273) previously COVID-19 Vaccine Moderna showed a VE of 71% (95% CI: 56-82) against symptomatic and asymptomatic SARS-CoV-2 infection, 88% (95% CI: 75-95) against COVID-19 hospitalisation and 97% (95% CI: 92-99) against COVID-19 related death [14]. Similar results were reported in another Spanish study with a VE among LTCF residents of 81% (95% CI: 80-82) against SARS-CoV-2 infection after full vaccination with Cormirnaty or with Spikevax [15]. Two outbreaks associated with breakthrough infections in LTCFs in the USA reported a VE after one dose of Comirnaty of 63% (95% CI: - 33-79%) against SARS-CoV-2 infection [16] and after full vaccination with Comirnaty a VE of 66% (95% CI: 41-81) against SARS-CoV-2 infection, 87% (95% CI: 66-95) against symptomatic illness, 94% (95% CI: 74-99) against hospitalisation and 94% (95% CI: 45-99) against death [17]. Among HCWs who received two doses of Comirnaty, a VE of 76% (95% CI: 33-91) against SARS-CoV-2 infection and 87% (95% CI: 46-97) against symptomatic illness was reported [17].

Vaccine effectiveness against SARS-CoV-2 VOCs

There are limited data on the effectiveness of the available COVID-19 vaccines against SARS-CoV-2 VOCs and no data on VE against the Delta VOC in the LTCF resident population. Vaccine effectiveness against infection with the Delta VOC is significantly lower after the first dose of two-dose regimens and slightly lower after the second dose than against infection with the Alpha VOC [18], but COVID-19 vaccines retain VE against severe disease and death [4].

Although full vaccination prevents the large majority of SARS-CoV-2 infections, severe disease and deaths, some breakthrough infections, hospitalisations and deaths can be expected if SARS-CoV-2 is introduced in healthcare settings, especially in people with multiple comorbidities and/or immunosuppression [19]. Therefore, it is important to minimise the risk of SARS-CoV-2 introduction and spread in these settings through vaccination of individuals who are in contact with LTCF residents, either directly (through providing medical care), or indirectly (through providing services in facilities) and maintaining non-pharmaceutical interventions (NPIs).

Overall, VE for HCWs was similar to that reported in phase three clinical trials for all three vaccines [21-23], but also comparable to the estimates in the general population from observational studies (REF). These studies confirmed that VE against infection with the Delta VOC is low after the first dose of a two-dose schedule. . Among HCWs and other frontline workers, being fully vaccinated guarantees the maximal level of protection against asymptomatic and symptomatic SARS-CoV-2 infection. Because prevention of asymptomatic infection can impact on disease transmission [REFS] and given the potential role of asymptomatic individuals in the transmission of SARS-CoV-2 [23,24], full vaccination should be a priority in HCWs at higher risk of transmitting SARS-CoV-2 to vulnerable patients.

ECDC risk assessment for the EU/EEA

This assessment is based on information available to ECDC at the time of writing and, unless otherwise stated, the assessment of risk refers to the risk that existed at the time of writing. It follows the ECDC rapid risk assessment methodology, with the overall risk determined by a combination of the probability of an event occurring and its consequences (impact) for individuals or the population [25].

Risk assessment question

Based on current vaccine uptake and the rise of the Delta VOC in the EU/EEA, what risk does SARS-CoV-2 pose to LTCF residents?

Long-term care facilities (LTCFs) have been identified as particularly high-risk settings for COVID-19 associated morbidity and mortality. The risk of COVID-19 in LTCF residents is based on the combination of the probability and the impact of the SARS-CoV-2 infection. The probability of infection is a function of the SARS-CoV-2 circulation in the community and of the vaccination uptake in HCWs and staff working in the LTCFs, and in LTCF residents.

Based on the data reported by EU/EEA countries on SARS-CoV-2 circulation and other indicators, ECDC classifies the epidemiological situation in EU/EEA countries into four categories according to the level of concern (very low, low, moderate and high). For this assessment, we grouped countries with very low and low level of concern in one category and we grouped moderate and high level of concern in another category [1].

Information on the full-vaccination uptake of HCWs is available for only 17 EU/EEA countries and specific data for LTCF staff are not available [26]. Due to the incompleteness of the information, we did not stratify the risk for LTCF residents by staff full-course vaccine uptake and assumed such uptake being <80%. In those countries with an LTCF staff full-course vaccination uptake ≥80%, the probability of SARS-CoV-2 infection in LTCF residents should be assessed as lower than in our assessment below (Table 2).

Based on the protection that a full-course COVID-19 vaccination offers towards severe disease and death, the impact of SARS-CoV-2 infection is stratified by vaccinated and unvaccinated (or incompletely vaccinated) LTCF residents [18]. The Delta VOC demonstrates potential for vaccine escape in individuals with an incomplete course of vaccination [4]; thus, LTCF residents partially vaccinated or unvaccinated are grouped together and face a higher probability of infection and a higher impact of such infection than the fully vaccinated LTCF residents.

Considering all points above and assuming a continuous application of non-pharmaceutical interventions (NPIs) in LTCFs, the different levels of risk for different groups of LTCF residents are presented in the table below.

Table 2. Probability and impact of SARS-CoV-2 infection and overall risk posed by SARS-CoV-2 for LTCF residents, by country overall epidemiological situation and vaccination status

Type of country and LTCF residents	Probability of SARS-CoV-2 infection*	Impact of SARS-CoV-2 infection	Overall risk of SARS-CoV-2 infection
Very low or low concern countries			
Fully vaccinated LTCF residents	Low	Moderate	Low
Partially vaccinated or unvaccinated LTCF residents	Moderate	Very high	Moderate-to-high
Moderate or high concern countries			
Fully vaccinated LTCF residents	Moderate	Moderate	Low-to-moderate
Partially vaccinated or unvaccinated LTCF residents	High	Very high	High-to-very high

** Assuming a COVID-19 vaccine coverage of LTCF staff <80% In those countries with a LTCF staff full-course vaccination uptake ≥80%, the probability of SARS-CoV-2 infection in LTCF residents should be assessed as being lower than presented in the table*

Options for response

Vaccination

The emergence and spread of the Delta VOC require continuing the rapid rollout of COVID-19 vaccines particularly for the populations that are at high-risk for severe disease. This is particularly relevant for LTCF residents, especially if they are not yet fully vaccinated.

COVID-19 vaccine(s) should be made easily accessible to LTCF residents and their vaccination encouraged aiming at the highest possible coverage and addressing their potential concerns and those of their relatives and caretakers. Vaccine uptake should also be strongly encouraged for all persons in contact with LTCF residents including HCWs and auxiliary staff, caretakers, visiting health professionals and visitors.

Addressing vaccine acceptance among HCWs and auxiliary staff in LTCFs

Strengthening vaccine acceptance among HCWs is important. Unvaccinated HCWs put themselves, their families and colleagues at risk of SARS-CoV-2 infection and can also increase the risk of SARS-CoV-2 infection of the LTCF residents that they are caring for.

Surveys recurrently show that HCWs are recognised as the most trusted source of information regarding vaccination. A recent Eurobarometer survey confirms that EU citizens see health professionals, doctors, nurses and pharmacists as the most trusted source of reliable information on COVID-19 vaccines [27]. Therefore, vaccine hesitancy in HCWs also has the potential to influence COVID-19 vaccination uptake of their patients and the general population [28].

An important first step to develop tailored interventions to promote vaccine uptake of HCWs and other staff working in LTCFs is to better understand their drivers of vaccine hesitancy. In early 2021, a rapid systematic review synthetising evidence on HCWs' attitudes towards COVID-19 vaccination [29] found that COVID-19 vaccine acceptance rates varied widely. Some common issues were recurrent in the studies and related to concerns about the safety, efficacy and effectiveness of the COVID-19 vaccines, as well as lack of trust in government. On the other hand, previous influenza vaccination acceptance and self-perceived risk from SARS-CoV-2 infection were facilitators of COVID-19 vaccination uptake.

Staff working in LTCFs make up a heterologous group of people and differs from staff working in other health care settings. A report published by the US CDC early 2021 [30] reported that lower influenza vaccination coverage among staff members working in LTCFs than in other healthcare settings had previously been described. The report also mentions a survey among LTCF staff in November 2020 that identified concerns around vaccine safety as the key reason for hesitancy around a COVID-19 vaccine once available. The report further highlights that high staff member turnover, staff members working in multiple facilities, and limited resources for staff member outreach and education are additional potential barriers to COVID-19 vaccination in LTCFs.

Given the variety of factors behind vaccine hesitancy, efforts to increase vaccine uptake are most effective when they include multi-component interventions. Information on its own has been shown to have a limited impact on facilitating vaccination uptake, therefore the inclusion of other strategies is needed [31]. Literature on understanding the psychology of vaccination [32] highlights the importance of facilitating vaccination, directly by leveraging, but not trying to change, what people think and feel. This can be achieved by a) facilitating action (reminders, prompts, primes, which build on favourable intentions to get vaccinated), b) reducing barriers (logistics and establishing default options), and c) by shaping behaviour (through incentives, sanctions and requirements). One-to-one conversations between trusted peers and those who may be hesitant are also advised, as evidence from primary care suggests that these may result in a 60-70% conversion from initial decline to uptake of a vaccine [33].

Some countries have implemented or consider implementing mandatory vaccination for specific groups such as HCWs and staff working in LTCFs and care homes, to increase uptake of COVID-19 vaccines, and this is a topic that raises differing perspectives and debates globally [34]. Italy was first to implement such a rule in Europe [35], with other countries following suit, such as Greece's announcement on 12 July 2021 of compulsory vaccination of health personnel, which includes unpaid leave if vaccination is refused and fines for healthcare facilities as well as the announcement by France on the same day recommending that the obligation to vaccinate all professionals in contact with vulnerable people be considered without delay [36,37].

Even though mandatory requirements can be highly effective, researchers caution that depending on the reasons for under-vaccination, other strategies may be sufficient or more advisable [32]. Potential negative effects need to be considered. Issues raised include: rejection by those who are ambivalent or unfavourable, anger by those that feel that their freedom to act is being curtailed (even making them more susceptible to anti-vaccination messages), people seeking ways to opt out. Practical, legal, and ethical issues also need to be considered.

Drawing on the literature and findings from country research, WHO identifies five key strategies to empower HCWs to help ensure successful public response to COVID-19 vaccination: 1) understand health worker barriers and drivers of vaccination; 2) engage health workers as active partners in shaping vaccination efforts; 3) motivate, support and acknowledge health workers; 4) build health workers' knowledge, skills and confidence on COVID-19 vaccination and its communication; 5) value health workers as a target group and partners, engaging with them regarding safety events both before and during any eventual crisis [38].

Non-pharmaceutical interventions

Controlling transmission of SARS-CoV-2 in the community will reduce the risk of introductions and the occurrence of outbreaks in LTCFs. Non-pharmaceutical interventions (such as physical distancing, hand and respiratory hygiene, use of face masks, etc.,) remain essential elements of the public health response to COVID-19 [5]. In LTCFs and in view of the rapid spread of the Delta VOC, NPIs need to be meticulously implemented. Use of face masks is advised for all LTCF staff in all resident care contacts, particularly indoors, irrespective of the vaccination status of the staff. Non-pharmaceutical interventions may also include minimising personal contacts with risk of SARS-CoV-2 transmission within LTCFs, especially by ensuring that the occupancy rate for common areas allows for appropriate physical distancing at all times and by ensuring appropriate ventilation [39,40].

For external visitors in the LTCFs, the use of medical face masks should be strongly considered [39], and both the residents and visitors at the LTCFs should practice appropriate hand hygiene. When possible, the visits should take place outdoors or in areas with appropriate ventilation, permitting appropriate physical distancing, and ideally should be accessible without traversing common areas. Persons with COVID-19 compatible symptoms should not visit LTCFs [8].

Other infection prevention and control measures should follow the existing ECDC guidance [41]. LTCF staff in all facilities should have continued access to guidance and procedures on the prevention and control of COVID-19, as well as access to appropriate personal protective equipment, and each LTCF should have a designated lead for COVID-19 preparedness and response [8].

Use of rapid antigen detection tests (RADTs), including self-tests, for screening asymptomatic persons at the workplace has been adopted by several EU/EEA countries and can be applied in LTCFs where the impact of COVID-19 can be high, as a complementary measure to decrease the risk of introduction of SARS-CoV-2 by asymptomatic or pre-symptomatic HCWs. Positive results should be confirmed by reverse transcriptase-polymerase chain reaction (RT-PCR) and in low incidence areas a sample of negative results should also be verified by RT-PCR due to of false negatives [42,43]. The European Centre for Disease Prevention and Control (ECDC) in collaboration with the European Agency for Safety and Health at Work (EU-OSHA) has published a technical report outlining the considerations on the use of rapid antigen detection (including self-) tests for SARS-CoV-2 in occupational settings [42].

Control of outbreaks in LTCFs

Timely testing of LTCF residents and staff with COVID-19 compatible symptoms, through ensuring availability and access to testing and encouraging testing as soon as possible after symptom onset, remain important to enable rapid identification of cases and clusters of SARS-CoV-2 infection and the initiation of contact tracing [7]. In LTCFs, testing, identification, managing and isolating COVID-19 positive cases [8], contact tracing, quarantine of contacts are essential for the control of outbreaks. Investigation of clusters and outbreaks in LTCFs should continue to be a priority for EU/EEA countries.

Screening of the LTCF residents and staff should be considered after the identification of one or more COVID-19 cases to ensure the early detection and isolation or cohorting of additional asymptomatic and pre-symptomatic cases.

Sequencing of SARS-CoV-2 samples from outbreaks in LTCFs should be a priority, as understanding the impact of the presence of specific VOCs on the frequency and severity of LTCF outbreaks is of importance. In case of circulation of variants associated with significant reduction in vaccine effectiveness especially against severe disease, stronger NPIs may be needed to completement full vaccination of LTCF residents and staff. This information can also be used to inform whether a booster vaccine dose should be recommended for LTCF residents and other vulnerable populations.

EU/EEA countries are encouraged to continue reporting data on detected outbreaks in LTCF settings in the ECDC EpiPulse to facilitate more accurate conclusions. To this purpose, ECDC has developed a specific protocol, along with a shortened version, at the disposal of public health authorities in EU/EEA countries [44].

Limitations

This assessment is undertaken based on information known to ECDC at the time of publication and has several key limitations.

The epidemiological data used in this assessment was made available through surveillance reporting or publicly available websites. The data do probably not cover all outbreaks in LTCFs in the EU/EEA and are also dependent on local testing strategies and local surveillance systems.

COVID-19 vaccine uptake data on LTCF residents is reported consistently by only a limited number of EU/EEA countries and shows significant variability, while data from some of the countries reporting outbreaks associated with breakthrough infections is missing. In addition, data on the vaccination coverage of LTCF staff is also missing at the EU/EEA level and the COVID-19 vaccine uptake data for HCWs cannot be used as a direct correlate of the vaccination coverage of LTCF staff.

It is also important to consider the lag time between infection, symptoms, diagnosis, case notification, outbreak investigation and reporting of LTCF outbreaks at the European level. This assessment is based on the currently reported breakthrough infections outbreaks, although it is expected that many more outbreaks in LTCF settings have occurred.

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This report was written with the coordination and assistance of an Internal Response Team at the European Centre for Disease Prevention and Control. All data published in this risk assessment are correct to the best of our knowledge at the time of publication. Maps and figures published do not represent a statement on the part of ECDC or its partners on the legal or border status of the countries and territories shown.

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