

# Overview of the implementation of COVID-19 vaccination strategies and deployment plans in the EU/EEA

14 June 2021

## Key messages

This report provides an updated overview of the progress of national COVID-19 vaccination strategies in EU/EEA countries, including updates on:

- overall vaccine uptake and uptake by target group;
- current vaccination phases and priority groups, including adjustments made to priority groups during the rollout;
- vaccination strategies and policies;
- the use of vaccination certificates;
- vaccine acceptance and hesitancy; and
- challenges and good practice with the rollout.

## Vaccine COVID-19 rollout overview

- As of 11 June 2021, a total of 333 678 903 COVID-19 vaccine doses have been distributed by manufacturers to European Union/European Economic Area (EU/EEA) countries, including over 39 million in the last week. Comirnaty (BNT162b2), developed by BioNTech/Pfizer, represents 67.3% of all doses distributed to EU/EEA countries via the European Commission's Vaccine Strategy, followed by Vaxzevria (AZD1222), previously called COVID-19 Vaccine AstraZeneca (19.5%), COVID-19 Vaccine Moderna (9.6%), and COVID-19 Vaccine Janssen (3.3%).
- A total of 284 124 689 vaccine doses have been administered in the EU/EEA, including over 25 million in the last week. Based on data available from 29 countries, 85% of the doses distributed in the EU/EEA since the beginning of the rollout have been administered.
- Since the start of COVID-19 vaccine deployment in the EU/EEA in December 2020, the cumulative vaccine uptake in the adult population (aged 18 years and older) in the EU/EEA has progressed, reaching 51.2% for at least one vaccine dose (range: 14.9-67.7%) and 26.8% for the full vaccination course (range: 11.8-55.1%) (30 reporting countries).
- Cumulative vaccine uptake is higher in those target groups that have been prioritised since the beginning of the vaccine rollout, in particular the elderly and healthcare workers (HCW).

Suggested citation: European Centre for Disease Prevention and Control. Overview of the implementation of COVID-19 vaccination strategies and deployment plans in the EU/EEA 14 June 2021. Stockholm: ECDC; 2021.

Stockholm, June 2021

© European Centre for Disease Prevention and Control, 2021. Reproduction is authorised, provided the source is acknowledged.

- In people aged 80 years and above, the median vaccine uptake was 80.7% (range: 14.6-100%) for at least one dose, and 71.6% (range: 10.4-100%) for the full vaccination course (26 countries reporting). Ten countries have administered the full vaccination course to more than 80% of the population aged 80 years and above.
- In HCW, the median vaccine uptake was 83.9% (range: 21.4–100%) for at least one dose, and 69.9% (range: 20–100%) for the full vaccination course (17 countries reporting). Ten countries have administered at least one vaccine dose to more than 80% of healthcare workers.

## Priority groups defined for vaccination

- Vaccinations continue to be rolled out in phases through various priority groups. As of 31 May 2021, one country is still in the first phase, while 21 countries have progressed to groups in subsequent phases (of 22 countries that responded to this question).
- Countries have primarily prioritised elderly people, residents and personnel of long-term care facilities (LTCFs), healthcare workers, social care personnel, and people with certain comorbidities. Countries are currently continuing vaccination of these groups, progressing to vaccination of younger age groups and essential workers critical to societal infrastructure. Ten countries have already opened up vaccination to any adult individual irrespective of age, underlying condition, or priority group.
- Fifteen countries have already fully vaccinated at least one priority group, such as healthcare workers, residents and/or personnel in LTCFs, elderly people (with various lower age cut-offs across countries) or adults with co-morbidities.
- Eighteen countries have further adapted the prioritised groups to be vaccinated, including additional age groups, healthcare workers in different settings, educational workers, and other groups with high risk of severe disease.

## Vaccination strategies and policies during rollout

- Sixteen countries have extended the timing between vaccine doses to provide the first dose to as many people in the priority groups as possible. The timing between the first and second dose varies by country and by vaccine product.
- For individuals previously infected with SARS-CoV-2, eleven countries currently recommend only one dose (for vaccines that have a two-dose schedule).
- Seventeen countries recommend specific COVID-19 vaccine products for specific population groups.
- Most countries have adapted their vaccination guidelines following the report of the very rare side effects of thromboembolic events associated with thrombocytopenia following vaccination with Vaxzevria and COVID-19 Vaccine Janssen. The adaptation is mainly based on age specific recommendations for both the Vaxzevria and COVID-19 Vaccine Janssen.
- A minority of countries (n=4) reported that they have adapted their COVID-19 vaccination strategy due to the circulation of new variants of concern. Adjustments included providing more vaccine doses to areas of high incidence of COVID-19 in general or due to high incidence of variants of concern or a redefinition of the priority groups based on the epidemiological situation. No further adjustment has been made compared to the previous report.
- Fourteen responding countries answered that they do offer vaccination to certain individuals/ target groups who live outside of the country (e.g. transnational workers, with certain criteria such as working in LTCF, health facilities or essential workers).
- All responding countries answered that vaccination will be accessible to any EU citizens in the country, but there may be certain conditions.
- Five countries are planning to expand vaccination to all adolescents and in 14 countries the vaccination of children under the age of 12 years is currently under discussion and decisions will be made at a later time if the European Medicines Agency authorises any COVID-19 vaccines for that age group.

## Vaccination certificates

The majority of responding countries are planning to issue COVID-19 vaccination certificates, and many have started discussions regarding the possible use of these certificates in the future, for example for travel, tourism, the easing of non-pharmaceutical interventions, or access to specific places/events.

## Vaccine acceptance and hesitancy

Eleven countries have observed an increase in vaccine hesitancy mostly in relation to lower acceptance of the Vaxzevria vaccine.

## Challenges and good practices

- The majority of countries (15/23, 65%) reported that limited vaccine supply is the main challenge they face with the rollout of vaccines.
- Some countries shared lessons learned so far in the vaccination rollout, such as establishing mass vaccination centres in cooperation with municipalities to ensure faster and effective vaccine rollout, using and optimising waiting lists for reduced wastage of doses, and using pedagogical communication.
- Countries provided information about different measures taken to reach those who are under-served or vulnerable in the population, such as using the single dose vaccine or mobile vaccination teams.

As countries continue with the rollout of their national vaccination campaigns, strategies and plans will continue to be adapted. This is a rapidly moving process, and this report provides a snapshot of the progress to date.

## Scope of this document

On 19 January 2021, the European Commission set out actions to step up the response against the pandemic and accelerate the rollout of vaccination campaigns, with the targets of vaccinating at least 80% of people over the age of 80 years, and 80% of health and social care professionals in every Member State by March 2021. In addition, a minimum of 70% of the adult population should be vaccinated by the summer of 2021 [1].

ECDC has previously published technical reports on vaccination strategies and vaccine deployment across EU/EEA countries, on 2 December 2020 [2], 1 February 2021 [3], 29 March 2021 [4] and 6 May 2021 [5]. This fifth technical report provides an updated overview of the progress of national COVID-19 vaccination strategies in EU/EEA countries, including updates on: vaccine uptake overall and by target group; current vaccination phases and priority groups, as well as any adjustments made to priority groups during the rollout; vaccination strategies and policies in place; the use of vaccination certificates, vaccine acceptance and hesitancy, and challenges countries face with the rollout and good practices to mitigate these challenges.

## Target audience

Target audiences for this document are the European Commission, the Health Security Committee (HSC), the EU/EEA National Immunisation Technical Advisory Groups (NITAGs) collaboration and national public health institutes and ministries of health in the EU/EEA, as well as public health experts and decision-makers at subnational level in charge of implementing vaccine deployment plans.

## Methods

The information provided in this report was collected from the following sources:

### The Integrated Situational Awareness and Analysis report

Questions on vaccines are sent by the European Commission to EU/EEA countries via the Integrated Situational Awareness and Analysis (ISAA) report. The ISAA report is prepared under the Integrated Political Crisis Response Mechanism (IPCR) of the Council of the European Union [6,7].

- Since 9 December 2020, a weekly set of questions has been sent via the ISAA report to representatives of countries, as validating authorities of the IPCR, to gather regular information on various topics around COVID-19. One section of these questions covers vaccination strategies and deployment. The representatives of countries gather the responses to the questions from different agencies and ministries in their countries.
- This report is based on the responses from countries to the vaccine-related questions received on 3 May 2021, 10 May 2021, 17 May 2021, 31 May 2021. Where relevant, data are included from responses provided before May. The response rate from countries to each question is specified in the sections below.
- On 3 June 2021, a draft version of this report was sent to the Health Security Committee Members for verification and validation, and to complement any missing information.

## Data from The European Surveillance System

ECDC, in conjunction with the World Health Organization's Regional Office for Europe, has implemented a monitoring system to collect information on vaccine rollout (the number of doses distributed to EU/EEA countries and administered, including by age groups and other prioritised populations) since mid-January 2021. EU/EEA countries have been reporting data on the COVID-19 vaccine rollout through The European Surveillance System (TESSy), which can be viewed on the COVID-19 Vaccine Tracker [8] on ECDC's website, as well as the weekly report on the COVID-19 vaccine rollout overview [9]. The information on the COVID-19 vaccine rollout presented in this report is based on most recent data reported by EU/EEA countries to TESSy and displayed in the Vaccine Tracker as of 11 June 2021. The Vaccine Tracker may be consulted for additional details and country specific disclaimers on data.

## Results

### COVID-19 vaccine rollout overview

By January 2021, all 30 EU/EEA countries had started COVID-19 vaccination campaigns [3], and different COVID-19 vaccine products have been gradually introduced as they became available through the EU Vaccines Strategy. The Annex (Table 18) presents an overview of COVID-19 vaccines currently being rolled out in EU/EEA countries and the dates of their first administration.

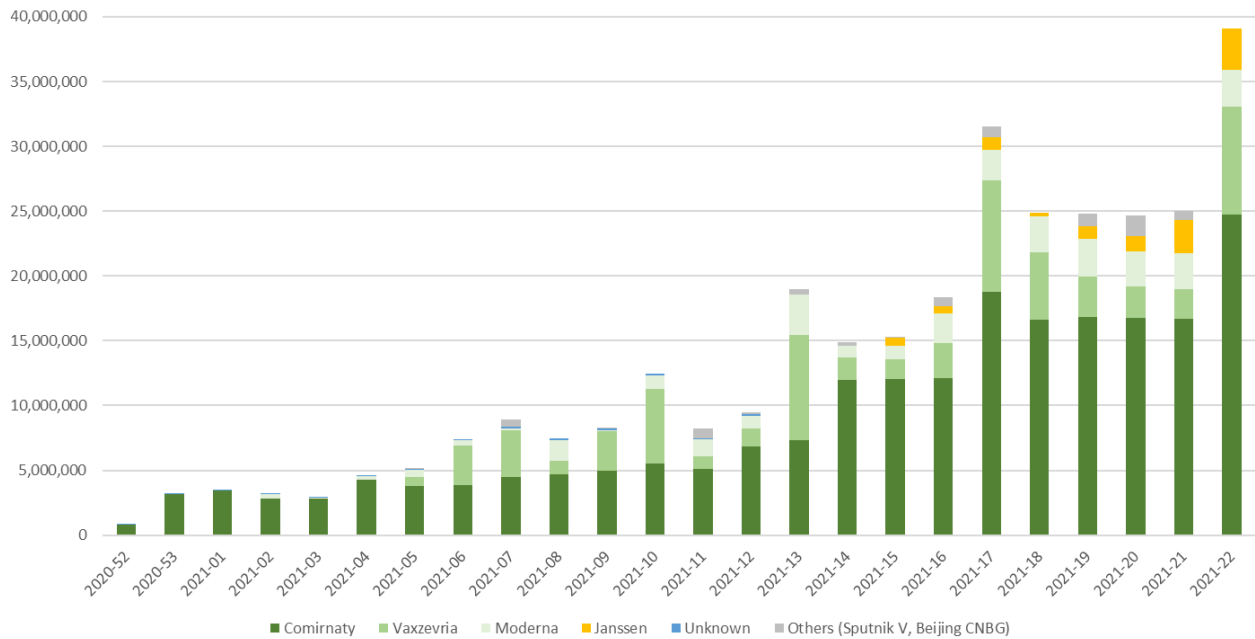
Currently, four COVID-19 vaccines have received conditional marketing authorisation in the EU [10], following evaluation by EMA, and are part of the EU Vaccines Strategy Portfolio: Comirnaty (BNT162b2) developed by BioNTech/Pfizer, COVID-19 Vaccine Moderna (mRNA-1273), Vaxzevria (AZD1222) previously COVID-19 Vaccine AstraZeneca, and COVID-19 Vaccine Janssen (Ad26.COV 2.5). Rolling reviews for additional COVID-19 vaccines are ongoing: NVX-CoV2373 by Novavax (started 03 February 2021), CVnCoV by CureVac (started 12 February 2021), and Sputnik V (Gam-COVID-Vac) by Gamaleya (started 4 March 2021)[11-13]. All vaccine products authorised in the EU are registered for use in people aged 18 years and older, with the exception of Comirnaty which was approved for use in adults and adolescents aged 16 and above and whose indication was recently extended to include children aged 12 to 15 years [14].

All EU/EEA countries have received and are using Comirnaty, COVID-19 Vaccine Moderna and Vaxzevria, except for Liechtenstein, where only the first two products are being used and in Denmark Vaxzevria is no longer used routinely (only in specific situations) and in Norway Vaxzevria is no longer used. By week 20, 2021 (23 May 2021), supplies of COVID-19 Vaccine Janssen have also been distributed to 25 EU/EEA countries. In addition, Hungary has received supplies of Sputnik V by Gamaleya and Inactivated Beijing CNBG by Sinopharm through bilateral negotiations with the manufacturers. Slovakia started using Sputnik V by Gamalya in week 23 2021.

As of 11 June 2021, a total of 333 678 903 vaccine doses have been distributed by manufacturers to EU/EEA countries, including 39 077 495 in the last week (week 22, 2021) (29 countries reporting; data for Malta not reported to TESSy).

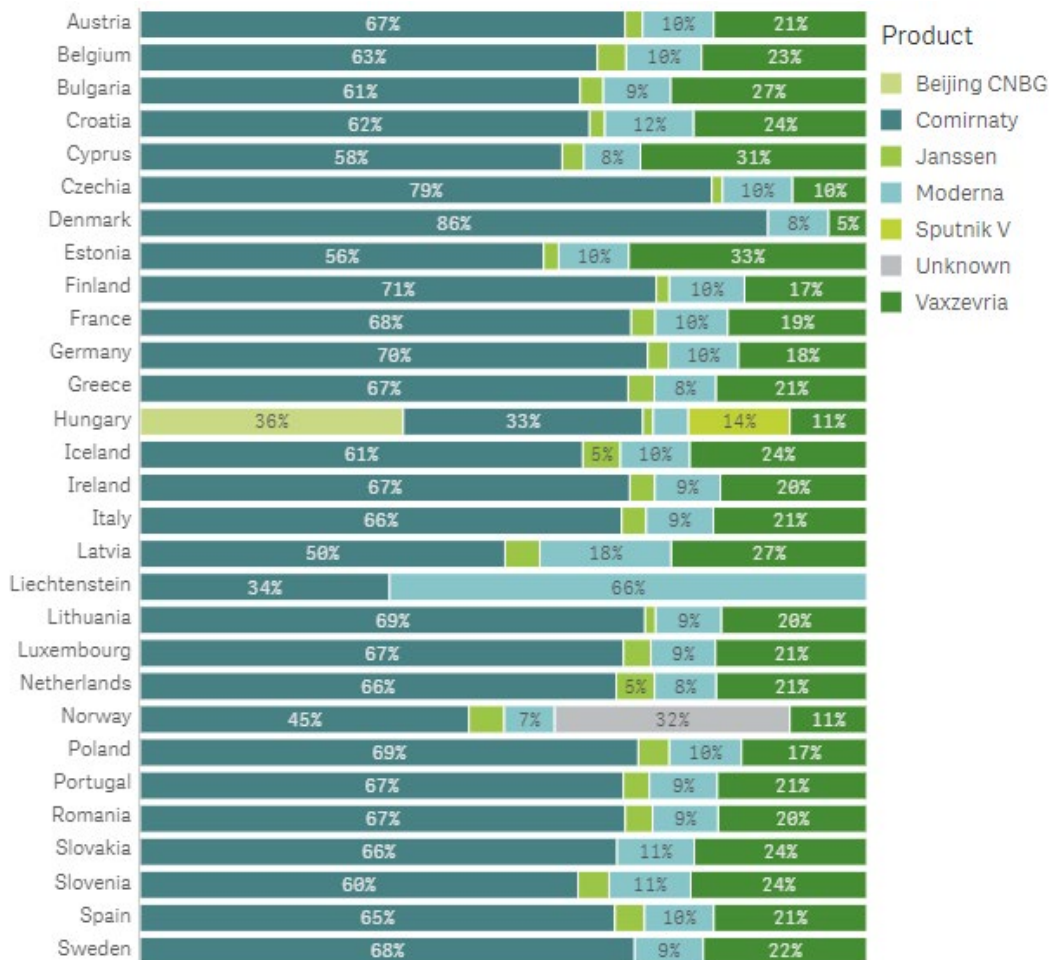
Figure 1 shows the weekly number of vaccine doses distributed by manufacturers to EU/EEA countries by vaccine product since the beginning of the rollout and as of 11 June 2021. Overall, Comirnaty represents 67.3% of all doses distributed to EU/EEA countries via the European Commission's Vaccine Strategy, followed by Vaxzevria (19.5%), COVID-19 Moderna (9.6%) and Janssen (3.3%); 1 056 885 vaccine doses distributed to Norway are reported to TESSy as an unspecified product (0.3%). Sputnik V and Inactivated Beijing CNBG were only supplied to Hungary. Figure 2 shows the proportion of vaccine doses distributed by manufacturers to each EU/EEA country by vaccine product as of 11 June 2021.

**Figure 1. Weekly number of COVID-19 vaccine doses by product, distributed by manufacturers to EU/EEA countries\***



\*Source: TESSy; data reported by 29 countries as of 11 June 2021 (missing Malta); partial data for week 23, 2021 not shown.

**Figure 2. Proportions of COVID-19 vaccine doses by product, distributed by the manufacturers to EU/EEA countries\***

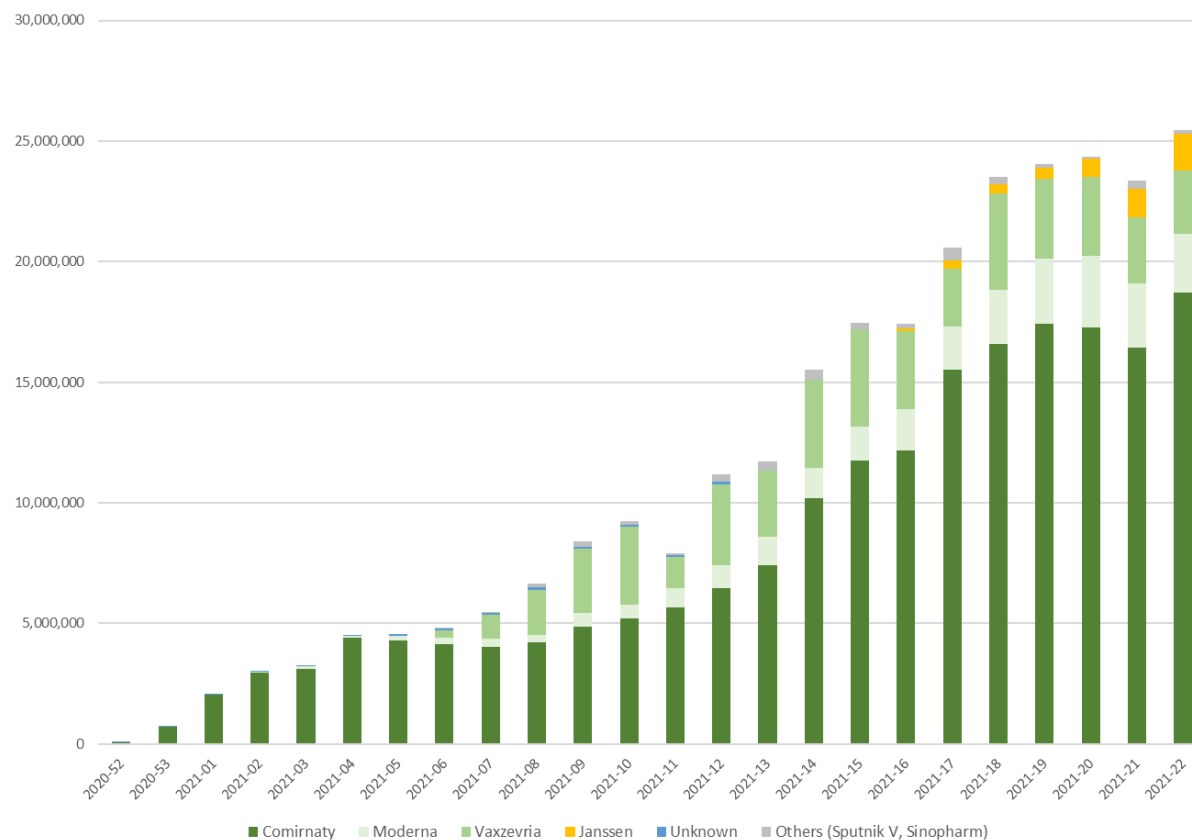


\*Source: TESSy; data reported by 29 countries as of 11 June 2021 (missing Malta).



As of 11 June 2021, a total of 284 124 689 vaccine doses have been administered to adults aged 18 years and above in all EU/EEA countries, 25 437 581 in the last week (week 22, 2021) (30 countries reporting). Based on data available from 29 EU/EEA countries (missing Malta), 85% of the doses distributed since the beginning of the rollout have been used. Considering the increase in vaccine supply, the weekly number of doses administered has also been increasing overtime (Figure 3); an average of 24 650 723 doses have been administered per week in the last four weeks.

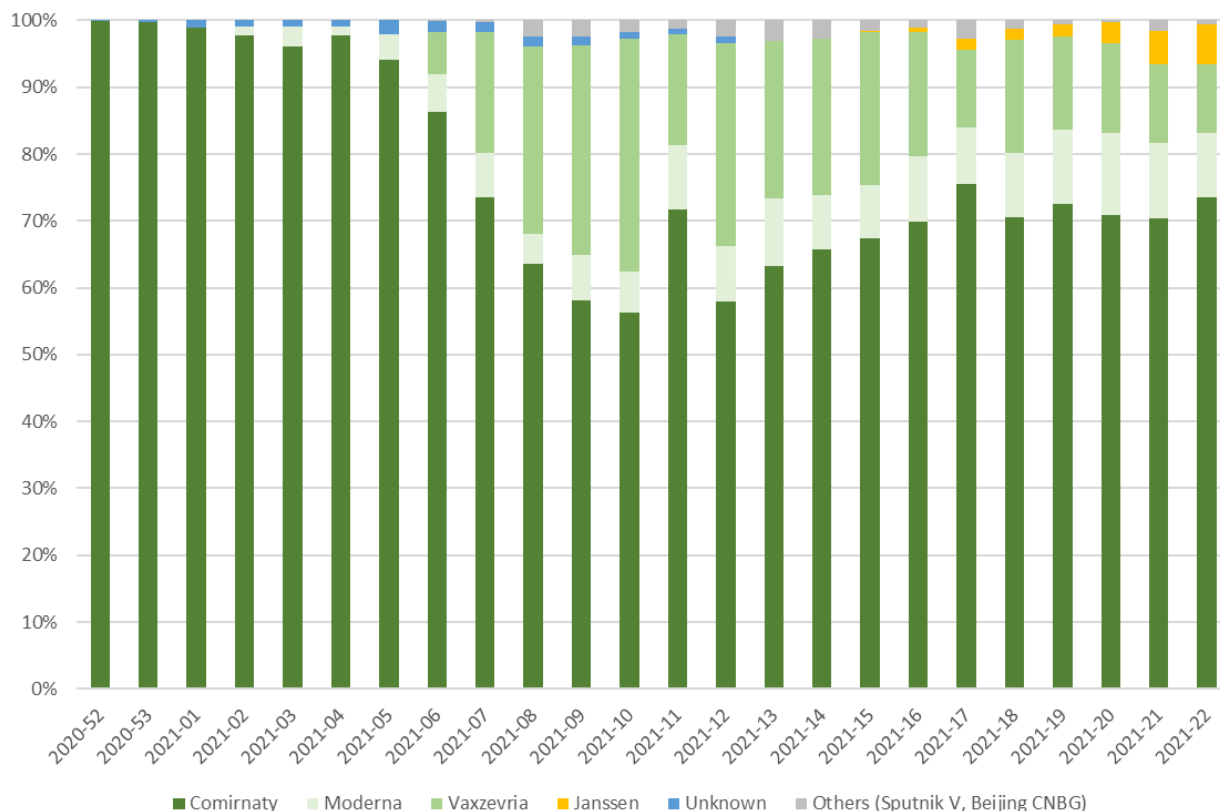
**Figure 3. Weekly number of COVID-19 vaccine doses by product, administered in EU/EEA countries\***



\*Source: TESSy; data reported by 30 countries as of 11 June 2021; partial data for week 23, 2021 not shown.

Overall, Comirnaty represents 71.1% of all doses administered in EU/EEA countries, followed by Vaxzevria (16.5%), COVID-19 Moderna (8.9%), and Janssen (1.8%); 1.3% others (Sputnik V and Inactivated Beijing CNBG), and 0.3% unknown vaccine products. Figure 4 shows the proportion of vaccine doses administered in EU/EEA countries by vaccine product per week as of 11 June 2021.

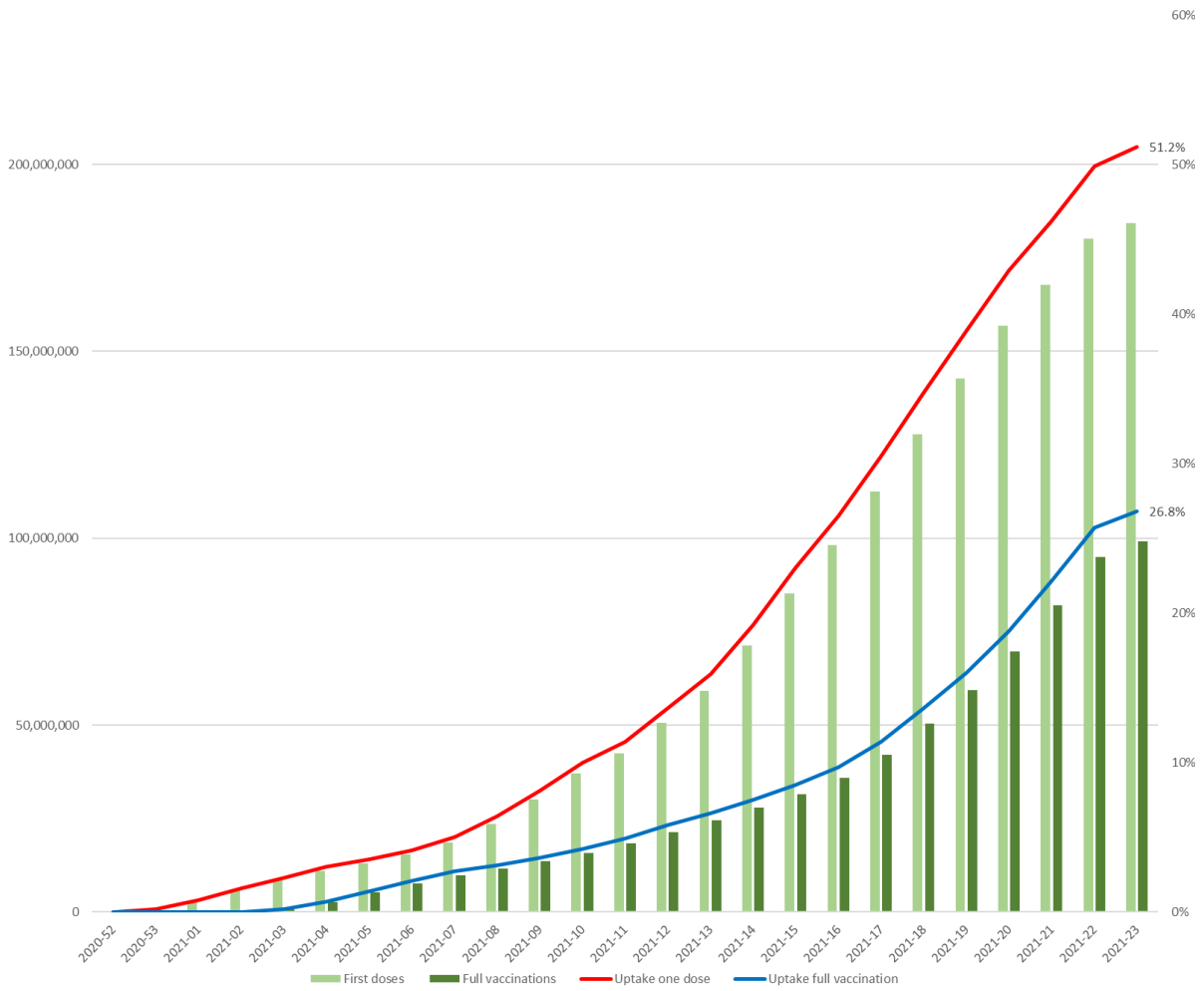
**Figure 4. Proportion of COVID-19 vaccine doses administered in EU/EEA countries by vaccine product per week\***



\*Source: TESSy; data reported by 30 countries as of 11 June 2021; partial data for week 23, 2021 not shown.

Since the start of the rollout of COVID-19 vaccination campaigns in the EU/EEA in December 2020 and as of 11 June 2021, the cumulative vaccine uptake in the adult population (aged 18 years and older) has reached 51.2% for at least one vaccine dose (range: 14.9-67.7%) and 26.8% for the full vaccination course (range: 11.8-55.1%) (30 reporting countries) (Figure 5). The cumulative uptake of at least one vaccine dose and full vaccination in the adult population (18+) in each EU/EEA country is shown in Figure 6.

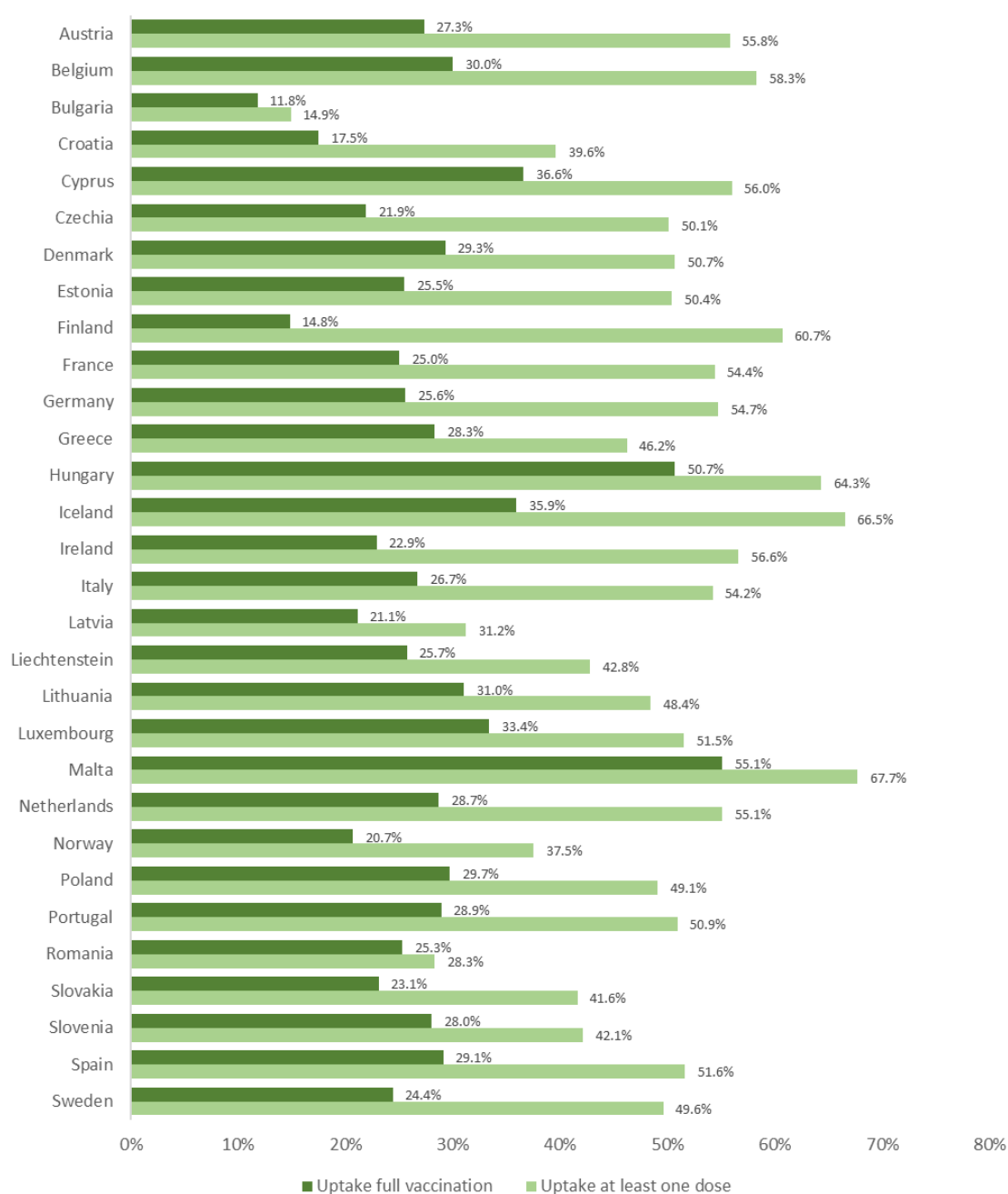
**Figure 5. Cumulative uptake of at least one vaccine dose and full vaccination among adults aged 18 years and above in the EU/EEA by reporting week\***



\*Source: TESSy; data reported by 30 countries as of 11 June 2021; data for week 23, 2021 are preliminary.



**Figure 6. Cumulative uptake of at least one vaccine dose and full vaccination among adults aged 18 years and above by EU/EEA country\***



\*Source: TESSy; data reported as of 11 June 2021; uptakes are based on data reported up to week 21, 2021 for Norway; week 22, 2021 for Denmark, Germany, Iceland, Latvia, Liechtenstein, Malta, Romania, and Slovenia; and partial data for week 23, 2021 for all remaining EU/EEA countries.

Cumulative vaccine uptake is higher in those target groups that have been prioritised since the beginning of the vaccine rollout, in particular the elderly and healthcare workers (see section below on **Priority groups defined for vaccination**).

As of 11 June 2021, the median vaccine uptake among people aged 80 years and above was 80.7% (range: 14.6–100%) for at least one dose and 71.6% (range: 10.4–100%) for the full vaccination course (26 countries reporting). Thirteen countries (Austria, Belgium, Cyprus, Denmark, Finland, Iceland, Ireland, Italy, Malta, Norway, Portugal, Spain, and Sweden) administered at least one vaccine dose to more than 80% of the population aged 80 years and above, while 10 (Cyprus, Denmark, Iceland, Ireland, Italy, Malta, Norway, Portugal, Spain, and Sweden) also administered a full vaccination course to more than 80% of this target population.

Among healthcare workers (HCW), as of 11 June 2021, the median vaccine uptake was 83.9% (range: 21.4–100%) for at least one dose and 69.9% (range: 20–100%) for the full vaccination course (17 countries reporting). Ten countries (Czechia, Estonia, France, Hungary, Iceland, Ireland, Latvia, Romania, Spain, and Sweden) administered at least one vaccine dose to more than 80% of healthcare workers, while six countries (Czechia, Hungary, Iceland, Ireland, Latvia and Romania) also administered a full vaccination course to more than 80% in this target group.

Table 1 shows a summary of the cumulative uptake of at least one vaccine dose and full vaccination in adults (18+), people aged 80 years and above and healthcare workers (EU/EEA median and range). More information on the COVID-19 vaccine rollout in EU/EEA countries can be found on the ECDC Vaccine Tracker [8] and in the weekly COVID-19 vaccine rollout overview [9].

**Table 1. Summary table of vaccine uptake by target populations**

Vaccine uptake	Uptake (range)	Reporting countries
At least one dose among adults (18+ years)	51.2% (range: 14.9–67.7%)	All 30 EU/EEA countries
Full vaccination among adults (18+ years)	26.8% (range: 11.8–55.1%)	All 30 EU/EEA countries
At least one dose among people 80+ years (median)	80.7% (range: 14.6–100%)	26 (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden)
Full vaccination among people 80+ years (median)	71.6% (range: 10.4–100%)	26 (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden)
At least one dose among healthcare workers (HCW) (median)	83.9% (range: 21.4–100%)	17 (Bulgaria, Croatia, Czechia, Denmark, Estonia, France, Greece, Hungary, Iceland, Ireland, Latvia, Luxembourg, Malta, Romania, Slovenia, Spain, Sweden)
Full vaccination among HCW (median)	69.9% (range: 20–100%)	17 (Bulgaria, Croatia, Czechia, Denmark, Estonia, France, Greece, Hungary, Iceland, Ireland, Latvia, Luxembourg, Malta, Romania, Slovenia, Spain, Sweden)

\*Source: TESSy; data reported as of 11 June 2021.

## Priority groups defined for vaccination

Due to the limited availability of COVID-19 vaccines at the start of vaccination campaigns, most countries opted to prioritise vaccination for those individuals most at risk of severe disease (e.g. the elderly and residents in long-term care facilities (LTCFs), as well as healthcare workers. Vaccination phases differ by country, with a range of two to 16 different phases (Table 2), depending on their specific prioritisation strategies and vaccine availability.

This section of the report focuses on population groups that are being offered vaccination in the current stage of the rollout. As more vaccines become available, countries can start vaccinating additional groups, such as younger individuals or workers of essential public services other than healthcare or even open the vaccination to all adults and adolescents 12 years and above.

**Table 2. Number of phases to vaccinate prioritised groups in EU/EEA countries (n=30)\*\***

Number of phases to vaccinate prioritised target groups	Countries
Two	Italy, Portugal
Three	Austria, Belgium, Croatia, Czechia, Greece, Poland, Romania, Spain
Four	Finland, Germany, Malta, Sweden
Five	Estonia, France, Slovenia, the Netherlands
Six	Cyprus, Luxembourg
Other	Denmark (12 phases), Hungary (seven phases), Iceland (10 phases), Ireland (9 phases), Latvia (eight phases), Lithuania (16 phases), Norway (nine phases), Slovakia (12 phases), Slovenia (seven phases)

\*Information gathered from ISAA reports between 9 February and 29 March 2021; information received from HSC and NITAG members on 28 January 2021

# Several countries provided detailed information on the description of different vaccination phases:

**Belgium:** Phase 1A: started on 5 January 2021, involves residents and staff in nursing homes and has been completed by all healthcare workers. Phase 1B: begins in March and will address people aged 65 years and older, people aged 45 years and older at risk, and those fulfilling so-called 'essential' social or economic functions. Phase 2 will take place in May or June and will involve the adult population 18 years and older.

**Croatia:** Phase 1: elderly and staff in long-term care facilities, healthcare workers, primarily those working with COVID-19 patients (ICU, testing-sites). Phase 2: elderly age range > 65 years and adults with chronic diseases, age range < 65. Phase 3: others.

**Czechia:** 3 phases (Phase IA, IB, and II). In Phase II, vaccines should already be available to the general public.

**Cyprus:** Phase 1: since 27 December 2020, residents and staff of LTCFs and healthcare workers. Phase 2: since 26 January 2021, people > 80 years old (priority in vulnerable groups); the age limit is lowered at regular intervals. Phase 3: since 16 February 2021, people > 75 years old (priority in vulnerable groups). Phase 4: since the end of February 2021, people ≥ 16 years with high risk for severe disease. Phase 5: since the end of February 2021, people working in primary healthcare centres, followed by other health professionals/personnel, and residents in other closed structures, such as prisons and hosting centres for refugees and migrants. Phase 6: the rest of the population according to age.

**Estonia:** Phase 1 (since 27 December 2020): healthcare workers and people working in healthcare institutions; Phase 2 (since January 2021): residents and staff of LTCF; Phase 3 (since end of January 2021): the elderly and risk groups; Phase 4 (started in mid-February 2021 due to Vaxzevria's preliminary use-recommendation, continued on a small scale and depending on available vaccine quantities and recommendations for different vaccines): front-line and essential services providers; Phase 5 (since May 2021): the rest of the population by age-groups. The phases are overlapping in most cases and depend mostly on available vaccine quantities and recommendations.

**Germany:** Four phases: Three phases with priority groups (very high, high, moderate), followed by the remaining population (not listed in group 1-3).

**Italy:** Phase 1: healthcare workers and socio-healthcare workers, residents and staff of long-term facilities for the elderly; elderly > 80. Phase 2 (with six categories of prioritisation): extremely vulnerable people; people aged between 75 and 79 years; people aged between 70 and 74 years; people with increased clinical risk if infected by SARS-CoV-2 aged 16-69 years; people aged 55-69 years; people aged 18-54 years. Vaxzevria can be administered to school and university staff, to members of the army and police, in at-risk settings such as prisons, specific communities, and to people working in essential services.

**Iceland:** The population is divided into 10 priority groups. For information on priority groups, see: <https://www.covid.is/covid-19-vaccine#w-tabs-0-data-w-pane-1>

**Latvia:** The population is divided in eight priority groups.

**Spain:** Phase 1: elderly and staff in long-term care facilities, healthcare and social care workers, primarily those working with COVID-19 patients (frontline), non-institutionalized individuals with high level of dependency. Phase 2: elderly age range > 60 years and adults with chronic diseases, age range < 60, essential workers critical to societal infrastructure. Phase 3: <60 years (50-59 years; 40-49 years).

**Sweden:** Four phases: Three phases with priority groups, followed by the remaining population (not listed in group 1-3) starting with the oldest in each group.

Twenty-two countries replied to the question about indicating their current priority phase (Table 3). Twenty-four countries had also replied to the question on 27 April 2021. As of 31 May 2021, eight countries are in the same vaccination phase as on 27 April 2021. Of these, one country is in phase 1, two countries are in phase 2 and two countries are in phase 3, one country is in phase four and three countries are vaccinating all groups. Eleven countries have progressed from the vaccination phase reported on 27 April 2021 and 10 countries are already in their final vaccination phase (Austria, Croatia, Denmark, Estonia, Finland, Latvia, Luxembourg, Malta, the Netherlands, Romania).

**Table 3. Current vaccination phases in EU/EEA countries (n=22)\*#**

Current vaccination phase	Countries
Phase 1	Belgium (phase 1B),
Phase 2	Czechia, Portugal, Spain
Phase 3	Austria, Croatia, Romania
Phase 4	Malta, Finland, Sweden
Other	Denmark (phase 10) Estonia (phase 5) Germany (all groups) Hungary (all groups) Iceland (group 7-10) Ireland (phase 9) Latvia (phase 8) Lithuania Luxembourg (phase 6) the Netherlands (phase 5) Norway (phases 6-8) Poland (all groups) Slovakia (all groups)

\*Information gathered from ISAA reports on 3, 10, 17, and 31 May 2021. To consider the current vaccination phase latest information available is displayed in the table.

Countries marked in bold are currently in their final vaccination phase.

#Several countries provided detailed information on the description of different vaccination phases:

**Belgium:** Phase 1A started on 5 January 2021 and involves nursing homes (residents and staff), health care staff (hospitals and first line healthcare workers), healthcare workers and police intervention units. Phase 1B began in March 2021 and includes people aged 65 and older and those aged 18 and older at risk (due to underlying comorbidities). Phase 2, starting in May or June 2021, will involve the adult population over 18 years old without registered comorbidities.

**Germany:** Phase 1 and 3 are still ongoing, while phase 4 has started in some federal states. On 7 June, opening up the vaccination to any adult and children older than 12 years.

**Latvia:** Since 3 May 2021 vaccination of the entire adult population is ongoing. Since 17 May 2021 vaccination is available for population aged 16+ and from 2 June 2021 age 12+ is available.

**Lithuania:** Starting from 10 May 2021, a new 10-year age group will be included in the vaccination process every week: from 10 May, population aged 55-64; from 17 May, population aged 45-54; from 24 May, population aged 35-44; from 31 May, population aged 16-34.

**The Netherlands:** The phases were slightly modified: Phase 1 (people living in elderly care and their healthcare staff; people and staff in long term care facilities; acute care and ICU medical staff), phase 2 (people 60 years and older (from old to young) and healthcare staff delivering home-based care), phase 3 (people (>16 years) with high-risk medical conditions; specified groups of healthcare professionals (involved in care/treatment of COVID-19 patients)), phase 4 (people between 18 and 60 years with certain underlying medical conditions), phase 5 (people between 18 and 60 years). Currently in the last phase of prioritisation, people aged 45-55 years are currently being vaccinated.

**Poland:** Since 9 May 2021 all age groups (adults) are released to sign up for a vaccination.

**Sweden:** Phase 3 is still ongoing, while phase 4 has started in some regions.

Twenty-four countries replied to the question which priority groups are currently vaccinated (Table 4). Due to high vaccine uptake, ten countries have already opened up vaccination to any adult individual irrespective of age, underlying condition, or priority group (Table 6). All countries that replied are still prioritising the elderly and/or adults of different age groups. Eight countries report having almost fully vaccinated the elderly (Table 5) and, considering that in several countries the cumulative vaccine uptake has increased in older age groups, younger age groups are now also being vaccinated. Sixteen countries (64%) are prioritising residents in LTCFs. Twenty-one countries (84%) are currently vaccinating adults with comorbidities compared with 96% of countries that were prioritising this group in April 2021. Healthcare workers, personnel in LTCFS and social care personnel are considered as priority groups in 17 (68%), 15 (60%) and 15 (60%) countries, respectively. In 23 countries other groups, including essential workers critical to societal infrastructure, educational staff, people with mental or physical disabilities, socially vulnerable, and younger people with high risk of severe COVID-19 are also prioritised for vaccination.

**Table 4. Overview of priority groups currently being vaccinated in EU/EEA countries (n=25)\***

Countries	Priority groups currently being vaccinated						
	Elderly/adults in different age groups	Elderly in LTCFs	Adults with co-morbidities	Healthcare workers	Personnel in LTCFs	Social care personnel	Other risk groups (i.e. workers of essential public services other than healthcare; others)
Austria	Yes (65+)	Yes	Yes (regardless of age)	Yes	Yes	Yes	Other essential workers critical to societal infrastructure. Socially vulnerable groups. Staff in schools, kindergartens, crèches and childcare facilities. People below 65 years with increased risk according to prioritisation of the NITAGs. Close contact persons of pregnant women. Selected employees with direct personal contact and increased risk of infection, especially in the police, penal system, federal army. Total population under 65 years prioritised by age and health risks. Further ranking based on living and working conditions.
Belgium	Yes (65+)		Yes				Phase 1B started in March and includes people aged 65+ years and those aged 18+ and years at risk. The vaccination strategy recommends vaccinating older adults by decreasing age categories. In most regions, the category 70-75 years is currently invited to be vaccinated; in other regions younger people with comorbidities are already invited.
Croatia	Yes		Yes				Other essential workers critical to societal infrastructure. Vaccination available for people of all age groups for whom there is a licenced vaccine (vaccinating 12-15 years under discussion).

Countries		Priority groups currently being vaccinated					
	Elderly/adults in different age groups	Elderly in LTCFs	Adults with co-morbidities	Healthcare workers	Personnel in LTCFs	Social care personnel	Other risk groups (i.e. workers of essential public services other than healthcare; others)
Czechia	Yes (16+)						No system of prioritisation applies as for now. From 1 June, registration will be open to the last age group (16+ years).
Denmark	Yes						Vaccination available for people of all age groups for whom there is a licenced vaccine (vaccinating 12-15 years under discussion).
Estonia	Yes						Vaccination available for people of all age groups for whom there is a licenced vaccine (vaccinating 12-15 years under discussion).
Finland	Yes (70+)	Yes	Yes	Yes	Yes	Yes	Election officers of the 2021 municipal elections.
France	Yes (18+)	Yes	Yes	Yes		Yes	People aged 16-17 years with a very high risk of severe COVID-19. Relatives aged 16 years and over of severely immunocompromised persons. Pregnant women from the second trimester of pregnancy.
Germany	Yes	Yes	Yes	Yes	Yes	This group was not a priority group.	Other essential workers critical to societal infrastructure. Socially vulnerable groups. Educational staff. On June 7, vaccination was opened for those aged 12 years and above.
Hungary	Yes (60+)	Yes	Yes	Yes	Yes	Yes	Other essential workers critical to societal infrastructure. Socially vulnerable groups, anyone above 16 years asking for the vaccination.
Iceland	Yes		Yes				Socially vulnerable groups.

Countries		Priority groups currently being vaccinated					
	Elderly/adults in different age groups	Elderly in LTCFs	Adults with co-morbidities	Healthcare workers	Personnel in LTCFs	Social care personnel	Other risk groups (i.e. workers of essential public services other than healthcare; others)
Ireland	Yes (40+)	Yes	Yes	Yes	Yes	Yes	Socially vulnerable groups. People 16-69 years old at very high risk of severe COVID-19.
Latvia	Yes	Yes	Yes	Yes	Yes	Yes	Other essential workers critical to societal infrastructure. Socially vulnerable groups. Educational staff. Since 3 June vaccines are available to the entire adult population; vaccination is available for those 12 years and above.
Lithuania	Yes	Yes	Yes	Yes	Yes	Yes	Other essential workers critical to societal infrastructure. Socially vulnerable groups. Educational staff.
Luxembourg	Yes	Yes	Yes	Yes	Yes		Other essential workers critical to societal infrastructure. Socially vulnerable groups. In phase 6, the general resident population between 16 and 54 years, starting with the oldest, who have not been previously vaccinated due to vulnerability are now vaccinated.
Malta	Yes (16+)	Yes	Yes	Yes	Yes	Yes	Yes, and vaccination is now available to those aged 12 years and above.
The Netherlands	Yes						Other essential workers critical to societal infrastructure. Socially vulnerable groups.
Norway	Yes (55+)		Yes	Yes			Certain groups of healthcare workers. People 16-64 years with conditions leading to a high risk of severe illness.
Poland	Yes	Yes	Yes	Yes	Yes	Yes	Other essential workers critical to societal infrastructure. Socially vulnerable groups. Educational staff.



Countries		Priority groups currently being vaccinated					
	Elderly/adults in different age groups	Elderly in LTCFs	Adults with co-morbidities	Healthcare workers	Personnel in LTCFs	Social care personnel	Other risk groups (i.e. workers of essential public services other than healthcare; others)
Portugal	Yes		Yes			Yes	Other essential workers critical to societal infrastructure. Socially vulnerable groups.
Romania	Yes	Yes	Yes	Yes	Yes	Yes	Other essential workers critical to societal infrastructure. Socially vulnerable groups. Educational staff.
Slovenia	Yes (16+)	Yes	Yes (16+)	Yes	Yes	Yes	Other essential workers critical to societal infrastructure. Socially vulnerable groups. Educational staff. All persons aged 16 years and over (with priority vaccination of priority groups in accordance with the national vaccination strategy)
Slovakia	Yes	Yes	Yes	Yes	Yes	Yes	Other essential workers critical to societal infrastructure. Socially vulnerable groups.
Spain	Yes (50+)	Yes	Yes	Yes	Yes	Yes	Other essential workers critical to societal infrastructure. Socially vulnerable groups. Educational staff. Non-institutionalized individuals with a high level of dependency.
Sweden	Yes (50+)	Yes	Yes	Yes	Yes	Yes	Close contact persons of those living in nursing homes or receiving home care. Socially vulnerable groups. Pregnant women with risk factors.

*\*Information gathered from ISAA reports on 3, 10, 17, and 31 May 2021. To consider the current vaccination phase latest information available is displayed in the table.*

*Note: In Germany, all healthcare workers and personnel working in long-term care facilities are eligible for vaccination even if they live outside Germany.*

Nineteen countries replied to the question about fully vaccinated priority groups (Table 5). Fully vaccinated does not necessarily mean that 100% of the respective groups have been vaccinated. Even fully vaccinated groups can include certain individuals who have not been vaccinated, such as people who refused vaccination or people who are not eligible for vaccination due to risk factors. Some countries have added further explanations about what they mean by 'fully vaccinated' (e.g. in percentage to define the number of vaccinated persons within one group). To reflect the full picture, we show fully vaccinated groups as reported by the countries and add further explanations where available.

Seventeen countries had also replied to the question on 27 April 2021. As of 31 May 2021, 15 countries report at least one fully vaccinated priority group (compared to 13 countries on 27 April). Thirteen countries reported that healthcare workers have been fully vaccinated (compared to eleven countries on 27 April). The elderly in LTCFs and personnel in LTCFs have been fully vaccinated in 11 countries and in eight countries, respectively (compared to nine and six countries, respectively, on 27 April). Nine countries have fully vaccinated elderly people with different age-ranges, while four countries have fully vaccinated adults with co-morbidities and five countries have fully vaccinated social care personnel (compared to four and two countries, respectively, on 27 April). Four countries have fully vaccinated other priority groups, e.g. essential workers critical to societal infrastructure, LTCF residents with intellectual disabilities and people in home care (also six countries on 27 April).

**Table 5. Fully vaccinated priority groups in EU/EEA countries<sup>1</sup> (n=18)\*#**

Countries	Priority groups fully vaccinated (including comments provided by countries)						
	Elderly	Elderly in LTCFs	Adults with co-morbidities	Healthcare workers	Personnel in LTCFs	Social care personnel	Other risk groups (i.e. workers of essential public services other than healthcare; others)
Austria		Yes		Yes (HCW in highly exposed settings).	Yes		
Croatia				Yes (87% of all HCW with at least one dose).			
Denmark	Yes (75+)	Yes	Yes	Yes (almost fully vaccinated).			
Estonia		Yes		Yes	Yes	Yes	
Finland	Yes (60+)	Yes	Yes	Yes (at least one dose).	Yes	Yes (at least one dose).	Yes (essential workers critical to societal infrastructure).
Hungary				Yes			
Iceland		Yes		Yes (HCW in COVID-19 wards, ICU and emergency rooms).			
Lithuania				Yes	Yes	Yes	
Malta	Yes (60+)	Yes	Yes	Yes	Yes	Yes	Yes (essential workers critical to societal infrastructure)

<sup>1</sup> Depending on how a country defines it, it may mean e.g. >80% of full vaccination coverage

Countries	Priority groups fully vaccinated (including comments provided by countries)						
	Elderly	Elderly in LTCFs	Adults with co-morbidities	Healthcare workers	Personnel in LTCFs	Social care personnel	Other risk groups (i.e. workers of essential public services other than healthcare; others)
The Netherlands	Yes (60+, partially)	Yes		Yes (HCW directly involved in the care and treatment of COVID-19 patients).	Yes	Yes (district nurses and social support workers)	Yes (residents of small-scale residential homes and disability care homes, nursing homes for people with intellectual disabilities).
Norway	Yes (65+)						
Portugal	Yes (80+)	Yes		Yes	Yes		
Slovenia	Yes (70+, about 60%)	Yes		Yes	Yes		
Spain	Yes (70+)	Yes	Yes	Yes	Yes	Yes	Yes
Sweden	Yes (75+)	Yes (94% with first dose, 89% with second dose).					Yes (87% of people in home care with first dose, 71% with second dose).

*\*Information gathered from ISAA reports on 3, 10, 17, and 31 May 2021. To consider the most recent adjustments of the priority groups the latest information available is displayed in the table.*

*\*Countries with no fully vaccinated priority groups: Czechia, Latvia, Poland, Romania (Romania stating there is no fully vaccinated group as vaccination is not mandatory).*

Twenty-two countries replied to the question about opening up the vaccination to any adult individual irrespective of age, underlying condition or priority group. Ten countries had opened up vaccination to the entire adult population, while two countries are currently preparing and will open up shortly and nine countries have not opened up the vaccination outside of the prioritised groups.

Some countries provided additional information on how vaccination for all adults was or is being prepared:

- In Austria, the primary prioritisation is done by age and medical condition. Further prioritisation is based on living and working conditions. Workplace vaccination is planned to further increase vaccine uptake.
- In Croatia, vaccination sites for mass vaccination have been organised in each county. The online platform for scheduling vaccination has been developed.
- Czechia reported to continuously open the vaccination for particular age groups (without any prioritisation regarding i.e. comorbidities).
- Iceland reported that vaccination staff are prepared, and the vaccination clinics are ready to start vaccinating all adults.
- In Latvia, all vaccination centers are operating; mobile units are operating in rural areas and those aged over 60 years are served even without prior booking in the morning hours (9:00-10:00).
- In Lithuania, with the introduction of the public vaccination, a unified electronic registration system was launched. From 17 May, all residents of the country are invited to quickly and conveniently register on the online platform, which will allow not only to register yourself, but also to register another person.

- Residents who do not have the ability to register online and who cannot register them can do so by telephone by calling the Hotline.
- The authorities in Estonia and Romania are opening additional vaccination centres and in Poland they have increased the number of vaccination sites, including vaccinations in the workplace and also trained additional staff to administer vaccines such as general practitioners and pharmacists.

**Table 6. Countries who have opened up vaccination to any adult individual irrespective of age, underlying condition or priority group (N=22)\***

Opened up vaccination to any adult individual irrespective of age, underlying condition or priority group	Countries
Yes	Bulgaria, Croatia, Estonia, Germany, Latvia, Lithuania, Malta, Poland, Romania, Slovenia
No	Belgium, Czechia, Denmark, Finland, Ireland, Luxembourg, Spain, the Netherlands, Norway, Sweden
Not yet but preparations are underway, and country plans to open up shortly	Austria, Iceland

*\*Information gathered from ISAA reports on 17 and 31 May 2021. To consider the most recent adjustments of the priority groups the latest information available is displayed in the table.*

As of 31 May 2021, 18 of 24 countries have adjusted their original plans to efficiently administer COVID-19 vaccines to target groups (Austria, Czechia, Denmark, Estonia, Finland, France, Iceland, Ireland, Lithuania, , Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden) (Table 7). Adjustments were made to prioritise additional age groups (Austria, Denmark, Finland, , Sweden), healthcare workers and staff in long-term care facilities (Austria, Czechia, the Netherlands), people working in the educational system (Malta, Romania), people with high exposure to SARS-CoV-2 at work (Finland, Lithuania), and other groups with high risk of severe disease (Austria, France, Iceland, Ireland, Norway, Sweden).

**Table 7. Adjustments made to the original priority groups during the rollout (n=24)\*\***

Countries	Adjustments to original priority groups	Reason for adjustment
Austria	Prioritisation of people of 80 years and older, people with additional severe underlying health conditions, people with special cognitive and physical needs (living in the community), staff in mobile (nursing) care, people with disabilities and with personal assistance and their personal assistants, people in LTCFs.	Slow initial uptake in elderly care homes, more specific definitions of risk groups.
Czechia	Prioritisation of healthcare workers, social care workers and elderly in long-term care facilities over the originally envisaged people aged 65+ and people with comorbidities.	Logistics and need for cold chain as the mRNA vaccines were the first vaccines available.
Denmark	Age is now the primary factor for prioritisation for vaccination.	
Estonia	Yes	
Finland	Prioritisation of election officers of the June 2021 municipality elections in priority phase 1 and people younger than 70 years not belonging to any risk group. Areas with an incidence of over > 100 COVID-19 cases/100 000 inhabitants/14 days will receive a larger proportion of vaccines than areas with a lower incidence.	
France	Inclusion of home care workers, firefighters, people with serious comorbidities. Since 12 May 2021, leftover doses are open to the general public (appointment < 24h). Since 31 May, vaccination is open to anyone 18+.	

Countries	Adjustments to original priority groups	Reason for adjustment
Germany	Opened up vaccination to any adult individual /child >12 years irrespective of age, underlying condition or priority group.	
Iceland	People of prioritisation group 4, first responders, have been vaccinated along with group 2.	Part of the group has been vaccinated with doses that would otherwise have gone to waste because of no-shows at vaccination sites.
Ireland	Number of priority groups have been reduced and simplified. People aged 16-69 years at very high risk of severe COVID-19 disease have been prioritised. Age-based allocation (10-year bands) has been introduced for the final group.	
Latvia	Since 3 May vaccination is available to entire population.	
Lithuania	Inclusion of workers who have contact with other people at work in large companies (>100 employees).	
Malta	Workers in the educational cohort were always in the third cohort, but they were prioritised within that cohort.	
The Netherlands	Prioritisation of acute COVID-19 care staff in hospitals and general practitioners. High-risk groups with a medical indication have been defined.	
Norway	More vaccine doses will go to 24 municipalities, who have been subject to high incidence over time. People aged 18 years and older will be prioritized.	A new distribution key for vaccines to the municipalities based on the number of people aged 18 years or older is introduced. High infection rate within the age group of 18+.
Poland	Yes (adjustments are made according to current needs).	
Portugal	Prioritisation by age and of workers in the educational system. Prioritisation of additional vulnerable populations, such as homeless and house-bound patients. The clinical risk groups were also updated.	
Romania	Inclusion of workers in the educational system in the category of essential workers.	
Slovenia	Yes	
Spain	Yes	Adverse events following vaccination with Vaxzevria and the COVID-19 vaccine Janssen.
Sweden	Yes. Prioritisation of people with additional severe underlying health conditions, including bone marrow or other organ transplantation, dialysis treatment and Down's syndrome. Inclusion of pregnant women with risk factors.	

\* Information gathered from ISAA reports on 3, 10, 17, and 31 May 2021. To consider the most recent adjustments of the priority groups, the latest information available is displayed in the table.

#Countries with no adjustments to original priority groups: Belgium, Croatia, Hungary, Luxembourg.

## Vaccination strategies and policies during rollout

Countries continue to adapt vaccination strategies and policies based primarily on the changing epidemiological situation at country and subnational level, vaccine supply, new information regarding different COVID-19 vaccines efficacy, safety, effectiveness and new evidence about the virus and its impact on human health.

The vaccination policies captured in this section include the timing of COVID-19 vaccine doses; vaccination of individuals previously infected with SARS-CoV-2; extraction of additional doses of vaccine from vials; recommendations of vaccine products for age or target groups; changes in vaccination strategy due to variants

of concern; eligibility for vaccination of individuals who live outside the country and eligibility for vaccination of citizens from other EU countries, and vaccination of individuals under the age of 18 years.

## Extension of timing between the first and second dose of COVID-19 vaccines

Sixteen responding countries have extended the timing between vaccine doses to provide the first dose to as many people in the priority groups as possible. Romania applied extended timing in special circumstances. Currently, six countries (Iceland, Latvia, Lithuania, Malta, Slovakia, Slovenia, Spain) have not extended the timing between the first and second dose of authorised vaccines, although Lithuania and Spain have special recommendations.

Regarding the timing between first and second dose, policies vary by country and product as follows:

- Comirnaty: 28 days (Ireland, Portugal), 35 days (Belgium, Poland), 42 days (Austria, Croatia, Czechia, Estonia, France, the Netherlands, Norway), up to 42 days under special circumstances in Romania, 3 to 6 weeks (Denmark, Germany), 7 weeks (Sweden) and up to 12 weeks (Finland, Norway).
- COVID-19 Vaccine Moderna: 28 days (Italy, Portugal), up to 35 days under special circumstances in Romania, 35 days (Hungary, Poland), 42 days (Austria, Czechia, the Netherlands, Norway,) 7 weeks (Sweden), 4 to 6 weeks (Denmark), 5 to 7 weeks (France), 6 weeks (Germany) and 12 weeks (Finland, Norway).
- Vaxzevria: 35 days (Poland), 9-11 weeks (Sweden), 12 weeks (Croatia, Estonia, Finland, Ireland, Poland, Portugal, Slovenia, Spain), up to 12 weeks (France, Germany, Hungary, Latvia).

**Table 8. Extension of timing between the first and second dose of COVID-19 vaccines (n=25)**

Has the timing between the first and second dose of vaccine been extended?	Countries
Yes	Austria, Belgium, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Ireland, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden
No	Iceland, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia, Spain

Some countries provided further details about timing between doses:

- Lithuania: the second dose of Vaxzeria is recommended 12 weeks after the first dose, but the timing can be shortened for some population groups (e.g. educational institutions workers). Extension of the second dose of the Comirnaty vaccine under discussion.
- Norway: The Ministry of Health and Care Services has decided to extend the time interval between the first and second dose of mRNA vaccines from 6 to 12 weeks. Extension of the time interval between doses 1 and 2 for mRNA vaccines to up to 12 weeks applies to persons under 65 years old without underlying conditions.
- Romania: under special circumstances.
- Spain: extension of the timing for the second dose of Vaxzeria to 16 weeks only in essential workers aged <60 years (between 30 April to 18 May until vaccination was resumed offering Comirnaty as second dose).
- Sweden changed the timing for Comirnaty and COVID-19 Vaccine Moderna from six to six weeks.

## Recommendation of COVID-19 vaccination in individuals previously infected with SARS-CoV-2

There is some evidence that for those individuals who have already been previously infected with SARS-CoV-2, for currently available vaccines that require a two-dose schedule, a single dose may provide sufficient immunity [15-18].

Thirteen of the 25 countries that responded currently recommend the full vaccination schedule to those individuals who were previously infected while eleven countries recommend only one dose of vaccine (for vaccines that have a two-dose schedule). Iceland does not recommend vaccination for those previously infected.

### Timing of dose administration

One dose following infection:

- Austria: one dose after three months (neutralisation test) or six to eight months (PCR test) following infection (for all vaccines currently in use).

- France: One dose three months after infection (except for those in residential care homes).
- Germany recommends only a single dose of vaccine in previously infected individuals, even if more than six months have passed since diagnosis of the infection.
- In the Netherlands, one dose of vaccine is offered to people infected with SARS-CoV-2 in the last six months, but two doses are recommended for people with primary immunodeficiency.
- Slovenia recommends one dose for all previously infected, if they are vaccinated up to eight months after infection (for those persons vaccination can be postponed up to six months after infection). If they are vaccinated more than eight months after infection, they recommend vaccination with the full vaccination course. For persons who get COVID-19 after vaccination with one dose, they recommend a second dose after six months.
- Norway recommends one dose three months after recovery.
- Croatia recommends the one dose 3-6 months after being infected.
- In Estonia, vaccination with one dose is recommended on the sixth month after recovery.
- In Spain, one dose after six months following infection with SARS-CoV-2 is recommended.
- In Portugal, one dose six months after infection is recommended.

### Full vaccination schedule

- Latvia postpones the full course of vaccination in previously infected persons by at least three months and then the full course of vaccination is given (two doses).
- Finland reported that individuals infected with SARS-CoV-2 in the last three to six months previously are recommended to be vaccinated six months after the infection with the full vaccination course.

### Documentation of previous infections

Regarding the question on how documentation of previous infection is performed, Croatia requires a proof of infection (PCR or rapid antigen test). Finland indicated that a proof of a laboratory test is required (the information can be accessed through National Patient Healthcare Register). In Iceland, all diagnosed cases and their test results are logged in the national health care database. In Latvia, self-declaration is sufficient. In Norway, a previously infected individual must have a proof of infection based on a laboratory test (Norway has a national registry for all positive lab tests). In the Netherlands, proof of infection is not required. In Romania the infection status of an individual is available within the integrated health information system. In Slovenia, a laboratory test (PCR) or a doctor's certificate of past COVID-19 infection is required. Spain indicated that in people aged 18-65 years, previous infection should be documented with a laboratory test confirming infection or through available information within the integrated health information system. In Iceland all cases are diagnosed by testing and test results are logged in the national health care database. In Estonia, the information must be provided either in the national e-health registry or in a certificate on paper. The current proof of infection accepted is a positive PCR or antigen test taken by a health-care worker or a diagnosis done by a doctor. In Portugal, previous infection is provided by the national mandatory disease notification system, which requires a positive laboratory test.

### Record of vaccination status in previously infected

Nine countries gave information on how the vaccination status is recorded for previously infected individuals. In Austria, Croatia, Germany, Portugal, and Slovenia they are recorded as individuals receiving a single dose of the vaccine. In Germany, status about previous infection is also recorded. In Norway they are also recorded as individuals receiving a single dose of the vaccine, however in the register, the healthcare practitioner administering the vaccine to individuals previously infected with COVID-19 can register/make a note in the journal that a second dose is contraindicated. In Ireland, Spain and in the Netherlands, previously infected individuals who receive one dose are recorded as an individual receiving both a single dose of the vaccine and the full course of the vaccine (e.g. two doses). In Estonia the vaccination status is recorded as completed or fully vaccinated with one dose.

**Table 9. Recommendations of COVID-19 vaccination in individuals previously infected with SARS-CoV-2 (n=25)**

COVID-19 vaccine recommendations for those previously infected	Countries
The full vaccine schedule is given	Belgium, Czechia, Denmark, Finland, Hungary, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Sweden
Only one dose of vaccine is recommended (for vaccines that have a two-dose schedule)	Austria, Croatia, Estonia, France, Germany, Ireland, the Netherlands, Norway, Portugal, Slovenia, Spain
No vaccination is recommended	Iceland



## Extraction of additional COVID-19 vaccine doses

As of May 2021, a total of 19 responding countries (Austria, Belgium, Czechia, Denmark, Estonia, France, Germany, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, and Spain) reported extracting additional doses from vaccine vials (e.g. a seventh dose from the six-dose vial of Comirnaty, 11th dose from the COVID-19 Vaccine Moderna). Four countries (Croatia, Finland, Slovenia, and Sweden) do not use additional doses from COVID-19 vaccine vials.

## Recommendations of specific COVID-19 vaccine products to any target group/age group

Twenty-one countries are recommending specific COVID-19 products to certain target and/or age groups. Three countries have suspended the use of certain COVID-19 vaccine products in their vaccination campaigns – in Denmark, the vaccines Vaxzevria and COVID-19 Vaccine Janssen are not used routinely (only in specific situations) and in Norway Vaxzevria is no longer used and COVID-19 Vaccine Janssen is not used routinely (only in specific situations). In Sweden, COVID-19 Vaccine Janssen is not being used in their vaccination campaign.

**Table 10. Details of country recommendations of specific COVID-19 vaccine products for specific age or target groups**

Country	Comirnaty	COVID-19 vaccine Moderna	Vaxzevria	COVID-19 Vaccine Janssen
Belgium			≥55 years	≥41 years
Bulgaria			Not to be used in women under 60 years with increased risk of thrombosis and/or history of thrombocytopenia.	
Denmark			Vaccine no longer used but can be given to people who want to take the vaccine after consultation with a doctor.	Vaccine not used but can be given to people who want to take the vaccine after consultation with a doctor.
Estonia			≥50 years.	No official age-limit recommendation, but recommended to use for vaccinating those people who have difficulty reaching a family doctor or a serious illness due to which they cannot go to a vaccination venue themselves or in a situation where one dose of vaccine is considered optimal (e.g. people moving to elderly care homes, risk group patients in hospitals etc).
Finland	Recommended primarily for 70+ years	Recommended primarily for 70+ years	≥50 years	
France			≥55 years	≥55 years
Germany			≥60 years	≥60 years
Greece			≥30 years	
Iceland			≥60 years, who do not have risk factors that increase the risk of thrombosis.	
Ireland	mRNA vaccines preferred for 70+ years	mRNA vaccines preferred for 70+ years	≥50-69 years; Not recommended for pregnant women	≥50-69 years; <50 years if two-dose vaccine not feasible; not recommended for pregnant women.
Italy			≥60 years	≥60 years

Country	Comirnaty	COVID-19 vaccine Moderna		Vaxzevria	COVID-19 Vaccine Janssen
Latvia				Not recommended for pregnant women.	Not recommended for pregnant women.
Luxembourg	mRNA vaccine for people under <30 years and pregnant women  For people aged 30-54 at risk for severe COVID-19, preference should be given to mRNA vaccines, if available.	mRNA vaccine for people under <30 years and pregnant women  For people aged 30-54 at risk for severe COVID-19, preference should be given to mRNA vaccines, if available.	≥55 years  Those between 30-54 years can register to be voluntarily vaccinated.	Those between 30-54 years can register to be voluntarily vaccinated. ≥55 years.	≥30 years
Malta				18-70 years	
The Netherlands				≥ 60 years	
Norway				Vaccine no longer used	Vaccine suspended for use*
Poland				69 years and under (born in 1952 and younger)	
Portugal				≥ 60 years	≥50 years
Romania				Not recommended in individuals who developed vein thrombosis after the Vaxzevria vaccine	
Spain				≥60 years	Recommended primarily for those > 50 years
Sweden				≥65 years	Janssen vaccine suspended.

\* An emergency stockpile of the Janssen vaccine is being built up, and the government has decided that the vaccine should be offered outside of the national vaccination programme to persons who meet relevant medical standards and who have had a consultation with a physician prior to vaccination.

Note: Information about recommendations gathered from ISAA responses, ECDC technical report on the overview of country recommendations on COVID-19 vaccination with Vaxzevria [19] and official public health authority websites.

## Changes in vaccination strategy due to the circulation of new variants of concern

The introduction and increased spread of new SARS-CoV-2 variants of concern including Alpha (B.1.1.7 and B.1.1.7+E484K first identified in the United Kingdom), Beta (B.1.351 first identified in South Africa), Gamma (P.1 first identified in Brazil) and Delta (B.1.617.2 first identified in India) has raised concerns of increased transmissibility, possibly of more severe disease and possible immune/vaccine escape. Such an increased transmissibility is likely to lead to an increased number of infections, which leads to higher hospitalisation and death rates across all age groups, but particularly for those in older age groups or with co-morbidities [20].

Nineteen responding EU/EEA countries (Belgium, Croatia, Czechia, Denmark, Estonia, Finland, France, Iceland, Ireland, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden) made no changes to the public health objective of the vaccination campaign in light of the circulation of new variants of concern. Austria, Germany, Malta, Norway reported changes made to the health objective of the vaccination campaigns in relation to the new variants of concern.

- Austria reported that, due to a high circulation of B.1.351 in the Tyrolian district of Schwaz, the Austrian government in collaboration with the EU and BioNTech/Pfizer agreed to provide an additional 100 000

- Comirnaty doses to this area. All inhabitants aged 16 years and older were eligible to be vaccinated and almost 50 000 inhabitants have been vaccinated.
- In Germany, the Coronavirus Vaccination Ordinance of March 10, 2021 (CoronaImpfV) introduced the possibility of deviating from the order of eligibility specified, in order to prevent dynamic spread of SARS-CoV-2 from highly contaminated border regions and in or from high-incidence areas in Germany.
  - Malta reported that different cohorts are being called for vaccination in parallel to the priority groups due to new variants of concern.
  - Norway reported that on 9 March 2021, the National Institute of Public Health (NIPH) announced that more vaccine doses will be distributed to 24 municipalities that have had high incidence over time.
  - France commented that there has not been a change in strategy, but that additional doses were sent to regions most exposed to the virus circulation.

**Table 11. Changes in COVID-19 vaccination strategy due to the circulation of new variants of concern (n=23)**

Change in COVID-19 vaccination strategy due to the circulation of new variants of concern	Countries
Yes	Austria, Germany, Malta, Norway
No	Belgium, Croatia, Czechia, Denmark, Estonia, Finland, France, Iceland, Ireland, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden

## Eligibility for vaccination of individuals/target groups who live outside of the country

Fifteen responding countries answered that they do offer vaccination to certain individuals/ target groups who live outside of the country (e.g. transnational workers, with certain criteria such as working in LTCF, health facilities, or essential workers).

**Table 13. Eligibility for vaccination of people living out of the country (n=22)**

Eligibility for vaccination of people living out of the country	Countries
Yes	Austria, Belgium, Czechia, Denmark, Estonia, France, Finland, Germany, Luxembourg, Malta, the Netherlands, Norway, Romania, Slovenia, Sweden
No	Croatia, Estonia, Latvia, Lithuania, Poland, Spain
Under discussion	Hungary

Some countries provided further details about the specific population living outside the country who will be offered vaccination:

- Austria: commuters are eligible for vaccination.
- Belgium: vaccination will be possible in Belgium for Belgian nationals living abroad, particularly for those living in a country where non EMA-approved vaccines are being used or those who have no access to COVID-19 vaccines (as per priority groups).
- In Estonia, COVID-19 vaccination is offered to all either living, studying, or working in Estonia. Estonian residents or diplomats living abroad are also offered vaccination, as well as those on missions.
- Germany: Healthcare workers who are temporary residents.
- The Netherlands: transnational workers.
- Norway: Healthcare workers who are temporary residents.
- Slovenia: Slovenian diplomats.

## Eligibility for vaccination of citizens from other EU countries

All responding countries answered that vaccination will be accessible to any European citizens in the country, but there may be certain conditions.

**Table 14. Eligibility for vaccination of citizens from other EU countries (n=25)**

Citizens from other EU countries can be vaccinated in your country	Countries
Yes	Austria, Denmark, Hungary, France, Iceland
If they are long-term residents	Bulgaria, Croatia, Denmark, Estonia, Finland, Ireland, Lithuania, Malta, the Netherlands, Norway, Spain,
If they are long-term residents or if they are in the national social security/health insurance scheme (e.g. through work)	Belgium, Czechia, Germany, Latvia, Luxembourg, Poland, Portugal, Romania, Slovenia, Sweden

## Planned vaccination of adolescents aged 12-18 years

Six countries (Austria, Czechia, Germany, Latvia, Malta, Poland) are planning to expand vaccination to all adolescents if the vaccines are authorized by EMA for that age group (this question was asked before EMA approved Comirnaty for children aged 12 to 15 years in EU [14]). Spain indicated that they do plan on expanding vaccination to adolescents, but only to those with risk factors at the moment. In the Netherlands, the topic is under discussion for adolescents with risk factors.

**Table 15. Planned vaccination of adolescents aged 12-18 years (n=20)**

Planned vaccination of adolescents aged 12-18 years	Countries
Yes, for all adolescents	Austria, Czechia, Germany, Latvia*, Malta, Poland
Yes, but only for children with risk factors	Spain
No	Iceland
Under discussion	Belgium, Croatia, Denmark, Estonia, Finland, Lithuania, Luxembourg, the Netherlands, Norway, Portugal, Romania, Slovenia, Sweden

\* Vaccination for adolescents aged 12-18 has started as of 2 June

## Planned vaccination of children under the age of 12 years

In 14 countries, the vaccination of individuals under the age of 12 years is currently under discussion and decisions will be made at a later time if the EMA authorises any COVID-19 vaccines for that age group. Austria and Czechia reported that they do plan to expand vaccination to all children. The Netherlands and Spain are only planning to expand vaccination for children with risk factors. Germany does not plan to expand vaccination to children. Estonia reported that this is not under discussion until there is a vaccine which is suitable for under 12-year-olds according to the specific product characteristics.

**Table 16. Vaccination of children under the age of 12 years (n=19)**

Vaccination of children under the age of 12 years	Countries
Yes, for all children	Austria, Czechia
Yes, but only for children with risk factors	The Netherlands*, Spain
No	Germany
Under discussion	Belgium, Croatia, Denmark, Finland, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, Romania, Slovenia, Sweden

\*under discussion

## COVID-19 vaccination certificates

Twenty two countries (Austria, Belgium, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden) answered that their country is planning to issue official vaccination certificates. In Latvia official vaccination certificates have been introduced as of 1 June 2021. The use of vaccination certificates is currently under discussion in nine countries (Belgium, Germany, Finland, France, the Netherlands, Norway, Portugal, Slovenia, Spain).

Nineteen countries (Austria, Croatia, Czechia, Denmark, Estonia, Finland, Germany, Greece, Iceland, France, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Slovenia, Sweden) indicated that the certificate is planned for medical use and for secondary use such as travel.

- Several countries provided additional information: in Finland, the certificates are primarily to be used for travelling according to the EU Digital COVID Certificate. Possible use for other purposes is under discussion. Finland does not currently exempt travellers with vaccination certificate from testing and quarantine measures upon arrival.
- France has been discussing the Commission's proposition of the EU Digital COVID Certificate. Possible use at national level is still under discussion.
- In Germany, digital vaccination certificates are under discussion.
- In Ireland, ongoing consideration is given to the possible use of vaccination certificates based on scientific evidence. Ireland is engaging at EU level to ensure alignment across Member States in preparing for the reopening of international travel for non-essential purposes, as soon as it is safe to do so.
- Lithuania changed its legislation: if an individual meets at least one of the following criteria (vaccinated, recovered, and tested with PCR or RAT during 24-hour period), the individual has a right to reduced non-pharmaceutical interventions (implementation May 24).
- The Netherlands is currently developing vaccination certificates. The future use and conditions of the certificates are still under discussion.
- Romania has already started issuing official vaccination certificates and uses them for medical purpose only.
- In Norway, on May 5, a simplified version of the certificate was launched, where you can currently see vaccination status and negative test results. The solution for the COVID-19 vaccination certificate will be developed step by step. What the certificate can be used for has not yet been clarified, neither nationally nor with a view to entry and quarantine on arrival in Norway from abroad. The government will decide how the certificate will be used in the reopening of society in the future.

## Vaccine acceptance and hesitancy

### *Percentage of the population, on average, refusing vaccination*

For the fourteen countries that responded to the question on the percentage of the population on average that is refusing vaccination, six countries responded that this information was not available (Belgium, Croatia, France, Germany, Lithuania, Poland). Seven countries provided information on vaccine acceptance in the population:

- In Czechia the percentage of the population, on average, who is refusing vaccination, is approximately 40%.
- Latvia reported that according to polls up to 35% of the population are refusing vaccination. They have observed a lower number of refusals in the elderly population. The refusal rate in the age group 50-74 years is 18-26% compared to the refusal rate in the 15-49 years which is 35-38%.
- In Spain it is estimated that 5-10% (depending on the age group and higher in the population group vaccinated with Vaxzevria) of the population is refusing vaccination.
- Denmark reported on average refusal of 5-10%.
- In Finland 8-15 % (estimate based on a population survey) - younger age groups seem to be more critical towards vaccinations than older age groups – based on a population survey 15-21% of those under 30 years old would hesitate to be vaccinated.
- Slovenia: According to results of a panel online survey on the impact of the pandemic on life (SI-PANDA), approximately one third of respondents refuse vaccination against COVID-19.
- Austria reported that market research carried out in December 2020 and again in April 2021 suggests that the strong anti-vaccine sentiment has decreased in the course of the vaccination campaign – in December 2020, 14.2 % of respondents opposed the vaccine altogether, while in April 2021 only 6.2% of respondents reported strong opposition to vaccination. Looking at all groups of society the groups of 'strong vaccination opponent', 'concerned vaccination critic', 'sceptic in need of further information' have all decreased between December 2020 and the present (spring 2021), with the groups 'optimistic pragmatic willing to get a jab' and 'dedicated vaccine enthusiasts' steadily gaining ground. There are no exact figures on the percentage of the different groups who are refusing COVID-19 vaccination, but the above-mentioned market research characterises members of the group of 'strong vaccination opponents' as follows: on average 40 years, male to female ratio 48:52, low level of formal education, based primarily in rural settings (13% in cities), and politically conservative.

- In Sweden, about 3% of people having received one dose reported hesitancy towards completing the vaccination with a second dose. There is still a great willingness to get vaccinated. The results of the latest survey, which was answered between April 26 and May 5, show that the willingness to vaccinate among adults in Sweden remains high: almost nine out of 10 people replied that they will surely (70 percent) or probably (18 percent) accept an offer of vaccination against COVID-19. Of the participants in the survey vaccinated with a dose of vaccine, 97 percent said they would be completely sure to get vaccinated at dose two, and three percent said they were hesitant to take the second dose.

### **Vaccine hesitancy in any specific population or age group and for any specific vaccines in particular**

Eleven countries (Austria, Croatia, Czechia, Estonia, Iceland, Latvia, Lithuania, Malta, the Netherlands, Romania, Slovenia, Spain) reported to have observed an increase in vaccine hesitancy in specific population or age groups or for any specific vaccines.

Austria indicated that they see an increase of hesitancy towards the Vaxzevria vaccine, but that this is not related to a specific population or age group. They reported that in general a shift in public opinion since the start of the campaign can be noted in the older as well as the younger population – from a situation where COVID-19 vaccines were regarded primarily with scepticism in the early days of the vaccination campaign (December 2020/January 2021) to a situation of better acceptance of vaccination in general and a more diverse mix of publicised problem factors: from (perceived and/or real) slow progress in the rollout of the campaign to individual discontent with one's own prioritisation in it ('When will I get my jab?' 'Why can't I choose which vaccine I get?') to distrust in regard to the equality of the various vaccines used.

In Estonia, they see vaccine hesitancy in specific regions and population groups. There is more hesitancy toward Vaxzevria vaccine, and most people would prefer another vaccine. In addition, they see that getting those 80 years old and above to vaccinate is more difficult than in the 70-79 age-group.

Lithuania reported that during periodic meetings with vaccination coordinators the authorities have been informed that the population does not want to be vaccinated with Vaxzevria vaccine, and they also see this trend of hesitancy of Vaxzevria by monitoring unused vaccine doses.

Latvia reported that in general vaccine hesitancy is decreasing – more people are willing to be vaccinated. However, although the attitude towards the mRNA vaccine has improved since April, acceptance for Vaxzevria has dramatically decreased, with only 5% of the population choosing this vaccine.

Croatia, Iceland, Malta, the Netherlands, Romania, Slovenia, and Spain also indicated that generally there is some hesitancy towards Vaxzevria.

Slovenia also reported that younger age groups are less interested in vaccination than older age groups.

Czechia do not observe a major increase in vaccine hesitancy for a specific vaccine, but see that hesitancy persists mainly among younger adults.

In Finland, vaccine acceptance overall has increased since spring 2020. There was a slight drop in acceptance in December 2020, just before the EMA vaccine authorisation, but acceptance has increased after that and is now higher than before.

## **Current challenges and good practices with vaccine rollout**

The majority of countries that responded (14/23, 61%) to questions about challenges with the rollout reported that limited vaccine supply is the main issue they are facing (Table 17). Nine countries (Denmark, Croatia, France, Hungary, Latvia, Malta, Norway, Portugal, and Romania) reported that they are not facing challenges with vaccine supply.

Due to challenges with vaccine supply, eight countries have needed to make adaptations to priority groups (Austria, Estonia, Finland, Lithuania, Poland, Portugal, Spain, and Sweden) and eight countries have responded that the limited vaccine supply has led to suspensions, delays, or adjustments to timelines of the vaccination campaign in different regions (Belgium, Estonia, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, and Sweden).

The other main challenges mentioned by countries include aspects around the communication and uptake of vaccines, especially around communication with different population groups, and scheduling appointments to ensure vaccination time slots are filled, with back-up plans for those who don't turn up.

**Table 17. Current challenges countries are facing with the rollout of COVID-19 vaccines (n=23)**

Challenge	EU Member States
<b>Vaccine supply</b>	
Limited vaccine supply	Austria, Belgium, Czechia, Estonia, Germany, Finland, Iceland, Ireland, Lithuania, Luxembourg, the Netherlands, Poland, Spain, Sweden
<b>Equipment</b>	
Shortages of equipment needed for vaccination, such as syringes, including shortage of low dead-end space syringes/needles	Hungary, Malta
<b>Communication and uptake of vaccines</b>	
Communication with different population groups	Austria, Estonia, Germany, Hungary, Latvia, Lithuania, the Netherlands, Sweden
Communicating about prioritisation of population groups and the rationale behind the choices	Austria, the Netherlands, Poland, Slovenia
Communicating adaptations made to vaccination strategies	Lithuania, the Netherlands, Spain
Vaccine acceptance among those groups eligible for vaccination	Belgium, Estonia, Hungary, Latvia, Lithuania, Slovenia
<b>Scheduling vaccination appointments</b>	
Identifying and contacting target groups for vaccination	Austria, Portugal
Lack of capacity to ensure vaccination time slots are filled and back up plans for those that don't turn up	Austria, Slovenia
<b>Logistics and infrastructure</b>	
Optimal management of stock and avoiding expiration and wastage of doses	France, Germany, Lithuania, Slovenia, Sweden
Shipping and trans-shipment (e.g. from distribution hubs to vaccination delivery sites, such as vaccination centres)	
Managing vaccines with different requirements (regarding adapting logistics, storage and/or administration)	Poland
<b>Workforce</b>	
Necessity to train additional staff such as GPs and pharmacists	Poland
<b>Vaccination delivery sites</b>	
Access to vaccination of vulnerable population groups	Latvia
Reaching hard to reach population (such as in rural areas)	Hungary, Latvia
<b>Systems to monitor vaccinations</b>	
Data from all vaccination centres do not reach the authorities within the agreed timeframe	Latvia, Poland
Incomplete reporting, but distributed at random in the national territory	Latvia
Incomplete data for some specific population groups	Austria

\* information gathered from ISAA reports on 3 May 2021, 10 May 2021, 17 May 2021, 31 May 2021



Some countries provided further details on the challenges above:

- Three countries mentioned that they are vaccinating outside of target groups to avoid wasting of doses (France, Lithuania, Slovenia).
- In Belgium, regarding data quality in the vaccination systems, there can be missing data on key variables such as vaccine product, dose number, or date of dose administered. When data are missing on vaccine dose number, this needs to be calculated based on date of administration, which in case of incomplete reporting can lead to errors. There can also be errors in lot number that requires manual reporting. Belgium also mentioned that it can be challenging to identify individuals at risk, but that most of these issues have been resolved. Regarding adequate workforce supply, in Belgium this has been a point of attention during the whole vaccination campaign, and strategies have been put in place to ensure that sufficient workers will be recruited for the next months.
- In Spain, regarding systems to monitor vaccinations, they have faced issues with debugging the data in real time due to the large number of daily registrations. They also mentioned that it can be more difficult to reach and vaccinate those dependents with severe disabilities.
- In Hungary, the proportion of those registering for vaccination is not the same in the different priority groups.
- Latvia reported challenges around second dose planning, which include vaccinees who aren't able to visit the same site and/or reserved time slot and want to be rebooked.
- Germany responded that there are different booking systems available in parallel which poses a challenge with scheduling appointments. They also mentioned that they are facing challenges with communicating with different population groups, in particular with immigrant communities.
- In Sweden, a new report from the Public Health Agency shows that vaccination rates vary depending on a person's country of birth. This applies to people vaccinated during phase one and the groups currently being vaccinated.
- Norway also reported some challenges with communicating with older age groups and with certain migrant populations. In addition, Norway mentioned that the large quantities of vaccines being delivered during summer while a lot of the workforce will be on vacation and with the general public being more mobile during these summer months may pose a potential challenge.
- Spain reported that they face specific challenges with improving communication with the population and healthcare workers and with catch-up of people who initially refused vaccination.
- Countries also reported people refusing vaccination with Vaxzevria (Slovenia, Latvia).
- In Austria, challenges in increasing uptake in the priority groups of elderly and/or healthcare workers are mainly in the areas of logistics and/or misinformation. Elderly members of the community are particularly challenged by the method chosen for the vaccination rollout (online pre-registration in order to be assigned a vaccination date – pre-registration can also be done via phone; however, call centre capacities are an issue). Healthcare workers in general seem most concerned with the type of vaccine they are assigned (doubts about the safety of the Vaxzevria), particularly following extended negative media coverage about this vaccine.

## Lessons learned and good practices to mitigate challenges

### Logistics and workforce

- In Latvia, mass vaccination centres of different sizes are operating, including during holidays. The system of waiting lists has also been optimised to avoid the wastage of doses.
- In Austria, vaccination sites are encouraged via various channels to avoid vaccine wastage at all costs, preferably by vaccinating those on the official COVID-19 vaccination prioritisation list as defined by the Austrian NITAG. However, if unable to do so, all those eligible for vaccination may be called in for last-minute spots to avoid vaccine wastage. If, despite all efforts, vaccines are discarded, this must be documented separately, by calendar week, and reported upon request.
- Belgium responded that in addition to invitations sent for vaccination, reserve lists are also created to complete the daily schedules to avoid the wastage of doses from those that do not turn up for their appointments. Belgium also reported that vaccination centres were established following the forecasts (around 200 vaccination centres throughout the territory were estimated based on vaccination needs).
- In Hungary, general practitioners are also involved in mass vaccination. Their additional time on weekends and holidays is reimbursed; additional working hours of hospital staff are also reimbursed.
- Spain has ensured that there is wide coordination and communication between key actors involved.

### Communication and uptake of vaccines

- France have put in place strategies to effectively communicate about COVID-19, such as using a pedagogical approach to communication.
- The Norwegian Institute of Public Health maps the population's attitudes and knowledge around COVID-19 vaccination every fortnight. This, along with input from the vaccine counselling given to health personnel, has provided valuable input on which topics are important during the rollout of the vaccines.

The information campaigns that have been used on paid channels have been tested in focus groups among adults, young people, and those with Norwegian as a second language. Daily media monitoring of relevant topics has provided insight into areas and questions around vaccination. Throughout the program period, the strategy has been to be open and accessible, both about what the authorities know and do not know about COVID-19 vaccination. The authorities have also initiated communication campaigns that target different population groups. The goal is for everyone who is recommended vaccination to choose to get vaccinated.

- In Latvia, a vaccination campaign, '2 million reasons to be vaccinated', is ongoing. Latvia have also offered vaccination without prior booking in the mass vaccination centres for those aged over 60 years during the morning hours (9:00-10:00). In addition, they are using the contacts gathered from healthcare providers to proactively invite elderly citizens (cold calling) who were not registered for vaccination in any other way. They are also introducing exemptions from restrictions (gatherings, social distancing etc) for vaccinated individuals and more will be announced.
- In Spain, there are ongoing media campaigns and the dissemination of informational materials about COVID-19 vaccination. They are trying to improve communication to the population and healthcare workers as well as the catch-up of people who initially refused vaccination.
- In Slovenia, they are trying to mitigate the public distrust of the Vaxzevria vaccine by communicating with the public.
- In Austria, they are building trust with the elderly and healthcare workers using a range of individual trust-building measures, from the provision of tailor-made materials (leaflets, videos, social media content, etc.) to the tailoring of individual exchange and communication formats (such as online Q&A meetings) to the needs of individual groups. Within the Federal Ministry of Social Affairs, Health, Care and Consumer Protection a vaccination communication team was created specially to facilitate these exchanges. In addition, communication and engagement initiatives (such as video formats for social media, a focus on online channels, etc.) are being devised for the younger population groups. This focal point of stakeholder communication efforts will be rolled out in due course.

## Reaching under-served/socially vulnerable populations for vaccination

- In Estonia, the single dose COVID-19 Vaccine Janssen will firstly be provided for those people who have mobility difficulties or a serious illness that makes it challenging for them to reach a family doctor or a vaccination site. The COVID-19 Vaccine Janssen is also preferred for situations in which administering one dose is more reasonable such as risk groups in hospitals, those entering LTCFs, etc. In Eastern Estonia a 1+1 system was used, where an elderly (70 years or over) person was accompanied by a younger person, who also received a vaccination.
- In Spain, there is coordination between social services and non-governmental organisations to ensure that the most suitable vaccines for these populations, such as the single dose COVID-19 Vaccine Janssen, are acquired and used.
- Ireland is offering the single dose COVID-19 Vaccine Janssen for people that may find it difficult to access vaccination sites to receive a second dose.
- Latvia is also trying to use COVID-19 Vaccine Janssen as a single-dose vaccine in those that are under-served or socially vulnerable. In addition, Latvia are using mobile vaccination units to improve access in rural areas.
- Poland reported that they offer vaccinations at home and prioritisation with the scheduling of vaccination. Vaccinations can be organised by the following types of support facilities for people with disabilities: occupational therapy workshops and occupational activity centres, social integration centres and social integration clubs, rehabilitation and educational centres and special schools preparing for work, participants of the 'Rehabilitation 25 plus' program, sheltered housing.
- Romania uses mobile vaccination centres in order to reach those under-served/socially vulnerable populations.
- Norway reported that official information about COVID-19 vaccination is available in several languages, and communication initiatives are aimed at specific groups.
- In Austria, stakeholder communication measures are being rolled out on the basis of elaborate interdisciplinary needs assessments, with a strong focus on vulnerable groups (i.e. groups affected by language barriers or disabilities or groups less likely to be reached by the governmental information campaign or nationwide media outlets).
- Croatia have organised mobile teams for vaccination. All Croatian citizens have their own general practitioner, who will support the process of vaccination for people who belong to socially vulnerable populations. HIV-positive patients can be vaccinated in HIV clinics.
- Denmark is ensuring close collaboration with the municipalities and social workers.
- In the Netherlands, specific communication strategies are being used to target and serve vulnerable populations.

- In Slovenia, the vaccination of people with reduced mobility is provided in their homes. For residents in long-term care facilities and individuals in institutions, vaccination is organised at the institution where they reside.

## Limitations of the information collected in this report

The information presented in this report is not exhaustive. There were different response rates from countries to the vaccine questions collected via the ISAA report from week to week. Countries will continue to adapt strategies and plans as the rollout continues, and this report provides an overview of the progress at a particular time.

## Conclusions

The COVID-19 vaccine rollout continues to accelerate within EU/EEA countries. With the increase in vaccine supply, the weekly number of doses administered has also been increasing and as of 11 June 2021, over 283 million doses have been administered to adults aged 18 years and above in the EU/EEA. The cumulative vaccine uptake in the adult population (aged 18 years and older) has reached 51.2% for at least one vaccine dose and 26.8% for the full vaccination course in the EU/EEA (30 reporting countries). Ten countries had administered a full vaccination course to more than 80% of the population aged 80 years and above, and six countries had administered a full vaccination course to more than 80% in healthcare workers. As vaccination continues to progress, many countries have started to expand access to younger age groups, with some countries opening vaccination up to all.

Several countries are recommending specific COVID-19 vaccine products to different target groups/age groups, mostly based on changes to age groups recommended for Vaxzevria vaccine due to very rare side effects of thromboembolic events associated with thrombocytopenia following vaccination. Some countries have made changes to vaccination strategy based on the circulation of new variants of concern. Many countries have put in place policies to vaccinate as many people in the priority groups as possible, including extracting extra doses from vaccine vials and extending timing between doses. Eleven countries (11/25, 44%) are recommending only one dose of vaccine to those individuals who have been previously infected with SARS-CoV-2, but the timing for providing a dose following infection and the ascertainment of the previous infection continues to differ among countries. A more standardised approach across EU/EEA countries on the vaccination protocol in previously infected individuals, including the timing of vaccination after infection, should be considered.

Vaccine acceptance varies across countries, with some showing higher refusal of vaccines than others, most reporting higher hesitancy in younger age groups, and general hesitancy towards the Vaxzevria vaccine. However, some countries reported seeing a general increase in vaccine acceptance, with more people saying they are willing to be vaccinated now in comparison to the numbers reported at the start of the vaccination campaign.

To ensure a smooth scale-up of the vaccination deployment, it is important to understand what challenges countries are facing with the rollout. Majority of countries reported continued challenges with vaccine supply however compared to last month, more countries are reporting that they are no longer facing this issue. The other main challenges countries are facing are around the communication and uptake of vaccines. It is essential to maintain an efficient communication strategy, especially with a focus on messaging around safety and risk/benefit evaluation towards target groups and for the general population to ensure high vaccine uptake. It is important to monitor vaccine acceptance across the population and to have strategies in place to reach out to those individuals, groups and/or communities that are hesitant. It is also essential to reach those populations that are under-served/socially vulnerable, who may find it difficult to access vaccination sites. Measures shared by countries to reach vulnerable populations, such as using the single dose COVID-19 Vaccine Janssen for those that may find it difficult to access a second dose, coordination between social services and non-governmental organisations, using mobile vaccination units, and providing information in several languages and targeted communication initiatives based on specific needs assessments are ways to ensure that vulnerable populations are reached.

Ensuring the rapid and effective deployment of vaccines is critical to reduce hospitalisations, deaths, and viral circulation in the community, as well as to protect against emerging variants. As countries proceed to accelerate their vaccine rollout, they will continue to adjust their vaccination policies and strategies based on their current epidemiological situation, vaccine supply, scientific evidence about the virus, and vaccine performance.

## Contributing ECDC experts (in alphabetical order)

Karam Adel Ali, Silvia Funke, Nathalie Nicolay, Kate Olsson, Lucia Pastore Celentano, Giovanni Ravasi.

## Acknowledgements

Ingrid Keller, Virginia Arnecci, Danila Pietersz, Katherine Poole Lehnhoff and Annika Kramer from the European Commission Directorate-General for Health and Food Safety coordinated the sending of questions via the ISAA to Member State representatives and provided summary reports of the results. We would also like to thank the IPCR Member State representatives for responding to the ISAA report questions, the HSC Members for providing validation of the data included in the report.

## Disclaimer

All data published in this report are correct to the best of our knowledge at the time of publication.

## Annex

**Table 18. Overview of COVID-19 vaccines in use in EU/EEA countries and date of first administration (n=30)\***

Country	Comirnaty	Moderna	Vaxzevria	Janssen
Austria	27/12/2020	15/01/2021	08/02/2021	29/04/2021
Belgium	05/01/2021	18/01/2021	15/02/2021	week 17, 2021
Bulgaria	27/12/2020	week 2, 2021	week 5, 2021	week 19, 2021
Croatia	27/12/2020	13/01/2021	08/02/2021	26/04/2021
Cyprus	27/12/2020	19/01/2021	17/02/2021	week 17, 2021
Czechia	26-27/12/2020	14/01/2021	11/02/2021	16/04/2021
Denmark	27/12/2020	14/01/2021	09/02/2021 (no longer in use)	
Estonia	27/12/2020	week 2, 2021	week 7, 2021	week 17, 2021
Finland	27/12/2020	08/01/2021	10/02/2021	
France	27/12/2020	14/01/2021	06/02/2021	23/04/2021
Germany	26/12/2020	13/01/2021	08/02/2021	26/04/2021
Greece	27/12/2020	week 7, 2021	week 7, 2021	week 18, 2021
Hungary**	26/12/2020	week 2, 2021	week 5, 2021	week 18, 2021
Iceland	29/12/2020	13/01/2021	11/02/2021	week 17, 2021
Ireland	29/12/2020	16/01/2021	08/02/2021	05/05/2021
Italy	31/12/2020	week 2, 2021	week 6, 2021	week 16, 2021
Latvia	28/12/2021	13/01/2021	09/02/2021	27/04/2021
Liechtenstein	18/01/2021	missing	not in use	
Lithuania	27/12/2021	13/01/2021	09/02/2021	23/04/2021
Luxembourg	28/12/2020	week 3, 2021	week 6, 2021	15/04/2021
Malta	27/12/2020	04/02/2021	12/02/2021	06/05/2021
The Netherlands	06/01/2021	25/02/2021	week 6, 2021	21/04/2021
Norway	27/12/2020	15/01/2021	25/02/2021 (no longer in use)	
Poland	26-27/12/2020	12-20/01/2021	12/02/2021	15/04/2021
Portugal	27/12/2020	13/01/2021	08/02/2021	01/05/2021
Romania	27/12/2020	04/02/2021	15/02/2021	week 18, 2021
Slovakia***	26/12/2020	week 4, 2021	week 6, 2021	
Slovenia	27/12/2020	week 3, 2021	week 5, 2021	week 17, 2021
Spain	27/12/2020	14/01/2021	09/02/2021	22/04/2021
Sweden	27/12/2020	13/01/2021	week 6, 2021	not in use

\* Updates vaccines in use and date of first vaccine administration gathered from ISAA reports from 3 to 31 May 2021; missing data complemented with data reported by EU/EEA countries to TESSy (e.g. vaccine products and reporting week of first administration of doses for each product); updates received from HSC members on 7 June 2021. Dates of first administration presented as dates (dd/mm/yyyy) or epidemiological week depending on the source and format that the country used in the ISAA reports.

\*\* Hungary started using Sputnik V (Gamaleya) in week 5 2021 and BBIBP-CorV (Sinopharm) in week 7 2021.

\*\*\* Slovakia started using Sputnik V (Gamaleya) in week 23 2021.

# References

1. European Commission. Communication from the Commission to the European Parliament and the Council. A united front to beat COVID-19. 19 January 2021. EC: Brussels; 2021. Available at: [https://ec.europa.eu/info/sites/info/files/communication-united-frontbeat-covid-19\\_en.pdf](https://ec.europa.eu/info/sites/info/files/communication-united-frontbeat-covid-19_en.pdf)
2. European Centre for Disease Prevention and Control. Overview of COVID-19 vaccination strategies and vaccine deployment plans in the EU/EEA and the UK. 2 December 2020. ECDC: Stockholm; 2020. Available at: <https://www.ecdc.europa.eu/en/publications-data/overview-current-eu-eea-uk-plans-covid-19-vaccines>
3. European Centre for Disease Prevention and Control. Overview of the implementation of COVID-19 vaccination strategies and vaccine deployment plans in the EU/EEA. 1 February 2021. ECDC: Stockholm; 2021. Available at: <https://www.ecdc.europa.eu/en/publications-data/overview-implementation-covid-19-vaccination-strategies-and-vaccine-deployment>
4. European Centre for Disease Prevention and Control. Overview of the implementation of COVID-19 vaccination strategies and vaccine deployment plans in the EU/EEA – 29 March 2021. ECDC: Stockholm; 2021. Available at: <https://www.ecdc.europa.eu/sites/default/files/documents/Overview-implementation-COVID-19-vaccination-strategies-vaccine-deployment-plans.pdf>
5. European Centre for Disease Prevention and Control. Overview of the implementation of COVID-19 vaccination strategies and deployment plans in the EU/EEA – 6 May 2021. ECDC: Stockholm; 2021. Available at: <https://www.ecdc.europa.eu/en/publications-data/overview-implementation-covid-19-vaccination-strategies-and-vaccine-deployment>
6. European Council Council of the European Union. The Council's response to crises (IPCR). Available at: <https://www.consilium.europa.eu/en/policies/ipcr-response-to-crises/>
7. The Council of the European Union. COUNCIL IMPLEMENTING DECISION (EU) 2018/1993 of 11 December 2018 on the EU Integrated Political Crisis Response Arrangements. 11 December 2018. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018D1993&qid=1583154099617&from=EN>
8. European Centre for Disease Prevention and Control. The COVID-19 Vaccine Tracker 2021. Available at: <https://gap.ecdc.europa.eu/public/extensions/COVID-19/vaccine-tracker.html#uptake-tab>
9. European Centre for Disease Prevention and Control. COVID-19 Vaccine rollout overview, weekly report Available at: <https://www.ecdc.europa.eu/en/covid-19/vaccine-rollout-overview>
10. European Medicines Agency. COVID-19 vaccines: authorised 2021. Available at: <https://www.ema.europa.eu/en/human-regulatory/overview/public-health-threats/coronavirus-disease-covid-19/treatments-vaccines/vaccines-covid-19/covid-19-vaccines-authorized#authorised-covid-19-vaccines-section>
11. European Medicines Agency. EMA starts rolling review of Novavax's COVID-19 vaccine (NVX-CoV2373) 2021. Available at: <https://www.ema.europa.eu/en/news/ema-starts-rolling-review-novavaxs-covid-19-vaccine-nvx-cov2373>
12. European Medicines Agency. EMA starts rolling review of CureVac's COVID-19 vaccine (CVnCoV). 2021. Available at: <https://www.ema.europa.eu/en/news/ema-starts-rolling-review-curevacs-covid-19-vaccine-cvncov>
13. European Medicines Agency. EMA starts rolling review of the Sputnik V COVID-19 vaccine. 2021. Available at: <https://www.ema.europa.eu/en/news/ema-starts-rolling-review-sputnik-v-covid-19-vaccine>
14. European Medicines Agency. First COVID-19 vaccine approved for children aged 12 to 15 in EU. 2021. Available at: <https://www.ema.europa.eu/en/news/first-covid-19-vaccine-approved-children-aged-12-15-eu>
15. Angyal A, Stephanie L, Shona M, Rebecca P, Adam H, Tom T, et al. T-Cell and Antibody Responses to First BNT162b2 Vaccine Dose in Previously SARS-CoV-2-Infected and Infection-Naive UK Healthcare Workers: A Multicentre, Prospective, Observational Cohort Study. Preprints with The Lancet. 25 March 2021. Available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3812375](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3812375)
16. Krammer F, Srivastava K, Alshammary H, Amoako AA, Awawda MH, Beach KF, et al. Antibody Responses in Seropositive Persons after a Single Dose of SARS-CoV-2 mRNA Vaccine. New England Journal of Medicine. 2021;384(14):1372-4. Available at: <https://www.nejm.org/doi/full/10.1056/NEJMc2101667>
17. Reynolds CJ, Pade C, Gibbons JM, Butler DK, Otter AD, Menacho K, et al. Prior SARS-CoV-2 infection rescues B and T cell responses to variants after first vaccine dose. Science. 2021:eabh1282. Available at: <https://science.sciencemag.org/content/sci/early/2021/04/29/science.abh1282.full.pdf>
18. Gokhan T, Tara L, Maria K, Panagiota S, David B, Nayandeep K, et al. Profile of Humoral and Cellular Immune Responses to Single BNT162b2 or ChAdOx1 Vaccine in Residents and Staff Within Residential Care Homes (VIVALDI Study). Preprints with The Lancet. 4 May 2021. Available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3839453](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3839453)
19. European Centre for Disease Prevention and Control. Overview of EU/EEA country recommendations on COVID-19 vaccination with Vaxzevria, and a scoping review of evidence to guide decision-making. 18 May

2021. Stockholm: ECDC; 2021. Available at: <https://www.ecdc.europa.eu/en/publications-data/overview-eueea-country-recommendations-covid-19-vaccination-vaxzevria-and-scoping>
20. Funk T, Pharris A, Spiteri G, Bundle N, Melidou A, Carr M, et al. Characteristics of SARS-CoV-2 variants of concern B.1.1.7, B.1.351 or P.1: data from seven EU/EEA countries, weeks 38/2020 to 10/2021. *Eurosurveillance*. 2021;26(16):2100348. Available at: <https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2021.26.16.2100348>