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## SHORT COMMUNICATION

# National strategies for vaccination against COVID-19 in people living with HIV in Central and Eastern European region

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## Abstract

**Introduction:** People living with HIV (PLWH) are at higher risk of poorer COVID-19 outcomes. Vaccination is a safe and effective method of prevention against many infectious diseases, including COVID-19. Here we investigate the

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strategies for national COVID-19 vaccination programmes across central and eastern Europe and the inclusion of PLWH in vaccination programmes.

**Methods:** The Euroguidelines in Central and Eastern Europe Network Group consists of experts in the field of infectious diseases from 24 countries in the region. Between 1 November 2020 and 19 March 2021 the group proceeded an on-line survey consisting of 20 questions.

**Results:** Twenty-two countries (out of 24 invited) participated in the survey and 20/22 countries in the period between December 2020 and March 2021 had already started their COVID-19 vaccination programme. In total, seven different vaccines were used by participating countries. In 17/21 countries (81%), vaccinated persons were centralized within the national registry. In 8/21 countries (38%) PLWH were prioritized for vaccination (the Czech Republic, Greece, Hungary, Lithuania, Montenegro, Romania, Slovakia, Slovenia) and the Czech Republic, Greece and Serbia had put in place national guidelines for vaccination of PLWH. In 14/20 countries (70%) vaccination was only provided by designated centres. Eighteen respondents (18/21; 85.7%) reported that they planned to follow up HIV patients vaccinated against COVID-19, mainly by measuring antibody levels and checking COVID-19 incidence (11/21; 52.3%).

**Conclusions:** This survey-based study suggests that there are significant differences in terms of prioritizing PLWH, the types of vaccines used, vaccination coverage, and the development and implementation of a vaccination programmes within the region. Regardless of heterogeneity and existing barriers within the region, systematic vaccination in PLWH should have the highest priority, especially in those with severe immunodeficiency, risk factors, and in the elderly, aiming for prompt and high vaccination coverage.

**KEYWORDS**

COVID-19, HIV, vaccination

**INTRODUCTION**

As some studies suggest, people living with HIV (PLWH) are at higher risk of poorer COVID-19 outcomes, including a higher rate of hospitalization and increased mortality as compared with the general population [1–3]. In recent data published by the WHO Global Clinical Platform, there was a significantly higher risk of severe/critical presentation and mortality in individuals with risk factors such as diabetes and hypertension, and those aged > 65 years in a large cohort of hospitalized PLWH [4]. This finding is consistent with well-defined risk factors including severe immunodeficiency in the HIV-negative population [5–7]. Hoffmann et al. [8] found an association between a severe course of COVID-19 and higher mortality even in successfully treated PLWH without severe immunodeficiency and low nadir CD4.

Vaccination is an effective and safe method to prevent many infectious diseases (ID), including COVID-19. There is a consensus of national and international professional associations about the need for vaccinating PLWH against COVID-19 despite the fact that accurate data about efficacy and safety in this subpopulation are currently very limited [9–11]. Nor is there a clear recommendation for the preferred type of vaccines. In registrational trials of mRNA-based vaccines, PLWH were included, but they were not analysed separately [12,13]. Some small sample studies with vector COVID-19 vaccines show high immunogenicity among PLWH [9,10]. On the other hand, there is a safety concern about Ad5-based vaccines in Ad5-seropositive individuals [14]. Other vaccines for which PLWH were included in the study cohort are under development [15]. There is still a need for a clear consensus about the preferred vaccine,

vaccination scheme and timing of booster dose. A significant proportion of HIV centres in Europe have faced various problems and barriers during the COVID-19 era, e.g. shorter working hours, reduced staff, limitations of normal activities (blood tests, visits) and providing care for PLWH from other centres (or even foreign countries) who were not able to return to their place of residence [16]. In our survey-based study, we present the status of national programmes as of March 2021 for vaccination against COVID-19 in PLWH in the heterogenous region of central and eastern Europe.

## METHODS

The Euroguidelines in Central and Eastern Europe (ECEE) Network Group consists of professionals from 24 countries actively involved in HIV care. On 16 March 2021 we decided to review the readiness of member countries to start the process of vaccination against COVID-19 in PLWH. For this purpose, we proceeded with an online survey which consisted of 20 questions (see Appendix S1). Respondents were recruited from the ECEE members, based on their involvement in HIV care, and they were contacted via e-mail. Database closure was established on 19 March 2021.

## RESULTS

In total, 22 out of 24 country representatives (91.6% response rate) participated the survey, namely Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Greece, Hungary, Lithuania, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkey and Ukraine. All 22 respondents (100%) responded to all 20 questions. The majority of respondents (19/22; 86%) were ID specialists or HIV specialists directly involved in HIV care and working in HIV centres of different size (the number of patients in follow-up care was in the range 220–4777). Most centres (13/20; 65%) were in-patient clinics at ID departments and seven (25%) operated as outpatient HIV clinics.

### Vaccine availability

At the time of the survey, vaccination against COVID-19 had already started in all but two countries (Armenia, Bosnia and Herzegovina). The earliest start of vaccination was recorded in Russia, in November 2020. Twelve countries had started vaccinations in December 2020, three in January 2021, two in February and three in March 2021 (Table 1).

Availability and use of different vaccines vary among countries (Table 1). Vaxzevria vaccine (Oxford/Astra-Zeneca) was available in 15 countries (75%), Comirnaty (Pfizer/BioNTech) in 13 countries (65%), Anti-COVID-19 Moderna (Moderna/NIAID) in 11 countries (55%), Sputnik V (Gamaleya Research Institute of Epidemiology and Microbiology) in five countries (25%), Vero Cell (Sinofarm Life Sciences) in three countries (15%), EpiVacCorona (Vector State Research Center) in one country (5%) and Covishield (Serum Institute of India) in one country (5%). In all participating countries there was no specific recommendation/preference for use of particular vaccine(s) in PLWH. Vaccination practice was based on availability of vaccines in particular countries Table 2.

### HIV status prioritization and vaccination coverage

Upon database closure, 21 countries (Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Greece, Hungary, Lithuania, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkey and Ukraine) were planning or had already started COVID-19 vaccination, following a national strategy, which was promoted in the local media or on official websites. In 17/21 countries (81%) vaccinated persons were centralized within the national registry. All countries (21/21) identified different subgroups to be prioritized for vaccination but only in 8/21 countries (38%) were PLWH prioritized (Czech Republic, Greece, Hungary, Lithuania, Montenegro, Romania, Slovakia, Slovenia), and only three (14.2%) countries (Czech Republic, Greece, Serbia) had national guidelines for vaccination of PLWH. Some of those countries have prioritized all HIV-infected persons (e.g. Czech Republic, Poland), others have prioritized those with advanced HIV disease only (e.g. Slovakia). During the study period the official local recommendation for vaccination of PLWH did not change significantly across our region, but the process of implementation was ongoing and vaccination availability has mostly improved. In 13/21 (62%) countries vaccination of PLWH started before 19 March 2021 as part of their national programmes, including groups prioritized due to other risk factors. In these countries PLWH vaccination coverage (on 19 March 2021) varies widely, ranging from 1.1% to 23% for partial coverage (one dose) and from < 1% to 4.1% for full coverage (two doses).

### Mode of vaccination delivery/distribution

In 11/16 (68.7%) countries, vaccination of PLWH against COVID-19 is concentrated within specialized centres. In

TABLE 1 National COVID-19 vaccination programmes details

	Starting date	Comirnaty and Moderna	Sputnik-V	Vaxzevria	Other	Centralized registration programmeme	Dedicated centres as other persons
Albania	11 January 2021	Yes				Yes	Yes
Belarus	18 January 2021		Yes			No	Yes
Bosnia and Herzegovina	11 March 2021			Yes		No	
Bulgaria	27 December 2020	Yes		Yes		Yes	Yes
Croatia	27 December 2020			Yes		Yes	
Czech Republic	27 December 2020	Yes		Yes		Yes	Yes
Estonia	27 December 2020	Yes		Yes		Yes	Yes
Georgia	14 March 2021			Yes		Yes	
Greece	27 December 2020	Yes		Yes		Yes	Yes
Hungary	26 December 2020	Yes	Yes	Yes	Sinofarm Vero-Cell	Yes	Yes
Lithuania	27 December 2020	Yes		Yes		Yes	
Moldova	2 March 2021			Yes		Yes	
Montenegro	20 February 2021		Yes			No	
Poland	27 December 2020	Yes		Yes		Yes	Yes
Romania	27 December 2020	Yes		Yes		Yes	Yes
Russian Federation	1 November 2020		Yes		EpiVacKorona by 'Vector' Institute, Novosibirsk	Yes	Yes
Serbia	24 December 2020	Yes	Yes		Sinofarm Vero-Cell	Yes	Yes
Slovakia	26 December 2020	Yes		Yes		Yes	
Slovenia	27 December 2020	Yes		Yes		Yes	
Turkey	14 January 2021				Coronavac by Sinovac China	Yes	Yes
Ukraine	24 February 2021				Covishield, Serum Institute of India	Yes	Yes

one out of 16 countries (6.2%), the preferred scenario is a specialized centre or a department of infectious diseases, and in another one (6.2%) it is a specialized centre together with general medical services. A department of infectious diseases together with general medical services is the preferred model in three out of 16 (18.7%) countries, and in one country, vaccination is provided by general medical services only (6.2%).

Eighteen respondents (18/21; 85.7%) claimed they were planning to follow up the outcomes of vaccination, mostly by measuring antibody levels and checking COVID-19 incidence (11/21; 52.3%); in two countries this was to be done by measuring of antibodies only (2/21; 9.5%) and two other countries by checking COVID-19 incidence in vaccinated PLWH only (2/21; 9.5%).

## DISCUSSION

We found that only a few countries from central and eastern Europe specified PLWH as a prioritized group in a COVID-19 national vaccination programme. This reflects ambiguous data evaluating evidence for higher susceptibility and risk of severe course of COVID-19 in PLWH available at the time of data collection [11,17–20].

A recently published European Centre for Disease Prevention and Control (ECDC) report of COVID-19 vaccination strategies mainly discusses the prioritization of certain subgroups (people aged > 80, health and social care workers) and the types of vaccines used [21]. In contrast to the ECDC report, besides the mRNA and vector-based

TABLE 2 HIV status acknowledgement in the national COVID-19 vaccination programmes

	HIV-positive priority	National guidelines for HIV-positive COVID vaccination	Vaccinated HIV-positive patients in your practice	Plan to vaccinate at HIV centre	Do you plan to follow-up HIV-positive vaccinated?
Albania	No		Yes	No	Yes
Belarus	No		No	No	No
Bosnia and Herzegovina	No		No	Yes	Yes
Bulgaria	No		Yes	No	Yes
Croatia	No		No	Yes	Yes
Czech Republic	Yes	Yes	Yes	Yes	Yes
Estonia	No		Yes	Yes	No
Georgia	No		No	Yes	Yes
Greece	Yes	Yes	Yes	No	Yes
Hungary	Yes		Yes	Yes	Yes
Lithuania	Yes		Yes	Yes	Yes
Moldova	No		No	No	Yes
Montenegro	Yes		No	Yes	Yes
Poland	No		Yes	Yes	Yes
Romania	Yes		Yes	No	Yes
Russian Federation	No		Yes	Yes	Yes
Serbia	No	Yes	Yes	No	Yes
Slovakia	Yes		Yes	No	Yes
Slovenia	Yes		No	No	Yes
Turkey	No		No	Yes	No
Ukraine	No		No	Yes	Yes

vaccines we have recorded other vaccines which are not registered in the EU but are being used in a number of ECEE member countries.

During the COVID-19 era, only 30% of European countries continued operating their HIV centres in a normal way and the continuation of HIV care was limited or at least endangered, so the intention to prevent COVID-19 in risk groups of patients including PLWH should be emphasized [16,22]. As most of the ECEE member countries administer vaccination in designated medical centres, it is unlikely that HIV-positive patients will be identified and effective surveillance for such a specific group of patients will be provided, taking into account the high burden of stigmatization and social disclosure in the region. The responsibility of the post-vaccination follow-up in PLWH should be systematized, and the position of HIV centres during this process should be clearly defined. As provided by our respondents, such a plan is already in place, with the majority of clinics claiming to be prepared to play an active role in follow-up care focused on immune response and post-vaccination incidence of COVID-19.

There is a large discrepancy in terms of prioritization of population subgroups including PLWH. According to

our data, only eight out of 21 countries prioritize PLWH in COVID-19 vaccination and just three out of 21 have their own guidelines for vaccination of PLWH, while Armenia has not even begun any preparations whatsoever, due to economic and political reasons. Therefore partial/one-dose vaccination coverage at the end of our data collection (19 March 2021) varies extremely, ranging from 1.1% (in the Czech Republic) to 23% (in Hungary). In comparison with the general population, vaccination coverage data are heterogeneous. In the same period, partial vaccination coverage in the HIV-negative population ranges from 4.7% (in Poland) to 15.6% (in Hungary) and full coverage/two doses from 3.6% (in the Czech Republic) to 4.8% (in Hungary) [23–26]. It is questionable whether PLWH should be vaccinated at HIV centres instead of designated vaccination centres in order to ensure better access to vaccines and secure confidentiality. It is therefore very important to re-evaluate national vaccination strategies to establish a consensus across European countries to ensure equity of access to COVID-19 prevention.

Based on lack of relevant data on efficacy and safety, real-life data become essential in making progress towards better vaccination practice for COVID-19. Therefore

regional systematic collaboration, e.g. registry, clinical trials, guidelines and long-term follow-up of vaccinated persons, is the way forward to collecting enough data (and not just data on safety and efficacy of vaccines) within a relatively short period of time.

There is a need for more extensive data on efficacy and safety of COVID vaccines in PLWH, originating from large cohorts including people of different age, current immunostatus, nadir CD4 and comorbidities. Based on accurate data on post-vaccination protection, appropriate timing of a booster dose should be identified and included in updated guidelines. Nevertheless, clinicians should use all existing tools to highlight the importance of vaccination in PLWH and aim for the highest vaccination coverage to prevent COVID-19-related morbidity, mortality and sequelae.

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## AUTHOR CONTRIBUTIONS


DJ, ASK, LF, and JK has contributed study design, statistics, preparing the text. DB, SA, TB, JB, AC, GD, DG, AH, KK, BL, RM, VM, CO, AP, NR, JT, LT, LS, AV, NY, and OY has contributed collection of data, approving the text.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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