



**Health  
Information  
and Quality  
Authority**

An tÚdarás Um Fhaisnéis  
agus Cáilíocht Sláinte

# **Public health measures and strategies to limit the spread of COVID-19: an international review**

## **Antigen testing in asymptomatic individuals in community settings**

Submitted to NPHE: 10 February 2021

Published: 24 February 2021

## Version history

Version	Date	Specific updates
V1.0	24 November 2020	Provided to the National Public Health Emergency Team (NPHE) for information.
V2.0	1 December 2020	<p>Updated and provided to NPHE for information.</p> <ul style="list-style-type: none"> <li>▪ Included an additional table (Table 1) to summarise the recent changes in current public health measures.</li> <li>▪ Updated the epidemiological data to the latest available data from the European Centre for Disease Prevention and Control (ECDC).</li> <li>▪ Included information on the proposed plans for mass testing in Austria.</li> </ul>
V3.0	8 December 2020	<p>Updated and provided to NPHE for information.</p> <ul style="list-style-type: none"> <li>▪ Updated the epidemiological data to the latest available data from the European Centre for Disease Prevention and Control (ECDC).</li> </ul>
V4.0	15 December 2020	<p>Updated and provided to NPHE for information.</p> <ul style="list-style-type: none"> <li>▪ Updated the epidemiological data to the latest available data from the European Centre for Disease Prevention and Control (ECDC).</li> </ul>
V5.0	23 December 2020	Reduced version of report created with updated public health measures on education only.
V6.0	06 January 2021	<ul style="list-style-type: none"> <li>▪ Included information on the current epidemiological situation in each country.</li> <li>▪ Updated the education public health measures only.</li> </ul>

V7.0	3 February 2021	<ul style="list-style-type: none"><li>▪ Included updated information on antigen testing in asymptomatic individuals in community settings only.</li></ul>
V8.0	10 February 2021	<ul style="list-style-type: none"><li>▪ Included information on the current epidemiological situation in each country.</li><li>▪ Included updated information on antigen testing in asymptomatic individuals in community settings only.</li></ul>

## About the Health Information and Quality Authority

The Health Information and Quality Authority (HIQA) is an independent statutory authority established to promote safety and quality in the provision of health and social care services for the benefit of the health and welfare of the public.

HIQA's mandate to date extends across a wide range of public, private and voluntary sector services. Reporting to the Minister for Health and engaging with the Minister for Children, Equality, Disability, Integration and Youth, HIQA has responsibility for the following:

- **Setting standards for health and social care services** — Developing person-centred standards and guidance, based on evidence and international best practice, for health and social care services in Ireland.
- **Regulating social care services** — The Chief Inspector within HIQA is responsible for registering and inspecting residential services for older people and people with a disability, and children's special care units.
- **Regulating health services** — Regulating medical exposure to ionising radiation.
- **Monitoring services** — Monitoring the safety and quality of health services and children's social services, and investigating as necessary serious concerns about the health and welfare of people who use these services.
- **Health technology assessment** — Evaluating the clinical and cost-effectiveness of health programmes, policies, medicines, medical equipment, diagnostic and surgical techniques, health promotion and protection activities, and providing advice to enable the best use of resources and the best outcomes for people who use our health service.
- **Health information** — Advising on the efficient and secure collection and sharing of health information, setting standards, evaluating information resources and publishing information on the delivery and performance of Ireland's health and social care services.
- **National Care Experience Programme** — Carrying out national service-user experience surveys across a range of health services, in conjunction with the Department of Health and the HSE.

## Contents

Version history.....	2
About the Health Information and Quality Authority .....	4
Key points .....	6
1 Background .....	8
2 Methods .....	8
3 Findings .....	10
3.1 Summary epidemiological data .....	10
3.2 Antigen testing in asymptomatic individuals in community settings .....	14
4 Discussion .....	24
References .....	29
Appendix .....	34

## Key points

- As of 8 February, the 14-day incidence rate of new cases in Ireland stood at 313.4 per 100,000 population. Of the 21 included countries, the rate was highest in Portugal (1,224.0), Czechia (909.5), and Spain (846.3).
- Thirteen of 21 countries had seen a decrease in the number of new COVID-19 cases recorded over the previous seven days, nine of which had been in excess of a 10% decrease including Ireland (17.6%).
- For week four in January, weekly testing (RT-PCR and antigen tests) per 100,000 population ranged from 741.6 in Poland to 13,409.2 in Denmark, with Ireland's rate at 2,794.8 per 100,000.
- In a number of countries, the weekly positivity rate (RT-PCR and antigen tests) was trending downwards with the following exceptions: Austria, Finland, Greece, Malta, the Netherlands, Portugal and Slovakia.
- Antigen testing of asymptomatic individuals in community settings was reported in 22 of the 24 jurisdictions reviewed with the exception of Malta and Northern Ireland.
- Use of antigen testing varied considerably and ranged from little or no use in some countries to include population-wide screening (Austria, Czechia and Slovakia), infection control and outbreak management in either general settings and or specific settings in all but five jurisdictions (England, Finland, Greece, Malta and Northern Ireland), and testing contacts after identification (Austria, Denmark, France, Germany, Ireland, Italy, Portugal, Spain, Wales and Switzerland).
- There was also considerable variation between the specific criteria for considering antigen testing and the applicable settings. Germany, Ireland, Italy and Portugal (only for screening in education settings) limited the use of antigen testing to situations where there was a high test positivity rate (e.g.,  $\geq 10\%$ ) or the 7- or 14-day incidence exceeded a stated threshold for that setting.
- The use of antigen testing for screening was reported in 18 countries although the recommended frequency of screening was only specified in six countries.
- Testing for infection control or outbreak management purposes in specific settings was reported in 12 of the 24 countries. For eight countries, care facilities were included, although these were specifically excluded in Belgium, with schools specified in five countries.
- Antigen tests are generally less sensitive than RT-PCR for detecting SARS-CoV-2, and their clinical performance largely depends on the circumstances in which they are used, performing best when viral load is highest.
- Although not systematically searched for, there appears to be currently limited evidence on the effectiveness of antigen screening to reduce the

spread of COVID-19. The findings from three studies reporting on the effectiveness of mass population screening in Slovakia suggest that the role of population screening using antigen tests remains uncertain.

- HIQA's rapid health technology assessment of alternatives to laboratory-based real-time RT-PCR published in October 2020 advises the following issues should be considered regarding the expansion of test capacity: identification of the goal of testing in a given setting, selection of the most appropriate technology, taking into account the necessary resources to establish testing in this setting, and investigation of available CE-marked devices, with consideration to key device characteristics.
- While many countries have identified a role for antigen testing for asymptomatic individuals in community settings, the actual extent to which it is used in asymptomatic individuals is difficult to ascertain. There is variation in the criteria for testing, test specimens, test characteristics, the requirements for confirmatory molecular testing and in the settings or circumstances in which the tests may be used. These factors have implications for the diagnostic test accuracy and the effectiveness of the antigen testing to inform infection prevention and control measures and prevent transmission.

## 1 Background

Since the onset of the coronavirus disease 2019 (COVID-19) pandemic in early 2020, governments across the globe have applied restrictive public health policy measures, or non-pharmaceutical interventions, at various stages, and with different levels of intensity, to reduce or slow down transmission of the virus.

National testing strategies have been developed to identify cases of COVID-19 in symptomatic individuals and expanded over the course of the pandemic to identify and isolate asymptomatic cases through preventive screening programmes. Mass testing programmes have also been implemented to rapidly identify and isolate cases in high-risk areas, for example, as well as across populations. To further interrupt chains of transmission, governments, either at a national or local level, have been tracing contacts of confirmed cases to isolate potentially infected individuals in the community. In some situations, enhanced contact tracing measures have been deployed to identify the index case, as well as any close contacts. Governments have also relied on technology as a means to either identify close contacts of a confirmed case, or to support traditional contact tracing efforts.

The Health Information and Quality Authority's (HIQA's) Health Technology Assessment (HTA) Team has been requested to review the public health measures and strategies that are being used internationally to limit the spread of COVID-19.

## 2 Methods

A detailed summary of the methods used for this review is provided in the protocol: *Public health measures and strategies to limit the spread of COVID-19: an international review*, available on [www.hiqa.ie](http://www.hiqa.ie). Briefly, the review focuses on the national response to COVID-19 in 17 countries that were experiencing a resurgence in COVID-19 cases in October 2020 and which were identified by NPHET as being in a similar phase of pandemic response as Ireland. The countries comprise 12 EU/EEA countries (Austria, Belgium, Czechia, Denmark, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Sweden), the UK (England, Northern Ireland, Scotland and Wales), and Switzerland. For the purposes of this update, the national response to COVID-19 in Finland, Greece, Hungary, Malta, Norway, Poland and Slovakia was also included.

A number of key epidemiological parameters are extracted as part of the review for the purposes of describing the current epidemiological situation in each country. As the European Centre for Disease Prevention and Control (ECDC) has moved to a weekly reporting of COVID-19 data, up-to-date information on the epidemiological



situation in each country was directly sourced from *Our World in Data*,<sup>(1)</sup> which is produced by the Oxford Martin School at the University of Oxford and the Global Change Data Lab (A UK-based charity in the education sector). Since the data for the UK are aggregated, a breakdown of the epidemiological data by country is not provided. The epidemiological parameters include the:

- daily number of new cases
- 14-day notification rate of newly reported COVID-19 cases per 100,000 population
- daily number of new deaths
- 14-day notification rate of newly reported COVID-19 deaths per million population
- percentage of COVID-19 tests performed weekly that are positive.

With respect to testing data, *Our World in Data*<sup>(1)</sup> report RT-PCR tests only, while the ECDC<sup>(2)</sup> report both RT-PCR tests and antigen tests. Therefore the following epidemiological parameters are also provided based on the ECDC data:

- weekly number of tests conducted
- testing rate per 100,000 population
- percentage of COVID-19 tests performed weekly that are positive.

Information on public health measures (that is, restrictive measures or non-pharmaceutical interventions) that are currently in place to limit the spread of COVID-19 was sought from government resources. The public health measures of interest include those related to:

- movement of people (for example, stay at home measures or curfews)
- social or mass gatherings
- education
- business activities
- sporting activities
- religious activities
- travel (domestic and or international)
- extended use of face coverings
- special arrangements for the Christmas or end of year holiday period.

Where countries have developed detailed frameworks for living with COVID-19 at varying levels of community transmission, for example, this information was extracted, alongside any criteria that are being used to inform a change in public health measures, or level of restrictions.

Finally, details of national testing and contact tracing strategies were extracted for each country to provide information on the extent that these measures are being used to quickly identify and isolate cases of COVID-19.

The review was first undertaken on 24 November. Weekly updates were provided up to 15 December, as required by the NPHET.

An update of education public health measures only was provided on 23 December 2020 and included data extracted on 22 December 2020. An update of the epidemiological situation and education public health measures in each country as at 5 January 2021 was provided on 6 January 2021. An update on antigen testing in asymptomatic people in community settings only was provided on 3 February 2021 with data extracted on 1 February 2021.

This report provides an update on the epidemiological situation in each country with data extracted on 8 February 2021 and antigen testing in asymptomatic people in community settings only with data extracted on 5 February 2021.

## 3 Findings

### 3.1 Summary epidemiological data

Table 1 presents a brief snapshot of the latest epidemiological data by country. A large number of countries, including Ireland, have seen a considerable decrease in the number of new coronavirus cases recorded over the previous seven days. The 14-day incidence rate of new cases per 100,000 population in Ireland currently stands at 313. Of the included countries, the rate is highest in Portugal (1,224), Czechia (909), and Spain (846). While the rate fell over the previous seven days in Portugal (down 26.5%) and Spain (18.6%), the 14-day incidence rate increased in Czechia (up 2.0%). The rate also increased over the previous seven days in Finland (4.4% [to 93.8 / 100,000 population]), Greece (41.9% [116.7]), Hungary (7.7% [178.4]), and Slovakia (4.2% [495.6]), while in all other countries, the 14-day incidence rate declined, reflecting the downward trend in the number of new cases recorded in each country.

Despite declines in the 14-day incidence rate, the recent surge in cases continues to impact on the death rate in most countries. The 14-day death rate per million population in Ireland currently stands at 144.8. It is surpassed only by Czechia (175.6 per million population), Portugal (356.3), Slovakia (220.3), and the UK (210.5).

With respect to testing data, *Our World in Data*<sup>(1)</sup> report RT-PCR tests only, while the ECDC<sup>(2)</sup> reports both RT-PCR tests and antigen tests. Therefore both sets of testing

data are reported separately in Table 1 and Table 2, respectively. Based on ECDC data (including both RT-PCR and antigen tests), weekly testing per 100,000 population currently ranges from 742 in Poland to 13,409 in Denmark, with Ireland at 2,795 per 100,000. In a number of countries, the positivity rate (that is, the share of tests that are returned as positive over the previous seven days) is trending downwards. However, the positivity rate has increased in Austria (up 58.3% [to 1.4% positivity]), Finland (15.9% [2.7% positivity]), Greece (23.9% [2.4% positivity]), Malta (7.9% [to 5.2% positivity]), the Netherlands (5.6% [10.9% positivity]), Portugal (73.7% [to 20.3% positivity]) and Slovakia (13.5% [19% positivity]). It is important to note that the data are not up-to-date; the latest data from the ECDC were published on 05 February 2021 and reflect activity and test positivity for the final week of January. In addition, it is important to note that cross-country comparisons of the positivity rate are difficult due to changes in testing criteria over time.

**Table 1** Summary epidemiological data on 08 February 2021 (Source: Our World in Data<sup>(1)</sup>)

Country	Daily number of new cases (weekly % change)	14-day notification of new cases / 100,000 population (weekly % change)	Daily number of new deaths (weekly % change)	14-day notification of deaths / million population (weekly % change)	Daily share of tests returned as positive* (weekly % change) [04-Feb-21]
<b>Austria</b>	1,057 (-6.0%)	212.9 (-6.9%)	20 (-64.9%)	64.5 (-11.4%)	<i>No data</i>
<b>Belgium</b>	873 (-30.9%)	272.9 (-0.1%)	34 (6.3%)	52.5 (-6.6%)	5.4 (-1.8%)
<b>Czechia</b>	2,430 (-4.9%)	909.5 (2.0%)	98 (16.7%)	175.6 (-3.2%)	13.2 (-5.7%)
<b>Denmark</b>	430 (-11.9%)	116.7 (-25.5%)	0 (-100.0%)	35.6 (-39.4%)	0.5 (-16.7%)
<b>Finland</b>	353 (44.7%)	93.8 (4.4%)	0 (-100.0%)	6.0 (-44.1%)	2.9 (20.8%)
<b>France</b>	4,343 (-1.0%)	435.0 (-1.2%)	460 (0.9%)	90.9 (1.8%)	6.5 (-4.4%)
<b>Germany</b>	4,650 (-30.3%)	169.1 (-18.1%)	483 (-46.1%)	108.2 (-16.0%)	8.5 (-14.1%) [31-Jan-21]
<b>Greece</b>	629 (16.9%)	116.7 (41.9%)	25 (-24.2%)	31.3 (-4.4%)	2.8 (27.3%)
<b>Hungary</b>	1,160 (3.2%)	178.4 (7.7%)	65 (20.4%)	117.1 (-3.3%)	7.6 (-5.0%)
<b>Ireland</b>	829 (-17.6%)	313.4 (-31.9%)	6 (-40.0%)	144.8 (2.0%)	5.4 (-34.9%)
<b>Italy</b>	7,969 (0.6%)	280.1 (-0.9%)	307 (-6.7%)	94.3 (-9.4%)	4.8 (-5.9%)
<b>Malta</b>	137 (10.5%)	442.1 (-14.6%)	0 (-100.0%)	65.7 (3.6%)	<i>No data</i>
<b>Netherlands</b>	2,246 (-30.4%)	325.5 (-14.4%)	27 (0.0%)	50.0 (-12.4%)	10.9 (5.8%) [31-Jan-21]
<b>Norway</b>	346 (16.9%)	70.1 (-10.1%)	0 (-100%)	6.3 (-26.1%)	1.7 (-5.6%) [03-Feb-21]
<b>Poland</b>	2,431 (-2.9%)	197.0 (-3.1%)	45 (7.1%)	98.6 (-2.2%)	13.5 (-4.9%)
<b>Portugal</b>	2,505 (-56.8%)	1,224.0 (-26.5%)	196 (-28.7%)	356.3 (-2.6%)	18.1 (-10.0%)
<b>Slovakia</b>	757 (70.5%)	495.6 (4.2%)	72 (4.3%)	220.3 (1.5%)	20.4 (44.7%)
<b>Spain</b>	47,095 (-40.9%)	846.3 (-18.6%)	909 (19.3%)	130.2 (14.6%)	14.1 (-6.0%) [28-Jan-21]
<b>Sweden†</b>	3,388 (41.2%)	404.9 (-5.9%)	87 (22.5%)	109.9 (-12.5%)	10 (-16.0%) [31-Jan-21]
<b>UK</b>	14,138 (-24.3%)	429.0 (-27.8%)	333 (-18.2%)	210.5 (-14.6%)	3.2 (-31.9%)
<b>Switzerland</b>	3,280 (-13.1%)	249.0 (-14.3%)	38 (-46.5%)	58.4 (-23.5%)	8.3 (-6.7%)

\*Calculated as 7-day rolling average of daily cases, divided by the 7-day rolling average of daily tests (RT-PCR tests only)

† Latest available data on the number of new cases and deaths are for 05-Feb-21

**Table 2** Summary international testing data for week four, 2021 [published 05-Feb-21]\* (Source: ECDC<sup>(2)</sup>)

Country	Number of tests conducted	Testing rate per 100,000 population (weekly % change)	Weekly % test positivity (weekly % change)
<b>Austria</b>	655,713	7,401.8 (-42.7%)	1.4 (58.3%)
<b>Belgium</b>	345,046	3,012.1 (11.8%)	4.8 (-3.2%)
<b>Czechia</b>	344,053	3,230.6 (6.7%)	13.8 (-7.9%)
<b>Denmark</b>	778,547	13,409.2 (4.3%)	0.5 (-34.9%)
<b>Finland</b>	105,759	1,916.6 (11.6%)	2.7 (15.9%)
<b>France</b>	2,122,366	3,167.1 (7.7%)	6.8 (-6.6%)
<b>Germany</b>	1,070,000	1,288.9 (0.2%)	7.5 (-20.6%)
<b>Greece</b>	209,772	1,956.0 (19.1%)	2.4 (23.9%)
<b>Hungary</b>	109,018	1,115.5 (10.7%)	7.6 (-2.9%)
<b>Ireland</b>	137,066	2,794.8 (-6.4%)	6.6 (-35.2%)
<b>Italy</b>	1,732,691	2,870.6 (14.7%)	5.0 (-12.1%)
<b>Malta</b>	22,620	4,583.0 (-2.5%)	5.2 (7.9%)
<b>Netherlands</b>	262,630	1,519.7 (-23.7%)	10.9 (5.6%)
<b>Norway</b>	153,361	2,878.3 (8.6%)	1.2 (-28.7%)
<b>Poland</b>	281,620	741.6 (-1.0%)	12.5 (-9.2%)
<b>Portugal</b>	410,589	3,995.4 (-44.7%)	20.3 (73.7%)
<b>Slovakia</b>	67,850	1,244.9 (-10.2%)	19.0 (13.5%)
<b>Spain</b>	1,743,885	3,715.4 (1.3%)	13.2 (-11.9%)
<b>Sweden</b> <sup>†</sup>	193,188	1,888.4 (-3.8%)	10.7 (-11.1%)

\* Testing data for the UK and Switzerland are not routinely captured by the ECDC (includes RT-PCR and antigen tests)

† Latest data are for week three, 2021

### **3.2 Antigen testing in asymptomatic individuals in community settings**

Of the 24 jurisdictions included in this review, 22 reported use of antigen testing in asymptomatic individuals in community settings. The two exceptions were Malta and Northern Ireland; use in Finland is limited to testing inbound travellers, although RT-PCR remains the most common testing method. In many countries antigen testing for asymptomatic persons in the community is advised for consideration in the context of screening, outbreak management and testing of contacts after identification. However, there is considerable variation in the criteria for testing, in the requirements for confirmatory testing and in the settings or circumstances in which the tests may be used (from little or no use in some countries to use in a range of settings in others).

The information is summarised by setting below and in Table 3 which includes criteria for testing, context and setting in each country. Full details of testing in all countries are provided in Appendix Table 1.

#### **General settings**

In Belgium, antigen testing of asymptomatic people is only proposed as part of a cluster investigation in group settings with a low-risk profile, such as schools, businesses, sports clubs and special youth care, but not in care facilities. In Denmark, testing may be considered for select groups (including specific age groups) or in areas where prevalence is particularly high and there is widespread spread of infection. In France, testing may be used for collective screening organised by a public authority or an employer in the event of a suspected cluster or particularly active circulation of the virus. Testing in Italy may be recommended in the context of a high positivity rate for example  $\geq 10\%$  and includes community screening for public health reasons. Testing may also be considered as part of outbreak management in work places and other institutions in the Netherlands. Similarly in Czechia, Norway and Poland, testing may be considered in the event of an infection outbreak. Positive results in Czechia and Norway should be confirmed by a RT-PCR test. While RT-PCR tests are preferred, in Spain antigen testing may be considered for population subgroup epidemiological studies with a positive result requiring a follow-up RT-PCR test. In Switzerland, it may be considered as part of large-scale outbreak prevention, for example in schools, ski areas and certain regions and as part of precautionary measures in screening attendees at a sporting event or concert and screening employees at the request of an employer.

Voluntary population-wide antigen testing is being carried out in both Austria and Czechia with a positive result requiring a follow-up RT-PCR test. Free random sample

testing for citizens commenced in Greece in December 2020 as part of its strategy to protect citizens and break the chains of transmission. Slovakia has conducted two rounds of national mass screening to date using antigen tests, with a number of follow up rounds in areas with high positivity in previous rounds. A number of community testing pilots are due to commence in targeted communities with high prevalence across the UK.

### **Residential and long-term care facilities**

In Germany, antigen testing in care facilities is considered for asymptomatic staff, patients and visitors in the context of screening in geographical areas with increased incidence of infection and for infection control purposes in facilities where RT-PCR capacity is limited or for an immediate decision to initiate cohort isolation. Positive results require a follow-up RT-PCR test. In Italy and Switzerland, it may also be considered for periodic screening in facilities in areas where there is high community transmission. Although RT-PCR is preferred, in Spain antigen testing is considered for screening of staff and both existing and new residents, with all positive results followed up with a RT-PCR test. Similarly in Sweden it may be considered for screening new and returning residents and weekly screening of staff in special housing for the elderly. In Czechia, England and Scotland, staff and visitors at residential care facilities may be screened (using lateral flow tests in England and Scotland), while staff may be considered for weekly or fortnightly testing in Wales. Positive test results in Czechia and Scotland require a follow-up RT-PCR test.

In the Netherlands, testing may be considered as part of outbreak management within a facility and a negative result should be confirmed by a RT-PCR test. In the event of a high spread of infection in the local community, staff and residents in care facilities in Norway may undergo regular testing with positive results followed up with a RT-PCR test. In Portugal, Scotland and Sweden, antigen testing may also be considered as part of outbreak management. In Switzerland it may be considered as a precautionary measure for visitors to care homes, in which case the visitor will be invited for a test by the establishment. In Hungary and Spain, asymptomatic close contacts in long-term care institutions can be considered for testing and a RT-PCR test is mandatory following a negative test result.

### **Other health care settings outside the hospital or acute setting**

In England, antigen testing (using lateral flow tests) is offered to patient-facing staff delivering NHS services in primary care across all four primary care contractor groups (Medical, Dental, Optometry, and Community Pharmacy) and includes staff at vaccination sites.

## **Contacts**

Asymptomatic contacts may avail of an antigen test in France. In Germany however, antigen testing of asymptomatic contacts should only be considered in exceptional circumstances, such as in the case of limited RT-PCR capacity or in urgent cases to bridge the waiting time for the result of a simultaneously initiated RT-PCR test. Similarly, in Ireland, testing of asymptomatic close contacts can be considered as part of the response to a notification of a potential outbreak in the community or in the early stages of management of a confirmed outbreak, but only if there is (i) evidence of widespread community transmission (>10% positivity in the local community), (ii) there are symptomatic person(s) on site and (iii) the outbreak involves a vulnerable population, including among staff and or residents of long-term care facilities, homeless hostels, residents of direct provision centres and prisons. If a “not detected” test result is obtained in the close contact, the test should be repeated using RT-PCR. Asymptomatic contacts with high risk exposure in Italy should only be tested with antigen tests in areas where the positivity rate is  $\geq 10\%$ . In Denmark, it may be considered when people are notified via the Danish COVID App that they have been in contact with a confirmed case and for screening non-close contacts in cases of infection within work places with large offices. In Portugal, antigen testing may be offered to high risk contacts if RT-PCR testing is not available, or the result is not available in less than 24 hours; however RT-PCR confirmation of positive antigen tests is only required for those deemed close contacts. Although RT-PCR is preferred, in Spain antigen testing can be used in the case of asymptomatic close contacts cohabiting or in outbreaks and where the speed of the response time helps the rapid handling of contacts. A positive result requires a follow-up RT-PCR test. In Switzerland, it may also be considered in the case of notification from the SwissCovid App that someone has been in contact with a confirmed case.

## **Education**

If there is a confirmed case in schools or day care facilities in Germany, rapid antigen tests can be sought from pharmacies. The respective group, usually the class, should quarantine for five days. A rapid test should follow on day five and children who test negative can then return to school. In Hungary, weekly testing of teachers and staff of nurseries and kindergartens commenced in November. In Portugal, screening in schools and education establishments is generally considered as part of outbreak management and or when the region’s 14-day cumulative incidence is more than 960 per 100,000 inhabitants. Similarly in Belgium, the Netherlands and Wales, testing is considered as part of outbreak management. In England, screening can be considered in schools using lateral flow tests. In both England and Scotland there is voluntary screening in universities, while returning



university students in Wales can be offered testing for participation in onsite activities, all using lateral flow tests. In Scotland, a positive result must be followed up with a RT-PCR test. Under a phased approach that commenced in January 2021, voluntary testing, using lateral flow tests, will be made available to all members of staff and all pupils and students in schools, special schools and colleges in Wales. In schools and colleges, there will be daily testing for those identified as close contacts (outside their household) of confirmed cases. In special schools, there will be weekly testing.

## **Travel**

Antigen testing of asymptomatic inbound travellers may be considered in Finland (RT-PCR preferred), the Netherlands and Norway.

**Table 3** Summary of antigen testing in asymptomatic individuals in community settings (extracted 5 February 2021)

Purpose	Criteria	Purpose						Follow-up testing	Other
		Screening		Infection control/ Outbreak management		Testing contacts			
		General	Care/Other	General	Care/Other	General	Care/Other		
Austria <sup>(3-5)</sup>	-	Mass screening.	In facilities with exposed personnel or those at high risk of serious illness.	No detail.	-	No detail.	-	Positive results requires a PCR test.	-
Belgium <sup>(6, 7)</sup>	-	-	-	-	Low risk settings with cluster, e.g. schools, businesses, sports clubs & special youth care.	-	-	-	-
Czechia <sup>(8, 9)</sup>	-	Mass screening.	Visitors and staff in LTCFs.	No detail.	-	-	-	Positive result requires a PCR test.	-
Denmark <sup>(10, 11)</sup>	-	Gradual implementation across settings.	Gradual implementation across settings.	Only select groups, e.g. 15-25yrs.	-	Close contact if notified via App.	Non close contacts in large work places.	-	-
Finland <sup>(12, 13)</sup>	-	-	-	-	-	-	-	-	PCR test primarily used to test at border but antigen test also used.
France <sup>(14)</sup>	-	No detail.	No detail.	No detail.	No detail.	No detail.	No detail.	-	-

Purpose	Criteria	Purpose						Follow-up testing	Other
		Screening		Infection control/ Outbreak management		Testing contacts			
		General	Care/Other	General	Care/Other	General	Care/Other		
Germany <sup>(15, 16)</sup>	7-day incidence > 50/100,000 population.	-	Staff, patients (if PCR not available before (re) admission) and visitors to health care facilities without a COVID case.	-	Facilities with confirmed infection - only if PCR capacity limited/need to urgently initiate cohort isolation. Schools & day care following confirmed case in a class (criterion re 7-day incidence doesn't apply).	Exceptional circumstance e.g. limited PCR capacity or in urgent cases before confirmation of PCR test.	Exceptional circumstance e.g. limited PCR capacity or where need to urgently isolate.	Positive result requires a PCR test.	-
Greece <sup>(17, 18)</sup>	-	Random sampling of registered citizens.	-	-	-	-	-	-	-
Hungary <sup>(19, 20)</sup>	-	-	Weekly (voluntary) testing of social care workers, teachers & nursery staff.	-	LTCFs.	-	Close contact staff and residents in LTCFs.	Negative tests in LTCFs confirmed by PCR.	-

Purpose	Criteria	Purpose						Follow-up testing	Other
		Screening		Infection control/ Outbreak management		Testing contacts			
		General	Care/Other	General	Care/Other	General	Care/Other		
Ireland <sup>(21)</sup>	>10% positivity rate in local community And Symptomatic person on site. And Outbreak involves specific settings/groups.	-	-	-	LTCFs, homeless hostels, residents of direct provision centres, prisons, Irish Travellers etc.	-	Close contacts of staff/residents in LTCFs, homeless hostels, residents of direct provision centres, prisons, Irish Travellers etc.	If test is 'not detected', PCR test required.	-
Italy <sup>(22)</sup>	High positivity rate e.g. ≥10%	Community screening for public health reasons.	Periodic screening of residents/staff/visitors in prisons and migrant reception centres.	-	RCFs and LTCFs where rapid action required.	Contacts with high risk exposure.	-	-	-
Malta <sup>(23)</sup>	-	-	-	-	-	-	-	-	-
Netherlands <sup>(24, 25)</sup>	-	Confirm validity of negative PCR test in order to attend events. (not currently applicable).	-	-	RCFs. Schools. Workplaces.	-	-	A negative result should be confirmed by PCR in RCFs.	Travellers returning from high risk areas.
Poland <sup>(26)</sup>	-	-	-	No detail.	-	-	-	-	-

Purpose	Criteria	Purpose						Follow-up testing	Other
		Screening		Infection control/ Outbreak management		Testing contacts			
		General	Care/Other	General	Care/Other	General	Care/Other		
Portugal <sup>(27, 28)</sup>	-	-	Students & staff in education settings in areas with a 14-day cumulative incidence > 960/100,000 inhabitants.	-	LTCFs. Schools and educational establishments.	-	High-risk contacts if PCR not available/ test result not available in <24hrs.	Positive results for close contacts of confirmed case require a PCR test.	For admission to facilities when PCR unavailable (e.g. children at risk, victims of violence).
Slovakia <sup>(29)</sup>	-	Mass and region specific.	-	Mass and region specific.	-	-	-	-	-
Spain <sup>(30)</sup>	-	Population subgroup Epi studies (PCR preferred).	Workers, residents and new admissions in LTCFs (PCR preferred).	Where the speed of the response times helps with handling of contacts.	-	Cohabiting close contacts (PCR preferred).	Cohabiting close contacts (PCR preferred).	Positive result requires a PCR test. In health and social health settings, a negative result requires a PCR test.	-
Sweden <sup>(31, 32)</sup>	-	-	Care home residents moving in/ returning after hospital stay. Weekly testing for staff in special housing for elderly.	-	Individuals in municipal care and nursing home settings.	-	-	-	-

Purpose	Criteria	Purpose						Follow-up testing	Other
		Screening		Infection control/ Outbreak management		Testing contacts			
		General	Care/Other	General	Care/Other	General	Care/Other		
England <sup>(33, 34)</sup>	-		Staff and visitors at RCFs. Patient-facing NHS primary care staff. Universities & schools.	-	-	-	-	-	-
Northern Ireland <sup>(35)</sup>	-	-	-	-	-	-	-	-	-
Scotland <sup>(36-38)</sup>	-	-	Staff (twice weekly) & visitors at RCFs. Universities (voluntary).	Pilots in targeted communities with high prevalence.	Staff at RCFs.	-	-	Positive results require a PCR test.	-
Wales <sup>(39-41)</sup>	-	-	Staff at RCFs (weekly/fortnightly). Universities – returning students & for onsite activities). Staff & students in special schools (weekly).	-	Schools.	-	Schools: close contact (outside household) of confirmed case.	-	-
Norway <sup>(42)</sup>	In the event of a high spread of infection in the local community.	-	Regular testing of employee and residents in care facilities.	No detail.	-	-	-	Positive result followed by PCR test.	Border testing. Positive must be PCR confirmed.

Purpose	Criteria	Purpose						Follow-up testing	Other
		Screening		Infection control/ Outbreak management		Testing contacts			
		General	Care/Other	General	Care/Other	General	Care/Other		
Switzerland <sup>(4 3)</sup>	-	-	Precautionary measures: Visitors to LTCFs/RCFs. Attendees at sporting events, concerts. Requested by employer.	Regions.	Schools. Ski-areas.	Notification on App/by doctor.	-	In certain situations a positive result requires a PCR test.	-

## 4 Discussion

The role of antigen testing for SARS-CoV-2 detection in asymptomatic individuals in community settings varies considerably between the 24 countries reviewed. There is variation in the criteria for testing, in the requirements for confirmatory molecular testing and in the settings or circumstances in which the tests may be used (from little or no use in some countries to use in a range of settings in others). Uses include population-wide screening, infection control and outbreak management, and testing contacts after identification. Although not specified in the majority of documents reviewed, the antigen testing considered within these reports likely refers to the use of rapid antigen tests (lateral flow assays) in the context of near patient testing (NPT). This is distinct from laboratory-based antigen testing; companies report that a number of laboratory-based antigen tests which can be run on existing immunochemistry analysers will be commercially available in early 2021.

While guidance on the use antigen testing is quite broad in a number of countries, the actual extent to which antigen testing is being undertaken, and specifically the extent to which antigen testing is used in asymptomatic individuals is difficult to ascertain. For example, data have been reported on the numbers screened under the population-wide screening programme in Slovakia, but specific data on the numbers of asymptomatic individuals that were screened are not reported. Similarly, while individual countries may report disaggregated data on the number of antigen and RT-PCR tests conducted, data are not available on the number of antigen tests undertaken in asymptomatic individuals.

In the EU/EEA countries included in this review, for the time period (week 4, 2021) there was an apparent 18-fold difference in the total (RT-PCR plus antigen) SARS-CoV-2 test rate between countries ranging from 741.6 per 100,000 in Poland to 13,409.2 per 100,000 in Denmark; the test rate for Ireland (2,794.8 per 100,000) that week was at the median rate for the countries reviewed (2,870.6 per 100,000). However, as noted, both the ECDC and Our World in Data advise caution in comparing testing rates between countries due to heterogeneity in reporting practices relating to the unit of measurement (for example, number of people tested, cases tested, tests performed etc.), whether pending results are included and the time period covered.

Antigen tests are generally less sensitive than RT-PCR for detecting SARS-CoV-2. Their clinical performance largely depends on the circumstances in which they are used, generally performing best when viral load is highest.<sup>(44)</sup> The test accuracy depends on a number of factors including the time from infection onset, the concentration of virus in the specimen, the quality and processing of the specimen collected, and the precise formulation of the reagents in the test kits.<sup>(45)</sup> The specific



setting in which they are deployed and likely impact on RT-PCR test capacity are also relevant considerations in their deployment. In a high prevalence setting, antigen testing will have a high positive predictive value with a positive value likely to indicate true infection.<sup>(46)</sup> In such settings, and where RT-PCR capacity is limited or where urgent identification of potentially positive cases is required, such as in settings with medically vulnerable individuals, antigen testing in asymptomatic individuals may have a role to play in an overall testing strategy. However, a negative result in such a setting may require a confirmatory RT-PCR test, particularly for those with a known history of exposure. Our current review identified that Germany, Ireland, Italy, and Portugal (only for screening in education settings) limit the use of antigen testing to situations where there is a high test positivity rate (e.g.,  $\geq 10\%$ ) or the 7- or 14-day incidence exceeds a stated threshold for that setting. The guidance from Germany goes further in only recommending antigen testing in the event of limited RT-PCR test capacity and or if rapid cohort isolation is required. In low prevalence settings, a rapid antigen test will have a high negative predictive value, but a low positive predictive value.<sup>(46)</sup> If used correctly, a rapid antigen test should be able to rule out a highly infectious case in such a setting. However, if deployed on a large scale in such settings, a large proportion of positive results will be false positives. For example, at a prevalence of 50/100,000 and a test sensitivity and specificity of 0.8 and 0.98 respectively, of 2,039 positive results, 40 (0.2%) would be true positives and 1,999 (98%) would be false positive results.<sup>(46)</sup> The requirement for confirmatory RT-PCR testing of these positive results could potentially impact on overall RT-PCR test capacity and the overall efficiency and cost-effectiveness of the testing programme.

With regard to test performance, the WHO recommends a minimum sensitivity of 80% and a minimum specificity  $\geq 97\%$ , but ideally greatly than 99%.<sup>(45)</sup> However, there is considerable variation between commercially available tests and the WHO report available independent data demonstrating sensitivity ranging from 0% to 94%; specificity data are more consistent between tests, typically exceeding 97%.<sup>(45)</sup> Therefore, the clinical performance of the test should be evaluated for the intended use and conditions, including the specific target population (including symptomatic and or asymptomatic). While multiple studies have reported rapid antigen test sensitivity rates exceeding 80% in symptomatic individuals with suspected COVID-19 tested shortly after symptom onset, sensitivity is substantially lower among asymptomatic individuals.<sup>(47-49)</sup> Studies report a correlation between test sensitivity and cycle threshold (Ct values) with improved sensitivity at lower Ct values. While Ct values cannot be used to determine viral load or infectivity of an individual, on a population level, it is noted that there is an inverse relationship between Ct value and the amount of genetic material present in the sample.<sup>(47-49)</sup> Therefore, it has been argued that antigen tests have a role in identifying individuals most likely to be infectious to others. However, given reports of false negative

results in individuals despite high viral loads, there remains a risk of missed diagnoses that could have a substantial impact from a public health point of view.

A rapid search was conducted to identify literature reporting on the effectiveness of the strategies adopted by the countries included in this review. Three studies (two preprints) were identified that reported on the effectiveness of the population-wide screening in Slovakia. Pavelka et al. report the results of the mass screening,<sup>(50)</sup> concluding that a combination of restrictions on movement and two rounds of large scale rapid antigen testing contributed substantially to achieve reductions in prevalence of over 50% within a week. They also acknowledge that quarantining of household contacts was a crucial contribution to the effectiveness of mass testing. However, in response, Černák criticised this study and reports that the authors refer to conclusions that are not supported by experimental data.<sup>(51)</sup> He argues that the authors failed to consider many fundamental phenomena in their proposed computer simulations and data analysis, in particular the complexity of SARS-CoV-2 virus spread. Lastly, Frnda and Durica provide an overview of the first and second rounds of testing analysing the results using mathematical simulations.<sup>(52)</sup> They report that their results have proven that screening can substantially reduce the number of daily reported new cases in areas with high prevalence, but the benefits of such testing are questionable in regions with low prevalence of COVID-19. In response to the reported results of population wide testing in Slovakia, it was also highlighted that a suggestion of effectiveness of mass screening in one place, is not straightforward to interpret as suggesting that it will work everywhere.<sup>(53)</sup> Additionally, a number of recently published articles in academic journals highlight the ongoing debate concerning whether or not the use of antigen tests can help to control the spread of SARS-CoV-2.<sup>(53-55)</sup> While many countries have identified a role for antigen testing for asymptomatic individuals in community settings, the actual extent to which it is used in asymptomatic individuals is difficult to ascertain. There is variation in the criteria for testing, test specimens, test characteristics, the requirements for confirmatory molecular testing and in the settings or circumstances in which the tests may be used. These factors have implications for the diagnostic test accuracy and the effectiveness of the antigen testing to inform infection prevention and control measures and prevent transmission.

The need for a robust ethical framework to guide mass testing of COVID-19 in asymptomatic individuals has been highlighted in the UK. It is argued that the development of such a framework, based on stakeholder engagement and ethical analysis, would enable systematic and principled decision making, helping to assure the ethical standing of mass testing programmes for COVID-19.<sup>(56)</sup>

The European Centre for Disease Prevention and Control (ECDC) published a report in November 2020 detailing scenarios and settings during which it is appropriate to

use rapid antigen tests. At that point in time, they reported that most rapid antigen tests available on the market were developed for testing in symptomatic persons and were not currently recommended for use in asymptomatic persons.<sup>(46)</sup> However, the World Health Organization (WHO) published a report on 21 December 2020 advising that testing of asymptomatic contacts of cases may be considered even if the antigen test is not specifically authorised for this use as asymptomatic cases have viral loads similar to symptomatic cases. However, the WHO recommend that a negative result is not sufficient to remove a contact from quarantine requirements.<sup>(45)</sup>

HIQA's rapid health technology assessment of alternatives to laboratory-based real-time RT-PCR published in October 2020, identified a number of issues to consider with regard to the expansion of test capacity:<sup>(57)</sup>

- identification of the goal of testing in a given setting
- selection of the most appropriate technology
- taking into account the necessary resources to establish testing in this setting
- investigation of available CE-marked devices, with consideration to key device characteristics.

From an operational and resource perspective there are a number of important considerations. The WHO advise the following critical elements that are required for the safe and effective implementation of antigen testing:<sup>(45)</sup>

- integrating an antigen testing strategy into the national response plan
- procurement of the right tests and associated requirements
- supply chain management and logistics
- training and supervision
- quality assurance
- data management and connectivity
- monitoring and evaluation
- communication and community engagement.

The distinction between laboratory-based testing, where tests are processed by trained laboratory personnel and near patient testing where tests are processed outside a laboratory setting (and potentially outside a healthcare setting) is important. As noted, it is assumed that to date, the antigen testing referred to in international guidance documents relates to near patient testing (NPT) and use of lateral flow antigen tests, also known as rapid antigen detection tests (RADTs). There are important considerations in relation to the clinical and quality governance

over any NPT testing programme, including the requirement for quality management systems, so to be assured of the performance of antigen test analysis on site. A number of European countries have comprehensive NPT programmes for other conditions, so there may have been the potential to leverage existing quality management systems and to deploy staff that have been trained in NPT. The use of NPT in community-based settings in Ireland is very limited, so deployment of rapid antigen testing for SARS-COV-2 would have substantial resource considerations including the requirement for appropriately trained staff onsite to process the tests. While rapid antigen tests can provide a test result within 12 to 15 minutes, tests must be processed individually, with very limited potential for efficiency. Testing a large cohort of individuals is therefore time-consuming and has significant staffing implications.

## References

1. Max Roser HR, Esteban Ortiz-Ospina and Joe Hasell. Coronavirus Pandemic (COVID-19). 2020. Available from: <https://ourworldindata.org/coronavirus>.
2. European Centre for Disease Prevention and Control (ECDC). Data on testing for COVID-19 by week and country 2021. Available from: <https://www.ecdc.europa.eu/en/publications-data/covid-19-testing>.
3. Government of Austria. Austria Tests 2021. Available from: <https://www.oesterreich.gv.at/>.
4. Federal Ministry of Social Health Care and Consumer Protection (Austria). Austrian test strategy SARS-CoV-2 2020. Available from: [https://www.sozialministerium.at/dam/jcr:cc1471e2-154b-48bc-aad6-d43ce13d7098/%C3%96sterr\\_Teststrategie\\_SARS-CoV-2\\_Update\\_20201216.pdf](https://www.sozialministerium.at/dam/jcr:cc1471e2-154b-48bc-aad6-d43ce13d7098/%C3%96sterr_Teststrategie_SARS-CoV-2_Update_20201216.pdf).
5. Federal Ministry of Social Health Care and Consumer Protection (Austria). FAQ: Population-wide tests 2021. Available from: <https://www.sozialministerium.at/Informationen-zum-Coronavirus/Coronavirus---Haeufig-gestellte-Fragen/FAQ--Bevoelkerungsweite-Testungen.html>.
6. Government of Belgium. Rapid Antigen tests 2020. Available from: <https://www.info-coronavirus.be/en/news/rapid-antigen-tests/>.
7. Sciensano (Belgium). Use of Rapid antigen testing, case of investigation of a cluster of covid-19 in secondary schools 2020. Available from: <https://covid-19.sciensano.be/fr/procedures/tests-rapides-antigeniques-ag>.
8. Ministry of Health (Czechia). Voluntary Antigen testing- who can be tested 2020. Available from: <https://koronavirus.mzcr.cz/antigenni-testovani/>.
9. Ministry of Health (Czechia). Extraordinary measure - change of extraordinary measure for antigen testing of the population with effect from 1 February 2021. 2021. Available from: <https://koronavirus.mzcr.cz/mimoradne-opatreni-zmena-mimoradneho-opatreni-k-antigennimu-testovani-obyvatel-s-ucinnosti-od-1-2-2021/>.
10. National Board of Health (Denmark). Recommendations for using quick tests 2020. Available from: <https://www.sst.dk/da/Udgivelser/2020/Anbefalinger-for-brug-af-hurtigtest>.
11. National Board of Health (Denmark). When to test and which test can you use? 2020. Available from: <https://www.sst.dk/da/Nyheder/2020/Hvornaar-skal-man-testes-og-hvilken-test-kan-man-bruge>.
12. Ministry of Social Affairs and Health (Finland). Coronavirus testing strategy. 2021. Available from: <https://stm.fi/koronaviruksen-testausstrategia>.
13. Finnish Institute for Health and Welfare. Coronavirus tests 2021. Available from: <https://thl.fi/en/web/infectious-diseases-and-vaccinations/what-s-new/coronavirus-covid-19-latest-updates/symptoms-and-treatment-coronavirus/coronavirus-tests>.
14. Health Insurance (France). Everything you need to know about antigenic testing for SARS-CoV-2 2021. Available from: <https://www.ameli.fr/assure/covid-19/tester-alerter-protoger-comprendre-la>

- [strategie-pour-stopper-lepidemie/les-tests-de-depistage-de-la-covid-19/tout-ce-quil-faut-savoir-sur-les-tests-antigeniques-du-sras-cov-2.](#)
15. Robert Koch Institut (Germany). National test strategy - who is tested for a SARS-CoV-2 infection in Germany? 2021. Available from: [https://www.rki.de/DE/Content/InfAZ/N/Neuartiges\\_Coronavirus/Teststrategie/Nat-Teststrat.html;jsessionid=A35914259A56A41794F4332A9006D0A5.internet082?nn=13490888](https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Teststrategie/Nat-Teststrat.html;jsessionid=A35914259A56A41794F4332A9006D0A5.internet082?nn=13490888).
  16. European Observatory on Health Systems and Policies. COVID-19 Health System Response Monitor. Policy responses for Germany - Testing. 2021. Available from: <https://www.covid19healthsystem.org/countries/germany/livinghit.aspx?Section=1.5%20Testing&Type=Section#61Secondwavemeasures:Testing>.
  17. National Public Health Organization (Greece). Coronavirus disease (COVID-19) 2021. Available from: <https://eody.gov.gr/en/covid-19/>.
  18. Ministry of Health (Greece). Ministry of Health. 2021. Available from: <https://www.moh.gov.gr/>.
  19. National Centre for Public Health (Hungary). COVID-19 Information page. 2021. Available from: <https://www.nnk.gov.hu/index.php/jarvanyugyi-es-infekciokontroll-foosztaly/lakossagi-tajekoztatok/koronavirus>.
  20. European Observatory on Health Systems and Policies. COVID-19 Health System Response Monitor. Policy responses for Hungary - Testing. 2020. Available from: <https://www.covid19healthsystem.org/countries/hungary/livinghit.aspx?Section=1.5%20Testing&Type=Section>.
  21. HSE Health Protection Surveillance Centre (Ireland). Interim guidance on the use of Antigen Detection Tests (ADTs) in the public health system in Ireland. Version 1. 2021. Available from: <https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/laboratoryguidance/Guidance%20on%20use%20of%20ADT%20in%20the%20public%20health%20system.pdf>.
  22. Ministry of Health (Italy). Update of the COVID-19 case definition and testing strategies. 2020. Available from: <https://www.trovanorme.salute.gov.it/norme/renderNormsanPdf?anno=2021&codLeg=78155&parte=1%20&serie=null>.
  23. Ministry of Health (Malta). COVID-19. 2021. Available from: <https://deputyprimeminister.gov.mt/en/health-promotion/covid-19/Pages/landing-page.aspx>.
  24. National Institute for Public Health and the Environment Ministry of Health Welfare and Sport (the Netherlands). Different types of tests 2020. Available from: <https://www.rivm.nl/node/167431>.
  25. National Institute for Public Health and the Environment Ministry of Health Welfare and Sport (the Netherlands). The antigen test 2020. Available from: <https://www.rivm.nl/en/novel-coronavirus-covid-19/testing-for-covid-19/antigen-test>.
  26. Government of Poland. Coronavirus: information and recommendations. 2021. Available from: <https://www.gov.pl/web/coronavirus>.

27. Ministry of Health (Portugal). COVID-19 National Testing Strategy for SARS-CoV-2 2020. Available from: <https://www.dgs.pt/normas-orientacoes-e-informacoes/normas-e-circulares-normativas/norma-n-0192020-de-26102020-pdf.aspx>.
28. Directorate-General for Health (Portugal). COVID-19 National Testing Strategy for SARS-CoV-2 2021. Available from: <https://covid19.min-saude.pt/dgs-e-dgeste-publicam-orientacao-sobre-campanha-de-rastreio-nas-escolas/>.
29. Ministry of Health (Slovakia). Press Releases 2021. Available from: <https://www.health.gov.sk/Clanky?tlacove-spravy>.
30. Ministry of Health (Spain). Strategy for early detection surveillance and COVID-19 control 2020. Available from: [https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/COVID19\\_Estrategia\\_vigilancia\\_y\\_control\\_e\\_indicadores.pdf](https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/COVID19_Estrategia_vigilancia_y_control_e_indicadores.pdf).
31. Public Health Authority - Folkshalsomyndigheten (Sweden). Guidance for the use of antigen tests in covid-19. 2020. Available from: <https://www.folkhalsomyndigheten.se/publicerat-material/publikationsarkiv/v/vagledning-for-anvandning-av-antigentester-vid-covid-19/>.
32. Public Health Authority - Folkshalsomyndigheten (Sweden). Sampling for covid-19 in municipal care and care for the elderly. 2020. Available from: <https://www.folkhalsomyndigheten.se/publicerat-material/publikationsarkiv/p/provtagning-for-covid-19-inom-kommunal-varld-och-omsorg-for-aldre/>.
33. NHS (England). Lateral flow antigen test FAQs: roll out in primary care 2021. Available from: <https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/12/C0964-lft-in-primary-care-faqs-v2-jan-2021.pdf>.
34. Department of Health and Social Care (England). Understanding lateral flow antigen testing for people without symptoms 2021. Available from: <https://www.gov.uk/guidance/understanding-lateral-flow-antigen-testing-for-people-without-symptoms>.
35. Queen's University Belfast (Northern Ireland). Book a free COVID-19 Test 2021. Available from: <https://www.qub.ac.uk/home/coronavirus-faqs/asymptomatic-testing/>.
36. Scottish Government (Scotland). Community Asymptomatic Test site opens in Johnstone 2020. Available from: <https://www.gov.scot/news/community-asymptomatic-test-site-opens-in-johnstone/>.
37. Scottish Government (Scotland). Coronavirus (COVID-19): adult care home visitor testing guidance 2021. Available from: <https://www.gov.scot/publications/coronavirus-covid-19-adult-care-home-visitor-testing-guidance/>.
38. University of Edinburgh (Scotland). Asymptomatic testing in Semester 2 2021. Available from: <https://www.gov.scot/news/community-asymptomatic-test-site-opens-in-johnstone/>.
39. Welsh Government (Wales). Care homes testing policy 2020. Available from: [www.gov.wales/testing-process-care-homes-covid-19.html](http://www.gov.wales/testing-process-care-homes-covid-19.html).
40. Welsh Government (Wales). The managed movement of students to in-person teaching and learning in January 2020. Available from:

- <https://gov.wales/managed-movement-students-person-teaching-and-learning-january>.
41. Welsh Government (Wales). Coronavirus (COVID-19) asymptomatic testing in schools and colleges 2020. Available from: <https://gov.wales/coronavirus-covid-19-asymptomatic-testing-schools-and-colleges>.
  42. National Institute of Public Health - Folkehelsinstituttet (Norway). Rapid tests for coronavirus detection 2021. Available from: <https://www.fhi.no/nettpub/coronavirus/testing-og-oppfolging-av-smittede/hurtigtester-for-pavisning-av-koronavirus/?term=&h=1>.
  43. Federal Office of Public Health (Switzerland). Coronavirus: Tests 2021. Available from: <https://www.bag.admin.ch/bag/en/home/krankheiten/ausbrueche-epidemien-pandemien/aktuelle-ausbrueche-epidemien/novel-cov/testen.html>.
  44. Centers for Disease Control and Prevention. Interim Guidance for Antigen Testing for SARS-CoV-2 2020. Available from: [cdc.gov/coronavirus/2019-ncov/lab/resources/antigen-tests-guidelines.html](https://www.cdc.gov/coronavirus/2019-ncov/lab/resources/antigen-tests-guidelines.html).
  45. World Health Organization (WHO). SARS-CoV-2 antigen-detecting rapid diagnostic tests: An implementation guide. Geneva: WHO; 2020.
  46. European Centre for Disease Prevention and Control (ECDC). Options for the use of rapid antigen tests for COVID-19 in the EU/EEA and the UK. Technical Report. Stockholm: ECDC; 2020.
  47. James AE, Gulley T, Kothari A, Holder K, Garner K, Patil N. Performance of the BinaxNOW coronavirus disease 2019 (COVID-19) Antigen Card test relative to the severe acute respiratory coronavirus virus 2 (SARS-CoV-2) real-time reverse transcriptase polymerase chain reaction (rRT-PCR) assay among symptomatic and asymptomatic healthcare employees. *Infection Control & Hospital Epidemiology*. 2021:1-3.
  48. Torres I, Poujois S, Albert E, Álvarez G, Colomina J, Navarro D. Point-of-care evaluation of a rapid antigen test (CLINITEST® Rapid COVID-19 Antigen Test) for diagnosis of SARS-CoV-2 infection in symptomatic and asymptomatic individuals. *Journal of Infection*. 2021.
  49. Bullete O, Lorente P, Leiva A, Carandell E, Oliver A, Rojo E, et al. Panbio™ rapid antigen test for SARS-CoV-2 has acceptable accuracy in symptomatic patients in primary health care. *Journal of Infection*. 2021.
  50. Pavelka M, van Zandvoort K, Abbott S, Sherratt K, Majdan M, Jarcuska P, et al. The effectiveness of population-wide, rapid antigen test based screening in reducing SARS-CoV-2 infection prevalence in Slovakia. *medRxiv*. 2020.
  51. Černák J. The questionable impact of population-wide public testing in reducing SARS-CoV-2 infection prevalence in the Slovak Republic. *arXiv preprint arXiv:210100613*. 2021.
  52. Frnda J, Durica M. On Pilot Massive COVID-19 Testing by Antigen Tests in Europe. *Case Study: Slovakia. Infectious Disease Reports*. 2021;13(1):45-57.
  53. Mahase E. Covid-19: Mass testing in Slovakia may have helped cut infections. *BMJ*. 2020;371:m4761.
  54. Guglielmi G. Rapid coronavirus tests: a guide for the perplexed. *Nature*. 2021;590(7845):202-5.
  55. Holt E. COVID-19 testing in Slovakia. *The Lancet Infectious Diseases*. 2021;21(1):32.



56. Cox C, Dixon-Woods M. Need for ethical framework to guide mass testing for asymptomatic covid-19. *bmj*. 2020;371.
57. Health Information and Quality Authority (HIQA) Ireland. Rapid health technology assessment (HTA) of alternatives to laboratorybased real-time RT-PCR to diagnose current infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Dublin: HIQA; 2020.

## Appendix

**Appendix Table 1** Description of antigen testing in asymptomatic people in community settings (extracted on 5 February 2021)

Country	Antigen testing of asymptomatic individuals in community settings	Description of use
<b>European Union</b>		
<b>Austria</b> <sup>(3-5)</sup>	Yes	Antigen tests are recommended for asymptomatic persons in the context of outbreak management, testing of contacts after identification, screening tests in facilities with particularly exposed personnel or with people at high risk of serious illness (especially health and care facilities) or testing of large population infection control groups.  Mass antigen testing is being carried out on a voluntary basis. Positive antigen tests should be confirmed by PCR tests within 24 hours. From 8 Feb 2021, testing using rapid antigen tests is available free of charge in pharmacies throughout Austria.
<b>Belgium</b> <sup>(6, 7)</sup>	Yes	Rapid antigen tests can be used immediately for the diagnosis of infections in asymptomatic persons as part of a cluster investigation in group settings with a low-risk profile, such as schools, businesses, sports clubs and special youth care but not in care facilities.
<b>Czechia</b> <sup>(9)</sup>	Yes	Voluntary population-wide testing once every three days via a network of antigen sampling centers and GP/outpatient clinics. Positive result is followed up by a PCR test.  Screening of visitors and staff in long-term care facilities. Positive result is followed up by a PCR test.  Outbreak management. Positive result is followed up by a PCR test.

**Appendix Table 1** Description of antigen testing in asymptomatic people in community settings (extracted on 5 February 2021)

Country	Antigen testing of asymptomatic individuals in community settings	Description of use
<b>Denmark</b> <sup>(10, 11)</sup>	Yes	<p>Due to the lower sensitivity, rapid tests should not be used for testing people with symptoms of COVID-19 or close contacts.</p> <p>Quick tests can be implemented immediately for the following groups:</p> <ul style="list-style-type: none"> <li>▪ Selected groups or areas where prevalence is particularly high and there is a widespread spread of infection. Currently the Danish Health and Medicines Authority recommends the 15-25 year old age group.</li> <li>▪ When notified that you have been in contact via the app infect stop.</li> <li>▪ For screening of non-close contacts in cases of infection within work places with large offices.</li> </ul> <p>In addition, it will be gradually implemented for the following groups:</p> <ul style="list-style-type: none"> <li>▪ Screening of classes, when there has been one case of infection</li> <li>▪ Screening of visitors, spectators, etc. at major cultural and sporting events</li> <li>▪ Frequent screening (twice a week) of 15-25 year olds in educational institutions at reopening and in dormitories in areas with widespread spread of infection</li> <li>▪ Frequent screening of persons (twice a week) working in special occupations, where physical attendance is necessary and the knowledge of the epidemic suggests many outbreaks e.g. slaughter houses, construction sites and prison staff. The list of these professions will be further qualified on an ongoing basis in collaboration with the Danish Agency for Patient Safety and the Statens Serum Institut.</li> <li>▪ Frequent screening (twice a week) of staff in care centers and other institutions, treating people with increased risk of COVID-19 in areas with widespread infection and dispersion.</li> </ul>
<b>Finland</b> <sup>(12, 13)</sup>	Yes	PCR testing is primarily used for passenger testing on arrival into Finland, but antigen testing is also possible.

**Appendix Table 1** Description of antigen testing in asymptomatic people in community settings (extracted on 5 February 2021)

Country	Antigen testing of asymptomatic individuals in community settings	Description of use
France <sup>(14)</sup>	Yes	<p>Asymptomatic people who are contacts, detected individually or within a cluster, can avail of an antigen test. The test must be carried out within 24 hours if the contact case lives in the same home as the contaminated person or 7 days after the last contact with the contaminated person if the contact case does not live with the contaminated person.</p> <p>The tests can be used for asymptomatic people when the doctor, physiotherapist, midwife, dentist, pharmacist or nurse considers it necessary.</p> <p>The tests can also be used within the framework of collective screening operations, organized in particular by an employer or a public authority within targeted populations, in the event of a suspected cluster or particularly active circulation of the virus.</p>

**Appendix Table 1** Description of antigen testing in asymptomatic people in community settings (extracted on 5 February 2021)

Country	Antigen testing of asymptomatic individuals in community settings	Description of use
<b>Germany</b> <sup>(15, 16)</sup>	Yes	<p>Antigen testing of asymptomatic people may be considered in the following circumstances:</p> <ul style="list-style-type: none"> <li>▪ Contact persons: if testing deemed necessary, antigen test should only be used in exceptional circumstances e.g. in case of limited PCR capacity or in urgent cases to bridge the waiting time for the result of a simultaneously initiated PCR test.</li> <li>▪ In facilities with confirmed SARS-CoV-2 infection: extensive testing required but antigen test should only be used in event of limited PCR capacity or for an immediate decision to initiate cohort isolation where rapid antigen tests can be performed. If available, laboratory-based antigen tests can also be used.</li> <li>▪ Personnel in facilities without a COVID-19 case including facilities for rehabilitation, for people with disabilities, for ambulant care and day clinics: regular testing should only done in areas with an increased incidence (e.g. 7-day incidence &gt; 50/100,000) and if antigen tests are used they must have a high specificity. Every positive antigen test must be confirmed by PCR.</li> <li>▪ Patients in facilities without a COVID-19 case including facilities for rehabilitation, for people with disabilities, for ambulant care and day clinics: can be tested with an antigen test before (re) admission and before outpatient operations if PCR test unavailable. After admission, it is recommended that these people be tested with a rapid antigen test. This should be done randomly and on an ad hoc basis in coordination with the local health authority, and only in the case of an increased regional incidence (e.g. 7-day incidence &gt; 50/100,000).</li> <li>▪ Visitors to facilities for rehabilitation and for people with disabilities: in the case of an increased incidence (e.g. 7-day incidence &gt; 50/100,000) found in a region from which visitors to one of the above-mentioned facilities come, a rapid antigen test is recommended in coordination with the local health authority immediately before visiting the facility. Testing with an antigen test can be carried out up to once a week. A negative test result only applies to the day of the visit.</li> </ul> <p>Antigen testing of asymptomatic people may be considered in schools with a confirmed case as follows:</p> <ul style="list-style-type: none"> <li>▪ Schools and day care facilities can now receive rapid antigen tests for COVID-19 from pharmacies. After a case occurs in a class, the respective group, i.e. usually the class, should go into quarantine for five days. A rapid test should follow on day five. Children who test negative can then return to school.</li> </ul>

**Appendix Table 1** Description of antigen testing in asymptomatic people in community settings (extracted on 5 February 2021)

Country	Antigen testing of asymptomatic individuals in community settings	Description of use
<b>Greece</b> <sup>(17, 18)</sup>	Yes	<p>From 21 Dec 2020, the health ministry added free random sample tests for the public to its testing strategy, in order to protect all citizens and break the chain of coronavirus transmission. The test will be performed with rapid antigen detection tests.</p> <p>The platform for applying for a test is accessible through the testing website. Those interested in getting tested for the coronavirus can fill out an online application form and then wait to be chosen by the system at random. Those selected will receive an SMS on their cell phone with useful information for their appointment (e.g. which testing site to visit and the time).</p>
<b>Hungary</b> <sup>(19, 20)</sup>	Yes	<p>For asymptomatic close contacts in the health care sector and in the social care sector (people working/living in long term care institutions) a rapid antigen test should be conducted. If it is negative, a PCR test is also mandatory.</p> <p>On 11 Nov 2020, it was announced that hospital and social care workers, teachers, as well as the staff of nurseries and kindergartens will be tested weekly. The testing is done with rapid antigen tests, and participation is voluntary. The testing started on 20 Nov 2020.</p>
<b>Ireland</b> <sup>(21)</sup>	Yes	<p>Rapid antigen detection tests can be considered for testing asymptomatic close contacts as part of the response to a notification of a potential outbreak in the community (PCR tests not yet carried out), OR in the early stages of management of a PCR confirmed COVID-19 outbreak, as part of the Public Health Risk Assessment, if the following three criteria are met:</p> <ol style="list-style-type: none"> <li>1. There is evidence of widespread community transmission (&gt;10% positivity in the local community)</li> <li>2. There are symptomatic person(s) on site</li> <li>3. The outbreak involves a vulnerable population, including among staff and/or residents of long-term care facilities, homeless hostels, residents of direct provision centres, prisons, Irish Travellers etc.</li> </ol> <p>If the test is "not detected" in the close contact, the test should be repeated using PCR.</p> <p>Validation work is ongoing in relation to the use of rapid antigen detection tests in asymptomatic close contacts in the community who are tested in community testing centres.</p>

**Appendix Table 1** Description of antigen testing in asymptomatic people in community settings (extracted on 5 February 2021)

Country	Antigen testing of asymptomatic individuals in community settings	Description of use
<b>Italy</b> <sup>(22)</sup>	Yes	<p>The use of rapid antigen tests may be recommended to test people without symptoms, when a high positivity rate is expected, e.g. <math>\geq 10\%</math> as follows:</p> <ul style="list-style-type: none"> <li>▪ in contact tracing activities, to test asymptomatic contacts with high risk exposure;</li> <li>▪ in community screening activities for public health reasons (e.g. school environment, places of work, etc.). In such a situation, the risk of not detecting all cases or of false negative results is balanced by the timeliness of the results and the possibility of carrying out periodic tests;</li> <li>▪ in health and social welfare/social health contexts such as closed or semi-closed communities (e.g. prisons, reception centers for migrants), in areas with high community transmission for the periodic screening of residents/operators/visitors;</li> <li>▪ in residential care facilities, long-term care and other places health care, the use of the latest generation rapid antigen tests can be considered where public health measures need to be taken very quickly.</li> </ul> <p>Timing: If the exposure date is unknown or if there have been multiple exposures for at least three days, the rapid antigen test should be performed as soon as possible and within 7 days of the last exposure. In if there has been only one exposure, the rapid antigen test must be carried out between the third and seventh day from the onset of symptoms.</p> <p>In periodic screening programs, the repeat frequency of the test should be commensurate with the infectious risk, the circulation of the virus and the possible impact of an outbreak.</p> <p>Discordant results: In case of discrepancy between a rapid antigen test and molecular test performed within a short time interval, the RT-PCR result overrides the antigen test result and the data communicated to the surveillance system will be modified accordingly.</p>
<b>Malta</b> <sup>(23)</sup>	No information found	N/A

**Appendix Table 1** Description of antigen testing in asymptomatic people in community settings (extracted on 5 February 2021)

Country	Antigen testing of asymptomatic individuals in community settings	Description of use
<b>Netherlands</b> <sup>(24, 25)</sup>	Yes	<p>Screening in residential care facilities as part of outbreak management (repeated ADT). A negative result should be confirmed by PCR.</p> <p>Screening in schools, work and other institutional settings as part of outbreak management.</p> <p>Screening travellers returning from high-risk area.</p> <p>Screening healthy target groups (non-vulnerable) for short-term validity (no more than 48 hours) of a negative PCR test result for the specific test purpose e.g. to attend events. However, due to current restrictions this is not applicable at this point in time.</p>
<b>Poland</b> <sup>(26)</sup>	Yes	<p>The current epidemic situation should focus on testing symptomatic patients. However, the use of rapid diagnostic tests including antigen tests are recommended for the diagnosis of asymptomatic patients in identified infection locations, in line with WHO recommendations for antigen testing.</p>
<b>Portugal</b> <sup>(27, 28)</sup>	Yes	<p>If a PCR test is not available or the result cannot be obtained in less than 24 hours, a rapid antigen test should be used for high-risk contacts of a confirmed COVID-19 case.</p> <p>Screening as part of outbreak management in a range of settings such as schools, educational establishments, long-term care facilities and similar institutions.</p> <p>For admission to institutions (that are currently closed) when PCR is not available or does not allow the result to be obtained in less than 72 hours or in urgent situations such as children at risk or victims of violence.</p> <p>Screening of students (with signed consent by their parents), teaching and non-teaching staff at educational settings in counties with a 14-day cumulative incidence of more than 960 per 100,000 inhabitants. For secondary schools, three rounds should be performed separated by a 7-day interval even if the municipality is no longer above the defined cumulative incidence rate.</p> <p>Only positive results that are close contacts of a confirmed case should be followed up with PCR.</p>



**Appendix Table 1** Description of antigen testing in asymptomatic people in community settings (extracted on 5 February 2021)

Country	Antigen testing of asymptomatic individuals in community settings	Description of use
<b>Slovakia</b> <sup>(29)</sup>	Yes	<p>A pilot of mass testing using rapid antigen tests was conducted from 23-25 Oct 2020. Testing has progressed as follows:</p> <ul style="list-style-type: none"> <li>▪ Nationwide testing from 31 Oct-1 Nov 2020. A total of 3.6 million people, out of an estimated 4 million target population, were tested for COVID-19.</li> <li>▪ Follow-up testing took place from 7-8 Nov in 45 regions where the number of positive cases from previous testing was &gt;0.7%.</li> <li>▪ Further testing took place 21-22 Nov in 458 towns and municipalities who had a test positive rate &gt;1% in the in the previous round. 110,609 people were tested, with 2,501 (2.26%) positive tests.</li> <li>▪ The 2nd round of nationwide testing took place from 18-26 Jan 2021. 2.9 million participated with 36,547 (1.2%) presenting a positive result. Testing will be repeated in 36 districts where the positivity rate was higher than 1.01% and will take place in these districts from 3-7 Feb 2021.</li> </ul>
<b>Spain</b> <sup>(30)</sup>	Yes	<p>Screening in certain circumstances, for example, workers or residents in long-term care facilities; new admissions to health or social health centres and population subgroup Epi studies. PCR is preferred (pooled if possible) and all positive results must be followed up with PCR test.</p> <p>Although not preferred, antigen testing can be used in the case of asymptomatic close contacts cohabiting or in outbreaks and where the speed of the response time helps the rapid handling of contacts. In health and social health settings, a negative test result must be followed up with a PCR test.</p>
<b>Sweden</b> <sup>(31, 32)</sup>	Yes	<p>Antigen testing may be used for asymptomatic individuals in municipal care and nursing home settings for the purposes of (i) infection tracking where sampling is introduced around newly discovered cases and (ii) screening of care recipients who move into a home/return after a hospital stay/receive care from alternating providers in order to reduce the risk of COVID-19 being introduced into a group.</p> <p>Antigen testing may be also be used to screen care and nursing staff, regardless of type of employment, who work in special housing for the elderly. The testing should take place once a week.</p>
<b>UK Jurisdictions</b>		
<b>England</b> <sup>(33, 34)</sup>	Yes	<p>Screening at universities, schools, staff and visitors at residential care facilities using lateral flow antigen tests.</p> <p>Patient-facing staff delivering NHS services in primary care across all four primary care contractor groups (Medical, Dental, Optometry, and Community Pharmacy) should be offered lateral flow antigen testing.</p> <p>Previous pilots include Liverpool mass testing.</p>

**Appendix Table 1** Description of antigen testing in asymptomatic people in community settings (extracted on 5 February 2021)

Country	Antigen testing of asymptomatic individuals in community settings	Description of use
<b>Scotland</b> <sup>(36-38)</sup>	Yes	<p>Outbreak management at residential care facilities for staff using lateral flow antigen test kits.</p> <p>Screening of staff (twice weekly alongside PCR testing) and visitors at residential care facilities, including professional visitors, using lateral flow antigen test kits. Positive results followed up with PCR.</p> <p>Voluntary screening at universities using lateral flow antigen test. Positive result followed up with PCR, negative result followed up with another lateral flow antigen test.</p> <p>Community asymptomatic testing pilots in targeted communities with high prevalence using lateral flow antigen test as part of the larger UK mass testing pilots.</p>
<b>Wales</b> <sup>(39-41)</sup>	Yes	<p>Under a phased approach beginning in Jan 2021, voluntary testing (using lateral flow tests) will be made available to all members of staff and all students in schools, special schools and colleges. In schools and colleges, there will be daily testing for those identified as close contacts (outside their household) of confirmed cases. In special schools, there will be weekly testing.</p> <p>Outbreak management at schools via Mobile Testing Units or temporary testing satellites and drop-off and collection routes.</p> <p>Screening of staff at residential care facilities on a weekly or fortnightly basis.</p> <p>Screening at universities of returning students for on-campus activities using self-sampling lateral flow tests.</p>
<b>Northern Ireland</b> <sup>(35)</sup>	No information found	Note: Queen's University in Belfast has launched its own rapid COVID-19 testing programme for students using lateral flow antigen tests. All positive test results are followed up with PCR test.
<b>Others</b>		

**Appendix Table 1** Description of antigen testing in asymptomatic people in community settings (extracted on 5 February 2021)

Country	Antigen testing of asymptomatic individuals in community settings	Description of use
<b>Norway</b> <sup>(42)</sup>	Yes	<p>The PCR method is recommended as a first choice, but rapid antigen tests can be an alternative, or addition to PCR, in the following situations:</p> <ul style="list-style-type: none"> <li>▪ In the event of an outbreak of infection in order to quickly identify infected people and get started with infection tracking, quarantine and isolation, as well as clarify the extent of infection. Regular testing (every 3-4 days) of potentially exposed people will help to get faster control and stop the outbreak. In the event of an outbreak in the health service, parallel testing should be performed with PCR.</li> <li>▪ Regular testing of employees and residents in health and care institutions in the event of a high spread of infection in the local community, due to an increased risk of a serious disease course due to infection.</li> <li>▪ Testing at border crossings, either as a supplement or replacement for PCR testing. Positive antigen test in border testing must be confirmed by PCR test. Border testing has been made mandatory.</li> <li>▪ A positive rapid antigen test result for individuals who have no symptoms or known exposure to infection should be confirmed by PCR testing at a microbiological laboratory.</li> </ul>
<b>Switzerland</b> <sup>(43)</sup>	Yes	<p>From 28 Jan 2021, a rapid antigen test can be considered if you do not have symptoms. The goal of this strategy is to detect infections early and thus prevent large-scale outbreaks.</p> <ul style="list-style-type: none"> <li>▪ You receive a notification from the SwissCovid App that you have been in contact with a positive case.</li> <li>▪ Your doctor or the cantonal office responsible orders a rapid test because you have been in contact with someone who has tested positive.</li> <li>▪ You are called for a test to prevent a large-scale outbreak, for example in schools, ski areas, in certain regions, etc. In this case you will be contacted by the cantonal office.</li> <li>▪ You have a test to protect vulnerable people, for example before visiting a hospital or retirement or care home. In this case you will be invited for a test directly by the establishment in question.</li> <li>▪ You are tested as part of precautionary measures (e.g. at a sporting event, concert, etc.) or at the recommendation of your employer.</li> </ul> <p>Since rapid antigen tests yield a less reliable result than PCR tests, in certain situations a positive result from a rapid test will be confirmed with a PCR test.</p>

**Published by the Health Information and Quality Authority (HIQA).**

**For further information please contact:**

**Health Information and Quality Authority**

**George's Court**

**George's Lane**

**Smithfield**

**Dublin 7**

**D07 E98Y**

**+353 (0)1 8147400**

**[info@hiqa.ie](mailto:info@hiqa.ie)**

**[www.hiqa.ie](http://www.hiqa.ie)**

**© Health Information and Quality Authority 2021**