Digital contact tracing
for COVID-19 in Europe

Austria

In the period March 2020 - February 2022 Austria offered its citizens a digital contact tracing app in its efforts to combat the COVID-19 pandemic. The Stopp Corona app could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. The Stopp Corona App has been downloaded more than 1.4 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	25 March 2020	Suspended	Yes (February 2021 – February 2022)	Link

Main organisations involved

Data controller	Operating system provider	Additional partners
Austrian Red Cross	Accenture GmbH	See app website

Key app functionalities

- Notify contacts when positive
- Symptom tracker
- Diary/ journal

Digital contact tracing
for COVID-19 in Europe

Austria

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Austrian Red Cross

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

In the period February 2021 – February 2022, the Stopp Corona app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. More than 16,500 Austrian keys have been uploaded to the EFGS.

Available information about use and uptake[3]

App downloads:	**1.47 million**
App downloads as a share (%) of the population:	**16 %**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022. The latest number of downloads for Austria was reported on 12.01.2022.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

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Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Belgium

Coronalert

Belgium's app Coronalert has been developed to combat the COVID-19 pandemic. The app was launched on 30 September 2020 and is currently active[1]. It can be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Coronalert app has been downloaded more than 4 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	30 September 2020	Active	Yes	Link

Main organisations involved

Data controller	Operating system provider	Additional partners
Sciensano	Devside supported by Ixor	See app website

Key app functionalities

- Notify contacts when positive
- Symptom tracker
- Diary/ journal
- In-app COVID-19 related statistics
- Navigate to external resources
- Receive test results in app

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Belgium

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Sciensano

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

The Coronalert app is part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. Belgium joined the EFGS on 4 January 2021 and has since uploaded more than 467,000 keys.

Available information about use and uptake[3]

App downloads:	**4.2 million**
App downloads as a share (%) of the population:	**36 %**
Number of COVID-19 codes issued:	**336,916**
Number of COVID-19 codes entered:	**118,564**
Proportion of all positive tests that occur among app users:	**8.3 % (issued codes)** **2.9 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**35.2 %**
Ratio of exposure notifications received to positive test results entered:	**Ø 3.6**
Total number of exposure notifications generated:	**425,931**
Number of test results received in the app:	**4,051,165**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for number of COVID-19 codes and positive tests: 30.09.2020 – 05.06.2022.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Croatia

Stop COVID-19

The Croatian app Stop COVID-19 was launched on 27 July 2020 as part of the country's strategy to combat the COVID-19 pandemic. The app can be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Stop COVID-19 app has been downloaded more than 243,000 times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	27 July 2020	Active	Yes	Link

Main organisations involved

Data controller	Software developer	Others	
Croatian Ministry of Health	APIS IT	Bornfight	Croatian Agency for the Protection of Personal Data

Key app functionalities

Notify contacts when positive

Digital contact tracing
for COVID-19 in Europe

Croatia

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Croatian Personal Data Protection Agency

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

Since November 2020, the Stop COVID-19 app has been part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures.

Available information about use and uptake[3]

App downloads:	**243,426**
App downloads as a share (%) of the population:	**6 %**
Number of COVID-19 codes issued:	**81,931**
Number of COVID-19 codes entered:	**87**
Proportion of all positive tests that occur among app users:	**6.9 % (issued codes)** **0.007 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**0.1 %**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection: 27.07.2020 – 08.08.2022

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Republic of Cyprus

COVTRACER-EN

Cyprus developed the Covtracer-EN app to combat the COVID-19 pandemic. The app was launched on 11 March 2021 (with an earlier GPS-version released on 5 April 2020) and has since been suspended. It could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Covtracer-EN has been downloaded more than 60,000 times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	11 March 2021	Suspended on 25 July 2022	Yes (December 2020 – March 2022)	Link

Main organisations involved

Data controller

Ministry of Health of the Republic of Cyprus

Others

KIOS Center of Excellence at the University of Cyprus
CYENS Centre of Excellence
Deputy Ministry of Research, Innovation and Digital Policy (DMRID)
National eHealth Authority (NeHA)

Additional partners

See app website

Key app functionalities

- Notify contacts when positive
- Symptom tracker
- In-app COVID-19 related statistics
- Reach the call centre

Digital contact tracing
for COVID-19 in Europe

Republic of Cyprus

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Impact Assessment:
Available upon request

Cross-border tracing and warning

In the period December 2020 – March 2022 the Covtracer-EN app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications in case of detected exposures. The app was disconnected due to low usage from the public and subsequently low impact of the app among the Cypriot society.

Available information about use and uptake[2]

App downloads:	**60,958**
App downloads as a share (%) of the population:	**7 %**
Peak number of active users:	**23,395**
Percentage of population who actively used the app (peak):	**3 %**
Number of COVID-19 codes issued:	**197**
Number of COVID-19 codes entered:	**79**
Proportion of all positive tests that occur among app users:	**0.2 % (issued codes)** **0.1 % (entered codes)**

1: Check performed on 31 August 2022

2: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for number of COVID-19 codes and positive tests: 05.04.2020 – 29.10.2021

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Czech Republic

eRouska

The Czech Republic developed the eRouska app to combat the COVID-19 pandemic. The app was launched on 11 April 2020 and has since been suspended. It could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the eRouska has been downloaded more than 1.6 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	11 April 2020	Suspended on 1 November 2021	Yes (March – October 2021)	Link

Main organisations involved

Data controller	Others	Additional partners
Ministry of Health of the Czech Republic	National Agency for Communication and Information Technologies	See app website

Key app functionalities

Notify contacts when positive

Digital contact tracing
for COVID-19 in Europe

Czech Republic

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Czech Data Protection Authority

Data Protection Impact Assessment[1]: Link unavailable

Cross-border tracing and warning

In the period March – October 2021 the eRouska app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. 65,859 keys were uploaded to the EFGS via the eRouska app.

Available information about use and uptake[2]

App downloads:	**1.6 million**
App downloads as a share (%) of the population:	**15 %**
Peak number of active users:	**500,000**
Percentage of population who actively used the app (peak):	**5 %**
Number of COVID-19 codes entered:	**67,802**
Proportion of all positive tests that occur among app users:	**4.6 % (entered codes)**
Ratio of exposure notifications received to positive test results entered:	**Ø 3.8**
Total number of exposure notifications generated:	**257,086**

1: Check performed on 31 August 2022. The app is interoperable with the German Corona-Warn-App but not connected to the EFGS

2: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for COVID-19 codes, positive tests, and exposure notifications: 20.04.2020 – 24.03.2021

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Denmark

Smittestop

Denmark developed the Smittestop app to combat the COVID-19 pandemic. The app was launched on 18 June 2020 and has since been suspended. It could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Smittestop app has been downloaded more than 2.2 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	18 June 2020	Suspended on 31 March 2022	Yes (November 2020 – March 2022)	Link

Main organisations involved

Data controller	Operating system provider	Others		
Danish Patient Safety Agency	Netcompany	Danish Ministry of Health	Danish Health Authority	Danish Agency for Digitisation

Key app functionalities

- Notify contacts when positive
- In-app COVID-19 related statistics

Digital contact tracing
for COVID-19 in Europe

Denmark

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Danish Data Protection Agency Datatilsynet

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

In the period November 2020 – March 2022 the Smittestop app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. Denmark was one of the first Member States to join, with more than 4.8 million keys uploaded to the EFGS.

Available information about use and uptake[3]

App downloads:	**2.3 million**
App downloads as a share (%) of the population:	**39 %**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Estonia

Estonia developed the HOIA app to combat the COVID-19 pandemic. The app was launched on 20 August 2020 and has since been suspended. It could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the HOIA app has been downloaded more than 300,000 times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	20 August 2020	Suspended on 2 May 2022	Yes (July 2021 – May 2022)	Link

Main organisations involved

Data controller	Operating system provider	Additional partners
Estonian Health Board	Estonian Health and Welfare Information Systems Centre	See app website

Key app functionalities

- Notify contacts when positive
- Symptom tracker
- In-app COVID-19 related statistics
- Navigate to external resources

Digital contact tracing
for COVID-19 in Europe

Estonia

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Estonian Data Protection Inspectorate

Data Protection Impact Assessment[1]: Link unavailable

Cross-border tracing and warning

In the period July 2021 – May 2022 the HOIA app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. 16,715 keys from Estonia have been uploaded to the EFGS.

Available information about use and uptake[2]

App downloads:	**301,585**
App downloads as a share (%) of the population:	**23 %**
Number of infection confirmations in the app:	**8,556**
Proportion of infection confirmations in the app:	**2.6 %**

1: Check performed on 31 August 2022

2: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection: 20.08.2020 – 01.2022. In Estonia, no COVID-19 codes are issued. Instead, the Estonian DCT app HOIA had a mechanism that allowed users to prove their identity to the backend using national electronic identity. The number of infection confirmations is equivalent to number of entered codes in other countries.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Finland

Koronavilkku

Finland developed the Koronavilkku app to combat the COVID-19 pandemic. The app was launched on 31 August 2020 and has since been suspended. It could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Koronavilkku app has been downloaded more than 3 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	31 August 2020	Suspended on 1 June 2022	Yes (January 2021 – June 2022)	Link

Main organisations involved

Data controller	Backend operator	Others		
Finnish Institute for Health and Welfare	Social Insurance Institution of Finland (Kela)	Ministry of Social Affairs and Health	Solita Oy	DigiFinland Oy	National Cyber Security Centre

Key app functionalities

- Notify contacts when positive
- Integration to symptom assessment
- In-app COVID-19 related statistics
- Navigate to external resources

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Finland

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Office of the Data Protection Ombudsman

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

In the period January 2021 – June 2022, the Koronavilkku app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. More than 582,000 Finnish keys have been uploaded to the EFGS.

Available information about use and uptake[3]

App downloads:	**2,5 million**
App downloads as a share (%) of the population:	**45 %**
Peak number of active users:	**892,216**
Percentage of population who actively used the app (peak):	**16 %**
Number of COVID-19 codes issued:	**94,461**
Number of COVID-19 codes entered:	**64,742**
Proportion of all positive tests that occur among app users:	**8.7 % (issued codes) 6 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**68.5 %**
Median time between exposure and receipt of exposure notification through the app:	**2 days**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for COVID-19 codes and positive tests: 31.08.20 – 31.05.2022

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

France

France developed the TousAntiCovid app to combat the COVID-19 pandemic. The app was launched on 22 October 2020 and is one of only two EU apps which use a centralised app architecture. The app can be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology, based on which the French public health authority can issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the TousAntiCovid app has been downloaded more than 59 million times, making it the contact tracing app with the highest number of unique downloads in the EU.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	22 October 2020	Active	No	Link

Main organisations involved

Data controller	Backend operator	Software developer
INRIA	Capgemini	Lunabee Studio

Key app functionalities

- Notify contacts when positive
- Symptom tracker
- In-app COVID-19 related statistics
- Manage vaccine and test certificates
- Navigate to external resources
- Call button to a call centre
- Check-in with QR code and check-in history

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

France

App architecture

Centralised: the anonymised interactions (keys) are uploaded to a central server operated by the public health authority, which performs the assessment of risk interactions (matching of keys of users who have been in contact with an infected person) directly on that server. It is up to the app of the users to contact the server to get a "contact status" on a daily basis (the server by definition can't contact apps for privacy reasons).

France chose the centralised approach, stating several reasons, which can be grouped under efficiency-related reasons (enabling real-time knowledge of the epidemiological situation, monitoring of the number of warnings sent, full control of warning criteria), sovereignty-related reasons (keeping control of citizens' health data and of the technology) and privacy-related reasons.

Data protection

Data Protection Authority: French Data Protection Authority

Data Protection Impact Assessment[1]: Link unavailable

Cross-border tracing and warning

Currently, apps with a centralised architecture cannot be connected to the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures.

Available information about use and uptake[2]

App downloads:	**59.2 million**
App downloads as a share (%) of the population:	**87 %**
Peak number of active users:	**18 million**
Percentage of population who actively used the app (peak):	**27 %**
Number of COVID-19 codes entered:	**5.5 million**
Proportion of all positive tests that occur among app users:	**16.5 % (entered codes)**
Ratio of exposure notifications received to positive test results entered:	**Ø 1.9, max 3.4**
Total number of exposure notifications generated:	**4.2 million**
Proportion of diagnosed cases among app users who have previously received an exposure notification through the app:	**2.3 %**
Median time between exposure and receipt of exposure notification through the app:	**2 days**

1: Check performed on 31 August 2022

2: Based on the analysis performed in the study at the end of August 2022 and on the Ministry of Solidarity and Health Directorate General of Health Activity Report of TousAntiCovid for the period 02.06.2020 – 30.11.2021. Timeframe of data collection for COVID-19 codes, positive tests and exposure notifications: 22.10.2020 – 12.08.2022. In France COVID-19 codes are generated for all positive tests.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Germany

Germany offers its citizens a digital contact tracing app in its efforts to combat the COVID-19 pandemic. The Corona-Warn-App was launched on 16 June 2020 and is currently active[1]. The app, which can be installed on citizens' smartphones, captures anonymised interactions between smartphones based on Bluetooth technology and issues warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Corona-Warn-App has been downloaded more than 46 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning	Source code
Link	16 June 2020	Active	Yes	Link

Main organisations involved

Data controller	Backend operator	Software developer	Additional partners
Robert Koch Institute	Deutsche Telekom	SAP	See app website

Key app functionalities

- Notify contacts when positive
- Symptom tracker
- Diary/ journal
- In-app COVID-19 related statistics
- Manage vaccine and test certificates
- Navigate to external resources
- Check-in with QR code and check-in history
- Create QR codes for events
- Receive test results in app
- Book tests in app

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Germany

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Federal Commissioner for Data Protection and Freedom of Information (BfDI)

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

The Corona-Warn-App is part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. Germany was one of the first countries to have joined the EFGS on 12 November 2020 and has since uploaded more than 57 million keys, or more than 85 % of all EFGS uploads.

Available information about use and uptake[3]

App downloads:	**46 million**
App downloads as a share (%) of the population:	**56 %**
Peak number of active users:	**31 million**
Percentage of population who actively used the app (peak):	**37.2 %**
Number of COVID-19 codes issued:	**9,387,164**
Number of COVID-19 codes entered:	**6,656,979**
Proportion of all positive tests that occur among app users:	**28.1 % (issued codes) 20 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**71%**
Ratio of exposure notifications received to positive test results entered:	**6 – 19 red warnings**
Total number of exposure notifications generated:	**172,474,208**
Proportion of diagnosed cases among app users who have previously received an exposure notification through the app:	**6 % – 11.7 %**
Median time between exposure and receipt of exposure notification through the app:	**warned individuals get tested on Ø 4.4 days after the warning (half of them in 1.7 days)**
Number of test results received in the app:	**209,803,348**

1: Check performed on 15 July 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022 and on the German evaluations performed (About the Effectiveness and Benefits of the Corona-Warn-App and How many active users does the Corona-Warn-App have?). Timeframe of data collection for COVID-19 codes, positive tests and exposure notifications: 16.06.2020 - 26.07.2022.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Hungary

The Hungarian VirusRadar app was launched on 13 May 2020 and has since been suspended. It is one of only two EU apps which use a centralised app architecture. The app could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology, based on which the Hungarian public health authority could issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the VirusRadar app has been downloaded more than 95,000 times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Not available	13 May 2020	Suspended	No	Not available

Main organisations involved

Data controller	Software developer	Others		
National Centre for Public Health	Nextsense	Ministry of Innovation and Technology in Hungary	Biztributor	Hungarian Government Agency for Development of Informatics

Key app functionalities

Notify contacts when positive

Digital contact tracing
for COVID-19 in Europe

Hungary

App architecture

Centralised: the anonymised interactions (keys) are uploaded to a central server operated by the public health authority, which performs the assessment of risk interactions (matching of keys of users with a confirmed infection) directly on that server and informs users via their smartphones, where necessary. Hungary was one of only two EU countries to choose the centralised approach, alongside France.

Data protection

Data Protection Authority: National Authority for Data Protection and Freedom of Information

Data Protection Impact Assessment[1]: Link unavailable

Cross-border tracing and warning

Currently, apps with a centralised architecture cannot be connected to the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures.

Available information about use and uptake[2]

App downloads:	**95,000**
App downloads as a share (%) of the population:	**1 %**

1: Check performed on 31 August 2022

2: Based on the analysis performed in the study at the end of August 2022.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Iceland

Iceland developed the Rakning C-19 app to combat the COVID-19 pandemic. The app was launched on 2 April 2020. It can be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Rakning C-19 app has been downloaded more than 547,000 times.[1]

Rakning C-19

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	2 April 2020	Active	No	Link

Main organisations involved

Data controller	Software developer
Ministry of Justice	Directorate of Health

Key app functionalities

- Notify contacts when positive
- Navigate to external resources

Digital contact tracing
for COVID-19 in Europe

Iceland

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Icelandic Data Protection Authority

Data Protection Impact Assessment[1]: Link unavailable

Cross-border tracing and warning

The Rakning C-19 app was not part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications in case of detected exposures. Despite great interest from non-EU countries, the scope of application of the EFGS was limited to EU Member States.

Available information about use and uptake[2]

App downloads:	**547,937**
App downloads as a share (%) of the population:	**146 %**
Peak number of active users:	**100,000**
Percentage of population who actively used the app (peak):	**27 %**
Number of COVID-19 codes issued:	**5,018**
Number of COVID-19 codes entered:	**2,590**
Proportion of all positive tests that occur among app users:	**2.5 % (issued codes)** **1.3 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**51.6 %**

1: Check performed on 31 August 2022

2: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection: 02.04.2020 – 23.08.2022

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Ireland

Ireland developed the COVID Tracker app to combat the COVID-19 pandemic. The app was launched on 7 July 2020. It can be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the COVID Tracker app has been downloaded more than 4.5 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	7 July 2020	Active	Yes	Link

Main organisations involved

Data controller	Software developer	Additional partners
Health Service Executive (HSE)	NearForm	See app website

Key app functionalities

- Notify contacts when positive
- Symptom tracker
- In-app COVID-19 related statistics
- Manage vaccine and test certificates
- Navigate to external resources

Digital contact tracing
for COVID-19 in Europe

Ireland

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Data Protection Commission

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

Ireland was the first country to join in November 2020 the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. Since then, more than 85,000 Irish keys have been uploaded to the EFGS.

Available information about use and uptake[3]

App downloads:	**4.5 million**
App downloads as a share (%) of the population:	**89 %**
Peak number of active users:	**2 million**
Percentage of population who actively used the app (peak):	**40 %**
Number of COVID-19 codes issued:	**102,000**
Number of COVID-19 codes entered:	**24,857**
Proportion of all positive tests that occur among app users:	**6.3 % (issued codes) 1.5 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**24.4 %**
Ratio of exposure notifications received to positive test results entered:	**Ø 2.1**
Total number of exposure notifications generated:	**50,974**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection: 07.07.2020 – 23.08.2022

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Italy

Italy developed the Immuni app to combat the COVID-19 pandemic. The app was launched on 15 June 2020. It can be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Immuni app has been downloaded more than 21 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	15 June 2020	Active	Yes	Link

Main organisations involved

Data controller	Software developer	Additional partners
Presidency of the Council of Ministers	Bending Spoons	See app website

Key app functionalities

- Notify contacts when positive
- Manage vaccine and test certificates
- Navigate to external resources

Digital contact tracing
for COVID-19 in Europe

Italy

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Italian Data Protection Authority (Garante)

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

Italy was one of the first countries to join in November 2020 the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. Since then, more than 307,000 keys from Italy have been uploaded to the EFGS.

Available information about use and uptake[3]

App downloads:	**2.2 million**
App downloads as a share (%) of the population:	**37 %**
Number of COVID-19 codes entered:	**88,363**
Proportion of all positive tests that occur among app users:	**0.5 % (entered codes)**
Ratio of exposure notifications received to positive test results entered:	**Ø 2.2**
Total number of exposure notifications generated:	**195,045**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection: 15.06.2020 – 30.06.2022

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

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Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Latvia

APTURI COVID

Latvia developed the Apturi Covid app to combat the COVID-19 pandemic. The app was launched on 29 May 2020. It can be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Apturi Covid app has been downloaded more than 476,000 times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	29 May 2020	Active	Yes	Link

Main organisations involved

Data controller

Ministry of Health and Centre for Disease Prevention and Control

Additional partners

A consortium of Latvian entities (see app website)

Key app functionalities

- Notify contacts when positive
- In-app COVID-19 related statistics
- Navigate to external resources

Digital contact tracing
for COVID-19 in Europe

Latvia

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Latvian Data State Inspectorate

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

Latvia was one of the first countries to join in November 2020 the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. More than 42,000 keys from Latvia have been uploaded to the EFGS.

Available information about use and uptake[3]

App downloads:	**476,512**
App downloads as a share (%) of the population:	**25 %**
Number of COVID-19 codes issued:	**17,016**
Number of COVID-19 codes entered:	**7,787**
Proportion of all positive tests that occur among app users:	**2 % (issued codes) 1.9 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**45.8 %**
Ratio of exposure notifications received to positive test results entered:	**Ø 1.5**
Total number of exposure notifications generated:	**12,004**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for COVID-19 codes and positive tests: 29.05.2020 – 26.06.2022

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

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Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Lithuania

Korona Stop LT

The Korona Stop LT app was launched on 6 November 2020 as part of Lithuania's strategy to combat the COVID-19 pandemic. The app can be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Korona Stop LT app has been downloaded more than 410,000 times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	6 November 2020	Active	Yes (May 2021 – April 2022)	Not available

Main organisations involved

Data controller	Software developer	Others	
Lithuanian Ministry of Health	Dizaino Kryptis	Ministry of Health of the Republic of Lithuania	National Public Health Centre under the Ministry of Health of Lithuania

Key app functionalities

- Notify contacts when positive
- Navigate to external resources
- Call button to a call centre

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Lithuania

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Lithuanian Data Protection Inspectorate

Data Protection Impact Assessment[1]: Link unavailable

Cross-border tracing and warning

In the period May 2021 – April 2022 the Korona Stop LT app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. 83,085 keys from Lithuania have been uploaded to the EFGS.

Available information about use and uptake[2]

App downloads:	**410,300**
App downloads as a share (%) of the population:	**15 %**
Number of COVID-19 codes issued:	**40,800**
Number of COVID-19 codes entered:	**11,900**
Proportion of all positive tests that occur among app users:	**3.5 % (issued codes) 1 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**29.2 %**

1: Check performed on 31 August 2022

2: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for COVID-19 codes and positive tests: 06.11.2020 – 31.07.2022

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Malta

The COVIDAlert app is used by the Maltese government to combat the COVID-19 pandemic. The app was launched on 18 September 2020 and has since been suspended. It could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the COVIDAlert app has been downloaded more than 115,000 times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link (decommissioned)	18 September 2020	Suspended on 6 July 2022	Yes (March 2021 – July 2022)	Link

Main organisations involved

Data controller	Software developer	Others		
Superintendent of Public Health	Malta Information Technology	Maltese government	Ministry of Health	Malta Digital Innovation Authority

Key app functionalities

- Notify contacts when positive
- Symptom tracker
- In-app COVID-19 related statistics
- Navigate to external resources
- Call button to a call centre

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Malta

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Office of the Information and Data Protection Commissioner

Data Protection Impact Assessment[1]: Link unavailable

Cross-border tracing and warning

In the period March 2021 – July 2022 the COVIDAlert app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures.

Available information about use and uptake[2]

App downloads:	**115,695**
App downloads as a share (%) of the population:	**22 %**
Number of COVID-19 codes issued:	**737**
Number of COVID-19 codes entered:	**458**
Proportion of all positive tests that occur among app users:	**0.7 % (issued codes) 0.4 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**62 %**
Proportion of diagnosed cases among app users who have previously received an exposure notification through the app:	**8.6 %**

1: Check performed on 31 August 2022

2: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for COVID-19 codes and positive tests 18.09.2020 – 06.07.2022.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Netherlands

CoronaMelder

CoronaMelder is the Dutch app developed as part of the country's efforts to combat the COVID-19 pandemic. The app was launched on 10 October 2020 and has since been put on hold. It could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the CoronaMelder app has been downloaded more than 5.8 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	10 October 2020	Suspended on 22 April 2022	Yes (December 2020 – April 2022)	Link

Main organisations involved

Data controller

Municipal Health Service (GGD)

Others

Ministry of Health, Welfare and Sports (VWS)

Working groups of the National Institute for Public Health and Environment (RIVM) and the GGD

Key app functionalities

- Notify contacts when positive
- Call button to a call centre

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Netherlands

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Dutch Data Protection Authority

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

In the period December 2020 – April 2022 the CoronaMelder app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. More than 1.7 million keys from the Netherlands have been uploaded to the EFGS.

Available information about use and uptake[3]

App downloads:	**5.9 million**
App downloads as a share (%) of the population:	**33 %**
Peak number of active users:	**3 million**
Percentage of population who actively used the app (peak):	**19 %**
Number of COVID-19 codes entered:	**455,083**
Proportion of all positive tests that occur among app users:	**5.7 % (entered codes)**
Ratio of exposure notifications received to positive test results entered:	**0.8 – 1.4**
Proportion of diagnosed cases among app users who have previously received an exposure notification through the app:	**7.5 %**
Proportion of app users who have previously received an exposure notification through the app and weren't notified by manual contact tracing at the time of booking a test:	**77 %**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022 and on Ebbers et al., Evaluation CoronaMelder. An overview after 9 months. 28 May 2021. Timeframe of data collection: 10.10.2020 – 22.04.2022

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Norway

Smittestopp

In the period December 2020 - August 2022 Norway offered its citizens a digital contact tracing app in its efforts to combat the COVID-19 pandemic. The Smittestopp app could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. The app has been downloaded more than 1.3 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	21 December 2020	Suspended on 10 August 2022	Yes (February 2021 – August 2022)	Link

Main organisations involved

Data controller	Software developer	Others
Norwegian Institute of Public Health	Netcompany	Horsk Helsenett

Key app functionalities

- Notify contacts when positive
- In-app COVID-19 related statistics
- Navigate to external resources

Digital contact tracing
for COVID-19 in Europe

Norway

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Norwegian Data Protection Authority

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

In the period February 2021 – August 2022 the Smittestopp app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. 280,191 keys from Norway have been uploaded to the EFGS.

Available information about use and uptake[3]

App downloads:	**1.3 million**
App downloads as a share (%) of the population:	**24 %**
Number of COVID-19 codes entered:	**48,351**
Proportion of all positive tests that occur among app users:	**3.5 % (entered codes)**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for COVID-19 codes and positive tests: 21.12.2020 – 06.04.2022.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Poland

The Polish app ProteGO-Safe was used in the period June 2020 – March 2022 to help Poland combat the COVID-19 pandemic. The app could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the ProteGO-Safe app has been downloaded more than 2.9 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	9 June 2020	Suspended on 25 March 2022	Yes (November 2020 – March 2022)	Link

Main organisations involved

Data controller	Others		Additional partners
Chief Sanitary Inspector	Ministry of Digital Affairs	GovTech Polska	Chief Sanitary Inspectorate	See app website

Key app functionalities

- Notify contacts when positive
- Symptom tracker
- Diary/ journal
- In-app COVID-19 related statistics
- Travel restrictions
- Navigate to external resources

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Poland

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Polish Data Protection Authority (UODO)

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

In the period November 2020 – March 2022 the ProteGO-Safe app was part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. 446,387 keys from Poland have been uploaded to the EFGS.

Available information about use and uptake[3]

App downloads:	**3 million**
App downloads as a share (%) of the population:	**8 %**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Portugal

Portugal developed the StayAway COVID app to combat the COVID-19 pandemic. The app was launched on 1 September 2020 and has since been suspended. It could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the StayAway COVID app has been downloaded more than 3.2 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	1 September 2020	Suspended	No	Link

Main organisations involved

Data controller

- Directorate-General of Health (DGS)

Others

- Institute of Computer Systems Engineering, Technology and Science (Inesc Tec)
- Institute of Public Health of the University of Porto
- Keyruptive
- Ubirider
- The Telecommunications Institute
- The Robotics and System Engineering Laboratory

Key app functionalities

- Notify contacts when positive
- Navigate to external resources

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

Portugal

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Portuguese Data Protection Authority (CNPD)

Data Protection Impact Assessment[1]: Link unavailable

Cross-border tracing and warning

Portugal did not connect to the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. Portugal cited technical and societal aspects (i.e. the lack of societal confidence in the app's efficiency and effectiveness) as the main reasons for not connecting.

Available information about use and uptake[2]

App downloads:	**3.2 million**
App downloads as a share (%) of the population:	**31 %**
Number of COVID-19 codes issued:	**14,741**
Number of COVID-19 codes entered:	**3,137**
Proportion of all positive tests that occur among app users:	**1.9 % (issued codes) 0.4 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**21.3 %**

1: Check performed on 31 August 2022

2: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for COVID-19 codes and positive tests: 16.04.2020 – 31.09.2021

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Digital contact tracing
for COVID-19 in Europe

Slovenia

#OstaniZdrav

Slovenia developed the #OstaniZdrav app to combat the COVID-19 pandemic. The app was launched on 17 August 2020. It can be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the #OstaniZdrav app has been downloaded more than 475,000 times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	17 August 2020	Active	Yes	Link

Main organisations involved

Data controller	Software developer	Others
Ministry of Public Administration	PC7	National Institute of Public Health

Key app functionalities

- Notify contacts when positive
- Navigate to external resources
- Diary/ journal
- Manage vaccine and test certificates
- Create QR codes for events
- Check-in with QR code and check-in history

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Digital contact tracing
for COVID-19 in Europe

Slovenia

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Slovenian Information Commissioner

Data Protection Impact Assessment[1]: Link unavailable

Cross-border tracing and warning

The #OstaniZdrav app is part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. Slovenia joined the EFGS on 10 February 2021 and has since uploaded more than 270,000 keys.

Available information about use and uptake[2]

App downloads:	**475,687**
App downloads as a share (%) of the population:	**23 %**
Peak number of active users:	**107,380**
Percentage of population who actively used the app (peak):	**5.1 %**
Number of COVID-19 codes entered:	**24,906**
Proportion of all positive tests that occur among app users:	**3.3 % (entered codes)**

1: Check performed on 31 August 2022

2: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for COVID-19 codes and positive tests: 07.04.2021 – 30.07.2022

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Digital contact tracing
for COVID-19 in Europe

Spain

Radar **COVID**

The Radar Covid app was developed for the Spanish population to combat the COVID-19 pandemic. The app was launched on 21 August 2020 and is currently active1. The app, which can be installed on citizens' smartphones, captures anonymised interactions between smartphones based on Bluetooth technology and issues warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Radar Covid app has been downloaded more than 8.5 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	21 August 2020	Active	Yes	Link

Main organisations involved

Data controller

Ministry of Health and the Autonomous Communities

Others

General Secretariat of Digital Administration

Secretary of State for Digitalisation and Artificial Intelligence

Ministry of Economic Affairs and Digital Transformation

Key app functionalities

- Notify contacts when positive
- Diary/ journal
- Navigate to external resources

Digital contact tracing
for COVID-19 in Europe

Spain

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Spanish Data Protection Authority (AEPD)

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

The Radar Covid app is part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications (keys) in case of detected exposures. Spain was one of the first countries to have joined the EFGS on 12 November 2020 and has since uploaded more than 287,000 million keys.

Available information about use and uptake[3]

App downloads:	**8.5 million**
App downloads as a share (%) of the population:	**18 %**
Number of COVID-19 codes issued:	**3,324,839**
Number of COVID-19 codes entered:	**123,996**
Proportion of all positive tests that occur among app users:	**25.9 % (issued codes) 1 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**3.7 %**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for COVID-19 codes and positive tests: 21.08.2020 – 29.07.2022

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Digital contact tracing
for COVID-19 in Europe

Switzerland

SwissCovid

In the period June 2020 - March 2022 Switzerland offered its citizens a digital contact tracing app in its efforts to combat the COVID-19 pandemic. The SwissCovid App could be installed on citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. The SwissCovid App has been downloaded more than 3.8 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	25 June 2020	Suspended	Partly	Link

Main organisations involved

Data controller	Operating system provider	Others	Additional partners
Federal Office of Public Health (FOPH)	Federal Office for Information Technology, Systems and Telecommunication (FOITT)	Federal Institute of Technology in Zurich (ETH) Federal Institutes of Technology in Lausanne (EPFL)	See app website

Key app functionalities

- Notify contacts when positive
- In-app COVID-19 related statistics
- Navigate to external resources
- Call button to a call centre
- Check-in with QR code and check-in history
- Create QR codes for events

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
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Digital contact tracing
for COVID-19 in Europe

Switzerland

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Swiss Federal Data Protection and Information Commissioner (FDPIC)

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

The SwissCorona App was not part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications in case of detected exposures. Despite great interest from non-EU countries, the scope of application of the EFGS was limited to EU and Member States. However, Switzerland and Germany worked together on making their two apps interoperable.

Available information about use and uptake[3]

App downloads:	**3.8 million**
App downloads as a share (%) of the population:	**44 %**
Peak number of active users:	**2.3 million**
Percentage of population who actively used the app (peak):	**26.2 %**
Number of COVID-19 codes entered:	**204,862**
Proportion of all positive tests that occur among app users:	**5.9 % (entered codes)**
Ratio of exposure notifications received to positive test results entered:	**2.5 – 4**
Total number of exposure notifications generated:	**172,474,208**
Proportion of diagnosed cases among app users who have previously received an exposure notification through the app:	**19 % (Alpha) – 41 % (Omicron)**
Median time between exposure and receipt of exposure notification through the app:	**2 days**

1: Check performed on 31 August 2022. The app is interoperable with the German Corona-Warn-App but not connected to the EFGS

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022 and on publications by Daniore et al., 2021: https://publichealth.jmir.org/2021/12/e30004 and Ballouz et al., 2022: https://publichealth.jmir.org/2022/5/e35653. Timeframe of data collection for number of COVID-19 codes and positive tests: 25.06.2020 – 31.03.2022.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
Study team contact: contacttracing@empirica.com; European Commission contact: CNECT-H3@ec.Europa.eu

Digital contact tracing
for COVID-19 in Europe

England Wales

The digital contact tracing app NHS COVID-19 was developed in support of combatting the COVID-19 pandemic in England and Wales. The app was launched on 24 September 2020. It can be installed on English and Welsh citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the NHS COVID-19 app has been downloaded more than 31 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	24 September 2020	Active	Partly	Link

Main organisations involved

Data controller

Department of Health and Social Care (DHSC)

Software developer

VMware Pivotal Labs

Others

Accenture
Alan Turing Institute
NHS Digital
NHSx
Oxford University
Zuhlke Engineering
The UK's NHS
The UK Government

Key app functionalities

- Notify contacts when positive
- Symptom tracker
- Navigate to external resources
- Check-in with QR code and check-in history
- Create QR codes for events
- Receive test results in app
- Book tests in app
- Self-isolation countdown

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
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Digital contact tracing
for COVID-19 in Europe

England Wales

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Information Commissioner's Office

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

The NHS COVID-19 app was not part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications in case of detected exposures. Despite great interest from non-EU countries, the scope of application of the EFGS was limited to EU Member States. However, the app is interoperable with the apps developed for Northern Ireland (StopCOVID NI) and Scotland (Protect Scotland).

Available information about use and uptake[3]

App downloads:	**31 million**
App downloads as a share (%) of the population:	**52 %**

1: Check performed on 31 August 2022
2: Last accessed on 31 March 2022
3: Based on the analysis performed in the study at the end of August 2022.

This fact sheet has been developed as part of the study "Lessons learned, best practices and epidemiological impact of the common European approach on digital contact tracing to combat and exit the COVID-19 pandemic" commissioned by the European Commission's DG CONNECT, Unit H3 – eHealth, Well-Being and Ageing and carried out by empirica Communication and Technology Research.
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Digital contact tracing
for COVID-19 in Europe

Northern Ireland

StopCOVID NI

The digital contact tracing app StopCOVID NI was developed in support of combatting the COVID-19 pandemic in Northern Ireland. The app was launched on 30 July 2020. It can be installed on Northern Ireland's citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	30 July 2020	Active	Partly	Link

Main organisations involved

Data controller	Software developer	Others	
Health and Social Care Northern Ireland, Department of Health	Expleo	NearForm	Department of Health

Key app functionalities

- Notify contacts when positive
- Self-isolation countdown
- Self-isolation certificate

Digital contact tracing
for COVID-19 in Europe

Northern Ireland

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Information Commissioner's Office

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

The StopCOVID NI app was not part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications in case of detected exposures. Despite great interest from non-EU countries, the scope of application of the EFGS was limited to EU Member States. However, the app is interoperable with the apps developed for England and Wales (NHS COVID-19 app) and Scotland (Protect Scotland).

Available information about use and uptake

No information available

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

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Digital contact tracing
for COVID-19 in Europe

Scotland

The digital contact tracing app Protect Scotland was developed in support of combatting the COVID-19 pandemic in Scotland. The app was launched on 10 September 2020 and has since been suspended. It could be installed on Scottish citizens' smartphones to capture anonymised interactions between smartphones based on Bluetooth technology and issue warnings about close contacts with persons who have tested positive for the coronavirus. Since its launch, the Protect Scotland app has been downloaded more than 2.3 million times.[1]

Key facts at a glance

Website	Launch	App status[1]	Cross-border tracing warning[1]	Source code
Link	10 September 2020	Suspended on 29 April 2022	Partly	Link

Main organisations involved

Data controller

Scottish Government

Software developer

NearForm

Others

Public Health Scotland
NES Digital Service
(part of NHS Education for Scotland)
Amazon Web Services
NHS National Services Scotland
Gov.UK Notify
Cello Signal Ltd
Scottish Local Authorities

Key app functionalities

- Notify contacts when positive
- Self-isolation certificate

Digital contact tracing
for COVID-19 in Europe

Scotland

App architecture

Decentralised: the anonymised interactions (keys) are uploaded to a central server, but the assessment of risk interactions (matching of keys of users with a confirmed infection) happens on the user's smartphone only.

Data protection

Data Protection Authority: Scottish Government

Data Protection Impact Assessment[2]: **Download**

Cross-border tracing and warning

The Protect Scotland app was not part of the European Federation Gateway Service (EFGS), which enables apps from different Member States to talk to each other and exchange cross-border notifications in case of detected exposures. Despite great interest from non-EU countries, the scope of application of the EFGS was limited to EU Member States. However, the app is interoperable with the apps developed for England and Wales (NHS COVID-19 app) and Northern Ireland (StopCOVID NI).

Available information about use and uptake[3]

App downloads:	**2.3 million**
App downloads as a share (%) of the population:	**43 %**
Number of COVID-19 codes issued:	**407,081**
Number of COVID-19 codes entered:	**68,355**
Proportion of all positive tests that occur among app users:	**57.9 % (issued codes)** **9.7 % (entered codes)**
Proportion of positive tests among app users that are entered into the app (positive tests uploaded):	**16.8 %**

1: Check performed on 31 August 2022

2: Last accessed on 31 March 2022

3: Based on the analysis performed in the study at the end of August 2022. Timeframe of data collection for COVID-19 codes and positive tests: 10.09.2020 – 25.11.2021

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