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Response plan to control and manage the threat of multi- and extensively drug-resistant gonorrhoea in Europe

Indicator monitoring 2023

ECDC SURVEILLANCE REPORT

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This report was commissioned by the European Centre for Disease Prevention and Control (ECDC), coordinated by Csaba Ködmön, and produced by UK Health Security Agency, London, United Kingdom and Örebro University Hospital, Örebro, Sweden.

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Acknowledgements

We wish to thank the members of the Euro-GASP network who have contributed data to this report:

Austria - Stefanie Schindler; Belgium - Amaryl Lecompte; Bulgaria - Ivva Philipova; Croatia - Blaženka Hunjak; Cyprus - Panagiota Maikanti-Charalampous; Czechia - Hana Zákoucká; Denmark - Steen Hoffmann; Estonia - Kairi Tõnsau; Finland - Jari Jalava; France - Beatrice Bercot; Germany - Regina Selb; Greece - Ioanna Magaziotou; Hungary - Eszter Balla; Iceland - Anna M. Gudmundsdottir; Ireland - Angeline McIntyre; Italy - Barbara Suligoi and Paola Stefanelli; Latvia - Gatis Pakarna; Liechtenstein - Esther Walser-Domjan; Lithuania - Algirdas Griskevicius; Luxembourg - Kirstin Khonyongwa; Malta - Francesca Mifsud; Netherlands - Maartje Visser; Norway - Anne O Olsen ; Poland - Beata Młynarczyk-Bonikowska; Portugal - Maria José Borrego; Romania - Denisa Janta; Slovak Republic - Peter Pavlik; Slovenia - Julija Germ; Spain - Javier Gómez Castellá; Sweden - Magnus Unemo.

Suggested citation: European Centre for Disease Prevention and Control. Response plan to control and manage the threat of multi- and extensively drug-resistant gonorrhoea in Europe – Indicator monitoring 2023. Stockholm: ECDC; 2026.

Stockholm, July 2026

ISBN: 978-92-9498-909-3
DOI: 10.2900/9709801
Catalogue number: TQ-01-26-054-EN-N

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Abbreviations

AMR	Antimicrobial resistance
AST	Antimicrobial susceptibility testing
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EPIS	Epidemic Intelligence Information System
EQA	External quality assessment
EU	European Union
Euro-GASP	European Gonococcal Antimicrobial Surveillance Programme
HIV	Human immunodeficiency virus
MDR NG	Multidrug-resistant *Neisseria gonorrhoeae*
MDR	Multidrug-resistan
MIC	Minimum inhibitory concentration
NAAT	Nucleic acid amplification test
NG-MAST	*Neisseria gonorrhoeae* multi-antigen sequence typing
ST	Sequence type
STI	Sexually transmitted infection
TESSy	The European Surveillance System
UK	United Kingdom
WGS	Whole-genome sequencing
WHO	World Health Organization
XDR NG	Extensively drug-resistant *Neisseria gonorrhoeae*

Key findings

Progress towards implementation of the 2019 Response Plan to control and manage the threat of multidrug-resistant gonorrhoea in Europe was mixed. While improvements were observed in training activities and alignment with European treatment guidelines (100% of countries reported guidelines aligned with the 2020 European recommendations in 2023, compared with 73.1% in 2019), there were decreases in several critical indicators. In particular, capacity for antimicrobial surveillance weakened, with participation in Euro-GASP decreasing slightly from 26/31 countries (83.9%) in 2019 to 24/30 (80%) in 2023. Similarly, the number of laboratories participating in external quality assessment (EQA) fell from 28 to 24. At national level, access to culture and antimicrobial susceptibility testing (AST) declined substantially, with the estimated proportion of sexually transmitted infection (STI) clinics with access to culture and AST decreasing from an average of 97.3% in 2019 to 82.6% in 2023, and the proportion of reported cases tested with culture falling from 38.5% to 29.5%.

Reporting completeness improved slightly, with overall epidemiological data completeness increasing from 83.2% in 2019 to 86.1% in 2023. However, key variables, such as mode of transmission, remained incomplete at approximately 50% completeness.

Overall, these findings indicate a reduced capacity in the European Union/European Economic Area (EU/EEA) to detect, monitor, and respond to antimicrobial-resistant *Neisseria gonorrhoeae* since the last reporting period.

1 Background

Gonorrhoea continues to be one of the most common bacterial sexually transmitted infections (STIs) in the EU/EEA. In 2024, 28 EU/EEA countries reported 106 331 confirmed cases, corresponding to a notification rate of 26.9 cases per 100 000 population, the highest recorded since European surveillance began [1]. The notification rate increased by 4.3% between 2023 and 2024, continuing a sustained upward trend. Transmission patterns remained heterogeneous. Rates increased among men (+7.9%) while they decreased among women (−8.6%). Men who have sex with men (MSM) accounted for approximately 62% of reported cases. The highest rates were observed among men aged 25–34 years and women aged 20–24 years.

Over the past two decades, *Neisseria gonorrhoeae* has demonstrated a strong capacity to develop resistance to successive antimicrobial classes. This includes resistance to penicillins, fluoroquinolones, macrolides, and extended-spectrum cephalosporins, posing a significant threat to effective treatment and control. Inadequate treatment of gonorrhoea or treatment with drugs to which the strain is resistant may result in complications such as pelvic inflammatory disease, ectopic pregnancy, and infertility [2], as well as an increased risk of HIV acquisition and transmission [3].

Ceftriaxone remains the cornerstone of empiric treatment for gonorrhoea, so the treatment failures reported in the early 2010s caused concern worldwide. ECDC and a group of international experts led development of the 'Response plan to control and manage the threat of multidrug-resistant gonorrhoea in Europe', which was published in 2012 [4]. This complemented the World Health Organization (WHO) Global Action Plan [5], as well as national action plans published by the United States Centers for Disease Control and Prevention [6] and the UK Health Security Agency (formerly Public Health England) [7]. Furthermore, in 2012, the 'European guideline on the diagnosis and treatment of gonorrhoea' was updated, recommending a first-line dual antimicrobial therapy of a single 500 mg intramuscular dose of ceftriaxone, together with a single 2 g oral dose of azithromycin [8]. Around the same time, other international gonorrhoea treatment guidelines were also updated to recommend similar dual therapies, although with differing dosages [9-11].

Following reports of treatment failures with dual antimicrobial therapy and the emergence of extensively drug-resistant (XDR) *N. gonorrhoeae* strains in 2016–2018, including cases associated with international transmission, concern increased regarding the potential risk of untreatable gonorrhoea. In response, ECDC published a rapid risk assessment in 2018, highlighting the need to strengthen surveillance, improve detection and reporting of treatment failures, and reinforce prevention measures.

Against this backdrop of emerging resistance — particularly increasing azithromycin resistance in the EU/EEA — the ECDC Response Plan was updated in 2019, providing a strategic framework to strengthen antimicrobial resistance surveillance, clinical management and control measures [12].

Current European treatment guidelines (2020) recommend ceftriaxone-based therapy, typically a single 1 g intramuscular dose, with or without azithromycin depending on local epidemiology and clinical context [13]. These recommendations are broadly aligned with other international guidelines, which have similarly adapted treatment strategies in response to evolving resistance patterns [14–16].

The 2012 Response Plan included indicators to be used for monitoring the plan's effectiveness. The updated 2019 Response Plan used these indicators to review the effectiveness of the 2012 Response Plan, updated the indicators with data from 2017, and assessed progress made over the intervening years. In 2020, data were collected on the Response Plan indicators for 2019, using 2017 as a baseline [17]. Similarly, data were collected on the indicators for 2023, using 2019 as a baseline. This report reviews the progress made between 2019 and 2023 and monitors the effectiveness of the 2019 Response Plan.

2 Methods

A structured survey was developed to monitoring the effectiveness of the updated 2019 Response Plan (Annex 1). Section A of the survey collected limited participant information, while Section B gathered data on the Response Plan indicators for 2023, using 2019 as a baseline. Section C collected information on barriers to participation in Euro-GASP via decentralised testing.

The survey was implemented using the EUSurvey tool (https://ec.europa.eu/eusurvey/home/welcome). All questions were mandatory, except for Section C. Section C was visible only to countries that did not participate in Euro-GASP via decentralised testing as of 2022 (2023 antimicrobial susceptibility testing (AST) submissions were still in progress when the survey was developed). For Section B on Response Plan indicators, participants were asked to provide further information in a free-text field for any indicators that were not met. For Section C on barriers to decentralised testing, participants were required to submit 'True' or 'False' responses, and there was a free-text field where participants could describe any additional barriers.

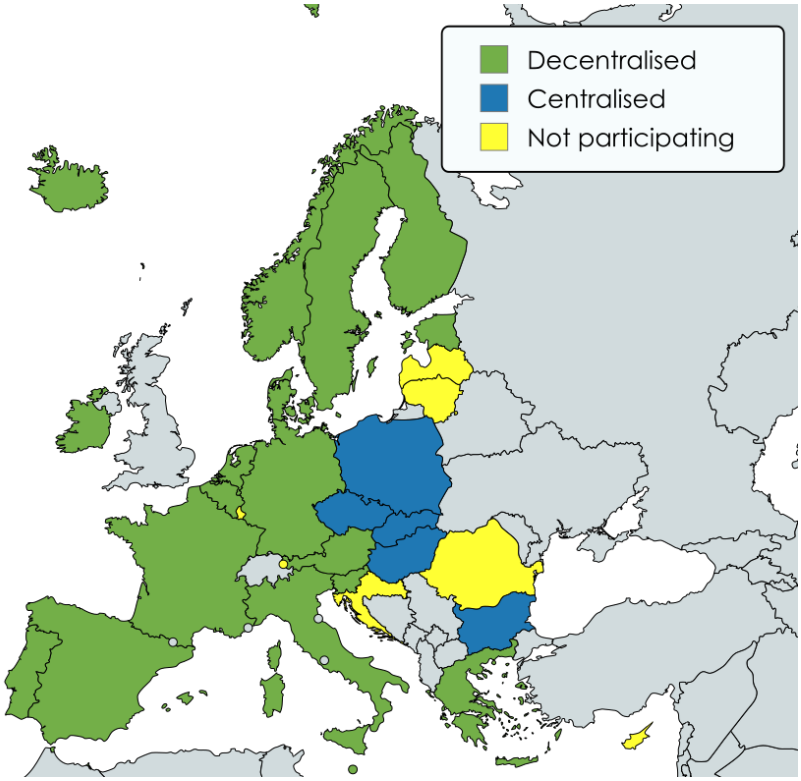
In July 2024, current members of Euro-GASP and the European STI network were asked to nominate one representative per country to complete the survey. The survey was available between 1 August and 1 October 2024. Survey responses were collated and exported from the EUSurvey tool. Responses to structured questions and additional participant comments were evaluated to determine whether indicators had been met and to summarise barriers to decentralised testing. Additional data on EU/EEA-level indicators were extracted from the Annual Report or provided by ECDC.

3 Results

3.1 Survey participation

The survey was completed by 30/30 (100%) EU/EEA countries, 12 (40%) of which were not participating in Euro-GASP via decentralised testing as of 2022 (Figure 1).

Figure 1. Participation of EU/EEA countries in the Response Plan indicator monitoring survey



Created with MapChart and Inkscape.

Countries that participated in Euro-GASP in 2022 via decentralised and centralised testing are shown in green and blue, respectively.

Countries that did not participate in Euro-GASP in 2022 are shown in yellow.

Liechtenstein and Luxembourg are both shaded yellow.

3.2 Monitoring the implementation of the Response Plan, 2023

The indicators described in the updated Response Plan published in 2019 [12] encompassed three main themes to be assessed at both the EU/EEA and national levels:

- strengthening antimicrobial surveillance;
- clinical management and treatment failure monitoring;
- control strategy and communications.

Data were combined from the Euro-GASP annual report, Gonorrhoea Annual Epidemiological Report, and Euro-GASP participants' survey responses to assess whether indicators were met in 2023, and to monitor the progress made since 2019. EU/EEA-level indicators for 2019 and 2023 are shown in Table 1, along with the results of indicator monitoring between 2012 and 2017. National-level indicators for 2019 and 2023 are shown in Table 2. In both tables, indicators are numbered as in the updated Response Plan. Although a subset of indicators had improved, the results for several important indicators had decreased at both the EU/EEA and national level between 2019 and 2023 (Tables 1 and 2).

Table 1. Euro-GASP Response Plan indicators (2012–2023) and descriptive trends (2019 vs 2023), EU/EEA-level[a]

Component	Indicator	2012	2017	2019	2023	Trend (2019 vs 2023)
Strengthening antimicrobial surveillance	1.1 Number and proportion of countries participating in Euro-GASP	20/30 (66.7%)	27/31 (87.1%)	26/31 (83.9%)	24/30 (80%)	↓/↓∞
	1.2 Number of isolates reported through Euro-GASP	1 927 (4% of reported gonorrhoea cases)	3 248 (3% of reported gonorrhoea cases)	4 166 (3.5% of reported gonorrhoea cases)	5 269 (5.8% of reported gonorrhoea cases)	↑
	1.3 Number of laboratories participating in Euro-GASP EQA	15	28	28	24	↓
	1.4.1 Number of countries that have participated in the ECDC laboratory training modules*	14 (2014)	12 (2016); 13 (2017)	12 (2020)**	14 (2024)§	↑
	1.4.2 Number of professionals from these countries that have participated in the ECDC laboratory training modules*	14 (2014)	12 (2016); 13 (2017)	12 (2020)**	14 (2024)§	
	1.5 Proportion of countries reporting epidemiological characteristics in Euro-GASP (based on mode of transmission)	16/20 (80.0%)	17/27 (63.0%)	22/26 (84.6%)	21/24 (87.5%)	↑
	1.6 Completeness of Euro-GASP data for key epidemiological characteristics[#]	85.9% (51.2% for mode of transmission)	87.7% (61.6% for mode of transmission)	83.2% (48.2% for mode of transmission)	86.1% (50.4% for mode of transmission)	↑/↑
	Supplemental indicator: time between Euro-GASP data collection and publication of (interim) annual report	12 months	8 months	12 months	Not yet published	→
Clinical management and treatment failure monitoring	2.1 ECDC contributes to public health aspects of revision of the gonorrhoea patient management guidelines~	Achieved	Achieved	Achieved	Achieved	→
	2.2 European access to an online reporting template for treatment failures supported by ECDC (EpiPulse, previously EPIS-STI)	No	Yes	Yes	Yes	→
	2.3 Number of reported verified gonorrhoea treatment failures to ECDC (as available in EpiPulse, previously EPIS-STI)	N/A	Only two cases reported in EPIS-STI since publication of 2012 response plan	None	None	→

Component	Indicator	2012	2017	2019	2023	Trend (2019 vs 2023)
Control strategy and communications	3.2 Number of visits to ECDC Response Plan website	N/A	N/A	293 in 2019 (7 October[†]–31 December 2019) and 262 in 2020	N/A	N/A
	3.3 Number of peer-reviewed publications or other communications on antimicrobial resistant NG from Euro-GASP[‡]	Not determined	Not determined	5 peer-reviewed publications (average of 1.7 per year). Other communications: molecular typing report, annual EQAs and Euro-GASP reports, laboratory capacity survey, training survey, Response Plan.	10 peer-reviewed publications (average of 2.5 per year). Other communications: EQA reports, annual Euro-GASP reports, and training survey.	↑

[a] Comparisons across years should consider the change in denominator from 30 to 31 when Croatia joined the EU in 2013 and from 31 to 30 EU/EEA countries following the UK's withdrawal in 2020.
∞ The indicator includes both the number and proportion. As the denominator changed over time, both measures are presented in the trend column. The first arrow indicates the change in the number of participating countries and the second the change in percentage of participating countries.
** ECDC laboratory training courses are not offered every year. Courses delivered within two years of indicator monitoring were considered with the year shown in parentheses.*
*** The course planned for 2020 was cancelled due to the COVID-19 pandemic.*
§ The course delivered in 2024 included participants from 10 EU/EEA countries.
 # Percentage completeness average was taken across all countries for age, gender, mode of transmission and site of infection.
~ At the EU/EEA level, this was defined as membership of the European STI Guideline Editorial Board.
† Date of publication for the updated response plan.
‡ Total number of peer-reviewed publications written by Euro-GASP hub/ECDC provided for the periods 2017–2019 and 2020–2023. Other communications listed also span these periods.
EQA: External quality assessment; EPIS-STI: Epidemic Intelligence Information System - Sexually transmitted infection; N/A: not available; NG: Neisseria gonorrhoeae

Table 2. Euro-GASP Response Plan indicators and descriptive trends (2019 and 2023), national-level responses from EU/EEA countries[a]

Component	Indicator	Indicator achieved*		Trend
		2019 (responses from 26/31 EU/EEA countries)†	2023 (responses from 30/30 EU/EEA countries)	
Strengthening antimicrobial surveillance	1.8 Presence of a national representative isolate collection	21 countries (80.8%)	23 countries (76.7%)	↑/↓**
	1.9 Number of countries offering national training modules (laboratory and/or clinical)	2 countries (7.7%)	5 countries (16.7%)	↑
	1.10 Proportion of all STI clinics (sentinel sites) that have access to culture and antimicrobial susceptibility testing	Range: 71–100%; average: 97.3% (four countries reported variable unknown or NA)	Range: 0–100%; average: 82.6%; median: 100% (six countries reported variable unknown)	↓
	1.11 Proportion of all (reported) gonorrhoea cases tested with culture and with antimicrobial susceptibility results available	Range: 5–100%; average: 38.5% (six countries reported variable unknown or NA)	Range: 0–80%; average: 29.5%; median: 30% (nine countries reported variable unknown)	↓
	1.12 Proportion of patients who received recommended gonorrhoea treatment	Range: 35-100%; average: 93.2% (14 countries reported variable unknown or NA)	Range: 8–100%; average: 78.1%; median: 90% (14 countries reported variable unknown)	↓
Clinical management and treatment failure monitoring	2.1 ECDC contributes to public health aspects of revision of the gonorrhoea patient management guidelines~	19/26 (73.1%) countries recommended antimicrobial agents listed in the 2012 European treatment guidelines	27/30 (90%) countries had national treatment guidelines, 100% of which recommended antimicrobial agents listed in the 2020 European treatment guidelines	↑
	2.2 Online reporting template for possible and confirmed treatment failures developed#	5 countries (19.2%)	2 countries (6.7%)	↓
	2.3 Number of reported verified gonorrhoea treatment failures to ECDC	0 countries (0%)	0 countries (0%)	→
Control strategy and communications	3.1. Adoption of national plan to control multidrug resistant/extensively drug-resistant (MDR/XDR) gonorrhoea or inclusion of MDR/XDR gonorrhoea in gonorrhoea, STI, sexual health or other relevant strategy	6 countries (23.1%)	9 countries (30%)	↑
	3.3 Number of peer-reviewed publications or other communications on antimicrobial resistant NG from Euro-GASP	Two reports, 47 peer-reviewed papers, one book chapter from 12 countries (46.2%)	33 publications and four conference proceedings from 12 countries (42.9%) (2 countries reported variable unknown)	↓

[a] Comparisons across years should consider the change from 31 to 30 EU/EEA countries following the UK's withdrawal in 2020.
** Summary statistics were calculated excluding countries that responded 'unknown' or 'N/A'.*
*** The first arrow indicates the number of countries, while the second arrow represents the corresponding percentage. As the number of countries responding to the survey varied over time, both measures are presented.*
 # Refers to the existence of a predefined template for reporting treatment failures, rather than the development of a new template.
† Results extracted from [17]. Note that the number of EU/EEA countries surveyed changed between 2019 and 2023 due to the withdrawal of the UK from the EU.
~ At the national level, this was defined as countries recommending first-line antimicrobial agents for treatment of uncomplicated gonorrhoea infection listed in the EU treatment guidelines.
STI: Sexually transmitted infection; NA: not available; MDR: Multidrug-resistant; XDR: Extensively drug-resistant; NG: Neisseria gonorrhoeae.

3.2.1 Strengthening antimicrobial surveillance

Europe-wide surveillance for antimicrobial resistance (AMR) in *N. gonorrhoeae* is critical due to inter-connected sexual networks and cross-border spread of gonococcal strains across the region. Monitoring of resistance levels and detection of emerging resistance is essential to inform European and national treatment guidelines for successful patient management and interruption of transmission. The use of suboptimal medication increases the risk of emergence of multidrug-resistant *N. gonorrhoeae* (MDR NG) and XDR NG. Consequently, the updated 2019 Response Plan sought to strengthen antimicrobial surveillance at both the EU/EEA and national levels.

3.2.1.1 EU/EEA level

Participation in Euro-GASP

Euro-GASP provides EU/EEA Member States with access to quality-assured AST, regular EQA exercises, expert advice (including country visits), and laboratory training. Participation in Euro-GASP has expanded since the initial Response Plan was published in 2012 (Table 1). However, both the number and proportion of countries participating declined between 2019 (26/31 countries, 83.9%) and 2023 (24/30 countries, 80%) (Table 1). One contributing factor was the withdrawal of the United Kingdom from the EU, but gaps also remained in parts of Central and Eastern Europe (Figure 1). Similarly, the number of laboratories participating in the Euro-GASP EQA also decreased between 2019 (n=28) and 2023 (n=24). The EQA is essential for gaining valid and comparable AST data to reliably detect emerging AMR and optimise patient management [18].

Barriers to participation in Euro-GASP via decentralised testing

Twelve countries were asked to provide additional data to explore factors preventing them from participating in Euro-GASP or transitioning to decentralised testing (Annex 1). Invitation to participate in this section of the survey was based on Euro-GASP participation in 2022 (2023 AST submissions were still in progress when the survey was developed). The participation status of these countries in 2023 was unchanged, with the exception of Cyprus, which submitted one isolate. In the survey, countries selected between one and ten of the twelve barriers listed as impediments to participation in decentralised testing. Aggregated responses are summarised in Table 3. The most commonly identified barrier (58.3%) was a lack of isolates due to increased use of nucleic acid amplification tests (NAATs). A lack of consumables, media and reagents, as well as the cost of minimum inhibitory concentration (MIC) gradient strip tests were also identified as barriers by 50% of the countries, while a further 41.7% cited a lack of financial resources for performing AST.

Participants were also asked to provide further information on additional barriers to decentralised testing that were not covered by the survey. Countries highlighted issues such as data protection, concerns regarding local AST data quality, difficulties related to laboratory restructuring, and limited resources (financial and personnel). Based on the survey responses, further capacity building will help to enable more countries to participate in Euro-GASP via decentralised testing. Nine (75%) countries were open to ECDC visiting their laboratory to facilitate participation in Euro-GASP via decentralised testing, and ten (83.3%) were willing to send staff for laboratory training.

Table 3. Barriers to participation in Euro-GASP via decentralised testing

Barrier to decentralised testing	Number of countries* (%)
Isolates are not available for susceptibility testing due to widespread use of nucleic acid amplification tests (NAATs)	7 (58.3%)
Lack of consumables, media and reagents for performing susceptibility testing	6 (50.0%)
Gradient strips are too expensive to use for local susceptibility testing	6 (50.0%)
Lack of financial resources for performing susceptibility testing	5 (41.7%)
Prevalence of gonorrhoea is too low to justify establishing local susceptibility testing	5 (41.7%)
Low temperature storage (−70°C or below) is not available to archive isolates	4 (33.3%)
Isolates for local susceptibility testing are often not retrievable after storage	4 (33.3%)
Laboratory is not accredited	3 (25.0%)
No trained staff for performing susceptibility testing	1 (8.3%)
Laboratory diagnostics are not performed for gonorrhoea	1 (8.3%)
You do not wish to share local susceptibility testing data	1 (8.3%)
No laboratory infrastructure for susceptibility testing	0 (0%)

* *A total of twelve countries did not participate through decentralised testing and are included in the analysis. Of these, five countries participated in centralised testing, while seven did not participate at all.*

Representativeness, completeness, and timeliness of the Euro-GASP AST report

Although Euro-GASP participation decreased slightly between 2019 and 2023, the number and proportion of isolates reported increased (Table 1). In 2023, 5.8% of reported gonorrhoea cases were submitted to Euro-GASP compared to 3–4% between 2012 and 2019 (Table 1). The 26.5% increase in the total number of isolates reported between 2019 (n=4 166) and 2023 (n=5 269) was primarily due to a subset of countries submitting isolates collected throughout the year, rather than during the three-month collection period. Conversely, some countries continue to submit low isolate numbers based on sample size estimates. A subset of isolates submitted to TESSy was analysed in the 2023 annual report to ensure compliance with the Euro-GASP reporting protocol, which aims to ensure the dataset is representative.

Reporting of epidemiological variables is important for understanding the spread of infection, identifying key populations at risk of emerging MDR or XDR *N. gonorrhoeae*, and ensuring appropriate targeting of control measures at national and international levels. Although the proportion of countries reporting epidemiological characteristics in Euro-GASP increased between 2019 (84.6%) and 2023 (87.5%), the absolute number of countries submitting these data decreased from 22 to 21 (Table 1). The completeness of epidemiological data also increased between 2019 (83.2%) and 2023 (86.1%) (Table 1). Although the completeness of mode of transmission increased between 2019 and 2023, it remained relatively low at 50.4%, and 3/24 countries did not report any data for this variable. The summary of epidemiological data completeness included in the annual report since 2018 highlights specific epidemiological variables that require improvements in reporting; however, countries have cited technical, logistical, and legal obstacles to linking *N. gonorrhoeae* isolates with epidemiological data.

AST data need to be shared on a timely basis to rapidly detect emerging trends. The COVID-19 pandemic negatively affected the timeliness of AMR and epidemiological data reporting. With the exception of the pandemic period, the time between the AST data submission deadline and sharing of the annual report has been less than 12 months (Table 1).

Training

Training is an important mechanism for ensuring that Euro-GASP surveillance data are high-quality and that countries are equipped to participate in Euro-GASP, ultimately via decentralised testing. For this reason, ECDC provides training courses for STI laboratory staff in EU/EEA countries (Table 1). A 2024 survey of 26/30 EU/EEA countries indicated that 30.8–57.7% of countries required training in topics related to basic laboratory diagnostic methods, AST, and molecular typing for *N. gonorrhoeae*, *Chlamydia trachomatis*, and *Treponema pallidum*, while up to 76.9% required training in *N. gonorrhoeae* whole-genome sequencing. Based on these training requirements, the 2023 EQA results, and the 2023 annual report, the 2024 course was developed to focus on the basics of *N. gonorrhoeae* detection, culture, and AST. The aim was to build knowledge and skills to expand participation in Euro-GASP, both in terms of increasing the number of countries and the number of isolates from countries with low isolate numbers based on sample size estimates. In December 2024, the course was delivered to 14 participates from 14 countries, 10 of which were EU/EEA countries. This marked the first course delivered since 2017, as the one scheduled for 2020 had to be cancelled due to the COVID-19 pandemic.

3.2.1.2 National level

National gonococcal antimicrobial surveillance

Euro-GASP is dependent upon national gonococcal antimicrobial surveillance programmes or on specimen collections specifically designed for Euro-GASP in participating countries to provide data for information at the EU/EEA level. In 2023, 23/30 (76.7%) countries reported the presence of a national representative isolate collection, which was a greater number, but smaller proportion of countries than reported in 2019 (21/26, 80.8%). With respect to local capacity building, more countries offered national training modules in 2023 (5/30, 16.7%) than in 2019 (2/26, 7.7%), but this figure remained relatively low.

Gonococcal culture and AST

The updated 2019 Response Plan highlighted capacity for gonococcal culture and AST as important components for national AMR surveillance. It is, therefore, of concern that results for the two relevant national-level indicators (1.10 and 1.11) have both decreased since 2019 (Table 2). On average, 97.3% of STI clinics (range 71–100%) were estimated to have access to culture and AST in 2019, compared to 82.6% of clinics (range 0–100%) in 2023. The median for this indicator was 100% in 2023, indicating substantial heterogeneity between countries, and that clinics in a subset of countries have little to no access to culture and AST. In comparison, participants estimated that 88.8% of STI clinics (range 9–100%; median 100%) had access to gonococcal NAATs. Multiple countries highlighted increased use of NAATs as the primary diagnostic method, which has decreased the availability of samples for culture and AST.

The estimated percentage of reported gonorrhoea cases tested with culture and AST decreased from 38.5% (range 5–100%) in 2019 to 29.5% (range 0–80%) in 2023, although only 21/30 (70%) countries were able to provide an estimate for this indicator (Table 2). The median for this indicator was 30% in 2023, indicating that multiple countries estimated low proportions of cases being tested with culture and AST. Several countries again highlighted decreasing availability of samples for culture and AST due to widespread use of gonococcal NAATs.

Gonorrhoea treatment data

The updated 2019 Response Plan encouraged countries to collect prescription data for gonorrhoea treatment to improve interpretation of AMR data. Only 16/30 (53.3%) countries were able to estimate the percentage of patients who received the recommended gonorrhoea treatment, making it the least complete national-level indicator (Table 2). Based on the available data, the percentage of patients receiving the recommended gonorrhoea treatment had decreased from 93.2% in 2019 (range 35–100%) to 78.1% in 2023 (range 8–100%). The median for this indicator was 90%, indicating relatively high adherence to treatment guidelines in most countries.

3.2.2 Clinical management and treatment failure monitoring

Clinicians play a pivotal role in curbing the spread of gonococcal AMR through appropriate clinical management, partner notification services, and the confirmation and reporting of cases with suspected treatment failure. At the national level, public health authorities can further investigate treatment failures, including sexual contacts and travel history, and alert ECDC of such cases via an online treatment failure reporting tool (EpiPulse Events). The updated Response Plan included three indicators for monitoring the effectiveness of clinical management and treatment failure monitoring at both the EU/EEA and national levels (Tables 1 and 2).

3.2.2.1 Patient management guidelines

ECDC is represented on the European STI Guideline Editorial Board, which is responsible for the European gonorrhoea treatment guideline, thereby ensuring that ECDC contributes to public health aspects of the revision of gonorrhoea patient management guidelines at the EU/EEA level, as in 2019 (Table 1). In 2023, additional information was collected to assess this at the national level (Table 2, indicator 2.1). Overall, 27/30 (90%) countries reported that they had patient management guidelines in place, 21 (77.8%) of which referred to national guidelines with the remaining six (22.2%) referring to international guidelines. Twenty-three (85.2%) of the countries with patient management guidelines stated that they had been updated since 2019. Overall, 27/27

(100%) of countries with patient management guidelines recommended first-line antimicrobial agents for the treatment of uncomplicated gonorrhoea infections that were described in the 2020 EU treatment guidelines (ceftriaxone monotherapy or ceftriaxone and azithromycin dual therapy). This was an improvement on 2019 when only 19/26 (73.1%) countries recommended the first-line antimicrobial agents listed in the 2012 EU treatment guidelines (ceftriaxone and azithromycin dual therapy).

3.2.2.2 Treatment failure monitoring

The updated 2019 Response Plan provided case definitions for possible and confirmed treatment failures, outlined steps for reporting treatment failures (and ceftriaxone-resistant or XDR isolates), and provided a template reporting form. At the EU/EEA level, European access to an online reporting template for treatment failures supported by ECDC was achieved in 2023 through the provision of EpiPulse and in previous years with EPIS-STI (Table 1, Indicator 2.2). At the national level, the updated Response Plan called for the development of an online reporting template for possible and confirmed treatment failures (Table 2, Indicator 2.2). Use of such an online reporting template decreased between 2019 (19.2%) and 2023 (6.7%). However, feedback from participants indicated that other reporting mechanisms were in place in 2023, such as telephone contact or other paper-based and/or digital methods of data collection and reporting. A subset of countries also highlighted legal issues pertaining to online storage of treatment failure data. The third treatment failure monitoring indicator assessed aspects of reporting verified gonorrhoea treatment failures to ECDC at the EU/EEA and national levels (Tables 1 and 2, Indicator 2.3). At the EU/EEA level, no treatment failures were recorded in EpiPulse in 2023, as in 2019 (Table 1). There were, however, six ceftriaxone-resistant *N. gonorrhoeae* isolates reported to EpiPulse in 2023 by Norway (n=2), Belgium (n=1), and the United Kingdom (n=3). At the national level, no verified treatment failures were reported to ECDC in 2023, as in 2019 (Table 2). Given the importance of reporting treatment failures, additional questions were asked in 2023 to attempt to assess national capacity for reporting to ECDC. Fourteen countries (46.7%) indicated that they had the ability to collect national-level data on gonorrhoea treatment failures and report them to ECDC.

3.2.3 Control strategy and communications

The final indicators from the updated 2019 Response Plan focused on national MDR/XDR gonorrhoea control strategies and dissemination of surveillance information to increase awareness of the threat of AMR in *N. gonorrhoeae*. The number and proportion of countries that had adopted a national action plan to control MDR/XDR gonorrhoea (or included MDR/XDR gonorrhoea in another relevant strategy) increased between 2019 (23.1%) and 2023 (30%) (Table 2). Dissemination of surveillance data increased slightly at the EU/EEA level when comparing the periods 2017–2019 and 2020–2023 (Table 1). Conversely, outputs decreased slightly between 2019 and 2023 at the national level (Table 2).

4 Conclusions

Between 2019 and 2023, progress towards the objectives of the 2019 Response Plan was mixed. While some indicators improved, particularly those related to training and guideline alignment, implementation of several critical indicators declined. Overall, these findings suggest that the capacity of the EU/EEA to monitor and respond to antimicrobial-resistant *N. gonorrhoeae* has weakened over this period.

The most worrying findings relate to antimicrobial surveillance. Participation in Euro-GASP declined slightly, and gaps in geographical representation persist, particularly in parts of Central and Eastern Europe. Although the absolute number of isolates increased, this was driven by a limited number of countries. In addition, variability in sampling approaches raises concerns regarding representativeness. At the national level, indicators for access to culture and AST, as well as the proportion of cases tested, have decreased. The widespread use of NAATs, while beneficial for diagnosis, continues to reduce the availability of isolates for surveillance. Together, these trends weaken the ability to detect and monitor emerging resistance.

Reporting of epidemiological variables showed modest improvement, however completeness remains suboptimal for key variables, particularly mode of transmission. Persistent challenges in linking laboratory and epidemiological data limit the ability to identify populations at risk and to target interventions effectively. In addition, several indicators rely on estimates or incomplete reporting, highlighting the need for more systematic and harmonised data collection.

Indicators related to clinical management were largely achieved. Most countries reported having treatment guidelines aligned with the 2020 European recommendations, representing an improvement since 2019. However, important gaps remain in monitoring treatment practices. Only around half of the countries could provide estimates of adherence to recommended treatment, and available data suggest a decline since 2019. Strengthening the collection and reporting of prescribing data is essential for interpreting AMR trends and ensuring appropriate clinical management.

Although no verified gonorrhoea treatment failures were reported to ECDC in 2023, this probably reflects under-detection or under-reporting rather than absence of such events. Fewer than half of countries reported the capacity to collect and report treatment failure data to ECDC, and use of standardised online reporting tools remains limited at the national level. These gaps are critical, as timely detection and reporting of treatment failures are essential to identify and respond to emerging untreatable infections.

Although the number of countries with national strategies addressing MDR/XDR gonorrhoea has increased slightly, it remains low. Many countries have broader AMR action plans, which may provide an opportunity to strengthen integration of gonorrhoea-specific actions. Outputs related to dissemination of surveillance findings showed mixed trends, with slight increases at EU/EEA level, but stagnation or decline at national level.

The findings highlight the need for renewed efforts to strengthen gonococcal AMR surveillance across the EU/EEA. Priority actions include:

- improving access to and use of culture and AST alongside NAAT-based diagnostics;
- increasing participation in Euro-GASP and enhancing representativeness of sampling;
- strengthening linkage and completeness of epidemiological and laboratory data;
- improving monitoring of treatment practices and outcomes;
- enhancing national capacity to detect and report treatment failures.

Furthermore, the 2019 Response Plan should be reviewed and updated to reflect current epidemiological trends, diagnostic practices, and treatment recommendations. Without sustained investment in surveillance and reporting systems, the ability to detect and respond to emerging multidrug-resistant and extensively drug-resistant *N. gonorrhoeae* in the EU/EEA will remain limited.

References

1. European Centre for Disease Prevention and Control (ECDC). Gonorrhoea. Annual Epidemiological report for 2024. Stockholm: ECDC; 2026. Available from: https://www.ecdc.europa.eu/sites/default/files/documents/AER%20gonorrhea%202024.pdf?embed=true.
2. Westrom L. Incidence, prevalence, and trends of acute pelvic inflammatory disease and its consequences in industrialized countries. Am J Obstet Gynecol. 1980;138(7 Pt 2):880-92. Available from: https://www.ncbi.nlm.nih.gov/pubmed/7008604.
3. Laga M, Manoka A, Kivuvu M, Malele B, Tuliza M, Nzila N, et al. Non-ulcerative sexually transmitted diseases as risk factors for HIV-1 transmission in women: results from a cohort study. AIDS. 1993;7(1):95-102. Available from: https://www.ncbi.nlm.nih.gov/pubmed/8442924.
4. European Centre for Disease Prevention and Control (ECDC). Response plan to control and manage the threat of multidrug-resistant gonorrhoea in Europe. Stockholm; 2012. Available from: https://www.ecdc.europa.eu/en/publications-data/response-plan-control-and-manage-threat-multidrug-resistant-gonorrhoea-europe.
5. World Health Organization (WHO). Global action plan to control the spread and impact of antimicrobial resistance in *Neisseria gonorrhoeae*. Geneva; 2012. Available from: https://www.who.int/publications/i/item/9789241503501.
6. US Centers for Disease Control and Prevention. Cephalosporin-resistant *Neisseria gonorrhoeae* public health response plan. Atlanta; 2012. Available from: https://www.cdc.gov/std/treatment/ceph-r-responseplanjuly30-2012.pdf.
7. Public Health England. Gonococcal Resistance to Antimicrobials Surveillance Programme (GRASP) Action Plan for England and Wales: Informing the Public Health Response. London; 2013. Available from: https://webarchive.nationalarchives.gov.uk/20140714113033/http:/www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317138215954.
8. Bignell C, Unemo M, European STIGEB. 2012 European guideline on the diagnosis and treatment of gonorrhoea in adults. Int J STD AIDS. 2013;24(2):85-92. Available from: https://www.ncbi.nlm.nih.gov/pubmed/24400344.
9. World Health Organization (WHO). WHO Guidelines for the Treatment of *Neisseria gonorrhoeae*. Geneva; 2016. Available from: https://www.who.int/publications/i/item/9789241549691.
10. Bignell C, Fitzgerald M, Guideline Development G, British Association for Sexual H, Hiv UK. UK national guideline for the management of gonorrhoea in adults, 2011. Int J STD AIDS. 2011;22(10):541-7. Available from: https://www.ncbi.nlm.nih.gov/pubmed/21998172.
11. Workowski KA, Bolan GA, US Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. MMWR Recomm Rep. 2015;64(RR-03):1-137. Available from: https://www.ncbi.nlm.nih.gov/pubmed/26042815.
12. European Centre for Disease Prevention and Control (ECDC). Response plan to control and manage the threat of multi- and extensively drug-resistant gonorrhoea in Europe – 2019 update. Stockholm; 2019. Available from: https://www.ecdc.europa.eu/en/publications-data/response-plan-control-and-manage-threat-multi-and-extensively-drug-resistant.
13. Unemo M, Ross J, Serwin AB, Gomberg M, Cusini M, Jensen JS. 2020 European guideline for the diagnosis and treatment of gonorrhoea in adults. Int J STD AIDS. 2020:956462420949126. Available from: https://www.ncbi.nlm.nih.gov/pubmed/33121366.
14. World Health Organization (WHO). Updated recommendations for the treatment of *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *Treponema pallidum* (syphilis) and new recommendations on syphilis testing and partner services. Geneva; 2024. Available from: https://www.who.int/publications/i/item/9789240090767
15. Fifer H, Saunders J, Soni S, Sadiq ST, FitzGerald M. 2018 UK national guideline for the management of infection with *Neisseria gonorrhoeae*. Int J STD AIDS. 2020;31(1):4-15. Available from: https://www.ncbi.nlm.nih.gov/pubmed/31870237.
16. Workowski KA, Bachmann LH, Chan PA, Johnston CM, Muzny CA, Park I, et al. Sexually Transmitted Infections Treatment Guidelines, 2021. MMWR Recomm Rep. 2021;70(4):1-187. Available from: https://www.ncbi.nlm.nih.gov/pubmed/34292926.
17. European Centre for Disease Control and Prevention (ECDC). Response plan to control and manage the threat of multi-and extensively drug-resistant gonorrhoea in Europe - Indicator monitoring 2019. Stockholm; 2021. Available from: https://www.ecdc.europa.eu/en/publications-data/response-plan-control-and-manage-threat-multi-and-extensively-drug-resistant-0
18. Cole MJ, Quaye N, Jacobsson S, Day M, Fagan E, Ison C, et al. Ten years of external quality assessment (EQA) of *Neisseria gonorrhoeae* antimicrobial susceptibility testing in Europe elucidate high reliability of data. BMC Infect Dis. 2019;19(1):281. Available from: https://www.ncbi.nlm.nih.gov/pubmed/30909883.

Annex 1. Response Plan Indicator Monitoring Survey, 2023

Euro-GASP Response Plan Indicators Survey 2024

Fields marked with * are mandatory.

Information for participants

Response plan to control and manage the threat of multidrug-resistant gonorrhoea in Europe

In 2012, ECDC in collaboration with a group of international experts published a Response Plan to control and manage the threat of multidrug-resistant gonorrhoea in Europe. The Response Plan was subsequently updated in 2019. Your responses to this survey will allow us to monitor the ongoing effectiveness of the Response Plan and determine whether any further updates are required.

Data use

Only a restricted group of Euro-GASP contractors (run under the Framework Contract ECDC/2023/022) and ECDC staff - those members of the Euro-GASP survey team actually managing the survey administration via EUSurvey tool - will have access to names, surnames, and email addresses. Anonymised survey results will be compiled into reports for ECDC, elements of which may be published.

All Euro-GASP staff are required to agree to take reasonable precautions to protect the integrity and confidentiality of security credentials.

Should you want to know more on confidentiality and data protection of this survey, please refer to the ECDC Personal Data Protection webpage.

Completing the survey

Please ensure that only one response is submitted per country. For any enquiries, please use the "Contact" button on the right-hand side of your screen. Alternatively, please email Melissa Jansen van Rensburg (m.jansenvanrensburg@ukhsa.gov.uk) and Susanne Jacobsson (susanne.jacobsson@regionorebrolan.se).

To save a draft of your survey and return to it later, click the "Save as draft" button on the right-hand side of your screen and follow further instructions. You will be able to print or save a PDF copy of your responses after submission.

Section A: Participant details

* Name and surname

* Email address

* Institution

* Country

- (○) AT - Austria
- (○) BE - Belgium
- (●) BG - Bulgaria
- (○) HR - Croatia
- (○) CY - Cyprus
- (○) CZ - Czechia
- (○) DK - Denmark
- (○) EE - Estonia
- (○) FI - Finland
- (○) FR - France
- (○) DE - Germany
- (○) EL - Greece
- (○) HU - Hungary
- (○) IS - Iceland
- (○) IE - Ireland
- (○) IT - Italy
- (○) LV - Latvia
- (○) LI - Liechtenstein
- (○) LT - Lithuania
- (○) LU - Luxembourg
- (○) MT - Malta
- (○) NL - Netherlands
- (○) NO - Norway
- (○) PL - Poland
- (○) PT - Portugal
- (○) RO - Romania
- (○) SK - Slovak Republic
- (○) SI - Slovenia
- (○) ES - Spain
- (○) SE - Sweden

Section B: Response Plan Indicators

When describing progress made towards particular indicators, please use your country's situation in 2019 as your baseline and compare to the end of 2023. You should have received an email containing your country's responses to the last survey for reference (if available).

Strengthening antimicrobial surveillance at the national level

* 1.8 What type of gonococcal antimicrobial surveillance did your country carry out in 2023?
  - ○ National surveillance
  - ○ Sentinel surveillance
  - ○ No surveillance but participated in Euro-GASP
  - ◉ No surveillance and did not participate in Euro-GASP

* Please describe any progress towards establishing a surveillance programme or joining Euro-GASP since 2019

* 1.9 Did your country offer any national gonococcal training modules (laboratory and/or clinical) in 2023? *Note: these should be **local courses**, not Euro-GASP activities.*
  - ○ Yes
  - ◉ No

* Please indicate if any national training modules have been offered since 2019, or details of progress made towards offering such training

* 1.10 Approximately what percentage of STI clinics in your country had access to routine gonococcal culture and antimicrobial susceptibility testing in 2023? *Note: this could be through on-site or centralised laboratories.*

Enter a percentage or 'Unknown'

10 character(s) maximum

Comments on access to routine gonococcal culture and antimicrobial susceptibility testing, or details of progress in this area since 2019 (optional)

* Approximately what percentage of STI clinics in your country had access to gonococcal nucleic acid amplification tests (NAATs) in 2023? *Note: this could be through on-site or centralised laboratories.*

Enter a percentage or 'Unknown'

10 character(s) maximum

Comments on access to gonococcal NAATs (optional)

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* 1.11 Approximately what percentage of all (reported) gonorrhoea cases in your country had antimicrobial susceptibility results available in 2023?

Enter a percentage or 'Unknown'

10 character(s) maximum

Comments on the availability of antimicrobial susceptibility results, or details of progress in this area since 2019 (optional)

---

* 1.12 Approximately what percentage of patients received your country's recommended gonorrhoea treatment in 2023?

Enter a percentage or 'Unknown'

10 character(s) maximum

Additional information regarding patients receiving the recommended gonorrhoea treatment, or details of progress in this area since 2019 (optional)

Clinical management and treatment failure monitoring

* 2.2 Was an online reporting template for probable and confirmed treatment failures available and in use in your country in 2023?
  - ○ Yes
  - ◉ No

* Please describe any progress towards implementing an online reporting template since 2019

* 2.3 Did you report any verified gonorrhoea treatment failures to ECDC in 2023?
  - ○ Yes
  - ◉ No

* Please clarify why no gonorrhoea treatment failures were reported to ECDC in 2023
  - ○ There were no verified treatment failures to report
  - ○ Treatment failures occurred but were not reported to ECDC
  - ◉ No national data on treatment failures were collected
  - ○ Other

* Please provide further information, or describe progress made towards reporting treatment failures to ECDC since 2019

Control strategy and communications

* 3.1 Did your country have a national plan to control MDR/XDR gonorrhoea in 2023? *Note: this could be a plan focused specifically on* N. gonorrhoeae *or a component of a broader STI/sexual health/AMR strategy.*
  - ○ Yes
  - ◉ No

* Please describe any progress made towards developing a national action plan since 2019

* 3.3 How many peer-reviewed publications or other communications on antimicrobial resistant *N. gonorrhoeae* did your country publish in 2023?

Additional questions

* What was the recommended first-line treatment for uncomplicated gonorrhoea in your country in 2023? *Note: select all that apply.*
  - [ ] Ceftriaxone + azithromycin
  - [ ] Ceftriaxone
  - [ ] Cefixime + azithromycin
  - [ ] Cefixime
  - [x] Other

* Please describe any other first-line treatments recommended in your country

* Have national gonorrhoea patient management guidelines been revised in your country since **2019**?
  - ( ) Yes, our national guidelines have been updated
  - ( ) No, our national guidelines have not been updated
  - ( ) We use international guidelines, which have been updated
  - ( ) We don't use any patient management guidelines

Section C: Participating in Euro-GASP via decentralised testing

Potential barriers to participating in Euro-GASP via decentralised testing

Our records show that your country previously did not participate in Euro-GASP via decentralised testing. Please specify which issues were barriers to your country participating in decentralised testing.

* Lack of financial resources for performing susceptibility testing
  - ( ) True
  - ( ) False

* No trained staff for performing susceptibility testing
  - ( ) True
  - ( ) False

* Lack of consumables, media and reagents for performing susceptibility testing
  - ( ) True

- False

* Gradient strips are too expensive to use for local susceptibility testing
  - True
  - False

* No laboratory infrastructure for susceptibility testing
  - True
  - False

* Prevalence of gonorrhoea is too low to justify establishing local susceptibility testing
  - True
  - No

* Laboratory diagnostics are not performed for gonorrhoea
  - True
  - False

* Low temperature storage (–70 °C or below) is not available to archive isolates
  - True
  - False

* Isolates are not available for susceptibility testing due to widespread use of nucleic acid amplification tests (NAATs)
  - True
  - False

* Isolates for local susceptibility testing are often not retrievable after storage
  - True
  - False

* Laboratory is not accredited
  - True
  - False

* You do not wish to share local susceptibility testing data
  - True
  - False

* If you responded 'True' above, please provide further details

* Are there any other factors preventing you from participating in decentralised testing?
  - Yes

- ○ No

* If you responded 'Yes' above, please provide further details

Support and training to participate in decentralised testing

* Would you be open to ECDC visiting your laboratory to facilitate participation in Euro-GASP through decentralised testing?
  - ○ Yes
  - ○ No

* Would you be willing to send staff for laboratory training?
  - ○ Yes
  - ○ No

Thank you for completing this survey!

Contact

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