Antimicrobial resistance in *Neisseria gonorrhoeae*, Ireland 2010-2024

Health Protection Surveillance Centre & National Gonococcal Reference Laboratory, SJH.

Based on data from isolates submitted to EURO-GASP

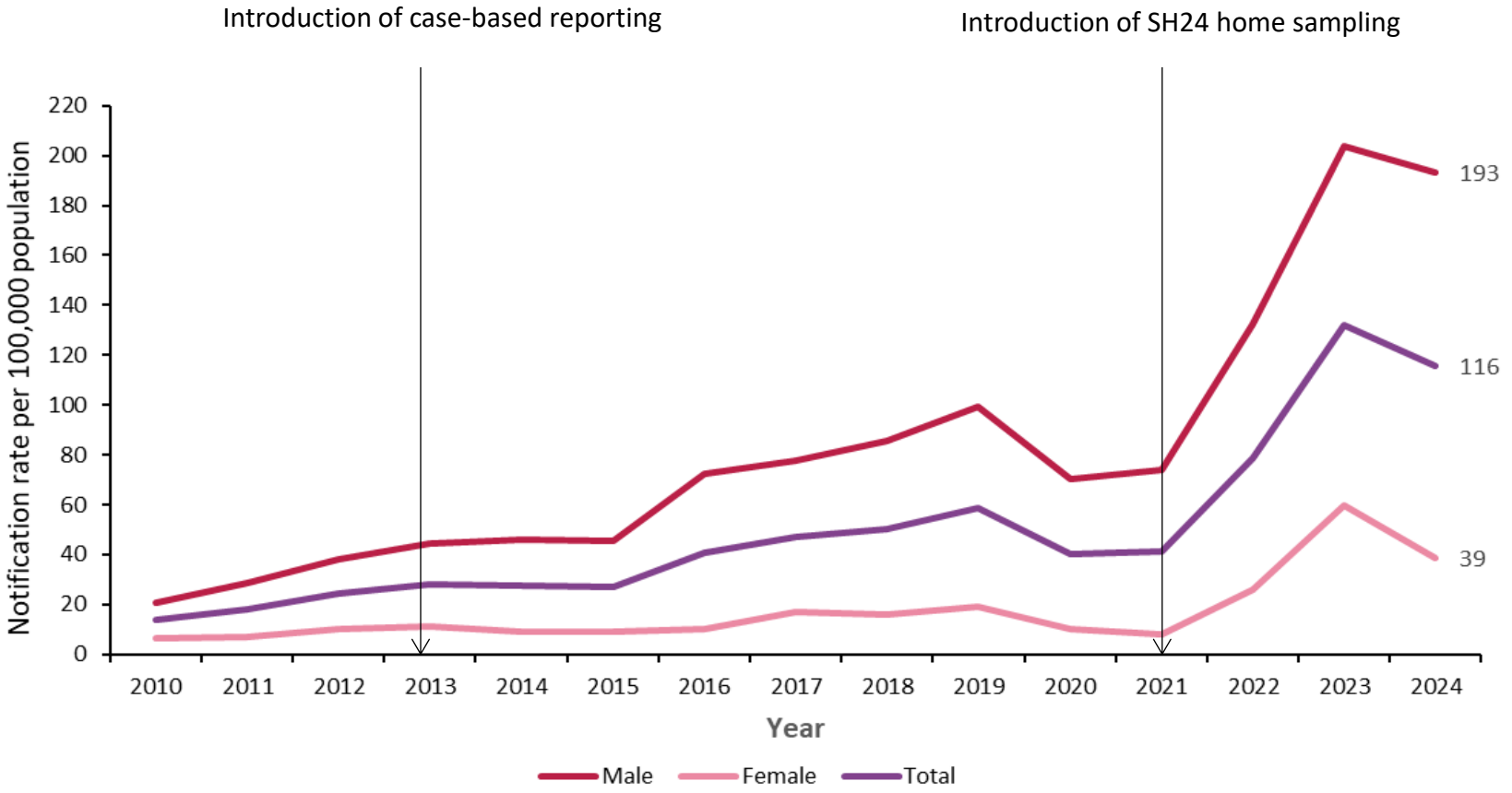
January 2026

Gonorrhoea in Ireland

Trend in notification rate of gonorrhoea by gender, 2010-2024

There were **5,960** cases of gonorrhoea notified in 2024

Further information on epidemiology of gonorrhoea in 2024 can be found in the [Sexually Transmitted Infections (STIs) in Ireland: Trends to the end of 2024 report]



Male includes cis male and trans male (where known) and female includes cis female and trans female (where known)

Rates calculated: 2010-2013=2011 census, 2014-2019= 2016 census, 2020-2024= 2022 census

Between 2021 and 2022 free home Sexually Transmitted Infections (STI) sampling was introduced www.sexualwellbeing.ie

Antimicrobial resistance (AMR) in *Neisseria gonorrhoeae,* a World Health Organization priority

- Gonorrhoea infection is becoming increasingly difficult to treat due to the development of antimicrobial resistance to all major drug classes used to treat infection

- The extended spectrum cephalosporin (ESC), ceftriaxone, is the current last remaining option for first-line treatment

- The WHO Bacterial Priority Pathogen List, 2024, includes 15 families of antibiotic-resistant pathogens, grouped into critical, high and medium categories of priority for research and development and for public health measures. *N. gonorrhoeae*, of which multidrug-resistant strains have emerged, limiting treatment options has been listed in the high priority category

Euro-GASP

European Gonococcal Antimicrobial Surveillance Programme

- Euro-GASP monitors trends in gonococcal antimicrobial susceptibility to detect increasing and emerging antimicrobial resistance and to provide quality-assured data to inform national and international treatment guidelines

European Gonococcal Antimicrobial Surveillance Programme (Euro-GASP) (europa.eu)

- Euro-GASP is a sentinel surveillance programme involving centralised or de-centralised antimicrobial susceptibility testing of *N. gonorrhoeae* isolates in participating countries

- EU/EEA Member States participate in Euro-GASP's annual survey conducted over 3 month period (September-November)

- Countries should aim to report AMR and linked epidemiological data for 100 cases (or 10%) of total national notifications and up to 200 cases for countries with a higher number of national notifications

Irish participation Euro-GASP

- Participating since 2010
- Antimicrobial susceptibility testing performed by National Gonococcal Reference Laboratory (NGRL), St James's Hospital (2017-present), Department of Clinical Microbiology St James's Hospital (SJH) (2013-2016), and Public Health England (2010-2012)
- Linked epidemiological data is collated from isolate referral forms, enhanced surveillance forms and clinical notes (where available)
- **Data source:** All isolates received and tested in the NGRL over Euro-GASP survey period. Most recent data presented in this report are on **243** Irish isolates reported for 2024 (September-November): they represent **4%** of total national gonorrhoea notifications and **20%** of isolates tested at NGRL in 2024
- This report is based on data submitted to Euro-GASP and does not represent the total antimicrobial resistant profile nationally for 2024

Epidemiological characteristics of individuals with isolates submitted to Euro-GASP by gender and mode of transmission, 2024

	Females	Heterosexual Males	~gbMSM	Other/unknown Males	Not reported	Total
Number of individuals	28	4	143	67	1	243
	n(% of N)	n(% of N)	n(% of N)	n(% of N)	n(% of N)	n(% of N)
Age Group Years						
15-19	5 (18%)	0	2 (1%)	4(1%)	0%	11 (5%)
20-24	12 (43%)	1 (25%)	15 (10%)	15 (22%)	0%	43 (18%)
25-29	5 (18%)	1 (25%)	34 (24%)	14 (21%)	1 (100%)	55 (23%)
30-34	3 (11%)	0	36 (25%)	15 (22%)	0	54 (22%)
35-39	2 (7%)	0	24 (17%)	6 (9%)	0%	32 (13%)
40-44	0%	2 (50%)	17 (12%)	5 (7%)	0	24 (10%)
45-49	1 (4%)	0%	6 (4%)	1 (1%)	0%	8 (3%)
50+	0%	0%	9 (6%)	7 (10%)	0%	16 (7%)
Unkown	0%	0%	0%	0%	0%	0%
Median age (Years)	36	35	33	30	28	31
Age range (Years)	18-48	21-44	18-66	17-71	28	17-71
Residence						
Dublin	20 (71%)	0	123 (86%)	52 (78%)	1 (100%)	195 (81%)
Outside Dublin	8 (29%)	4 (100%)	20 (14%)	15 (22%)	0	47 (19%)

~ gbMSM: gay, bisexual and other men who have sex with men

*Antimicrobial resistance in Neisseria gonorrhoeae, Ireland 2010-2023

Comparing 2023* and 2024 isolates:

- The proportion of isolates from females remains stable,11% in 2023 to **12%** in 2024
- The age distribution of all isolates remains relatively unchanged; the median age has increased slightly from 29 yrs in 2023 to 31 yrs in 2024
- The proportion of isolates from people living in Dublin has increased from **79%** in 2023 to **81%** in 2024
  - The large proportion of isolates from the Dublin area is not unexpected. The NGRL test samples predominantly from STI clinics in Dublin

Epidemiological characteristics of individuals with isolates submitted to Euro-GASP by gender and mode of transmission, 2024

	Females	Heterosexual Males	~gbMSM	Other/unknown Males	Not reported	Total
Number of individuals	28	4	143	67	1	243
	n (% of N)	n (% of N)	n (% of N)	n (% of N)	n (% of N)	n (% of N)
Country of Birth						
Ireland	1 (4%)	3 (75%)	20 (14%)	1 (1%)	0%	24 (10%)
Outside Ireland	2 (7%)	1 (25%)	33 (23%)	2 (3%)	0%	38 (16%)
Unknown	25 (89%)	0%	90 (63%)	64 (96%)	1 (100%)	179 (74%)
HIV Status						
Negative	1 (4%)	0%	32 (22%)	9 (13%)	0%	42 (17%)
Positive	2 (7%)	0%	25 (17%)	1 (1%)	0%	28 (12%)
Not reported	25 (89%)	4 (100%)	86 (60%)	57 (85%)	1 (100%)	173 (71%)
Site of Infection †						
Genital	23 (82%)	4 (100%)	40 (28%)	47 (70%)	1 (100%)	115 (47%)
Rectal	1 (4%)	0%	76 (53%)	4 (6%)	0%	81 (33%)
Pharyngeal	4 (14%)	0%	27 (19%)	15 (22%)	0	46 (19%)
Other Site	0%	0%	0%	1 (1%)	0%	1 (<1%)
Concurrent STI^						
Chlamydia	4 (14%)	1 (25%)	21 (15%)	2 (3%)	0%	28 (12%)
Syphilis	0%	0%	5 (3%)	6 (9%)	0%	11 (5%)
No concurrent infection	16 (57%)	0%	42 (29%)	40 (60%)	0%	98 (40%)
Unknown	8 (29%)	3 (75%)	75 (52%)	19 (28%)	1 (100%)	106 (42%)
Previous gonorrhoea infection						
Yes	1 (4%)	0%	61 (43%)	4 (6%)	0%	66 (27%)
No	0%	0%	0%	0%	0%	0%
Unknown	27 (96%)	4 (100%)	82 (57%)	63 (94%)	1 (100%)	177 (73%)

Note: Direct comparison with previous years is not advised due to lack of completeness in enhanced data

From the available enhanced data:

- 12% of isolates are from individuals who are living with HIV
- 47% of isolates were obtained from genital swabs
- 12% of individuals were co infected with chlamydia
- 27% of individuals had a previous gonorrhoea infection

† Not all individuals are tested for gonorrhoea at each site, and individuals can be infected at more than one site

^ Concurrent STI: another STI diagnosed within 4 weeks of the positive gonorrhoea notification

~ gbMSM: gay, bisexual and other men who have sex with men

Epidemiological antimicrobial resistance definitions

To allow for European comparison, results from antimicrobial susceptibility testing were interpreted in line with Euro-GASP analysis, using breakpoints from the European Committee on Antimicrobial Susceptibility Testing (EUCAST):

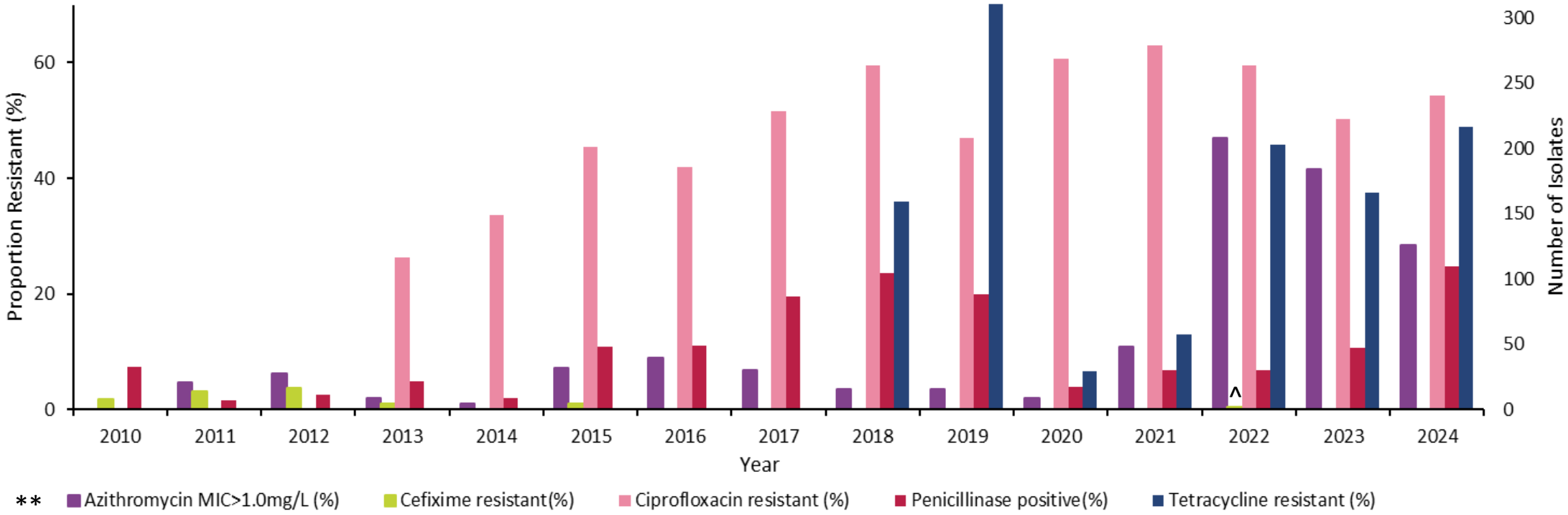
- cefixime resistance, MIC* >0.125 mg/L
- ceftriaxone resistance, MIC >0.125 mg/L
- tetracycline resistance, MIC> 0.5mg/L
- ciprofloxacin resistance, MIC >0.06 mg/L
- β-lactamase production for detection of high-level penicillin resistance, penicillinase screen positive
- azithromycin epidemiological cut-off value (ECOFF), MIC >1 mg/L^

*MIC: Minimum Inhibitory Concentration

^Until 2018, EUCAST set a breakpoint of MIC 0.5 mg/L for *N. gonorrhoeae* azithromycin resistance. This has since been replaced with an 'epidemiological cut-off' (ECOFF) of >1.0 mg/L

European Committee on Antimicrobial Susceptibility Testing (EUCAST). 'Breakpoint tables for interpretation of MICs and zone diameters, version 14' EUCAST

Trends in gonorrhoea antimicrobial resistance in Ireland* (Euro-GASP, 2010-2024)



*EUCAST guidelines, version 14' EUCAST

**Azithromycin MIC above ECOFF (>1 mg/L)

^1 cefixime resistant isolate in 2022

Trends in gonorrhoea antimicrobial resistance in Ireland* (Euro-GASP, 2010-2024)

Year	Isolates tested	AZM-MIC>1.0 mg/L	%AZM-MIC>1.0 mg/L	CFM-R	%CFM-R	CIP-R	%CIP-R	PPNG	% PPNG	Isolates tested (TET)	TET-R	%TET-R
2010	54	0	0%	1	2%	0	0%	4	7%	0		
2011	64	3	5%	2	3%	0	0%	1	2%	0		
2012	80	5	6%	3	4%	0	0%	2	3%	0		
2013	103	1	1%	1	1%	27	26%	5	5%	0		
2014	101	1	1%	0	0%	34	34%	2	2%	0		
2015	110	8	7%	1	1%	50	45%	12	11%	0		
2016	100	9	9%	0	0%	42	42%	11	11%	0		
2017	163	11	7%	0	0%	84	52%	32	20%	9	0	0%
2018	200	7	4%	0	0%	119	60%	47	24%	25	9	36%
2019	200	7	4%	0	0%	94	47%	40	20%	4	3	75%
2020	104	2	2%	0	0%	63	61%	4	4%	15	1	7%
2021	119	13	11%	0	0%	75	63%	8	7%	23	3	13%
2022	294	138	47%	1	0%	175	60%	20	7%	247	113	46%
2023	253	105	42%	0	0%	127	50%	27	11%	253	95	38%
2024	243	69	28%	0	0%	132	54%	60	25%	243	119	49%

AZM- MIC>1.0mg/L – above ECOFF; CFM-R, cefixime- resistant; CIP-R, ciprofloxacin-resistant; PPNG, penicillinase positive, TET-R, tetracycline resistance

*EUCAST guidelines, version 14' EUCAST

Cefixime and Ceftriaxone

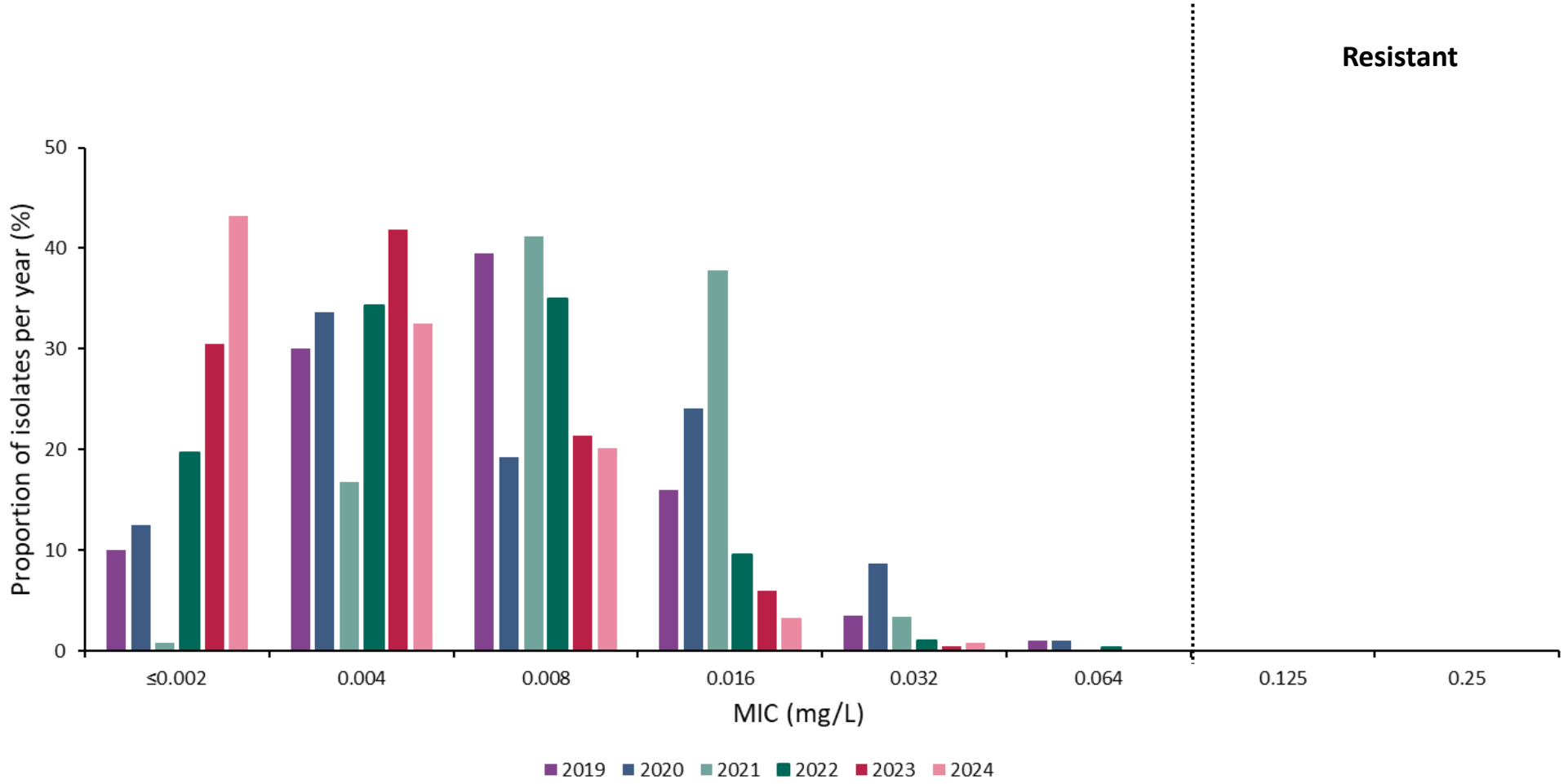
- In 2024, one extended cephalosporin resistant isolate was reported in Ireland outside the study period (Sept-Nov 2024). This isolate exhibited resistance to both cefixime and ceftriaxone.

- Ceftriaxone is the only recommended empirical monotherapy for treatment of gonorrhoea at present (for treatment guidelines, see Gonorrhoea - HSE.ie)

- One ceftriaxone resistant isolate was reported in Ireland in 2018 (outside Euro-GASP survey period): http://ndsc.newsweaver.ie/epiinsight/bv8rkspoij310gkzp9yxn5?a=1&p=53827183&t=17517774

- Ireland has not yet reported a ceftriaxone resistant isolate to the Euro-GASP programme

Ceftriaxone MIC (mg/L) among gonococcal isolates in Ireland, (Euro-GASP, 2019-2024)



The line indicates the threshold for antimicrobial resistance according to EUCAST guidelines.

Azithromycin

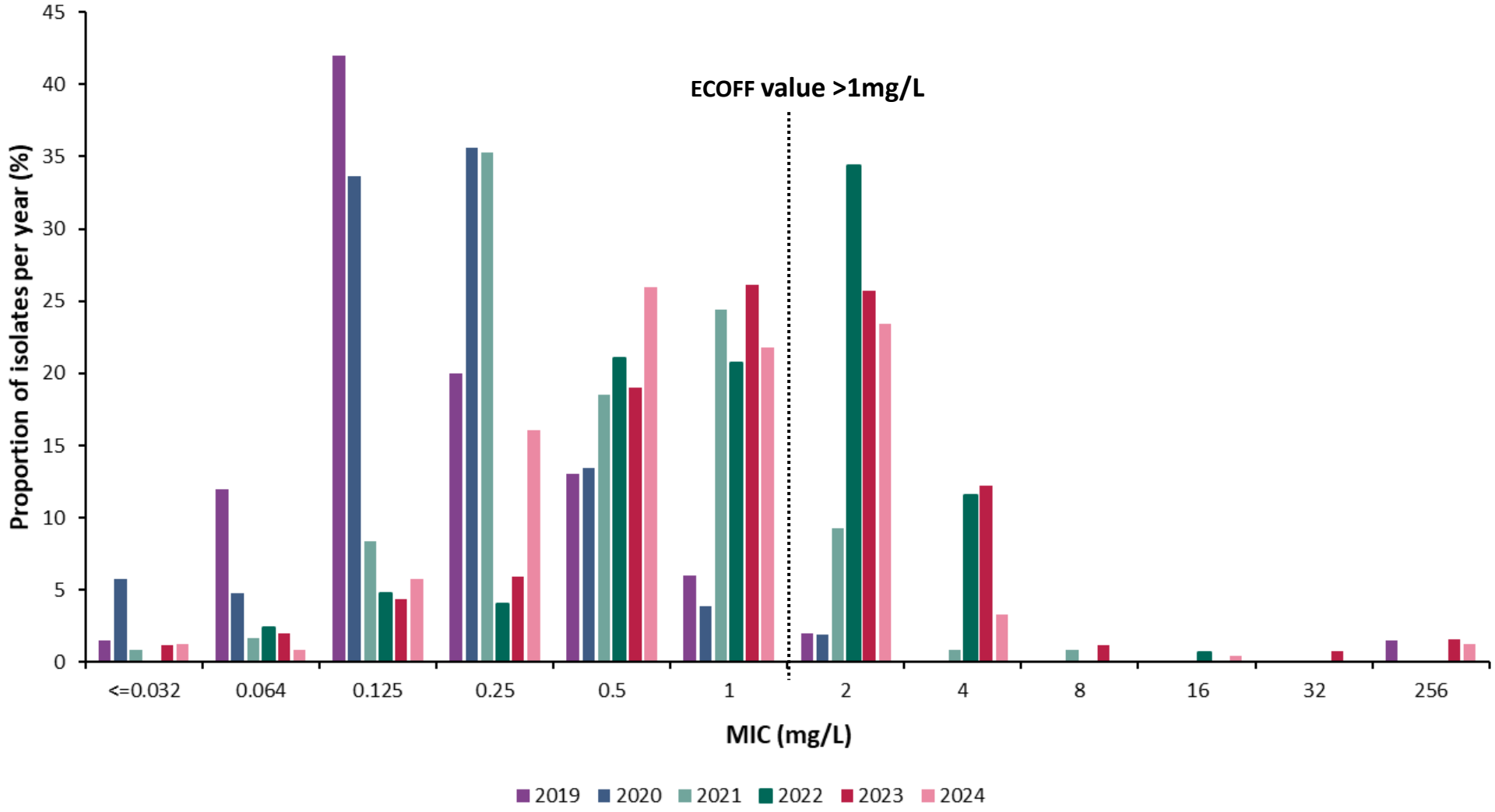
- Dual therapy including azithromycin is no longer recommended as first-line treatment for gonorrhoea

-for treatment guidelines, see Gonorrhoea - HSE.ie

- The European Committee on Antimicrobial Susceptibility Testing (EUCAST) removed the clinical resistance breakpoint of >0.5mg/L for azithromycin treatment of gonorrhoea
  - Use of the Epidemiological Cut-Off Value (ECOFF) of >1.0mg/L is now recommended.
- Interpretation using the ECOFF was retrospectively applied for analysis of trends in azithromycin susceptibility
- The proportion of isolates exhibiting MICs above the ECOFF decreased to **28%** in 2024
  - Compared with 42% in 2023, 47% in 2022, 11% in 2021, 2% in 2020 and 4% in 2019
  - Although there has been a decrease in proportion of isolates exhibiting MICs above the ECOFF in 2024, the increase above 2020 levels may reflect use of azithromycin for non-genital infections
- Isolates with MICs above the ECOFF by sex and mode of transmission in 2024

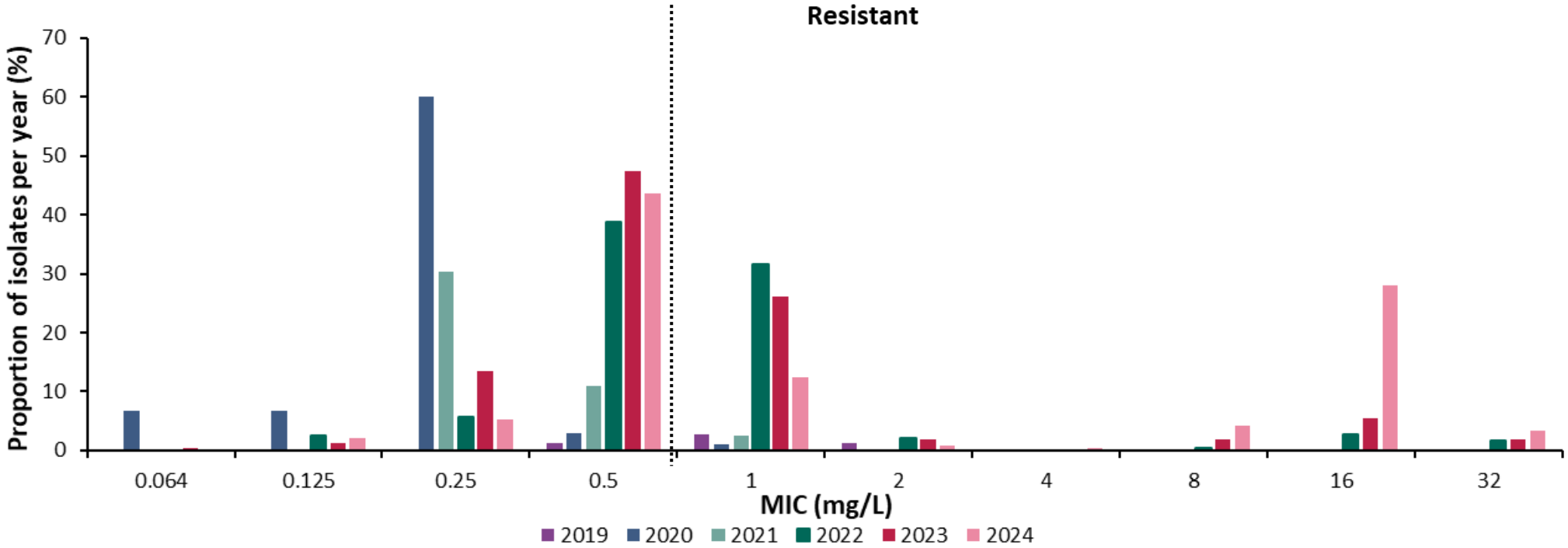
Male	%
Total Male	27%
gbMSM	74%
Heterosexual males	0%
Males where mode of transmission not known	26%
Female	
Total Female	39%

Azithromycin MIC (mg/L) among gonococcal isolates in Ireland (Euro-GASP, 2019-2024)



Tetracycline resistance MICs among gonococcal isolates in Ireland, 2019-2024

The European Committee on Antimicrobial Susceptibility Testing (EUCAST) updated the resistance breakpoint to > 0.5mg/L for tetracycline treatment of gonorrhoea in 2023. Interpretation using the new breakpoint was retrospectively applied for analysis of trends in tetracycline resistance



	2019	2020	2021	2022	2023	2024
Number of isolates	200	104	219	298	253	243
Number of isolates tested for Tetracycline Resistance	26	15	23	248	253	243

Other antimicrobials

- Ciprofloxacin may be recommended for treatment of gonorrhoea in cases of cephalosporin allergy if the isolate is known to be quinolone sensitive
- **54%** of isolates were resistant to ciprofloxacin in 2024, an increase of **4%** from 2023
- The percentage of female isolates with Ciprofloxacin resistance increased from **33%** in 2023 to **57%** in 2024
- The percentage of gbMSM isolates with Ciprofloxacin resistance increased from **59%** in 2023 to **70%** in 2024
- Isolates resistant to ciprofloxacin by sex and mode of transmission in 2024

Male	%
Total Male	54%
gbMSM	70%
Heterosexual males	0%
Males where mode of transmission not known	30%
Female	
Total Female	57%

- Production of β-lactamase confers high level resistance to penicillin
- **25%** of isolates produced β-lactamase (i.e. penicillinase screen positive) in 2024
  - Increased proportion from **11%** in 2023

Key points summary

These data have important implications for the clinical management of gonorrhoea in Ireland:

- Gonorrhoea notifications have risen by 112.5% from 2019 (n=2805) to 2024 (n=5,961)
- Data submitted to Euro-GASP covered 4% of all 2024 gonorrhoea notification
- One case of extended spectrum cephalosporin resistant *N. gonorrhoeae* was reported outside the study period (Sept-Nov 2024)
- Azithromycin ECOFF above (MIC >1 mg/L) in **28%** of isolates, a reduction of **33**% from 2023
- Ciprofloxacin resistance (MIC >0.06 mg/L) in **54%** of isolates, an increase of **4**% from 2023
- Tetracycline resistance (MIC >0.5 mg/L) in **49%** of isolates, an increase of **29**% from 2023
- β-lactamase (i.e. penicillinase screen positive) in **25%** of isolates, an increase of **127**% from 2023

Summary of Gonorrhoea Surveillance Evaluation

An evaluation of gonorrhoea surveillance in Ireland was carried out in late 2024 and early 2025 to assess the current surveillance system from the perspective of laboratory, clinical, and public health professionals. It found that while core laboratory data reporting is robust, enhanced surveillance data—such as partner notification, ethnicity, and mode of transmission was often incomplete, especially in high-burden regions like Dublin and during the COVID-19 pandemic. The system is generally considered acceptable to staff working within the public health system, but manual data entry and lack of integration between IT systems were major challenges.

These findings are timely as Ireland prepares to transition to the new **Outbreak, Case and Incident Management and Surveillance System (OCIMS).** The evaluation highlights the need for automation, better interoperability between systems, and streamlined data collection processes to reduce burden and improve data quality. Strengthening these areas will enhance Ireland's ability to respond to rising gonorrhoea cases and antimicrobial resistance, ensuring both national oversight and effective local action.

Public health implications and key recommendations for Public Health

- Surveillance of AMR in *N. gonorrhoeae* is crucial for monitoring national and international trends in antimicrobial resistance. Strengthening *N. gonorrhoeae* and *N. gonorrhoeae* AMR surveillance should be a priority to safeguard existing antimicrobial drugs and deliver effective public health measures

- Lack of complete enhanced data on *N. gonorrhoeae* notifications make it difficult to interpret data trends and effectively monitor disease transmission dynamics

- Initiatives to improve data collection and completeness:
  - HPSC along with colleagues in Public Health and the Gay Men's Health Service (GMHS) are participating in a European Centre for Disease Prevention and Control (ECDC) project designed to improve national surveillance systems for STIs through using electronic health records (EHR) (EHR-STI). The aim is to identify a data flow process that will improve the timeliness, and completeness for enhanced data on STI notifications. The project has directly informed the development of the HIV/STI component in the new Outbreak, Case and Incident Management and Surveillance System (OCIMS) OCIMS will replace CIDR and is due to go live in 2026 OCIMS has been developed to future proof, digitalise and strengthen our national surveillance system, providing benefits to both clinics and public health.

Public health implications and key recommendations for Public Health Cont.

- Current submissions to EuroGASP only include isolates tested at the NGRL during Sept-Nov annually, expansion of surveillance to include regional laboratories and year round surveillance would increase understanding of AMR in *N. gonorrhoeae* at a national level
- It is important to monitor tetracycline resistance in *N. gonorrhoeae* in light of the evolving role and use of doxycycline as post-exposure prophylaxis for STIs (DoxyPEP)
- Support the development of comprehensive sexual health services that are appropriately funded and resourced to meet sexual health needs.
- Clinicians should ensure that all cases of gonorrhoea are managed according to national guidelines and that samples for culture and antimicrobial susceptibility testing are taken as recommended in the national guidelines
- All laboratories should ensure isolates are tested for susceptibility to ceftriaxone and azithromycin, the recommended antimicrobials for first and second-line use in the treatment of gonorrhoea infection. Ciprofloxacin or cefixime may be considered as alternative options (only if shown to be sensitive on MIC testing, and where ceftriaxone is unsuitable)
- Isolates suspected of resistance should be submitted to the NGRL for confirmation, determination of antibiogram and molecular analysis
- A focus on prevention of gonorrhoea should be maintained through promotion of public health messages on safer sex and regular testing for STI
- Possible cases of treatment failure should be reported to the HPSC. The treatment failure form, enhanced Euro-GASP Surveillance form and the protocol for surveillance of ceftriaxone resistant gonorrhoea and Surveillance of High Level Azithromycin Resistant (HL-AziR) Gonorrhoea can be found on the HPSC website

Further information

Further information on gonorrhoea and gonorrhoea antimicrobial resistance can be found on the HPSC website	https://www.hpsc.ie/a-z/sexuallytransmittedinfections/gonorrhoea/
National Gonococcal Reference Laboratory, SJH	National Gonococcal Reference Laboratory | St James's Hospital
National guidelines for the prevention and control of gonorrhoea and for managing the impact of antimicrobial resistance in *Neisseria gonorrhoeae*	https://www.hpsc.ie/a-z/sexuallytransmittedinfections/gonorrhoea/amrgonorrhoea/amrgonorrhoeaguidance/
National framework for sexual health and wellbeing	https://www.gov.ie/en/policy-information/8feae9-national-sexual-health-strategy/?referrer=/wp-content/uploads/2015/10/national-sexual-health-strategy.pdf/
ECDC response plan to control and manage the threat of MDR and XDR gonorrhoea	https://www.ecdc.europa.eu/en/publications-data/response-plan-control-and-manage-threat-multi-and-extensively-drug-resistant
The Man2Man campaign for gbMSM aged 18+	Man2Man.ie
The HSE Sexual Health Programme (SHP)	Sexualwellbeing.ie

Technical notes

This report is based on data submitted to Euro-GASP and does not represent the total antimicrobial resistant profile nationally for 2024

Slide 2: Gonorrhoea in Ireland

- Please note that the information from previous years is updated on an ongoing basis in the Computerised Infectious Disease Reporting (CIDR) system, and so information on previous years represents our current understanding and most up to date data as of 1st August 2025 and may not correspond exactly with what was reported in previous annual reports. Similarly, data for 2024 may be updated further in due course and will be reported on in subsequent annual reports.
- While efforts are made to remove duplicate records from these data, it is not always possible to link and remove all duplicate records and some patients or disease events may be counted more than once.

Abbreviations

- gbMSM: gay, bisexual and other men who have sex with men
- Trans female: Assigned sex at birth is male and gender identity is female
- Trans male: Assigned sex at birth is female and gender identity is male

Acknowledgements

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