

# *Neisseria gonorrhoeae*: Antimicrobial Resistance and Co-infections in Patients in Vienna, Austria

## 2015 - 2022

Ursula Fürnkranz, Maria Haller, Katharina Schwarz, Claudia Heller-Vitouch, Gudrun Heidler, Tamara Gagic, Angelika Stary

Outpatient's Centre for Diagnosis of Infectious Venero-Dermatological Diseases, Vienna

**Background:** The number of gonorrhoea cases as well as the number of resistant *N. gonorrhoeae* are increasing globally. Co-infections with *Chlamydia trachomatis* have been described to be frequent.

**Objectives:** To determine the incidence of gonococcal infections at the Outpatient's Centre for Diagnosis of Infectious Venero-Dermatological Diseases (OCD) in Vienna and to evaluate the resistance patterns of *N. gonorrhoeae* strains, as well as co-infections with other STIs (*C. trachomatis*, *Mycoplasma genitalium*, *Trichomonas vaginalis*, HIV, and Syphilis).

### Methods:

**Samples:** 2848 isolates from men and women diagnosed at the OCD from 2015 to 2022

### Diagnostic:

- Nucleic acid amplification test (sampling sites: pharyngeal, anal, cervical/ urethral): *N. gonorrhoeae*, *C. trachomatis*, *M. genitalium*, *T. vaginalis*
- Culture on selective and nonselective GC agar
- Serology of HIV and Syphilis

**Antibiotic resistance testing:** Etest (ceftriaxone, cefixime, azithromycin, ciprofloxacin, penicillin, tetracycline)

### Results:

**Patients:** 10-times more men than women; Age: 12-85; most samples genital (urethra for men and cervix/urethra for women) [Figure 1]

**Antibiotic resistance testing:** ceftriaxone: none; cefixime: decreased after peaking in 2016 and 2017 (15.3% and 14%); azithromycin: increased to 15% (2022); ciprofloxacin: increased from 50% (2015) to 75.4% (2022); penicillin and tetracycline: constantly at ~20%, with the exception of penicillin in 2019 (6%) [Fig 2A]

Co-resistances with cefixime decreased, co-resistances with azithromycin and ciprofloxacin increased; isolates susceptible to all drugs investigated decreased (26% in 2015; 0.03% in 2022) [Fig 2B]

Median minimal inhibitory concentrations (MICs) increased in case of ceftriaxone, azithromycin, ciprofloxacin and penicillin

**Co-infections:** Most frequent co-infection was *C. trachomatis* (14% on average), followed by *M. genitalium* (3.1%), Syphilis (1%), HIV (1%) and *T. vaginalis* (1%) [Figure 3]

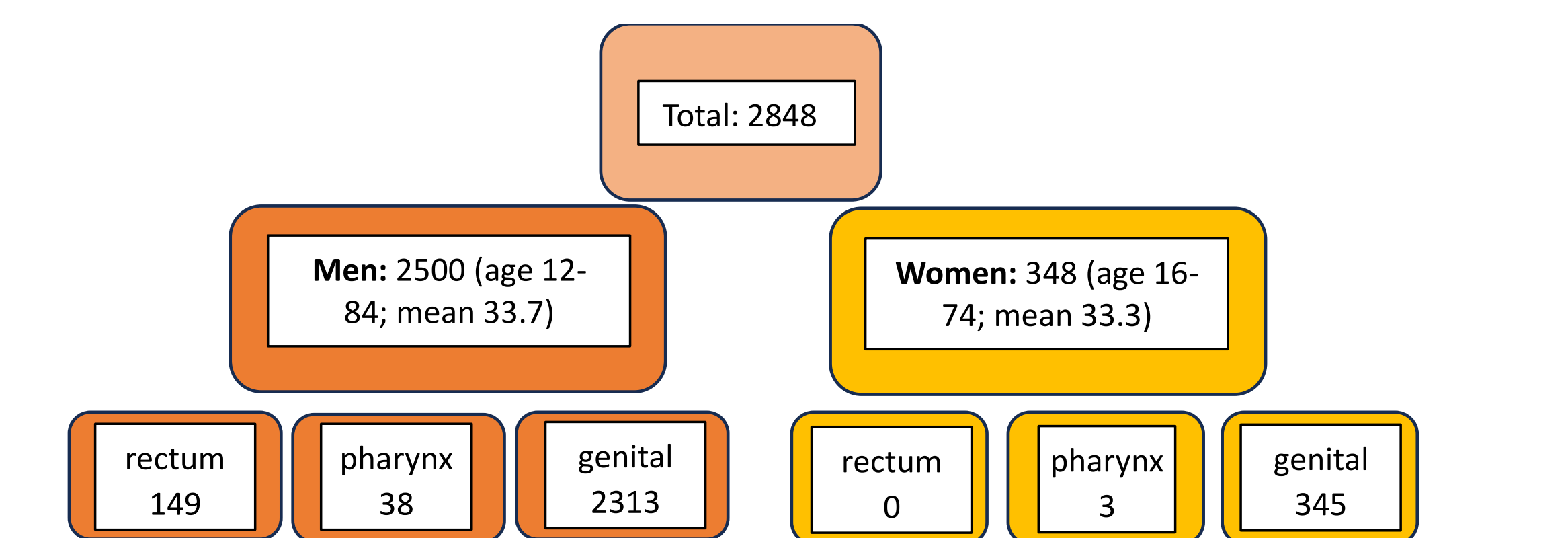


Figure 1: Number of *N. gonorrhoeae* isolates, sex, and sampling site as well as mean age and range of age of patients.

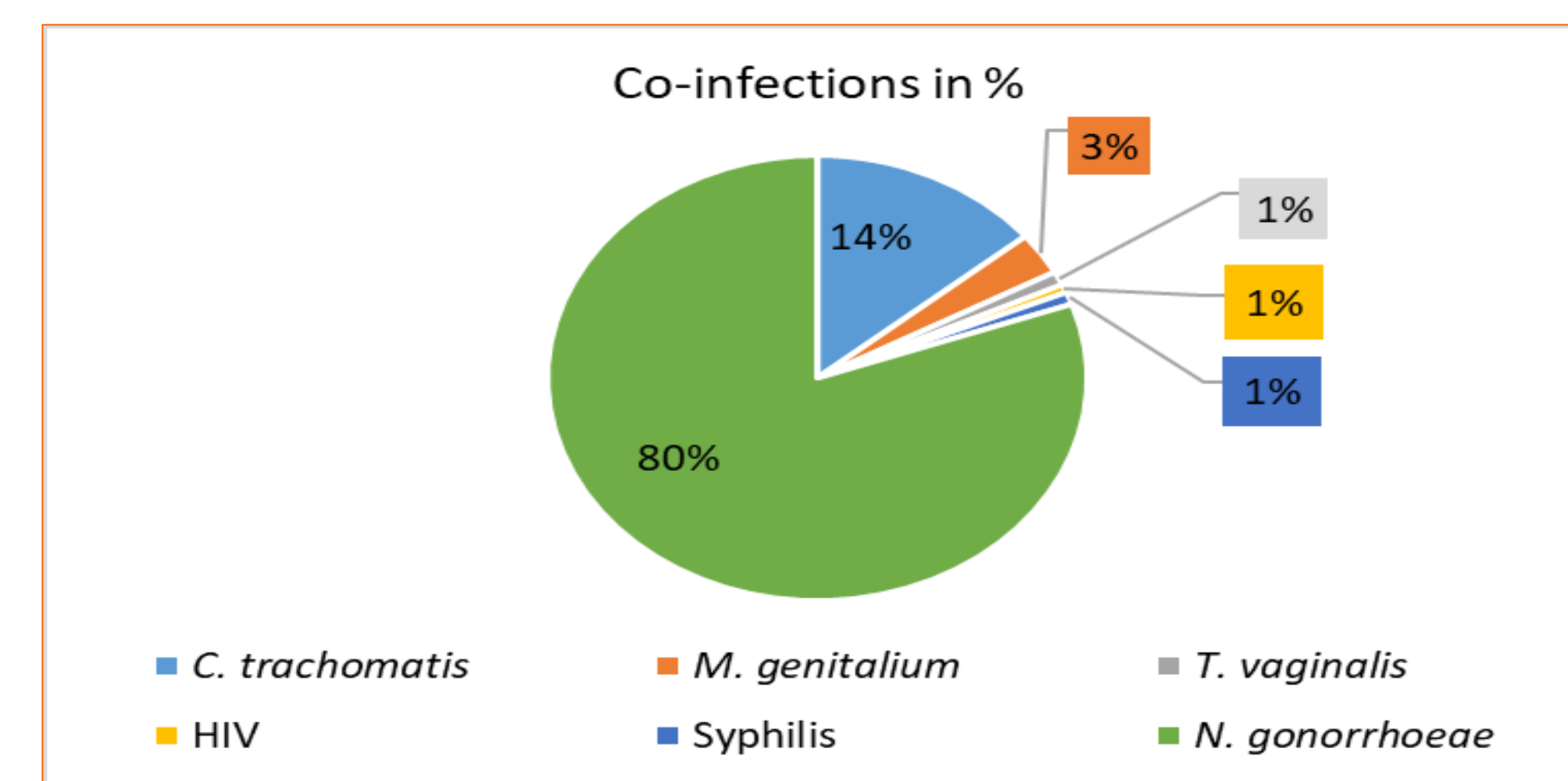


Figure 3: Co-infections in patients diagnosed with *N. gonorrhoeae*.

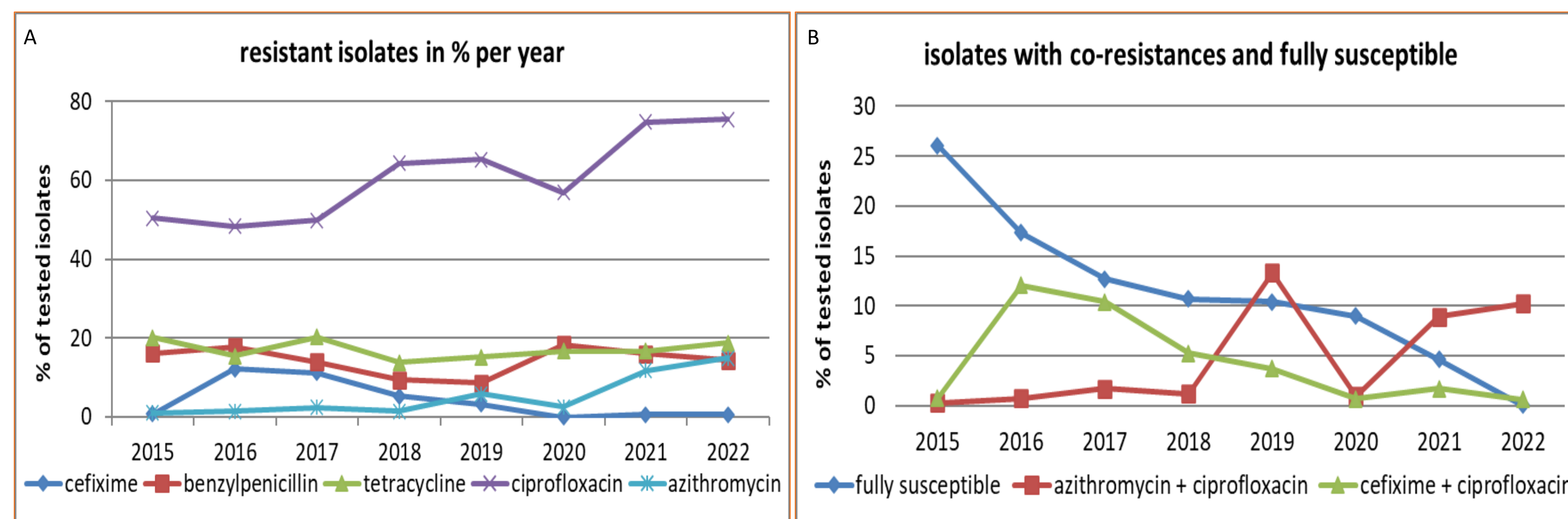


Figure 2 A and B: resistant isolates (A) and co-resistant, as well as fully susceptible isolates (B) from 2015 -2022

**PREVIEW: one ceftriaxone resistant isolate in 2023**

MIC 0.25µg/ml  
acquired in Thailand

also resistant to cefixime, azithromycin, tetracycline and ciprofloxacin

### Conclusions:

Ceftriaxone is still the gold standard for antibiotic therapy  
no autochthonous ceftriaxone resistant strains in Austria to date

Rising resistances (azithromycin) are alarming!

In 80% of cases *N. gonorrhoeae* is a single infection

→ **urgent need for the performance of gonococcal culture to determine resistance patterns of gonococcal strains**