



**Implementation of strategies for management
and prevention of sexually transmitted
infections with focus on *Neisseria gonorrhoeae*
and *Chlamydia trachomatis***

av

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Akademisk avhandling

Avhandling för medicine doktorsexamen i Medicinsk vetenskap
med inriktning Biomedicin,
som kommer att försvaras offentligt
Fredag den 17 juni 2022 kl. 09.00,
Hörsal C1 Campus USÖ, Örebro universitet

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Abstract

Ronza Hadad (2022): Implementation of strategies for management and prevention of sexually transmitted infections with focus on *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. Örebro Studies in Medicine 267.

Sexually transmitted infections (STIs) are a public health issue of great importance worldwide, with effects on fertility and reproduction. *Chlamydia trachomatis* and *Neisseria gonorrhoeae*, causative agents of chlamydia and gonorrhoea, respectively, are the most common bacterial STIs with an estimated 127 million new global cases of chlamydia and 87 million new gonorrhoea cases. The continued emergence of antimicrobial resistance (AMR) in *N. gonorrhoeae* may in the future lead to an untreatable infection. Prevention of these infections and controlling the development of AMR rely on several strategies developed by the World Health Organization (WHO). This thesis aimed to implement several of these strategies, including supporting vaccine development for *C. trachomatis* and *N. gonorrhoeae*, evaluating molecular methods for detecting *N. gonorrhoeae*, predicting AMR and supporting surveillance of the spread and prevalence of AMR in *N. gonorrhoeae*. The present studies on a *C. trachomatis* recombinant vaccine antigen and the investigation of similarities of *N. gonorrhoeae* antigen amino acid sequences to the antigens included in the meningococcal vaccine 4CMenB contributed to the field of vaccine development for STIs. The assay SpeDx ResistancePlus® GC performed well in detecting *N. gonorrhoeae* and predicting ciprofloxacin resistance and could be used in AMR surveillance and individualised treatment. In 2016, the first national genomic surveillance of all *N. gonorrhoeae* isolates in Sweden was performed. This national surveillance study included whole-genome sequencing combined with phenotypic AMR and epidemiological data, which provides valuable information on circulating strains, epidemiology and phylogeny. Greater knowledge of gonorrhoea and gonococcal AMR epidemiology could inform decisions on guidelines and prevention. It is essential to continue to implement WHO strategies at the national and global levels to prevent and control chlamydia and gonorrhoea infections.

Keywords: *Neisseria gonorrhoeae*, epidemiology, whole-genome sequencing, antimicrobial resistance (AMR), *Chlamydia trachomatis*, vaccine, strategies, management and prevention.

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