

Epidemiology of *Chlamydia trachomatis* Infection in Finland During 1983–2009

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Erika Wikström defended her PhD thesis on June 7, 2013 at the University of Oulu. Her main supervisors were Professor Matti Lehtinen, University of Tampere, Professor Jorma Paavonen, Helsinki University Central Hospital, Associate Professor Heljä-Marja Surcel, National Institute of Health and Welfare, and Professor Kaisa Tasanen-Määttä, Oulu University Hospital and University of Oulu, Finland. The opponent was Associate Professor Dan Apter, the Family Federation of Finland, Helsinki, Finland. The thesis is available at <http://urn.fi/urn:isbn:978-952-62-0153-5>.

Chlamydia trachomatis epidemic continues at a slowly, albeit steadily increasing rate in the Western world despite health education, easy/user-friendly diagnostic measures, and effective treatment. In Finland, 8,031 and 13,227 *C. trachomatis* infections were reported in 1995 and 2012, respectively. Over half of the chlamydia cases were diagnosed among young women, who suffer from the chlamydia-related complications such as infertility many years after initial infection. The rates of all but first of the following major chlamydia-related complications: cervical intraepithelial neoplasia, ectopic pregnancy, hospitalised pelvic inflammatory disease, tubal factor infertility have, however, decreased since the 1990s.

The aim of this study was to clarify the discordance between the apparently increasing incidence of *C. trachomatis* and decreasing *C. trachomatis* IgG antibody rates (seroprevalence).

The study material consisted of a random subsample of first trimester serum samples of 7,999 women from the population-based Finnish Maternity Cohort (FMC) registry from 1983 to 2005, and 147,148 women and men with a total of 177,138 *C. trachomatis* genital infections reported to the Finnish National Infectious Diseases Registry (NIDR) during 1995–2009. Both registries are maintained by the National Institute for Health and Welfare (THL).

Serum IgG antibodies were measured by a *C. trachomatis* major outer membrane protein-specific peptide enzyme immunoassay and the standard micro-immunofluorescence method. We found that while *C. trachomatis* seroprevalences decreased > 50% among fertile-aged women the seroconversion rates (seroincidences) were comparable to the NIDR reported rates.

The numbers of annual repeated *C. trachomatis* infection in the NIDR increased until 2009 by 49% in women and 39% in men. In 2009, about 25% of the females and 20% of the



Erika Wikström defended her PhD thesis on *Chlamydia trachomatis* epidemiology in Oulu, Finland on 7th June, 2013. Left to right: Opponent, Associate Professor Dan Apter, PhD Erika Wikström, Associate Professor Heljä-Marja Surcel.

males had had an earlier *C. trachomatis* infection, 34% of the repeat diagnoses occurring within 12 months. Most of the first infections were observed among females and males under 25 years of age, but the numbers of repeated chlamydial infections increased up to the age of 30 years.

The *C. trachomatis* serotype distribution changed between the 1980s and 1990s, but the leading 1980 serotypes bounced back by 2005. The numbers of women with multiple serotype infections peaked in the 1990s, and serotypes G and J were temporarily replaced by serotypes E and D.

In conclusion, the serological observations fit the polymerase chain reaction (PCR)-based data on *C. trachomatis* epidemiology. The observed increases in the repeated chlamydial infections among young women and men comply with increasing sexual risk-taking behaviour in Finland. Our observations help to understand the discrepancy between *C. trachomatis* occurrence and sequelae rates as the overall *C. trachomatis* infection burden in the population may be decreasing despite the increasing incidence trend.