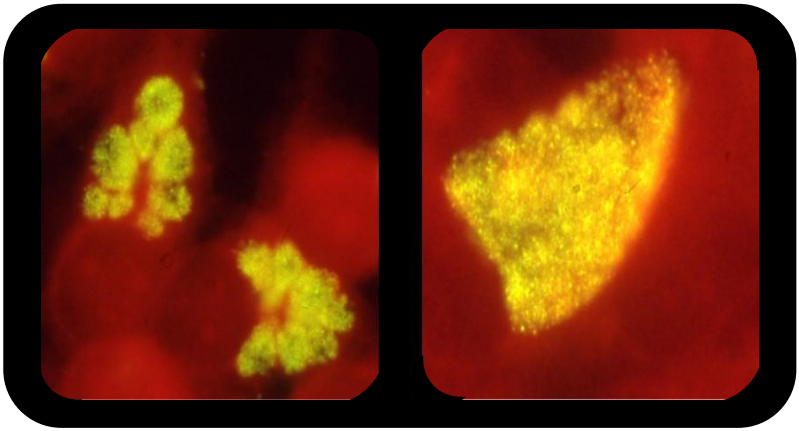
12th AACM

# Twelfth Annual Amsterdam

# *Chlamydia* Meeting



Hotel Mercure Amsterdam City

10 February 2017
9.00 – 17.00

## Preface

**Welcome:** This year we organise the 12th Annual Amsterdam *Chlamydia* Meeting (12th AACM). As we introduced previous two years we have a Prize for the best oral presentation by a PhD student, and also for the best Pitch. The quality of the oral presentations will be assessed by the Moderators of our sessions.

This year our opening keynote lectures is from Prof.Thomas Meyer (Germany) on organoids and in addition we have three other foreign keynote lectures from Prof.dr. Per-Anders Mårdh, MD (Sweden), Prof.dr. Remco Peters (South Africa), and Dr. Otilia Mårdh, MD (Sweden). As from the first AACM forward, we have many junior speakers including PhD students. We have this year for the second time pitches from students, PhD students and post-docs to pitch the work in which they are engaging for the upcoming years. This year we have 24 speakers including nine 4-minute pitches from the Netherlands and abroad. We are confident that the speakers will spark the minds of both young as well as established Chlamydiologists and trigger valuable discussions this day!

Next year (2018) there is no AACM since in 2018 Prof.dr. Servaas Morré is the meeting Director of the International *Chlamydia* meeting (ISHCI) held once every 4 years and once every 8 years outside the US. This meeting will be held from 1-6 July 2018 in Woudschouten, Zeist, The Netherlands. The co-organisors for this meeting are Prof.dr. Henry de Vries en Dr. Sander Ouburg. So, the 13th AACM will be Friday February 1st 2019.

**Acknowledgements:** We would like to thank our sponsors, without their support this meeting would not be possible in the current format: Roche, Mediphos, Hologic, and Genetic Signatures are all present with a stand. Finally, we would also like to thank those involved in the organization of this meeting from our Laboratory of Immunogenetics.

**Prof. Servaas A. Morré**
Head of the Laboratory of Immunogenetics

**Dr. Sander Ouburg**
Assistant professor
Infectious Diseases

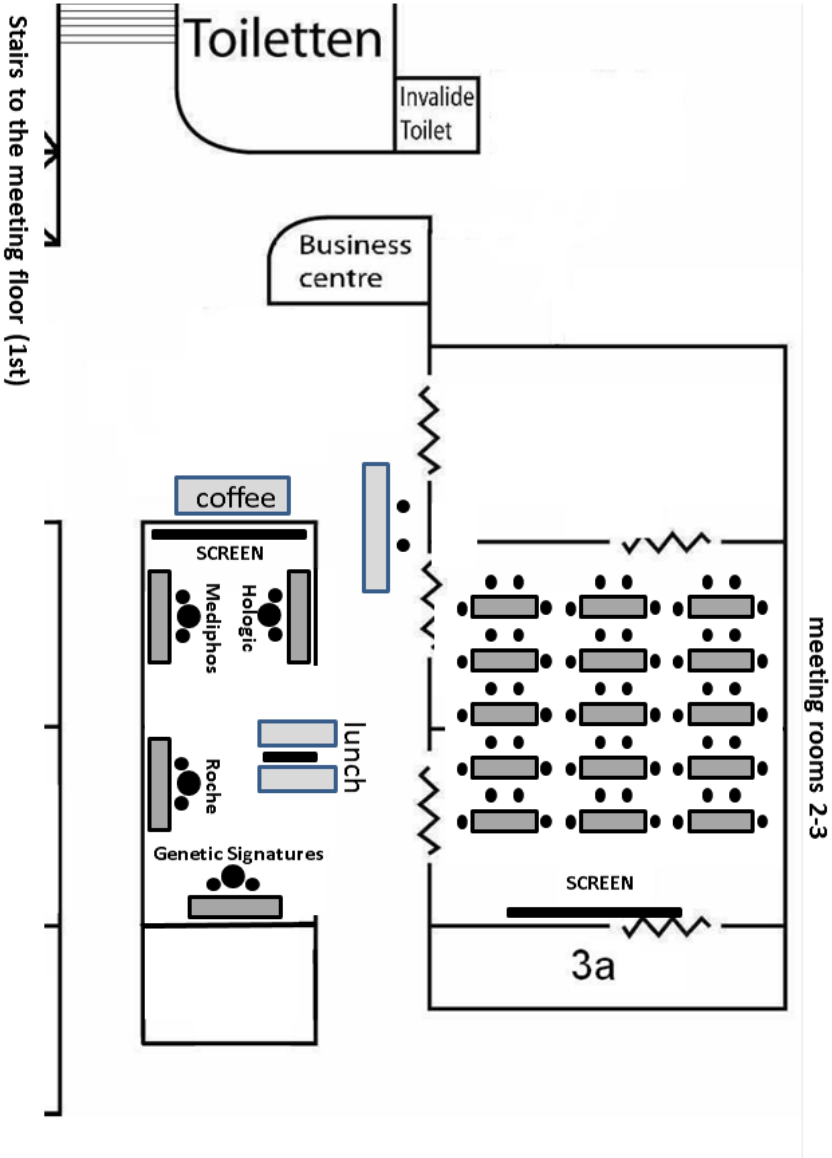
**Dr. Joke Spaargaren, MD, MBA-Health**
Staff researcher
Infectious Diseases

Laboratory of Immunogenetics, Dept. Medical Microbiology and Infection Control, VUmc, Amsterdam, The Netherlands

Cover photographs: Immunofluorescence staining of *Chlamydia trachomatis* within epithelial cells. HeLa cells were infected with a clinical isolate and stained with a monoclonal antibody specific for the major outer membrane protein (OmpA) of *C. trachomatis*. The left panel shows a nonfusogenic phenotype, while the right panel shows a fusogenic phenotype. Images courtesy of Yvonne Pannekoek, Department of Medical Microbiology, Academic Medical Center, Amsterdam, The Netherlands.

*Amsterdam, 10 February 2017*

# Floor plan (1st Floor, room 3)


Stairs to the meeting floor (1st)
Toiletten
Invalide Toilet
Business centre
coffee
SCREEN
Mediphos
Hologic
lunch
Roche
Genetic Signatures
meeting rooms 2-3
SCREEN
3a

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# Programme

9.00 – 9.30 **Registration to the symposium (1st floor, Foyer outside Room 3)**

9.30 Prof. Servaas Morré (NL)
*Opening of the symposium*

**Session: Keynote lectures & Late complications**
Moderator: Prof. Servaas Morré

9.35 Prof. Thomas Meyer (DE)
*Novel approaches to assess persistence and cancer-promoting activities of Chlamydia trachomatis infections*

10.10 Drs. Bernice Hoenderboom (NL)
*The Netherlands Chlamydia Cohort Study (NECCST): Risks of long-term complications after Chlamydia trachomatis infection in women, intermediate outcomes*

10.25 Jelmer Jukema (NL)
*Host genetic factors in relation to late complications of urogenital Chlamydia trachomatis infections*

10.40 – 11.00 **Coffee Break (In front of the meeting room)**

**Session: *C. trachomatis* control and clinical presentations**
Moderator: Dr. Joke Spaargaren

11.00 Dr. Otilia Mårdh (SE)
*Prevention and control of Chlamydia in Europe – from data to policies addressing the young population*

11.30 Dr. Hannelore Götz (NL)
*PICC-UP: Patient Initiated Contact treatment for Chlamydia: Understanding the Potential for increased effectiveness of partner treatment in the Netherlands: current practice and attitude of health professionals*

11.45 Drs. Lisanne Eppings (NL)
*FemCure: Prospective multicentre study on the transmission of genital and extra-genital Chlamydia trachomatis infections in women receiving routine care. An update*

# Programme

**Session: Pitches**
Moderator: Dr. Sander Ouburg

12.00 Drs. Juliën Wijers (NL)
*Chlamydia trachomatis: geographical variation in test practices of general practitioners, 2011-2015*

12.04 Dr. Janneke Heijne (NL)
*Prevalence Estimate of Chlamydia and gonorrhoeA in the Netherlands (PECAN-study): preliminary results*

12.08 Drs. Eleanne van Ess (NL)
*Evaluation of the performance of the multi-target Mikrogen Chlamydia trachomatis IgG ELISA in the prediction of tubal factor infertility (TFI) in subfertile women: comparison with the Medac MOMP IgG pELISA*

12.12 Drs. Jeanine Leenen (NL)
*The relation between oropharyngeal and incident anorectal Chlamydia trachomatis in MSM and women*

12.16 Drs. Anne Dirks (NL)
*Bacterial load in Chlamydia trachomatis control*

12.20 Drs. Kevin Jansen (NL)
*Viability-PCR as a new approach to assess Chlamydia trachomatis viability*

12.24 Dr. Ivan Branković (NL)
*Analysis of host genetic biomarkers in a Chlamydia-infected fallopian tube organoid model*

12.28 Drs. Pierre Thomas (NL)
*The ChlamIndia Project*

12.32 Drs. Jimmy Wilford (ZW)
*STI education in Zimbabwe. Challenges and opportunities for reaching out the youth.*

12.36 – 13.15 **Lunch (In front of the meeting room)**

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# Programme

**Session: *Late complications and the vaginal microbiome***
Moderator: Prof. Henry de Vries

13.10 Prof. Per-Anders Mårdh (SE)
*A critical review on current knowledge on pelvic inflammatory disease (PID) with special reference to Chlamydial infections*

13.45 Dr. Eline op de Coul (NL)
*Chlamydia trachomatis, Neisseria gonorrhoeae, and Trichomonas vaginalis infections in pregnant women and their partners in the Netherlands: prevalence, risk factors, and pregnancy outcomes*

14.00 Drs. Jeanne Tamarelle (FR)
*Vaginal microbiota composition and association with Chlamydia trachomatis infection among young women attending a STI clinic in France*

14.15 Dr.Ir. Petra Wolffs (NL)
*Chlamydia trachomatis Antibiotic resistance: Towards a Ribosomal sequence approach*

14.30 Drs. Martin Singer (NL)
*Next Generation Sequencing versus ISPro-technique to define the vaginal microbiome*

14.45 – 15.15 **Coffee break (In front of the meeting room)**

**Session: *Prevalence and epidemiology***
Moderator: Prof. Remco Peters

15.15 Prof. Remco Peters (SA)
*Chlamydia trachomatis control in South Africa: Fighting a losing battle?*

15.45 Prof. Daisy Vanrompay (BE)
*Transfer of Chlamydia suis from pigs to the human eye*

16.00 Drs. Bart Versteeg (NL)
*In silico multilocus sequence typing of Chlamydia trachomatis plasmids shows clustering of isolates according to the disease related biovars*

# Programme

16.15 Dr. Geneviève van Liere (NL)
*Oropharyngeal testing and positivity between 2009-2015 in South Limburg*

16.30 Drs. Daphne van Wees (NL)
*Double Trouble: The Impact of low risk perception and high risk sexual behaviour on Chlamydia transmission*

**16.45 Moderators meet to select the best oral presentation by a PhD student, and the best pitch by a PhD student**

**16.55 Best presentation and best pitch by a PhD student prizes**

**Closing remarks: Prof. Servaas Morré**

**17:00 - 18:30 Drinks with "bitterballen" (Foyer, lobby level)**

**18:30 Diner (Restaurant Mercure Amsterdam City)**

# Notes

## Prof. Thomas F. Meyer, PhD

*Max Planck Institute for Infection Biology,*
*Department of Molecular Biology, Berlin-Mitte*

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**9:35** Novel approaches to assess persistence and cancer-promoting activities of *Chlamydia trachomatis* infections

## Curriculum Vitae

Thomas F. Meyer started his career by establishing an in vitro replication system of bacteriophage fd/M13 circular DNA during his Ph.D. at the Max Planck Institute (MPI) for Medical Research in Heidelberg. In the late 80's his focus shifted gradually towards the pathogen-host cell interface, where he discovered central adhesins, invasins, and host cell receptors crucial for the neisserial infection. As director of the Department of Infection Biology in Tübingen (1990) and co-founding director of the new Max Planck Institute for Infection Biology in Berlin (1994), he continued to explore crucial aspects of pathogen-host cell interactions using *Neisseria*, *Chlamydia*, and *Helicobacter* as model systems. With the discovery of short interfering RNAs (siRNA) applicable to gene knockdown in human cells, he placed emphasis on the exploration of human gene function during infection. His current research interests have shifted and now focus on the influence of long-term infection and inflammation on chronic disease as well as the manifestation of somatically inheritable genetic marks upon infection and the causality between bacterial infections and human cancers.

## Abstract


Chlamydia infections are long-lasting and difficult to treat. We are interested in understanding the molecular basis of the Chlamydia trachomatis (Ctr) interactions with host cells and the long-term consequences of infections for the human host. To study this, we pursued the establishment of long-lasting in vitro cultures of normal human epithelial cells from sites targeted by Ctr, including the fallopian tube and the cervix. Interestingly, an organoid model of the human fallopian tube maintained persistent Ctr infection, providing intriguing clues on the pathogen - host interaction. We also investigated the role played by host cell determinants in the infection more comprehensively by performing a genome-wide RNAi screen in HeLa cells. This led to the identification of host cell factors with potential for host-directed treatment of the infection. Finally, we investigated the influence of Ctr of host cell pathways involved in the DNA damage response and observed striking indications for a potential of Ctr as a cancer-initiating species.

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## Bernice Hoenderboom, MSc

*Epidemiology and Surveillance Unit, Centre for Infectious Disease Control, National Institute for Public Health and the Environment, The Netherlands and Laboratory of Immunogenetics, dept. Medical Microbiology and Infection Control, VU University Medical Center, The Netherlands.*

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**10:10** The Netherlands Chlamydia Cohort Study (NECCST): Risks of long-term complications after *Chlamydia trachomatis* infection in women, intermediate outcomes

## Curriculum Vitae

Bernice Hoenderboom (1988) graduated in Health Sciences, specialization Infectious Diseases and Public Health in 2014 at the VU University in Amsterdam. She completed her master thesis about HIV drug resistance in Sub Saharan Africa, at the Amsterdam Institute for Global Health and Development. After graduation, she worked at the Public Health Services (GGD) at the STD department. Since June 2015, she is working as a PhD student at the National Institute for Public Health and the Environment in collaboration with the Laboratory of Immunogenetics at the VU medical center. Her PhD project is about the Netherlands *Chlamydia* Cohort Study (NECCST) investigating long-term complications of *Chlamydia trachomatis* infections in women, including the role of host genetic biomarkers.

## Abstract

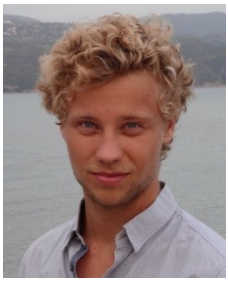

**Background:** The Netherlands *Chlamydia* Cohort Study (NECCST) follows a cohort of women of reproductive age for ≥10 years to investigate *Chlamydia trachomatis* (CT) related risk (factors) for late complications, including the role of host genetic biomarkers. The NECCST-cohort builds on a prior large-scale *Chlamydia* Screening Implementation (CSI, 2008-2011). Here outcomes from the first NECCST collection round are described.

**Methods:** In 2015-16 CSI women were invited to participate in NECCST. Data on CT-infections, pregnancies and the late complications Pelvic Inflammatory Disease (PID), ectopic pregnancy (EP), and tubal infertility (TI) were collected by questionnaires. CT Immunoglobulin G (IgG) was measured in self-collected blood samples.

A positive CT history was defined as ≥1 positive outcome, either a positive CSI CT Polymerase Chain Reaction (PCR) result, a self-reported CT-infection or CT IgG presence. Current NECCST data were combined with background CSI-data.

**Results:** Of 13,500 invited women 5,704 (42.3%) were enrolled. Preliminary results show a CT IgG prevalence of 14.5%. Overall, 29.2% (n=1,665) had a positive CT-history. Women with a positive CT-history reported less often planned pregnancies compared to women with a negative CT-history (19.5% versus 27.4%, P<0.001). In contrast, unplanned pregnancies were more common among women with a positive CT-history (24.7% versus 12.4% p<0.001). Women with a positive CT-history had a significantly higher risk of PID and TI compared to women with a negative CT-history: 5.0% versus 2.0% (p<0.001) and 1.1% versus 0.3% (p<0.001), respectively.

**Conclusion:** Intermediate outcomes of NECCST after 4-7 years follow-up from initial CT screening suggest a higher risk for PID and TI in women with a positive CT-history. This ongoing cohort study is expected to yield valuable results for identification of risk factors for CT-complications, which might enable targeted secondary preventive measures.




## Jelmer Jukema

*Laboratory of Immunogenetics, Dept. Medical Microbiology and Infection Control, VU University Medical Center, The Netherlands*

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**10:25** Host genetic factors in relation to late complications of urogenital *Chlamydia trachomatis* infections

## Curriculum Vitae

Jelmer Jukema is a Medical student who follows the Honours Programme at the VU University Medical Center in the start of his academic career. His research is supervised by Prof.dr. Servaas A. Morré, dr. Sander Ouburg, and dr. Joke Spaargaren. During secondary school in Leiden he followed the Leiden Pre-University Programme for top students. In 2014 he published his first article in the Netherlands Heart Journal called: "*Waterpipe smoking: not necessarily less hazardous than cigarette smoking: Possible consequences for (cardiovascular) disease.*"


## Abstract

Single nucleotide polymorphisms (SNPs) have been linked to an altered CT susceptibility and/or severity of late complications. In order to investigate the potential application in practice of SNPs as part of a tubal pathology prediction algorithm fifty SNPs were selected. These SNPs were selected by literature search conducted in order to select SNPs with a presumably relatively high influence on long-term complications and by checking online databases for their prevalence in European/Caucasian cohorts. Four of these fifty SNPs were tested as a proof of principle. Next, the susceptibility and prevalence in Dutch cohorts was examined using four cohorts from the Netherlands (STD and gynaecology department derived), consisting of a total of 1652 women. For some women also long-term complication information was available. Furthermore, 416 CT positive women from the NECCST cohort were enrolled for an in-house genotyping study. Cases here were defined as women with a positive CT history and pelvic inflammatory disease and/or ectopic pregnancy and/or tubal factor subfertility and/or chronic pelvic pain. Controls were fertile women with a positive CT history and none of the earlier mentioned complications. Of all these participants DNA was isolated and tested for the four SNPs using KASP genotyping.

*Amsterdam, 10 February 2017*

## Otilia Mårdh, MD, PhD

*European Centre for Disease Prevention and Control (ECDC), Sweden*

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**11:00** Prevention and control of *Chlamydia* in Europe – from data to policies addressing the young population

## Curriculum Vitae

Otilia Mårdh is a medical epidemiologist that works for the European CDC since 2011. Over the years she coordinated ECDC work on *Chlamydia* control in Europe and the development of ECDC *Chlamydia* Control in Europe Guidance (2015). Several other projects in the area of HIV/STI prevention and control are: Comprehensive approach to HIV/STI prevention in the context of sexual health, STI and HIV prevention in men having sex with men in Europe, ECDC Guidance for antenatal screening for infections - addressing the vulnerable groups. Otilia also contributes to the epidemic intelligence and response activities in ECDC that aim at early detection and assessment of threats for human health in EU/EEA. A latest involvement is in ECDC recommendations for prevention sexual transmission of Zika. Speaker in international conferences: FIGO-SAFOG-SLCOG, Sri Lanka 2014, Ministerial conference – Women's health: a life course approach, Italy 2014, ISSTDR Vienna 2013, Policy Exchange symposium – Young people and sexual health, Brussels 2013.

## Abstract


*Chlamydia trachomatis*, the most frequently reported sexually transmitted infection (STI) in the EU/EEA, is of public health concern as untreated infections can lead to severe reproductive tract complications and infertility. In 2015, a total of 396,163 cases were reported in 27 Member States with the largest proportion (61%) among 15-24 year-olds. While the overall EU/EEA rate was 173/100,000 population, the rate among those 20-24 years-olds was 1022/100,000 reflecting this group at highest risk in EU/EEA.

*Chlamydia* prevalence estimates vary across the EU/EEA countries and are impacted by age, geographic coverage and sexual experience. In sexually experienced young adults (aged 18–26 years) the prevalence was pooled-estimated as 3.6% (95% confidence interval (CI) 2.4% - 4.8%) in women and 3.5% (95% CI 1.9% - 5.2%) in men. Evidence was found that widespread testing can reduce the risk of pelvic inflammatory disease within one year after testing

(RR= 0.64 [95%CI 0.44-0.9]) but not the prevalence of infection (*ECDC Technical report on Chlamydia control in Europe- literature review*).
In 2016, the European Centre for Disease Prevention and Control (ECDC) published the second edition of its *Chlamydia* control in Europe guidance (first published in 2009) with the aim of supporting policy makers and national programme coordinators in EU/EEA countries to develop, implement and improve their *chlamydia* control activities. ECDC guidance recommends the minimum level for *chlamydia* prevention and control activities to include: a national strategy/plan for STIs control, primary STIs prevention activities, evidence-based case management guidelines (with partner notification), surveillance of diagnosed cases and an evaluation plan for the strategy. Widespread opportunistic testing or a screening programme is recommended if resources exist and adequate monitoring and evaluation implemented. ECDC's guidance policy options should be considered by Member States according to their specific epidemiological, healthcare and resource environments. (*ECDC Guidance on chlamydia control in Europe, 2015*)

## Hannelore Götz MD, PhD, MPH

*Centre for Infectious Diseases Control, RIVM, Bilthoven & Municipal Public Health Service Rotterdam-Rijnmond, Rotterdam, The Netherlands*

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**11:30** PICC-UP: Patient Initiated Contact treatment for *Chlamydia*: Understanding the Potential for increased effectiveness of partner treatment in the Netherlands: current practice and attitude of health professionals

## Curriculum Vitae

Hannelore works as 'arts Maatschappij en Gezondheid' in infectious disease/STI control at the Municipal Public Health Office Rotterdam-Rijnmond, as well as researcher at the Centre for Infectious Diseases Control, National Institute for Public Health and the Environment, Bilthoven, The Netherlands.
As Chair of physicians working in sexual health centers in the Netherlands she works on improving guidelines and evidence based working. Assessing the value of regional surveillance data to improve understanding of STI epidemiology and informing control policy was a recent project at RIVM.
Her PhD (2006) was on *Chlamydia* screening. A large *chlamydia* screening implementation project led to several publications *e.g.* reinfections. Applied research on improving methods and evaluation of STI control has her specific interest. She is Principal Investigator of FEMCURE at the sexual health center in Rotterdam. As projectleader of PICC-UP (Patient Initiated Contact treatment for *Chlamydia*), a project investigating the potential of Patient Initiated Partner therapy (PIPT) for *chlamydia*, she coordinates quantitative and qualitative research investigating possible ways of improving partner therapy for *chlamydia* in both GP practices and sexual health centers.

## Abstract


**Introduction:** *Chlamydia* prevalence remains high and recurrent infection frequently occurs despite scaled-up control efforts. In the Netherlands, the majority of *chlamydia* patients are seen by general practitioners (GPs) and at sexual health centres (SHC). Partner notification and partner treatment are addressed in guidelines but treatment of the partner via 'patient-initiated partner therapy' (PIPT) is not an (official) option. As part of a larger research project (PICC-UP) we investigated the potential of implementing direct partner treatment for *chlamydia* among health professionals.

We also assessed potentially overtreatment and missed STI in partners notified for chlamydia if PIPT would be implemented.

**Methods:** Various data-sources were combined to collect information on current practice and attitude towards PIPT. These included questionnaires at a GP conference and among GPs in NIVEL Primary Care Database. At SHC we performed an electronic survey among doctors and nurses. Furthermore, we used SHC data from 2015 of heterosexual clients notified for chlamydia and investigated their STI rates.

**Results:** The majority of GPs discuss partner notification of current (97%) and ex-partner (92%) with chlamydia-patients, but leave further steps to the patients (83%). GPs rarely give PIPT (2-6%, via partner prescription or double doses for the index), except when partners are registered in the same practice (16%). One in five GPs indicated willingness to provide PIPT and 1/3 if possible after patient-initiated partner notification.
The SHC staff acknowledged the need to treat current partners immediately (especially in steady relationships) but was critical towards PIPT without counselling or taking medical history from partners. A higher proportion of SHC staff indicated to consider PIPT for a steady partner (51%) than for a casual partner (8%).
Fourteen percent (N=14,435) of heterosexuals consulting STI clinics in 2015 were notified for chlamydia only. Of these, 34% was diagnosed with *chlamydia* (n=4,937), while 1.2% had gonorrhoea (n=174), which was 10% of all cases found in heterosexual clients in 2015 (n=1702). 1 person had syphilis and 2 HIV.

**Conclusion:** At present, PIPT for *chlamydia* is seldom applied at the GP or SHC. Health professionals are both critical and open to options for PIPT. The SHC data showed that two-thirds of partners would get treated unnecessarily and a considerable proportion of gonorrhoea would be missed among heterosexuals with PIPT for chlamydia only. Applying PIPT would need to be accompanied by offering STI testing. Pro's and con's of PIPT have to be weighed and, if decided, clear guidelines to arrange this legally and practically are needed.

## Lisanne Eppings, MSc

*Public Health Service South Limburg & School of Public Health and Primary Care (CAPHRI), Maastricht University Medical Center (MUMC+), The Netherlands*

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**11:45** FemCure: Prospective multicentre study on the transmission of genital and extra-genital *Chlamydia trachomatis* infections in women receiving routine care. An update

## Curriculum Vitae

Lisanne Eppings was born on October the 24th 1989. After obtaining her BSc. degree in Physical Therapy in 2011, she continued her scientific career at the VU University in Amsterdam. There, she received her MSc. degree in Health Sciences – Infectious Diseases & Public Health in 2014. She started working as a PhD-student at the Public Health Service (GGD) in South Limburg in May 2015 under supervision of Prof. Dr. CJPA Hoebe and Dr. NHTM Dukers-Muijrers in collaboration with the Care and Public Health Research Institute (CAPHRI) of the Maastricht University Medical Center (MUMC+). The focus of her PhD will be anorectal *Chlamydia trachomatis* and its persistence after treatment, which will be investigated with the currently ongoing multicenter longitudinal cohort study FemCure.

## Abstract


**Background** *Chlamydia trachomatis* (CT) is the most common STI worldwide and may lead to severe complications among women. The number of positive tests is high, especially among women below the age of 25, and still rising annually. The prevalence of anorectal CT hardly differs from that of genital CT among women. However, better understanding of the impact of anorectal CT in transmission is needed to inform more effective control strategies. FemCure is a currently ongoing longitudinal multicenter cohort study aiming to recruit and follow 400 CT positive women who visited the Public Health Services (GGD) of South-Limburg, Rotterdam or Amsterdam. Participants are asked collect vaginal, anorectal and (nurse-taken) oral swabs and to complete online questionnaires regarding their sexual behavior pre-treatment, 1, 2, 4, 6, 8, 10 and 12 weeks post-treatment. Nucleic acid amplification tests (NAATs) will be used to determine the bacterial load and vPCR will be used to determine the CT viability. The outcomes will be compared with the online questionnaires in order to gain better insights in CT transmission and treatment efficacy, with special focus on the role of anorectal CT. Here, we will provide a unique insight in how to handle recruitment and drop-out in such a large scale and time-intensive longitudinal cohort study as this is.

**Methods** In order to assess recruitment and minimize drop-out a team of 3 researchers are on a day to day basis in contact with the 15 study-nurses who are responsible for recruitment and follow-up visits. Every day, the researchers monitor whether participants complete questionnaires in time and attend their visits at the clinic. A semi-automatic system is set up to provide cues and reminders to participants (by text messages and telephone calls).
Logistic regression analyses and Cox-regression analyses will be used to clarify predictors for drop out. Variables of interest include age, education, ethnicity, number of sex partners, having a steady sex partner, previous CT diagnosis and anatomic site of infection.

**Findings and Discussion** At the end of 2016, after the first 9 months of recruitment, 259 women were enrolled in the ongoing FemCure. Most participants were 24 years or younger (77%), higher educated (71%) and had a western nationality (81%). About 80% of participants had complete follow up, which can be considered high retention. 12% of the women provided their samples or data after receiving a reminder. Identified predictors for drop-out (20%) will be presented and discussed to further optimize recruitment and retention.

## Juliën Wijers, MSc

*Department of Sexual Health, Infectious Diseases and Environmental Health, Public Health Service South Limburg, Care and Public Health Research Institute (CAPHRI), Maastricht University Medical Center (MUMC+)*

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**12:00** *Chlamydia trachomatis*: geographical variation in test practices of general practitioners, 2011-2015

## Curriculum Vitae

Juliën Wijers (1991) has obtained his BSc. degree in Medical Imaging and Radiation Therapy at the Fontys University of Applied Sciences in 2013. In 2015 he graduated at Maastricht University in Epidemiology. Since spring 2016 he is doing his challenging PhD at the department of Sexual Health, Infectious Diseases and Environmental Health (public health service South Limburg, Geleen, the Netherlands). He is now focusing on (re)test practices of general practitioners regarding *Chlamydia trachomatis*. Later on he will extend his research field into *Mycoplasma genitalium*.

## Abstract


**Background**: Retesting *Chlamydia trachomatis* (CT) treated people after 3-12 months is recommended as it can yield substantial numbers of reinfections. A test-of-cure (TOC) shortly after treatment (within 3 months) is not advisable due to the likelihood of false positive findings leading to overtreatment. Spatial analyses are useful to detect geographical areas of low guideline adherence to inform local testing policies and targeted interventions. The aim was to assess geographical variation in test practices of general practitioners (GPs) in The Netherlands.

**Methods**: Retrospective laboratory data containing CT tests of 48 GPs in 4 municipalities were obtained (2011-2015) from the public laboratory in the south western part of the Netherlands (183 thousand residents). First recorded urogenital positive CT tests of men (n=249;39.2%) and women (n=386;60.8%) ≥16 years between January 2011 and July 2015 were included in the analyses and TOC and re-tests were outcomes. Logistic regression was used for analyses.

**Results**: Overall, 8,275 CT tests were performed (positivity 8.4%;n=691);only 0.4% (n=43) from extra genital sites. On a GP level, the number of CT tests varied geographically from 1 to 2,421 (p<0.001). A TOC was performed in 19.1% of the CT cases (n=123;13.8% positive). TOC was more often performed in south

Maastricht in comparison with the center of Maastricht (p=0.02,OR 3.0,95%CI 1.23-7.33). A retest was performed in 23% of the CT cases (n=146;10.3% positive). The rate of retests non-significantly varied geographically between 6.3% and 30.2% p=0.33. Patients with a TOC were more likely to have a re-test in comparison with cases without a TOC (p=0.02).

**Conclusion**: Testing at extra genital sites and the overall proportion of retests was low at GP practices. Almost one out of five CT cases returned within three months and many (re-)infections were probably missed. Moreover, it seems that there are geographical variations in test practices of GPs. Thus, targeted interventions at the local level are needed to increase CT testing and re-testing practices of GPs.

## Janneke Heijne, PhD

*National Institute for Public Health and the Environment (RIVM), the Netherlands.*

janneke.heijne@rivm.nl


**12:04** Prevalence Estimate of *Chlamydia* and *gonorrhoeA* in the Netherlands (PECAN-study): preliminary results

## Curriculum Vitae

Dr. Janneke Heijne specializes in combining mathematical modelling and epidemiology to investigate the impact of interventions to control transmission of sexually transmitted infections. She obtained her PhD at the University of Bern, Switzerland in the department of social and preventive medicine (ISPM). Her PhD thesis focused on chlamydia (re)infections. She now works as a post-doc at the STI department of the RIVM, the Netherlands.

## Abstract


*Chlamydia* and *gonorrhoea* surveillance data in the Netherlands mainly come from STI clinics and general practitioners. People visit these facilities because they have symptoms or have other reasons for STI testing. A prevalence estimate in the general population could provide insights in the occurrence of STI, including in people whose infection would otherwise have gone unnoticed. This might help identifying groups who are not reached by current care and enables us to put the current surveillance data into perspective.

The objective of this study was to obtain prevalence estimates for *chlamydia* and *gonorrhoea* among Dutch men and women aged 18 to 34 years.

In collaboration with Rutgers, SANL and CBS, a probability sample survey of 17.000 men and women aged 18-34 years in the Netherlands was performed between November 2016 and February 2017. Participants were invited to complete a web-based questionnaire about sexual health. At the end of the questionnaire, participants who reported at least one sexual partner (oral, anal, or vaginal sex), were asked to participate in the additional prevalence module and received a kit for self-collection of urine or vaginal swab samples. Participants returned the sample by mail to the laboratory (Streeklaboratorium, GGD Amsterdam) for testing for the presence of *chlamydia* and *gonorrhoea* using NAAT. Treatment was provided via STI clinics or general practitioners.

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Here, the study design will be presented, together with the first results on response rates, and unweighted chlamydia and gonorrhoea test positivity, if available.

## Eleanne van Ess, MD

*TubaScan Ltd & Laboratory of Immunogenetics, VU University Medical Center*

e.vaness@vumc.nl


**12:08** Evaluation of the performance of the multi-target Mikrogen *Chlamydia trachomatis* IgG ELISA in the prediction of tubal factor infertility (TFI) in subfertile women: comparison with the Medac MOMP IgG pELISA

## Curriculum Vitae

Eleanne van Ess (1989) started her studies in biomedical sciences and medicine at the VU University in Amsterdam in 2008 and 2009. In 2011 she obtained her bachelor of science in biomedical sciences and graduated as a medical doctor in 2015. After graduation she started working as a PhD student at the laboratory of Immunogenetics at the VU University Medical Center in Amsterdam under supervision of prof.dr. S.A. Morré. Her PhD project focusses on improvement of the prediction of tubal factor infertility (TFI) in women based on serology and human genetics.

## Abstract


**Background:** In the clinical fertility work-up there is a need for more accurate *Chlamydia trachomatis* (CT) IgG tests for tubal factor infertility (TFI). This study evaluates the predictive value of the widely used Medac pELISA (MOMP) and the multi-target Mikrogen ELISA (MOMP-CPAF-TARP).

**Method:** Based on Medac pELISA results 183 subfertile women underwent either hysterosalpingography (HSG) or laparoscopy to diagnose TFI. TFI was defined as extensive adhesions and/or distal occlusion of at least one tube. Controls had no occlusions during diagnostics. Serum was subsequently tested with Mikrogen ELISA and results were compared in prediction for TFI.

**Results:** 48 patients had TFI, 135 were controls. Mikrogen ELISA tested 93 patients positive of which 33.3% had TFI. Medac pELISA tested 63 patients positive of which 31.7% had TFI. Mikrogen ELISA tested 40 out of 48 TFI patients positive, Medac 23 out of 48. Kappa value was 0.34. PPV and NPV of Mikrogen ELISA and Medac pELISA were respectively 32% and 86%, and 30% and 76%.

**Conclusion:** Mikrogen ELISA is comparable to the Medac pELISA in the prediction of TFI. However Mikrogen ELISA has a higher NPV and thus seems more reliable in the exclusion of patients without TFI. Kappa value shows limited concordance between tests.

## Jeanine Leenen, MSc

*Department of Sexual Health, Infectious Diseases and Environmental Health, Public Health Service South Limburg, Care and Public Health Research Institute (CAPHRI), Maastricht University Medical Center (MUMC+)*

Jeanine.Leenen@ggdzl.nl


**12:12** The relation between oropharyngeal and incident anorectal *Chlamydia trachomatis* in MSM and women

## Curriculum Vitae

Jeanine Leenen graduated in Health Sciences – Biology and Health in 2015 at Maastricht University. She started the master Health Science Research Master – Clinical Epidemiology at Maastricht University in 2015. In September 2016 she started her internship at the Public Health Service (GGD) South Limburg under supervision of Prof dr. Hoebe and dr. Dukers-Muijrers. Her internship project is about the relation between oral and anorectal *Chlamydia trachomatis*. In 2017 she will start her PhD project at the Public Health Service (GGD) South Limburg about the implementation of homebased STI testing methods.

## Abstract


**Background** *Chlamydia trachomatis* (CT) is the most common bacterial sexually transmitted infection (STI) worldwide. CT has been detected in the gastrointestinal (GI) tracts of mice, and it could colonize there for long periods of time. This makes the GI tract a possible reservoir for CT in animals, but possibly also in humans. While anorectal infections are commonly diagnosed in women and in men who have sex with men (MSM), their detection is sometimes unexplained. There is an ongoing debate whether anorectal infection can occur by autoinoculation from the GI tract in humans. The relation between oropharyngeal and anorectal infections in humans has not been studied extensively so far and remains unclear. This study aims to understand the relation between oropharyngeal and subsequent anorectal CT in MSM and women using longitudinal STI clinic data.

**Methods** Data were collected from January 2006 to December 2013, from the outpatient Public Health Service STI clinics in Amsterdam and South Limburg (observational study). Women and MSM who where aged 16 years or older and who had been tested for CT (n=290,130) were included. This study will assess (repeat) testing behaviour, the relation between oropharyngeal and anorectal CT, and associated factors. Using Kaplan Meier techniques and uni- and multivariable

cox proportional hazard analyses, the association between oropharyngeal CT and subsequent anorectal CT (in the next 3 months) will be analysed, including adjustment for possible confounders (such as other STI and demographics).

**Discussion** Although it is not possible to find a causal relation in this epidemiological study, we will be able to make an estimate due to our large and extended dataset. We will assess associations with different approaches, including adjustment for relevant confounders.
Thereby, this study will provide insight in the role of oropharyngeal CT infection in establishing anorectal infections in both women and MSM. This information could be an important key factor for the development of adequate CT screening policies and effective treatment strategies.

## Anne Dirks, MD

*Dept. Medical Microbiology, Maastricht University Medical Center (MUMC+), The Netherlands*

anne.dirks@mumc.nl


**12:16** Bacterial load in *C. trachomatis* control

## Curriculum Vitae

Jeanne Agnes Maria Catharina Dirks (1986) commenced her Bachelor of Science at University College Roosevelt in Middelburg in 2004. Her university education was continued in Maastricht, with the Physician-Clinical Investigator programme, resulting in an MD and MSc-degree in 2011. Hereafter a PhD-trajectory was started under supervision of C Hoebe, P Wolffs and N Dukers-Muijrers in Maastricht. The topic of the PhD is the bacterial load in *Chlamydia trachomatis* infections, and its relation to both bacterial and host factors. Since September 2014, Anne is a registrar in medical microbiology at the Maastricht University Medical Centre.

## Abstract


The *Chlamydia trachomatis* (CT) bacterial load, defined as a 'measurable quantity of bacteria in an object, organism, or organism compartment' [Medical Subject Headings, Pubmed], has been extensively studied by culture, and as newer techniques emerged with quantitative PCR. The bacterial load has been analysed in correlation to patient characteristics, symptoms, transmission, concurrent sexually transmitted infections and serovar, with inconsistent results. Explanations include sampling variability, sample type, the detection of dead bacteria, and, not unimportant, differences in quantification methods. A review of literature shows more than 10 different quantification methods (14 uitkomstmaten; 18 artikelen), reflected in the wide range in reported loads. Uniformity of CT load quantification, including a correction for the human cell load, can even out these differences. With clear clinical correlates such as treatment failure and an increased chance of reinfection, it is time to standardize molecular CT quantification across microbiological laboratories.

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## Kevin J.H. Janssen, BSc

*Department of Medical Microbiology, School of Public Health and Primary Care (CAPHRI), Maastricht University Medical Center (MUMC+), Maastricht, The Netherlands*

kevin.janssen@mumc.nl


**12:20** Viability-PCR as a new approach to assess *Chlamydia trachomatis* viability

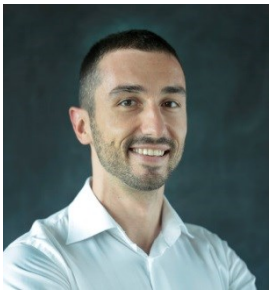
## Curriculum Vitae

Kevin Janssen (1986) obtained his bachelor degree in Biomedical Sciences at the Zuyd University of Applied Sciences in Heerlen. In November 2009 he started working as a clinical laboratory technologist at the Central Diagnostic Laboratory (CDL) of the Maastricht University Medical Center (MUMC+). Parallel to his job at the CDL he commenced his master Biomedical sciences in 2011 at the University of Maastricht (UM) and graduated successfully in July 2013. Since June 2015 Kevin is working as a PhD student at the department of Medical Microbiology of the MUMC+ in collaboration with the Public Health Service (GGD) South Limburg and the UM Research school CAPHRI. His PhD project is about *Chlamydia trachomatis* viability.

## Abstract


According to the World Health Organization (WHO), infections with *Chlamydia trachomatis* (CT) are the most commonly reported bacterial sexual transmittable infections (STIs) in the world. Current laboratory guidelines state that the nucleic acid amplification test (NAAT) is the preferred method for the determination of CT positivity in clinical samples. However, NAATs are known to detect the available target DNA without discriminating between DNA originating from viable or non-viable CT. In a previous study, we have shown that CT positive patients treated with azithromycin show frequently intermittent patterns of CT positivity up to 8 weeks post treatment. These findings could reflect treatment failure or re-infection, but might also indicate clearance of DNA from non-viable CT. The clinical implications of such results are still unexplored. The assessment of CT viability will provide new insight in the current knowledge gaps for the clinical (*e.g.* sequelae, treatment and screening management) and public health (*e.g.* transmission) implications. In a recent study, we established the validation of the viability-PCR (V-PCR) method. Furthermore, we utilized V-PCR to assess CT viability in vaginal and anorectal swab samples of CT positive women before treatment with antibiotics. Results have indicated that CT viability of anorectal CT positive samples was comparable to vaginal swab samples. Overall, assessment of CT viability has shown that in up to 35% of samples less than 1% of the

detected CT DNA originated from viable bacteria, suggesting that there is a potential overestimation of quantitative CT positivity by currently used NAATs. Future research will focus on the assessment of CT viability in a larger cohort of CT positive women (about 400 patients) who will also be followed up during a period of 12 weeks post-treatment (the FemCure Study).




## Ivan Branković, PhD

*Department of Molecular Biology, Max Planck Institute for Infection Biology, Berlin, Germany & Institute for Public Health Genomics, Maastricht University, Maastricht, The Netherlands*

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**12:24** Analysis of host genetic biomarkers in a *Chlamydia*-infected fallopian tube organoid model

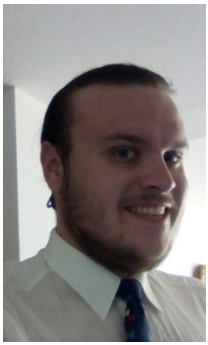
## Curriculum Vitae

In his research, Ivan focuses on the role of host genetic factors in *Chlamydia* infection and its associated sequelae. Upon completing his biology studies at the University of Belgrade (Serbia), he received the MTEC scholarship for funding of his MSc studies in Public Health at Maastricht University. In 2014, he successfully defended his PhD dissertation, on the topic Public Health Genomics of *Chlamydia trachomatis* and *human papillomavirus* (HPV). In the thesis, he researched immunogenetic factors in these infections, and their association with host susceptibility to and severity of sequelae. Thereafter he worked as a postdoctoral researcher at TubaScan Ltd. and Maastricht University, continuing his research on *Chlamydia* host factors. Since November 2016, Ivan is furthering his line of work as a postdoctoral fellow at Max Planck Institute for Infection Biology.

## Abstract


Carriership of Single Nucleotide Polymorphisms (SNPs) in genes regulating the immune response in women's reproductive tract has been linked to different clinical outcomes in infections with *Chlamydia trachomatis* (CT). Women with a particular SNP assortment are more likely to develop tubal damage after genital infections with CT. However, the exact role of host genetic factors in the aetiology of *Chlamydia*-associated subfertility or infertility is not entirely understood. Our aim is to examine the role of selected SNPs in CT infection in a 3D fallopian tube organoid model. The model allows for a highly reliable re-enactment of various aspects of long-term infections of the tubae. We will furthermore introduce targeted mutations into these genes via the CRISPR/Cas9 editing assay and screen their effect on the course of the infection. The project is a collaborative effort between the group of Prof. Dr. Thomas F. Meyer from Max Planck Institute for Infection Biology and the teams of Prof. Dr. Servaas A. Morré from Institute for Public Health Genomics (Maastricht University) and Laboratory of Immunogenetics (VU University Medical Center).

The research will be the first ever functional analysis of highly validated host factors associated with susceptibility to CT infection and CT-associated tubal damage in this model. Achieving these objectives will be the basis for the development of a novel genetic diagnostic assay that will address the existing health need – it will improve the currently suboptimal diagnosis of women at highest risk of tubal pathology, and reduce the referrals to invasive, psychologically burdening and costly laparoscopies.




## Pierre Thomas, MSc

*Institute for Public Health Genomics, Maastricht University, Maastricht, The Netherlands*

pierrepaulmichelthomas@gmail.com


**12:28** The ChlamIndia Project

## Curriculum Vitae

Pierre Thomas is a Junior Researcher at the Institute of Public Health Genomics (IPHG) at the University of Maastricht. He was born on the 8th of February 1991 on Belfort (France). He completed his bachelor's degree in European Public Health at the University of Maastricht in 2013. He went on to be part of the Health Sciences Research Master and specialized in clinical epidemiology with a focus on Sexually Transmittable Diseases (STDs) and genetic epidemiology. He obtained his Masters diploma from the University of Maastricht (UM) in 2016 where he now works and teaches. He is part of the collaboration between UM and the Sam Higginbottom University of Agriculture technology and Sciences (SHUATS) in Allahabad, India and has been involved in joint research and teaching activities. Pierre has also been part of other cooperation projects with India in the past, namely with the Institute of Public Health (IPH) in Bangalore, the Public Health Foundation of India (PHFI) and UNICEF in Hyderabad.

## Abstract


The ChlamIndia project is being run conjointly by the Vrije Universiteit Amsterdam, The University of Maastricht and the Sam Higginbottom University of Agriculture Technology And Science. It aims at identifying *C.trachomatis*, *N. gonorrhoea*, and *T. vaginalis* within the semi-urban district of Allahabad, in the state of Uttar Pradesh in India. The project aims at identifying the pathogens among four patient categories (symptomatic women, infertile women, pregnant women, and healthy controls) using PCR and ELISA serology. The identification of the pathogens will be performed on three distinct biological samples (Whole blood, urine and vaginal swabs).The vaginal and immunogenetic profile of the study participants will also be conducted, making it the first study of its kind in India. The aim is to include 600 patients for analysis.

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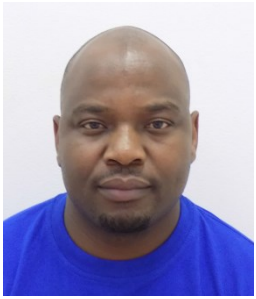


## Jimmy Wilford, MSc

*Students and Youth Working on reproductive Health Action Team (SAYWHAT) & Southern African Regional Students and Youth Conference & Maastricht University, the Netherlands*

jimmalo@gmail.com


**12:32** STI Education in Zimbabwe: Challenges and opportunities for reaching out the youth

## Curriculum Vitae

Jimmy Wilford was born in Zimbabwe three decades ago. He graduated with a Bachelor of Arts Degree (Human and Social Sciences) majoring in Development Studies from University of South Africa (UNISA). He further graduated from Africa University in Zimbabwe with a Master Degree in Public Policy and Governance. He is currently studying towards a Master of Science in Global Health with Maastricht University. He is the founder of Students and Youth Working on reproductive Health Action Team (SAYWHAT) – www.saywhat.org.zw. He is also the convener of Southern African Regional Students and Youth Conference (SARSYC) which is to be hosted at University of Johannesburg, South Africa,13 - 16 July 2017. www.sarsyconference.co.za.

## Abstract

Zimbabwe remains one of the countries with the highest HIV and AIDS burden in the world. With a total of 1.4 million people living with HIV, and an HIV prevalence of 15% (GAPS Report 2014) the sub-Saharan country has struggled to curtail the ragging HIV pandemic and other STIs. Albeit evidence of conceited efforts by government and the civil society to address the challenge, the STI burden remains a critical threat to the gains made thus far, especially in the entire sexual and reproductive health terrain the country. In 2014, a National AIDS Council Zimbabwe Report revealed that 53 000 new cases of STIs were recorded in Harare alone, the capital city of Zimbabwe, with a total population of around 1.5 million citizens. The most affected are young people, with the ZDHS 2010-11 pointing to a high HIV prevalence of 7.3% for females in the ages of 15-24 and 3.6% for males of the same age group, making HIV and STIs a gendered challenge in the Zimbabwean context. While the burden is this huge, reaching out the young people is critical but faced with numerous socio-economic and political impediments that have not only made access to information difficult but access to the services becoming almost like a privilege. For instance, in tertiary institutions, the country is yet to establish standard guidelines for SRH service delivery while

in rural areas, access to the nearest clinic do not come so easy. What remains pertinent is the need to invest in finding effective models of reaching out to the youth through research. SAYWHAT intends to carry out researches in order to inform programing that benefits young people.

## Prof.Em. Per-Anders Mårdh, MD, PhD

*Institute of Clinical Sciences, Department of Obsterics and Gynecology, Lund Univeristy, Sweden*

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**13:15** A critical review on current knowledge on pelvic inflammatory disease (PID) with special reference to *Chlamydial* infections

## Curriculum Vitae

At present at the Institute of Clinical Sciences, Department of Obsterics and Gynecology, Lund Univeristy in south of Sweden. The department is a WHO Collaborating Centre for improvement of obsteric methodologies The University is this year celebrating its 350-year-birthday. It is the largest university in Scandinavia with appr. 45.000 students. I am a tutor for several students mainly working with infectious disease projects. Has had a long-standing interest in *chlamydia* research and currently involved in *chlamydia*-related infertility studies.

## Abstract


Pelvic inflammatory disease (PID) is a term often used when referring to infections of the uterine tubes, but is a misnomer better to be used for endometriosis. Salpingoophoritis is another term that has been used in "PID" studies, which with very few exceptions, is also a misnomer. In such studies, parametritis has generally been neglected and little attention has been given to endometritis and intraabdominal infections with *Chlamydia trachomatis*, such as in periappendicitis, peritonitis, and perisigmoiditis. In vitro fertilisation (IVF) saves many women from involuntary childlessness, but could be less effective in women with untreated *chlamydia* endometritis and in cases of recurrent spontaneous abortion. In involuntarily childless coupes a male factor must be evaluated, such as sperm fragmentation, which is present in half of all those cases. Challenges with the diagnosis of "PID" will be elaborated on.

*Amsterdam, 10 February 2017*

## Eline Op de Coul, PhD

*Centre for Infectious Diseases Control (CIb), National Institute for Public Health and the Environment (RIVM)*

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**13:45** *Chlamydia trachomatis, Neisseria gonorrhoeae, and Trichomonas vaginalis infections in pregnant women and their partners in the Netherlands: prevalence, risk factors, and pregnancy outcomes*

## Curriculum Vitae

Dr Eline Op de Coul is a senior epidemiologist at the Centre for Infectious Diseases Control (CIb), National Institute for Public Health and the Environment (RIVM), Netherlands. She is involved in national surveillance and research of HIV, STI, and hepatitis. Her current research focuses on monitoring of recent HIV infections, community based HIV testing, geographical analyses of HIV, and STIs during pregnancy. She is member of several (inter)national scientific committees, reviewer for scientific journals, and operational contact point for HIV for the European Centre for Disease Control and Prevention (ECDC). Previously, she worked as an epidemiologist at the Public Health Service Amsterdam where she completed her PhD on molecular epidemiology of HIV. She graduated at the Agricultural University of Wageningen.

## Abstract


**Background:** Antenatal screening for HIV, syphilis and hepatitis B is implemented in the Netherlands, but data on other STI among pregnant women or partners is lacking. The study objectives were to (1) assess the prevalence of *Chlamydia trachomatis* (CT), *Neisseria gonorrhoeae* (NG), and *Trichomonas vaginalis* (TV) infections among pregnant women and partners, (2) identify risk factors for these STI during pregnancy, and (3) identify adverse pregnancy outcomes in relation to STI.

**Methods**: Pregnant women aged ≤30 years and partners were enrolled in 2011-2015 at 30 midwife practices across the country. After informed consent, participants completed a questionnaire at home and took a vaginal swab (women) or urine sample (male partners). After labour, pregnancy outcome data were collected through the midwives and linked to the survey database. Univariable and multivariable logistic regression analyses were used to identify risk factors for STI during pregnancy, and adverse pregnancy outcomes (APO).

**Results**: The final study population included 530 pregnant women and 428 partners. STI were present in 2.5% of the women (CT 1.7%, TV 0.6%, NG 0.2%). Among sexual partners only CT infections were identified (2.1%). In the multivariabe model, having STI during pregnancy was associated with a history of ≥1 STI (aOR 11.7, 95%CI 2.5 – 55.6), condom use (no/mostly not aOR 5.9, 95%CI 1.1-32.7 vs yes/mostly yes) and having a partner of non-Dutch ethnicity (aOR 4.2, 95%CI 1.0 – 20.7).
For 90% of the women follow-up data on pregnancy outcomes was collected. APO were observed in 10.5% of the women and were associated with complications during previous pregnancies (aOR 7.5, 95%CI 2.3 – 24.0), and lower education of the mother (aOR Low: 12.9, 95%CI 2.6 – 64.8, medium: 3.8, 95%CI 1.2-12.3 vs high). Of neonates, 5.3% were small-for-gestational-age (SGA). SGA was associated with mothers with a history of STI (aOR 2.9, 95%CI 1.1 – 7.6,) or having a low education (aOR 9.2, 95%CI 2.6 – 32.0).
**Conclusion**: Prevalence rates of CT, NG and TV among pregnant women and partners are low in the Netherlands. Yet, pregnant women who had a history of STI had higher odds for SGA-babies. Midwives should be encouraged to offer at least CT testing to young women with a risk profile, additionally to the current prenatal screening program.

## Jeanne Tamarelle, BSc, BA, MPH

*"Biostatistics, Biomaths, Pharmacoepidemiology and Infectious diseases" (B2PHI), Institut Pasteur / Inserm / UVSQ, France*

Jeanne.tamarelle@gmail.com


**14:00** Vaginal microbiota composition and association with *Chlamydia trachomatis* infection among young women attending a STI clinic in France

## Curriculum Vitae

Jeanne Tamarelle was born on September 27th 1990 in France. She followed a double degree in Science and Social Sciences at the University of Paris VI and at Sciences po Paris. She obtained an Advanced Vocational Certificate in Laboratory Methods, specializing in microbiology. She then graduated from a Master of Public Health, specializing in the epidemiology of Infectious Disease, at the Pasteur/CNAM School of Public Health in 2015. She is currently working as an epidemiologist in the UMR 1181 "Biostatistics, Biomaths, Pharmacoepidemiology and Infectious Diseases" at the Institute Pasteur and preparing a phD thesis on the role of the vaginal microbiota in *Chlamydia trachomatis* infection, as part of the i-Predict prevention trial.

## Abstract


**Introduction** Genital infection with *Chlamydia trachomatis* (Ct) is the most frequent bacterial sexually transmitted infection (STI), in particular among young women. Though mostly asymptomatic, this infection can evolve towards Pelvic Inflammatory Disease (PID), which in turn can lead to tubal factor infertility and ectopic pregnancy, if left untreated. In France, screening has been recommended for sexually active young women attending STI clinics since 2003. Recent data suggest that Ct infections are not yet controlled in France and Europe. Throughout the course of the natural history of Ct infection, many factors are thought to play a role in favoring or preventing Ct infection, persistence and evolution towards PID, among which the vaginal microbiota composition. New molecular techniques have permitted to describe groups of bacterial communities in the vagina (community state types (CST)).

**Objective** Here, we sought to characterize the vaginal microbiota of a sample of women attending a STI clinic in France and determine whether any particular CST was associated with a greater susceptibility to Ct infection.

**Methods** A cross sectional study on vaginal microbiota composition among young women attending a STI clinic in Bordeaux, France, was carried out in June 2015. Participants provided vaginal sample for routine Ct screening and

sociodemographic data were collected. These samples were kept in an Aptima (Hologic©) medium allowing transportation at room temperature. Ct screening was carried out at the National Reference center using the Aptima-combo 2 Transcription-Mediated-Amplification assay. Vaginal microbiota composition was studied using high-throughput 16S RNA genome sequencing (University of Maryland). Statistical analysis was performed using Stata 12.0.

**Results** Of the 151 women attending the STI clinic during the study period, microbiota composition and Ct status were available for 132 women. Community State Types dominated by *L. crispatus* (I), *L. iners* (III), and a diversity of anaerobes (IV) represented 28.6%, 28.6% and 18.2% of the sample respectively. Proportions of Ct positive women were higher in *L. iners*-dominated-CST (17.7%) and the diversity group (20.8%) than in *L. crispatus*-dominated-CST (9.8%), though these results were not statistically significant.

**Conclusion and discussion** This study is the first to characterize the vaginal microbiota of young women in France. Five CSTs were found in 132 women from a STI clinic, that corresponded to the CSTs described in the literature. Due to the lack of power, we were not able to find any significant association between *Chlamydia trachomatis* and the vaginal microbiota but higher proportions of Ct-positive women were found in CST III (dominated by *L. iners*) and CST IV (diversity group). Though our study corresponded to a cross-sectional configuration, it is a first necessary step before future studies on wider longitudinal data.

## Petra Wolffs, PhD

*Unit Molecular Diagnostics, Medical Microbiology, Maastricht University Medical Center (MUMC+)*

p.wolffs@mumc.nl


**14:15** *C. trachomatis* antibiotic resistance: Towards a ribosomal sequence approach

## Curriculum Vitae

Dr. Petra Wolffs is a medical molecular microbiologist, assistant professor as well as head of the Molecular Diagnostics unit at the department of Medical Microbiology, Maastricht UMC. With a master degree in Biological Process Engineering she obtained her doctorate at Lund University in Sweden. Since 2006, she is working at Maastricht UMC on the development of molecular diagnostic tools, mechanisms of antibiotic resistance and STI and she has published more than 70 peer reviewed papers in these areas. She is a member of the board of the Dutch working Party on molecular diagnostics of infectious diseases.

## Abstract


Recent studies have shown indication of cases of *Chlamydia trachomatis* (CT) treatment failure. For this reason the assessment of potential antimicrobial resistance (AMR) in CT is of high interest. The gold standard for assessment of AMR is culture in the presence of increasing concentrations of antibiotics. However, due to the technical challenges involved in CT culturing, very few laboratories worldwide are monitoring AMR of CT in this way. Monitoring of genotypic resistance could provide a more high-throughput and effective way to assess AMR in CT. The currently known cause of resistance to macrolides such as azithromycin are mutations in the 23S ribosomal RNA gene. So far only few groups have studied mutations in 23S rRNA in CT and most studies have focused on cultured CT isolates instead of direct detection from clinical samples. This presentation will summarise developments in the area of AMR detection in CT.

*Amsterdam, 10 February 2017*

## Martin Singer, MSc

*Laboratory of Immunogenetics, Dept. Medical Microbiology and Infection Control, VU University Medical Center, Amsterdam, The Netherlands & TubaScan Ltd, Beverwijk, The Netherlands*

m.singer@vumc.nl


**14:30** Next Generation Sequencing versus ISPro-technique to define the vaginal microbiome

## Curriculum Vitae

Martin Singer, born 26th of July 1989, has a bachelor of applied sciences degree and a master degree in biomedical sciences (VU University of Amsterdam). During internships at the laboratory of immunogenetics at the department of Medical Microbiology and Infecton Control of the VU Medical Center he worked on *Chlamydia trachomatis* among other bacterial STDs. He studied genetics that influence the susceptibility and severity of a *Chlamydia trachomatis* infections as well as the influence of cytokines on the severity of the infection. He has recently begun research into the vaginal microbiome and its relation to vaginal health. He is now a PhD student at the laboratory of Immunogenetics and does additional research for Tubascan Ltd.

## Abstract


There is increasing evidence that suggest that the vaginal microbiome plays a major role in the host susceptibility and response to STIs. Currently the most popular method of profiling the vaginal microbiome is through 16s rDNA sequencing. Here we compare this technique with the IS-pro fragment analysis technique through identification of urogenital microbiome profiles. Additionally, we examine if vaginal swab samples or urine samples are better suited for identification of the urogenital microbiome.

Included in this study were 298 otherwise healthy women attending reproductive clinics for IVF treatment. Urine samples and Vaginal swabs were collected at 7 collection sites from August 2015 until August 2016. Next generation sequencing was performed on the V3/V4 region of the 16s rRNA gene and hierarchically clustered. IS-pro analysis was performed by amplifying and analyzing the 16s-21s interspatial region and were also hierarchically clustered. Urogenital microbiota profiles were assessed based on quality of the microbiome profile and compared for diversity between profiles extracted from the vaginal swab samples and the urine samples.

*Amsterdam, 10 February 2017*

## Prof. Remco Peters, MD, PhD, DLSHTM, Dip HIV Man (SA)

*Anova Health Institute, Johannesburg, South Africa & Department of Medical Microbiology, University of Pretoria, Pretoria, South Africa.*

rph.peters@gmail.com


**15:15** *Chlamydia trachomatis* control in South Africa: Fighting a losing battle?

## Curriculum Vitae

Remco Peters is a clinical epidemiologist with prime interest in infectious diseases. He works as clinical programme specialist for the Anova Health Institute in South Africa and is an extraordinary professor at the Department of Medical Microbiology at the University of Pretoria.
Prof Peters obtained is Master of Science degree at the Erasmus University Rotterdam and moved to the VU University Medical Center, Amsterdam, to obtain his MD (2006) and his PhD (2007) in clinical microbiology and infectious diseases. After graduation, he worked as medical doctor at the municipal STI clinic in The Hague before moving to South Africa where he worked as senior clinician and researcher in rural Mopani District. During this period he completed his Master in Epidemiology and the London School of Hygiene and Tropical Medicine (2012) and obtained the Diploma of HIV Management from the Colleges of Medicine of South Africa (2014). In his current job, he heads the department of clinical governance and department of monitoring, evaluation and research at the national office of Anova Health Institute in Johannesburg. Prof Peters is examiner for the Higher Diploma of Sexual Health and HIV Medicine at the Colleges of Medicine and he supervises several PhD and MSc students in the field of translational and molecular epidemiology of infectious diseases, with special focus on STI and HIV. He works in close collaboration with several national and international academic institutions and governmental organizations.

## Abstract

Incidence and prevalence of *Chlamydia trachomatis* infection is high across populations in South Africa. Various socio-economic, clinical and programmatic factors contribute to the high prevalence of infection. Untreated *C. trachomatis* infection is associated with reproductive tract complications, may affect sexual health and facilitate HIV acquisition if exposed. However, efforts to control the burden of sexually transmitted infections (STIs), including genital *C. trachomatis* infection, in sub-Saharan Africa have been limited. In this presentation, the burden of infection and disease in South Africa is summarized, current control

efforts are presented and new initiatives to control *C. trachomatis* infection are discussed. These will show that there is no simple solution and highlight the immense challenge in achieving *C. trachomatis* control in South Africa.

## Prof. Daisy Vanrompay, DVM, PhD, DVP

*Laboratory of Immunology and Animal Biotechnology, Faculty of Bioscience Engineering, Ghent University*

Daisy.vanrompay@ugent.be


**15:45** Transfer of *Chlamydia suis* from pigs to the human eye

## Curriculum Vitae

D. Vanrompay is Director of the Laboratory for Immunology and Animal Biotechnology at Ghent University and Director of the National (WIV) Diagnostic Reference Laboratory for *C. psittaci* infections in humans. She is a member of PROVAXS (www.provaxs.com), the UGhent Center for Strategic Prophylaxis and Vaccine Development. She has published more than 100 papers in international scientific journals and much of them are on *Chlamydia* infections.
Her research is focused on: i) the development of molecular diagnostic methods for identifying bacterial pathogens in both humans and animals, ii) unravelling the cellular and molecular pathogenesis of bacterial infections, and iii) on mucosal immunology. Here laboratory focuses on *Chlamydia* infections in humans and animals, EHEC infections in ruminants and Vibrio infections in fish and shellfish.

## Abstract


*Chlamydiaceae* are Gram-negative obligate intracellular bacteria infecting a broad range of animals and humans. Pigs can become infected by *Chlamydia pecorum*, *Chlamydia abortus*, *Chlamydia psittaci* and *Chlamydia suis*. *Chlamydia suis* is phylogenetically highly related to the human pathogen *Chlamydia trachomatis*. Both *C. trachomatis* and *C. suis* cause sexually transmitted disease and kerato-conjunctivitis. *Chlamydia suis* is highly prevalent in the pork industry and spreads rapidly in the pig population. The type strain of this species, S45, was isolated in Europe in the late 1960s from feces of an asymptomatic Austrian pig. The strain is tetracycline sensitive (TcS), as other *chlamydial* species. However, tetracycline resistant *C. suis* strains have been isolated on swine farms in several European countries as well as China. The *C. suis* tetracycline resistant phenotype (TcR) is manifested through the TcR gene, tet(C), which is integrated into the *chlamydial* chromosome (Dugan et al., 2004).
*C. suis* is often still considered as an insignificant pathogen of pigs. Recently, it was demonstrated to be a primary pathogen of the urogenital tract (De Clercq et al., 2015). Currently, *C. suis* infections are mainly associated with conjunctivitis and reproductive disorders in sows and boars. *Chlamydia suis* infections in breeding sows, boars and piglets occur more often than originally thought.

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Recently, *C. suis* mRNA was found in the eye of trachoma patient in a rural village in Nepal (Dean et al., 2013) and De Puysseleyr et al., (2014, 2015) could isolate *C. suis* from the eyes of slaughterhouse workers and in the eye and pharyngeal swabs of pig farmers. The clincial impact of this transmission is not clear as well as the risk for public health.
The objective of the present study was to examine the presence of *C. suis* DNA and *C. suis*-specific antibodies in humans visiting a meeting on ventilation techniques for pig barns. Two novel diagnostic tests were used, the first one being a *C. suis*-specific realt-time PCR and the second one being a *C. suis*-specific antibody ELISA based on the detection of human antibodies against a polymorphic membrane protein of *C. suis*. Results will be presented.

## Bart Versteeg, MSc

*Public Health Laboratory, Department of Infectious Diseases, Public Health Service Amsterdam, the Netherlands*

bversteeg@ggd.amsterdam.nl


**16:00** *In silico* multilocus sequence typing of *C. trachomatis* plasmids shows clustering of isolates according to the disease related biovars

## Curriculum vitae

Bart Versteeg (1987) obtained his Bachelor degree in Biology and Medical laboratory research specializing in microbiology. After this he continued studying at the VU University in Amsterdam, where he obtained his Master degree in Biomedical Sciences specializing in infectious diseases and international public health. He is currently employed as a PhD student at the Public Health Laboratory of the Public Health Service (GGD) Amsterdam, the Netherlands. His PhD research focuses on the molecular epidemiology of *Chlamydia trachomatis* and the development of an in-vitro urethral (3D) equivalent that can be used for *Chlamydia trachomatis* infection experiments.

## Abstract


**Background** *Chlamydia trachomatis* is the commonest cause of bacterial sexually transmitted infection and preventable blindness worldwide. Nucleotide sequencing of the ompA gene, encoding the outer membrane protein MOMP, divides *C. trachomatis* into 15 main genovars comprising three biovars associated with different disease phenotypes along with distinct tissue tropisms. The extra chromosomal plasmid of *C. trachomatis* is suggested to encode genes essential for chlamydial infection and transmission. Using an in silico plasmid MLST scheme, the clustering of *C. trachomatis* isolates was investigated in association with previously defined ompA biovars

**Methods** In silico analysis using publicly available whole genome sequence data (WGS) of *C. trachomatis* isolates deposited in the Chlamydiales pubMLST database (http://pubmlst.org/chlamydiales/) was performed. Only data from WGS were investigated ensuring that complete sequence data in all eight known plasmid genes and ompA, were included. An in silico plasmid MLST scheme was developed to assign allele numbers and plasmid sequence types to all included isolates. Clustering of *C. trachomatis* plasmids was assessed using minimum spanning tree analysis. Moreover, we performed a polymorphism analysis of each plasmid gene.

**Results** Using the in silico plasmid MLST scheme, plasmid alleles and sequence types were successfully assigned to 157 *C. trachomatis* isolates. Overall, 47 unique plasmid sequence types were detected. Minimum spanning tree analysis identified 5 large clusters, which showed clustering of *C. trachomatis* plasmids according to the ompA defined biovars. Further analysis of individual plasmid genes showed that besides specific STs, each biovar also had distinct plasmid alleles. Moreover, analysis of the polymorphic variation of plasmid genes confirmed that the *C. trachomatis* plasmid was highly conserved with all isolates sharing >99% sequence identity.

**Conclusion** In silico multilocus sequence typing of *C. trachomatis* plasmids showed clustering of isolates according to biovars, suggesting that the *C. trachomatis* plasmid along with specific plasmid genes may play a role in the distinct disease phenotypes found in *C. trachomatis* infections.

## Geneviève van Liere, PhD

*Department of Sexual Health, Infectious Diseases and Environmental Health, Public Health Service South Limburg, Geleen, the Netherlands & Department of Medical Microbiology, Maastricht University Medical Center (MUMC+), Maastricht, the Netherlands.*
Genevieve.vanLiere@ggdzl.nl


**16:15** Oropharyngeal testing and positivity between 2009-2015 in South Limburg

## Curriculum Vitae

Geneviève van Liere (1987) graduated in Health Sciences - Infectious Diseases and Public Health in 2010 at the VU University in Amsterdam. After graduation she started working as a researcher and data manager at the Public Health Service (GGD) South Limburg. In 2011, she started her PhD project under supervision of Prof dr. Hoebe and dr. Dukers-Muijrers, in collaboration with the department of Medical Microbiology, Maastricht University Medical Center. She successfully defended her PhD thesis entitled "*Chlamydia trachomatis testing policy and control: the neglected role of the anorectal site*" on December 14, 2015. She is currently working as a researcher and staff member at the Public Health Service South Limburg (GGD).

## Abstract


**Background** Oropharyngeal *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG) are not routinely tested for in STI clinic attendees. Although oropharyngeal infections are often asymptomatic, they contribute to transmission in the population. Routine systematic oropharyngeal testing was implemented in men who have sex with men (MSM) in 2010, and on behavioral indication in heterosexuals, but it is unknown whether this was successful in practice. Moreover, data on oropharyngeal testing and CT/NG positivity in heterosexuals is limited.

**Methods** Men and women aged >16 years attending our STI-clinic between 2009- 2015 were included (n=47317). Specimens were tested using NAATs. Data were collected on demographics and sexual behavior. Multivariable backward logistic regression analyses were used to test associations with oropharyngeal testing and oropharyngeal CT and NG. Tested determinants were age, sex, symptoms, number of sex partners and warned by (ex) partner.

**Results** Oropharyngeal testing in heterosexuals increased yearly from 13% in 2009 to 16% in 2015 (OR 1.3, 95%CI 1.2-1.3). In MSM, testing increased from 88% to 98% (OR1.6, 95%CI 1.5-1.8). Oropharyngeal CT positivity varied between

1.0-1.6% in women (54/4198), between 0-1.3% in heterosexual men (13/2226) and between 0.8-1.5% in MSM (79/8158), but was not associated with year of testing. Oropharyngeal NG positivity varied between 1.5-3.4% in women (123/4201), between 0.6-4.1% in heterosexual men (61/2226) and between 2.8-6.4% in MSM (406/8156). Oropharyngeal NG positivity increased with year of testing in heterosexual men (OR 1.2, 95%CI 1.01-1.4) and MSM (OR 1.2 95%CI 1.1-1.2).

**Conclusion** Routine oropharyngeal testing in MSM was successfully implemented in practice. Oropharyngeal CT positivity remained stable after increased oropharyngeal testing in all groups, and in women also for oropharyngeal NG. In heterosexual men and MSM, increased oropharyngeal testing led to increased oropharyngeal NG positivity. This justifies routine oropharyngeal testing in MSM, and warrants careful monitoring in heterosexuals.

## Daphne van Wees, MSc

*Epidemiology and Surveillance Unit, Centre for Infectious Disease Control, National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands*

daphne.van.wees@rivm.nl


**16:30** Double Trouble: The impact of low risk perception and high risk sexual behaviour on *Chlamydia* transmission

## Curriculum Vitae

Daphne van Wees (1991) graduated from the VU University in Amsterdam with a Master of Science Degree in Health Sciences (specialization Infectious Diseases and Public Health) in July 2015. She completed her master thesis about the influence of climate, economic wealth and sanitation practices on the incidence and seasonality of infectious diarrhoea at the Biomedical Research department of the Royal Tropical Institute (KIT) in Amsterdam. In September 2015, she started her PhD project at the National Institute for Public Health and the Environment (RIVM), where she is currently working on combining epidemiology, behavioural sciences and mathematical modelling to study the link between behavioural and psychological determinants and *chlamydia* (re-)infection.

## Abstract


**Background** Transmission of *Chlamydia trachomatis* (chlamydia) is influenced by both sexual behaviour and psychological determinants (*i.e.*, risk perception). However, mathematical models describing *chlamydia* transmission often consider only sexual behaviour. We explored the influence of incorporating risk perception in a mathematical model that estimated the impact of different testing scenarios on *chlamydia* prevalence.

**Methods** We developed a pair compartmental model with a susceptible-infected-susceptible structure representing heterosexuals aged 16–26 years. Model parameters were informed by an online pilot study (N=173) on sexual behaviour, psychological determinants, and chlamydia (re-)infections and will be updated with data from an ongoing longitudinal cohort study.
The model population was divided in two sexual risk behaviour groups (based on the number of partners in the last year) and further divided in two risk perception groups (based on perceived risk for *chlamydia*). We compared the impact of an overall testing uptake of 20% per year on population *chlamydia* prevalence with different testing scenarios: 1) differential uptake among sexual behaviour groups

(higher uptake in high sexual behaviour group) and additionally 2) differential uptake among risk perception groups (higher uptake in high risk perception groups).

**Results** Respondents with high sexual risk behaviour (SB) and low risk perception (RP) had the highest mean number of partners (high SB/low RP=5.3, compared to high SB/high RP=5.0, low SB/high RP=1.3 and low SB/low RP=1.1, $p<0.001$), shortest mean duration of partnerships (high SB/low RP=153 days, compared to high SB/high RP =233, low SB/high RP=512 and low SB/low RP=607 days, $p<0.001$) and the highest percentage of self-reported chlamydia infections in the past year (high SB/low RP=22.2%, compared to high SB/high RP=14.3%, low SB/high RP=3.1% and low SB/low RP=0%, $p=0.02$). Models that did not consider differential testing uptake among risk perception groups overestimated the impact of testing on chlamydia prevalence. This effect was largest in the high sexual behaviour/low risk perception group.

**Conclusion** Mathematical models incorporating risk perception could improve the estimation of the impact of testing interventions on the prevalence of *chlamydia* in specific subgroups.

# Symposium Organizer
# Servaas A. Morré

Laboratory of Immunogenetics, Dept. of Microbiology and Infection Control, VU University Medical Centre, Amsterdam, The Netherlands,

samorretravel@yahoo.co.uk

## Curriculum vitae

Professor Servaas A. Morré is working on *Chlamydia trachomatis* infections for over 20, with a central focus on female infertility and women's reproductive health. He is a serial entrepreneur in the field of infectious disease diagnostics and human biomarkers. Coordination of large international consortia funded by European money is the basis for his translational output.

Education
He graduated at the VU University, The Netherlands, in Biochemistry and Molecular Biology in 1994. His internships were at The Zaadunie, Department of Cell biology on plant genetics: polyploidization of *Brassica oleracea* (Cauliflower) during cell culture (M. Tan, PhD) and at the Department of Biochemistry and Molecular Biology VU on processing of ribosomal RNAs in Saccharomyces cerevisiae (Prof. H. Raué, PhD). His PhD thesis (1999) was performed at Department of Pathology (VU University, Amsterdam) on the epidemiology, transmission, natural course, diagnostics and immunopathogenesis of human urogenital *Chlamydia trachomatis* infections. Finally, in 2009-2010 he got his Master in Biobusiness and Entrepreneurship.

Positions:
He is currently working as Head of the Laboratory of Immunogenetics (started in 2001), VU University medical center, Amsterdam and as Director of the Institute of Public Health Genomics (IPHG) (started in 2011), University of Maastricht. From Feb 2012 he is Professor Host-pathogen Genomics in Public Health at IPHG. Since 1st of Sept 2009 the coordinates the Dutch *Chlamydia trachomatis* Reference Laboratory (Amsterdam) for the RIVM including specific CT research tasks and since 1st of January 2014 together with Prof.dr Christian Hoebe, MD, PhD (Maastricht, NL)

Studies abroad:
As an Erasmus Fellow he studied at the Universidade Do Porto, Laboratório de Genética Molecular, Portugal, on POLO: an essential kinase for mitosis in *Drosophila melanogaster* (Prof. C. Sunkel, PhD). As a postdoc, the Van Coeverden Adriani Foundation made it possible to extend his *Chlamydial* research at the Department of Infectious Diseases, The City of Hope Medical Center, California, USA, in collaboration with Dr. Joseph Lyons, specialists in murine modelling in a period of 5 years yearly visits were made, the longest 4 months.

Research, grants and consortia:
He is working on infectious diseases for more than 20 years and has over 180 publications, from which most are on *Chlamydia trachomatis*. His research is for the major part focused on the immunogenetics of infectious diseases with special attention to *Chlamydia trachomatis* and Bacterial meningitis (collaboration Pediatrics, VUmc). He was Scientific Consortium Director, of the European Framework Programme 6 (FP6) grant (LIFESCIHEALTH FP6, Co-ordination Actions (CA)) on functional genomics research entitled: "Contribution of molecular epidemiology and host-pathogen genomics to understand *Chlamydia trachomatis* disease (Acronym: (EpiGen*Chlamydia*)" with 20 European, African, and US groups. This consortium had his first meeting on 12 December 2007. This consortium is extended via new collaborative activities including a EuroTransBio grant (Start 2012) and a Eurostars grant (Start 2015) into a spin-in company (TubaScan Ltd). In addition, he is PI in 5 other grants. As a partner he is participating in several other European programmes and grants. In December 2016 the H2020 SME Associate grant was awarded entitled "Using proteins, amoebae, *Waddlia chondrophila* and zebrafish to conquer the human reproductive market".

Organisation on scientific meetings:
Together with Prof. Salvador Peña, he organised the "First Annual Amsterdam *Chlamydia* Meeting" (AACM) in December 2004 and 6th of February 2015 he organized together with Dr. Sander Ouburg the Lustrum "10th AACM". In July 2005 at the 16th Biennial meeting of the International Society for Sexually Transmitted Diseases Research (ISSTDR) he was a member of the Scientific Committee and organized amongst others the workshop "Immunogenetics of *Chlamydia trachomatis* Infections", with Prof. David Mabey (London, UK, Trachoma research). He was organizing Committee member of 6th Meeting of the European Society for *Chlamydia* Research, University of Aarhus, Aarhus, Denmark, July 1-4, 2008 and at this meeting also session organizer: "Immunogenetics of *Chlamydia trachomatis* infections". Finally, he was the organizer of the 7th Meeting of the European Society for *Chlamydia* Research in 2012 (1-6 July) in Amsterdam, a meeting held only once every 4 years. In September 2016 his tender for organizing the 2018 International *Chlamydia* meeting was granted by the International Board after a two day side visit in September 2016. This meetings held every 4 years is held once every 8 years outside the USA.

Entrepreneurship:
Intellectual Property (patents and know-how) has been obtained and linked to several VUmc Spin-in companies including Microbiome Ltd, (Co-Founder and Co-Director) which won the Amsterdam Inventor Award in 2008 and the FD Gazellen Award in December 2011 and 2012. The second spin-in company founded is named TubaScan Ltd (Founder & Director since 2011) a company focusing on medical diagnostics on the basis of human biomarkers including host genetic markers amongst others for Periodontitis, Rheumatology, Female subfertility, and HLA typing.

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# Future STI / *Chlamydia* Meetings

15th German *Chlamydia* Workshop
*February 22 - 14 2017, Jena, Germany*
*http://www.chlamydienworkshop.org/*

8th Biennial Meeting Chlamydia Basic Research Society (CBRS)
April 7 – 10 2017, Charlotte, NC, USA

5th World Congress on Control and Prevention of HIV/AIDS, STDs & STIs
June 19 – 20 2017, June. London, UK

International Congress on Rickettsia and other Intracellular Bacteria (ESCCAR)
June 19 – 21 2017, Marseille, France

World STI & HIV Congress (IUSTI/ISSTDR)
July 9 – 12 2017, Rio de Janeiro, Brasil

Southern African Regional Students and Youth Conference (SARSYC)
"Building a business case a solid future: Access to Youth Sexual Rights and Health services and commodities"
July 13 – 16 2017; www.sarsyc.org

31st Congress of IUSTI-Europe on Sexually Transmitted Infections
August 31 – Spetember 2 2017, Helsinki, Finland

5th International Conference on HIV/AIDS, STDs and STIs
November 13 – 14 2017, Las Vegas, Nevada, USA

22nd ISSTDR and 18th IUSTI joined meeting
June 27 - 30 2018, Woudschoten, The Netherlands

14th International Symposium on Human *Chlamydial* Infections
*July 1 – 6, 2018, Woudschoten, The Netherlands*

13th Annual Amsterdam Chlamydia Meeting
February 1st 2019, Amsterdam, The Netherlands

9th Meeting of the European Society for Chlamydia Research
2020, exact date to be decided. Lausanne, Switzerland

# An overview of PhD work in The Netherlands on *Chlamydia trachomatis*

**Table I:** *PhD theses in the Netherlands*

| | |
|---|---|
| 2016 Jan Henk Dubbink | Maastricht University / VU University Amsterdam |
| 2016 Amy Matser | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| 2016 Kevin Theunissen | Maastricht University |
| 2016 Marleen Jansen | Maastricht University / VU University Amsterdam |
| 2015 Geneviève van Liere | Maastricht University / Public Health Service ZL |
| 2014 Jelena Malogajski | Maastricht University / VU University Amsterdam |
| 2014 Ivan Brankovic | Maastricht University / VU University Amsterdam |
| 2014 Rianne Vriend | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| 2014 Monique Pereboom | VU University Amsterdam |
| 2014 Jannie van der Helm* | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| 2014 Stephan P. Verweij* | VU University Amsterdam |
| 2014 Reinier Bom* | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| 2013 Jonathan Lal | Maastricht University / VU University Amsterdam |
| 2013 Laura van Dommelen* | Maastricht University |
| 2013 Marlies Heiligenberg* | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| 2012 Janneke Heijne* | University of Bern / RIVM |
| 2011 Ouafae Karimi | VU University Amsterdam |
| 2011 Koen D. Quint* | VU University Amsterdam |
| 2010 Caroline J. Bax* | University of Leiden / Medical Center Haaglanden |
| 2010 Janneke E. den Hartog* | Maastricht University |
| 2010 Ingrid Rours | Erasmus University Rotterdam |
| 2008 Liesbeth Duijts* | Erasmus University Rotterdam |
| 2007 Denise A.M. Perquin | University of Leiden / Medical Center Haaglanden |
| 2006 Sander Ouburg | VU University Amsterdam |
| 2006 Joke Spaargaren* | University of Amsterdam and VU University Amsterdam |
| 2006 Tanja P. Gijsen* | Maastricht University |
| 2006 Hannelore M. Götz* | Erasmus University Rotterdam |
| 2005 Jan E.A.M. van Bergen* | University of Amsterdam |
| 2004 Joseph M. Lyons* | City of Hope Medical Center, CA, USA, and VU University Amsterdam |
| 2003 Laura S. Murillo | VU University Amsterdam |
| 2002 Monica Molano Luque | VU University Amsterdam |
| 2001 Irene G.M. van Valkengoed* | VU University Amsterdam |
| 1999 Servaas A. Morré* | VU University Amsterdam |
| 1999 Johannes W. Trum | University of Amsterdam |
| 1999 Bernardus W.J. Mol | University of Amsterdam |
| 1998 Yvonne T.H.P. van Duijnhoven | University of Amsterdam |
| 1997 Marita J.W. van de Laar | University of Amsterdam |
| 1995 Jar Lan* | VU University Amsterdam |
| 1994 Josina van Ulsen | Erasmus University Rotterdam |
| 1994 Jacobus M. Ossewaarde* | University of Utrecht |
| 1993 Hans J.H. Theunissen* | Erasmus University Rotterdam |
| 1992 Johannes T.M. van der Schoot* | University of Amsterdam |

| | |
|---|---|
| 1992 Arent J.P. Boeke and Janny H. Dekker | VU University Amsterdam |
| 1992 André H. van der Willigen | Erasmus University Rotterdam |
| 1991 Eric C.J. Claas | VU University Amsterdam |
| 1990 Gijsbertus J.H.M. Ruijs* | Rijksuniversiteit Groningen |
| 1989 Henk J. Vonsée | Rijksuniversiteit Limburg |
| 1987 Kie H. Tjiam* | Erasmus University Rotterdam |

**Chlamydia trachomatis* is the major focus in the thesis.

Ranking position for number of theses 1987-2014: VU 16, UVA 10, Erasmus 7, UM 9

**Table II:** *Current PhD fellows working (partially) on* Chlamydia trachomatis.

| | |
|---|---|
| Anne Dirks | Maastricht University / Public Health Service ZL |
| Eleanne van Ess | VU University Amsterdam |
| Martin Singer | VU University Amsterdam |
| Dewi de Waaij | VU University Amsterdam |
| Esmée Lanjouw | VU University Amsterdam |
| Marleen Jansen | VU University Amsterdam / Maastricht University |
| Vitaly Smelov | VU University Amsterdam and<br>St. Petersburg State Medical University, Russia |
| Carolien Wind | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| Bart Versteeg | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| Charlotte van der Veer | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| Nynke de Vrieze | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| Menne Bartelsman | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| Martijn van Rooijen | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| Titia Heijman | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| Roel Achterbergh | University of Amsterdam / Public Health Services (GGD) Amsterdam |
| Pierre Thomas | Maastricht University / VU University Amsterdam |
| Juliën Wijers | Maastricht University/Public Health Service ZL |
| Lisanne Eppings | Maastricht University/Public Health Service ZL |
| Bernice Hoenderboom | VU University Amsterdam/RIVM |
| Daphne van Wees | University of Utrecht/RIVM |

# An overview of PhD work on *Chlamydiae*

**Table III:** *PhD theses on* Chlamydiae

| | | |
|---|---|---|
| 2016 Sarah van Lent | Ghent University, Belgium | CPs |
| 2015 Stefanie Lagae | Ghent University, Belgium | CPs |
| 2015 Kristien de Puysseleyr | Ghent University, Belgium | C |
| 2015 Leentje de Puysseleyr | Ghent University, Belgium | C |
| 2014 Evelien de Clercq | Ghent University, Belgium | C/CT |
| 2013 Lizi Yin | Ghent University, Belgium | CPs/CAb |
| 2011 Veerle Dickx* | Ghent University, Belgium | CPs |
| 2010 Katelijn Schautteet* | Ghent University, Belgium | C / CT |
| 2010 Caroline van Droogenbroeck* | Ghent University, Belgium | CPs |
| 2009 J.J.M. Bouwman | Utrecht University, The Netherlands | CP |
| 2009 Delphine Beeckman* | Ghent University, Belgium | CPs |
| 2008 Kristel Verminnen* | Ghent University, Belgium | CPs |
| 2008 Taher Harkinezhad* | Ghent University, Belgium | CPs |
| 2008 M.D. de Kruif | University of Amsterdam, The Netherlands | CP |
| 2007 Edou R. Heddema* | University of Amsterdam, The Netherlands | CPs |
| 2007 Ellen Boelen* | Maastricht University, The Netherlands | CP |
| 2006 Arnaud Daniël Hauer | Leiden University, The Netherlands | CP |
| 2005 Tom Geens* | Ghent University, Belgium | CPs |
| 2005 Marnix Van Loock* | Catholic University Leuven, Belgium | CPs |
| 2005 Manuela Voorend* | Maastricht University, The Netherlands | CP |
| 2005 Tryphon Vainas | Maastricht University, The Netherlands | CP |
| 2004 H.F. Berg | University of Amsterdam, The Netherlands | CP |
| 2004 Boulos Maraha* | VU Universtiy, Amsterdam, The Netherlands | CP |
| 1997 Roel P.A.J. Verkooyen* | Erasmus University Rotterdam, The Netherlands | CP |
| 1994 Daisy Vanrompay* | Belgium | CPs |

**Table IV:** *Current PhD fellows working (partially) on* Chlamydiae.

| | | |
|---|---|---|
| Cindy de Boeck | Ghent University, Belgium | CPs |
| Matthias van Gils | Ghent University, Belgium | C |

**Chlamydiae* are the major focus in the thesis.
*C: Chlamydiae*
*CAb: C. abortus*
*CT: C. trachomatis*
*CP: C. pneumoniae*
*CPs: C. psittaci*

*Amsterdam, 10 February 2017*

# Attendants:

| Title | Last name | Surname | Affiliation | E-mail |
|---|---|---|---|---|
| Ing | Adams | Karin | GGD Amsterdam | kadams@ggd.amsterdam.nl |
| | Borg | Melisa | Maastricht University | M.borg@student.maastrichtuniversity.nl |
| Dr | Bos | Martine | Microbiome | mp.bos@vumc.nl |
| Dr | Brankovic | Ivan | Max Planck Institute for Infection Biology | brankovic@mpiib-berlin.mpg.de |
| Dr | Bruisten | Sylvia | GGD Amsterdam | sbruisten@ggd.amsterdam.nl |
| Dr | Crusius | Bart | VUMC | b.crusius@vumc.nl |
| | de Feijter | Maud | RIVM | mauddefeijter@gmail.com |
| Drs | de laat | myrthe | AMR/GGD Amsterdam | myrthe_delaat@hotmail.com |
| Prof | de Vries | Henry | Universiteit van Amsterdam | h.j.devries@amc.nl |
| BSc | de Waaij | Dewi | VU medical center | d.dewaaij@vumc.nl |
| Dr | Delarocque-Astagneau | Elisabeth | Institut Pasteur/Université de Versailles-saint-Quentin-en-Yvelines | elisabeth.delarocque-astagne@pasteur.fr |
| Dr | den Hartog | Janneke | Maastricht UMC+ | janneke.denhartog@mumc.nl |
| MD | Dijkstra | Maartje | GGD Amsterdam | mdijkstra@ggd.amsterdam.nl |
| Dr | Dubbink | Jan Henk | VUmc / MU | janhenkdubbink@gmail.com |
| Drs | El Tahir | Omaima | VUmc | omaimaeltahir@gmail.com |
| Drs | Eppings | Lisanne | GGD Zuid Limburg | lisanne.eppings@ggdzl.nl |
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*Amsterdam, 10 February 2017*

# Announcement

# 13th Annual Amsterdam *Chlamydia* Meeting

February 1st 2019

*Organisers: Servaas Morré, Sander Ouburg & Joke Spaargaren*
*Laboratory of Immunogenetics,*
*Dept. Medical Microbiology & Infection Control, VUmc, Amsterdam*

We hope to welcome you all in Februari 2019

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# Notes

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*Amsterdam, 10 February 2017*

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