

Report 210261006/2009

E.L.M. Op de Coul | T.C. Weenen | M.A.B van der Sande | I.V.F. van den Broek

Process evaluation of the Chlamydia Screening Implementation in the Netherlands: phase 1



RIVM Report 210261006/2009

# Process evaluation of the *Chlamydia* Screening Implementation in the Netherlands: phase 1

Challenges and opportunities during preparation and first operational phase

E.L.M. Op de Coul T.C. Weenen M.A.B. van der Sande I.V.F. van den Broek

#### In collaboration with:

J. E.A.M. van Bergen E.E.H.G. Brouwers E.M. de Feijter J.S.A. Fennema H.M. Götz C.J.P.A. Hoebe R.H. Koekenbier S.M. van Ravesteijn

#### Contact:

E.L.M. Op de Coul Epidemiology and Surveillance, Centre for Infectious Disease Control eline.op.de.coul@rivm.nl

This investigation has been performed by order and for the account of Ministry of Health, Welfare and Sport within V/210261/01/IE 'Interventie en Evaluatieonderzoek'

© RIVM 2009
Parts of this publication may be reproduced, provided acknowledgement is given to the National Institute for Public Health and the
Environment along with the title and year of publication.

### **Abstract**

#### Process evaluation of the Chlamydia Screening Implementation in the Netherlands: phase 1

The *Chlamydia* Screening Implementation (CSI) for 16 to 29 year-old residents in Amsterdam, Rotterdam and South Limburg started in April 2008. The Public Health Services (PHSs) implemented the screening, and STI AIDS Netherlands is coordinating the programme. The Centre for Infectious Disease Control RIVM in collaboration with the PHSs and STI AIDS Netherlands, is responsible for the process- and effect evaluation. The results will be crucial for deciding whether and how a national roll-out of *Chlamydia trachomatis* screening in the Netherlands will take place in the future.

The process evaluation of the preparatory phase and first operational phase examines the extent to which the programme is operating as intended and determines whether the target population has been reached. Overall, the results demonstrated that well-structured, comprehensive *Chlamydia* screening - with information technology (IT), logistic and laboratory components – has been developed and is operating efficiently. The project group itself, the commitment of all parties involved, and the successful outsourcing of IT and logistics were key factors of success. The complex programme management, underestimation of the workload, and postponement of the programme challenged the programme staff.

The participation rate in the first 2 months (15%) was lower than anticipated (30%). Reminders contributed significantly to response - and participation rates. The participation rates were higher for women than for men. They were also higher for people more than 20 years old than for teenagers. Overall, 4.3% of the participants were positive for *C. trachomatis*.

The preliminary results from a survey among nurses and general practitioners (GPs) working with sexually transmitted infections (STIs) showed that participants, whether positive or negative for *C. trachomatis*, seek consultation, but there was no evidence for severe extra workload at these facilities. Most nurses and GPs referred and treated partners, but proceeded in various ways.

Key words: Process evaluation, Screening, Chlamydia trachomatis



### Rapport in het kort

#### Procesevaluatie van de Chlamydia Screening Implementatie in Nederland: de eerste fase

De Chlamydia Screening in Amsterdam, Rotterdam en Zuid-Limburg onder jongeren van 16 tot en met 29 jaar is in april 2008 succesvol van start gegaan. De technische uitvoering is goed verlopen, maar de participatiegraad valt wat tegen. Dit blijkt uit een eerste evaluatie van de voorbereiding en de eerste twee maanden van de uitvoering. De toekomstige besluitvorming over een landelijke screening op chlamydia in Nederland is afhankelijk van dit evaluatieonderzoek. Soa Aids Nederland coördineert de screening, die wordt uitgevoerd door de GGD'en van de drie regio's. Het Centrum voor Infectieziektenbestrijding (CIb) van het RIVM evalueert het programma in samenwerking met bovengenoemde partijen.

De screening is bedoeld om seksueel actieve jongeren in twee rondes te screenen op Chlamydia. Onder hen komt deze geslachtsziekte het meest voor. De jongeren kunnen na een schriftelijke oproep via een website een testpakket aanvragen. De combinatie van IT, logistiek en laboratoriumwerk maakte de screening een complexe aangelegenheid. Factoren die de uitvoering bevorderden waren de expertise van de projectgroep zelf, de grote inzet van alle betrokkenen en de geslaagde uitbesteding van IT en logistieke zaken. Belemmerende factoren waren de veelheid aan betrokken partijen, de onderschatting van de werkbelasting en tijdsinvestering en daarmee het uitstel van het programma.

#### Eerste resultaten screening

De participatiegraad in de eerste twee maanden was 15%, lager dan vooraf geschat was geschat (30%). Herinneringsbrieven en e-mails droegen in belangrijke mate bij aan de deelname. Vrouwen deden vaker mee dan mannen. Personen tussen de 20 en 29 jaar deden vaker mee dan 16 tot 19 jarigen, bij wie vaker chlamydia is geconstateerd.

Uit de eerste cijfers blijkt dat 4,3% van de deelnemers de geslachtsziekte had. De screening leidde niet tot een ernstig verhoogde werkdruk bij soa-centra of huisartspraktijken. De meeste verpleegkundigen en huisartsen benoemden het belang om partners te waarschuwen; de wijze waarop zij zijn benaderd verschilde.

Trefwoorden: procesevaluatie, screening, Chlamydia trachomatis

### **Contents**

Summary		9
1	Background	11
1.1	Epidemiology	11
1.2	Historical perspective	12
1.3	Implementation of <i>Chlamydia</i> Screening	13
2	Aims and objectives	15
2.1	First process evaluation	15
2.2	Main research questions	15
3	Organisation of the Chlamydia Screening	17
4	Process evaluation: technical design	19
4.1	Framework	19
4.2	Data collection	19
4.2.1	Quantitative data collection	20
4.2.2	Qualitative data collection	20
5	Interview results: preparation phase	23
5.1	Project group	23
5.2	Working groups	23
5.3	Advisory committee	24
5.4	Project planning	24
5.5	Logistics	25
5.6	Communication Information technology	25
5.7 5.8	Information technology Laboratories	26 27
5.9	Finances	27
3.9	Tillances	21
6	Interview results: first operational phase	29
6.1	Project group	29
6.2	Logistics	29
6.3 6.4	Information Technology Laboratories	29 30
6.5	Other issues	30
0.5	Other issues	30
7	Monitoring: first months of screening	31
7.1	Performance monitoring	31
7.1.1	Invitations for screening	31
7.1.2	Undeliverable letters	32
7.1.3	Time process of reminder invitations  Time from invitation to requesting test package	32 32
7.1.4 7.1.5	Time from invitation to requesting test package Time needed to handle the test package	32
7.1.6	Time from posting the package to the return of the sample	34
7.1.7	Laboratory processes	35
7.1.8	Re-testing results	35
7.1.9	Time needed for processing samples	35

7.1.10	Time between availability and checking of test result	37
7.1.11	Overall process time	38
7.2	Participation monitoring	38
7.2.1	Participation rate and informed consent	38
7.2.2	Women's specimen choice: urine versus swab	42
7.2.3	Completed questionnaires	43
8	Functioning of the risk score: first evaluation	45
9	Helpdesk questions	49
9.1	Aids STI info line	49
9.2	Public Health Service telephone lines	49
9.3	Information technology helpdesk	50
10	Healthcare providers' experiences	51
10.1	Preliminary results	51
11	CSI participants visiting the STI centres	55
12	Conclusions and future considerations	57
12.1	Program management and collaborations	57
12.2	Process-, performance- and participation monitoring	58
12.3	Health care providers' experiences	60
12.4	General points and conclusions	60
Reference	es ·	63
Appendix 1 - List of screening organizers		65
Appendix 2 – (Interview) questionnaires		67
Appendix 3 – Description of Block A		75
Appendix 4 – Flowchart technical processes		77
Appendix 5 – Outline process monitoring		79
Appendix	6 – Outline performance monitoring	80
Appendix	7 – Promotional Poster	83
Appendix	Appendix 8 – The website	
Appendix	9 – Website visitors	87
Appendix 10 – Media publicity		88
ist of abbreviations		

### Summary

Chlamydia trachomatis (Ct) is the most prevalent bacterial sexually transmitted infection (STI) in the Netherlands; an estimated 60,000 cases occur annually. About half of the infections are detected and treated. The Ministry of Health, Welfare and Sport decided to start a screening programme in three regions.

The Chlamydia Screening Implementation (CSI) is a first large-scale intervention, piloting a sustainable, selective, systematic and internet-based Chlamydia Screening during the period 2008-2010. A total of 315,000 16 to 29-year-old residents of Amsterdam, Rotterdam and South Limburg are being invited to two screening rounds. In the high-prevalence urban areas, all sexually active people are encouraged to participate, while in the lower-prevalence area of South Limburg only those who match a certain risk-profile are invited. The Public Health Services (PHSs) have implemented the screening, and STI AIDS Netherlands is coordinating the programme.

The Centre for Infectious Disease Control, RIVM, in collaboration with the PHSs and STI AIDS Netherlands, will provide a process and effect evaluation. The results will be crucial for deciding whether and how a national roll-out of *Chlamydia trachomatis* screening in the Netherlands will take place in the future. Here, we describe the results of the first process evaluation of the preparatory and first operational phase. The evaluation includes observing daily processes, interviews with screening organizers, document review and analysis of the screening database.

Overall, the results show that well-structured, comprehensive *Chlamydia* screening - with Internet technology (IT), logistic, and laboratory components – has been developed and is operating efficiently. The project group itself, the commitment of all parties involved, and the successful outsourcing of IT and logistics were key factors in the success. Complex programme management, underestimation of the workload and postponement of the program challenged the programme staff. The thorough preparation, however, clearly contributed to the good functioning of IT, logistic and laboratory processes. Delays in processing samples, the website being out of order during one weekend, and some wrongly delivered invitation letters and test packages were minor obstacles.

In the period of April to June 2008, 57,000 invitations were sent. The overall *response rate* (requested packages) was 21%. The overall *participation rate* (returned samples) was 15%, which was lower than the anticipated 30%. Reminders contributed significantly to response and participation rates. Participation rates among women were higher than among men. They were also higher among people aged 20 years or more than among teenagers. Specific recommendations to enhance participation rates should be considered. An extra reminder was sent to encourage the return of samples. Of the returned samples, 4.3% were positive for *C. trachomatis* (women: 4.3%, men: 4.2%).

Preliminary results from a survey among nurses and general practitioners working with STIs showed that both *C. trachomatis*-positive and - negative screening participants seek consultation, but there was no evidence for severe extra workload at these facilities. Most nurses and general practitioners referred and treated partners, but proceeded in various ways. The acceptability and non response results are not included in this first evaluation, but will be described when more results are available.

### 1 Background

### 1.1 Epidemiology

Chlamydia trachomatis (Ct) is the most prevalent bacterial sexually transmitted infection (STI) in the Netherlands, an estimated 60,000 cases occur annually [Van Bergen et al., 2006, 2007]. About half of the infections are detected and treated; STI centres see approximately 8,000 cases annually and general practitioners see an estimated 28,000 cases.

The *Chlamydia* pilot study [Pilot Ct, Van Bergen et al., 2005] shows an overall prevalence of 2% among participants in four areas. The prevalence of *C. trachomatis* was higher (3.2%) in the large cities.

The overall Ct-positivity rate in the national registry of the STI centres was 10.1% in 2007 (Figure 1). The highest rates of infection occurred among young people, especially in the group aged 15-25 years [Van den Broek et al., 2008]. Of the three regions participating in the screening, Ct-positivity rates at the STI centres are highest in Rotterdam (2007: 13.4%), especially in the group aged 16-19 years (20.6%). In Amsterdam and South Limburg, the positivity rates were 11.0% and 10.6%, respectively (Figure 2).

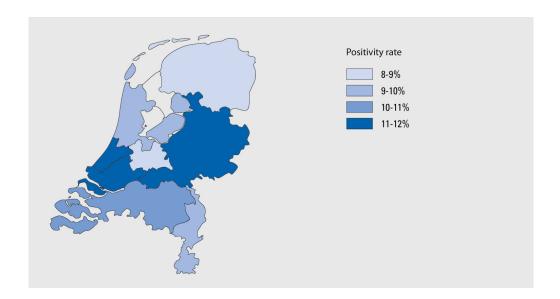


Figure 1: Positivity rates for genital Chlamydia infection at the STI centres, by region, 2007

*C. trachomatis* is largely asymptomatic and the disease burden is determined by (late) complications in women: pelvic inflammatory disease (PID), tubal factor infertility (TFI), ectopic pregnancy and neonatal infections. *C. trachomatis* has also been associated with preterm delivery [Rours et al., 2008]. Early detection and treatment of Ct-infections are a strategy to reduce complications in infected individuals and to limit the spread of the infection in the population.

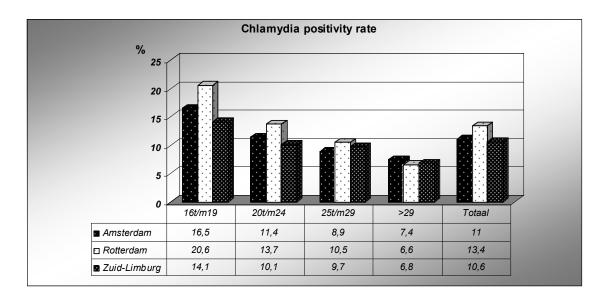


Figure 2: Positivity rates for genital Chlamydia infection at STI centres, by screening region, 2007

### 1.2 Historical perspective

Dutch national *Chlamydia* screening has been subject of debate for many years. The Dutch Health Council was reluctant to agree to national screening for *C. trachomatis*, partly because population-based data were not available, which seems a prerequisite before embarking on screening at the national level [GR, 2004].

During 2002 and 2003, a pilot study was carried out in four regions in which 21,000 adolescents were invited to participate in a home screening programme (Pilot Ct). The study showed that *Chlamydia* infections were particularly prevalent in the major cities and amongst specific risk groups [Van Bergen, 2005]. The evaluation of the pilot study showed that the Public Health Services (PHSs) are well equipped to conduct the screening, and the low-threshold approach was much appreciated by the participants.

In view of the outcomes of the pilot study, STI Aids Netherlands recommended starting selective screening in a few regions. The minister endorsed this advice and asked for a pilot implementation [Dutch Organisation for Health Research and Development (ZONMw)]. During an expert meeting in January 2006, the experts decided to start this pilot implementation in two major cities and in one less urbanized area.

The aims of the *Chlamydia* Screening Implementation (CSI) are to seriously start *Chlamydia* screening in the Netherlands and to determine its feasibility, effectiveness and cost-effectiveness. The results of this implementation programme will provide data for a decision regarding a national *Chlamydia* screening programme.

### 1.3 Implementation of *Chlamydia* Screening

The *Chlamydia* Screening Implementation started in three regions in the Netherlands in April 2008. In total, approximately 315,000 young adults (16-29 years old) are eligible to participate. In view of the statutory regulations, those younger than 16 years have been excluded from the programme. The decision to include people aged 25 to 29 years relates to the relatively high prevalence found in this group in the Ct pilot study (2.1% of the male participants and 2.9% of the female participants) [Van Bergen et al., 2005].

The selection criterion for participation in the major cities is sexual activity (i.e. experience with sexual intercourse). On the basis of this criterion, the expected prevalence is more than 3% (4% among the sexually active in the Pilot Ct). Information in brochures and on the website particularly encourages the participation of members of the high-prevalence target groups (e.g. individuals with more than one sexual partner, individuals with new sexual partner(s), people originating from Surinam or the Netherlands Antilles, and those with a lower social-economic status. For South Limburg, where we expect the Ct-prevalence to be lower, we use a risk score that selects people at higher risk. This risk score, adopted from the Pilot Ct [Götz et al., 2005], includes the place of residence, age, education, Ct-related symptoms, condom use, ethnic group, number of sexual partners, and new partner(s) in the last year.

The providers of the screening are the PHSs in Rotterdam, Amsterdam and South Limburg. STI AIDS Netherlands is coordinating the programme.

### 2 Aims and objectives

A process evaluation examines the extent to which a programme is operating as intended by assessing ongoing programme operations and determining whether the target population is being served [WHO, 2000; Bliss et al., 2002].

Here, we describe the results of the first process evaluation of the *Chlamydia* Screening Implementation which started in April 2008. Outcome measurements such as uptake of invitations are described only briefly, since participation rates, numbers of detected and treated *Chlamydia* infections, nonresponse, and acceptability of the screening will be described in detail elsewhere.

### 2.1 First process evaluation

As a new programme moves from planning to the operational phase, the organizers often discover obstacles in the programme delivery. Therefore, this first process evaluation focuses on the preparatory and first operational phase. It includes both quantitative and qualitative research methods that are complementary and that were used simultaneously.

We used interviews and questionnaires among key stakeholders and health care providers (e.g. nurses, general practitioners (GPs), and helpdesk employees), to obtain insights into the bottlenecks and successes during the early stage of the programme (qualitative research). We studied documents from project group meetings and analysed data from the screening database (quantitative research) to monitor the process, performance, and participation.

### 2.2 Main research questions

- What were the main bottlenecks and successes in the preparation and first operational phase of the CSI programme in the views of the screening organizers and health care providers?
- How did the screening proceed in the first months (process and performance monitoring)? Is the implementation consistent with quality standards?
- What adjustments to the programme were needed to reach an optimum way of operating?
- What proportion of the eligible invitees participated? And what are their main characteristics?

#### Organisation of the Chlamydia Screening 3

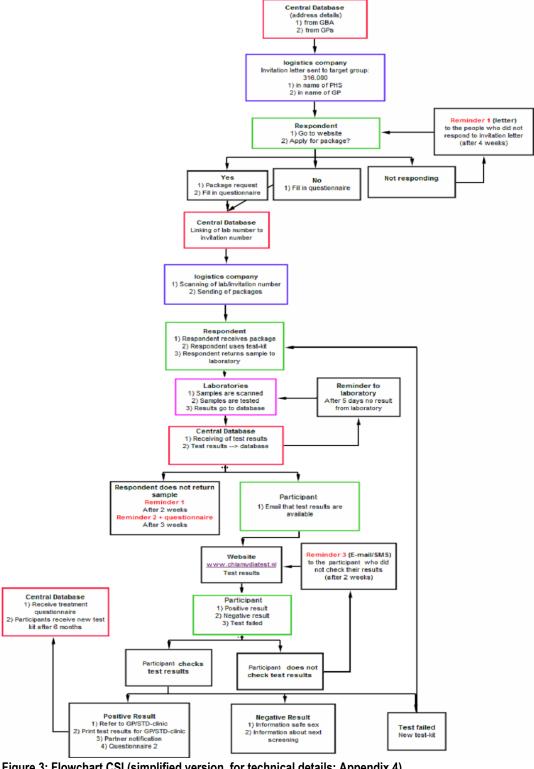


Figure 3: Flowchart CSI (simplified version, for technical details: Appendix 4)

To evaluate ongoing processes, an assessment of all logistic - and technical steps in that process was made (Figure 3 and Appendix 4). In the three regions, the PHSs send invitations to addresses taken from the municipal population registers. In Amsterdam, GPs send part of the invitations (6%) to addresses in the patient information system. In total, approximately 315,000 invitation letters will be sent in the first screening round (Amsterdam: 150,000; Rotterdam: 125,000, South-Limburg: 40,000).

The invitation letter contains a personal log-in code that enables the invitee to request a test package via the website (<a href="www.chlamydiatest.nl">www.chlamydiatest.nl</a>). The website provides information about *Chlamydia* infections, consent issues, sample taking and optional questionnaires. People who do not respond to the invitation receive a reminder letter 1 month later (Figure 3).

Respondents receive the test package at their home address or another address if they prefer. The test package includes a sample kit (men: urine; women: vaginal swab or urine) that can be sent in an envelope for biological material (Polymed) to the regional certified laboratory (Figure 4).



Figure 4: Polymed (left) and blister (right)

Individuals who have not returned the sample to the laboratory receive a reminder e-mail 2 weeks later. Nucleic amplification techniques (NAAT) are used to test the samples for *C. trachomatis*. Participants receive an e-mail stating when the test result will be available. Participants who have not provided an e-mail address have to track their own test results. The test result can be obtained via Internet with a username and password. Participants, who have not checked their results, receive a reminder e-mail message. Ct-positive participants also receive an SMS message (if a mobile phone number is provided). Individuals with a Ct-positive result receive an online letter (\*pdf) which can be printed. The letter includes the test result and information for healthcare providers (GPs and STI centres) about medical treatment, treatment during pregnancy and information about partner notification and treatment. Treatment is to be provided primarily through the GP or, if preferred, at the STI centre. Ct-positive participants who have not checked the result on-line receive a letter with the result at the address provided.

The target population will be invited in phases (district by district, in random order) in two screening rounds with separated by 1 year. Ct-positive participants automatically receive a new test package 6 months after diagnosis.

### 4 Process evaluation: technical design

#### 4.1 Framework

The process has been evaluated according to the Centres for Disease Control (CDC) guideline and other guidelines for health programme evaluation [CDC, 1999/2007; WHO, 2000]. First, we approached various screening organizers to find out what they expected from the evaluation. Then, we described the programme beginning to end and determined the objectives of evaluation. Although informal evaluation is ongoing in routine practice, having evaluation standards helped us determine whether the evaluated activities were well designed. Important standards such as utility, feasibility, propriety, and accuracy were applied in this evaluation. The standards were intended to ensure that the evaluation served the information needs of the users (utility). Feasibility standards were intended to ensure that the evaluation is realistic and procedures are practical. Furthermore, the evaluation should be legally and ethically correct (propriety) and should reveal technically adequate information (accuracy).

#### 4.2 Data collection

We used a mix of qualitative and quantitative data sources for the process evaluation (Figure 5). This mix included interview data (programme staff and external partners), electronic questionnaires (healthcare providers), programme documents (meeting reports, memos, protocols et cetera), observational data, and information from the screening database.

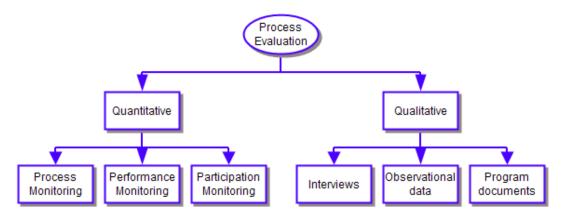


Figure 5: Data collection for process evaluation

We analysed the screening database to determine the performance and uptake of the screening. This 'live' database is automatically generated from IT processes during the screening. It contains regularly updated databases from the municipal administrations (monthly updates), laboratory results, and website outputs of track records of each individual responding to the invitation, received test package, test results, completed questionnaires et cetera, including dates when these events took place. An anonymised database was extracted every week for the evaluation. For technical details see Appendix 4.

### 4.2.1 Quantitative data collection

To guarantee optimal screening, different types of monitoring were used: process, performance, and participation monitoring.

*Process monitoring* is conducted on a daily and weekly basis to obtain information about daily errors in the regional setting (Appendix 5). Feedback from participants contacting the helpdesk is passed on to the regional coordinators. This allows the coordinators to quickly respond to errors and to optimize procedures in the programme from the beginning. The programme coordinators from the three PHSs collected quantitative data and did the analyses regionally.

Performance monitoring is conducted to obtain information about key aspects of how the programme is operating; whether and to what extent prespecified programme objectives are attained. We developed quality indicators to guarantee optimal execution of the programme (Appendix 6). The screening database was analysed monthly to provide coordinators with feedback, allowing them to take timely action and to determine whether actions had positive effects on the programme. See Appendix 6 for the performance checklist.

The purpose of *participation monitoring* is to study (region-specific) use of the screening, participation rates, and characteristics (i.e. gender, age, country of origin) of the participants in relation to the target population. We describe the participation rates briefly (chapter 7); details of nonresponse will be published elsewhere.

#### 4.2.2 **Oualitative data collection**

#### Observational data

Meetings were scheduled at different locations, including the laboratories and companies (IT and logistics) directly involved in the screening programme. The aim was to obtain insight into the daily procedures at these locations. The observational information collected from these meetings was used to prepare interview questionnaires for the screening organizers.

#### Interviews

Interviews were scheduled with the various parties involved (Appendix 1). Project coordinators (from PHSs and STI AIDS Netherlands) were interviewed about their key roles in the programme and in the working groups. The four working groups coordinated the IT processes, logistics (mailings of invitation letters and test packages), communication (development of screening materials, advertising, and website), and laboratory processes.

The interview topics included the functioning of the project group and working groups, as well as bottlenecks and successes within the four sections mentioned above. One or two people from each external company (logistics, communication, and IT), were interviewed, including contacts for the project group. Everybody agreed to be interviewed face to face.

The interviews, based on semi-standardized questionnaires (Appendix 2), included expected and experienced bottlenecks and successes in the programme preparation and first operational phase. The questionnaires were based on the process evaluation of the Pilot Ct and were adjusted as necessary on the basis of the information gathered in observational meetings (chapters 5 and 6). A checklist for validating evaluation questions was used for further revision of the questionnaires [Bliss et al., 2002].

#### On-line questionnaires

Healthcare providers (STI centres and GPs) were approached with an on-line questionnaire (Questback programme, Appendix 2). The questionnaire included topics that provided information about the screening, treatment of participants, partner notification and treatment, and STI testing (chapter 10).

#### Data analysis

All interviews were recorded and transcribed. Text fragments were labelled with names or descriptions. Rough labels were created before the interviews took place; more detail was added during the analysis of the interview texts. Labels referred to people, products, situations, and processes. The interview subjects were: the functioning of the project group and the working groups (logistics, communication, IT, and laboratories). Other labels, such as project coordination, schedule and finances, were included during the interviews, and an inventory of the program successes was made

During the analysis, problems, causes, (possible) solutions and successes were grouped by question. Labels were assigned to sentences or parts of them, and placed in analysis tables. These tables were classed by (1) phase of the programme (preparation versus operational) and (2) problems versus successes. To identify underlying root causes of the problems, we used the causal tree method to analyse the data (not shown).

We used descriptive statistics in SAS (version 9.1) and SPSS (version 16.0) to analyse data from the screening database. We designed a performance and participation monitoring list to measure frequency tables and time processes efficiently.

### 5 Interview results: preparation phase

Project group members were interviewed about the functioning of the project group and four working groups. Commercial partners were interviewed about collaboration with project group members and their tasks within the screening programme. In total, 14 interviews took place.

### 5.1 Project group

Members: 10 (2 per organisation)

Interviewed: 8 (two people responsible for the evaluation were excepted)

Successes. All interviewees stated that the project group had been effective and that it consisted of the right combination of different people. Most people had experience with *Chlamydia* research and three of them had participated in the Pilot Ct; their experience was well used in the screening programme. Another positive aspect mentioned was that each coordinator assigned a colleague to assist him/her in the programme. This was a good decision since all coordinators were working on other projects as well. The project group much appreciated the flexibility of the organization financing the program (ZonMW), who provided the programme with an adequate budget and were lenient when postponement of the programme was needed.

Communication. Communication within the project group is done by e-mail, telephone and monthly meetings. The monthly meetings aim to keep everyone informed about programme proceedings, having discussions and making decisions. All interviewees mentioned that communication within the group had been challenging at times during the preparations. On the one hand, a great many programme documents were sent by e-mail (often too much to read in preparation for meetings), but on the other hand, project group members sometimes felt they were not well enough informed. One of the underlying causes of miscommunication was the great pressure of time and its corresponding stress. Despite some misunderstandings, the overall atmosphere in the group was good.

Decision-making. Another challenge was the size of the project group. The group of ten people made it difficult to make decisions. People had opposite opinions, which resulted in time-consuming discussions. To solve this, the project coordinator, who was also chairman of the meetings, set up stricter rules for discussion time and agenda items. Smaller working groups that included at least one member of the project group were formed. These working groups worked on specific subjects and were only to discuss the more important subjects with the project group.

### 5.2 Working groups

Communication: 4 members (PHS: 3, STI AIDS Netherlands:1)

Laboratory: 5 members (PHS: 2, laboratories:3)

IT: 4 members (PHS: 4) Logistics: 2 members (PHS: 2)

Interviewed: 1 or 2 people from each working group

Efficiency. Four working groups (IT, logistics, communication, and laboratories) were formed to facilitate the decision-making process and to delegate the workload by assigning specific tasks. The project leaders of the PHSs were responsible for the working groups. Although the working groups were formed to speed up decisions, sometimes they caused delays (for external partners as well). The project group, who only met once a month, still had to make important decisions. Furthermore, the structure of the various groups was inefficient at times, because processes - such as IT and logistics - were closely linked, which resulted in items being discussed twice. In general, the interviewees were positive about the working group structure that resulted in a thorough preparation of the screening programme.

### 5.3 Advisory committee

Members: 10 (external advisors and project group members (auditors))

Interviewed: 4 (project group members)

The main tasks of the programme advisory committee are (1) to advise the project group about the development of the screening programme, communication and diagnostic issues, and outcomes of the screening; and (2) to assist in the programme evaluation. The project group invited experts on *Chlamydia* testing, population screening, gynaecology, public health epidemiology, and family practice to be part of the advisory committee.

Meetings with the committee were planned to take place every 6 months for obtain their advice on various topics. At the time of this evaluation, three meetings with this committee had taken place. The project group members appreciated the feedback and advice from the committee. The committee filled in gaps in the expertise of the project group members, and since committee members were less directly involved, they could reflect on the programme from a certain distance.

### 5.4 Project planning

Coordination: 2 (STI AIDS Netherlands)

Interviewed: 8 (coordinator and seven project group members)

Coordination. Due to the size and comprehensiveness of the programme, coordination was tough. The project coordinator had to deal with complex financial contracts and tendering, but encountered no major obstacles. The overall opinion of the project group members was that STI AIDS Netherlands was the right partner for the job. Coordination was more difficult at the beginning of the preparations. Over time, the coordinator applied a stricter management style that was needed to adhere to schedules and planned goals.

Timing. The planned preparation time for the screening was 6 months, but the actual time needed was more than a year. The main cause of the delay was underestimation of the size and complexity of the programme. All local project leaders emphasized the fact that, before preparations had started, they had assumed that many organizational aspects from the Pilot Ct could be used. However, many issues needed to be reconsidered, and the Internet set-up was completely new. Furthermore, the handling of legal requirements, which were obligatory due to the size of the programme, were time consuming.

The interviewees mentioned other reasons for the delay:

- The selection of external, commercial partners took more time;
- Some external partners had little experience with large-scale projects;
- The delivery of the databases from municipalities was time consuming due to incompatible data formats and restraints in providing data about ethnic background in one municipality.

Although the postponement of the program was regarded as a bottleneck, it also resulted in a thorough preparation of the screening. 'Quality first' was very important for all project group members.

### 5.5 Logistics

Logistic working group: 2 members (2 interviewed)
Logistic company: 2 people interviewed

Logistic processes were to be coordinated regionally during the preparatory phase. To improve efficiency, it was later decided to organize logistics centrally. Therefore, logistics needed to be put out to tender. The main tasks of the logistics company were printing of the invitation letters, assembling test packages, and planning the delivery of letters and packages. Members of the working group were asked about logistic processes and collaboration with the logistics company. Conversely, the logistics company was interviewed about their experiences and collaboration with project group members.

Contract negotiations. Two companies were selected from various companies that were invited to provide financial proposals. The negotiator was the project leader of the IT working group, who was assisted by an experienced negotiator from the Amsterdam PHS. The company with the most experience in medical and re-closable packaging was chosen.

*Preparation phase.* Several project group members visited the logistics company. In the beginning, project members had some doubts about the capacity of the company to handle large-scale distributions of region-specific packages. However, the company had advantages as an experienced partner in medical packaging material, although printing and posting was not their main area OF expertise. The worry proved to be unnecessary, as from the start of the screening the logistic processes matched the requirements. Interviewees from this company mentioned that they felt pressured to finish the preparation on time, even though processes were delayed.

Collaboration. Overall, collaboration between the various parties was successful. At first, communication was difficult for the logistics company due to the large number of contact persons. This situation was altered so that there was one contact person in order to achieve more structure in communication. The project members mentioned that their collaborating partner was indeed available, and solved problems quickly when asked.

#### 5.6 Communication

Communication working group: 4 members (2 interviewed)
Communication consultancy: 1 person interviewed

Contract negotiations. Pre-negotiations were conducted with various parties in communication, and one was appointed as the preferred partner. Although there was only a small budget for communication, this company was able to provide an adequate communication plan. They designed the lay-out of the brochures, advertisements, and website. Students from the St. Lucas College in Boxtel made the videos for the website. All communication materials were pre-tested among a panel of 18 people aged 16 to 29 years, men and women from various ethnic groups.

Collaboration. The communication working group collaborated with this company during these preparations. One obstacle in the collaboration was the different expectations of these two parties. The working group expected a more editorial role from the communication company. The communication experts, stated that this had not been made clear to them, and that it would be difficult since they had little know-how about *Chlamydia* infections or screening programmes. The company also regretted that the portrayal of the screening did not have a more 'national' feeling ('that everyone is invited') instead of the regional approach.

Communication. Communication was slightly inflexible and too formal at times, according to one project group member. Furthermore, the development of the website took longer than planned since the processes also involved the IT group. However, the fast production of promotional brochures and posters speeded things up, and there were no serious delays. The company was easily reached and customer friendly. They quickly grasped what the project group wanted. The project group was satisfied with the final products (Appendices 7 and 8).

### 5.7 Information technology

IT working group: 3 members (2 interviewed)
IT company: 1 person interviewed

Contract negotiations. Three contract proposals were received from various IT companies. The company with experience in building large database applications in the public health field was chosen as the partner.

*Tasks*. The development of the website was challenging, since the company was experienced in databases, but less so in designing websites. The graphic representation of the website took more time than expected, but ultimately the website functioned well. According to the interviewees, having the company build both the website and the database saved time.

Collaboration. Members of the IT working group described the testing of the application as labour intensive. They said that better agreements about testing any future application after new releases are essential. The contact person from the IT working group said that the communication with the IT company was always very structured.

Overall, the IT processes went well. One problem was that an externally built conversion application was needed for reading the format of the population register data. A great advantage of the current CSI application is that it can be used in future screening projects involving laboratory tests. We note that maintenance costs are relatively low compared to development costs.

### 5.8 Laboratories

Laboratory working group: 5 members (4 interviewed).

Contract negotiations. The PHS in each region appointed one laboratory to test the samples. Negotiations with laboratories were hampered by requirements for test procedures. Prices were fixed and based on the pooling of samples. Project group members had assumed that each laboratory would pool samples for *C. trachomatis* testing. This was described as standard methodology in the programme proposal on the basis of experience in the Pilot Ct. Due to the sampling methods and the handling of samples, this was not the choice for two laboratories.

An important issue to be negotiated was the project group's request to re-test all Ct-positive samples, if the samples were not pooled. This condition was set to confirm positive cases and minimize false-positive results, although this is not regular practice at these laboratories. The laboratories agreed that false-positive results should be minimized, but they regretted the project group's late communication. The re-testing also resulted in higher costs than anticipated for the laboratories.

*Procedures.* The head of one laboratory mentioned that he expected that the whole logistic process would be tested with real samples rather than with electronic 'virtual' records. This could have prevented some of the problems described in section 6.3.

Quality control. A topic repeatedly discussed at meetings of the project group and the laboratory working group was the different testing methods used in each laboratory. Although sensitivity and specificity of all three *Chlamydia* tests are high (> 98% and > 99%, respectively), various discussions about the potential differences in test results took place. Finally, it was decided that each laboratory could perform its own tests with their own routine quality control procedures, as this would be the situation if Ct-screening were implemented nationally. Exchanging samples between laboratories was not considered necessary: in any case, it was difficult to test samples from other laboratories due to different collection devices (dry versus wet) and buffers (GenProbe Aptima, Probetec buffer, and Roche Cobas CT/NG).

*Timing*. All three laboratories found the postponements of the programme unpleasant. They were ready for testing before the initial launch of the programme, and the delay affected staff planning.

#### 5.9 Finances

The STI AIDS Netherlands's budget control proceeded smoothly according to the interviewees. Costs for laboratories were met the price agreements, but were based on pooling instead of single testing. This made laboratory costs higher due to re-testing of all Ct-positive samples. Coordination costs were higher and due to numerous adaptations outside the contract, and IT-costs were also higher. However, money was saved by centralizing the logistics. Communication funds were spent on the website and folders. The budget for communication was relatively small, and large media campaigns were not an option. However, free media publicity was good when the screening started and large campaigns were not planned due to the systematic character of the screening (not everyone is invited at the same time).

### 6 Interview results: first operational phase

The same screening organizers (chapter 5) were interviewed about their experiences during the first 2 months of the operational phase of the *Chlamydia* Screening programme. Here, we summarize the main achievements and constraints that the interviewees mentioned.

### 6.1 Project group

The main success, as most project group members mentioned, is that they had managed to set up well-organized *Chlamydia* Screening with each component (IT, logistics, laboratories, and communication) functioning well. Although some issues described below happened in the first weeks, the chain of processes functioned adequately.

### 6.2 Logistics

The logistics company expressed concern about personnel planning if screening responses were lower than expected. They would have too many employees and not enough packages to assemble, which would cause a financial loss. This problem did not occur in the course of the programme. In June 2008, the company reported a 1-day delay for a batch of invitation letters due to printing problems. This meant a 4-day delay for the target population since the letters were delivered only twice a week. Second-line print facilities were arranged after this event occurred.

Overall, postal handling of the invitation letters went well, with the exception of a few instances of delivery problems (stacks of letters delivered to a single address). The postal company started an internal investigation among their employees, and the issue was solved.

### 6.3 Information Technology

Various project group members mentioned that, although they trusted the IT component, they feared a breakdown of the web application, which would immediately affect the programme. In the fourth weekend of May, a website problem occurred. Various participants notified the IT helpdesk that they were unable to log in. The problem was caused by an improperly tuned database parameter and was solved the next day.

Software problems occurred in one laboratory. Samples that had to be re-tested were assigned the same participation number as the initially tested samples. The software was not designed for this, and laboratory staff had to carry out operations manually.

### 6.4 Laboratories

One person from the laboratory working group and two regional project leaders mentioned the issue of sample storage. If many participants gave informed consent for saving their samples, this would lead to storage problems, especially in the large cities.

In the 3<sup>rd</sup> week of June, test results were not passed to the database application in another laboratory, resulting in a stack of test results. The problem was quickly solved, but caused a delay of several days in the transfer of test results to participants.

In one large laboratory, the testing machine broke down twice, in weeks 25 and 26, which caused a delay in sample testing. A back-up machine was used during that period. Samples were rejected more often than anticipated in one of the laboratories. Reasons for rejection: too much urine in the test tube or a participant had handled a test tube incorrectly.

Pooling was difficult in the first few weeks due to the small number of samples that arrived at the laboratory. This caused failure to meet set time limits in one laboratory.

#### 6.5 Other issues

Although reallocation of finances was needed, overall costs in the first phase of the programme did not exceed the planned budget.

Almost all project group members mentioned that they feared a low response rate to the screening, which could affect effectiveness and cost-effectiveness. They also mentioned that, due to the risk score in South Limburg, some people were excluded from participation. The helpdesk received some protests from people who were excluded, but wanted to participate. The first evaluation of the risk score is described in chapter 8.

### 7 Monitoring: first months of screening

The *Chlamydia* Screening Implementation (CSI) started in April 2008. Performance and participation were monitored so that we could follow the proceedings in the early operational phase (1<sup>st</sup> 2 months of invitations), and to determine whether the programme was reaching the targeted population. Data from the screening database were analysed to determine screening outcomes such as time processes and uptake of invitations. Regular process monitoring using a fixed set of indicators is an integral part of the management information system.

Here, we limit the analyses to the data from Block A, the first group of invitees selected for effect evaluation purposes (details described elsewhere). Block A covers one-sixth of the population to be screened in Amsterdam and Rotterdam and one-third of the population in South Limburg (Appendix 3). Invitations to this group were sent from the start (mid-April) until the first week of June 2008.

### 7.1 Performance monitoring

Success (or quality) indicators and a performance monitoring checklist were developed to monitor the logistic processes. Variables that were analysed are described in Appendices 4 and 6.

### 7.1.1 Invitations for screening

#### Cluster sequence

The mailing of invitation letters is divided into three blocks (A, B and C) of selected neighbourhoods (or clusters). In Amsterdam, 83 clusters were defined; in Rotterdam 62, and in South-Limburg 47.

Block A covered the first 2 months of screening and included 13 clusters in Amsterdam, 10 in Rotterdam and 16 in South Limburg (Appendix 3). The population sizes of the clusters varied from 1083 and 3846 inhabitants for Amsterdam, 384 to 4127 for Rotterdam and 472 to 1771 for South Limburg.

Data analysis showed that people in 37 of the 39 clusters were invited according to the planned sequence for the outcome evaluation (stepped wedge design, not shown). Two consecutive clusters in Amsterdam were switched with 1 day in between, which is no problem for the outcome evaluation.

Delivery of invitation letters was finished within 3 days for most (67%) of the clusters. Due to a planned stop week between mailings, the distribution of the invitations took longer (13-14 days) in two clusters in Amsterdam and Rotterdam.

#### Invited population

In block A, 57,000 invitation letters were sent during weeks 16 to 23 (Figure 6). Of these, 25,519 (45%) were sent in Amsterdam, 18,188 (32%) in Rotterdam, and 13,293 (23%) in South Limburg. Of the invitees, 51.6% were women and 48.4% were men.

Altogether, 3776 persons (6.6%) were categorized as 'not to invite again'. Of these, 2660 people (70.4%) had reached the age of 30 years. 1066 persons (28.2%) had moved to another area and 9 people had died (0.2%). Forty-one people (1%) had reached the maximum age and also moved to another area.

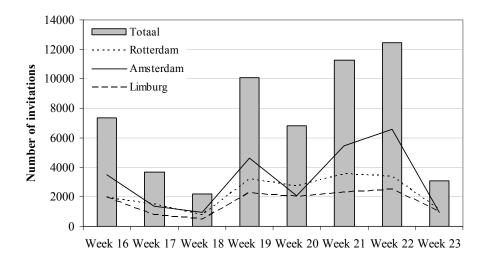


Figure 6: Number of invitations sent per week (Block A)

#### 7.1.2 Undeliverable letters

A special post office box was opened for returned invitation letters. Given that not everyone will return mail addressed to another person, the minimum of undeliverable letters can be described. In Amsterdam, 1.7% of the invitations were returned, in Rotterdam 1.3%, and in South Limburg 1.0%. In addition, the postal company returned a small number of undeliverable letters.

#### 7.1.3 Time process of reminder invitations

A reminder letter is sent in a computerized process 1 month after the initial invitation if the invitee has not responded. 99.5% of the reminders were sent on day 28 or 29. A total of 225 reminders (0.5%) were delayed  $(\ge 30 \text{ days})$ . Reasons for the delay were likely mutations in population registers (people moving away).

NB: The calculations are based on the date of preparation of the invitation list, which can take 1-4 days before the invitee receives the letter (Appendix 6).

#### 7.1.4 Time from invitation to requesting test package

The time people took to order the test package varied from 2 to 196 days (median: 16 days) at the time of analysis.

N.B.: See Appendix 6 for the calculations

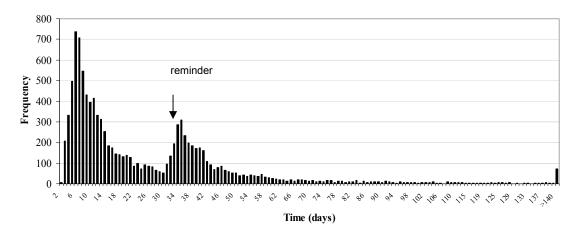


Figure 7: Time (days) from invitation to test package request

Of the 10,822 people ordering the test package (19%), 48% ordered it within 2 weeks, 64% within 1 month, and 94% within 2 months (1 month after the reminder). A group of 6% responded late: i.e. between 2 to 6.5 months after the initial invitation (Figure 7). Trends were similar for the three regions (Figure 8).

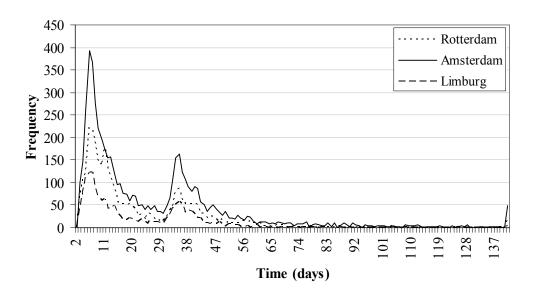


Figure 8: Time (days) from invitation to test package request, by region

### 7.1.5 Time needed to handle the test package

The time between the package request and the logistic company's posting the package is shown in Figure 9. Most packages (99.8%) were sent within 4 days, of which 70.9% were sent within 1 day. Twenty-six packages took 5 to 22 days to distribute.

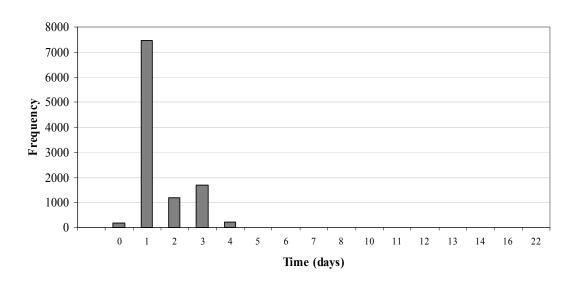


Figure 9: Time (days) from test package request to posting of the package by the logistic company

### 7.1.6 Time from posting the package to the return of the sample

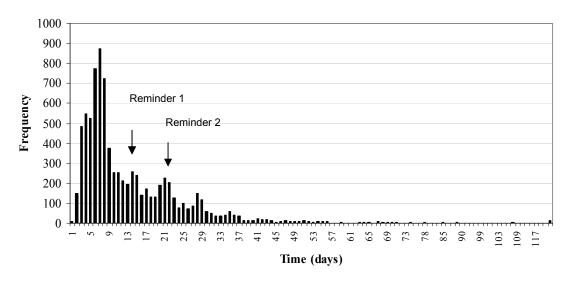


Figure 10: Time (days) from package sending and the returning sample to the laboratory

Altogether, 8533 of 10,822 samples (79%) were returned to the laboratories. A total of 205 people (1.9%) requested a second package (e.g. package was not received, lost, or sampling failed). The time from the logistics company posting the package to the participant's returning the sample, varied from 1 to 161 days (median: 9 days). Forty percent of the participants return the sample within 1 week, 66% within 2 weeks and 92% within 1 month. Eight percent return the sample 1 to 5.5 months after the package is sent (calculated at the time of analysis). A clear effect in the return of samples was seen after the two reminders (2 and 3 weeks after ordering the package: Figures 10 and 11).

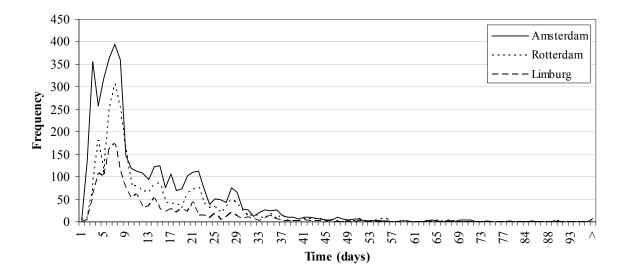


Figure 11: Time (days) from package sending to returning the sample to the laboratory, per region

In total, 2289 test packages (21.2%) were not returned to the laboratories (Amsterdam: 21.5%, Rotterdam: 21.7%, South Limburg: 19.8%). For more information: see section 7.2.

#### 7.1.7 Laboratory processes

Laboratory processes that were monitored included the time between receipt of the sample and the availability of the *Chlamydia* test result, time from the laboratory knowing the test result and its availability on the website, and the proportion of re-tested samples. One of the programme targets set for laboratories was a maximum of 10 working days to inform participants of their test results.

#### 7.1.8 Re-testing results

Test results were available for 8548 people, while arrival of the samples was registered for 8533. Presumably, 19 samples arrived at the laboratory without documentation of the arrival. Furthermore, arrival of 4 samples was registered, but no test result was available. It is likely that these four were incorrectly documented.

Of the 8548 test results, 8134 were Ct-negative (95.2%), 369 were Ct-positive (4.3%) and 45 failed (MIS result, 0.5%). The 45 people were asked to send a second sample, and 31 people did (68.9%). Of these 31, 18 people were Ct-negative (58.1%), 12 (38.7%) failed the second time and one test result was not registered. People with a test result that failed twice were advised to go to the GP or STI clinic for a new *Chlamydia* test. Two hundred and five people requested a new package on their own initiative, of whom 170 returned a sample to the laboratory (83.0%). Of these, 160 were Ct-negative (94.2%) and 10 were Ct-positive (5.9%).

#### 7.1.9 Time needed for processing samples

Figure 12 shows the overall time between the arrival of the sample and the availability of the test result on the website. For 96%, test results were available within 14 days. These samples fulfilled the agreed target of 10 working days (+ weekends). In laboratory 2, fewer test results were available after 15 days or more (0.2%) than in laboratories 1 and 3 (both 5.3%). Reasons for the delays were:

not enough samples to run the machine, failure of the test machinery, and technical malfunction in the application for sending the result to the database (chapter 6).

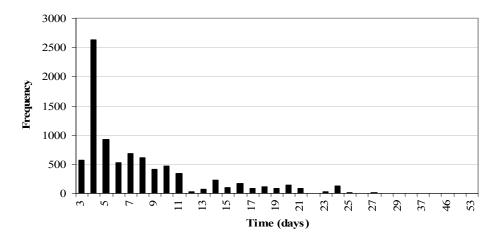


Figure 12: Time from receiving the sample and the availability of the test result

The proportion of test results available within the agreed period was more than 90% in all weeks at all laboratories (Figure 13).

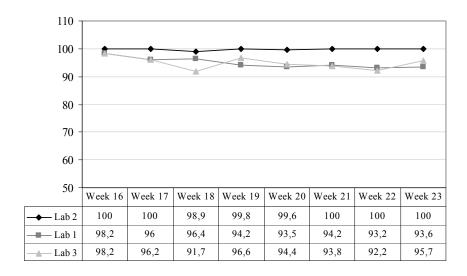


Figure 13: Percentage of samples processed within 14 days, by laboratory



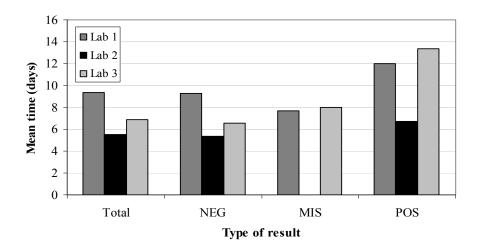


Figure 14: Mean time from sample arrival at the laboratory and availability of the test result on the website, by result

Processing Ct-positive test results took longer than negative results due to the re-testing of positive samples. In laboratory 2, no failures (MIS results) were reported. In laboratory 1, processing times were longer in the first weeks than in the other labs due to the use of a new testing machine.

### 7.1.10 Time between availability and checking of test result

In total, 8540 people received a message that their test result was available on-line, and 7951 people (93.1%) checked their results on the website. Time between availability and checking the result varied from 0 to 197 days. Most participants (76.3%) checked their results within 2 days (54.3% the same day, Figure 15); 88.2% checked their results within 1 week and 92.8% within two weeks. The results were similar for the three regions.

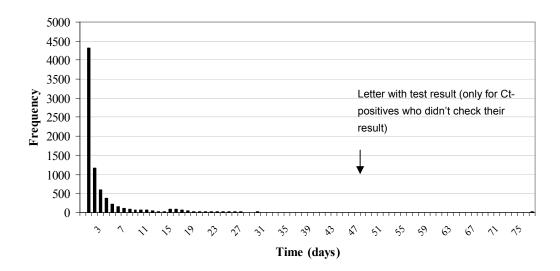


Figure 15: Time (days) from availability of the test result and checking the test result by the participant

Of the 8540 people who received a message that their test results were available on-line, 589 did not check (6.9%). Of these people, 560 were Ct-negative (95.1%), 8 failed the test (1.3%) and 21 were Ct-positive (3.6%). These 21 people (12 women and 9 men) each received a letter with the result 7 weeks after availability at the addresses they provided.

### 7.1.11 Overall process time

The overall time between the invitation and the date of checking the test result was monitored in order to determine truncation dates for data analysis on participation rates in the upcoming months.

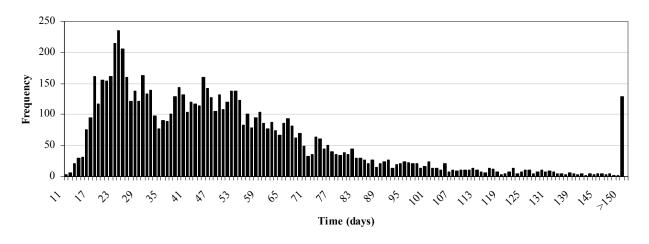


Figure 16: Overall process time; from date of invitation to checking the test result by the participant

The time between the invitation and getting the test result varied from 11 to 233 days (Figure 16). Half of the participants finished the process within 45 days. In 110 days, 95% had finished the whole procedure. The results were similar for the three regions (not shown).

### 7.2 Participation monitoring

The participation rate for the *Chlamydia* Screening is continuously monitored. We monitor characteristics such as age, gender, and country of origin to be able to study the representativeness of the participants compared to the invited population.

### 7.2.1 Participation rate and informed consent

### Uptake of invitations

Of the 57,000 invitees in Block A, 10,822 requested the *Chlamydia* test package (19.0%); 7267 women (67.2%) and 3555 men (32.8%). In Amsterdam, 5667 people requested the test package (22.2% of all invitations) and in Rotterdam 3358 (18.5%, Figure 17). In South Limburg, 2955 people (22.2%) intended to order the package and filled in the risk score questionnaire. Taken together, the overall *response rate* is 21%. In South Limburg, 63% were able to participate, and

most (96.3%) requested the test package. This constitutes 13.5% of the invitees in South Limburg (Figure 18).

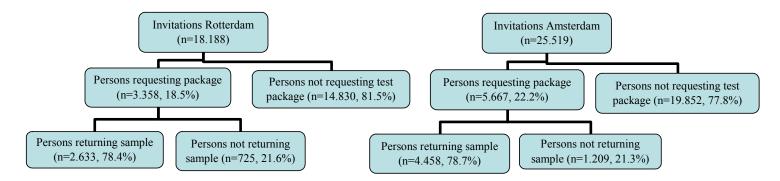


Figure 17: Response rates (package request) and participation rates (sample return) in Rotterdam and Amsterdam

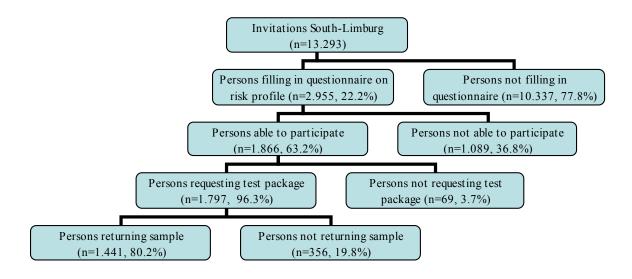


Figure 18: Response rate (filling in risk score questionnaire) and participation rate (sample return) in South Limburg

Of the 10,822 people who requested the test package, 8533 (78.8%) returned a sample and thus became participants. Women more often returned a sample (81.3%) than men did (73.8%; chi-square test p < 0.001). The proportions of returned samples were regionally comparable: South Limburg 80.2%, Rotterdam 78.4% and Amsterdam 78.7%.

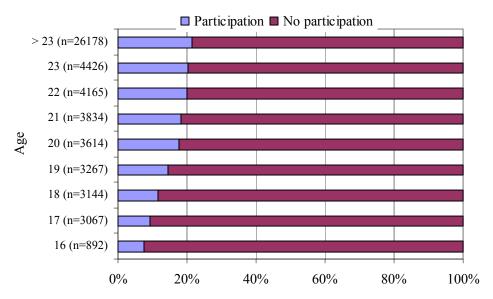


Figure 19: Participation rates by age

The participation rates increased with age, to the age of 22 years. Presumably, younger age groups (16-19 years) participate less often since fewer of them have become sexually active.

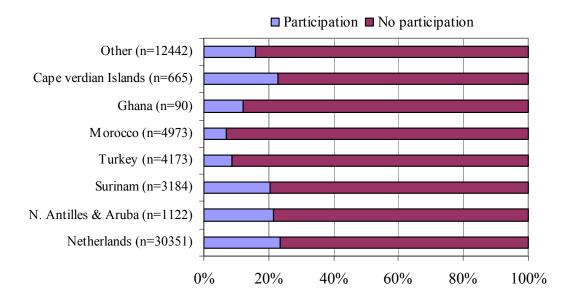


Figure 20: Participation rates by country of origin

People originating from Turkey and Morocco participate less often than other groups (p < 0.001).

### Unreturned samples

In total, 2290 samples (21.2%) were not returned after two reminders were sent. One hundred and twenty-eight people answered the on-line question why they did not return a sample. The three main reasons were: I didn't have time to sent it back (24.2%), I never received the package (16.4%) and I

forgot to return the sample (14.1%) (Table 1). The question was answered by 52 people who did return a sample. Their most common answer was: I didn't have time to send it back (42.3%). Presumably, after filling in the questionnaire, they decided to return a sample after all. Strangely, 13% stated that they never received the package although they did return a sample. The mean time between requesting the package and returning the sample was 48 days in this group, which differs significantly (Student's t-test, p < 0.0001) from the time for the general participants (14 days). The 76 persons who never returned a sample, reported other main reasons (Table 1).

Table 1: Reasons for not returning the sample for a Chlamydia test

Most important reason for not returning sample	N=76 (people not	N=52 (people	N=128 (total	
	returning the	returning the	group)	
	sample)	sample)		
I never received a test package	14 (18.4%)	7 (13.5%)	21 (16.4%)	
I didn't have time to sent it back	9 (11.8%)	22 (42.3%)	31 (24.2%)	
I forgot	13 (17.1%)	5 (9.6%)	18 (14.1%)	
I lost the test package	7 (9.2%)	1 (1.9%)	8 (6.3%)	
I changed my mind about participation	10 (13.2%)	0 (0%)	10 (7.8%)	
Someone discouraged me to participate	0 (0%)	0 (0%)	0 (0%)	
I didn't understand how to take the sample	0 (0%)	0 (0%)	0 (0%)	
I am already treated for Chlamydia in the	5 (6.6%)	4 (7.7%)	9 (7.0%)	
meantime				
I am already tested for Chlamydia in the meantime	3 (4.0%)	0 (0%)	3 (2.3%)	
I am afraid that the test will show that I have	1 (1.3%)	0 (0%)	1 (0.8%)	
Chlamydia and I'd rather not know				
I don't know if the test result will remain private	0 (0%)	0 (0%)	0 (0%)	
I took the sample the wrong way	1 (1.3%)	0 (0%)	1 (0.8%)	
Other reasons	13 (17.1%)	13 (25.0%)	26 (20.3%)	

Note: due to small numbers results may not be representative for all people not returning a sample

### Reasons for not participating in the screening

People who decided not to participate in the screening can sign themselves out on the website and give their main reason. Altogether, 293 people (0.5%) reported that they were not interested in participating, and 103 of them gave a reason. A total of 36.9% reported that they had not yet had sexual intercourse, 12.6% believed that they were not at risk of *Chlamydia*, 12.6% did not participate because they had no symptoms of *Chlamydia* infection, 9.7% had already been tested for *Chlamydia* in the last 6 months, 7.8% were not interested in participating, and 5.8% had no time to participate. The remaining 14.8% mentioned other or not specified reasons.

Note: due to small numbers results may not be representative for all nonparticipants. Results from the large-scale nonresponse study will be published elsewhere.

### Informed consent

When invitees log in on the website, they can fill in three informed consent forms. With the first form, they agree to participate in the screening; with the second one, they consent to storage of a sample, and with the third one, they agree that they can be approached for future STI related research. Of the participants, 4851 people (57.1%) consented to sample storage and 4394 (51.7%) for future approach. In total, 4007 people consented to sample storage and future approach.

### 7.2.2 Women's specimen choice: urine versus swab

The default option on the website for women requesting a test package is a vaginal swab. However, 7.3% of the women requested the urine package. The choice for a swab or urine sample differed among ethnic and age groups (p < 0.0001, Figures 21 and 22). Moroccan and Turkish women chose the urine package (28.1% and 31.1%, respectively) more often than Dutch women (4.9%) and women from other ethnic groups. Women aged 18 or 19 years also chose the urine package more often.

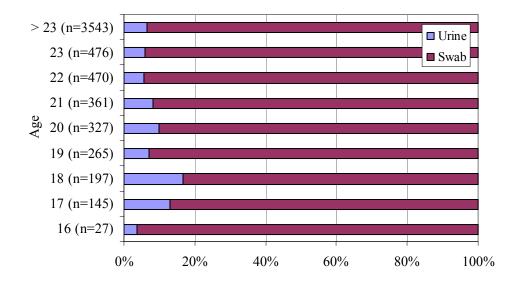


Figure 21: Proportion of women choosing the swab or the urine test, by age

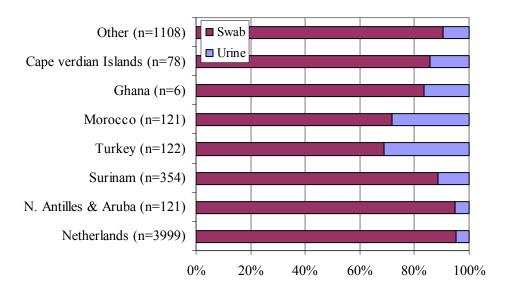


Figure 22: Proportion of women choosing the swab or the urine test, by country of origin

### 7.2.3 Completed questionnaires

Figure 23 shows how many participants answered the general questionnaire. This on-line questionnaire includes demographics, sexual risk behaviour, number and duration of partnerships and history of STIs. Of the 8533 participants, 5265 filled in the questionnaire completely (61.7%) and 5.6% partially. Women more often completed the questionnaire than men (65.8% versus 52.6%, p < 0.0001). More than 50% of all age groups completed the questionnaire.

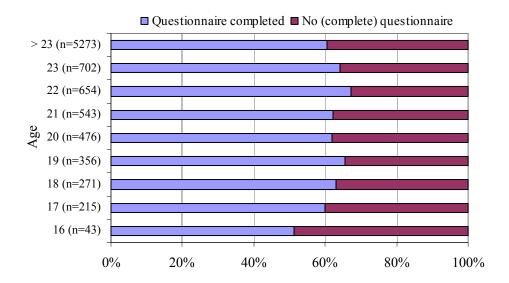


Figure 23: Proportion of participants answering the general questionnaire, by age

Turkish and Moroccan groups (p < 0.0001) less often completed the questionnaire compared to other groups. More than 60% of the people from Surinam, the Netherlands Antilles and the Netherlands filled in the questionnaire completely.

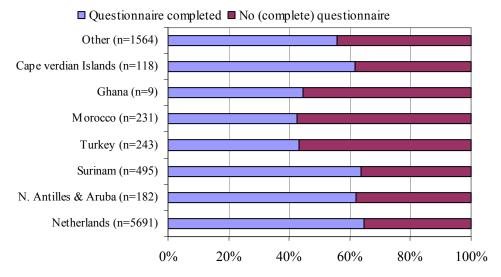


Figure 24: Proportion of participants answering the general questionnaire, by ethnic group

# 8 Functioning of the risk score: first evaluation

We evaluated the risk score as it was used in South Limburg. We analysed data from participants who answered the on-line risk score questionnaire. In the first 2 months of screening (Block A), 13,276 people in South Limburg were invited. They can log in on the website and fill in the risk score questionnaire. A score is determined on the basis of nine questions (Table 2). People with a score of 6 or more are advised to participate. People with a lower score cannot participate. On the basis of the experience from the Pilot Ct (results from Heerlen only), we expected that about 63% would be eligible for screening and a positivity rate of nearly 3% would be reached in that group.

Table 2: Questions to determine risk score

Question	Answer	SCORE	
Age	15 - 19 year	1	
	20 - 29 year	0	
Place of residence	Brunssum	2	
	Gulpen-Wittem	0	
	Heerlen	2	
	Kerkrade	2	
	Landgraaf	2	
	Nuth	0	
	Onderbanken	0	
	Simpelveld	0	
	Vaals	0	
	Voerendaal	0	
	Higher Vocational Education/		
Education	university	0	
	Else	2	
Ethnic group	Dutch / (other) Eu	0	
	Turkish / Moroccan	0	
	Antillean / Surinamese	2	
	Other	0	
Blood loss (not during menstruation)	Yes	F: 1	M: 0
	No	0	
Urinating more frequently	Yes	M: 2	F: 0
	No	0	
	Yes	0	
Condom use at last sex contact	No	1	
Nr of sex partners	1 partner	0	
•	2-5 partners	F: 3	M: 2
	6 or more partners	F: 5	M: 3
	Yes	1	
New sex partner in the last 6 months	No	0	

F: female, M: male

### Response and score

Of the invitees in South Limburg, 22.2% filled in the questionnaire. The risk score (ASL score) varied from 0 to 13. Women had higher scores than men (women 6.6 points and men 5.6, Figure 25).

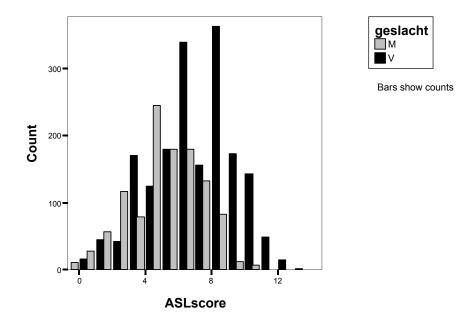


Figure 25: Number of respondents (men (M) and women (V)), by risk score

The cut-off point for participation was a minimum of 6 points (based on Pilot Ct). This cut-off point meant that 63% of all respondents (52.5% of the men and 68.1% of the women) were able to participate. We noticed that an error was made in the coding of one question ('urinating more frequently'); women received two points for a positive answer to this question, which was incorrect. Twenty-nine extra women (of 1272) with scores of 4 and 5 were made eligible to participate. This mistake was corrected in December 2008.

On the basis of this analysis, we concluded that the risk score selected 63% according to expectations, but that fewer men than women were able to participate. The positivity rate was higher than expected (data not shown), and higher for men than for women, even with lower risk scores. We calculated that, if people with a risk score of 5 were also included, 22% more men and 10% women could participate. This would mean that, potentially, there would be considerably more Ct-positive cases. After this analysis, we decided to also include people with a risk score of 5 as well. This will be adjusted from the start of the second screening round in March 2009.

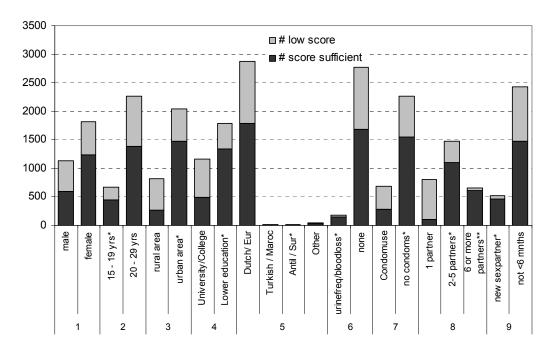


Figure 26: Number of respondents according to risk score ('high enough' versus 'too low'), by subject in the questionnaire ( \* received extra points)

### **Participants**

Younger men and women (< 20 years old) filled in the risk score questionnaire less frequently, but had a score high enough to participate as often as those who were older ( $\ge$  20 years old). The ethnicity of the participants had very little influence due to the small proportion of ethnic groups in Limburg.

Additional questionnaire for people with a low (< 6) risk score.

We sent a short evaluation questionnaire to 200 people in South Limburg who had a risk score below 6 and therefore could not participate. Seventy-six of them responded (38%); 29 men (33%) and 47 women (42%). Although the numbers were small, the response rate to this questionnaire seemed unrelated to the risk score (Table 3).

Table 3: Risk score of respondents and nonrespondents to the evaluation questionnaire

		Evaluation questionnaire returned No Yes			Total	
ASL Score	0	1	25.0%	3	75.0%	4
	1	4	33.3%	8	66.7%	12
	2	10	62.5%	6	37.5%	16
	3	35	64.8%	19	35.2%	54
	4	22	55.0%	18	45.0%	40
	5	51	69.9%	22	30.1%	73
Total		123	61.8%	76	38.2%	199

Of these respondents, more than 30% mentioned that they were disappointed that they could not participate in the *Chlamydia* Screening. Five percent reported that they may have been at risk of *Chlamydia*. However, they approved of the screening set-up in general (e.g. the information was clear, and Internet participation was appreciated). Fifty-eight percent mentioned that they would like to be able to participate in a future screening programme, and 72% would like the same procedure using Internet and home-based sampling. Of the 76 respondents, 11 (15%) mentioned that they had not yet been sexually active. In principle, they were not supposed to fill in the risk score questionnaire. Six people (8%) decided to go the GP or STI centre for a *Chlamydia* test.

### 9 Helpdesk questions

Screening invitees and participants with questions can contact one of the helpdesks by e-mail or telephone. The website first refers people to the Frequently Asked Questions (FAQ). If they cannot find the answer to the question, they can contact the Aids STI info line (ASI), one of the PHS telephone lines or they can e-mail the technical helpdesk. The incidences of questions, comments and complaints were monitored throughout the process.

### 9.1 Aids STI info line

At the ASI, a national telephone line located at STI AIDS Netherlands in Amsterdam, questions were registered during the first 6 weeks of screening (21 April-30 May 2008). In total, 173 questions were received from 117 women (68%) and 56 men (32%); an average of 30 questions a week. Of these, 97 were received by e-mail (56%) and 76 by telephone (44%). The questions concerned screening programme topics in general (n = 84, 49%), the *Chlamydia* test (n = 16, 9%) and how to request a test package (n = 70, 40%).

Questions about the screening programme:

'Why is my log-in code not working?'

'I lost the invitation letter with log-in code. What should I do now?'

'Can my boyfriend, who is living in another region, also participate?'

'I don't understand the invitation letter, am I obliged to participate?'

### Questions about the Chlamydia test:

'I received the wrong test package (urine/swab)'

'I ordered the wrong test package (urine/swab)'

In total, 76 people (43%) were referred to the PHSs and 4 people to the IT helpdesk. People also contacted the ASI as a result of media publicity.

The subjects of these questions were:

Transmission/prevention: 44 (25%)
Symptoms/ natural history of infection: 24 (14%)
Chlamydia test: 39 (23%)
Treatment of Chlamydia: 25 (14%)
Long-term complications: 13 (8%)

### 9.2 Public Health Service telephone lines

Most phone calls received at the PHSs were from (a) people who wanted to sign out of screening, (b) parents/caretakers who wanted to sign out their children/pupils, (c) people who had problems taking the sample, (d) people who wanted to participate but did not receive an invitation, (e) people who did not have a computer, and (f) people who did not receive the test package. The numbers of questions were not registered at the three PHSs. The PHSs reported that some people complained

<sup>&#</sup>x27;I don't have Internet. How can I participate?'

<sup>&#</sup>x27;I took the sample in the wrong way'

about the partial closed openings of postboxes around New Year's Eve. This issue was foreseen by the project group, and no invitations were sent during December. Complaints were most likely from people who received their invitations before December. Some people refused to take the package to the post office, because they were afraid that it would be recognized as a *Chlamydia* test package

### 9.3 Information technology helpdesk

At the technical helpdesk, 387 questions were registered between 21 April and 27 June 2008; 86% were technical, 6% were general questions about STIs and the screening programme, 3% were questions for the local PHS, and 5% were miscellaneous (e.g. responses to previous correspondence).

Most questions received at the IT helpdesk concerned log-in errors. Sixty-two questions were related to the disturbance in the IT application on the weekend of the 25th of May. The IT company solved the problem the next day. More than 200 questions were about the loss of personal log-in codes (username, password, and password recovery function). Furthermore, people who had not received an invitation, but wanted to participate, asked questions. People living outside the three participating regions or those who did not fulfil the age criteria were informed that they could not participate. Others were told that they could expect an invitation.

People also asked about the risk anamnesis ('risk score') in South Limburg. These were people who unintentionally made a mistake in the questionnaire and were excluded from screening. Some people disagreed with the resulting score.

Other questions addressed to the IT helpdesk included:

- Package delivery address;
- *Chlamydia* infections in general;
- Additional STI examination;
- Participants moving to other addresses;
- Wrong e-mail address;
- Wrong test;
- Pregnancy;
- Swab and menstruation;
- Wrong usage of test package.

In relation to the 57,000 invitations that were sent during this period, the 387 helpdesk questions does not seem a lot and this may indicate that the programme runs accurately. Nevertheless, the project group continuously keeps track of all questions to quickly solve any disturbance.

### 10 Healthcare providers' experiences

### 10.1 Preliminary results

An electronic questionnaire was distributed among healthcare providers at STI clinics and to GPs in the three regions. We asked about their experiences with the *Chlamydia* Screening (Appendix 2). Seventy-eight questionnaires were returned by e-mail. A link to the website questionnaire was placed in a newsletter for GPs. In total, 36 questionnaires were returned (Amsterdam: 21, Rotterdam: 6, and South Limburg: 9). We present only preliminary results since the survey is ongoing.

### Information supply

The questionnaires were answered by 19 nurses and 2 doctors at STI clinics, 14 GPs and 1 doctor's assistant. All 36 had been informed about the *Chlamydia* Screening, 17 at work, 9 by letter or email, and 9 via the collaborating network of GPs in Amsterdam (n=9). The question: 'What did you think of the general information provided by the PHS?' was answered by 28 (78%) as 'good', 7 (19%) as 'moderately good', and 1 (3%) as 'poor'. Overall, STI clinic nurses were somewhat less satisfied with the information supplied than the doctors.

'As nurses, we were well informed. And there was an instruction manual' (nurse)

'There was only an announcement in the newsletter' (doctor)

'Outside work, I didn't hear much about the screening' (nurse)

'Everything was clear to me' (doctor)

'Not all information reaches the work floor' (nurse)

'In the beginning the information was poor, but the presentation clarified things' (nurse)

'I haven't received an update on the figures yet' (doctor)

The question 'Was the information about treatment adequate?' was answered positively by 34 (94%). Four of 36 respondents (1 doctor's assistant excluded) disagreed with the treatment guidelines.

'The treatment recommendations are disturbing since they don't correspond with our own guideline. More patients buy medication through the Internet. Including treatment guidelines in the patient's letter will only encourage this further' (doctor)

'The treatment recommendations do not correspond with our guideline. We cannot provide azitromycine to pregnant women or women who do not use birth control' (nurse)

'I haven't read the information' (doctor)

Screening participants seeking consultation or treatment for a sexually transmitted infection The question 'Did screening participants visit you for STI consultation or treatment?' was answered positively by 33 of 36 respondents (92%). One GP reported no visits from CSI participants, and two others did not know. Both Ct-positive and Ct-negative participants made appointments made appointments either at the STI clinic or with their GP (Table 4).

Table 4: Screening participants seeking consultation or treatment

	Number	Percentage
Yes, only Ct-positive clients	19	52.7%
Yes, both Ct-negative and Ct-positive clients	13	36.1%
Yes, only Ct-negative clients	1	2.8%
No	1	2.8%
Unknown	2	5.5%
Total	36	100%

Of the 21 nurses, 19 reported that the electronic registration of screening participants who visited the clinic was clear to them (Section 11). Most of the healthcare providers (67%) received questions from screening participants who visited their practice. The questions were divers:

'About treatment and other STI tests'

'How to request the test result if they didn't have Internet access'

Healthcare providers reported that people also asked questions about screening procedures (e.g. lost log-in information, why only young people were invited, how to stop the procedure if they did not want to participate).

### Partner referral and treatment

Thirty-one of 36 respondents (86%) reported that the information about partner referral and treatment was adequate. Three people who disagreed specified their answers:

'Treatment of partners without a test, treatment of partners through the index patient' (doctor)

Twenty-seven of 33 people (82%), who answered the question about the treatment of current partners reported that current partners had been treated. The six respondents who reported that their partners had not been treated included two nurses and four GPs. It is unknown whether partner notification was discussed or whether the index patient reported recent partners. Partner treatment was provided differently. Nurses often reported that partners were not only treated, but also tested for *Chlamydia*. Doctors more often reported having treated current partners without a test.

'If the current partner appeared, he or she was treated. If they didn't appear, the index patient received a prescription for the partner' (n=5)

One GP referred a client to the STI clinic because the client had no medical insurance. Two nurses

<sup>&#</sup>x27;Mainly about possible consequences of the Chlamydia infection'

<sup>&#</sup>x27;About medication. Sometimes it appeared that they had symptoms but hadn't yet participated'

<sup>&#</sup>x27;A lot of practical questions, our telephone number is on the information letter'

<sup>&#</sup>x27;I haven't read the information' (doctor)

 $<sup>\</sup>hbox{`To be honest, I don't know what information was provided' (doctor)}$ 

<sup>&#</sup>x27;The partner appeared and treatment was provided' (n=2)

<sup>&#</sup>x27;Partners were informed by the index patient; the partner could visit us for testing and treatment' (n=2)

<sup>&#</sup>x27;We never provided medication for partners through the index patient, only after testing the partner'

<sup>&#</sup>x27;If partners couldn't go to their own GPs, I provided treatment'

<sup>&#</sup>x27;I tested the partner first before providing any treatment'

<sup>&#</sup>x27;Partners who came for consultation were tested, but treatment had already been provided'

referred a client to the GP. One reported doing this because it was difficult to make a new appointment.

#### Testing for other STIs

We asked doctors and nurses whether they tested Ct-positive screening participants for other STIs. Twenty-two of 34 respondents (65%) always tested for gonorrhoea, 18 (53%) always tested for lues, 17 (50%) always tested for human immunodeficiency virus (HIV) and 12 (35%) always for hepatitis B. Ten people reported that they had never tested Ct-positive participants for other STIs; of these nine were GPs.

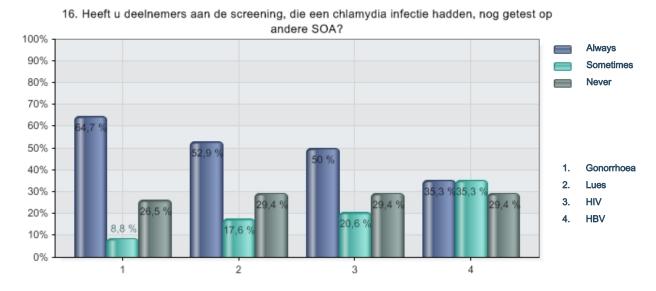


Figure 27: Chlamydia trachomatis-positive screening participants who were tested for other STIs

In Amsterdam, some screening invitations were distributed by GPs (chapter 7). We asked eight GPs in Amsterdam their opinion of this. Three were neutral and five were positive about the fact that invitation letters were distributed through their practices. One doctor specified the answer.

'Chlamydia is a common infection in my region. It is good that I am well informed, so that I can answer questions from participants. On the other hand, it is more anonymous if people go to the STI clinic'

The question 'Did the fact that invitations were sent through your practice lead to questions from patients?', was answered five times with 'no' and three times with 'yes'. Two people specified their answers.

'About treatment, natural history, prognosis'
'Questions from parents: It's not necessary for my daughter'

Eight people (28%) answered 'yes' and 21 people (72%) answered 'no' to the question: 'Did the screening lead to an extra flow of people to your practice/clinic?'.

```
'Yes, we had extra patients at our STI clinic due to the screening'
'I don't have an overview of this'
'A relatively small amount' (n=2)
'We have separate office hours for STI consultations'
'Only a few clients with questions or Ct-positive test results' (n=2)
```

Eight respondents (23%) reported that clients had complaints about the screening. Seventy-six percent reported no complaints.

```
'The website didn't work and the test results became available very late'

'Why they were invited without a reason'

'That they kept receiving letters even if they didn't want to participate. That is wasn't possible to exclude them from the screening' (n=2)
```

'Only one or two people who were waiting for an e-mail from the helpdesk after they lost their log-in codes. They reported that they had to wait too long'

'The information wasn't always clear to them'

'A women who received the test package for a men'

'One time from parents who didn't want their daughter to participate'

Five of seven GPs (71%) who invited people through their practice would have liked to receive the test results for their patients. All but one GP reported that, if screening would be continued in the future, they wanted to be involved in the invitation process again. One GP said 'Much better through the public health service'.

### Future prospects

Finally, we asked respondents their opinion about future screening. For example, we asked whether the current screening set-up (systematic, with home sampling, and Internet-based) needed changes in the future (e.g. opportunistic screening). The respondents seemed positive about the current set-up of the programme.

```
'No changes needed' (n=19)

'No, especially not in south-east Amsterdam'

'I believe the set-up is particularly good for the target population'

'The current set-up is very clear to clients as well as professionals'

'No opinion' (n=2)

'I believe that people should be able to stop the procedure if they don't want to participate'

'Send everyone a test package'

'In my region, the prevalence is high, so I believe the current methods are fine'
```

### Additional comments on the screening were:

```
'More media attention'
'Good initiative, my clients are motivated to participate'
'Don't provide treatment guidelines for doctors, just refer to the GP'
'The response to the first invitation is moderate. Those who respond will be in the risk groups'
'Good that this programme is there to stop Chlamydia being taboo. I often hear that in certain regions people have a looser sex life'
```

### 11 CSI participants visiting the STI centres

The numbers of Ct-positive CSI participants who visited the STI centres were registered. Consultations at STI centres are free of charge to high-risk groups, and the Ministry of Health, Welfare and Sport pays the costs. Although primarily GPs will provide treatment for participants and current partners, they are free to visit an STI centre, where they will be examined according to the regular procedure for STI testing, except that they do not have to be tested for *Chlamydia*. Visits of Ct-positive participants to STI centres were monitored so that we could estimate the costs of possibly continued future screening.

During the screening programme, payments for treatment and additional STI testing for Ct-positive participants will be financed by the CSI programme budget (including treatment of current partners). All STI centers, including those in other regions, have received an information letter about how to register Ct-positive CSI participants. For this purpose, an extra question 'CSI participant - yes/no' was added to the central electronic registration system as used by most STI centres. In Amsterdam, this question was noted in the electronic patient database of the clinic.

The instruction for registration, as sent to all STI centres, is:

1) Ct-positive participants with a CSI treatment letter -> register as 'an CSI participant'

2) Ct-positive participants without a treatment letter -> register as 'not an CSI participant'

3) Ct-negative participants -> register as 'not an CSI participant'

4) Current partner of Ct-positive participant -> register as 'not an CSI participant'

5) Ex-partner of Ct-positive participant -> register as 'not an CSI participant'

Consultations that the CSI programme will finance are only those for Ct-positive people who bring the CSI treatment letter with them (in nonparticipating regions as well). Other consultations will be financed according to the standard regulation for STI centers, which is the Additional Curative STI care or the patient's insurance if he/she is referred to the GP.

We estimated that approximately 200 Ct-positive CSI participants would visit the STI centres between April and December 2008. During that period, an 'CSI participant' was registered 176 times: 106 cases in the central patient database of the STI centres (56 in Rotterdam, 11 in South Limburg and 39 in other regions) and 70 cases in the patient database of the Amsterdam clinic (Table 5).

Nonetheless, there are indications that not all STI centers registered according to the instructions. Of the 106 cases registered in the central database, 69 persons were tested for *Chlamydia* at the STI clinic of whom 46 were registered as Ct-negative. Further research will clarify whether all registered CSI participants were Ct-positive, but only registered as Ct-negative to exclude them from the financial agreement, or whether these are CSI participants who tested negative in the screening. However, we can conclude that there were not more visitors at the STI clinics than expected. To improve the future registration of CSI participants, the instruction letter will be reviewed and resent to all STI centers.

Table 5: CSI participants visiting the STI centers, by region and sex (April-December 2008)

	CSI participant		
Location	Male Female		Total
CASA Rotterdam		2	2
Erasmus MC poli venerologie (Rotterdam)	3	5	8
GGD Den Haag	4	3	7
GGD Flevoland	4	2	6
GGD Gelre-IJssel	1	2	3
GGD Groningen		1	1
GGD Hart voor Brabant	2	2	4
GGD Kennemerland	8	6	14
GGD Nijmegen		1	1
GGD Noord- en Midden-Limburg	1	1	2
GGD Rotterdam Rijnmond	17	29	46
GGD Zaanstreek-Waterland	1		1
GGD Zuid-Limburg (South Limburg)	5	6	11
GGD Amsterdam	16	54	70
Total	62	114	176

GGD = PHS, MC= medical centre

### 12 Conclusions and future considerations

This first process evaluation focuses on the preparatory and first operational phase of the *Chlamydia* Screening Implementation (CSI) in the Netherlands. Because of the large-scale, multifaceted character of the programme, the great number of people involved, and the potential prospect of a national *Chlamydia* screening programme, process evaluations are essential. This evaluation examined the extent to which the programme is operating as intended and determined whether the target population was reached in the first few months. The evaluation included site visits, interviews with programme staff and external commercial partners, document reviews, Internet questionnaires for healthcare providers, and database analyses.

We will begin with some overall reflections on the process. The rest of the section is a compilation of summary remarks, conclusions, and recommendations that resulted from the preceding Sections. Overall, the results showed that a well-structured, comprehensive *Chlamydia* Screening - with IT, logistic, and laboratory components - was developed and is operating efficiently. Apart from some challenges and weaknesses during the preparation and the first operational phase, no serious threats to the programme progression occurred. Choices made during preparations for the programme were based as much as possible on previous experience (Pilot Ct) and scientific evidence.

### 12.1 Program management and collaborations

One of the key factors of success, as m project group members mentioned, was the project group itself and the experience that most members had with *Chlamydia* research. This appeared to be the right combination of people with different skills. The programme development, however, was labour intensive for all members; it was a significant addition to 'normal' workloads. The commitment of the group was, therefore, crucial to the development of such an extensive programme (chapters 5 and 6).

Other success factors were the outsourcing of IT and logistics, the performance of the two companies and their collaboration with the IT and logistics working groups. The good functioning of the website and the database application were often mentioned. The IT costs were greater than anticipated due to adaptations made after the contract was signed. Logistic processes, which were centralized, also went smoothly and costs did not exceed the budget. Although the overall budget for this first phase seemed adequate, the balance in programme costs will remain under review (chapters 5 and 6).

The programme clearly benefited from the preparation time being longer than initially planned. The period available for programme planning and implementation was inadequate (partly due to obligatory tender procedures for IT and logistics) and the project group underestimated the magnitude of the tasks. The group had thought that more experience from the Pilot Ct could be used. The government and financial sponsor, however, agreed to the request for delay in order to finish the programme development, to test each component thoroughly (chapter 5).

The project leader (also chairman of the meetings) led the programme with a strategic overview. Project management is important and should be well structured but not constraining, which was also the chairman's view. During preparations, tight project management became more important in

securing dates and achieving goals. Despite stricter scheduling and time rules, long project group meetings were difficult to avoid. Nonetheless, most project group members preferred face-to-face communication (chapter 5).

Securing the engagement of appropriate partners at the regional level is important. During the preparations, the project group faced some difficulties in making the necessary arrangements with laboratories. However, processes went more smoothly during the operational phase. The commitment of the GPs was significant, especially those in Amsterdam who invited part of the target population. Good collaboration with these GPs was achieved after a number of informative meetings. Other GPs were informed by post and newsletters (chapters 5, 6, 10).

According to the logistics partner, their role and deliverables could have been more specific before negotiations started. A detailed plan, similar to the one for the IT partner, complete with defined tasks and responsibilities could have avoided lack of clarity during negotiations with this external partner (chapters 5 and 6).

Municipal population registries use different data formats, which complicated the inclusion of these data in the CSI application. A conversion application had to be built. Since only three regions are participating in the current programme, this obstacle could become more complex and time consuming in a national systematic screening programme (chapter 5).

Taking on an advisory committee, which included a wide range of specializations to support the programme and its evaluation, appears to be a good decision. This committee filled in gaps in the expertise of project group members and provided any feedback that the group requested. They may also have a role in identifying additional *Chlamydia* research and elaboration of future implementation questions (chapter 5).

### 12.2 Process-, performance- and participation monitoring

Process and performance were continually monitored to provide information about key aspects of how the programme operated in the first 2 months. Data from the screening database were analysed regularly (daily, weekly, and monthly), including automatically generated individual track records, data from municipal administrations, laboratory results, and questionnaire data. We now describe some conclusions and recommendations that could result in refinements of the processes in the upcoming period.

More than 90% of the test results were obtained within the agreed period of 10 working days. Two laboratories did not always provide test results within the agreed period. Reasons for delay were the use of a new machine or too few samples to run the machine.

Possible solutions for future handling of small numbers of samples are now being discussed. The options are:

- 1. Run screening samples with the regular *Chlamydia*-tests from the clinic (note: different testing procedures may affect positivity rates)
- 2. Accept a longer period for obtaining the test result
- 3. Use manual sample input (logistically more complicated and error prone)
- 4. Run the machine with fewer samples (higher costs, chapter 7).

The three laboratories reported only small numbers of false-positive *Chlamydia*- test results. If this number remains low during the following months, the re-testing strategy needs to be reconsidered in the second screening round (chapter 5).

The reminder after the invitation letter contributed a great deal to the response rate (36% requested a test package after the reminder). Although it is unknown whether these invitees would have responded without the reminder, the steep increase in response rates highlights its importance. Reminder e-mails clearly enhanced the return of samples (participation rate). Nonetheless, since more than 20% still did not return a sample after two reminders, we decided to implement a third reminder by SMS (for those who provided a mobile phone number). This SMS reminder was a relatively simple, cheap and targeted improvement. Various reminders should be used in future screening programmes as well (chapter 7).

The participation rate was 15%, which is less than the anticipated 30%. There is some concern that this will not be enough to show an effect on outcome measurements (e.g. Ct-incidence and prevalence of pelvic inflammatory disease). Participation rates were also lower in certain subgroups (young people, men, and Moroccan and Turkish groups). Specific recommendations to enhance participation rates in general or in specific groups (e.g. those at higher risk), should be considered and can be based on information from the acceptability and nonresponse studies (chapter 7).

Turkish and Moroccan women chose the urine test more often than others, which might be related to the Islamic culture. To offer women a choice between the vaginal swab and urine test might be a good decision, since participation rates in these groups were already low (chapter 7).

In the next screening round, it should be determined whether a short duration between the test result and a new test offer affects participation rates, since approximately 50% of the participants needed more than 2 months to finish the process from invitation to checking the test result. Additional information is needed to determine whether the screening interval needs to be adapted in the future (chapter 7).

Seven percent of all participants and 6% of the Ct-positive participants did not look at their test results on-line even after they had been sent two reminders. This group received a letter with the Ct-positive test result at the address that they provided. This was a condition set by the Medical Ethics Committee before the programme started. The same approach should be continued in future programmes (chapter 7).

The overall response to the on-line general questionnaire was 63%. This is fairly good, especially since the questionnaire includes sexual behaviour details. Questionnaires were administered to the participants after they requested the test package to avoid any influence on participation rates, which appears to be a good decision (chapter 7).

The participants used all the helpdesks (telephone lines and e-mail). Telephone lines at the PHS were used the most. The STI Aids info line was less frequently contacted, and questions often had to be transferred to the PHS. Although the answering of questions is time consuming, there were no indications of an increased workload at the various locations (chapter 9).

Feedback or questions from participants will be continuously monitored since they may lead to essential adjustments to the programme. An automated function for recovery of passwords was incorporated and relevant new questions were added to the FAQ on the website. Since some people

were unable to request a new package after filling in a particular on-line question, this application problem was remedied (chapter 9).

Undeliverable invitation letters (returned to the post office box) will no longer be monitored in the next screening round. People in the same areas will be invited, and similar results are expected. A method of monitoring undeliverable test packages should be considered since the packages can be re-used (chapter 7).

Small adjustments to the risk score for participation entry in South Limburg were needed; specifically for offering men a chance of participating that is similar to the women's chance. The risk score evaluation will continue, in more detail, and in relation to Ct-positivity and participation rates (chapter 8).

### 12.3 Health care providers' experiences

Preliminary results of an electronic survey showed that most nurses and GPs dealing with STIs refer and treat partners, although not always according to the guideline that the project group provided. However, this does not mean that the treatment is less effective. More information about the treatment of Ct-positive people and their current partner(s) will become available in the outcome evaluation. This information will be used to determine the exact role of GPs in future screening programmes (chapter 10).

At present, there have been no indications of serious extra workloads for the STI centres or GPs due to the screening; not even for the GPs in Amsterdam who were part of the invitation process. Not many GPs referred CSI participants to the STI centres (chapter 10).

Testing Ct-positive people for other STIs seems to be the standard procedure at the STI centres, but GPs seldom did this. We need more information about the incidence of other STIs diagnosed for screening participants, to determine whether guidelines for STI testing need any adjustments (Section 10).

### 12.4 General points and conclusions

Our judgement is that the *Chlamydia* Screening Implementation has been successfully implemented and many of the goals have been achieved. Even though we have described only the early phase, there is evidence of a successful continuing process.

Implementing large-scale *Chlamydia* screening is time consuming but feasible; it requires programmatic commitment, investment, and support from all the screening organizers. The information presented may help maximize efficiency and participation rates for planning the next screening round and future screening programmes. Furthermore, the results can contribute to the international exchange of experiences with *Chlamydia* Screening programmes.

We expect that the criticisms of the process overshadow positive matters in process evaluations including interviews – since the positive matters tend to be more general, while criticisms are more specific and varied. We have carefully addressed the difficulties but we have also paid special attention to the positive aspects of the programme.

Not all elements of the process evaluation have been addressed in this first report. The next steps will include in-depth analysis of the programme coverage, characteristics of the participants and nonresponders, reasons for nonresponse, acceptability of screening, treatment and partner notification.

### References

Baarda D.B., de Goede M.P.M., Teunissen J. (2005) Basisboek Kwalitatief Onderzoek – Handleiding voor het opzetten en uitvoeren van kwalitatief onderzoek. Chapter 11 p318-336

Bergen van J.E.A.M. (2006) Subsidieaanvraag Chlamydia Screening Implementation Project (CSI-project)

Bergen J.E. van, Kerssens J.J., Schellevis F.G., Sandfort T.H., Coenen T.T., Bindels P.J. Prevalence of STI related consultations in general practice: results from the second Dutch National Survey of General Practice. Br J Gen Pract 2006 56(523): 104-9

Bergen J.E. van, Kerssens J.J., Schellevis F.G., Sandfort T.G., Coenen T.T., Bindels P.J. Sexually transmitted infection health-care seeking behaviour in the Netherlands: general practitioner attends to the majority of sexually transmitted infection consultations. Int J STD AIDS, 2007 18(6):374-9

Bergen van J., Götz H.M., Ricardus J.H., Hoebe C.J.B.A. Broer J., Coenen A.J.T. (2005) Prevalence of urogenital Chlamydia trachomatis increases significantly with level of urbanization and suggests targeted screening approaches: results from the first national population based study in the Netherlands. Sex Transm Infect 2005;81: 17-23

Bliss M.J., Emshoff J.G. Workbook for Designing a Process Evaluation. Dept. of Psychology Georgia State University, 2002

Boeije H., (2005) Analyseren in kwalitatief onderzoek. Denken en doen. Chapter 2 p50-52

Broek I.V.F. van den, Koedijk F.D.H., Veen M.G. van, Op de Coul E.L.M., Sighem A.I. van, Sande M.A.B. van der. Sexually transmitted Infections, including HIV, in the Netherlands in 2007. RIVM Report 210261004, 2008.

CDC (1999) Overview of the Framework for Program Evaluation. Retrieved February 10th, 2008, from http://www.cdc.gov/eval/framework%20overview.pdf

CDC (2007) Program Operations Guidelines for STD Prevention. Program Evaluation. Types of Evaluation. Retrieved February 15th, 2008, from http://www.cdc.gov/std/program/porgeval/3-PGprogeval.html

CDC (2007) Practical Use of Program Evaluation among Sexually Transmitted Disease (STD) Programs. p10

Chlamydia Operations Group (2006) Annual report of the National Chlamydia Screening Programme in England 2005/06. National Chlamydia Screening Programme

Doosje J., Blommerde B. Nieuwe landelijke subsidieregeling voor curatieve soa-bestrijding. Infectieziektenbulletin 2006 17(01):11-13

Gezondheidsraad (GR). Screenen op chlamydia. Den Haag: Gezondheidsraad, 2004; publicatie nr 2004/07. In English: Health Council of the Netherlands. Screening for Chlamydia. The Hague: Health Council of the Netherlands, 2004; publication no. 2004/07

Götz H.M., Van Bergen J.E.A.M., Veldhuijzen I.K., Broer J. et al. A prediction rule for selective screening of Chlamydia trachomatis infection. Sex Transm Inf 2005; 81:24-30

Götz H.M., de Groot F., Hoebe C.J., Richardus J.H., van Schaik D.T., Veldhuijzen I.K., Verhooren M.J.; PILOT CT Study Group (2005). Acceptability and consequences of screening for chlamydia trachomatis by home-based urine testing. Sex Transm Infect 2005 Sep;32(9):557-62.

Harrell A., The Urban Institute (date missing) (Washington D.C.) Evaluation Strategies for Human Services Practices. Retrieved from http://www.ojp.usdoj.gov/BJA/evaluation/guide/documents/evaluation strategies.html#p8

Jick T.D. (1979) Mixing qualitative and quantitative methods: triangulation in action. Administrative Science Quarterly, Vol. 24, No. 4, Qualitative Methodology (Dec., 1979), pp. 602-611 jaargang 17 nummer 01 2006 (pagina 11-13)

LaMontagne D.S., Fenton K.A., Randall S., Anderson S., Carter P. (2004) Establishing the National Chlamydia Screening Programme in England: results from the first full year of screening. Sex Transm Infect. 2004 Oct;80(5):331-3.

New York State Department of Health (1999) Disease Screening – Statistics Teaching Tools. Retrieved on March 3rd from: http://www.health.state.ny.us/diseases/chronic/discreen.htm

Northwest Health Foundation (2005) Program Evaluation: Principles and Practices

Public Health Agency of Canada (2007) A program evaluation tool kit. Retrieved February 7th, 2008, from: http://www.phac-aspc.gc.ca/php-psp/toolkit-eng.php

Rours I. et al. Chlamydia trachomatis infection during pregnancy causes preterm delivery. Abstract 5<sup>th</sup>. Annual Amsterdam Chlamydia Meeting, 2008.

The Joint Committee on Standards for Educational Evaluation, Inc (2007) Program Evaluation Standards. Retrieved February 22, 2008, from http://www.wmich.edu/evalctr/jc/

Veldhuijzen I.K., Van Bergen J.E., Götz H.M., Hoebe C.J., Morré S.A., Richardus J.H. (2005) PILOT CT Study Group. Reinfections, persistent infections, and new infections after general population screening for Chlamydia trachomatis infection in the Netherlands. Sex Transm Dis. 2005 Oct;32(10):599-604

Weyler J. (2007) Algemene informatie over Screening. Universiteit van Antwerpen. Retrieved on March 3rd from: http://www.kanker.net/uploadedFiles/Over\_de\_VLK/Symposium2007-Weyler.pdf

World Health Organization (WHO) (2000) Workbook 4 – Process Evaluations.

### **Appendix 1 - List of screening organizers**

Dutch expertise centre for HIV/Aids and other STI (STI AIDS Netherlands) STI AIDS Netherlands has written the program proposal, coordinates the program, controls the budget and chairs project group meetings.

Dutch organization for health research and healthcare innovation (ZONMW) ZONMW is the financier of the *Chlamydia* Screening Implementation.

### Chlamydia Screening Project group

The project group includes people from STI AIDS Netherlands, PHS (Rotterdam, Amsterdam, South Limburg), and the RIVM. The main task of the group is to prepare the Chlamydia Screening Implementation, to facilitate the implementation and contribute to the evaluation of the programme.

### Advisory Committee

This committee includes external experts in *Chlamydia trachomatis* diagnostics, population screening, Public Health epidemiology, gynaecology and family practice. Their task is to advice the project group in the preparation, implementation and evaluation of CSI from their expertise. The advisory committee meets every few months.

#### Public Health Services

The PHS' main responsibility is to set up and coordinate the screening programme within the region. The PHS is also responsible for contacts with laboratories, GPs, STI centres and municipalities. Furthermore, they organize regional publicity concerning the programme. Each PHS is in charge of a different working group (logistics, IT, laboratories, and communication).

### Centre for infectious disease control (CIb, RIVM)

The CIb is responsible for the evaluation of the screening which involves process and outcome evaluations. Two employees from the CIb are members of the project team.

### Laboratories

Three regional laboratories conduct the *Chlamydia trachomatis* tests according to their high quality standards.

#### IT company

The IT company developed the website application, the central database and provides regular updates of the data bases to the CIb and PHS. Databases for the CIb are anonymised.

#### Communication company

The communication company designed the website, the invitation letters and instruction folders for the target population. Also, it has developed communication the materials for publicity (posters et cetera).

### Logistic company

The logistic company is responsible for the sending of the letters and assembling of the test packages.

#### General Practitioners

GPs in the involved regions are responsible for the treatment of Ct-positive participants, including partner notification and treatment.

### STI centres

STI centres conduct treatment of Ct-positive participants, including partner referral and treatment. For financial reasons, the number of visitors who seek consultation is registered.

### Municipalities

The municipalities (GBA, 'Gemeentelijke Basis Administratie') provide the PHS with addresses and demographic information of the target population.

### **CSI-Netherlands**

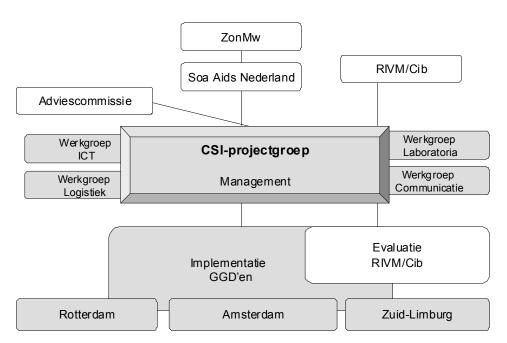


Figure 28 : CSI Netherlands

### **Appendix 2 – (Interview) questionnaires**

Over : Uitvoering door laboratoria

Wie : Laboratoria

### Voorbereiding

- 1. Kunt u kort toelichten wat uw taak was binnen het CSI-project?
- Bent u in de voorbereidingsfase tegen moeilijkheden of problemen aangelopen?
  - a. Welke problemen waren dit?
  - b. Wat was de oorzaak van dit probleem?
  - e. Hoe heeft u dit probleem opgelost?
- 3. Hoe bent u in de voorbereidingsfase tot een overeenkomst gekomen over de testkeuze?
- 4. Bent u afgeweken van uw reguliere chlamydia-testprocedure?
- 5. Wat waren uw (kwaliteits)eisen t.a.v. de manier van testen op chlamydia?
- 6. Wat waren de (kwaliteits)eisen vanuit het CSI-project voor het testen op chlamydia?
  - a. In hoeverre kwamen deze overeen met uw eisen?
  - b. Hoe bent u uiteindelijk tot een compromis gekomen wat betreft (kwaliteitseisen) en testkeuze?
- 7. Heeft u meebeslist over de inhoud van de verzendpakketten?
  - a. Zo ja, welke eisen heeft u daaraan gesteld?

#### Uitvoering

- 8. Hebt u problemen ondervonden bij het testen van de CSI samples naast de reguliere Ct testen?
- 9. Zijn er meer of minder samples dan verwacht in verkeerde staat (vies, te weinig materiaal, verkeerd ingepakt etc.) ontvangen?
  - a. Wat was het meest voorkomende probleem?
  - b. Hoe is hiermee omgegaan in het lab?
  - c. Maakt dit aanpassingen in CSI noodzakelijk? (b.v. voor de instructiefolder etc)
- 10. Hoe verloopt het hertesten van de primair positief geteste monsters?
  - a. Zijn er verschillen tussen swabs en urinemonsters qua hanteerbaarheid?
- 11. Hoeveel monsters worden er gemiddeld dagelijks getest?
  - a. Zijn dit er meer of minder dan verwacht?
- 12. Hoe verloopt het opslaan van monsters? En loopt u hierbij tegen moeilijkheden aan?
- 13. Hoe verloopt het hergebruik van de polymeds? (kan men voldoen aan de vraag door de logistieke partner?)
- 14. Worden er problemen ervaren bij de gegevensdoorgifte naar de CSI-database?
- 15. Zijn er vastgestelde termijnen die niet gehaald kunnen worden?
  - a. B.v. het aantal dagen tussen het ontvangen van het monster en het versturen van de testuitslag?
  - b. Zo ja, wat wordt er gedaan om de afgesproken termijn wel te halen?
- 16. Zijn er tijdens het uitvoeren van de Ct-testen personeelswisselingen geweest die hebben geleid tot belemmeringen in de uitvoering voor CSI?
- 17. Heeft het project geleid tot verwarring of onduidelijkheden bij medewerkers in het lab?
- 18. Worden er vanwege CSI extra uren gemaakt door het personeel of heeft dit tot verhoogde werkdruk geleid?
  - a. Zo ja, hoe ging men daar mee om?
- 19. [Hoe verloopt het poolen?]

#### Samenwerking met laboratoriumwerkgroep

20. Hoe was samenwerking met en communicatie tussen de laboratoriumwerkgroep en de laboratoria?

#### Om af te sluiten

- 21. Was het CSI-budget voor het lab toereikend? En hoe is dit vastgesteld?
- 22. Wat vindt u de 2 belangrijkste knelpunten en successen bij de voorbereiding van het CSI-project?
- 23. Wat vindt u de 2 belangrijkste knelpunten en successen bij de uitvoering van het CSI-project?
- 24. Hoe ziet u de Chlamydia Screening in de toekomst?

### Over : Uitvoering door laboratoria Wie : Werkgroep Laboratoria

- 1. Kunt u kort toelichten wat de taak was van de laboratoriumwerkgroep?
- 2. Kunt u kort toelichten wat uw rol binnen de werkgroep was?
- 3. Is de werkgroep in de voorbereidingsfase tegen problemen aangelopen met de laboratoria?
  - a. Welke problemen waren dit?
  - b. Wat waren de oorzaken?
  - c. Hoe zijn deze door de werkgroep aangepakt?
- 4. Hebben zich problemen voorgedaan die niet door de werkgroep opgelost konden worden?
  - a. Zo ja? Welke problemen waren dit?
  - b. Hoe zijn deze opgelost?
- 5. Was de werkgroep een krachtig instrument om de labwerkzaamheden voor CSI aan te sturen?
- 6. Hoe was de communicatie tussen de laboratoriumwerkgroep en de laboratoria?
  - a. Hebben zich hierbij problemen voorgedaan?
  - b. Hoe zijn deze opgelost?
- 7. Hoe is de werkgroep tot overeenstemming gekomen met de laboratoria over het hertesten van de Ctpositief getesten?
- 8. Hoe is de werkgroep tot overeenstemming gekomen met de laboratoria over het opslaan van monsters?

### Om af te sluiten

- 9. Wat vindt u de 2 belangrijkste knelpunten en successen bij de voorbereiding van het CSI-project?
- 10. Wat vindt u de 2 belangrijkste knelpunten en successen bij de uitvoering van het CSI-project?
- 11. Hoe ziet u de Chlamydia Screening in de toekomst?

### Over : Uitvoering logistiek Wie : Logistieke partner

- 1. Kunt u kort toelichten wat uw taak is binnen het CSI-project?
- Bent u in de voorbereidingsfase tegen problemen aangelopen?
  - a. Welke problemen waren dit?
  - b. Wat was de oorzaak van dit probleem?
  - c. Hoe heeft u deze problemen opgelost?
- 3. Hoe verloopt de dagelijkse aanlevering van adresbestanden vanuit de IT groep?
- 4. Hoe verloopt het printen en verzenden van de uitnodigingsbrieven, reminderbrieven en etiketten? (dag quota haalbaar?)
- 5. De brieven gaan naar een ander bedrijf om te vouwen/ in enveloppen te doen. Hoe verliep deze samenwerking? (dag quota haalbaar?)
- 6. Loopt u tegen problemen aan bij het inpakken van de pakketten? (bijstellen dagmax ? Extra personeel nodig in drukke tijden?)
- 7. Werd het materiaal om pakketten samen te stellen op tijd aangeleverd? (recyclebaar/ nieuw materiaal)
- 8. Hebben de verschillende pakketsamenstellingen tot problemen geleid? (natte/ droge swabs)
- 9. Hoe verliep het hergebruik van de polymeds (kapot etc)?
- 10. Verliep het verzenden van de brieven volgens planning?

- 11. Kunt u een schatting maken van het aantal brieven/pakketten die u retour krijgt?
  - a. Wat gebeurt er met deze brieven?
  - b. Wat gebeurt er met pakketten die niet door TNT bezorgd kunnen worden?
- 12. Heeft u zelf maatregelen getroffen (b.v. bijhouden van verzonden brieven, inscannen barcodes van verzonden pakketjes) om de kwaliteit vh proces te kunnen waarborgen? Heeft u op basis daarvan logistieke zaken bijgesteld?
- 13. Hoe bent u in de voorbereidingsfase tot overeenstemming gekomen over het budget? Was dit toereikend?
- 14. Hoe verliep de samenwerking en communicatie met de logistieke werkgroep? En met de IT werkgroep?
- 15. Hoe heeft u de tijdsplanning van de CSI projectgroep ervaren?

### Om af te sluiten

- 16. Wat vindt u de 2 belangrijkste knelpunten en successen bij de voorbereiding van het CSI-project?
- 17. Wat vindt u de 2 belangrijkste knelpunten en successen bij de uitvoering van het CSI-project?
- 18. Hoe ziet u de Chlamydia Screening in de toekomst?

Over : Logistiek

Wie : Logistiek werkgroep

- 1. Kunt u kort toelichten wat de taak was van de werkgroep?
- 2. Kunt u kort toelichten wat uw rol binnen de werkgroep was?
- 3. Bent u in de voorbereidingsfase tegen problemen aangelopen m.b.t. de logistiek?
  - a. Welke problemen waren dit?
  - b. Wat was de oorzaak van dit probleem?
  - c. Hoe zijn deze problemen opgelost?
- 4. Hebben zich problemen voorgedaan die niet door de werkgroep opgelost konden worden?
  - a. Welke problemen waren dit?
  - b. Wat waren de oorzaken?
  - c. Hoe zijn deze uiteindelijk opgelost?
- 5. Bleek de werkgroep een krachtig instrument om het project aan te sturen?
- 6. Hoe was de communicatie tussen de werkgroep logistiek en de logistieke partner?
  - a. Hebben zich hierbij problemen voorgedaan?
  - b. Hoe zijn deze opgelost?
- 7. Hoe is er overeenkomstemming bereikt over het budget tijdens de voorbereidingsfase met de logistieke partner? Heeft de werkgroep een rol gehad bij de onderhandelingen?
- 8. Hoe verliep de voorbereiding van het logistieke proces door de logistieke partner?
  - a. Wat ging daarbij goed en niet goed?

### Om af te sluiten

- 9. Wat vindt u de 2 belangrijkste knelpunten en successen bij de voorbereiding van het CSI-project?
- 10. Wat vindt u de 2 belangrijkste knelpunten en successen bij de uitvoering van het CSI-project?
- 11. Hoe ziet u de Chlamydia Screening in de toekomst?

Over : Algemene voorbereiding Wie : SOA AIDS Nederland

### De voorbereiding

- 1. Kunt u specificeren wat uw taak is binnen het CSI-project?
- 2. Tegen welke organisatorische problemen bent u aangelopen in de voorbereidingsfase?
  - a. Wat was de oorzaak hiervan?

- b. Hoe zijn deze opgelost?
- 3. Wat was de initiële tijdsplanning van het project, en hoeveel extra tijd was nodig?
- 4. Wat waren volgens u de belangrijkste redenen voor uitstel van het project?
- 5. Hoe is het uitstel van de startdatum met de opdrachtgever gecommuniceerd en werden hierbij problemen ervaren?
- 6. Welke (kwaliteits)eisen werden door de opdrachtgever aan het project gesteld? Hoe is hier aan tegemoet gekomen?

### De projectgroep

- 7. Hoe verliep het formeren en aansturen van de projectgroep?
- 8. Hoe verliep de communicatie binnen de CSI projectgroep?
- 9. Verliepen de projectvergaderingen in een positieve en constructieve sfeer?
  - a. Zo niet, wat waren hiervan de oorzaken? Wat verliep er anders bij vergaderingen die wel in positieve sfeer liepen?
- 10. Bleek de projectgroep een krachtig instrument om het project aan te sturen?
- 11. Vormden de werkgroepen (lab, IT, logistiek) een handig instrument bij de voorbereiding van het CSIproject?

#### De financiën

- 12. Hoe verliep de communicatie met de opdrachtgever over financiële zaken?
- 13. Verliep het budgetbeheer conform het projectvoorstel en afspraak met de betrokken partners?
- 14. Zijn er tijdens de voorbereidingsfase verschuivingen geweest in de verdeling van het budget?
- 15. Bleek het budget voor het eerste jaar toereikend voor het CSI-project?
- 16. Hoe bent u tot overeenstemming gekomen over het budget met de regionale coördinatoren?

#### Om af te sluiten

- 17. Zijn er aanbevelingen van de procesevaluatie van de Pilot overgenomen in het CSI-project?
- 18. Wat ging er beter dan in de Pilot? En wat slechter?
- 19. Wat vindt u de 2 belangrijkste knelpunten en successen bij de voorbereiding van het CSI-project?
- 20. Wat vindt u de 2 knelpunten en successen bij de uitvoering van het CSI-project?
- 21. Hoe ziet u de Chlamydia Screening in de toekomst?

Over : Algemene voorbereiding

Wie : GGD'en

### Organisatie

- 1. Kunt u specificeren wat uw taak is binnen het CSI-project?
- 2. Wat was de initiële tijdsplanning van het project en hoeveel extra tijd bleek nodig?
- 3. Wat waren volgens u de belangrijkste redenen voor uitstel van het project?
- 4. Tegen welke organisatorische problemen bent u aangelopen in de voorbereidingsfase?
  - a. Wat was de oorzaak hiervan?
  - b. Hoe zijn deze opgelost?
- 5. Hoe is het uitstel van de startdatum gecommuniceerd met betrokkenen in uw regio? (laboratoria, communicatieafdeling) en heeft u hierbij problemen ervaren?
- 6. Kunt u enkele kritieke punten noemen in het CSI project, die fout kunnen gaan?
- 7. Zijn er, bij uw weten, aanbevelingen van de procesevaluatie van de Pilot overgenomen in het CSI-project?
- 8. Wat gaat volgens u in het CSI project beter dan in de Pilot? En wat slechter?

### De projectgroep

- 9. Hoe heeft u de aansturing van de projectgroep ervaren door de projectleider?
- 10 Hoe verliep de communicatie binnen de CSI projectgroep?
- 11. Verliepen de projectvergaderingen altijd in een positieve en constructieve sfeer?
  - a. Zo niet, wat waren hiervan de oorzaken? Wat verliep er anders bij vergaderingen die wel in positieve sfeer liepen?
- 12. Bleek de projectgroep een krachtig instrument om het project aan te sturen?

#### De financiën

- 13. Hoe verliep de communicatie met de projectleider over financiële zaken?
- 14. Verliep het budgetbeheer conform het projectvoorstel en de afspraken die met de projectleider zijn gemaakt?
- 15. Zijn er tijdens de voorbereidingsfase verschuivingen geweest in de verdeling van het budget?
- 16. Was het CSI budget voor uw regio in het eerste jaar toereikend?
- 17. Wat waren de belangrijkste kostenposten binnen uw regio?
- 18. Hoe bent u tot overeenstemming gekomen met de laboratoria over het budget?

#### Om af te sluiten

- 19. Wat waren volgens u de 2 belangrijkste successen en knelpunten binnen de voorbereiding van het CSIproject?
- 20. Wat waren volgens u de 2 belangrijkste successen en knelpunten bij de uitvoering van het CSI-project?
- 21. Hoe ziet u de Chlamydia Screening in de toekomst?

#### Over : Uitvoering Huisartsen

#### Wie : Huisartsen

- 1. Bent u op de hoogte gebracht van het CSI-project?
- 2. Hoe heeft u de algemene informatievoorziening over de screening vanuit de GGD ervaren?
- 3. Vond u de informatievoorziening over de behandeling bij chlamydia toereikend?
- 4. Was u het eens met de behandelingsaanbevelingen?
- 5. Zijn er jongeren op het spreekuur geweest die hebben deelgenomen aan de screening?
- 6. Heeft u vragen ontvangen van jongeren over de screening?
- 7. Vond u de informatievoorziening voor partnerwaarschuwing en behandeling toereikend?
- 8. Heeft u de huidige partners van personen met een chlamydia infectie meebehandeld?
- 9. Heeft u deelnemers aan de screening doorverwezen naar de soa-polikliniek?
- 10. Heeft u deelnemers aan de screening, die een chlamydia infectie hadden, getest op andere SOA?
- 11. Heeft de screening geleid tot een verhoogde toeloop op uw spreekuur?
- 12. Heeft u klachten ontvangen van deelnemers over de chlamydia screening?
- 13. Had u graag testresultaten uit de screening ontvangen voor uw patiënten?
- 14. Vindt u dat de huidige opzet van de screening (systematisch, thuistest, internet) anders had gemoeten? (bv opportunistisch?)
- 15. Mocht er in de toekomst weer via huisartsen uitgenodigd worden, zou u hier dan bij betrokken willen zijn?
- 16. Heeft u nog andere opmerkingen over de screening?

#### Extra vragen voor huisartsen in Amsterdam

- 17. Wat vindt u ervan dat de uitnodiging voor de screening via uw praktijk is verlopen?
- 18. Hoe verliep het traject van uitnodigen?
- 19. Heeft dit tot vragen geleid bij uw patiënten?
- 20. Zou u bij een toekomstige screening dit op dezelfde manier willen, waarom wel/niet?

Over : Uitvoering SOA-centra Wie : SOA-verpleegkundigen

- 1. Bent u op de hoogte gebracht van het CSI-project?
- 2. Hoe hebt u de algemene informatievoorziening vanuit de GGD over de ct-screening ervaren?
- 3. Vond u de informatievoorziening over de behandeling bij chlamydia toereikend?
- 4. Was u het eens met de behandelingsaanbevelingen?
- 5. Zijn er jongeren op het spreekuur geweest die hebben deelgenomen aan de screening?
- 6. Wordt er al telefonisch gevraagd of mensen via het CSI-project komen?
- 7. Heeft u vragen ontvangen van jongeren over de chlamydia screening?
- 8. Vond u de informatievoorziening voor partnerwaarschuwing en behandeling toereikend?
- Heeft u de huidige partners van personen met een chlamydia infectie meebehandeld?
- 10. Heeft u deelnemers aan de screening doorverwezen naar de huisarts?
- 11. Heeft u deelnemers aan de screening, die een chlamydia infectie hadden, getest op andere SOA?
- 12. Heeft de screening geleid tot een verhoogde toeloop op het spreekuur?
- 13. Heeft u klachten ontvangen van deelnemers over de chlamydia screening?
- 14. Had u graag testresultaten uit de screening ontvangen voor uw patiënten?
- 15. Vindt u dat de huidige opzet van de screening (systematisch, thuistest, internet) anders had gemoeten? (by opportunistisch?)
- 16. Was de registratie van CSI-deelnemers in SOAP voor u duidelijk?
- 17. Heeft u nog andere opmerkingen t.a.v. de screening?

#### Over : Communicatie

#### Wie : Werkgroep communicatie

- 1. Kunt u kort toelichten wat de taak was van de werkgroep?
- 2. Kunt u toelichten wat uw rol binnen de werkgroep was?
- 3. Bent u in de voorbereidingsfase tegen moeilijkheden of problemen aangelopen met het communicatiebureau?
  - a. Welke problemen waren dit?
  - b. Wat waren de oorzaken?
  - c. Hoe zijn deze opgelost?
- 4. Hebben zich ook problemen voorgedaan die niet door de werkgroep opgelost konden worden?
  - a. Welke problemen waren dit?
  - b. Hoe zijn deze uiteindelijk opgelost?
- 5. Bleek de werkgroep een krachtig instrument om het project aan te sturen?
- 6. Hoe was de communicatie tussen de werkgroep communicatie en het communicatiebureau?
  - a. Hebben zich hierbij problemen voorgedaan?
  - b. Wat was daarvan de oorzaak?
  - c. Hoe zijn deze opgelost?
- Hoe bent u met het communicatiebureau tot overeenstemming gekomen over het budget?
- 8. Hoe kwam het tot een overeenkomst voor de lay-out van de website en informatiematerialen?
- 9. Hoe verliep de ontwikkeling van de instructiefilms voor de website?
- 10. Hoe tevreden was u met de ontwikkelde producten (website, folders, posters) door het communicatiebureau? Heeft u zaken bij moeten sturen?
- 11. Hebben bepaalde gebeurtenissen ertoe geleid dat dingen niet volgens planning liepen?
  - a. Welke waren dit?
  - b. Hoe kwam dit?
  - c. Hoe zijn deze uiteindelijk opgelost?

- 12. Wat vindt u de 2 belangrijkste bevorderende en belemmerende factoren binnen de voorbereiding van het CSI-project?
- 13. Hoe ziet u de Chlamydia Screening in de toekomst?

Over : Communicatie
Wie : Communicatiebureau

- 1. Kunt u kort toelichten wat uw taak was binnen het CSI-project?
- 2. Bent u in de voorbereidingsfase tegen moeilijkheden of problemen aangelopen?
  - a. En welke problemen waren dit?
  - b. Wat waren hiervan de oorzaken?
  - c. Hoe zijn deze opgelost?
- 3. Hoe verliep de communicatie met de communicatie werkgroep?
- 4. Zijn er bepaalde dingen niet gelopen zoals gepland?
  - a. Welke waren dit?
  - b. Hoe is dit uiteindelijk opgelost?
- 5. Hoe bent u tot een overeenstemming over het budget tijdens de voorbereidingsfase met de communicatie werkgroep/projectleiding?
- 6. Was dit budget, achteraf gezien, toereikend?
- 7. Hoe is het uitstel van de startdatum gecommuniceerd? Heeft dit tot problemen geleid in de planning van uw werkzaamheden?
- 8. Kunt u enkele kritieke punten noemen in het CSI project, die fout kunnen gaan?
- 9. Hoe verliep de overeenstemming over de lay-out van de website, folders etc?
- 10. Hoe tevreden bent u met de eindproducten (website, folders etc). Waar hebt u concessies moeten doen?
- 11. Bij de ontwikkeling van de communicatiemiddelen moest rekening gehouden worden met de wensen van de CSI projectgroep. Waren er zaken waar u het niet mee eens was? Zo ja, wat en waarom?
- 12. Voor het uittesten van vragenlijsten is een testpanel gebruikt. Hoe verliep de samenwerking met het testpanel?
- 13. Wat vindt u de 2 belangrijkste successen en knelpunten binnen de voorbereiding van het CSI-project?
- 14. Hoe ziet u de Chlamydia Screening in de toekomst?

Over : IT

Wie : IT company RV

- 1. Kunt u kort toelichten wat uw taak is binnen het CSI-project?
- Bent u in de voorbereidingsfase tegen problemen aangelopen?
  - a. En welke problemen waren dit?
  - b. Wat was daarvan de oorzaak?
  - c. Hoe zijn deze problemen opgelost?
- 3. Hoe bent u tot overeenstemming gekomen over het budget voor IT werkzaamheden?
- 4. Hoe is het uitstel van de startdatum gecommuniceerd? Heeft dit tot problemen geleid in planning van uw (andere) werkzaamheden?
- 5. Kunt u enkele kritieke punten noemen in het CSI project, die fout kunnen gaan?
- 6. Hoe verliep de ontwikkeling van de databases en website?
- 7. Hoe ging de samenwerking en communicatie met de IT werkgroep?
- 8. Hoe tevreden bent u met de eindproducten (database, website) en waar heeft u concessies moeten doen?
- 10. Bij de ontwikkeling van de databases/website moest rekening gehouden worden met de wensen van de CSI projectgroep. Waren er dingen waar u het niet mee eens was? Zo ja, wat en waarom?
- 12. Wat vindt de 2 belangrijkste successen en knelpunten binnen de voorbereiding van het CSI-project?

13. Hoe ziet u de Chlamydia Screening in de toekomst?

Over : IT

Wie : Werkgroep IT

- 1. Kunt u kort toelichten wat de taak was van de werkgroep?
- 2. Kunt u kort toelichten wat uw rol was binnen de voorbereiding van het CSI-project?
- 3. Bent u in de voorbereidingsfase tegen problemen aangelopen?
  - a. Welke problemen waren dit?
  - b. Wat waren de oorzaken?
  - c. Hoe zijn deze problemen opgelost?
- 4. Hebben er problemen voorgedaan die niet door de werkgroep opgelost konden worden?
  - a. Welke problemen waren dit?
  - b. Hoe zijn deze uiteindelijk opgelost?
- 5. Bleek de werkgroep een krachtig instrument om het project aan te sturen?
- 6. Hoe bent u tot overeenstemming gekomen over het budget voor het IT bedrijf?
- 7. Hoe was de communicatie tussen de IT-werkgroep en het IT bedrijf?
  - a. Hebben zich hierbij problemen voorgedaan?
  - b. Wat was daarvan de oorzaak?
  - c. Hoe zijn deze opgelost?
- 8. Hoe verliep de ontwikkeling van de databases?
  - d. Hoe verliep de ontwikkeling van de databases en website?
  - e. Hoe ging de samenwerking met het IT bedrijf?
  - f. Hoe verliep de communicatie met het IT bedrijf?
  - g. Hoe tevreden bent u met de eindproducten (database, website)?
- 9. Wat vindt u de 2 belangrijkste successen en knelpunten binnen de voorbereiding van het CSI-project?
- 10. Hoe ziet u de Chlamydia Screening in de toekomst?



# Appendix 3 – Description of Block A

Block A Amsterdam (n=25,519)

Block A Ams	neraam (n=25,519)		
Cluster nr	Area	# invitations	Ct risk
36	N66 Oostzanerwerf+N67 Kadoelen	1881	М
73	V26 Diamantbuurt	1594	М
83	W59/90 Station Zuid/WTC e.o.+ Buitenveldert-West	2577	L
4	A05 Haarlemmerbuurt	1402	L
45	Q82 Osdorp-Midden	2633	М
14	D17 Da Costabuurt	1083	L
61	T96 Holendrecht/Reigersbos-3	1362	Н
32	N60 Volewijck	2009	М
10	C12 Houthavens	1322	L
69	U56 Middenmeer	2251	L
6	A07 De Weteringschans	1669	L
71	V24 Oude Pijp	3846	М
27	H39 De Kolenkit	1890	М
Block A Roti	terdam (n=18,188)		
Cluster nr	Area	# invitations	Ct risk
47	Pernis+ Botlek+Ehaven+Wlhvn	785	L
34	Kop van Zuid-Entrepot	1159	M
8	Spangen	2498	Н
24	Hillegersberg-Noord	829	L
17	Provenierswijk	1372	М
16	Agniesebuurt	1238	Н
18	Bergpolder	2601	М
36	Bloemhof	3195	Н
25	Terbregge	384	L
21	Oude Noorden	4127	М
Block A Sou	th-Limburg (n=13,293)		
Cluster nr	Area	# invitations	Ct risk
37	Wijk 02 Hulsberg + Wijnandsrade	714	L
42	Wijk 01 Vaals	749	М
8	Wijk 04 Brunssum-Zuid	481	М
25	Wijk 38 Caumerveld-Douve Weien	787	M
13	Wijk 13 Nieuw Lotbroek + De Koumen	765	М
28	Wijk 41 Heerlerbaan-Schil + De Beitel	901	М
45	Wijk 00 Gulpen	605	L
47	Wijk 03/05 Wittem + Mechelen + Epen + Slenaken	728	L
11	Wijk 11 Mariarade	572	Н
21	Wijk 33 Heerlen-Centrum	1022	Н
19	Wijk 31 Schandelen-Grasbroek	972	Н
35	Wijk 02 Kerkrade-Noord-2	1024	М
24	Wijk 37 Bekkerveld	472	М
4	Wijk 02 Ubach over Worms	1771	M
40	Wijk 01 Bocholtz	779	L

RIVM Report 210261006 75

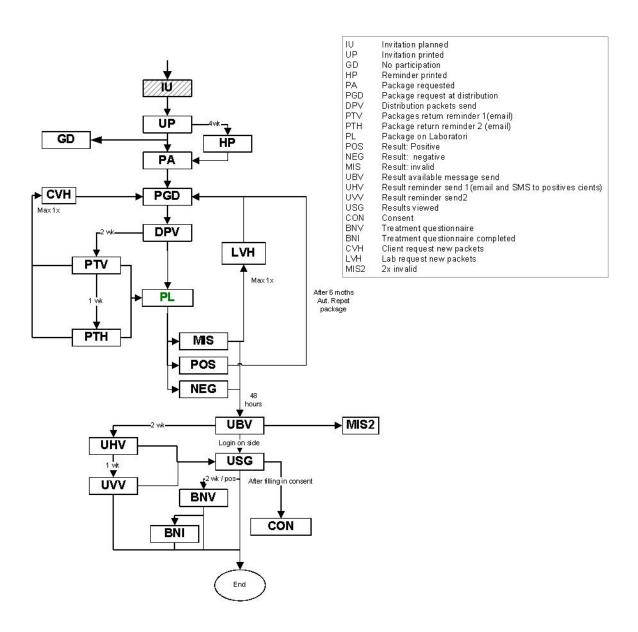
951

Μ

Wijk 02 Kerkrade-Noord-1

34

## **Appendix 4 – Flowchart of technical processes**





# **Appendix 5 – Outline of process monitoring**

Date

Region

Quantitative						
# UP		# POS				
		# letters POS				
PA/UP (%)		test results				
PL/UP (%)		# POS at PHS (indication)				
USGC/USG (%)		# UP EX				
% POS		PL/UP EX (%)				
Qualitative			·			
Laboratory						
	test result after re	ceiving package (PL_LAAT_US	L)			
Min						
Max						
Trends in relation to previous	ous overview? Acti	on undertaken? If yes, which o	те?			
Missing test results in relation to previous overview? Action undertaken? If yes, which one?  Other issues						
Communication	Communication					
News from Aids STI info line or Telephone Lines PHS, STI clinics etc.						
Action?						
Other issues						
Outer issues						

# **Appendix 6 – Outline of performance monitoring**

A selection of the performance monitoring indicators:

Nr.	Monitoring (per month)	Codes	Notes			
1. Logistics						
1.1	Minimum # of invitation letters not reaching invitees (GBA database).	PO Box file /	Returned letters ( PO Box)  / Letters sent → minimum  number of undeliverable  letters			
1.2	(Median) time (in days) between the sending of the first invitation and reminder invitation.	HP_datum =	invitation letter – Date sending of initial invitation letter			
1.3	# people signing themselves out from participation at the website	GD	Non-response group 1			
1.4	# people requesting package after first invitation compared to # people requesting package after reminder	UP, HP, PA	Response rate after initial invitation and reminder			
1.5	# people requesting a second package	CVH, PA	Indication of wrongly taken or not received test packages			
1.6	(Median) time (in days) between invitation letter and package request	PA_datum – (	dt_uitnodiging Duration of package request			
1.7	(Median) time (in days) between request for package and sending of the package by Logistic company	DPV_datum -	PA_datum Duration receiving package			
1.8	(Median) time (in days) between invitation and sending the sample	PL_datum – [	Ot-uitnodiging Duration of returning a sample			
1.9	(Median) time (in days) between the availability of the test result and the online checking of the test result	USG_datum -	date of availability of test results			
1.10	Total (median) processing time	USG_datum - Dt_uitnodigin				
2. Labo	pratories (per region, per month)					
2.1	Amount of samples processed within 10 working days (date of reception sample and date of	UBV_datum - (=1 => more t				

	test result)		
2.2	Mean time between date of	POS – PL_datum &	Date of test result - Date of
	package reception in laboratory	uitslag_datum	receiving package in lab
	and date of sending the		
	POSITIVE test results.		
2.3	Mean time between date of	NEG – PL_datum &	Date of test result - Date of
	package reception in laboratory	uitslag_datum	receiving package in lab
	and date of sending the		
	NEGATIVE test results.		
2.4	Mean time between date of	MIS - PL_datum &	Date of test result - Date of
	package reception in laboratory	uitslag_datum	receiving package in lab
	and date of sending the MIS		
	results.		
2.5	# lab requests for second	LVH, PA	Indication of requests of
	package		second sample by
			laboratory (test failures)

#### **Appendix 7 – Promotional Poster**





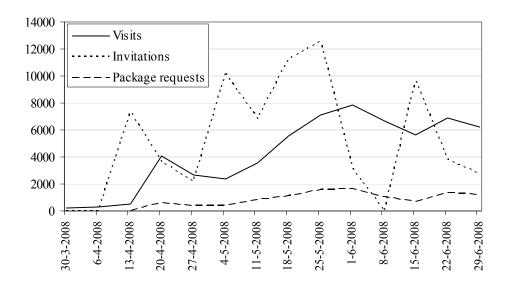
## Appendix 8 – The website

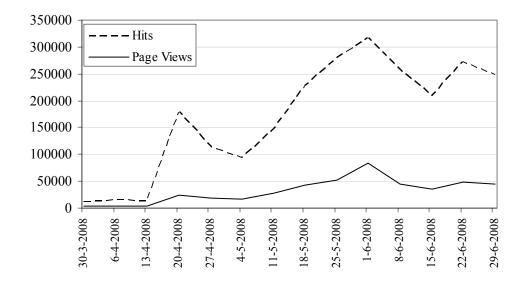
To view the website go to: <a href="http://www.chlamydiatest.nl">http://www.chlamydiatest.nl</a>



#### Appendix 9 – Website visitors

Website visitors at www.chlamydiatest.nl during the first weeks of screening.





#### **Definitions**

Page View: Requests to load a single page of an Internet site.

Visit: A series of requests from the same Uniquely Identified Client with a set timeout (often 30 minutes).

A visit is expected to contain multiple page views.

Hits: A request for a file at an internet site. Please note: a single web-page typically consist of multiple

(often dozens) of discrete files, each of which is counted as a hit as the page is downloaded.

#### Appendix 10 – Media publicity

#### A selection of the media publicity (April 2008):

http://kassa.vara.nl/portal? scr=nieuws artikel&no=4028899

http://www.limburger.nl/article/20080422/VIDEONIEUWS/804220321

http://www.trouw.nl/laatstenieuws/laatstenieuws/article971307.ece/Onderzoek\_naar\_chlamydia\_onder\_315 duizend\_jongeren#readmore

http://www.depers.nl/video/282536/Jongeren-test-jezelf-op-chlamydia.html

http://www.blikopnieuws.nl/bericht/74024

http://www.trouw.nl/laatstenieuws/laatstenieuws/article971307.ece/Onderzoek\_naar\_chlamydia\_onder\_315 duizend\_jongeren#readmore

http://www.parool.nl/nieuws/2008/APR/21/ams3.html

http://headlines.nos.nl/forum.php/list\_messages/10274

http://www.nos.nl/nosjournaal/artikelen/2008/4/21/210408 geslachtsziekte.html

http://www.kiesbeter.nl/algemeen/Algemeen/nieuwsbericht/default.aspx?nieuwsId=4038

http://www.elsevier.nl/lifestyle/gezondheid en gezin/gezondheid/artikel/asp/artnr/202603/

http://www.depers.nl/binnenland/194569/Chlamydiatest-onder-jongeren-begint.html

http://www.ziekenhuis.nl/index.php?cat=nieuws&nieuws=item&id=6022

http://gezondheid.blog.nl/actualiteiten/2008/04/22/grootschalig-chlamydia-onderzoek-via-het-internet

http://www.rtl.nl/(/actueel/rtlnieuws/binnenland/articleview/)/components/actueel/rtlnieuws/2008/04 april/

21/binnenland/0421\_0800\_chlamydia\_onderzoek.xml

http://player.omroep.nl/?afIID=6920049&start=00:07:17&end=00:14:35

http://dewerelddraaitdoor.vara.nl/fokkesukke.php?id=129&autostart=true

 $\underline{http://www.rtl.nl/(vm=/shows/jensen/home/)/system/video/html//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/jensen/miMedia/2008/ntml//components/shows/shows/shows/shows/shows/shows/shows/shows/shows$ 

week17/vr gasten.avi plain.xml

http://player.nos.nl/index.php/media/play/temid/tem:5-370726/

http://www.bnr.nl/static/jspx/play.jspx?datum=22/04/2008&tijd=11:10:00&lengte=15&titel=Titel

http://tijdvoortwee.kro.nl/

http://www.journalism.fcj.hvu.nl/index.php?id=6666

http://www.rtvnh.nl/programmas/tvarchief/index.asp

#### List of abbreviations

ASI Aids STI Info line

ASL Risk score used in South limburg

Clb Centrum voor Infectieziektenbestrijding (Centre for Infectious Disease Control

Netherlands)

CDC Centres for Disease Control and Prevention

CSI Chlamydia Screening Implementation

Ct Chlamydia trachomatis

FAQ Frequently Asked Questions

GBA Gemeentelijke Basis Administratie (Population registers from Municipalities)

GGD Gemeentelijk Gezondheids Dienst (Public Health Service)

GP General Practitioner

GR Gezondsheidsraad (Health Council of the Netherlands)

HIV Human immunodeficiency virus

MG Logistics company

NAAT Nucleic Acid Amplification Technology

NG Neisseria Gonorrhoea
PHS Public Health Service

PID Pelvic Inflammatory Disease

QC Quality Control

RIVM Rijksinstituut voor Volksgezondheid en Milieu (National Institute for Public Health

and the Environment)

RV IT company

SA-NL Dutch expertise centre for HIV/Aids and other STIs

STI Sexual Transmitted Infection

TFI Tubal Factor Infertility

WHO World Health Organisation
YW Communication company

ZONMw Nederlandse organisatie voor Gezondheidsonderzoek en Zorginnovatie (the

Netherlands Organisation for Health Research and Development)

## Acknowledgement

The authors gratefully acknowledge the contributions of G. Doornbos and M. Meijer for their assistance in data management and analysis. We thank T. de Cock Buning and I. Hellsten, the experts from the VU University in Amsterdam, for their input on the design of this evaluation and useful comments on first drafts of this report.

**The advisory committee**: T. Bakkenist, P. van den Broek, T. Coenen, S. de Gouw, B. Hoebee, J. Land, S. Morré, R. van Riel, M. van der Sande, E. Steyerberg.

**The CSI project group:** J. van Bergen, I. van den Broek, E. Brouwers, H. Fennema, H. Götz, C. Hoebe, R. Koekenbier, E. Op de Coul, L. Pars, S. van Ravesteijn.

# RIVM National Institute for Public Health and the Environment P.O. Box 1 3720 BA Bilthoven

The Netherlands www.rivm.com