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# Report

on the **BORDERNET***work* Sentinel-Surveillance

**Period of activity:  
1.1.2008 - 15.3.2009**

**BORDER|NET** *work*

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## I. Methods

### I.1. Study design

A sentinel surveillance approach was chosen to collect the needed data. With this design, the frequency of STIs can be properly estimated with limited resources. Information about circulation and distribution of STIs within the population is available as well as the detection of special risks, outbreaks or trends for the observed STIs. In this sentinel the national differences in health care can be considered by recruiting the participating institutions.

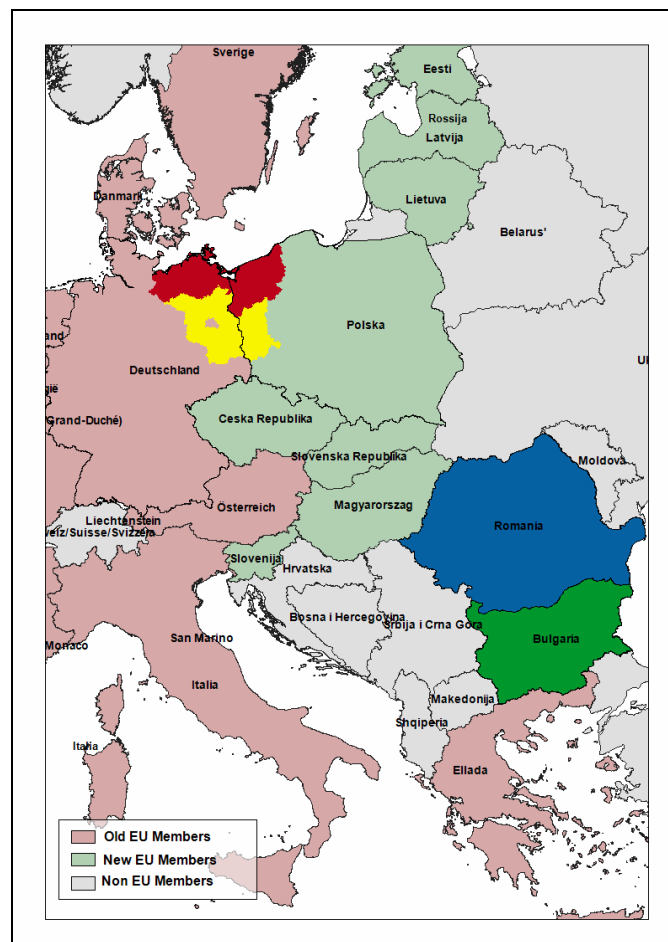
### I.2. Study population

The study population were all persons out of the participating regions being infected with HIV, syphilis, Chlamydia or gonorrhoea at the time of the study and attending a sentinel site.

### I.3. Indicators

All Chlamydia, gonorrhoea, Hepatitis B, HIV and syphilis infections, which are newly diagnosed and laboratory confirmed in the study period and region in the sentinel sites were reported, including asymptomatic infections. Also different or repeating STIs in one person should be reported separately.

### I.4. Selection and recruiting of the reporting sites



*Figure 1*  
Overview of the regions of the BORDERNETwork sentinel surveillance

In the scope of the project BORDERNETwork, two cross-border regions between Germany and Poland were inherited from the former project BORDERNET (Fig. 1). The sentinel surveillance was established in these regions as well as in two new regions covering the states of Bulgaria and Romania. Sentinel sites in each region were recruited by the leading cooperation partners of each region. The aim was to compose a sentinel system, which is able to represent the particular epidemiological situation of each region.

Therefore, before recruiting the sentinel sites, we collected detailed information about the number and kind of potential sentinel sites using literature and questionnaires sent to the regional coordinators and the WHO STI-Coordinators in the regions. Because of large differences between the model regions regarding degree of urbanisation, local health system, potential target population or the epidemiological situation, the composition of the sentinel sites had to differ between the regions. The sites were chosen also with the aim to reach a maximum of infected persons in the regions as well as risk groups. The participation in BORDERNET is voluntary and can be ended at any time. The sites leaving the project should then be replaced by new sentinel sites.

Consequently, the chosen sentinel sites are local health authorities, STI-clinics and specialised outpatient clinics for STIs.

### ***1.5. Required data and types of questionnaires***

Four different types of questionnaires were used in conducting the BORDERNETwork sentinel-surveillance. First, a basic questionnaire was handed out to the sentinel sites to provide information on their size, their equipment, the composition of staff, their catchment area as well as the monthly number and type of patients of each sentinel site.

Epidemiological data were collected about patients who are newly and laboratory confirmed diagnosed for Chlamydia, gonorrhoea, Hepatitis B, HIV and syphilis. These are five strongly important sexual transmitted infections (STIs) in respect of public health efforts and were therefore chosen.

Epidemiological information was provided through a monthly, a diagnosis and a patient questionnaire:

1. Via the monthly questionnaire, the sentinel sites report the number of clients, the sex distribution, the number of examinations for Chlamydia, gonorrhoea, Hepatitis B, HIV and syphilis and the number of diagnoses for the mentioned four STIs.
2. The treating physician completed a diagnosis questionnaire for each patient with a diagnosis of one of the stated STIs, gaining clinical information about the current infection and anamnestic details as well as socio-demographic characteristics of the patient and the likely mode of transmission.
3. STI patients voluntary were asked to complete a questionnaire on their socio-demographic background, likely mode and place of transmission, sexual behaviour and drug use. An information letter explaining study objectives and data protection issues as well as stating that participation was voluntary was handed over to the patients at the same time.

### ***1.6. Data flow***

The questionnaires were sent from the local sentinel sites to the regional coordinators, who checked them for consistency. The anonymous patient questionnaires, only linked by a unique reference number to the diagnosis questionnaire, were sent to the regional project coordinators. From there they were forwarded to the overall coordinator (SPI) who entered the data

into the database. The datasets were finally sent to RKI, where the data analysis was done. The dataflow guarantees a high standard of data protection (Fig 2).

Regarding the German regions of Mecklenburg-Vorpommern and some sentinel sites participated also in the German STD-sentinel surveillance. These institutions reported data only once, either to the Robert Koch-Institute or to the BORDERNET<sub>work</sub> sentinel surveillance. With permission of the respective sites, their data were exchanged between the two surveillance systems for analysis.

### ***1.7. Data analysis***

Following analysis was done regularly:

- Absolute and relative frequency of diagnosed cases of HIV, syphilis, Chlamydia and gonorrhoea with
  - distribution analysed by region
  - distribution analysed by demographic detail (age, sex, place of residence, origin)
  - distribution analysed by most likely mode of transmission (homo/bisexual contacts, iv.-drug abuse, sex work, heterosexual contacts, other)
- Analysis of risk parameters and identification of risk behaviour for the different STIs
- Having sufficient data: identification of
  - trends in time
  - trends in regional distribution
  - changes of risk behaviour

### ***1.8. Limitations***

A sentinel survey will not generate representative data of the population under surveillance. A direct comparison between different regions is difficult, but trends are fast and easily detectable.

The national differences of the previous recording and also the social attitude of the included STIs can influence the common collection of the data. Also the distinctions in the national health systems will have an impact on diagnosis and reporting within the sentinel. Some risk groups are expected to be difficult to reach (e.g. sex workers, drug user, migrants, partly MSM).

Meetings with the participating institutions as well as a good local cooperation are an important resource to detect problems early and to find appropriate solutions.

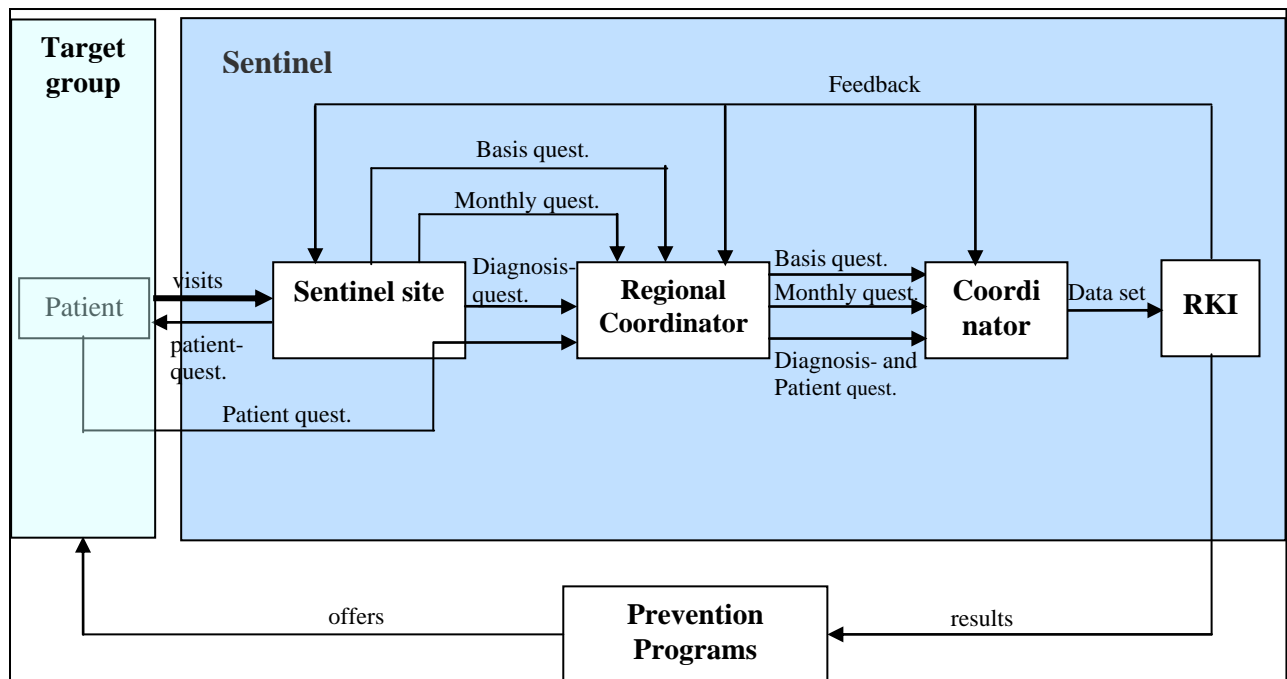


Figure 2  
Dataflow within the BORDERNETwork sentinel-surveillance

### 1.9. Ethical aspects / Data protection

STIs are diseases being often associated with stigma and shame for the concerned persons. Hence the confidentiality in the study is very important. This should be guaranteed through the following organisational properties.

The participation of the institutions was voluntary and could be ended at any time. The reporting was made anonymously from the participating institutions to the regional coordinators.

The questioning of the patients was also anonymous and voluntary. They were given a questionnaire and an information letter from their diagnosing site, which explained the study, the data protection and also the voluntary participation. This should improve the confidence between the patients and the local institutions and increase the response rate.

For the correct matching of the diagnosis and the patient questionnaire to one patient, the reporting sites assigned a reference numbers on both questionnaires. After the matching the numbers was separated and destroyed.

The collected data were kept in rooms which can be locked not accessible for others than the members of the project team.

## II. Data of German and Polish Regions

All data and analysis reported in this paper are based on a dataset as of 17.3.2009.

### II.1. Composition of the Sentinel-Surveillance-System

In 2006, two cross border regions between Germany and Poland were established within the scope of the former project BORDERNET. Region one was formed by the federal states Mecklenburg-Vorpommern and Zachodniopomorskie, region 2 by Brandenburg and Lubuskie.

In Germany and Poland, number and type of sentinel sites differed distinct, due to different structures of health care systems (s. appendix 3). Whereas the German health care system is characterised by a decentralised approach, including outpatient clinics as well as specialised private practitioners, the system in Poland is clearly more centralised, having only few complementary testing and treating points. Additionally, diagnosis and treatment of HIV and STI are mostly heavily separated in Poland, having very few relations. This separation of HIV- and STI-sectors made it difficult to establish a sufficient surveillance approach, having both branches included.

#### II.1.1. Properties of the Sentinel Sites

With assistance of a first basic questionnaire, the sentinel sites were asked to give general information regarding the size of institution, their service area as well as the composition of their clientele. 34 German sites and 1 Polish site responded to the basic questionnaire.

Eight of the German sites described their service area as “metropolitan”, 24 as “provincial”, two institutions as “rural”. The Szczecin site gave no answer, but is classifiable as metropolitan”.

In Germany, six sites offered a specific **STI-consultation**, eleven a specific HIV-consultation. The Polish site offered both. In Germany, HIV-consultation was anonymous at 18 sites and free of cost at 10 sites, STI-consultation was anonymous at 16 sites, free of cost at seven sites. Combined anonymous and free of cost testing was only available at public health authorities (“Gesundheitsämter”). Regarding Poland, there was free of cost testing for HIV, not for STI, both of them not anonymously.

The **size of the STI-sector** in Germany constituted 0 persons per month in 13 sites, between 1-25 persons in 17 sites and 26-50 persons in three sites. Regarding the HIV-sector, 15 sites reported 0 persons per month, 14 sites 1-25 persons, two sites 26-50 and another two sites 51-75. Number of persons tested for STI in the Polish institution was 26-50, tested for HIV > 100.

In Germany, **diagnostics** were performed mainly by private laboratories for HIV (25 sites) and STI (22). Only two sites each performed HIV- and STI-tests by their own. In Poland, both diagnostics were performed by the institution’s one laboratory.

#### II.1.2. Clientele of the sentinel sites

The estimated median proportion of men among all HIV-clients was 65.0% in Germany and 65.0% in Poland, concerning STD-clients 69.6% in Germany, there were no data for Poland. The estimated median proportion of people of a foreign origin in Germany regarding persons tested for HIV was 24.9% in Germany, concerning STD-clients 17.6%, having no data for Poland.

Further, the sentinel sites were questioned about the **proportion of several groups at risk**, separated by sex (table 1). Predominant group at risk in women were heterosexual persons, in

men homo- and bisexual men as well as heterosexual persons. There were no data given for Poland.

Table 1

Median of proportions of different risk groups of all patients of the sentinel sites in Germany (multiple answers possible)

		Median (%)
Women	Sex workers	6.6
	i.v. Drug user	7.3
	Heterosexual persons	83.4
	Homo-/bisexual persons	51.7
Men	i.v. Drug user	4.3
	Heterosexual persons	49.5

## II.2. Response rate

Table 2

Response of monthly, diagnosis and patient questionnaires by region

Region	Monthly Qu.	Diagnosis Qu.	Patient Qu.
Mecklenburg-Vorpommern	357	189	45
Zachodniopomorskie	5	58	54
Brandenburg	172	36	0
Lubuskie	40	3	3
Total	574	286	102

The response of the different type of questionnaires (monthly, diagnosis and patient questionnaire) varied between the regions (table 2).

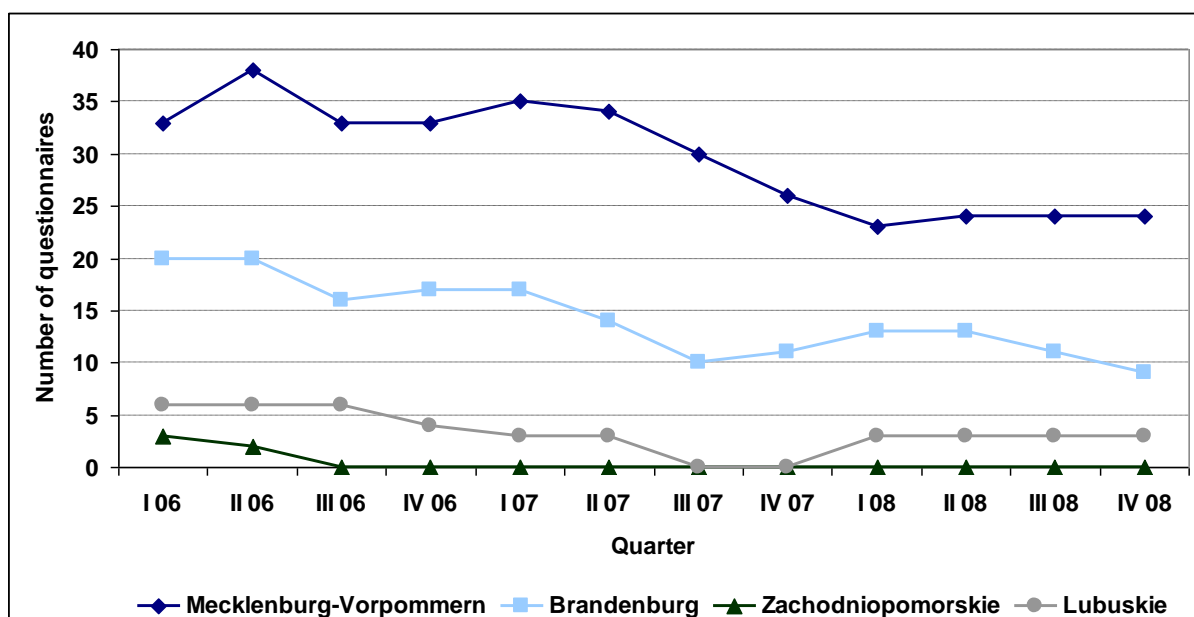


Figure 3

Response rate of monthly questionnaire, by quarter and region (monthly questionnaire)

Response rates of monthly questionnaires, which are important to picture an overview on the conducted tests and on trends in time, decreased in 2008 in Germany (figure 3). Proportions of patient questionnaires in comparison to regarding diagnosis questionnaires were distinct lower in Germany than in Poland (14.7% vs. 93.4%,  $p < 0.01$ ). Questionnaires out of the region Zachodniopomorskie were only of 2006.

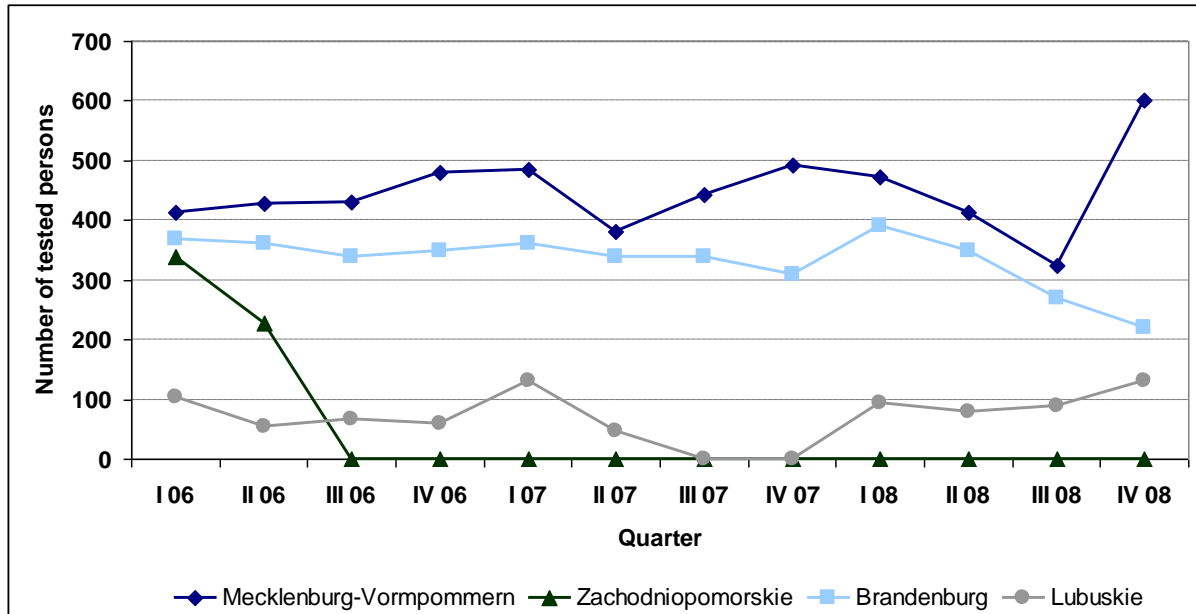


Figure 4

Number of tested persons, by quarter and region (monthly questionnaire)

The number of tested persons was without heavier oscillations for all regions with exception of Zachodniopomorskie, for which no data was reported after the second quarter of 2006 (figure 4).

### II.3. Epidemiological data: Germany

#### II.3.1. Performed tests

11,322 laboratory tests in 9,358 persons were reported in the two German regions since start of the sentinel surveillance in January 2006 till December 2008.

Table 3

Total number of lab tests (monthly questionnaire), number of positive tests and their proportion of the total number of lab tests (monthly questionnaire), number of sent in diagnosis questionnaires and their proportion of number of positive tests and number of patient questionnaires and their proportion of number of sent in diagnosis questionnaires, all by STI, Germany

STI	Number of lab. tests	# Positive tests (%)	# Diagnosis Questionnaire (%)	# Patient Questionnaire (%)
Chlamydia	1,756	178 (10.1)	62 (34.8)	13 (21.0)
Gonorrhoea	987	65 (0.6)	49 (75.4)	19 (38.8)
HIV	4,651	121 (2.6)	69 (57.0)	9 (13.0)
Syphilis	3,928	121 (3.1)	59 (48.8)	6 (10.2)

The highest proportion of positive tests was given for Chlamydia (10.1%, table 3).

### II.3.2. Sociodemographic characteristics<sup>1</sup>

The proportion of men in all examined persons was 73.8%. The sex distribution within positively tested patients equalled that proportion (table 5). The proportion of migrants (defined as coming from any other country than the country of diagnosis) was double as high in women as in men. Drug use was not very frequent, neither in men nor in women.

*Table 4*

Sex distribution, mean of age, origin working situation, drug use an STI anamnesis by sex , Germany (diagnosis questionnaire)

	<b>Men</b> n=161	<b>Women</b> n=63
Proportion (%)	71.9	28.1
Mean of age (years)	35	30*
Other origin than country of diagnosis	8.7	17.5*
Drug use	3.7	3.1
STI in anamnesis	36.6	25.4
* p < 0.01		

Due to the very low number of patient questionnaires, we report no analyses of sociodemographic or behavioural data derived from the patient questionnaires here in detail.

### II.3.3. Epidemiological situation

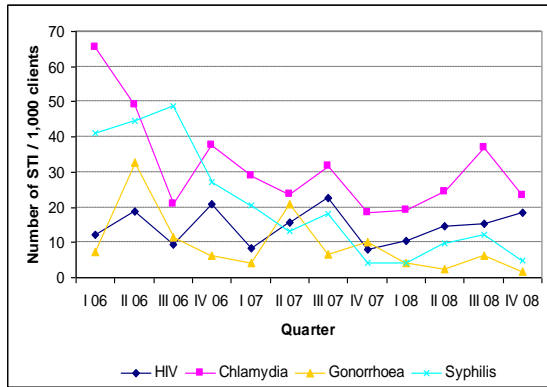
The **coverage** of epidemiological data of the BORDERNETwork sentinel surveillance in comparison to register-data of the Robert Koch-Institute (cumulated data of 2006-2008, each) accounted for 20.8% as to reported HIV-diagnoses in women up to 36.6% as to reported HIV-cases in men (table 5).

*Table 5*

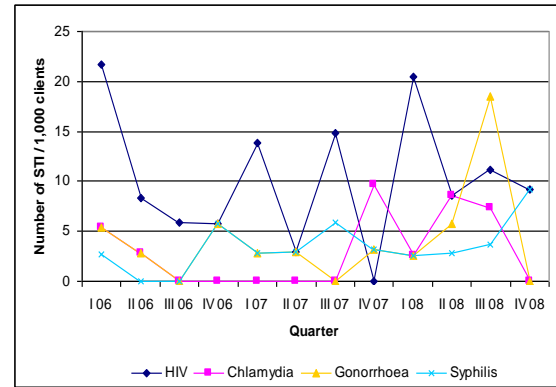
Coverage of the BORDERNETwork sentinel surveillance in comparison to register-data of the Robert Koch-Institute (cumulated data of 2006-2008)

<b>STI (%)</b>	<b>Men</b>	<b>Women</b>
HIV	36.6	21.1
Syphilis	22.1	20.8

<sup>1</sup> The sum of all reported STI via diagnosis questionnaire of 239 STI (table 3) is higher than the number of reported persons (224, table 4), due to concurrent diagnosis of two STI in 14 persons (s. II.3.3).



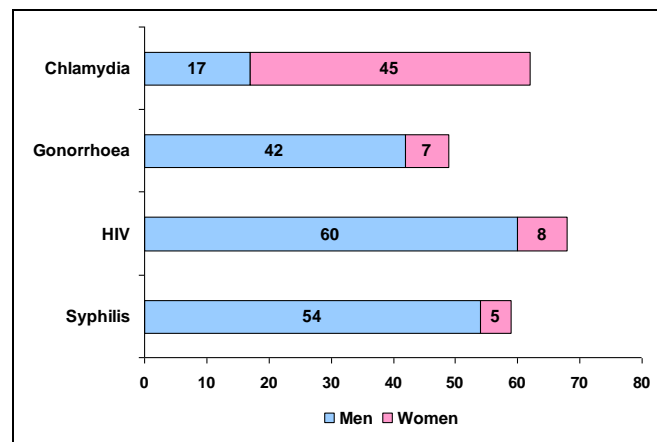
*Figure 5*  
Number of STI/1,000 clients in region Mecklenburg-Vorpommern, per quarter (monthly qu.)



*Figure 6*  
Number of STI/1,000 clients in region Brandenburg, per quarter (monthly qu.)

The reported number of STI/1,000 clients was unstable over time for the regions Mecklenburg-Vorpommern and Brandenburg (figures 5 and 6). In general, these numbers were higher in Mecklenburg-Vorpommern as in Brandenburg. There were also differences regarding the most frequent STI/1,000 clients between these regions: Chlamydia was the most frequent infection as to the numbers of tested persons in Mecklenburg-Vorpommern, HIV respectively Gonorrhoea in Brandenburg.

Analysis of the **sex distribution** showed a heavy overbalance for men regarding gonorrhoea, HIV, and syphilis (figure 7). Conversely, Chlamydia was more frequent in women.



*Figure 7*  
Number of cases by sex and infection, Germany (diagnosis questionnaire)

A previous STI was reported fairly equally in men and women (table 4). More than a quarter of patients with newly diagnosed syphilis infections were already diagnosed HIV-positive. More than a third of patients newly diagnose with gonorrhoea had that STI before (table 6).

*Table 6*  
Frequency of STI in anamnesis by infection of diagnosis, Germany (diagnosis qu.)

Previous STI (%)	Diagnosis			
	Chlamydia n=62	Gonorrhoea n=49	HIV n=69	Syphilis n=59
Chlamydia	9.7	10.2	0	0
Gonorrhoea	1.6	34.7	2.9	6.8
Hepatitis B	0	0	7.2	1.7
HIV	1.6	2.0	---	27.1
Syphilis	1.6	2.0	13.0	13.6
Other	8.1	4.0	5.7	6.8

### II.3.4. Groups at risk and risk behaviour

Besides data regarding medical details of the reported infection, estimations referring to the most likely way of transmission were collected via the diagnosis questionnaire in order to identify groups at risk and risk behaviour. Additionally, very detailed information concerning this topic was gathered via the patient questionnaire.

*Table 7*  
Most likely mode of transmission by sex, Germany (diagnosis questionnaire)

Way of transmission (%)	Men	Women
	n = 161	n = 63
MSM	54.0	---
Heterosexual contacts (not commercial)	29.8	57.1
Contact with female or male sex worker	4.3	0
Commercial sex work	0.6	28.6
other mode of transmission	1.9	0
Unknown/no answer	9.4	14.3

Main **risk of infection** in men was sex with other men (MSM) followed by heterosexual contacts (table 7). In women, the main reported mode of transmission was heterosexual contacts, followed by commercial sex work. 15.8% of sex workers were migrated. Proportions of patients having no data on risk of transmission were low.

In men who had a previous STI (n=59), the most likely mode of transmission reported was MSM (62.7%), followed by heterosexual contacts beyond sex work (16.9%). In women with previous STI (n=16), the most important mode of transmission was heterosexual contacts (50.0%), sex work was of minor importance (18.8%). Twelve of fourteen patients with newly diagnosed syphilis infections and previously diagnosed HIV-infection were MSM. Likewise, four of five patients with newly diagnosed HIV-infection and previous syphilis-infection, were MSM.

MSM was reported more frequently as the probable mode of transmission in HIV and syphilis patients compared to the proportion of MSM as mode of transmission in whole (table 8). Chlamydia-cases were overrepresented regarding heterosexual contacts and sex work as mode of transmission. The high proportion of MSM in diagnoses of HIV and syphilis was reflected in the sex distribution of these infections (figure 7).

Table 8

Mode of transmission, total and by infection, Germany (diagnosis questionnaire)

<b>Mode of transmission (%)</b>	<b>Total</b> n=225	<b>Chlamydia</b> n=62	<b>Gonorrhoea</b> n=49	<b>HIV</b> n=69	<b>Syphilis</b> n=59
MSM	38.7	4.8	38.8	60.9	54.2
Heterosexual Contacts (not commercial)	37.3	59.7	38.8	18.8	28.8
Contact with sex worker	3.1	4.8	6.1	0	1.7
Commercial sex work	8.4	24.2	10.2	0	1.7
Other way/not known/no answer	12.5	6.5	6.1	20.3	13.6

#### **II.4. Epidemiological data: Poland**

The sentinel site of the Polish region of Zachodniopomorskie was only able to report data via monthly questionnaires in the quarters I and II in 2006. Within that timeframe, 58 valid diagnosis questionnaires were sent in, reporting 54 diagnoses of Chlamydia, one diagnosis of gonorrhoea and three of HIV. There was no receipt of diagnosis questionnaires at a later date. Coming from the region Lubuskie, three valid diagnosis questionnaires were sent in 2008, documenting one diagnosis of Chlamydia, two of syphilis.

Due to that low number of valid monthly and diagnosis questionnaires coming from Polish regions, it is not possible to report meaningful epidemiological data at this point.

#### **II.5. Discussion of German and Polish data**

In Germany, the number of STI/1,000 clients by quarter (figures 5 and 6) fluctuated over time. It is most probable that this is caused by the small absolute numbers of diagnosed STI. Overall, the **epidemiological situation** of the German regions are characterised by a small number of positive diagnosis over time. No specific STI was predominantly given (table 3, figure 7).

With exception of Chlamydia, **sex proportions** of diagnosed STI showed a heavy overbalance of men (figure 7), corresponding to the proportion of men in all clients (s. II.3.2.). Men were of high impact for the epidemiological situation of the participating sentinel sites and therefore should be an important group for prevention campaigns.

Concerning the **risk of transmission**, MSM was the most important risk by far in (table 7). In women, heterosexual contacts were predominant, followed by commercial sex works. Regarding the latter, only a small proportion was migrants, most without data on origin. Concerning MSM, infections with HIV and syphilis played an important role, both newly diagnosed and anamnestic, confirming other studies<sup>1</sup> on that topic.

Coverage of the sentinel surveillance system (table 5) measured in comparison to mandatory reported data of the register of the Robert Koch-Institute, was sufficient in comparison to other sentinel surveillance systems. Nevertheless, the response rate of monthly questionnaires decreased, starting in the second midterm of 2007. We assume that this is mainly due to partly very seldom diagnosis of a STI in the rural regions of Mecklenburg-Vorpommern and Brandenburg. For this reason, it was difficult to convince physicians to integrate the surveillance system into their work flow completely regularly monthly questionnaires. This applied especially for private practitioners, of which several ended participation in the study over time. This resulted in a decreasing number of tested persons reported to the sentinel surveillance, especially in Brandenburg.

Against that background, it seems to be important to foster the acceptability of a surveillance system for STI within the institutions by having only one institution to report data to, on the one hand, for checking, analysing and publishing data on the other hand. By having only one well known system, we expect to increase the degree of popularity and therewith the commitment of the (potential) sites to that system. Therefore, we recommend running only one sentinel surveillance system in the regions of Mecklenburg-Vorpommern and Brandenburg. To create a maximum of synergies, it seems to be reasonable to integrate the BORDERNETwork sentinel surveillance into the nationwide German STD-sentinel surveillance system, which serves also all other federal states of Germany. Doing so, the already collected data of the BORDERNETwork sentinel surveillance can be used further and, additionally, can be integrated into a wider context.

Due to several difficulties, it was challenging to identify eligible sentinel sites in Poland and to have a continuous participation in the sentinel surveillance. Such difficulties were a low number of potential sites due to the centrally structured health care system and therewith only few possibilities to replace a site having problems in reporting data by another eligible site, the dispartment of the HIV- and the STI-sectors resulting in problems to convince institutions of both sectors to participate and to track HIV-infections as well as other STI. Another significant difficulty was the missing allowances for completing questionnaires, which hampered also willing institutions to convince their physicians to report data and to ask patients to complete the patient questionnaires continuously. Therefore and despite several attempts to revitalise participation, reporting of data out of Zachodniopomorskie stopped in 2006. Also in Lubuskie, reporting remained fragmentary over time.

Beside its epidemiological meaning, the sentinel surveillance approach within BORDERNETwork and the former project BORDERNET had a high impact on the improvement of health care structures on medical as well as on political level. In the frame of the sentinel surveillance, it was possible to conduct several trainings for physicians to improve diagnosis of STI, especially of Chlamydia and to increase awareness of stigmatisation of specific groups at risk such as commercial sex workers, drug users or MSM. Furthermore, the sentinel surveillance gave an important impulse to establish the gold standard for diagnostics of Chlamydia by PCR at the site in Szczecin.

The sentinel surveillance played also an important role on the political level in the Polish regions. Through frequent discussions on the particular conditions of setting up and conducting the sentinel surveillance with political stakeholders, it was possible to raise the awareness for consolidating the separated HIV- and STI-sectors with regard to a better diagnosis and treatment of patients and a more sufficient epidemiological knowledge.

All these steps contributed significantly to the development and enacting of binding aims to improve health care in a crossing border manner between German and Polish regions.

Due to the advanced stage of political cooperation between Germany and Poland in the specific regions, the sentinel surveillance seems not to be necessary any longer to support these processes. Currently, the sentinel surveillance in the Polish regions is of minor epidemiological explanatory power. Thus, we recommend closing the sentinel surveillance system in the Polish regions of Zachodniopomorskie and Lubuskie.

### III. Data of Bulgaria and Romania

#### III.1. Composition of the Sentinel-Surveillance-System

In Bulgaria and Romania, there were five sentinel sites each, covering several metropolitan, larger or provincial cities (s. appendix 3). Bulgarian sentinel sites started participation in the sentinel surveillance at the end of the Summer after a kick-off-meeting in April, Romanian sites, later in October 2009.

##### III.1.1. Features of the Sentinel Sites

All sites responded to the basic questionnaire. Four of the Bulgarian sites described their service area as “metropolitan”, one institution as “rural”. Four of the Romanian sites described their service area as “provincial”, one institution as “rural”.

In Bulgaria, all sites offered a specific HIV- and STI-**consultation**, mainly daily (4/5). In Romania, 4/5 sites offered a specific STI-consultation, 3/5 sites a specific HIV-consultation, also daily (4/5). HIV-consultation was anonymous and free of cost in all Bulgarian sites, STI-consultation was anonymous in every site, free of cost in three sites. Regarding Romania, there was anonymous testing for HIV and STIs in only one site, free of cost for HIV and STI in four resp. three sites.

The **size of the STI-sector** was bigger in Bulgaria (50-100) than in Romania (1-25), measured by the number of attended persons per month. Regarding the HIV-sector, sizes of the specific institutions differed more (Bulgaria: 20-75, Romania: 1-100).

In Bulgaria, **diagnostic** was performed mainly by site’s own laboratory (4/5) or by a hospital/university (3/5), in Romania, diagnostic was performed very differently by all kinds of laboratories.

##### III.1.2. Clientele of the sentinel sites

The estimated median proportion of men among all HIV-clients was 65.4% in Bulgaria and 52.7% in Romania, concerning STD-clients 58.3% in Bulgaria and 54.4% in Romania. The estimated median proportion of people of a foreign origin was very low in all regards (0.5-3.0%).

Table 9

Median of proportions of different risk groups of all patients of the sentinel sites, Bulgaria and Romania (multiple answers possible)

		Median (%)	
		Bulgaria	Romania
Women	Sex workers	4.6	23.3
	i.v. Drug user	15.6	0.5
	Heterosexual persons	91.8	84.8
Men	Homo-/bisexual persons	10.6	18.3
	i.v. Drug user	17.4	1.0
	Heterosexual persons	86.0	88.8

Further, the sentinel sites were questioned about the **proportion of several groups at risk**, separated by sex (table 9). Predominant group at risk were heterosexual persons.

## III.2. Response

Table 10

Response of monthly, diagnosis and patient questionnaires by region, Romania and Bulgaria

Region	Monthly Qu.	Diagnosis Qu.	Patient Qu.
Bulgaria	14	107	74
Romania	13	126	111
Total	27	233	175

Response of monthly questionnaire was equal comparing Bulgaria and Romania, despite a later start of surveying in Romania. Response of diagnosis and patient questionnaires were higher in Romania (table 10).

## III.3. Epidemiological data: Bulgaria

### III.3.1. Performed tests

14,5412 laboratory tests in 8,486 persons were reported since start of the surveillance in Bulgaria. The highest proportion of positive tests was given for Chlamydia (8.2%, table 11).

Table 11

Total number of lab tests (monthly questionnaire), number of positive tests and their proportion of the total number of lab tests (monthly questionnaire), number of sent in diagnosis questionnaires and of patient questionnaires, all by STI, Bulgaria

STI	Number of lab. tests	Positive tests (%)	Diagnosis questionnaire	Patient questionnaire
Chlamydia	848	70 (8.2)	30	30
Gonorrhoea	1,790	10 (0.6)	11	11
Hepatitis B	19	0 (0)	0	0
HIV	1,678	22 (1.3)	9	8
Syphilis	10,207	233 (2.3)	43	26

### III.3.2. Sociodemographic characteristics

Table 12

Sex distribution, mean of age, origin working situation, drug use an STI anamnesis by sex, Bulgaria (diagnosis qu.)

	Men n=68	Women n=25
Proportion (%)	76.3	23.7
Mean of age (years)	31	28
Other origin than country of diagnosis	0	4.0
Working abroad (last 3 years)	30.9	2.9*
Drug use	7.4	0
STI in anamnesis	38.2	16.0*

\*  $p < 0,05$

The proportion of men in all examined persons was 50.1%. The sex distribution within positively tested patients showed a strong overbalance in men (table 12). Migrants (defined as coming from any other country than the country of diagnosis) were very seldom within the positively tested population. Working migration was an important factor in men. Drug use was not frequent in men, not given in women.

78.6% of men and 71.4% of women who completed a patient questionnaire (n= 72) stated a complete professional education. 95.8% of men and 100% of women stated good language skills.

### III.3.3.Epidemiological situation

Syphilis was the **most frequent diagnosed infection**, followed by Chlamydia (figure 8). Regarding all infections, men were more frequent diagnosed than women.

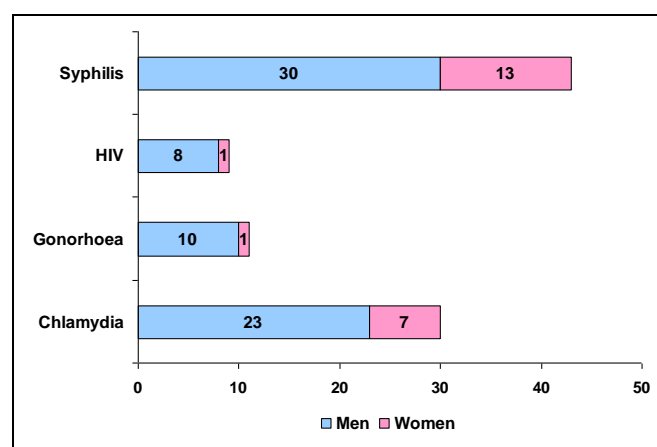


Figure 8

Number of cases by sex and infection, Bulgaria (diagnosis qu.)

A previous STI was reported for more than one third of men, frequency in women was halved (table 12). No anamnestic infections with tuberculosis were reported. We found no conspicuousities in the anamnesis of the specific, newly diagnosed STIs (table 13).

Table 13

Frequency of STI in anamnesis by infection of diagnosis, Bulgaria (diagnosis qu.)

Previous STI (%)	Diagnosis			
	Chlamydia n=30	Gonorrhoea n=11	HIV n=9	Syphilis n=43
Chlamydia	4	0	0	2
Gonorrhoea	3	1	0	3
Hepatitis B	1	0	0	3
HIV	1	0	---	2
Syphilis	1	2	0	2
Tuberculosis	0	0	0	0

### III.3.4. Groups at risk and risk behaviour

In addition to the data collected via the diagnosis questionnaire, very detailed information concerning risk behaviour were gathered via the patient questionnaire. A first analysis of these data will be given below.

Most frequent **risk of transmission** was heterosexual contacts, in both sexes (table 14). There were not many diagnosis questionnaires without data on risk of transmission in men, no in women. In men, MSM and contact to a sex worker were also given risks, but much less frequent.

*Table 14*  
Most likely mode of transmission by sex, Bulgaria (diagnosis qu.)

%	Men n = 68	Women n = 25
MSM	14.7	---
Heterosexual contacts (not commercial)	57.4	88.8
Contact with female or male sex worker	10.3	0
Commercial sex work	1.5	12.0
Unknown/no answer	10.3	0

MSM was reported more frequently as the probable mode of transmission in HIV and syphilis patients compared to the proportion of MSM as mode of transmission in whole (table 15). There were also higher proportion of HIV regarding contact to a sex worker or commercial sex work as risk of transmission, compared to the proportions of these risk overall.

*Table 15*  
Mode of transmission, total and by infection, Bulgaria (diagnosis qu.)

Mode of transmission (%)	Total n=94	Chlamydia n=30	Gonorrhoea n=11	HIV n=9	Syphilis n=43
MSM	10.6	3.3	9.1	22.2	20.9
Heterosexual contacts (not commercial)	64.9	80.0	72.7	11.1	58.1
Contact with sex worker	7.4	3.3	9.1	44.5	7.0
Commercial sex work	4.3	3.3	0	22.2	4.7
Not known/no answer	12.8	10.0	9.1	0	9.3

Via the patient questionnaire, patients reported the probable **source of their current STI** (table 16). There were distinct differences between men and women. In men, a casual sex partner was most frequently source of infection, in women their regular partner, but with a high proportion of “unknown” within women.

*Table 16*  
Source of infection by sex, Bulgaria (patient qu.)

%	Men n = 35	Women n = 37
Regular partner	8.6	27.0
Casual partner	57.1	13.5
By sex worker	5.7	0
By suitor	0	5.4
Unknown/no answer	28.6	54.1

As an important behaviour for reducing risk of infection on an individual level, data regarding the frequency of condom use were collected via the patient questionnaire, separate for sexual contacts with regular partners and casual sex partners (table 17). Regarding **sexual contacts with a regular partner**, about a half of women and 40% of men reported to use a condom not every time. Only 8.3% in men and no women reported to “always” use condoms.

Regarding **sexual contacts with casual sex partners**, even a higher proportion of men stated not to use a condom every time, the proportion of women making no statement with reference to their condom use with casual sex partners was very high. For 80% of men never using a condom with casual sex partners, mode of transmission were heterosexual contacts.

*Table 17*  
Frequency of condom use by kind of partner and sex, Bulgaria (patient qu.)

Condom use (%)	Regular partner		Casual sex partner	
	Men n=35	Women n=37	Men n=35	Women n=37
Always	8.3	0	8.6	0
Often/sometimes	2.9	19.9	31.4	13.5
Never	37.1	32.4	25.7	8.1
No sex with such partner	11.4	8.2	5.7	8.1
Not known/no answer	37.1	40.5	28.6	70.3

25.7% of men and 8.1% of women stated drug use at the presumed time of infection.

### **III.4. Epidemiological data: Romania**

#### **III.4.1. Performed tests**

852 laboratory tests in 835 persons were reported since start of the surveillance in Romania. There were very high proportions of positive tests compared to the number of performed examinations, the highest was given for syphilis (49.1%, table 18).

*Table 18*

Total number of lab tests (monthly questionnaire), number of positive tests and their proportion of the total number of lab tests (monthly questionnaire), number of sent in diagnosis questionnaires and their proportion of number of positive tests and number of patient questionnaires and their proportion of number of sent in diagnosis questionnaires, all by STI, Romania

STI	Number of lab. tests	Positive tests (%)	Diagnosis questionnaire (%)	Patient questionnaire (%)
Chlamydia	82	11 (13.4)	11	10
Gonorrhoea	69	2 (2.9)	2	2
Hepatitis B	0	0 (0)	0	0
HIV	529	10 (1.9)	10	5
Syphilis	212	104 (49.1)	103	94

#### **III.4.2. Sociodemographic characteristics**

The proportion of men in all examined persons was 29.1%. The sex distribution within positively tested patients showed a strong overbalance in men (table 19). There were no migrants (defined as coming from any other country than the country of diagnosis) within the posi-

tively tested population. Equal shares of men and women worked abroad within the last three years, having consistent data of the diagnosis and the patient questionnaires. Drug use was not frequent in men and in women.

*Table 19*

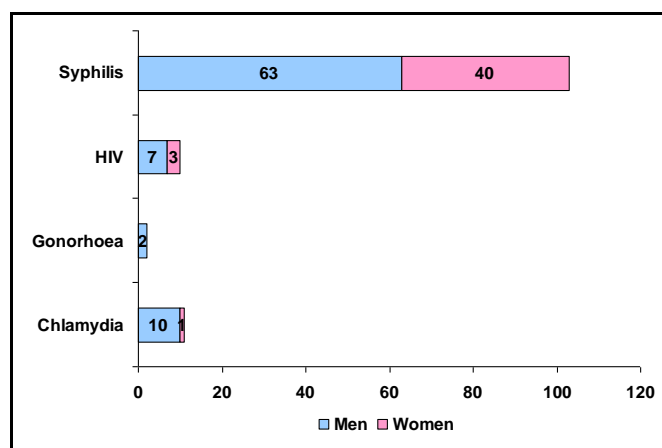
Sex distribution, mean of age, origin working situation, drug use an STI anamnesis by sex, Romania (diagnosis qu.)

	Men n=82	Women n=45
Proportion (%)	65.1	34.9
Mean of age (years)	31	30
Other origin than country of diagnosis	0	0
Working abroad (last 3 years)	17.1	13.3
Drug use	2.1	2.2
STI in anamnesis	12.1	8.9

81.9% of men and 64.9% of women who completed a patient questionnaire (n= 109) stated a complete professional education. 97.1% of men and 89.2% of women stated good language skills.

### III.4.3.Epidemiological situation

Syphilis was the **most frequent diagnosed infection** by far, all other infections were distinct less frequent (figure 9). Regarding all infections, men were more frequent diagnosed than women.



*Figure 9*

Number of cases by sex and infection (diagnosis qu.)

Shares of men and women having a previous STI were nearly equal (table 19). No anamnestic infections with tuberculosis were reported. We found no conspicuities in the anamnesis of the specific, newly diagnosed STIs (table 20).

*Table 20*  
Frequency of STI in anamnesis by infection of diagnosis, Romania (diagnosis qu.)

Previous STI (%)	Diagnosis			
	Chlamydia n=11	Gonorrhoea n=2	HIV n=10	Syphilis n=103
Chlamydia	1	0	0	0
Gonorrhoea	2	0	0	7
Hepatitis B	0	0	0	2
HIV	0	0	---	0
Syphilis	0	0	0	2
Tuberculosis	0	0	0	0

#### III.4.4. Groups at risk and risk behaviour

Most frequent **risk of transmission** was heterosexual contacts, in both sexes (table 21). There were not many diagnosis questionnaires without data on risk of transmission. In men, contact to a sex worker was also a noticeable risks, MSM was not of importance

*Table 21*  
Most likely mode of transmission by sex, Romania (diagnosis qu.)

%	Men n = 82	Women n = 45
MSM	3.7	---
Heterosexual contacts (not commercial)	67.1	93.3
Contact with female or male sex worker	20.7	0
Commercial sex work	0	4.5
Unknown/no answer	8.5	2.2

Proportions of risks of transmission by infection were distributed equally for syphilis (table 22). Risk of transmission for all cases of Chlamydia was heterosexual contacts. Regarding HIV, 60% of cases were reported without indication of risk of transmission.

*Table 22*  
Mode of transmission, total and by infection, Romania (diagnosis qu.)

Mode of transmission (%)	Total n=127	Chlamydia n=11	Gonorrhoea n=2	HIV n=10	Syphilis n=103
MSM	2.4	0	0	10	1.9
Heterosexual contacts (not commercial)	76.4	100	50	20	79.6
Contact with sex worker	13.4	0	50	10	14.6
Commercial sex work	1.6	0	0	0	1.9
Not known/no answer	6.3	0	0	60	1.9

Via the patient questionnaire, patients reported the probable **source of their current STI** (table 23). There were distinct differences between men and women. In men, a casual sex partner was most frequently source of infection; also contact to a commercial sex worker was frequently reported. Most frequent sources of infection in women were their regular partners, casual partners were also frequent.

Table 23  
Source of infection by sex, Romania (patient qu.)

%	Men	Women
	n = 72	n = 37
Regular partner	13.9	54.1
Casual partner	47.2	24.3
By sex worker	23.6	0
By suitor	1.4	0
Unknown/no answer	13.9	21.6

Regarding **sexual contacts with a regular partner**, more than half of men and more than three quarters of women reported to use a condom not every time (table 24). Only 2.8% in men and no women reported to “always” use condoms.

Regarding **sexual contacts with casual sex partners**, no men or women stated to use always a condom in such a case. Of men never using a condom with casual sex partners, mode of transmission were heterosexual contacts in 66.7% of all cases, 22.2% contacts to a commercial sex worker.

Table 24  
Frequency of condom use by kind of partner and sex, Romania (patient qu.)

Condom use (%)	Regular partner		Casual sex partner	
	Men	Women	Men	Women
	n=72	n=37	n=72	n=37
Always	2.8	0	0	0
Often/sometimes	1.4	2.7	27.8	8.2
Never	55.6	75.7	25.0	13.5
No sex with such partner	25.0	10.8	18.1	45.9
Not known/no answer	15.2	10.8	29.1	32.4

27.8% of men and 2.7% of women stated drug use at the presumed time of infection.

### III.5. Discussion of Bulgarian and Romanian data

There are some **limitations** in interpreting the given data of Bulgaria and Romania. All data reported in the chapters II.10 and II.11 have to be seen as preliminary. Due to the small numbers of completed questionnaires, conclusions on that data could differ having a more extensive surveillance period. On the actual basis, it was not possible to outline any time trends. Another limitation concerns the limited number of diagnosis and patient questionnaires in Bulgaria. It is not clear whether proportions of sex, risk of transmission etc. can be generalised to all infections reported via the monthly questionnaire. The number of diagnosis and patient questionnaires should be increased. By now, the sentinel surveillance only describes the epidemiological situation in the cities covered by sentinel sites, but not in the two countries as a whole.

Syphilis had a high impact on the **epidemiological situation** of the sentinel sites, both in Bulgaria and Romania. Regarding syphilis, we found a very high proportion of positive diagnosis of syphilis tests, to a more limited degree also concerning Chlamydia. In the scope of a follow-up workshop with the sentinel sites in Sofia on 6.3.2009, it was discussed whether this is due to a very late presenting of STI patients in the sentinel sites. The question could not be clarified at this point and has to be analysed further. Diagnostic procedures for Chlamydia

have to be improved partly, because not in all sentinel sites PCR is used, but serological methods which are known to be not as specific as PCR and therefore overestimate prevalence of infections.

We found high proportions of men in all reported STI in Bulgaria and Romania, especially compared to **sex proportion** in all examinations, which were fairly equal between men and women. In Bulgaria, also previous STIs were more frequent in men than in women. Considering that nearly all infections were reported to be transmitted via heterosexual contacts, it is questionable why there were not fairly equal shares of men and women, regarding both populations of examined and positively tested persons. During the follow-up-workshop, it was discussed whether men are more likely to become tested and diagnosed due to heavier symptoms. Because in many other countries proportions of sexes are contrary, this question has also to be analysed further.

For both countries, heterosexual contacts beyond commercial sex work were the most frequent **risks of transmission** by far. In Romania, contacts to commercial sex workers were an additional important risk factor. MSM was not of high importance. In Romania, 6/10 infections with HIV were without reported risk of transmission. It has to be clarified whether especially these infections could be diagnosed in MSM; who did not want to disclose their sexual orientation. If so, steps have to be undertaken to empower MSM to accept their sexual orientation and, therewith, becoming accessible for specially tailored prevention campaigns. In both countries, casual sex partners played an important role for getting an STI in men, regular partners for women.

In Bulgaria, we found a special risk profile as to infections with HIV: contrary to the other infections, MSM, contacts to and work as commercial sex workers were the main risks of transmissions. Also in syphilis cases, MSM was distinctly more frequent than in the total of all reported infections.

Concerning **condom use** as one of the most effective methods to reduce risk of transmission of an STI, proportions of men using not always a condom with casual sex partners were very high. In women, the proportions were lower, but also grave. Men and women in both countries did use condoms seldom with their regular partners. At first, this seem to be not as important as using condoms with casual sex partners, but a quarter of Bulgarian and half of Romanian women stated that they got infected by their regular partner, so sex with a regular partner is also an important source of infection. These data seem to be an important reason to strengthen campaigns to increase use of condoms, even in this early phase of analysis.

Analysing the data, migration and sex work were not of high importance to the epidemiological situation. In the scope of the follow-up workshop in March 2009, it became clear that Roma are an important group at risk having special risk patterns, but were not measured because they are of Bulgarian resp. Romanian origin. Documentation will be fitted to allow for analysis of this factor.

Concerning sex work, it seemed that the participating sentinel sites cover the population of sex workers insufficiently. Steps will be done to include more sites having larger proportions of sex workers.

Overall, the sentinel surveillance system in Bulgaria and Romania could be established and started to work quite efficiently, despite the initial constriction of missing compensation of documentation efforts. Sentinel sites were highly motivated during the follow-up workshop. Besides some difficulties on methodological level, which can be solved in future, the sentinel surveillance is of great benefit for the participating regions in terms of improvement of epidemiological and behavioural knowledge and of setting up appropriate prevention tasks. The acceptance of the system increased significantly while setting up the study and is on a high

level now. Against that background, we recommend to continue the sentinel surveillance in Bulgaria and Romania.

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- Appendix 2 Nomination of the regions
- Appendix 3 List of sentinel sites
- Appendix 5 Index of figures
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### *Appendix 1: Glossary*

**Case definitions:** obligatory definitions for measurement of infections resp. diseases via use of specified diagnostic methods. Important to estimate quality of reported data and to ensure possibility of comparison of data reported by different sites

**HIV- resp. STI-consultation:** Consultation at the sentinel sites including diagnostics and treatment of HIV resp. of other STIs. Counselling could be existing sometimes, but is not obligatory

**Modes of transmission (risk of infection):**

- (Commercial) sex work: sexual contact of a male or female prostitute to a suitor, for which the person received cash, drugs or accommodation
- Contact with female or male sex worker: sexual contact of a suitor to a sex worker of the same or the different sex
- Heterosexual contacts (not commercial): sexual contacts between people of different sex beyond commercial sex work
- MSM: Men who have sex with men (category that was defined because not all men who have sex with men define themselves as homo- or bisexual due to cultural or religious reasons)

**Sentinel (sentinel site):** an institution of medical care that is part of a sentinel-surveillance reporting system

**Surveillance (sentinel-surveillance):** monitoring system for gathering epidemiological data to detect trends and outbreaks of monitored events in selected sentinel sites

**Types of sentinel sites:**

- Hospital based STI-clinics: STI-clinics that are affiliated to a hospital or university which do not hospitalize patients, but only diagnose and treat them outpatient
- Private practitioners: physicians that are not employed by a public health office, a university or a hospital, but work on a private basis
- Public health offices: health care institutions that are run by the local government

**Appendix 2: Nomination of the regions**

Definition	Abbreviation	Region
Region 1	DE 1	Mecklenburg-Vorpommern
Region 2	PL 1	Zachodniopomorskie
Region 3	DE 2	Brandenburg
Region 4	PL 2	Lubuskie

**Appendix 3: List of sentinel sites (state of date: 15.3.2009)**

Nr.	Name	Adress	Branch of Study etc.
<b>Mecklenburg-Vorpommern (D)</b>			
1.	Dr. med. Renate Leis	An den Wurthen 22 17489 Greifswald	Gynaecologist
2.	Dipl.-Med. Eva Fischer	Mendelejewweg 16 17491 Greifswald	Venerologist
3.	Dr. med. Ingo Besthorn	Hufelandstr. 1 17438 Wolgast	Gynaecologist
4.	Dr. med. Elke Giehm	Knieperdamm 2 18435 Stralsund	Dermatologist
5.	Dr. med. Kerstin Neuber	St.-Georg-Str. 109 18055 Rostock	Gesundheitsamt Rostock
6.	Dr. med. Angelika Krzyzanowski	Heide 1 18055 Rostock	Gynaecologist
7.	Dr. med. Frank-Michael Putlitz	Kolumbusing 58 18106 Rostock - Schmarl	Gynaecologist
8.	Dr. med. Frank Michael Mäß	Pferdemarkt 11 18273 Güstrow	Gynaecologist
9.	Dr. med. Biedermann	Wismarsche Str. 397 19055 Schwerin	Helios-Klinik
10.	Petra Hermann	Woldegker Str. 4 17033 Neubrandenburg	Gesundheitsamt, SG Hygiene und amts- ärztlicher Dienst
11.	Dr. med. Christiane Albus	Hans-Beimler-Str. 1-3 17489 Greifswald	Gynaecologist
12.	Dr. med. Karin Behl	Bleistraße 13 18439 Stralsund	Gynaecologist
13.	Dipl. med. Heike Stein	Knieperdamm 2 18435 Stralsund	Dermatologist
14.	Prof. Dr. M. Jünger	Fleischmannstraße 42-44 17475 Greifswald	Universitätsklinikum Greifswald Direktor der Klinik und Poliklinik für Hautkrank- heiten
15.	Dr. med. Matthias Lademann	Ernst-Heydemann-Str. 6 18057 Rostock	HIV-Ambulanz Uni- Klinik Rostock

**Zachodnie-Pomorskie (PL)**

16.	Wojewódzka Przychodnia Wenerologiczna	Skórno- ul. Piłsudskiego 40/42 70-421 Szczecin	bezirkliches Krankenhaus
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**Brandenburg (D)**

Nr.	Name	Adress	Branch of Study etc.
17.	Frau Würzburg	Puschkinpromenade 25 03044 Cottbus	Stadtverwaltung Cottbus Gesundheitsamt Beratungsstelle für Aids und sexuell übertragbare Krankheiten
18.	Frau Ringk	Leipziger Straße 53 15232 Frankfurt (Oder)	Stadt Frankfurt (Oder) Gesundheitsamt Beratungsstelle für Aids und sexuell übertragbare Krankheiten
19.	Frau Petschke	Postfach 10 01 36 03141 Forst	Landkreis Spree-Neiße Gesundheitsamt AIDS-Beratung
20.	OA Dr. W. Güthoff	In der Aue 59-61 14480 Potsdam	Klinikum „Ernst von Bergmann“ Infektionsambulanz und Schwerpunktpraxis Dermatologist
21.	Dr. med. M. Winkler	Marktplatz 4 15230 Frankfurt (O.)	
22.	Amtsärztin Carola Kaiser	Stadtverwaltung Potsdam Gesundheitsamt – Aids-Beratung Friedrich-Ebert-Straße 79/81 14461 Postdam	GA Potsdam
23.	Dr. sc. med. Rudolf Markus	Leipziger Straße 18 15232 Frankfurt/Oder	HIV-Praxis
24.	Dr. med. Susanne Jantsch	Leipziger Straße 46 03048 Cottbus	Dermatologist
25.	Dr. med. Niemann	Jacobstraße 10 14776 Brandenburg	Gynaecologist
26.	Dr. med. Sigrid Blisse	J.-R.-Becher-Straße 24 15711 Königs-Wusterhausen	Dermatologist
27.	Dr. med. Niedermeyer	Fürstenberger Straße 1 15890 Eisenhüttenstadt	Dermatologist

#### Lubuskie (PL)

28.	Testing Point and HIV/AIDS Counselling Centre Zielona Góra		
29.	Head of Service – Ja- cek Smykał M.D. Szpital Wojewódzki in Zielona Góra Infectious Diseases Department	ul. Zyty 26 65-046 Zielona Gora	

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## ***Literature***

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