

Sexual and reproductive health services for people living with HIV/AIDS in Germany: are we up to the challenge?

M. C. Mueller · C. Walentiny · U. Seybold ·
C. Nöstlinger · T. Platteau · R. Borms ·
R. Draenert · J. R. Bogner

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Abstract

Purpose Germany is witnessing an increase in the number of new infections with human immunodeficiency virus (HIV). Enabling persons living with HIV (PLHIV) to adopt safer sex practices might contribute towards reducing the incidence of HIV infections. The aim of this study was to identify gaps in the sexual and reproductive health (SRH) services provided to PLHIV in Germany.

Methods Within the framework of the European public health project Eurosupport 5, self-reported questionnaires were distributed to PLHIV and a survey of SRH-service providers was carried out. The completed questionnaires and survey results were analysed.

Results Of the questionnaires distributed, 218 PLHIV (90 % men, 10 % women) returned a completed questionnaire. Of these, 74 % self-identified as men having sex with men (MSM) and 13 % as heterosexual men. MSM reported a median number of ten casual partners in the previous 6 months and unprotected sex in one-third of anal intercourses with casual partners, demonstrating that this group adopted more risky sexual behaviours than heterosexual PLHIV. Even though all PLHIV stated they would appreciate more support and service providers indicated that they provided a wide range of SRH services, SRH-relevant topics were rarely discussed between PLHIV and service providers. According to the patients' perception, shortage of time, lack of initiative by service providers and their own difficulty to address SRH-related topics were the most relevant obstacles to receiving satisfactory support.

Conclusion Many PLHIV consult their HIV-physician regularly for medical follow-up and also indicate that HIV-physicians should be the source of information concerning SRH counselling. HIV-physicians should take advantage of their key role in HIV care and strengthen their efforts to integrate SRH services in routine HIV care.

M. C. Mueller and C. Walentiny contributed equally to this work.

M. C. Mueller (✉) · U. Seybold · R. Draenert · J. R. Bogner
Sektion Klinische Infektiologie, Medizinische Klinik und
Poliklinik IV, Klinikum der LMU, Pettenkoferstr. 8a,
80336 Munich, Germany
e-mail: Matthias.Mueller@med.uni-muenchen.de

C. Walentiny
Department of Infectious Diseases and Tropical Medicine
(DITM), University Hospital, Ludwig-Maximilians
University, Munich, Germany

C. Nöstlinger
Department of Public Health, Institute of Tropical
Medicine, Antwerp, Belgium

T. Platteau
Department of Clinical Sciences, Institute of Tropical
Medicine, Antwerp, Belgium

R. Borms
Sensoa, Flemish Expertise Centre for Sexual Health,
Antwerp, Belgium

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Introduction

In Germany the number of newly diagnosed infections with human immunodeficiency virus (HIV) rose continuously between the 1990s and 2007 from approximately 2,000 to around 3,000 new cases per year. Since 2007 the number has remained stable until the present [1]. Many studies have shown that persons living with HIV (PLHIV) remain

sexually active after their HIV diagnosis and adopt sexual risk reduction strategies which are only partially effective [2–5]. This has led to the emergence of a new concept to curb ongoing transmission of HIV, namely, ‘positive prevention’. The aim of this approach is to educate and enable PLHIV to adopt safer sex practices, embedded in a comprehensive and rights-based context of health promotion [6, 7].

In Germany, sexual and reproductive health (SRH) services are provided by the public health system, non-governmental organisations and support groups. The public health system delivers SRH services mainly through local health authorities, general practitioners, urologists, gynaecologists and dermato-venerologists. PLHIV can also be provided with additional sources of support, such as HIV-specialised physicians and specialised psychosocial consultations, which are mostly provided by HIV clinics and support groups.

The aim of this study was to analyse the needs of PLHIV with regard to SRH, the SRH services offered to PLHIV and the interaction between PLHIV and SRH-service providers to identify existing gaps in SRH services for PLHIV in Germany.

Methods

Data collection and procedures

Responses to questionnaires distributed in Munich in the framework of Eurosupport 5 (ES 5), a European public health project funded by the European Union, are analysed. Munich was the only participating study centre in Germany and the Institute of Tropical Medicine (based in Antwerp, Belgium) was the coordinating centre. Institutional Review Board (IRB) approval was provided by the IRB of the Institute of Tropical Medicine and the University of Antwerp. Two instruments were used: a self-reported questionnaire for patients and a survey for health care providers (HCPs). The ES 5 study group developed a self-reported, standardised and anonymous questionnaire for PLHIV that includes questions on (1) demographic background characteristics, (2) general health-related aspects, (3) mental health, (4) sexual health, and (5) provision of HIV services. The questionnaire was distributed to consecutive patients between March and October 2007 at the collaborating sites in Munich (University of Munich HIV outpatient clinic, two private practices specialised in HIV medicine, a centre for psychosocial consultations for PLHIV based at the Department of Dermatology at the University of Munich and by two HIV-specialised support groups). The questionnaire was accompanied by a pre-paid envelope addressed to the coordinating study centre at the

Institute of Tropical Medicine of Antwerp. Inclusion criteria for study participants were voluntary participation and the ability to read and comprehend the questions and to understand the study goals and objectives; an additional criterion was being aware of the diagnosis of a HIV infection for at least 6 months.

The objective of the service provision questionnaire was to detect strengths and gaps in the current provision of SRH services for PLHIV. In Munich the survey was disseminated as a paper–pencil version and completed by the above-named service providers.

Statistical analysis

Data analysis was performed using the Statistical Package for Social Science (SPSS 17.0; SPSS, Chicago, IL). Descriptive analysis was carried out employing frequency analysis, and the results were described by central tendency, dispersion and distribution, where appropriate. Significant differences were defined as *p* values of < 0.05 or as not overlapping of 95 % confidence intervals.

Results

Results of the self-reported patient questionnaire

Sociodemographic data

In Germany 218 HIV-positive patients (90 % men, 10 % women) completed the questionnaire, which was a response rate (returned completed questionnaires/all delivered questionnaires) of 47 %. Of these, 74 % self-identified as homo- or bisexual men [men having sex with men (MSM)] and 13 % as heterosexual men. Among the 218 patients, 20 % were migrants, of whom 35 came from European countries and eight from other continents (4 Asia, 2 Africa, 2 South America); 11 were women and 32 were men.

The median age of the respondents was 43 (range 18–85) years; 64 % were employed, 25 % were retired, 7 % were permanently disabled, and 2 % were students.

Health status

Most of the respondents described themselves as being rather satisfied with their general health status (mean score of 7.3 on a visual analogue scale from 0 to 10). The self-reported mean number of CD4 cells was 506/mm³ (range 26–1,604/mm³). At the time of data assessment, 83 % of the study population took antiretroviral medication. Of those who took antiretroviral therapy (ART) and reported

their most recent viral load measurements, 83 % indicated to have a viral load below the limit of detection.

Sexual and reproductive health

Most PLHIV continued to be sexually active after learning about their HIV diagnosis (Table 1). Fifty-six percent of PLHIV always used a condom with their steady partner; for MSM and heterosexuals this value was 53 and 64 %, respectively. This difference was not statistically significant ($p = 0.46$). Forty-nine percent of respondents always used a condom during sexual intercourse with casual partners: 47 % of MSM and 70 % of heterosexuals. This difference did not reach statistical significance ($p = 0.35$). Figure 1 shows that rates of condom use in MSM and heterosexual men were generally higher in sexual encounters with casual than with steady partners. Heterosexual men in particular showed a high rate of condom use with casual partners, while women showed a low rate of condom use in sexual

encounters with casual and steady partners. These results were assessed separately for steady and casual partners by the questions: “In the last 6 months, how many times did you have sex with your steady/a casual partner?” and “In the last 6 months, how many times did you use condoms when having sex with your steady/a casual partner?” For each question, respondents had to state the frequency of having vaginal, active and passive anal sex.

The median number of casual partners in the last 6 months was ten for MSM (range 0–120), 2.5 (range 1–10) for heterosexual men and one (range 0–2) for women. Of the 50.3 % of MSM responding to the relevant questions, 50.0 % had only casual sexual partners with unknown HIV status, while 15.5 % had exclusively casual sexual partners with known HIV status and 34.5 % sometimes had casual partners with known, other times with unknown HIV status. Thus, 84.5 % of MSM responding to the questions had sexual casual partners with unknown HIV status (assessed by the questions: “In the last 6 months, how many casual sex partners did you have?” and “What was the HIV-status of these partners?” Participants had to provide the numbers of partners with positive, negative or unknown HIV status). Among the MSM and heterosexuals who responded, 43 and 64 %, respectively, disclosed their HIV status to none of their casual partners, and 11 and 18 %, respectively, to all of them ($p = 0.27$). The situation was different with respect to steady partners: here 82 % of MSM and 89 % of heterosexual respondents informed their partner about their HIV status.

There was no statistically significant correlation between having a suppressed viral load or being under

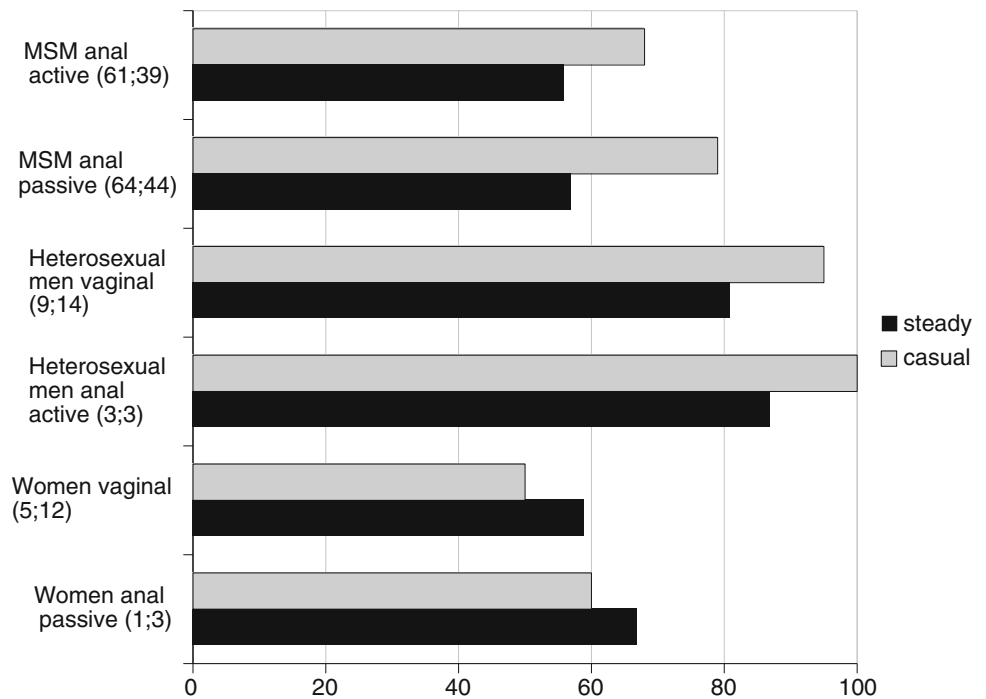
Table 1 Answer to the statement “I changed my sexual behaviour since knowledge of HIV diagnosis by not having sex”^a

Answer	MSM	Heterosexual men	Women
No	77 % (125)	62 % (18)	84 % (16)
Yes	23 % (37)	38 % (11)	16 % (3)

HIV, Human immunodeficiency virus; MSM, men having sex with men

^a Data are presented as the percentage of respondents with the number given in parenthesis

Fig. 1 Average percentage (mean) of protected sexual intercourses according to sexual practice and steady or casual nature of the partnership per group. The number of respondents are given in parenthesis, with the first number indicating the number of sexual encounters with casual partners and the second number indicating the number of sexual encounters with steady partners. *MSM* Men having sex with men



ART on the one hand and having unprotected sexual intercourse with casual partners on the other hand.

Of the 22 women in our sample, eight (36 %) became pregnant after their HIV diagnosis. Overall, 13 % of the study population desired to have (more) children: 9.6 % of MSM and 22 % of heterosexual men and women expressed the wish to have children.

Patients' perception of service provision

Study respondents reported discussing issues concerning SRH mainly with their HIV-physician (83 %); HIV counsellors (15 %), psychologists (16 %) and general practitioners (16 %) played a less important role (multiple answers were possible). However, most SRH-related matters were rarely discussed. For example, 84 % of the participants answered that they (almost) never had talked about condom use and 74 % of the women stated that they (almost) never had discussed how to reduce the risk of infection with HIV during conception (for a more in detail analysis, see Fig. 2). In only 6 % of cases did the HCP herself/himself exclusively address SRH issues, while 45 % of patients stated that they alone addressed these issues [assessed by the question "Who

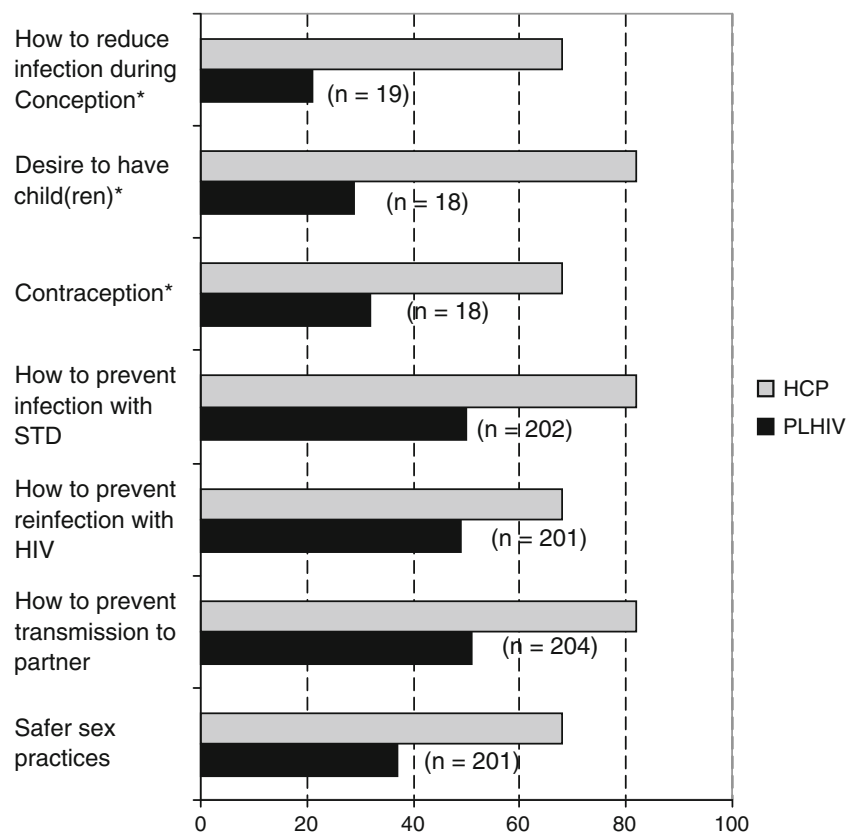
addresses these (SRH-) topics?" Answer: myself, HCP and myself or HCP]. Forty-three percent of the participants replied that they consulted no other medical or psychosocial service beside their HIV-physician. Forty-seven percent of the women also reported consulting a gynaecologist in addition to their HIV-provider. Of the PLHIV respondents 96 % believed that the HIV-physician would be the appropriate person to discuss SRH themes, followed by the HIV counsellor (78 %), psychologist (63 %), sexologist (58 %) and general practitioner (43 %). However, respondents were not always satisfied with service delivery: the points which were most often criticised included lack of time to discuss SRH issues (22 %), caregivers not addressing the issue (30 %) and difficulties in talking about safer sex practices with service providers (21 %). Altogether, 71 % of the participants would appreciate more support by their HCPs.

Main results from the service provider questionnaire

Guidelines

None of the six institutions stated that they had developed or adopted a policy guideline, an evidence-based

Fig. 2 Comparison of the perception of persons living with HIV (PLHIV) and HIV health care providers (HCPs): percentage of PLHIV or HCPs stating that a given topic is routinely discussed. In the case of PLHIV, this represents the percentage of respondents that stated the topics to be sometimes, almost always or always discussed, respectively. *n* Number of participants who answered the relevant question, *asterisk* only answers of women were considered. In the case of HCPs, value represents the percentage of centres stating to offer these services. Four or five of the six centres answered each of the questions. *STD* Sexually transmitted disease



intervention model or a documented standard operating procedure with respect to the integration of SRH topics in HIV-related services.

Areas covered in service provision

The medical HIV care facilities spent 50–60 % of their time on medical issues, 0–25 % on psychological issues, a maximum of 10 % on social issues and sexual health; reproductive health (RH)-related issues received little attention (0–5 %). Support organisations spent more time on psychological issues (10–30 %), social issues (10–30 %) and sexual health (15–30 %), while RH issues received as little attention as that provided by the HIV care facilities.

Training

In two of the medical centres staff received training on a regular basis on medical HIV treatment. In one medical centre training was provided for dealing with psychological problems. No one on the medical staff of the centres reported having been trained on sexual or RH issues. Staff of support organisations only received regular training on SRH issues in one organisation.

Service provision relating to sexual health topics

One medical practice stated that sexual health topics were not at all included in their services. The remaining five centres stated that they offer a wide range of services concerning sexual health, which were always discussed in a face-to-face consultation. All five centres stated that both the HCP and PLHIV usually would take the initiative to address sexual health issues.

Services relating to RH

One support organisation reported referring patients to a specialised centre to discuss all RH-related issues. All the other centres included a broad range of topics that integrated RH into their services. In two centres the initiative to talk about RH issues came from both the HCP and the PLHIV, in three centres from the PLHIV alone.

The comparison between the SRH services offered by HCPs and the perceived support of PLHIV in terms of SRH topics revealed an important discrepancy. While HCPs claimed to discuss a broad range of SRH topics on a regular bases, only 24–52 % of PLHIV (according to the specific SRH topic) reported having received these services in a consistent manner (Fig. 2).

Discussion

Against the background of ongoing HIV transmission in Germany and the fact that positive prevention contributes to a reduction in risky sexual behaviour of PLHIV [8–10], we investigated the need for and the functioning of SRH services provided to PLHIV in Munich, Germany.

With regard to sexual risk behaviour (i.e. unprotected anal or vaginal sex with changing partners), MSM reported a median number of ten casual partners over a period of 6 months. About one-third of anal intercourses with casual or main partners occurred without protection, and more than half of the casual sex partners were not informed about the respondent's HIV status. Unprotected sex with casual partners was not associated with suppressed viral load or treatment status, and half of the MSM had never been informed of the HIV status of their casual partners. This finding demonstrates that harm reduction strategies aimed at reducing the transmission of HIV, such as sero-sorting or only having unprotected intercourse when having an undetectable viral load, probably did not play a major role in determining sexual behaviour. The KABASTI study, which assessed knowledge, attitudes and behaviour of MSM towards sexually transmitted diseases (STDs) in Germany, demonstrated a similar risk-profile for HIV-positive MSM with regards to number of casual partners, rate of condom use and attitude towards harm reduction strategies. The KABASTI findings therefore corroborate our conclusions that HIV-positive MSM in particular still adopt risky sexual behaviours [11].

Our analysis of issues of sexual health among women showed that this group had the lowest rate of condom use in sexual encounters with steady and casual partners. These women also had the lowest number of casual partners compared to heterosexual men and MSM. Findings of the overall European study ES 5 showed that negative predictors for condom use by HIV-positive women were childbearing and miscarriage since HIV diagnosis, among others [12]. In October 2012, the German–Austrian recommendations on the diagnostics and treatment of HIV discordant couples who wish to have children were integrated into the EKAF (Federal Commission for AIDS) statement which stated that natural conception is as an equivalent option for discordant couples in addition to self-insemination or sperm washing if a number of conditions were met, including: the infected partner has had an undetectable viral load for at least 6 months, is adherent to his/her HIV medication, has his/her viral load regularly monitored and has no other sexually transmitted infections [13, 14]. Furthermore, low rate of condom use for women may be explained by the fact that women are not always able to exert immediate control of condom use and need to negotiate it, which may require disclosure of HIV status.

The latter can be a complex and complicated issue for many women.

Vice versa, the immediate control of condom use may be the reason that heterosexual men, who had more sexual encounters with casual partners than women, almost always used condoms, especially with casual partners.

In reaction to the national and international discussion following the EKAF statement in 2008, the German AIDS Society (DAIG) published a statement on the infectiousness of PLHIV under ART in October 2010 [13, 15]. The DAIG concludes that in stable discordant relationships, the uninfected partner may take the decision to discontinue using condoms after “in-depth information and counselling” if specific conditions are met. These include an undetectable viral load for at least 6 months, being adherent to HIV medication, regular monitoring of the viral load and the absence of any other STDs. Since its publication, the DAIG statement has endorsed by the findings of the so-called HPTN 052 trial, which showed that ART effectively reduces the rates of sexual transmission in serodiscordant couples [16]. The low rates of condom use in combination with a high rate of disclosure of sero-status in the group of PLHIV with steady partners may indicate that couples made their decision on condom use based on their own risk–benefit analysis, anticipating the EKAF and DAIG statements.

Our results and the DAIG statement emphasise the great importance of a patient-tailored approach in SRH counselling in the framework of positive prevention efforts, particularly (but not exclusively) in the group of HIV-positive MSM. Interestingly, PLHIV usually turned to their HIV-physician to discuss sexual health topics, who they felt to be the most appropriate person. However, PLHIV stated that sexual health topics were rarely discussed and that they would have appreciated receiving more information. In the KABASTI study also, physicians (i.e. general practitioners and HIV-specialists) were one of the most important sources of information. In analogy to our findings, MSM stated an unmet need for further information about sexual health [11]. While HCPs are key in delivering positive prevention, the results of an American (USA) study suggest that prevention is not a priority for physicians. In this study discussion of disclosure was reported by 50 % of participants, and 29 % of the full sample reported that no care provider had ever talked with them about safer sex [17].

In contrast to the insufficient support PLHIV experienced in regard to SRH issues, almost all HCPs claimed to offer to discuss a wide range of SRH topics. From this discrepancy we may conclude that there must have been factors that impeded an effective conversation about SRH topics between physicians and patients. According to the patients’ perception hindering factors for an appropriate

delivery of SRH services were shortage of time, a lack of initiative by service providers and their own difficulty to address these issues.

Metsch et al. [18] showed that physicians talked about risk reduction strategies more often with newly diagnosed than with long-term patients. Service providers in our study left the burden to initiate a discussion on SRH topics to patients. Because addressing sexual health issues still constitutes a taboo issue [11], in particular in relation to HIV, this is a difficult task for many patients. Indeed, guidelines for the management of SRH for PLHIV assign a pro-active part to the HCP, for example by conducting a sexual health assessment including a sexual history documented at first presentation and at 6-monthly intervals thereafter [19]. None of the six institutions stated that they followed a policy guideline or an intervention model with respect to the integration of sexually related health topics in their HIV-related services. One reason for the absence of guidelines and the subsequent lack of initiative by the HCPs in bringing up SRH topics may be an insufficient level of training in the field of SRH. Only one support organisation and none of the medical institutions stated to offer SRH training to their staff.

In addition, medical institutions stated that only very little time was devoted to discussing SRH-related topics and that most of their time was spent on medical issues. Metsch et al. [18] demonstrated that physicians who had a lower patient load and spent more than 30 min with a patient or felt very familiar with ART were more likely to provide counselling to long-term patients. In times of increasing constraints of time and resources physicians might feel unable to invest additional time for prevention measures. However, Rietmeijer [20] pointed out that prevention counselling to reduce high-risk sexual behaviour should not be seen as an alien, time-consuming add-on task for the overburdened care provider but rather as a natural outflow of a generic patient–provider interaction model with an increasing number of evidence-based models to intervene in busy clinical practices.

The limitations of our study should be noted. There was no way of tracing which patient-questionnaire was delivered by which institution. The respective proportion of questionnaires returned could have influenced the distribution of the preferentially contacted institution in case of SRH concerns. However, it is widely recognised that HIV-physicians play a central role in positive prevention because the patient’s visit at the clinic or the practice for medical follow-up and prescription of highly active anti-retroviral therapy (HAART) could be his/her only contact with someone capable of providing education on HIV transmission [7, 11].

For some of the questions there were high numbers of missing values. For example, the relevant question on the

disclosure of the participant's HIV status was answered by only 50.3 % of MSM. As disclosure was used as a proxy for the role of serosorting as a risk-reducing strategy by MSM, the conclusion that serosorting has minor relevance may be due to potential self-selection bias and therefore may be of uncertain external validity. Additionally, we could not determine the relation between unprotected intercourse and disclosure. Therefore, potentially, unprotected intercourse may have occurred predominantly with seroconcordant partners, and protected intercourse predominantly with serostatus discordant and unknown partners.

However, other studies have shown that on the one hand serosorting is often based on the assumption of the partner's HIV status than on the disclosure of this status, a practice which may be misleading and result in HIV transmission to uninfected persons and on the other hand that HIV-positive MSM practising serosorting do have an elevated risk for bacterial STDs. Consequently, also MSM who state to practise serosorting should remain in the focus of sexual health counselling efforts [11, 21].

In addition, the methodological problem of social desirability bias may apply in our analysis, which is generally the case in studies using self-reported data to assess sexual risk behaviour. However, anonymity was guaranteed in order to minimise barriers to participation in this survey.

Due to the formulation of the question concerning condom use, it cannot be excluded that the results reported by women and by men practising passive anal intercourse may be affected by interpretation. If respondents did not consider condom use of their partners, rates would be incorrectly low. Furthermore four men, who self-identified as heterosexual, claimed to have passive anal intercourse with steady (1) or casual partners (3) and two women stated to have active anal intercourse with steady (1) or casual (1) partners. These results may be due to misinterpretation of the used definitions, to a lack of concentration when filling in the questionnaire or to self-definition of these men as heterosexual while adopting homosexual sex practices.

A further limitation may be sampling bias due to convenience sampling, which was necessary to provide anonymity. However, the study did show a relatively high response rate and a substantial sample size for the area covered. Although there are no data available on the overall number of PLHIV living in Munich, the survey covered 8–14 % of HIV-positive MSM in Munich [11]. Furthermore, we noted that our cohort was very similar to the German Competence Network for HIV/AIDS cohort of 9,410 patients with respect to sociodemographic characteristics, such as sex, age, risk factor for HIV transmission, country of origin, as well as virological control, immunological and therapy status [22]. The PLHIV responding to the

questionnaire thus seem to be representative of PLHIV in Munich and also in Germany.

Munich is the third largest city in Germany and has an active gay community and a relatively high prevalence of HIV infection [11]. Despite differences in the structure of local support of PLHIV, the underlying organisation of the German health care system is comparable in all German federal states and cities. We therefore believe that even if the sample size is small in relation to the overall number of PLHIV in Germany our analysis of the SRH services for PLHIV may be extrapolated to the situation in other hot spots of the HIV epidemic in Germany.

Our results show ongoing risky sexual practices, particularly among MSM, as well as a great need for more substantial and patient-tailored sexual health counselling. HCPs showed a high willingness to discuss SRH-related issues, but deficiencies are present on the organisational level. Insufficient levels of training is likely to have impeded a satisfactory functioning of their SRH services. As many PLHIV see their HIV-physician on a regular basis and also believe that HIV-physicians should be the source of information on SRH topics, the medical care facility would constitute an ideal setting for delivering comprehensive and integrated HIV care. Restructuring the SRH services by adopting a policy guideline such as the UK guidelines for the management of SRH in PLHIV (which also include training in SRH topics), HIV-physicians could assume a pro-active role and thus improve the outcome of their efforts in positive prevention. These measures would not only enable more PLHIV to improve their quality of life by protecting their own health and by enjoying meaningful sexual relationships, but could also substantially contribute to decreased numbers of HIV transmission in Germany.

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Conflict of interest None.

References

- Schätzung der Prävalenz und Inzidenz von HIV-Infektionen in Deutschland, Stand Ende. Estimation of the prevalence and incidence of HIV-infections in Germany at the end of the year 2012. *Epidemiol Bull.* 2012;2012:47.
- Bouhnik AD, Preau M, Lert F, Peretti-Watel P, Schiltz MA, Obadia Y, Spire B. Unsafe sex in regular partnerships among

- heterosexual persons living with HIV: evidence from a large representative sample of individuals attending outpatients services in France (ANRS-EN12-VESPA Study). *AIDS*. 2007;21: S57–62.
3. Crepaz N, Hart TA, Marks G. Highly active antiretroviral therapy and sexual risk behavior: a meta-analytic review. *JAMA*. 2004;292:224–36.
 4. Elford J, Ibrahim F, Bukutu C, Anderson J. Sexual behaviour of people living with HIV in London: implications for HIV transmission. *AIDS*. 2007;21:S63–70.
 5. Peretti-Watel P, Spire B, Schiltz MA, Bouhnik AD, Heard I, Lert F, Obadia Y. Vulnerability, unsafe sex and non-adherence to HAART: evidence from a large sample of French HIV/AIDS outpatients. *Soc Sci Med*. 2006;62:2420–33.
 6. The Global Network of People Living with HIV/AIDS (GNP), Joint United Nations Programme on HIV/AIDS (UNAIDS). Positive health, dignity and prevention. Technical consultation report. 2009. GNP/UNAIDS, Amsterdam/Geneva
 7. del Rio C. New challenges in HIV care: prevention among HIV-infected patients. *Top HIV Med*. 2003;11:140–4.
 8. Crepaz N, Lyles CM, Wolitski RJ, Passin WF, Rama SM, Herbst JH, Purcell DW, Malow RM, Stall R. Do prevention interventions reduce HIV risk behaviours among people living with HIV? A meta-analytic review of controlled trials. *AIDS*. 2006;20:143–57.
 9. Johnson WD, Diaz RM, Flanders WD, Goodman M, Hill AN, Holtgrave D, Malow R, McClellan WM. Behavioral interventions to reduce risk for sexual transmission of HIV among men who have sex with men. *Cochrane Database Syst Rev*. 2008;3: CD001230.
 10. Wingood GM, DiClemente RJ, Mikhail I, Lang DL, McCree DH, Davies SL, Hardin JW, Hook EW III, Saag M. A randomized controlled trial to reduce HIV transmission risk behaviors and sexually transmitted diseases among women living with HIV: the WILLOW Program. *J Acquir Immune Defic Syndr*. 2004;37: S58–67.
 11. Marcus U, Schmidt AJ, Hamouda O. KABASTI-Study. Robert-Koch-Institut. 2007. Available at: http://www.rki.de/DE/Content/InfAZ/S/STI/Studien/KABASTI/Abschlussbericht%20KABASTI.pdf?__blob=publicationFile. Accessed 7 Feb 2013.
 12. Nostlinger C, Niderost S, Woo R, Platteau T, Loos J, Colebunders R. Mirror, mirror on the wall: the face of HIV+ women in Europe today. *AIDS Care*. 2010;22:919–26.
 13. Vernazza P, Hirschel B, Bernasconi E, Flepp M. HIV-infizierte Menschen ohne andere STD sind unter wirksamer antiretroviraler Therapie sexuell nicht infektiös. HIV-infected people under antiretroviral therapy without other sexual transmitted diseases are sexually not infectious. *Schweiz Ärztezeit*. 2008;89:165–9.
 14. Diagnostik und Behandlung HIV betroffener Paare mit Kinderwunsch. German-Austrian recommendations on the diagnostics and treatment of HIV discordant couples who wish to have children. 2011. Available at: <http://www.daignet.de/site-content/hiv-therapie/leitlinien-1/Diagnostik%20und%20Behandlung%20HIV%20betroffener%20Paare%20mit%20Kinderwunsch%2011.pdf>. Accessed 7 Feb 2013.
 15. German AIDS Society (DAIG). Two years discussion about the EKAF statement: an assessment. 2013. Available at: <http://www.daignet.de/site-content/news-und-presse/newsmeldungen/newsarchiv/DAIG%20Stellungnahme%20zu%20EKAF%20Okt%202010.pdf>. Accessed 30 Mar 2013.
 16. Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, Hakim J, Kumwenda J, Grinsztejn B, Pillotto JH, Godbole SV, Mehendale S, Chariyalertsak S, Santos BR, Mayer KH, Hoffman IF, Eshleman SH, Piwowar-Manning E, Wang L, Makhema J, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Eng J Med*. 2011;365:493–505.
 17. Marks G, Richardson JL, Crepaz N, Stoyanoff S, Milam J, Kemper C, Larsen RA, Bolan R, Weismuller P, Hollander H, McCutchan A. Are HIV care providers talking with patients about safer sex and disclosure?: a multi-clinic assessment. *AIDS*. 2002;16:1953–7.
 18. Metsch LR, Pereyra M, del Rio C, Gardner L, Duffus WA, Dickinson G, Kerndt P, Anderson-Mahoney P, Strathdee SA, Greenberg AE. Delivery of HIV prevention counseling by physicians at HIV medical care settings in 4 US cities. *Am J Public Health*. 2004;94:1186–92.
 19. Fakoya A, Lamba H, Mackie N, Nandwani R, Brown A, Bernard E, Gilling-Smith C, Lacey C, Sherr L, Claydon P, Wallage S, Gazzard B. British HIV Association, BASHH and FSRH guidelines for the management of the sexual and reproductive health of people living with HIV infection 2008. *HIV Med*. 2008;9: 681–720.
 20. Rietmeijer CA. Risk reduction counselling for prevention of sexually transmitted infections: how it works and how to make it work. *Sex Transm Infect*. 2007;83:2–9.
 21. Marcus U, Schmidt AJ, Hamouda O. HIV serosorting among HIV-positive men who have sex with men is associated with increased self-reported incidence of bacterial sexually transmissible infections. *Sex Health*. 2011;8:184–93.
 22. Jansen K, Brockmeyer NH, Hahn M, Kaul I, Fenske S, Rausch M, Kuhlmann B, Ulmer A, Lauenroth-Mai E, Harrer T, Hower M, Skaletz-Rorowski A, Michalik C. Epidemiological composition, clinical and treatment characteristics of the patient cohort of the German competence network for HIV/AIDS. *Eur J Med Res*. 2009;14:415–25.