Cross-sectional survey of treatment practices for urethritis at pharmacies, private clinics and government health facilities in coastal Kenya: many missed opportunities for HIV prevention

Peter M Mugo,1 Sarah Duncan,2 Samuel W Mwaniki,3 Alexander N Thiong’o,1 Evanson Gichuru,1 Haile Selassie Okuku,1 Elise M van der Elst,1 Adrian D Smith,4 Susan M Graham,1,5 Eduard J Sanders1,6

ABSTRACT
Background While bacterial sexually transmitted infections (STIs) are important cofactors for HIV transmission, STI control has received little attention in recent years. The aim of this study was to assess STI treatment and HIV testing referral practices among health providers in Kenya.

Methods In 2011 we assessed quality of case management for male urethritis at pharmacies, private clinics and government health facilities in coastal Kenya using simulated visits at pharmacies and interviews at pharmacies and health facilities. Quality was assessed using Ministry of Health guidelines.

Results Twenty (77%) of 26 pharmacies, 20 (91%) of 22 private clinics and all four government facilities in the study area took part. The median (IQR) number of adult urethritis cases per week was 5 (2–10) at pharmacies, 3 (1–3) at private clinics and 5 (2–17) at government facilities. During simulated visits, 10% of pharmacies prescribed recommended antibiotics at recommended dosages and durations and, during interviews, 28% of pharmacies and 27% of health facilities prescribed recommended antibiotics at recommended dosages and durations. Most regimens were quinolone-based. HIV testing was recommended during 10% of simulated visits, 20% of pharmacy interviews and 25% of health facility interviews.

Conclusions In an area of high STI burden, most men with urethritis seek care at pharmacies and private clinics. Most providers do not comply with national guidelines and very few recommend HIV testing. In order to reduce the STI burden and mitigate HIV transmission, there is an urgent need for innovative dissemination of up-to-date guidelines and inclusion of all health providers in HIV/STI programmes.

INTRODUCTION
Chlamydia trachomatis (CT) and Neisseria gonorhoae (NG), the commonest causes of male urethritis, result in considerable morbidity and are important cofactors for HIV-1 transmission.1, 2 As sexually transmitted infections (STIs) enhance acquisition and transmission of HIV-1, STI treatment is important in HIV-1 prevention in its own right. Care-seeking for STIs presents an important opportunity to test for HIV-1, which is associated with STIs via sexual behaviour patterns. Thus, in a high HIV-1 prevalence setting such as Kenya, it is essential that people seeking care for STIs receive HIV-1 testing and high-quality STI treatment.

Pharmacies in resource-limited settings are often the first—and sometimes the only—point of contact for patients seeking urgent care owing to greater accessibility and patients’ perception of increased privacy.3–5 Previous studies in sub-Saharan Africa and south-east Asia showed that, while the quality of STI care in pharmacies and other private providers was poor compared with government STI clinics,6–8 targeted interventions resulted in significant improvements.9–11

In Kenya the private health sector remains largely unregulated.12 A 2001 publication reported that the quality of STI care at pharmacies and private clinics was poor relative to government facilities,13 and a more recent study documented suboptimal care at pharmacies.14 There is no current information on how patients seeking care are targeted for HIV/STI prevention. No quality improvement interventions targeting pharmacies and private clinics have been evaluated in Kenya. The purpose of this study was to assess the current STI treatment and HIV testing referral practices in coastal Kenya, identifying potential areas for intervention.

METHODS
Study setting
The study was carried out in August and September 2011 in Mtwapa and Shanzu (total population ~100 000), two townships located 16 km north-east of Mombasa along the principal highway connecting Mombasa to Malindi. The area is home to many bars and nightclubs frequented by male and female sex workers and is popular for beach tourism as well as transient stays by truckers and business people. During a mapping exercise conducted 2 weeks before the study, 22 private clinics, 4 government facilities and 26 private pharmacies were identified and GPS-way points taken (figure 1). In general, health facilities are operated by diploma-level clinical and nursing officers. They provide outpatient services including basic laboratory testing, medication dispensing, family planning, delivery, paediatric vaccinations and growth monitoring. Pharmacies are
small to medium-sized businesses with at least one diploma-level pharmacy technician.

A Kenya Medical Research Institute (KEMRI) clinic in the area recruits at-risk adults, including men having sex with men (MSM) and female sex workers (FSWs), for HIV-1 prevention studies. STI diagnosis and treatment is provided to study participants.15 16 A high burden of asymptomatic CT and NG has been documented among MSM recently.17

Data collection
We invited all pharmacies and health facilities in the area to participate. Two methods of data collection were used: first we conducted simulated client visits at pharmacies and then, a week later, face-to-face interviews at pharmacies and health facilities. We did not send simulated clients to the health facilities because we felt it would be inappropriate to ask them to undergo physical examinations or laboratory testing. Pharmacies were asked for their consent the week before the simulated visits. We minimised bias by providing limited information on the purpose of the study: ‘the advice and treatment offered to patients with STI symptoms’. Health facilities were asked for their consent just before the interviews to minimise bias.

Simulated client visits
In the first phase we trained four men aged 22–26 years as simulated clients to role play a case of acute uncomplicated male urethritis (figure 2). One simulated visit was made at each pharmacy. We gave simulated clients 200 Kenya shillings (KSh) per visit for purchase of medicines (US$1 ≈ KSh85). Approximately 10–20 min after each visit a brief closed-ended questionnaire (see online supplementary appendix 1) was administered to the simulated clients to collect data on the questions that the
pharmacy staff had asked, medicines dispensed, cost of the medicines and advice given. Visits were unscheduled and they were all completed within 3 days. During a feedback meeting at the end of the study, none of the pharmacies reported being suspicious that the visit was simulated.

Interviews
In the second phase we interviewed one healthcare worker at each participating pharmacy and health facility. The questionnaire included both closed- and open-ended questions (see online supplementary appendices 2 and 3). Data collected included: health facility characteristics; male urethritis cases per week; interviewee characteristics; treatment for uncomplicated acute male urethritis; cost of treatment; interviewees’ awareness of care seeking by FSWs and MSM; and challenges experienced in STI management. The interviews were unscheduled, except at a few very busy pharmacies where there was postponement to an agreed-upon time. The interviews lasted a median of 50 min (range 30–85).

Main study outcome
The main study outcome was the quality of urethritis case management assessed against current Kenyan Ministry of Health guidelines for syndromic STI treatment, which are based on WHO guidelines.18–20 Syndromic STI treatment, an approach developed in the 1990s by the WHO, offers the opportunity to treat patients at the primary healthcare level, avoiding the need for laboratory capacity and highly trained healthcare providers.20

Quality elements were categorised into four groups:
1. History of present illness: History-taking was considered adequate if it included nature and duration of symptoms, recent sexual exposure and previous care-seeking for current illness.
2. Medication regimen compliance with guidelines: Regimens were considered compliant if they included at least one antibiotic to cover NG (amoxicillin 3 g in a single dose given immediately (stat) plus probenecid 1 g stat; amoxicillin-clavulanate 625 mg stat plus probenecid 1 g stat; cefixime 400 mg stat; intramuscular ceftriaxone 250 mg stat; intramuscular spectinomycin 2 g stat; ciprofloxacin 500 mg stat; norfloxacin 800 mg stat) and at least one to cover CT (doxycycline 100 mg twice daily for 7 days; azithromycin 1 g stat).
3. Potential treatment efficacy: Ideally, compliant antibiotics given and taken at the minimum recommended dosages and durations would be efficacious. However, for this study, quinolones and amoxicillins were considered ineffective given evidence of resistance.21–23 For CT, courses that were longer than recommended were assessed as potentially efficacious.
4. Provision of counselling messages: Counselling was considered adequate if it included the following messages: ‘get an HIV test’, ‘use condoms consistently’, ‘get partner treated’ and ‘adhere to the full course of treatment’.

Data management and analysis
Two investigators separately categorised responses to open-ended questions and differences were reconciled by a third investigator. Data from both phases of the study were double-entered in Questionnaire Development System (Nova, Bethesda, Maryland, USA) and compared for agreement. All discrepancies were reconciled with the source before locking the database.

All statistical analyses were done using Stata (StataCorp, College Station, Texas, USA). Data from each simulated visit or interview were assumed to represent the treatment practices at that pharmacy or health facility. Interviewees who did not state their preferred regimens were excluded from the analyses of regimen compliance and efficacy. We calculated proportions for categorical data and medians or means for continuous or count data. Summary scores for history of present illness and provision of counselling messages were calculated, with one point being awarded for each element. Using a χ² test or Fisher exact test for categorical data and a Student t test or Wilcoxon rank-sum test for continuous or count data, characteristics and outcomes were compared between pharmacies and all health facilities, and between government and private facilities.

RESULTS
Response rate
Twenty (77%) of 26 pharmacies, 20 (91%) of 22 private facilities and all four government facilities in the study area took part. There were no differences in terms of size, location and opening hours between the private facilities and pharmacies that took part and those that did not. The main reason given for declining participation was lack of time.

Characteristics of pharmacies and health facilities
Table 1 details the characteristics of participating pharmacies and health facilities. Individually, government facilities reported seeing more cases of male urethritis per week than private facilities.
Taken together, pharmacies, private clinics and government facilities reported seeing about 100, 60 and 20 cases of urethritis per week, respectively. The mean reported proportion of pharmacy clients presenting with prescriptions was 41%. Eight (40%) pharmacies reported having a private room for consultation.

Characteristics of interviewees
Apart from gender, there were no significant differences between private and government facility interviewees (table 2). About 90% of all interviewees reported being aware that some of their clients could be FSWs and about one-third were aware that some of their clients could be MSM.

Treatment strategies
Medicines were dispensed at all simulated visits. When simulated clients said they did not have enough money, 12 (60%) of 20 pharmacies dispensed partial courses of each medicine, four

Table 1  Characteristics of pharmacies and health facilities in Mtwapa and Shanzu, coastal Kenya, 2011

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Pharmacies (N=20)</th>
<th>Health facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%) or median (IQR†)</td>
<td>N (%) or median (IQR†)</td>
</tr>
<tr>
<td>Total number of staff (including interviewees)‡</td>
<td>2 (1–3)</td>
<td>4 (3–6)</td>
</tr>
<tr>
<td>Opening hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open 6 days per week (various hours)</td>
<td>20 (100%)</td>
<td>19 (95%)</td>
</tr>
<tr>
<td>Open 7 days per week (various hours)</td>
<td>10 (50%)</td>
<td>17 (85%)</td>
</tr>
<tr>
<td>Open 7 days per week, 24 h daily</td>
<td>0</td>
<td>13 (65%)</td>
</tr>
<tr>
<td>Mean opening hours per day</td>
<td>13 (12–14)</td>
<td>24 (13–24)</td>
</tr>
<tr>
<td>Patient load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of clients per day (all ages)</td>
<td>60 (30–100)</td>
<td>10 (10–15)</td>
</tr>
<tr>
<td>Male urethritis cases per week</td>
<td>5 (2–10)</td>
<td>3 (1–3)</td>
</tr>
<tr>
<td>Reference materials present</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formularies (Drug Index, BNF, MIMS Africa)</td>
<td>17 (85%)</td>
<td>12 (60%)</td>
</tr>
<tr>
<td>Medical references</td>
<td>6 (30%)</td>
<td>6 (30%)</td>
</tr>
<tr>
<td>STI guideline or flow chart</td>
<td>1 (5%)</td>
<td>7 (35%)</td>
</tr>
<tr>
<td>Internet access (computer or mobile phone)</td>
<td>15 (75%)</td>
<td>14 (75%)</td>
</tr>
<tr>
<td>Services relevant to STI/HIV management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV testing</td>
<td>0</td>
<td>19 (95%)</td>
</tr>
<tr>
<td>HIV care services§</td>
<td>0</td>
<td>1 (5%)</td>
</tr>
</tbody>
</table>

* p Values listed where there is significant difference (p<0.05) between private and government health facilities.
†All figures rounded to zero decimal places.
‡This includes both staff with healthcare training (medical, nursing, laboratory, pharmacy) and those with other qualifications.
§HIV care services include post-exposure prophylaxis, prevention of mother-to-child transmission and antiretroviral therapy.
BNF, British National Formulary; IQR, interquartile range; MIMS, Monthly Index of Medical Specialties; STI, sexually transmitted infections.

Table 2  Characteristics of health workers interviewed during a study of treatment practices for urethritis in Mtwapa and Shanzu, coastal Kenya, 2011

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Pharmacies (N=20)</th>
<th>Health facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%) or median (IQR*)</td>
<td>N (%) or median (IQR*)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>10 (50%)</td>
<td>19 (95%)</td>
</tr>
<tr>
<td>Women</td>
<td>10 (50%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>28 (25–31)</td>
<td>35 (31–43)</td>
</tr>
<tr>
<td>Highest level of health training attained†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificate</td>
<td>5 (26%)</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>Diploma and higher diploma</td>
<td>13 (68%)</td>
<td>13 (65%)</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>1 (5%)</td>
<td>2 (10%)</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>0</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Work experience (years)</td>
<td>4 (2–7)</td>
<td>8 (6–18)</td>
</tr>
<tr>
<td>Membership in a professional association</td>
<td>3 (15%)</td>
<td>14 (70%)</td>
</tr>
<tr>
<td>Ever attended an in-service course on STI/HIV management</td>
<td>2 (10%)</td>
<td>11 (55%)</td>
</tr>
<tr>
<td>Duration of in-service course (days)</td>
<td>5 (3–7)</td>
<td>5 (2–7)</td>
</tr>
<tr>
<td>Duration since the last course (years)</td>
<td>6 (2–10)</td>
<td>5 (3–9)</td>
</tr>
</tbody>
</table>

* All figures rounded to zero decimal places.
† Nineteen (95%) of 20 pharmacy interviewees had pharmacy certification (one had not completed training; n=19). Health facility interviewees had training in either medicine (62%) or nursing (38%).
IQR, interquartile range.
(20%) dispensed fewer medicines and four (20%) asked the client to come back with adequate funds.

During the interviews, when asked how they would manage an uncomplicated acute male urethritis case, 16 (80%) of 20 interviewees at pharmacies said they would dispense medicines, two said they would dispense some medicines and then refer, and two said they would only refer. At health facilities, 17 (71%) of 24 interviewees said they would treat based on symptoms and signs and seven (29%) said they would treat based on laboratory results (ie, aetiologically). Five interviewees in the latter group stated the medications they would use for each suspected agent and were therefore included in the analysis of regimen compliance and efficacy.

**History of present illness**

Health facilities scored higher than pharmacies in history-taking (2.1 vs 1.6, \(p=0.03\)), mainly due to a difference in asking about recent sexual exposure (table 3).

**Medication regimen compliance with guidelines and potential treatment efficacy**

Simulated client visits

While 16 (80%) of 20 pharmacies dispensed compliant antibiotics for NG (norfloxacin or ciprofloxacin), only 45% were at the recommended single dose (table 3); the rest were longer courses, including one 14-day course. With respect to CT treatment, while 85% of pharmacies dispensed a compliant antibiotic, only 10% were at the recommended dosage and duration (65% dispensed too few doses and 15% dispensed excessive doses). Overall, 25% of pharmacies dispensed efficacious CT regimens (four doxycycline-based, one azithromycin-based), but none dispensed an efficacious NG regimen.

Interviews at pharmacies

Fourteen (78%) of 18 pharmacies reported that they would prescribe a quinolone, 56% at the recommended dosage, and the rest would prescribe longer courses. Overall, eight (44%) would prescribe efficacious CT regimens (five doxycycline-based, two azithromycin-based, one based on both antibiotics) but none would have prescribed an efficacious NG regimen.

Interviews at health facilities

There were no significant differences in regimen compliance or potential treatment efficacy between private and government health facilities. Sixteen (73%) of 22 health facilities would prescribe compliant NG antibiotics (11 quinolones only; two quinolone plus ceftriaxone; one ceftriaxone only; one amoxicillin only; and one spectinomycin only). However, only 36% stated the right dosage. Overall, 36% would prescribe efficacious CT regimens (seven doxycycline-based, one azithromycin-based), 14% would prescribe efficacious NG regimens (all ceftriaxone-based) and 9% would effectively treat both agents.

**Provision of counselling messages**

Less than one-quarter of interviewees at pharmacies and private clinics and three-quarters at government facilities said they would recommend HIV-1 testing (table 3).

**Cost of treatment**

The median (IQR) cost of medicines dispensed during simulated visits was KSh350 (KSh175–623). During interviews, all pharmacies reported that consultation and dispensing were free of charge; the median (IQR) medication cost was KSh255 (KSh200–410). The median (IQR) consultation fee at health facilities was KSh100 (KSh200–200), KSh150 (KSh0–500) at private clinics and KSh20 (KSh10–20) at government facilities.

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**Table 3 Quality of male urethritis case management at pharmacies and health facilities in Mtwapa and Shanzu, Kenya, 2011**

<table>
<thead>
<tr>
<th>Quality elements assessed</th>
<th>Simulated visits</th>
<th>Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pharmacies (N=20)</td>
<td>Pharmacies (n=20)</td>
</tr>
<tr>
<td></td>
<td>N (%) or mean (SD)</td>
<td>N (%) or mean (SD)</td>
</tr>
<tr>
<td>History of present illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature and duration of symptoms</td>
<td>20 (100%)</td>
<td>18 (90%)</td>
</tr>
<tr>
<td>Recent sexual exposure</td>
<td>15 (75%)</td>
<td>9 (45%)</td>
</tr>
<tr>
<td>Previous care-seeking for current illness</td>
<td>1 (5%)</td>
<td>6 (30%)</td>
</tr>
<tr>
<td>Summary HPI score (maximum 3)</td>
<td>2 (0.5)</td>
<td>1.65 (0.6)</td>
</tr>
<tr>
<td>Medication regimen compliance†‡</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliant regimen for gonorrhoea (right dosage and duration)</td>
<td>9 (45%)</td>
<td>10 (56%)</td>
</tr>
<tr>
<td>Compliant regimen for Chlamydia (right dosage and duration)</td>
<td>2 (10%)</td>
<td>5 (28%)</td>
</tr>
<tr>
<td>Compliant regimen for both gonorrhoea and Chlamydia (right dosage and duration)</td>
<td>2 (10%)</td>
<td>5 (28%)</td>
</tr>
<tr>
<td>Potential treatment efficacy for both gonorrhoea and Chlamydia†</td>
<td>0</td>
<td>2 (11%)</td>
</tr>
<tr>
<td>Provision of counselling messages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get an HIV test</td>
<td>2 (10%)</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>Use condoms consistently</td>
<td>12 (60%)</td>
<td>9 (45%)</td>
</tr>
<tr>
<td>Get partner treated</td>
<td>13 (65%)</td>
<td>17 (85%)</td>
</tr>
<tr>
<td>Adhere to the full course of treatment</td>
<td>19 (95%)</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>Summary counselling score (maximum 4)</td>
<td>2.3 (1.3)</td>
<td>1.8 (0.9)</td>
</tr>
</tbody>
</table>

*Significant difference (\(p<0.05\)) between private and government health facilities.
†For interviews, two pharmacies that said they would only refer were excluded (n=18). Similarly, two health facilities that said they would wait for laboratory results were excluded (n=22).
‡During simulated visits the median (range) number of medicines dispensed was 2 (2–6), of which 2 (1–5) were antibiotics. During interviews the median (range) number of medicines that would be dispensed by pharmacies was 3 (2–5), of which 2 (2–3) would be antibiotics. The median (range) number of medicines that would be prescribed by health facilities was 3 (1–4), of which 2 (1–4) would be antibiotics.
§Other antimicrobials suggested were: fluoroquinolone, trimidazole, secnidazole, metronidazole, gentamicin and ofloxacin.
SD, standard deviation
Health services research

The median (IQR) medication cost at health facilities was KSh300 (KSh150–400), KSh300 (KSh190–500) at private clinics and zero at government facilities. The cost of ceftriaxone-based regimens was similar to other regimens. Cefixime was available at 65% of pharmacies and 17% of health facilities at a median (IQR) cost of KSh240 (KSh120–300).

Challenges experienced in STI management

The majority of interviewees reported difficulties in STI management (70% of pharmacies and 83% of health facilities) including: clients not disclosing important history (36%); inadequate or outdated information on STI management (25%); patient non-adherence (23%); inadequate diagnostic and referral facilities (14%); and language barriers (9%). Interviewees suggested that health provider training (38%), patient education (32%) and community education (18%) would address some of these barriers.

DISCUSSION

Our study shows that most men with urethritis present to pharmacies and private clinics for care, that most healthcare providers do not provide nationally recommended or efficacious treatment, and that very few recommend HIV-1 testing. We also found that, unlike government facilities in the study area, most private clinics open for 24 h a day, every day of the week, thus offering the greatest service availability.

Our study achieved a high response rate, but we acknowledge that the results may suffer from some selection bias since not all eligible pharmacies and health facilities consented to participate and only one health worker was interviewed per facility. Additionally, since the study was conducted in two adjacent townships, the results may not be generalisable to the whole of coastal Kenya. Pharmacies reported that they did not suspect any of the simulated clients, and data obtained through simulated visits were largely comparable to interview data. Our interview procedures may therefore have avoided reporting bias. It is worth noting that pharmacies tended to perform better during simulated visits than in interviews, possibly due to a difference in question type. Our sample was relatively small, limiting our ability to identify associations between provider characteristics and treatment practices.

Similar to earlier studies,4–8 11 13 14 we found that pharmacies and private clinics provide care for many adults with urethritis. Unlike previous studies in Kenya, we did not find significantly poorer quality of urethritis care management among pharmacies compared with health facilities, except in history-taking. However, this could be due to the small size of our sample or a difference in the definition of quality. Previous studies in Kenya did not assess service availability or specifically document if patients presenting with urethritis were targeted for HIV testing.

Our findings highlight the opportunity for HIV testing, counselling and referral that presents through the frequent STI care-seeking at private clinics and pharmacies. This is particularly relevant considering recent advances in point-of-care testing technology,7,8 which could make it more feasible for frontline healthcare providers to recommend and carry out HIV testing in these settings.

We found that most health providers would treat a case of urethritis syndromically and most would include a quinolone as part of the regimen, implying they had some prior exposure to the current syndromic guidelines. However, the guidelines themselves were rarely available on site. Besides availability, we also note with concern that the Kenyan guidelines,18 19 as well as the WHO guidelines,20 still recommend quinolones as a first-line regimen for syndromic treatment despite documented widespread NG resistance.21 22 We can only speculate that this failure to revise and disseminate new guidelines is due to a lack of priority given to keeping such documents up to date. Innovative strategies must be devised to ensure prompt updating and dissemination of guidelines. The STI control programme should borrow from other disease programmes that have successfully employed internet and mobile technologies.25

Since a majority of interviewees at health facilities and a minority at pharmacies reported being members of a professional association, continuing professional development programmes should aim to use as well as foster professional networks among trainees. As FSWs and MSM are being targeted for HIV prevention in Kenya and frequently seek care at health facilities and pharmacies, recently published guidelines on STI control among these key populations26 27 should be included in training programmes for health providers serving in similar settings.

In summary, we found that in an area of high STI burden, most patients with urethritis seek health care from pharmacies and private clinics, and that the treatment provided does not comply with guidelines. In order to reduce the STI and HIV burden, increase HIV testing uptake and enable timely linkage into care, pharmacies and private clinics should be more engaged in HIV/STI prevention programmes. Further research is required to enhance the development, revision and dissemination of guidelines on STI control.

Key messages

- In an area of high STI burden, most patients with urethritis seek healthcare from pharmacies and private clinics.
- Pharmacies and private clinics should be more engaged in upscaling HIV/STI prevention programmes.
- Healthcare provider compliance with recommended treatment regimens is low and HIV testing is infrequently recommended.
- Current guidelines still recommend quinolone-based STI regimens, which remain in use in Kenya despite the emergence of resistance.

Acknowledgements

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Contributors

EJS and SD conceived the study. EJS, SD, ADS, SMG, EVDE, EG, HSO and PMM prepared the draft manuscript. All authors contributed to the study. EJS and HSO analysed the data. PMM prepared the final manuscript. All authors reviewed and approved the final manuscript.

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Competing interests

None.

Ethics approval

Ethical approval was granted by the KEMRI National Ethical Review Committee. Participants provided written informed consent for both study phases. No financial incentive was given for participation. Participant information...
was protected at all times through the use of identification numbers in place of names, and through restriction of access to completed consent forms.

Provenance and peer review Not commissioned; externally peer reviewed.

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REFERENCES

# QUESTIONNAIRE FOR SURROGATE CLIENTS

## URETHRAL DISCHARGE

<table>
<thead>
<tr>
<th>Pharmacy code</th>
<th>Date of visit (dd/mm/yy)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Initials of surrogate client</th>
<th>Initials of Interviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. What is the gender of the pharmacy staff consulted?

   - Male = 1
   - Female = 2

2. After you complained to the pharmacy staff about the discharge from the penis, did he/she ask you whether you had other problems?

   - No = 0
   - Yes = 1

3. Did he/she ask you whether you have had such a problem before (urethral discharge)?

   - No = 0
   - Yes = 1

4. Did he/she ask when you first noticed the urethral discharge OR when the discharge started?

   - No = 0
   - Yes = 1

5. Did he/she ask to physically examine you?

   - No = 0
   - Yes = 1

6. Did he/she recommend a laboratory test?

   - No = 0
   - Yes = 1

7. Did he/she ask whether you had seen a doctor before going to the pharmacy?

   - No = 0
   - Yes = 1

8. Did he/she ask whether you had sexual intercourse before the symptoms appeared?

   - No = 0
   - Yes = 1
9. (a) Did he/she ask you whether you used condoms when you had sexual intercourse?

No = 0  
Yes = 1

(b) If yes for [a] above, did he/she ask why you did not use condoms?

No = 0  
Yes = 1

10. Did he/she recommend treatment by injection?

No = 0  
Yes = 1

11. (a) Did he/she (out of his/her initiative) recommend any medicines for you to take?

No = 0  
Yes = 1 (Go to 11c.)

(b) If no, did he/she (after your request) recommend any medicines for you to take?

No = 0 (Go to question 16)  
Yes = 1

(c) What medicines were recommended? (Interviewer to fill table as appropriate)

<table>
<thead>
<tr>
<th>Medicine name</th>
<th>Dose</th>
<th>Frequency</th>
<th>Duration (days)</th>
<th>Cost (kshs)</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

12. What did he/she advise when you said you did not have enough money?

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________
13. (a) Did he/she agree to write down for you the cost or quantities of the various medicines remaining?

\[ \text{No} = 0 \quad \text{Yes} = 1 \]

(b) If yes, interviewer to fill table below as appropriate. *Refer to the paper issued by the pharmacy staff/ what the client was told is the remainder*

<table>
<thead>
<tr>
<th>Medicine name</th>
<th>Dose</th>
<th>Frequency</th>
<th>Duration (days)</th>
<th>Cost (kshs)</th>
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</tbody>
</table>

14. What was his/her response to the question “Will this medicine cure me?”

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

15. What was his/her response to the question “What should I do if I do not get better?”

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
16. Were you given instructions/advice regarding the following:

a. Completion of dose of recommended medicines?

   No = 0  Yes = 1

b. Abstinence from sexual intercourse until cured?

   No = 0  Yes = 1

c. Use of condoms during future sexual intercourse?

   No = 0  Yes = 1

d. Treatment of sexual partner?

   No = 0  Yes = 1

e. HIV testing?

   No = 0  Yes = 1

17. What other instructions/advice were you given?

   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

18. What other comments can you make about the visit? e.g. your general impression of the pharmacy, any interesting/funny incidences or questions, etc.

   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

---END---
PHARMACY QUESTIONNAIRE

Provider ID |__|__|__|  Initials of interviewer |__|__|

Date form filled (dd/mm/yy) ___/___/___  Starting time |____| hours

Thank you for finding time for this interview. I would like to ask you some questions regarding general operations in your pharmacy and how you manage STDs...

SECTION I: RESPONDENT’S CHARACTERISTICS

I will start with general questions about you...

1. Gender:  Male = 1  Female = 2

2. Age:  |__|__| Years

3. (a) What is the highest level of formal education you have attained? (Interviewer to fill table as appropriate)

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<thead>
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<tbody>
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<tr>
<td>Secondary</td>
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<tr>
<td>Tertiary</td>
<td></td>
</tr>
</tbody>
</table>

(b) What type of healthcare training have you gone through? (Interviewer to fill table as appropriate)

<table>
<thead>
<tr>
<th>Type of training</th>
<th>Level reached (certificate, diploma, higher diploma, bachelors, masters)</th>
<th>Years completed</th>
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<tbody>
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<td></td>
<td></td>
</tr>
<tr>
<td>Others (Specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(c) What type of institution did you acquire the training from?

Public = 1  
Private = 2  
Faith based organization = 3  
Others (specify) = 4

______________________________________________________________

Name of institution *(if given)*

______________________________________________________________


4. For how long have you worked in a retail/community pharmacy setting?

|__|__|__| Months

5. (a) Are you a member of any professional association/society?

No = 0  
Yes = 1

(b) If yes for (a) above, what is the name of the association/society?

______________________________________________________________


6. (a) Have you attended any course on management of STDs since you started working in the retail/community pharmacy sector?

No = 0  
Yes = 1

(b) If yes, what was the specific course? *(Interviewer to fill the table as appropriate)*

<table>
<thead>
<tr>
<th>Course name</th>
<th>Duration (days)</th>
<th>Date (mm/yy)</th>
<th>Place (city, town)</th>
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</table>
7. (a) Which training method for STDs management would you most prefer?

Off-site training workshop/seminar = 1  
Online self-learning course = 3  
On-job mentoring = 2  
Others = 4, specify: __________________________

(b) Briefly explain why:____________________________________________________________________

SECTION II: PHARMACY OPERATIONS

Now I will go to questions regarding general operations in your pharmacy...

8. (a) How many other people work in this pharmacy? |__|__|

(b) What type of healthcare training have the other staff members completed? (Interviewer to fill table as appropriate)

<table>
<thead>
<tr>
<th>No. of staff</th>
<th>Type of training completed (Pharmacy, medical/clinical, nursing, laboratory others)</th>
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9. What are the opening hours of your pharmacy?

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10. (a) What reference materials do you have in your pharmacy? *(Interviewer to indicate whether materials seen or not)*

<table>
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</tbody>
</table>

(b) How can you access internet in your pharmacy?

________________________________________________________________________________________

________________________________________________________________________________________

11. (a) Approximately, how many customers are served in your pharmacy per day?  [ ] [ ] [ ] Customers

(b) Approximately how many of these come with prescriptions?

[ ] [ ] [ ] Customers

12. Suppose a customer asks to speak to a staff member in private, how do you go about it?

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

13. Apart from the money charged for medicines, do you charge the following fees?

Dispensing fee: No = 0  Yes = 1 [ ] [ ] [ ] [ ] Kshs.

Consultation fee: No = 0  Yes = 1 [ ] [ ] [ ] [ ] Kshs.

14. How does your pharmacy ensure the quality of medicines stocked?

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________
SECTION III: STANDARDS AND PRACTICES FOR STDs

Next, we will look at the questions concerning STDs...

15. Consider this case;

A man presents to your pharmacy with a thick yellow green discharge from his penis. He also reports that he feels pain and a burning sensation when urinating.

(a) What questions would you ask the client?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(b) How would you treat the client?

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Frequency</th>
<th>Duration (days)</th>
<th>Total Cost (Kshs)</th>
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</tbody>
</table>

(c) What advice would you give to the client?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(d): In a week, how many adult male clients are treated for urethral discharge in your pharmacy?

___ | ___ | ___ | Adult patients

16. (a) Do you have guidelines for the management of STDs in your pharmacy?

No = 0
Yes = 1

(b) If yes, may I see the guidelines? (Interviewer to fill table as appropriate)

<table>
<thead>
<tr>
<th>Author/ Issuer</th>
<th>Year of publication</th>
<th>Not seen = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Seen = 1</td>
</tr>
</tbody>
</table>
17. (a) Do you have a flow chart for the management of STDs in your pharmacy?

No = 0  
Yes = 1

(b) If yes, may I see the flow chart? *(Interviewer to fill table as appropriate)*

<table>
<thead>
<tr>
<th>Author/ Issuer</th>
<th>Year of publication</th>
<th>Not seen = 0</th>
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</tbody>
</table>

18. (a) Do you currently stock cefixime in your pharmacy?

No = 0  
Yes = 1

(b) What conditions do you treat with cefixime?

______________________________________________________________

______________________________________________________________

______________________________________________________________

(c) If yes for (a) above, how much does a single oral dose of cefixime 400mg cost in your pharmacy?

<table>
<thead>
<tr>
<th>Kshs</th>
</tr>
</thead>
</table>

19. Consider this case;

An adult client presents to your pharmacy with fever, body aches and diarrhoea. The client also reports feeling tired and loss of appetite. The symptoms have lasted for about one week now.

(a) What are the likely diseases the client could be suffering from?

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________
(b) What would you do to establish the diagnosis?
______________________________________________________________
______________________________________________________________
______________________________________________________________
(c) The client also reports having had unprotected sexual intercourse in the last one month;
   (i) What would you now think about the likely diagnosis?
______________________________________________________________
______________________________________________________________
______________________________________________________________
   (ii) What would you do now to establish the diagnosis?
______________________________________________________________
______________________________________________________________
______________________________________________________________
(d) How would you manage the client?
______________________________________________________________
______________________________________________________________
______________________________________________________________
(e) What other advice would you give the client?
______________________________________________________________
______________________________________________________________
______________________________________________________________
(f) What percentage (%) of people, who become HIV infected, do you think will have some of the symptoms mentioned above, 2-3 weeks after infection?
   |___|___|___|%
20. (a) Do you stock antiretroviral drugs (ARVS) in your pharmacy?

No = 0  Yes = 1

(b) If yes, which of these services do you provide? *(Tick all that apply)*

[ ] Highly active antiretroviral therapy (HAART)
[ ] Prevention of mother to child transmission (PMTCT)
[ ] Post exposure prophylaxis (PEP)
[ ] Others (specify)

______________________________________________

______________________________________________

21. (a) Do you get customers who ask for medicines they can take before sexual intercourse, to prevent HIV infection?

No = 0  Yes = 1

(b) If yes, what medicines do they ask for?

____________________________________________________

____________________________________________________________

____________________________________________________________

____________________________________________________________

(c) How do you help them?

____________________________________________________________

____________________________________________________________

____________________________________________________________
FSW AND MSM ASPECTS

Now I would like to ask you a few questions regarding some groups of clients who have a high risk for STDs...

22. (a) Do you think some of your customers do sex work?

\[ \begin{array}{ccc}
\text{No} = 0 & \text{Maybe} = 1 & \text{Yes} = 2 \\
\end{array} \]

(b) If yes or maybe, what makes you think they do sex work?

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

(c) If yes or maybe, what services, medicines or products do they ask for?

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

23. (a) Do you think some of your male customers have sex with other men?

\[ \begin{array}{ccc}
\text{No} = 0 & \text{Maybe} = 1 & \text{Yes} = 2 \\
\end{array} \]

(b) If yes or maybe, what makes you think they have sex with other men?

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

(c) If yes or maybe, what services, medicines or products do they ask for?

______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________
24. Apart from the symptoms that appear on the penis and vagina, where else may STD symptoms present?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

25. Consider this case;

A client presents with rectal discharge, anal itching, rectal bleeding and painful bowel movements.

(a) What are the likely conditions the client would be suffering from?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(b) How would you manage the client? *(Management includes treatment, advice given, referrals e.t.c.)*

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Now, I would like to ask you a few questions about barriers in STD management in your pharmacy...

26. (a) Do you experience any barriers or difficulties translating your knowledge of managing STDs into practice?

No = 0  Yes = 1

(b) If yes, describe:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
(c) How do you think these barriers or difficulties can be overcome?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

27. Finally, do you have any information you would like to add regarding the issues we have discussed during the entire interview?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

28. In a week, how many adult treatments for malaria are sold in your pharmacy?

_[ ] [ ] [ ] Adult malaria treatments

Finishing time [ ] [ ] [ ] [ ] hours

_Thank you once again for finding time for this interview and for your patience through the whole process!_
Thank you for finding time for this interview. I would like to ask you some questions regarding general operations in your health facility and how you manage STDs...

SECTION I: RESPONDENT'S CHARACTERISTICS

I will start with general questions about you...

1. Gender: Male = 1  Female = 2
2. Age: |___| Years
3. (a) What is the highest level of formal education you have attained? (Interviewer to fill table as appropriate)

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(b) What type of healthcare training have you gone through? (Interviewer to fill table as appropriate)

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<td>Others (Specify)</td>
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</tbody>
</table>
(c) What type of institution did you acquire the healthcare training from?

Public = 1  
Private = 2

Faith based organization = 3

Others (specify) = 4

__________________________________________________________________________

__________________________________________________________________________

Name of institution *(if given)*

__________________________________________________________________________

__________________________________________________________________________

4. For how long have you worked in a clinical setting?

___ |___ |___ |___ Months

5. (a) Are you a member of any professional association/ society?  

No = 0  
Yes = 1

(b) If yes for (a) what is the name of the association/ society?

__________________________________________________________________________

__________________________________________________________________________

6. (a) Have you attended any course on management of STDs since you started working in the clinical setting?  

No = 0  
Yes = 1

(b) If yes for (a) above, what was the specific course? *(Interviewer to fill table as appropriate)*

<table>
<thead>
<tr>
<th>Course name</th>
<th>Duration (days)</th>
<th>Date (mm/yy)</th>
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</table>
7. (a) Which training method for STDs management would you most prefer?

- Off-site training workshop/seminar = 1
- Online self-learning course = 3
- On-job mentoring = 2
- Others = 4, specify: ____________________________________________________________

(b) Briefly explain why:
_____________________________________________________________________________

SECTION II: HEALTH FACILITY OPERATIONS

Now I will go to questions regarding general operations in your health facility...

8. (a) How many other people work in this health facility? ___ ___ ___

(b) What type of health care training have the other staff members completed? *(Interviewer to fill table as appropriate)*

<table>
<thead>
<tr>
<th>No. of staff</th>
<th>Type of training completed (Medical/clinical, pharmacy, nursing, laboratory, others)</th>
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9. What are the opening hours of your health facility? *(Interviewer to fill table as appropriate)*

<table>
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<tr>
<th>Days/ Time</th>
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10. (a) What reference materials do you have in your health facility? *(Interviewer to indicate whether materials seen or not)*

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</table>

(b) How can you access internet in your health facility?

______________________________________________________________

11. (a) Approximately, how many patients are seen in your health facility per day?

|___|___|___| Patients

(b) Of these, approximately how many are regular patients (at least 2 visits)?

|___|___|___| Patients

12. (a) Apart from consultation, what other services do you offer? (tick all that apply)

[ ] Laboratory
[ ] X-ray
[ ] Pharmacy
[ ] Family planning
[ ] Mother child health
[ ] HIV testing, Specify:_________________________________________________________
[ ] Comprehensive care clinic (CCC) for HIV/AIDS
[ ] Others (specify)

______________________________________________________________

13. (a) What tests do you do for Malaria? (tick all that apply)

[ ] None
[ ] Rapid diagnostic tests (RDT)
[ ] Microscopy
(b) (i) In a week, how many adult patients are treated for malaria in your clinic?

\[
\text{\_\_\_\_\_ Adult patients}
\]

(ii) How many of these will have tested positive for malaria?

\[
\text{\_\_\_\_\_ Adult patients}
\]

14. On average, how much do you charge per consultation?

\[
\text{\_\_\_\_\_ Kshs.}
\]

SECTION III: STANDARDS AND PRACTICES FOR STDs

Next, we will look at the questions concerning STDs...

15. Consider this case;

A man presents to your health facility with a thick yellow green discharge from his penis. He also reports that he feels pain and a burning sensation when urinating.

(a) What questions would you ask the client?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(b) How would you treat the client?

<table>
<thead>
<tr>
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</table>

(c) What advice would you give to the client?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
16. (a) Do you have guidelines for the management of STDs in your health facility?

No = 0  
Yes = 1 

(b) If yes, may I see the guidelines? *(Interviewer to fill table as appropriate)*

<table>
<thead>
<tr>
<th>Author/ Issuer</th>
<th>Year of publication</th>
<th>Not seen = 0</th>
<th>Seen = 1</th>
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17. (a) Do you have a flow chart for the management of STDs in your health facility?

No = 0  
Yes = 1 

(b) If yes for (a) above, may I please see the flow chart? *(Interviewer to fill table as)*

<table>
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18. (a) Approximately how many patients with STDs do you see in a week?

|__|__|__| Patients

(b) In a week, how many male adult patients are treated for urethral discharge in your clinic?

|__|__|__| Male adult patients

19. (a) Do you have a pharmacy in your facility?

No = 0  
Yes = 1 

(b) If no for (a) above, do you dispense medicines for STD treatment in your health facility?

No = 0  
Yes = 1 

If yes, briefly describe:

____________________________________________________________________________________________
(c) If yes for (a) or (b) above:

(i.) How does your facility ensure the quality of medicines stocked?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(ii.) Do you stock cefixime?

No = 0 \hspace{1cm} \text{Yes} = 1

If yes, what is the cost of one 400mg oral dose?
| \_ | \_ | \_ | \_ | \text{Kshs.}

20. What conditions do you treat with cefixime?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

21. Consider this case:
An adult client presents to your health facility with fever, body aches and diarrhoea. The client also reports feeling tired and loss of appetite. The symptoms have lasted for about one week now.

(a) What are the likely diseases the client could be suffering from?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(b) What would you do to establish the diagnosis?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(c) The client also reports having had unprotected sexual intercourse in the last one month;

(i) What would you now think about the likely diagnosis?
(ii) What would you do now to establish the diagnosis?
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

(d) How would you manage the client?
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

(e) What other advice would you give the client?
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

(f) What percentage (%) of people, who become HIV infected, do you think will have some of the symptoms mentioned above, 2-3 weeks after infection?

|   |   |   | %

22. (a) Do you provide antiretroviral therapy (ART) services in your health facility?

No = 0
Yes = 1

(b) If yes, which of these services do you provide? *(Tick all that apply)*

[ ] Highly active antiretroviral therapy (HAART)

[ ] Prevention of mother to child transmission (PMTCT)

[ ] Post exposure prophylaxis (PEP)

[ ] Others, specify:
__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
23. (a) Do you get clients who ask for medicines they can take before sexual intercourse, to prevent HIV infection?
   **No = 0**  **Yes = 1**

   (b) If yes, what medicines do they ask for?
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

   (c) How do you help them?
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

FSW AND MSM ASPECTS

_Now I would like to ask you a few questions regarding some groups of clients who have a high risk for STDs..._

24. (a) Do you think some of your clients do sex work?
   **No = 0**  **Maybe = 1**  **Yes = 2**

   (b) If yes or maybe, what makes you think they do sex work?
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

   (c) If yes or maybe, what services or medicines or products do they ask for?
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

25. (a) Do you think some of your male clients have sex with other men?
   **No = 0**  **Maybe = 1**  **Yes = 2**
(b) If yes or maybe, what makes you think they have sex with other men?
______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

(c) If yes or maybe, what services/medicines/products do they ask for?
______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

26. Apart from the symptoms that appear on the penis or vagina, where else may STD symptoms present?
______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

27. Consider this case;
A client presents with rectal discharge, anal itching, rectal bleeding and painful bowel movements.

(a) What are the likely conditions the client could be suffering from?
______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________

(b) How would you manage the client? *(Management includes treatment, advice given, referrals e.t.c.)*
______________________________________________________________
______________________________________________________________
______________________________________________________________
______________________________________________________________
Now, I would like to ask you a few questions about barriers in STD management in your health facility...

28. (a) Do you experience any barriers or difficulties translating your knowledge of managing STDs into practice?

No = 0  
Yes = 1 

(b) If yes, describe?

______________________________________________________________ 
______________________________________________________________
______________________________________________________________ 
______________________________________________________________

(c) How do you think these barriers or difficulties can be overcome?

______________________________________________________________ 
______________________________________________________________
______________________________________________________________ 
______________________________________________________________

29. Finally, do you have any information you would like to add regarding the issues we have discussed during the entire interview?

______________________________________________________________ 
______________________________________________________________
______________________________________________________________ 
______________________________________________________________ 

Finishing time |__|__ |__|__| hours

Thank you once again for finding time for this interview and for your patience through the whole process!