Prevalence of Reproductive Tract Infections Among Rural Married Women in Tamil Nadu, India: A Community Based Study

Geetha Mani[1]

[1]*M. D. Community Medicine, Assistant Professor, Department of Community Medicine, Shri Sathya Sai Medical College and Research Institute, Tamil Nadu, India.*

Conflict of Interest: None declared

This article has been peer reviewed.

Article Submitted on: 7th June 2013

Article Accepted on: 22nd October 2013

Funding Sources: None declared

Correspondence to: Dr Geetha Mani

Address: Department of Community Medicine, Shri Sathya Sai Medical College and Research Institute, Tamil Nadu, India

Email: drgeethammc@gmail.com

Cite this article: Mani G. Prevalence of reproductive tract infections among rural married women in Tamil Nadu, India: A community based study. J Pioneer Med Sci. 2014; 4(1):18-24

ABSTRACT

BACKGROUND: Reproductive tract infections (RTIs), which include sexually transmitted infections (STIs), cause considerable morbidity among women of reproductive age worldwide. Any morbidity in this group presents as a huge obstacle to the overall socioeconomic development of the community. Countrywide data in India indicate a higher prevalence in rural areas compared to urban areas. This study was conducted to determine the prevalence of RTIs in married women aged 18 to 45 years in a rural area of Kancheepuram District, Tamil Nadu, and to determine its association with social, demographic, obstetric factors, and contraceptive and menstrual hygiene practices.

METHODS: This was a community based, cross sectional study conducted between March and November 2011, using a three stage sampling method on the prevalence of RTIs among married women aged 18-45 years. The study recorded the symptoms in the previous 12 months in the Karanai Puducheri village of Panchayat (Kancheepuram district, Tamil Nadu) using a standardized, semi-structured questionnaire.

RESULTS: Among the 520 women who participated in the study, the prevalence of RTIs was 33.3% (95% CI: 33.3±3.4%). Vaginal discharge was the commonest symptom (23.7%). RTIs were significantly associated with age of women, duration of marriage, contraceptive practices, and personal and menstrual hygiene practices ($p<0.05$).

CONCLUSION: The high prevalence of symptoms of RTIs and their association with modifiable risk factors, such as contraceptive usage and, personal and menstrual hygiene factors, suggest scope for intervention through health education programmes among women in preventing RTIs.

Keywords: Reproductive Tract Infections; Married Women; Rural

INTRODUCTION

Reproductive health of women is of immense importance due to its implications on women's health, health of their children, family members and socioeconomic development of society. Reproductive health includes several components such as fertility control, safe motherhood, and prevention and control of reproductive tract infections, which include sexually transmitted infections (STIs) [1].

Reproductive tracts infections (RTIs) and their complications are among the most important causes of illness and death for women in poor regions of the world [2]. Women in the reproductive age group are at risk of RTIs/STIs during natural events in their life such as menstruation, pregnancy and childbirth due to the inherent physiological characteristics of the female reproductive tract [3]. The problem is more pronounced in developing and underdeveloped countries where women often have to deal with unwanted pregnancies, unsafe abortions, problems arising from poor contraception practices, different sociocultural norms and lack of economic independence, which further reduce their capacity to protect themselves from RTI/STIs [2, 3].

According to the second National Family Health Survey (NFHS-II), nearly 4 out of 10 currently married women in India report at least one reproductive health problem that could be

symptomatic of a more serious RTI [4]. The most recent District Level Household and Facility Survey (DLHS-3) found a prevalence of 18.2% of RTI symptoms among ever-married women. The prevalence was higher in the rural (19.6%) compared to urban areas (15.0%) [5]. Although the prevalence of RTIs shows a declining trend, RTIs continue to be a significant health problem among women in terms of morbidity and mortality.

Many prevalence studies for RTIs/STIs based on symptoms have been conducted throughout the country in both rural and urban areas. But there is a paucity of community based studies from rural Tamil Nadu in recent years. This study was conducted to estimate the current prevalence of RTIs based on a syndromic approach among women between 18 to 45 years of age, in a rural area of the Kancheepuram District in Tamil Nadu. Additionally, the study aimed to determine the association of symptoms of RTI with socio-demographic characteristics, marital and obstetric history, contraceptive practices, and personal and menstrual hygiene practices.

METHODS

A community-based, descriptive, cross-sectional study was carried out in the Karanai Puducheri village of Panchayat (Kancheepuram District, Tamil Nadu, India) from March to November 2011. Approval for this study was obtained from the Institutional Ethics Committee of Madras Medical College. To determine the appropriate sample size for this study, we looked at the prevalence of RTIs among married women aged between 15-45 years in Veerapandi Panchayat Union (Salem District, Tamil Nadu). The prevalence was 44.6% [6], which, with an allowable error of 10%, means the required sample size estimates to 477. Assuming a 10% non-response rate, the final sample size chosen was 525.

All married women in the age group 18-45 years constituted the sampling frame. There were 1733 married women in this group based on the voter's list. Using this as the sampling frame, 525 women were chosen through random sampling using computer generated random numbers. Women who had any major gynecological problems such as cervical carcinoma, uterine fibroids, uterine prolapse, those not willing to participate in the study and those who could not be contacted after 3 visits, were excluded from the study.

A semi-structured interview schedule based on a questionnaire used in DLHS-3 [5] was devised in English, translated into Tamil and back into English (to check for accuracy and consistency). The schedule was divided into five sections, namely: social and demographic characteristics, perceived symptoms of RTIs/STIs, obstetric history, contraceptive practices and personal and menstrual hygiene practices. The Tamil schedule was pretested for clarity and reliability.

The prevalence of RTIs was assessed based on the self reporting of a set of symptoms (thus termed the 'syndromic approach') as was used for diagnosis of RTIs/STIs in the NFHS-2 and DLHS-3 [4, 5]. A diagnosis of RTI was considered if the participant had experienced one of the following symptoms in the previous 12 months: abnormal vaginal discharge (discharge accompanied by itching or irritation, bad odor, abdominal pain, fever and other problems), ulcers or boils in and around the genital region, pain in lower abdomen which was not related to menstruation, pain or burning sensation during urination, swelling in the groin and painful blister like lesions in and around vagina. Among currently married women, pain during sexual intercourse and spotting after sexual intercourse was also taken to be indicative of RTI.

The participants who reported symptoms of RTI were referred to the nearest governmental primary health center and followed up for completion of treatment and resolution of symptoms.

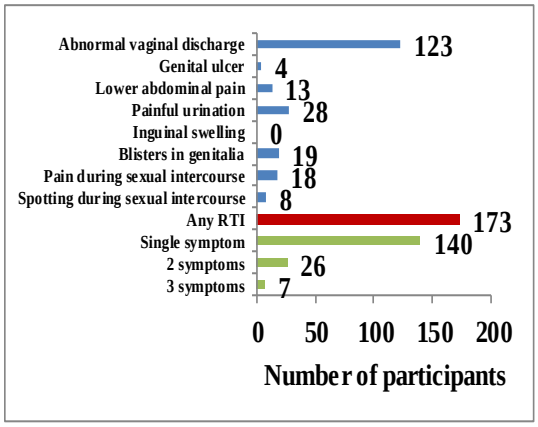
The data were recorded in Microsoft Office Excel 2007. Statistical analysis was carried out using Statistical Package for Social Sciences (SPSS for Windows Version 12.0). Prevalence of individual symptoms of RTI/STI was calculated. Cross tabulations were done to assess factors associated with RTIs. Chi-square test was used to analyse the significance of associations. A p-value of less than 0.05 was considered significant.

RESULTS

The number of women who participated in the study was 520. The mean age of participants was 29.5 years (± 6.9 years). The mean age at marriage was 21 years (± 3.5 years).

Among the total 520 participants, 173 (33.3%) women reported at least one symptom of RTI/STI in the past 12 months. Abnormal vaginal discharge was the commonest symptom reported (23.7%) followed by painful urination (5.4%). None of the participants reported inguinal swelling. 140 (26.9%) women reported

Figure 1: Distribution of perceived symptoms of RTIs/STIs among the study participants



only one symptom of RTI. 26 (5%) reported 2 symptoms and 7 (1.3%) reported 3 symptoms (Figure 1). The distribution of social and demographic characteristics was analyzed between those who did experience symptoms of RTI/STI and those who did not, in the past 12 months. The socioeconomic status of the study participants was classified from monthly per capita income based on the Modified B. G. Prasad scale for rural area (Class I being the highest socioeconomic group and Class V the lowest) (Table 1). Among the 520 participants, 52 women (10%) had never conceived. Among the 468 women who had ever conceived, 24 women (5.1%) had their first conception at <18 years of age, while the remaining 444 (94.9%) women were aged 18 years and above at their first conception (Table 2).

The prevalence of RTIs was proportionately higher among those using a Copper T (an intrauterine device) – an observation that was statistically significant.

Inadequate personal hygiene practices related to micturition, such as non-usage of sanitary toilets and non-washing of private parts, was found to be associated with a higher prevalence of RTI, and this difference was also statistically significant ($p<0.05$). Use of cloth or homemade pads during menstrual periods and poor washing and drying practices of reused napkins was also found to be related to higher prevalence of RTI (Table 3).

DISCUSSION

The prevalence of RTIs/STIs using the syndromic approach was found to be 33.3% (95% CI; 33.3% ± 3.4%) in our study. This is lower than the 95% confidence limits of the prevalence of RTIs/STIs in Veerapandi Panchayat Union [6]. This lower prevalence could be due to the wide-spread use of the syndromic approach in management of RTIs/STIs. However, it is still higher than the prevalence of RTIs reported in rural areas by DLHS-3 [5], which was 19.6%. Vaginal discharge was the most commonly reported symptom (123 women; 23.7%) followed by dysuria (28 women; 5.4%). Vaginal discharge was also the commonest symptom reported in other studies in rural areas of India [7, 8, 9, 10].

The prevalence of RTI/STI symptoms was highest in the age group 18-20 years (57.1%) followed by 36-40 years (48.1%) and this pattern showed a significant association ($p=0.006$). Kosambiya et al., [9] Sharma et al. [11] and Rathore et al. [12] have reported a maximum prevalence in the 25-34 years age group. The difference in the present study could be attributed to the composition of study groups (only 5.4% in 18-20 years group), biological factors and lack of awareness among women aged 36 to 40 years. There was a statistically significant association between duration of marriage and the prevalence of RTIs, with women married for less than 1 year showing highest prevalence (56%). This might be due to the community attitudes in rural India encouraging early conception after marriage resulting in non-usage of contraceptive methods in early years of marriage.

Our study did not show any significant association between the symptoms of RTI/STI and number of conceptions, live births or abortions. This could be due to the improved reproductive health care services and safe abortion services available now.

The current contraceptive status had a significant association with prevalence of RTI ($p=0.000$). The prevalence of RTIs/STIs was lowest among those who used condoms, highest in those who used Copper T, followed by those who used none of these methods. This confirms the well-known fact that contraceptive methods like condoms have a protective role in the prevention of RTI/STI. The increased prevalence in women using Copper T could be due to the poor follow-up care after insertion. Sharma et al. in West Bengal, Rathore et al. in rural Rajasthan, and Kumar et al. and Ravindran et al. in the Dharmapuri district of Tamil Nadu, have reported similar findings [11, 12, 13, 14].

The prevalence of RTI was lower among women who use toilets for urination and those who wash their private parts after urination ($p<0.05$). Low levels of personal hygiene was found to be associated with RTIs in studies by Riyami et al. among Omani women, Yang et al. in rural China

Table 1: Distribution of RTIs/STIs among study participants by selected social and demographic characteristics

Variables	Total (n=520)*	RTI (n=173)*	Chi-square value	p-value
Age group				
18-20 years	28 (5.4%)	16 (57.1%)		
21-25 years	162 (31.2%)	49 (30.2%)	16.299	0.006**
26-30 years	138 (26.5%)	43 (31.2%)		
31-35 years	85 (16.3%)	27 (31.8%)		
36-40 years	54 (10.4%)	26 (48.1%)		
41-45 years	53 (10.2%)	12 (22.6%)		
Marital status				
Living with husband	489 (94%)	160 (32.7%)	1.115	0.327
Widowed/ separated/ divorced	31 (6%)	13 (41.9%)		
Age at marriage				
Less than 18 years	62 (11.9%)	20 (32.3%)	0.032	1.000
18 and > 18 years	458 (88.1%)	153 (33.4%)		
Duration of marriage				
Less than 1 year	25 (4.8%)	14 (56%)		
1 to 5 years	233 (44.8%)	68 (29.2%)		
6 to 10 years	97 (18.7%)	37 (38.1%)	8.360	0.035**
More than 10 years	165 (31.7%)	54 (32.7%)		
Religion				
Hindu	442 (85%)	148 (33.5%)		
Muslim	35 (6.7%)	13 (37.1%)	0.803	0.669
Christian	43 (8.3%)	12 (27.9%)		
Education status				
Illiterate	42 (8.1%)	15 (35.7%)		
Primary school	81 (15.6%)	26 (32.1%)		0.659
High school	209 (40.2%)	75 (35.9%)	2.418	
Higher Secondary School	89 (17.1%)	30 (33.7%)		
College	99 (19%)	27 (27.3%)		
Occupational status				
Working	100 (19.2%)	29 (29%)	1.016	0.3134
Not working	420 (80.8%)	144 (34.3%)		
Type of family				
	352 (67.7%)	119 (33.8%)	0.142	0.765
Nuclear family	168 (32.3%)	54 (32.1%)		
Joint/Extended nuclear family				
Socioeconomic status ***				
Class I(≥Rs. 2830)	117 (22.5%)	41 (35%)		
Class II(Rs. 1415- 2829)	183 (35.2%)	54 (29.5%)		
Class III(Rs. 850- 1414)	138 (26.5%)	48 (34.8%)	4.675	0.322
Class IV(Rs. 425- 849)	78 (15%)	27 (34.6%)		
Class V (<Rs. 425)	4 (0.8%)	3 (75%)		

* Percentage in parentheses
**p value < 0.05
*** Per capita income range for each class

and Singh S et al. in rural Dehradun [15, 16, 17]. Analyzing menstrual hygiene practices, the prevalence of RTIs was higher among women who used cloth or homemade pads, followed by those who used both cloth/ homemade pads and commercial sanitary napkins ($p<0.05$). The prevalence of RTI was higher among women who reuse napkins, though the association was not significant. Women who use only soap and water for washing the napkins to be reused were found to have a higher prevalence than those who also use a disinfectant with soap ($p<0.05$). Analyzing the drying practices of napkins washed for reuse, women who dry the napkins under sunlight were found to have a significantly lower prevalence of RTI symptoms compared to

Table 2: Distribution of RTI/STIs among study participants by obstetric history and contraceptive practices

Variables	Total (N=520)*	RTI (n=173)*	Chi-square value	p-value
Number of conceptions				
None	52 (10%)	22 (42.3%)		
≤ 2 conceptions	352 (67.7%)	114 (32.4%)	2.136	0.344
> 2 conceptions	116 (22.3%)	37 (31.9%)		
Age at first conception	(n= 468)			
≤ 18 years	24 (5.1%)	7 (29.2%)	0.111	0.826
>18 years	444 (94.9%)	144 (32.4%)		
Number of live births	(n= 468)			
None	6 (1.3%)	3 (50%)		
1 or 2 live births	397 (84.8%)	125 (31.5%)	1.263	0.532
> 2 live births	65 (13.9%)	23 (35.4%)		
History of abortions	(n= 468)			
No abortions	371 (79.3%)	119 (32.1%)	0.831	0.410
Had abortions	149 (20.7%)	54 (36.2%)		
Current contraceptive status	(N= 520)			
None	188 (36.2%)	59 (31.4%)		
Oral contraceptive pills	11 (2.1%)	5 (45.5%)	63.283	0.000**
Copper T	44 (8.5%)	37 (84.1%)		
Condom	61 (11.7%)	9 (14.8%)		
Permanent sterilization	216 (41.5%)	63 (29.2%)		

* Percentage in parentheses
**= p-value < 0.05

Table 3: Distribution of RTI/STIs among study participants by personal and menstrual hygiene practices

	Total (N=520)*	RTI (n=173)*	Chi-square value	p-value
Personal hygiene practices				
Toilet usage for micturition				
Yes	503 (96.7%)	161 (32%)	11.025	0.0009**
No	17 (3.3%)	12 (70.6%)		
Washing private parts after micturition				
Yes	440 (84.6%)	96 (21.8%)	165.587	0.000**
No	80 (15.4%)	77 (96.3%)		
Menstrual hygiene practices				
Type of napkin used	N = 520			
Cloth or homemade pad	136 (26.2%)	59 (43.4%)	8.559	0.014**
Commercial sanitary napkin	333 (64%)	98 (29.4%)		
Both	51 (9.8%)	16 (31.4%)		
Reuse of napkin	N = 187			
Yes	177 (94.7%)	72 (40.7%)	1.692	0.193
No	10 (5.3%)	2 (20%)		
Washing practices before reuse	N = 177			
Soap and water only	128 (72.3%)	65 (50.8%)	19.559	0.000**
Soap and water with disinfectant	49 (27.7%)	7 (14.3%)		
Drying practices before reuse	N = 177			
Sunlight	70 (39.5%)	15 (21.4%)	17.781	0.000**
Shade	107 (60.5%)	57 (53.3%)		

* Percentage in parentheses
**= p-value < 0.05

those who dried the napkins in the shade ($p<0.05$). Similar association has also been reported by Riyami et al., Yang LR et al. and Singh S et al [15, 16, 17]. This association suggests the role for proper menstrual hygiene practices in prevention of RTIs. RTIs/STIs result in numerous serious consequences among women such as infertility, ectopic pregnancy, preterm labor, miscarriage, stillbirth, pelvic inflammatory disease, cervical cancer, increased susceptibility to opportunistic infections and pregnancy associated complications [18]. Apart from these complications, presence of symptoms of RTIs/STIs is associated with significant psychological distress, due to embarrassment and fear of rejection and stigma [19]. They also constitute a substantial burden owing to their potential to disrupt daily activities and reduce women's overall well-being. Women in the reproductive age group constitute 22.2% of the population in India [20]. Any morbidity in this group results in a huge burden on the socioeconomic and health status of the community. Thus, the prevention of RTIs/STIs and promotion of reproductive health of women is an issue that warrants high priority in a developing country like India.

A major limitation of our study is that laboratory investigations were not used to confirm the diagnosis of RTIs/STIs. However, our study has the advantage of being community-based with a high response rate. Interview based measurement techniques for diagnosis of RTIs/STIs in community surveys has the merit of generalization to the source population given the population-based sampling frame and strategy [21]. Symptomatic diagnosis of RTIs/STIs based on a syndromic approach has also been supported by World Health Organization (WHO) and Center for Disease Control and Prevention (CDC) as an effective and inexpensive approach for diagnosis of RTIs/STIs in low resource settings [22, 23]. This study was small but significant attempt in identifying those suffering from RTIs/STIs in the study area, helping them achieve cure and equipping them with knowledge to protect themselves and their close community from RTIs/STIs.

CONCLUSION

Our study shows that RTIs/STIs, with a prevalence of 33.3%, continues to be a significant problem in rural areas in spite of the various measures adopted by the Indian government to reduce the transmission of RTIs/ STIs. Age of the participant, duration of marriage, contraceptive usage practices, and personal and menstrual hygiene practices were found to be significantly associated with symptoms of RTIs. Most of these factors are amenable to change by health education and counseling and this study stresses the need for awareness programs for women with a focus on these factors.

Postponing the age of marriage to early twenties and creating awareness among young married women regarding contraceptive choices and use should be an important component of RTI/STI prevention programmes. Intrauterine contraceptive device insertion should be followed by proper post-insertion care. Condoms should be promoted not only as a barrier contraceptive but also to protect against RTIs/STIs. Those couples who have undergone permanent sterilization should be encouraged to use condoms for protection against RTIs/STIs. School health programs and health education sessions in antenatal and postnatal clinics should include promotion of proper personal and menstrual hygiene practices. Community based initiatives should be encouraged to promote the production and use of affordable, acceptable and safe sanitary pads. Considering the high prevalence of RTIs/STIs, there is need for further community based studies to assess the burden and other possible risk factors.

ACKNOWLEDGEMENTS

The author is grateful to Dr. A. K. Rajendran, Director, Institute of Community Medicine, Madras Medical College, and Dr. V. V. Anantharaman, Assistant Professor, Institute of Community Medicine, Madras Medical College (Tamil Nadu, India) for their guidance during the study.

REFERENCES

1. United Nations. *Report of the International Conference on Population and Development: conference proceedings, Cairo, 5-13 September 1994, New York, United States.* United Nations; 1995.
2. World Health Organisation. Integrating STI/RTI Care for Reproductive health - Sexually Transmitted and Other Reproductive Tract Infections: A guide to essential practice. *World Health Organisation*, 2005. http://whqlibdoc.who.int/publications/2005/9241592656.pdf
3. Jejeebhoy, SJ. Addressing Women's Reproductive Health Needs: Priorities for the Family Welfare Program. *Economic and Political Weekly* 1997; 32: 475-484.

4. International Institute for Population Sciences (IIPS) and Macro International. *National Family Health Survey (NFHS-2) 1998-99, Mumbai: India*. IIPS, 2000.
5. International Institute for population Sciences (IIPS). *District Level Household Survey- 3 (DLHS-3), Mumbai: India.* IIPS: 2007-08.
6. Kannan C, Athmaraman TN, Nayeem A, Sangeetha S, Sudha R, Ponsuganthi K, et al. Prevalence of Reproductive tract infections among recently married women in Veerapandi Panchayat Union of Salem district, Tamil Nadu. *Indian Journal of Community Medicine.* 2007; 32:144-5.
7. Patel V, Pednekar S, Weiss H, Rodrigues M, Barros P, Nayak B, et al. Why do women complain of vaginal discharge? A population survey of infectious and pyschosocial risk factors in a South Asian community. *International Journal of Epidemiology*. 2005; 34:853–862.
8. Samanta A, Ghosh S, Mukherjee S. Prevalence and Health-seeking Behaviour of Reproductive tract infection/Sexually transmitted infections symptomatic: A Cross-sectional study of a rural community in the Hooghly District of West Bengal. *Indian J of Public Health* 2011; 55:38-41.
9. Kosambiya JK, Desai VK, Bhardwaj P, Chakraborty T. RTI/STI prevalence among urban and rural women of Surat: A community based study. *Indian J Sex Transm Dis* 2009; 30:89-93.
10. Acharya A, Yadav K, Baridalyne N. Reproductive tract infections/Sexually transmitted infections in Rural Haryana: Experiences of Family Health Awareness Campaign. *Indian Journal of Community Medicine*. 2006; 31:274-276.
11. Sharma S, Gupta BP. The Prevalence of Reproductive Tract Infections and Sexually Transmitted Diseases among married women in the reproductive age group in a rural area. *Indian Journal of Community Medicine*. 2009; 34:63-65.
12. Rathore M, Swami SS, Gupta BL, Sen V, Vyas BL, Bhargav A, et al. Community-Based Study of Self Reported Morbidity of Reproductive Tract among Women of Reproductive Age in Rural Areas of Rajasthan. *Indian Journal of Community Medicine*. 2003; 28:117-121.
13. Kumar S, Gupta SD, Kumar D, Singh JP, Bhawsar R. Reproductive tract infections and their associated risk factors among the women in Bundi District of Rajasthan. *J Hum Ecol* 2002; 13:307-310.
14. Ravindran TKS, Balasubramaniam P, Mini GK. *Inequities in health in Tamil Nadu: A study of Dharmapuri district*. Rural Women's Social Education Centre (RUWSEC). www.ruwsec.org/uploads/54.pdf
15. Riyami AL, Afifi M, Fathulla MMF. Gynecological and related morbidity among ever-married Omani women. *African J Reprod Health* 2004; 8:188-197.
16. Yang LR, Zhao H, Wang HP, Li Y, Niu JP, Su KJ, et al. Improving Ability of Married Women to Prevent Reproductive Tract Infections in Rural Western China. *Environmental Health and Preventive Medicine*. 2006; 11:233–240.
17. Singh S, Kandpal SD, Roy D. Menstrual Hygiene Practices and RTI among ever married women in rural slum. *Indian Journal of Community Health* 2011; 22: 41-43.
18. World Health Organisation, Department of Reproductive Health and Research. Sexually transmitted and other reproductive tract infections: a guide to essential practice. *World Health Organisation*, 2005. http://whqlibdoc.who.int/publications/2005/9241592656.pdf
19. Prasad JH, Abraham S, Akila B, Joseph A, Jacob KS. Symptoms related to the reproductive tract and mental health among women in rural southern India. *Natl Med J India* 2003; 16:303-8.
20. Annual Report to the People on Health. *Government of India, Ministry of Health and Family Welfare*, 2010. http://mohfw.nic.in/showfile.php?lid=121
21. Sadana R. Measuring reproductive health: review of community-based approaches to assessing morbidity. *Bulletin of the World Health Organisation* 2000; 78: 640-654.
22. World Health Organisation. *Training Modules for the Syndromic management of Sexually Transmitted Infections, Module 2: Introducing STI Syndromic Case Management*. 2nd edition. World Health Organisation, 2007. http://whqlibdoc.who.int/publications/2007/9241593407_mod2_eng.pdf
23. Patel DA, Burnett NM, Curtis KM. *Reproductive Tract Infections - Reproductive Health Epidemiology Series: Module 3.* US Department of Health and Human Services, 2003. http://www.cdc.gov/reproductivehealth/ProductsPubs/PDFs/Epi_Module_03A_Tag508.pdf