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Self-reported Symptoms of Reproductive Tract Infections: The Question of Accuracy and Meaning

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Verbal surveys are the most common way of gauging any population's health status, but questions remain regarding the accuracy of the responses they elicit. The present paper compares women's self-reports regarding their experiences with reproductive tract infections (RTIs) and the medical diagnosis that they went through to ascertain the presence or otherwise of the infections. Weak concordance was found between women's self-reports and the medical diagnosis, with the former over-representing the presence of infections. Some of the self-reported symptoms were pathogenic in nature, as represented by the true positive reports, but the majority of the self-reports were false positives when compared to medical diagnosis. The conventional health surveys, relying solely on verbal responses, thus, do not essentially represent the actual health situation of a population studied, and any policy intervention formulated exclusively on this information would be flawed. There is a need to understand the non-medical context of illnesses to understand the disease fully.

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Many developing countries are devising means to improve collection of information regarding health by strengthening surveys, censuses and registration systems. Such surveys are used to identify health problems, estimate prevalence, determinants and distribution of health issues, and study possible trends in the health status of the population. The aim is to develop means to provide low-cost, valid, reliable and comparable information regarding health, and to build the base to monitor health systems. These surveys and censuses also provide policy-makers the evidence to formulate and adjust their strategies as the situation demands.

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Ever since reproductive health, especially women's reproductive health, was elevated in the agenda of governments throughout the world after the International Conference on Population and Development (ICPD) in Cairo, 1994, countless surveys on the topic have taken place. Measuring morbidity in a community, including reproductive morbidity, through interview questionnaire seems to be the cheapest and most practical way, but there is a difference between incurring a lower cost and being cost-effective. The latter quality largely depends on how valid the responses are when compared to the most thorough medical examination. The question of being cost-effective also arises in using alternative medical techniques. Thus, validity and cost are the two main concerns in evaluating the accuracy of women's reports of their disease conditions obtained in verbal surveys to that derived from medical examination.

Among all the issues confronting women's reproductive health, reproductive tract infections (RTIs) have gained much attention after an association was established between these infections and HIV/AIDS. The key components of reproductive health, as envisaged by the ICPD 1994 and later by the Fourth World Conference on Women in Beijing (1995), and the +5 conferences held in 1999 and 2000, include maternal mortality and morbidity, perinatal mortality and morbidity, abortion and post-abortion care, and contraceptive use, infertility and female genital mutilation, and all these factors are linked to RTIs in one way or another[1] making them an area of much interest.

The interest of the present paper is not just to compare information provided by women, expressed in reports of current experiences regarding RTI related symptoms, with the medical examination but to also compare two medical procedures, that is clinical and aetiological diagnoses. This gives us the opportunity to assess the WHO recommended syndromic approach to identify and manage reproductive tract infections in resource poor environments, as prevalent in low and middle-income countries, like Pakistan. Most studies have found rather poor concordance between these three diagnostic approaches, including those done by Walraven, *et al.* (2005), Desai, *et al.* (2003), Remez (2003), Bhatia and Cleland (2000), Kaufman, *et al.* (1999), Hawkes, *et al.* (1999), Filippi, *et al.* (1997), Zurayk, *et al.* (1995), Klitsch (2000), Sloan, *et al.* (2000) and Garg, *et al.* (2001). The low level of agreement found in these studies are attributed to lack of clarity in the diagnostic criteria, asymptomatic nature of some infections leading to no clinical signs, and cultural perceptions of women regarding gynaecological health.

The present paper, thus:

(1) Critically assesses the validity of self-reports obtained in verbal surveys with medical diagnoses, that is clinical examination based on the WHO's syndromic approach, and aetiological diagnosis.
(2) Evaluates the consistency of clinical diagnosis against aetiological diagnosis, with the first being cheaper and the latter considered to be a more reliable and accurate way of diagnosing the presence or otherwise of an infection. This is important for the sake of policy formulation regarding health delivery.
(3) Explores the meaning of self reports, especially in instances when they are not found to be in concordance with medical diagnoses.

[1]For details on the nature of RTIs, and linkages between these infections and materno-feotal health see Nayab (2005a).

METHODOLOGY

The paper is part of a larger study, Rawalpindi Reproductive Tract Study 2001-2002 [RRTIS (2001-2002)], conducted, as the name implies, in the city of Rawalpindi, Pakistan. The acceptable size of the sample for a survey to estimate the prevalence of any disease/infection depends upon: the expected prevalence of the disease in the population from the available evidence; the degree of precision wanted in the estimate; and whether a time trend is to be monitored or not [WHO (2000); de Vaus (1995)]. A large sample size is needed if: higher precision is required; there is an intention to study the trend over time; and if the expected prevalence is low. For an acceptable sample size for the present study, calculations were based on the existing evidence of RTI prevalence rates as found by laboratory diagnosis. Available evidence shows RTI prevalence rates, for the laboratory based studies, to range from ±5 percent to ± 15 percent [NACP (2002); Wasti, *et al.* (1997); Karachi Reproductive Health Project (1997); Mohammad, *et al.* (1997)]. Following the WHO guidelines, a sample size of 385 is acceptable for a similar prevalence rate, with 95 percent degree of confidence and a precision of ±3 percent. Using this as the base, a sample of 500 households was decided upon for the study, keeping in mind the probable refusal rate for the medical part of the study and the budgetary constraints.

Based on the economic status of the households, a representative sample of 500 households was drawn using 25 primary sampling units (PSUs) of the Federal Bureau of Statistics (FBS), which is 20 households from each PSU. Of these 500 households 508 women were found eligible for the study, of which 311 women gave consent for medical part of the study.[2] For eligibility, women were to: be aged between 15 to 49 years old; be currently married; and have their husbands living with them. With the median age of marriage in urban Pakistan hovering around 19 years [PFFPS (1998)], inclusion of young females aged 15–19 years was a logical choice. Being currently married was of significance because if women were not in a union, they were unlikely to be sexually active or using contraceptives, which were factors of interest to this study. Similar reasons led to the decision to include only those women whose husbands were living with them at the time of the study.

The sub-sample, comprising women who consented for the medical component of the study, was compared with the total sample to gauge any biases that might have crept in the selection. In many instances, no difference existed, while for others the difference generally remained in the range of 1-5 percent. Differences, however, were found in the proportions of the economic groups and the number of symptoms reported by women. The sub-sample has a 10 percent under-representation of women from the upper economic group. Similarly, women who did not report any symptoms were under-represented by 10 percent over women reporting more symptoms. Details of differences in background characteristics between women in the total sample and the sub-sample consenting for medical examination can be seen in Annex II.

For a holistic approach to the issues under study three tools were used for the collection of data. These were: administering a questionnaire; having a clinical examination based on the algorithms defined by the WHO in the Syndromic Approach;

[2] Refusal rate for undertaking medical part of this study by women having different characteristics can be seen in Annex II.

and finally to have an aetiological diagnosis to ascertain the presence or otherwise of any infection. An open-ended questionnaire was developed for the study inquiring about women's: social and economic characteristics; obstetric and gynaecological history; contraceptive history; hygiene practices, including menstrual hygiene; health status; knowledge regarding RTIs; experience of RTI symptoms including their frequency, duration and severity; health seeking behaviour; inter-spousal communication; and autonomy status.[3]

The clinical examination, based on the WHO recommended Syndromic Approach was the first step of the medical investigation regarding RTIs. This approach is based on identification of syndromes, which are a combination of symptoms, reported by the client, and signs, observed during clinical diagnosis, following the algorithms given by the WHO. Respondents were examined in a private space, where the bed was further shielded by a curtain. Except for the doctor,[4] and the nurse helping her, no one else had access to that part of room while the examinations were carried out. The examination included:

- Inspection of the genitals.
- Abdominal and bimanual exam.
- Pelvic exam.
- Collection of samples for aetiological diagnosis.

Samples for the aetiological diagnosis, taken from the respondents during the clinical examination, were clearly marked by the respondent's code number, her age, and the date the sample was taken. Her name was not written on the sample containers for confidentiality purposes. Samples were transported immediately to the laboratory as the clinical examinations were conducted in the same premises. It reduced the time and expenditure involved to transport the samples in a bio-safe manner and an appropriate environment.

Effort was made to use the method with better sensitivity and specificity for diagnosing each infection in the aetiological, while respecting the constraints of time and budget available for the study. The selected laboratory/hospital had sufficient equipment and trained pathologists to guarantee quality results. Table 1 gives an abridged account of the aetiological methods used for screening each infection, and the type of sample taken for it. (For a detailed description of the assays used in the study refer to Annex I.)

As stated earlier, it was one of the objectives of the study to investigate consistency of women's self-reports with the clinical and aetiological diagnoses. With the data available, accuracy of clinical diagnoses could also be measured, comparing them with the more reliable aetiological results. These measures would be calculated following the procedure given in Box 1. The measures given in the box will also tell us the rate of women responses for:

- *True positives*: women reporting symptom(s) and having an infection.
- *True negatives*: women not reporting symptom(s) and not having an infection.
- *False positives*: women reporting symptom(s) but not having an infection.
- *False negative*: women not reporting symptom(s) but having an infection.

[3]Despite hiring experienced enumerators, who had worked on many surveys by the Population Council, a month long training was given to them to fully understand the questionnaire, its aims, and the sensitivity with which it was to be conducted.

[4]A single doctor, an experienced gynaecologist, conducted all the clinical examinations so that there were no issues of standardisation or consistency.

Table 1

Aetiological Assays Used to Detect RTIs

Infection	Detection Assay	Nature of Sample
Candidiasis	Culture-Gram Stain	Vaginal smear
Bacterial Vaginosis	Culture-Gram Stain	Vaginal smear
Trichomoniasis	Culture	Posterior vaginal smear
Chlamydia	Direct Fluorescent Antibody (DFA)	Endo-cervical vaginal smear
Gonorrhoea	Culture	Endo-cervical vaginal smear
Syphilis	Rapid Plasma Reagin (RPR)	Serum
Genital Herpes	Culture	Cells from lesions
Chancroid	Culture	Smear from the base of the ulcer, pus removed
HPV	Cellular Morphology	Endo/ecto-cervix cells
Other[1]	Culture	Vaginal/cervical smear

Source: Nayab (2005a).

Note: 1. The other category includes infections like E-coli, staphlococus aureaus, etc.

2. For a detailed account of the aetiological assays employed in the study see Annex I.

Box 1: Comparison of Women's Report of Symptoms with Medical Diagnosis of Presence of Disease

Woman Reports Symptom(s)	Medical Diagnosis of Presence of Infection		
	Yes	No	Total
Yes	A	B	A+B
No	C	D	C+D
Total	A+C	B+D	N

Sensitivity: Ability of a symptom to lead to detection of a disease if present = $\frac{A}{A+C}$

Specificity: Ability of a symptom to cause the ruling out of a disease if not present = $\frac{D}{B+D}$

Positive Predictive Value: Percent of those who report a symptom and for whom the disease is present = $\frac{A}{A+B}$

Negative Predictive Value: Percent of those who did not report a symptom and for whom the disease is not present = $\frac{D}{C+D}$

Percentage of Agreement: Percent of those whose reporting of a symptom is consistent with the presence of disease = $\frac{A+D}{N}$

Kappa Statistics: Comparing agreement against that which might be expected by chance = $\frac{(P_o - P_e)}{(1 - P_e)}$, where P_o = observed agreement and P_e = expected agreement. P_o is same as Percentage of agreement

P_e is $\left\{\left(\frac{A+C}{N}\right)\times\left(\frac{A+B}{N}\right)\right\}+\left\{\left(\frac{B+D}{N}\right)\times\left(\frac{C+D}{N}\right)\right\}$

Sources: Detmer and Nicoll (1994), Bhatia and Cleland (2000), Zurayk, *et al.* (1995), WHO (2000).

The scale used to judge the strength of agreement, represented by the aforementioned indicators of specificity, sensitivity, positive and negative predictive values, percentage of agreement and Kappa value, is as follows.

- Zero percent – No agreement
- 10-20 percent – Poor agreement
- 21-40 percent – Fair agreement
- 41-60 percent – Moderate agreement
- 61-80 percent – Substantial agreement
- 81-100 percent – Strong agreement.

For the measurement of self-reported prevalence of RTIs, women were asked questions about their experiences regarding symptoms, associated with different reproductive tract infections, at the time of the interview. Some of these symptoms could represent problems other than RTIs but since they are associated with one of more RTIs they were part of the questionnaire. The symptoms, their description and their association with different RTIs are presented in Table 2.

Table 2

Symptoms, Their Description and RTIs they can be Linked to

Symptom	Description	Possible Link to RTIs
Abnormal Vaginal Discharge	Discharge that is not usual to the woman in colour, texture, odour or consistency, and if it caused an itch in the genitals.	Bacterial vaginosis, candidiasis, trichomoniasis, chlamydia, gonorrhoea
Lower Abdominal Pain	Nature, duration and severity of pain in the lower abdomen	Chlamydia, gonorrhoea
Menstrual Irregularity	Changes in duration, quantity, cyclicality or consistency of blood during menstruation.	Chlamydia, gonorrhoea
Dysmenorrhoea	Pain during menstruation.	Chlamydia, gonorrhoea
Sores, Warts, Ulcers on Genitals	Presence of sores/warts/ulcers on any genital.	Genital herpes, chancroid, syphilis (primary), HPV
Dyspareunia	Painful urination or burning sensation during urination.	Chlamydia, gonorrhoea
Dysuria	Painful intercourse, bleeding or bad odour after intercourse.	Chlamydia, gonorrhoea, trichomoniasis
Lower back ache	Only if it was reported accompanying any of the above symptoms.	Bacterial vaginosis, candidiasis, trichomoniasis

Source: RRTIS (2001-2002). Adapted from Nayab (2005b).

RTIs mentioned in Table 2 are mainly of two types, having different agents of infection, modes of transmission and possible health problems for mother and her child. The two types are:

- **Endogenous Infections.** These are the most common RTIs, resulting from an overgrowth of organisms normally present in the vagina. These include bacterial vaginosis and candidiasis.
- **Sexually Transmitted Infections (STIs).** These are transmitted through sexual activity with an infected partner, and have more serious repercussions. These include infections like, syphilis, herpes, human papillomavirus, gonorrhoea, trichomoniasis, chancroid and chlamydia.

Self-reported symptoms were classified as endogenous infections if the woman only complained about having abnormal vaginal discharge, with or without lower backache, and as STIs if the woman complained of experiencing one or more of the symptoms other than those categorising endogenous infections, and also when one or more of these symptoms were reported accompanying those categorising endogenous infections.

Ethical considerations are inseparable from a successful completion of a research process. Cassell and Jacobs (1987) define research ethics as, "A code is concerned with aspirations as well as avoidances, it represents our desire and attempt to respect the rights of others, fulfil obligations, avoid harm and augment benefits to those we interact with" [quoted in Glense and Peshkin (1992), p. 110]. Considering the nature of the problem under study a special effort was made to avoid any such situation. As a start, clearance was taken from the Ethics Committee at the Australian National University, Canberra, as it had funded the study, before leaving for the fieldwork, and then again from the Holy Family hospital, Rawalpindi, before the actual work began.

The ethical issues in this study vis-à-vis the respondents were mainly of three kinds:

(i) Informed consent.
(ii) Confidentiality.
(iii) Result notification, and partner notification in case of a positive result.
(iv) Provision of treatment if tested positive for an infection.

Before conducting the interview women were explained the nature and purpose of the study, the approximate length of the interview, the issues to be covered in it and her right to leave the interview at any stage she felt like. Interview was only conducted if she gave her consent knowing all these things. Likewise, respondents' consent was sought for the medical part of the study after explaining to them the procedures involved in it and the available opportunity of having free of cost treatment in case they tested positive for any infection. It was made clear that no remuneration in cash or kind would be given for their participation in the interview, other than free transport (for the initial examination) and treatment (till the infection is cured). Women also had the flexibility to change their mind and not go for the medical examination, after giving consent for it the previous day at the end of the interview.

RESULTS AND DISCUSSION

Comparison of Clinical Examination with Aetiological Diagnosis

As stated earlier, diagnosis in the clinic was based on algorithms defined in the WHO manuals for syndromic management, which recognises several possible causes of frequently presented syndromes and recommends treatment based on an assessment of

the most likely causative organisms, while aetiological diagnosis was based on the assays given in Table 1. Results of the comparison between these two instruments for the 311 women taking the medical diagnosis in the present study show very high sensitivity (95 percent) and substantially high specificity (77 percent) for infections (Table 3). This means that clinical examination is unlikely to miss the presence of an infection but is relatively more likely to miss the absence of an infection. From the low positive predictive value (56 percent), an over-diagnosis of infections in the clinical diagnosis can be inferred. Likewise, the Kappa value of 58 percent presents just a moderate strength of agreement between the clinical and aetiological diagnosis for the presence of any infection.[5]

Sensitivity of the clinical diagnosis for STIs was much poorer (50 percent) than the sensitivity for endogenous infections ((91 percent), implying missing of sexually transmitted infections in cases where they are present. On the contrary, the specificity of clinical diagnosis for STIs is better (99 percent) than its specificity for endogenous infections (77 percent), referring to the comparative inability of the procedure to rule out presence of an endogenous infection when it is not present (Table 3). The over-diagnosis of endogenous infections in clinical diagnosis is also reflected in the rather low positive predictive value (50 percent). There is just a fifty-fifty chance of a clinically diagnosed endogenous infection to be confirmed by aetiological testing. High percentage of

Table 3

Comparison of Clinical Diagnosis with Aetiological Assessment of Infection

I. Having any Infection			
Has an Infection Clinically	Has an Infection Aetiologically		
	Yes	No	Total
Yes	70	55	125
No	4	182	186
Total	74	237	311
Sensitivity = 95%			Positive predictive value = 56%
Specificity = 77%			Negative predictive value = 98%
Kappa value = 58%			Percentage of agreement = 81%
II. Having a STI			
Has any STI Clinically	Has a STI Aetiologically		
	Yes	No	Total
Yes	7	3	10
No	7	294	301
Total	14	297	311
Sensitivity = 50%			Positive predictive value = 70%
Specificity = 99%			Negative predictive value = 98%
Kappa value= 57%			Percentage of agreement = 97%
III. Having an Endogenous Infection			
Has an Endogenous Infection Clinically	Has an Endogenous Infection Aetiologically		
	Yes	No	Total
Yes	58	57	115
No	6	190	196
Total	64	247	311
Sensitivity = 91%			Positive predictive value = 50%
Specificity = 77%			Negative predictive value = 97%
Kappa value = 52%			Percentage of agreement = 80%

Source: RRTIS (2001-2002).

[5]Expressed here as a percentage, Kappa value can range from 1 to –1 passing through zero, with 1 signifying total agreement, 0 no agreement and –1 total disagreement.

agreements, for both, STIs and endogenous infections, are mainly due to the high negative predictive values, as the positive predictive value, especially for endogenous infection is a low 50 percent. After discounting the proportion of agreement that is to be expected according to chance alone, shown by the summary measure of Kappa value, the agreement between the clinical and aetiological diagnoses drops down to 57 percent and 52 percent for STIs and endogenous infections, respectively.

Comparison of Self-reports with Medical Diagnoses

Table 4 compares women's report of the RTI symptoms with the diagnosis of reproductive tract infections from the clinical examination. Along with comparing the responses for the presence of any RTI, analysis is also done for STIs and endogenous infections separately. Self-reported symptoms have high sensitivity (90 percent) when compared with clinical diagnosis for presence of any infection but the specificity is a low 26 percent. The positive predictive value and percentage of agreement are also a moderate 45 percent and 52 percent, respectively. These low values could be attributed to over-reporting of symptoms by women, in absence of clinically diagnosed infections. The Kappa value of 14 percent further shows poor concordance between self-reported symptoms and presence of infection clinically.

Table 4

Comparison of Self-reports with Clinical Diagnosis

I. Having any Infection			
Reports a Symptom	Has an Infection Clinically		
	Yes	No	Total
Yes	113	138	251
No	12	48	60
Total	125	186	311
Sensitivity = 90%			Positive predictive value = 45%
Specificity = 26%			Negative predictive value = 80%
Kappa value = 14%			Percentage of agreement = 52%
II. Having a Sexually Transmitted Infection			
Reports STI Related Symptoms	Has a STI Clinically		
	Yes	No	Total
Yes	9	216	225
No	1	85	86
Total	10	301	311
Sensitivity = 90%			Positive predictive value = 4%
Specificity = 28%			Negative predictive value = 99%
Kappa value= 2%			Percentage of agreement = 30%
III. Having an Endogenous Infection			
Reports Endogenous Infection Related Symptom	Has an Endogenous Infection Clinically		
	Yes	No	Total
Yes	12	14	26
No	103	182	285
Total	115	296	311
Sensitivity = 10%			Positive predictive value = 46%
Specificity = 93%			Negative predictive value = 64%
Kappa value = 4%			Percentage of agreement = 62%

Source: RRTIS (2001-2002).

Comparing self-reports with clinical examination for the nature of existing infection, we see the indicators to be slightly better for endogenous infections. For STIs, sensitivity is 90 percent but the specificity is a low 28 percent. On the contrary, the trend is reversed for the endogenous infections, with sensitivity being a poor 10 percent and specificity at a high 90 percent. The positive predictive value of self-reported symptoms is a poor 4 percent, with the total percentage of agreement at a fair 30 percent. The corresponding indicators for endogenous infections are comparatively higher but after discounting for agreement according to chance alone, comparison for both kinds of infections show a poor Kappa value (Table 4).

Comparison of self-reports with the aetiological diagnosis for any infection shows a further decrease in the percentage of agreement (Table 5). The positive predictive value of self-reports is only 28 percent, implying an over-reporting of symptoms by a big proportion of women, and the total percentage of agreement is just a fair 40 percent. Since over eighty percent women report having symptoms the chance of missing an infection is not much, reflected in the high sensitivity rate, but the actual infection rate diagnosed through aetiological testing being at 24 percent, the comparison shows a much lower rate of specificity and positive predictive value for the self-reports (Table 5). The poor agreement between self-reports and the aetiological diagnosis is also evident from the poor Kappa value for the comparison (10 percent).

Table 5

Comparison of Self-reports with Aetiological Diagnosis

I. Having any Infection			
Reports a Symptom	Has an infection Aetiologically		
	Yes	No	Total
Yes	70	181	251
No	4	56	60
Total	74	237	311
Sensitivity = 95%			Positive predictive value = 28%
Specificity = 24%			Negative predictive value = 93%
Kappa value = 10%			Percentage of agreement = 40%
II. Having a Sexually Transmitted Infection			
Reports STI Related Symptoms	Has a STI Aetiologically		
	Yes	No	Total
Yes	13	212	225
No	1	85	86
Total	14	297	311
Sensitivity = 93%			Positive predictive value = 6%
Specificity = 29%			Negative predictive value = 99%
Kappa value = 3%			Percentage of agreement = 32%
III. Having an Endogenous Infection			
Reports Endogenous Infection Related Symptom	Has an Endogenous Infection Aetiologically		
	Yes	No	Total
Yes	4	22	26
No	60	225	285
Total	64	247	311
Sensitivity = 6%			Positive predictive value = 15%
Specificity = 91%			Negative predictive value = 79%
Kappa value = –4%			Percentage of agreement = 74%

Source: RRTIS (2001-2002).

Comparison for the nature of infections as expressed in self-reports with aetiological diagnosis again shows weak concordance (Table 5). If the self-reports have strong sensitivity value, the specificity value is low and vice versa, for STIs and endogenous infections, respectively. Both comparisons, that is for STIs and endogenous infections, have poor positive predictive values, reflecting the wide gap between the reporting of symptoms and actual prevalence of infection. The overall agreement in the two comparisons is better for the endogenous infections, having a 74 percent agreement between self-reports and aetiological screening, while for the STIs the rate goes down to 32 percent (Table 5). However, if we discount the proportion of agreement that is to be expected by chance, represented by the Kappa values, the trend is reversed, with the self-reports for STIs, despite having very poor agreement (3 percent), being somewhat better than the value for endogenous infections (–4 percent). Irrespective of the differences in patterns shown by different indicators, the overall agreement between self-reports and aetiological diagnosis remains weak.

Classification and Meaning of Self-reports

The discordant responses given by women and the aetiological screening for RTIs need further analysis for explanation. The comparison between women's self-reports and aetiological testing helps us identify the magnitude of positive and negative responses, including both true and false reports. Table 6 presents these results achieved by comparing women's self-report for experiencing any symptom and an aetiological presence of any infection. Majority of the self-reports (58 percent) fall in the false positive category, followed by true positive (22.5 percent) and true negatives (18 percent). Women who did not report any symptom but tested positive for at least one infection comprised 1.3 percent of the sample (the false negatives in Table 6). The 58 percent false positive responses support the notion of over-reporting of symptoms by women.

Table 6 also shows differences between these classifications of responses across women with different characteristics. Age does not show significant relation with the four measures, however, level of education does (Table 6). Women with more years of education have the lowest true positive rate (9 percent), and the highest true negative (23 percent), false positive (64 percent) and false negative (3.6 percent) rates. Likewise, women living in joint/extended households, with a false positive rate of 65 percent, tend to over-report their symptoms. Differentials between economic groups also show a significant relation, with women in the upper economic group having the lowest true positive responses (12 percent), and the highest true negative (21 percent), false positive (64 percent) and false negative (2.4 percent) responses. Women with more years of schooling and those belonging to the upper economic group had the lowest rate of reporting symptoms but they had an even lower rate of aetiologically diagnosed infections, giving them higher false positive response rates. Women on the other end of these two categories, that is those with no education and those belonging to the lower economic group, had the highest rate of self-reported symptoms but they actually had more infections too, so despite some over-reporting by them they still have a lower false positive response rate.

Table 6

Classification of the Results of the Comparison between Self-reports for Any Symptom and Aetiological Testing for Any Infection by Selected Characteristics of Women

Background Characteristics		True Positive	True Negative	False Positive	False Negative	*p-value*
Total		22.5	18.0	58.2	1.3	
Age of Woman	<25	17.7	25.8	56.5	0.0	*0.485*
	25-34	26.0	14.5	58.0	1.5	
	34<	21.2	17.8	59.3	1.7	
Ever been to School	Yes	18.6	18.1	61.8	1.5	*0.134*
	No	29.9	17.8	51.4	0.9	
Level of Education	11 years or more	8.9	23.2	64.3	3.6	*0.051*
	1-10 years	22.3	16.2	60.8	0.7	
	No education	29.9	17.8	51.4	0.9	
Background Area	Urban	21.7	18.3	58.7	1.3	*0.947*
	Rural	25.0	17.1	56.6	1.3	
Family Type	Nuclear	25.1	17.9	55.6	1.3	*0.346*
	Joint/extended	15.9	18.2	64.8	1.1	
Economic Group	Lower	34.8	16.9	47.3	0.9	*.011*
	Middle	16.6	17.8	64.3	1.3	
	Upper	11.9	21.4	64.3	2.4	
Inter-spousal Age Difference	Wife older	35.7	7.1	42.9	14.3	*.000*
	Same age	22.2	16.7	61.1	0.0	
	Husband 1-10 yrs older	21.3	20.5	57.3	0.8	
	Husband >10 yrs older	25.0	7.5	67.5	0.0	
Duration of Marriage	≤ 1 year	5.6	27.8	66.7	0.0	*0.490*
	2-5 years	19.1	23.8	55.6	1.6	
	6-15 years	24.6	13.1	61.5	0.8	
	16 years or more	25.0	18.5	54.6	1.9	
Number of Pregnancies	None	0.0	37.5	62.5	0.0	*0.022*
	1-2	13.3	25.3	59.0	2.4	
	3-4	27.3	11.4	60.2	1.1	
	5 or more	28.2	15.3	55.7	0.8	
Number of Children	None	4.4	34.8	60.9	0.0	*0.034*
	1-2	16.4	20.0	60.9	2.7	
	3-4	31.4	12.8	55.9	0.0	
	5 or more	25.0	17.1	56.6	1.3	
Current Contraceptive Use	Not using	21.5	19.6	57.6	1.3	*0.101*
	Users	23.5	16.3	58.8	1.3	
	Traditional method users	*7.4*	*22.2*	*66.7*	*3.7*	
	Modern method user	*27.0*	*15.1*	*57.1*	*0.8*	
Ever Wanted to Get Pregnant and could not	Yes	11.8	26.5	55.9	5.9	*0.003*
	No	23.8	17.0	58.5	0.7	
Number of Symptoms Reported	No symptom	0.0	93.3	0.0	6.7	*0.000*
	1-2 symptoms	19.2	0.0	80.8	0.0	
	3-4 symptoms	26.6	0.0	73.4	0.0	
	5 or more symptoms	53.2	0.0	46.8	0.0	
Decision-making Authority	No sat at all	31.8	0.0	68.2	0.0	*0.244*
	Moderate say	25.0	18.8	54.7	1.6	
	Substantial say	24.4	17.3	55.9	2.4	
	Major say	16.3	22.5	61.2	0.0	
Freedom from Threat	Afraid and beaten *Battered)*	23.3	3.3	73.3	0.0	*0.011*
	Afraid but not beaten *(Anxious)*	24.7	15.1	59.1	1.1	
	Not afraid but beaten *(Defiant)*	28.2	23.1	48.7	0.0	
	Neither afraid nor beaten *(Contented)*	18.5	26.1	52.9	2.5	
Freedom of Mobility	*Needs permission:*					*0.478*
	Always	23.6	14.8	60.1	1.5	
	Never	21.7	25.3	51.8	1.2	
	Depends	16.0	20.0	64.0	0.0	
Control over Household Income **	Has control	19.3	21.5	57.4	1.8	*0.012*
	Does not have control	30.7	9.1	60.2	0.0	

Source: RRTIS 2001-2002.

The inter-spousal age difference is highly significant for the four response classification (Table 6). Women with husbands more than ten years older to them have the highest false positive rate (68 percent), while women who are older than their husbands have the highest true positive responses (36 percent). The latter also have the highest false negative response rate (14 percent). The number of pregnancies and children women have show significant relation with the response categories, as can be seen from Table 6. The true positive responses generally increase with the increasing number of pregnancies and children, accompanied by a gradual decrease in true negative responses. The false positive rate remains almost similar across women with different numbers of pregnancies and children, remaining within the 56-62 percent range (Table 6). Not much difference is found between women who are using contraceptives and those who are not, however women using traditional methods of contraception have the lowest true positive rate (7 percent), and the highest true negative (22 percent), false positive (67 percent) and false negative (4 percent) responses. Another significant association for this response classification exists for women who reported to be experiencing infertility, primary or secondary. Contrary to what is expected, reporting infertility has a lower true positive rate (12 percent), compared to those who did not complain of infertility (24 percent). There is not much difference between their false positive responses (Table 6). As would be expected, the number of symptoms reported by women is strongly related to this classification. The more the number of symptoms a woman report the more likely she is to have a true positive response, and the reverse being true for the false positive responses (Table 6). This relation do look tautological as to actually have an infection some or a combination of symptoms need to be present but the strong relation found between the two shows that in situations where laboratory testing is not possible, the number of reported symptoms can help in ascertaining the presence or otherwise of RTIs.

Association of women's autonomy status with this response classification shows an interesting pattern. Women with lower autonomy level not only have higher true positive responses but also higher false positive responses, the relation being significantly strong for the freedom from threat and control over household income indicators (Table 6). Battered women have a false positive rate of 73 percent compared to 53 percent for the contented women, despite the former having a true positive rate of 23 percent in comparison to 19 percent for the latter. Likewise, women having no say at all in household decision-making have a false positive rate of 68 percent with 32 percent of their responses classified as true positives, both rates being higher than the ones for women in other categories of this indicator (Table 6). This pattern is generally shared by all the four autonomy indicators used in this study.

A notable aspect of this classification is the comparatively higher rate of false negative responses among women with better socio-economic and autonomy status. Despite a low overall rate of false positive responses, this trend could be inferred from Table 6. Women with more years of education, those in the upper economic group, having substantial say in household matters, have freedom from threat and have at least some control over household income are examples of women with better socio-economic and autonomy status having higher false negative responses. Women with 1-2 pregnancies and children have a comparatively low true positive rate compared to those with more pregnancies and children but have a higher false negative rate (2.4 and 2.7,

respectively). A similar trend is also found for traditional contraceptive users, who have a low true positive rate (7 percent) but a comparatively high false negative rate (4 percent). Women who are older than their husbands present a peculiar situation that is not common in the socio-cultural environment of Pakistan. The rate of false negatives among them is higher (14 percent) than women having husbands older to them, irrespective of the age difference, along with having the highest true positive rate (36 percent).

Psychogenic[6] factors seem to underlie the trends and the disparity that exist between the reported and actual infection levels. Women with better status are less likely to report any symptom, including those having an infection aetiologically, mirrored in their higher false negative responses. On the contrary, women with lower socio-economic and autonomy status do have high infection rates but their rate of self-reported symptoms is even higher, represented by their high false positive responses.

Before further discussing this suggested relationship, it is worthwhile looking into the factors that determine a woman's reporting of symptoms and her actually having an infection. Table 7 presents the results of the most robust models created through logistic regression to determine factors influencing the report of symptoms and aetiological presence of an infection. The models include only those factors that came out to be significant after running stepwise forward conditional method logistic regression. The method allows specifying how independent variables are entered into the analysis. The entry criterion set to include a variable in the model was .05 and the removal criterion was set at 0.1, with a maximum of 20 iterations. A variable's entry in such a model relies not only on how well it fits the entry criterion but it is also omitted if it causes the tolerance of another variable already in the model to drop below the entry criterion. The final models generated for both reporting a symptom and having an infection are shown in Table 7. It is evident that factors determining the reporting of symptoms are quite different from those influencing the aetiological presence of an infection. Autonomy indicators of freedom from threat and control over household income are significantly related to the reporting of symptoms while they are not among the factors significantly affecting the aetiological presence of an infection. A similar trend exists for inter-spousal age-difference, which is significant for reporting of symptoms but not for actually having an infection. On the contrary, woman's economic status is significant for having an infection but not for reporting a symptom, with the women belonging to the lower economic group five times more likely to have an infection than their richer counterparts (Table 7). This is understandable in the light of other factors that are significant for the aetiological presence of an infection. Among these is the means of protection used during menstruation, with the women from the lower economic group mainly using old cloth, which is a sub-group that is more than three times likely to have an infection compared to women who are not menstruating. Women's contraceptive use is highly significant for having an infection, but it is not so for reporting of a symptom (Table 7). The likelihood of having an infection increases by over three times when the woman is using IUD, hinting towards iatrogenic sources of transmission of infection. Interestingly, it is the number of pregnancies that is significant for the reporting of symptoms but for actually having an infection, it is the gap between the last two pregnancies that is significant.

[6]Psychogenic responses refer to those that are produced by psychological and mental factors, rather than organic factors.

Women who had a gap of less than 12 months between the last two pregnancies were 12 times more likely to have an infection than those how had only one or no pregnancy at all (Table 7).

Reviewing the differences in factors significant for the reporting of symptoms and having an infection it is understandable to find a disparity between the two. While mainly socio-psychological factors influence the reporting of symptoms, the demographic and physiological factors affect the actual presence of an infection. Being a battered woman is more likely to affect her psychological well being, than using any particular contraceptive method or menstrual protection, prompting her to report symptoms. Thus the reported symptoms, especially those classified as the false positives, are greatly influenced by woman's psychological and emotional state, and could be referred to as what Nichter (1981) calls the "idioms of distress".

Table 7

Logistic Regression Analysis for Factors Significant for Reporting of Symptoms by Women, and for Aetiological Presence of an Infection

Predictor Variable		Reporting a Symptom Odds Ratio *(95% CI)*		Having an Infection Odds Ratio *(95% CI)*	
Age of Women	*<25*				
	25–34	–		–	
	34<				
Level of Education					
	11 or more years	–		–	
	Never been to school				
	1-10 years				
Family Structure					
	Nuclear	–		–	
	Joint/extended				
Background Area					
	Urban	–		–	
	Rural				
Economic Group					
	Upper	–		1.00	
	Middle			–1.57	*(0.69-4.11)*
	Lower			4.95	*(2.42-7.98)*
Inter-spousal Age Difference					
	Same age	1.00			
	Wife older	0.64	*(0.49-1.80)*	–	
	Husband 1-10 yrs older	–.71	*(0.54-2.34)*		
	Husband >10 yrs older	6.49	*(5.43-8.17)*		
Number of Pregnancies					
1-2		1.00			
	None	–0.51	*(0.21-1.71)*	–	
	3-4	3.07	*(1.40-6.89)*		
	5 or more	2.85	*(1.36-4.63)*		
Gap between the Last Two Pregnancies					
	None or only one			1.00	
	≤12 months	–		12.03	*(11.16-15.21)*
	13-36 months			4.27	*(2.87-5.79)*
	>36 months			6.50	*(3.79-8.91)*

Continued—

Table 7—(*Continued*)

Predictor Variable	Reporting a Symptom Odds Ratio *(95% CI)*		Having an Infection Odds Ratio *(95% CI)*	
Menstrual Hygiene				
Not menstruating			1.00	
Commercial sanitary pads		–	1.91	*(0.61-4.63)*
Cotton wool/new cloth			2.51	*(1.02-5.74)*
Old/used cloth			3.11	*(1.44-5.71)*
Current Contraceptive Use				
Non-users			1.00	
Pills			–0.38	*(0.96-1.48)*
IUD			3.49	*(1.80-6.28)*
Injections		–	–0.14	*(0.02-1.31)*
Condom			–0.16	*(0.05-0.55)*
Tubectomy			1.22	*(0.50-2.81)*
Rhythm			–0.00	*(0.00-0.00)*
Withdrawal			–0.77	*(0.24-2.76)*
Decision-making Authority				
Major say				
No say at all		–		–
Moderate say				
Substantial say				
Freedom from Threat				
Neither afraid nor beaten *(Contented)*	1.00			
Afraid and beaten *(Battered)*	8.99	*(5.67-11.40)*		–
Afraid but not beaten *(Anxious)*	1.7	*(0.86-3.52)*		
Not afraid but beaten *(Defiant)*	1.3	*(0.47-2.84)*		
Freedom of Mobility				
Needs permission:				
Never		–		–
Always				
Depends				
Control over Household Income				
Has control	1.00			–
Does not have control	3.90	*(1.63-6.43)*		
Constant	0.055*		–4.176***	
Model Chi square	47.827***		72.535***	
Degrees of freedom	10		15	
Reporting predictive correctly	84.6%		81.7%	
Hosmer- Lemeshow Test	0.740		0.690	
Number of cases	311		311	

Source: RRTIS 2001-2002.

Note: *** p<.001, **p<.01, and * p<.05, for having/not having any infection.

a. Category marked a represents the reference category.

b. Dashes represent factors that were excluded from the model as they were not found to be significantly associated with having/reporting an infection at the criteria set in the regression model.

c. Number of cases in each category can be found in Annex II.

"Idioms of distress" are "adaptive responses to circumstances where other modes of expression fail to communicate distress adequately or provide appropriate coping strategies" [Nichter (1981), p. 379]. The term distress here refers to a broad range of feelings, including those of vulnerability, dissent, apprehension, resentment, inadequacy, dissatisfaction, suppressed anger and other anxiety states that if expressed overtly could lead to conflict and disharmony. Women thus speak through their bodies what they cannot express in words. They, consciously or unconsciously, convert a psychological conflict into a physical manifestation, which helps them to divert their focus away from a troublesome emotional or psychological issue to what may be a more acceptable physical problem, something they also find comparatively easier to express than the actual cause of the problem. Since women's health is socially and culturally constructed around woman's reproductive health, it is usually symptoms related, directly or indirectly, to the womb that become a means of expression. In the words of Zola, this is "what constitutes the necessary part of being a woman" (1966, p. 619). This conversion of psychosocial stress is reflected in the large false positive response rate in the present study, expressing woman's perceived balance, or imbalance, in different domains of her life, including, body, marriage, family and household.

With knowledge about their bodies in general and reproductive system in specific being scant there are misconceptions among women regarding their bodily experiences. During the course of the present study when women were inquired about what they thought caused the symptom(s) they reported to be experiencing, 38 percent said it was due to "*Kamzori" (*weakness).[7] Likewise when they were asked about the possible consequences of experiencing RTI related symptoms 43 percent again considered weakness as a possible result. These responses were most common with regard to experiencing abnormal discharge. Thus, reported symptoms are associated to the cultural and personal meanings women attribute to their experiences. Assigning weakness as a cause and consequence of abnormal discharge can in fact be expressions of powerlessness, vulnerability, lack of control and psychosexual problems. As also pointed out by Patel and Oomman in India, the reporting of abnormal discharge is more a "somatic idiom" of depression and psychosocial distress than evidence of disease (1999, p. 30). Similarly, dyspareunia can be an expression of marital dissatisfaction, instead of a disease symptom. The high rate of reporting backache can in fact be a somatisation of stress and anxiety resulting from excessive and arduous housework that is not gratifying in itself. Dr John D. Stoeckel very aptly refers to it as the "trapped housewife syndrome" (cited in Zola 1966). The fatigue and pain is more related to depression than to actual physical exertion. There is a substantial body of literature linking chronic pelvic pain and backache to psychological factors [Savidge and Slade (1997); Fry, *et al.* (1997); May, *et al.* (2000); Wood, *et al.* (1990)]. The battered women being ten times more likely than the contented ones to report a symptom (Table 7) and having a false positive rate of 73 percent (Table 6) provide a clue to the psychogenic nature of self-reported symptoms.

[7] Bhatti and Fikree (2002), Ramasubban, *et al.* (2001), Mazhar (2001), Singh, *et al.* (2001), also show weakness as an illness in itself along with being the cause and consequence of other problems, especially the ones sexual in nature, including RTIs.

The disparity between the self-reports and aetiological diagnosis arises because of interpreting reports having deep personal socio-psychological and cultural meanings attached to them, in a totally biomedical framework. Self-perceived morbidity is a function of both, the actual burden of pathology and the individual's social, psychological and cultural context, while the biomedical framework naturally takes only pathological factors into account, leading to the gap between the two. There is potential for mistranslation while interpreting one in the other's framework, but both biomedical and individual meanings of the symptoms are important. As findings of this study show, not all women reporting symptoms have infections and not all those not reporting any symptom are without an infection. Not always are these symptoms used as an "idiom of distress" and may represent an actual presence of infection. Generalising self-reports either way can result in excessive or inappropriate treatment in one case or missing of infection in the other.

CONCLUSIONS

Poor agreement exists between women's self-reports and aetiological diagnoses, with the former over-representing the presence of infection. Some of the self-reported symptoms are pathogenic in nature, as represented by the true positive reports, but majority of the self-reports are false positives when compared to aetiological diagnosis. Self-reports can thus also have psychogenic origins, and are actually being used by women to express a state of psychological or emotional distress. Women in socially, culturally or emotionally weaker situations find their bodies to be the medium for their expression of distress. This could be especially true in situations where alternative means of expression or even stating the actual reasons of distress are judged to be more difficult and/or threatening than presenting them as physical conditions. This idea of psychogenic factors playing role in women's self-reported symptoms is further strengthened by the finding that for reporting of symptoms, socio-cultural and autonomy factors are significant while for actually having an infection it is mainly the demographic and physiological factors that play a significant role.

Clinical examination, based on the syndromic approach to manage RTIs, generally shows a moderate level of concordance with the aetiological diagnosis in this study. It not only over-diagnoses infections but in cases also misses infections. Validity of the reports is weaker for sexually transmitted infections than for endogenous infections. Although the cost of clinical examination would be less than aetiological diagnosis for the screening of reproductive tract infections, but findings of this study prove it an unreliable way of assessing the presence or absence of these infections.

For policy implications, clinical diagnosis, based on the syndromic management approach, was also assessed against laboratory diagnosis, that is considered to be a more reliable and accurate way of diagnosing the presence or otherwise of an infection. Based on the Kappa values, moderate agreement was found between the two. However, the worrying aspect of the comparison is the low sensitivity value for STIs and an equally low positive predictive value for endogenous infections in clinical diagnosis, representing missing of infections and over-diagnoses, respectively. Devising low-cost, easy to conduct, laboratory tests is imperative in the given scenario. Some of the tests, especially those needed for the more common endogenous infections, are actually not that

expensive to conduct but since they are rarely conducted commercial laboratories charge exorbitant rates for them.

Discordant responses while comparing self-reports with laboratory diagnosis, and the analysis to decipher what they actually meant lead us to conclude that women's self-reports and pathological presence of disease two different aspects of health, and this difference us reflected in the gap between the perceived and the actual disease level. As the multivariate analysis show, for actually having an infection it were mainly physical/tangible reasons that were responsible while for reporting of symptoms it were the perceived/intangible factors that were more dominant. What women could not say in words, they converted into bodily expressions, and with reproductive functions considered the primary focus of women's lives in the society, symptoms associated with this function were frequently used as the language to express their distress. Patel (2003) also found that in developing countries the strongest association of complaints regarding abnormal discharge is with depression not RTIs. Reported physical symptoms present psychosocial disorders through somatisation. There is evidence that anxiety and depression can have effect on autonomic nervous system, leading to muscle-tension related pains, and a distressed person is more likely to interpret normal physical experience as pathological [Patel and Oomman (1999); Hunter (1990) and Van Vliet, *et al.* (1994)].

In this scenario, it would be realistic to infer that the conventional health surveys, relying solely on verbal responses, do not necessarily represent the real health situation of a study population, and thus any policy intervention formulated exclusively on this information would be flawed and not achieve its desired results. If the health of the population, specifically that of women, is to be alleviated, there is a need for a fresher approach to understand the non-medical context of illnesses. It could be referred to as an ethno-sensitive approach to epidemiology. The relation between physiological and non-physiological factors is not that straight forward. Even if symptoms are not found to be associated with pathology, the finding of pathology does not necessarily imply that it was the cause of the symptom. Example in this regard can be chronic pelvic pain, caused by PID, which in turn may cause marital problems leading to depression, which in turn could aggravate the pain experience and delay recuperation. Self-reports, therefore, are important for their socio-cultural and metaphorical connotations, and could be used to address issues, like social and emotional stress and excessive workload, that concern women's health in the broader context. Thus, there is a need for, as put forward by Patel and Oomman (1999, p. 34), "An interactive model of aetiology which incorporates physiological and psychosocial factors" to understand this complex relation.

ANNEX I

Details of Laboratory Assays Used to Detect RTIs

Within the constraints of time and budget, attempt was made to select laboratory assays that had better diagnostic efficiency. Exception in this regard however was detection of HPV infection. For HPV, cellular morphology, having lower diagnostic efficiency, was selected to screen women for the infection because the more efficient alternative through DNA detection was neither affordable nor available.

Since samples were collected within the premises of the laboratory, there was no transportation time involved and the probability of samples being contaminated were thus minimised. The details of these assays are as follows:

Infection	Nature of Sample	Method of Detection
Candidiasis	Vaginal smear	A swab of the vaginal secretions was inoculated into Sabouraud's agar within an hour of collection and incubated for up to two days at 37° C. Colonies were identified as yeast by performing a Gram stain. The quantity of yeast was determined, with more than 103 colony-forming units/ml of vaginal secretions usually being associated with disease.
Trichomoniasis	Posterior vaginal smear	A swab of secretions taken from the posterior vaginal fornix was used within an hour of sample collection to inoculate a tube of Diamond's modified medium. The culture was incubated at 35°C for up to four days with daily examination by wet prep for motile trichomonas.
Bacterial Vaginosis	Vaginal smear	A swab of vaginal secretions was rolled onto a glass slide and air-dried. The slide was gram stained and a standardised 0-10 point scoring method was used to evaluate the smears. Points were given by estimating the number of three different bacterial morphotypes from 0 to 4+, including large Gram-negative rods, small Gram-negative/variable rods, and curved Gram-negative/ variable rods under the microscope.
Chlamydia	Endogenous-cervical vaginal smear	In direct immunofluorescence assay (DFA), cells collected on swabs were rolled onto glass slides, fixed and stained with fluorescein-labelled monoclonal antibodies specific for the major outer membrane protein of C. trachomatis. DFA allows for the visualisation of the distinctive morphology and staining characteristics of chlamydial inclusions and elementary bodies. It also permits simultaneous assessment of the specimen adequacy. The presence of ten or more elementary bodies is generally accepted for the test to be positive.
Gonorrhoea	Endogenous-cervical vaginal smears	The endo-cervical swab was used immediately after collection to inoculate a plate of modified Thayer-Martin. The selective medium contains anti-microbial agents that allow the growth of N. gonorrhoea and inhibit the growth of other bacteria. The plate was incubated at 35 degrees C for up to three days. Typical colonies were tested with Gram-stain, oxidase and catalase and superoxal tests for presumptive identification of N. gonorrhoea. To confirm a presumptive culture, the isolated organism was tested for sugar fermentation by growth in standard carbohydrate fermentation tubes.

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Syphilis	Serum	Nontreponemal antibody tests for syphilis, which are used for screening patient serum, are based on detection of antibodies to a cardiolipid-cholesterol-lecithin antigen. Undiluted serum was added to the antigen on a slide. The reagents were then mixed and rocked and observed for flocculation. The rapid plasma reagin (RPR) test, in which the antigen is mixed with charcoal so the antigen-antibody complexes can be seen without a microscope, was used to screen women for syphilis.
Genital Herpes	Cells from lesions	Lesions were rubbed at their base with a cotton swab after breaking any intact vesticles. The sample was then used to inoculate a fibroblast cell-line . The diagnosis was made by observation of a characteristic cytopathic effect on the cells after incubation for up to one week (although most positives occur within 48 hours of cell inoculation) and confirmation of the virus by staining the infected cells with monoclonal antibodies specific for HSV.
Chancroid	Smear from the base of the ulcer	Before obtaining material for culture, the ulcer base was exposed and made free of pus. Culture material was obtained from the base of the ulcer with a cotton swab and immediately inoculated directly onto culture plates. H. ducreyi is a fastidious organism and requires special media for growth. An effective medium for H. ducreyi isolation contains Columbia agar base, foetal bovine serum, haemoglobin, IsoVitalex, activated charcoal and vancomycin. Plates were incubated for up to three days at 33-35 degrees C in 5% CO2 atmosphere. A Gram stain was performed on suspected colonies. Gram-negative bacilli from colonies compatible with H. ducreyi were identified based on their requirements for X but not V factor for growth.
HPV	Endo/ecto-cervix cells	Epithelial cells were collected from the endo-cervix and ecto-cervix using a wooden spatula. Cells were rolled onto a glass slide, and stained with the Papanicolaou stain and read by the pathologist. Particular abnormal cellular morphology is indicative of an HPV infection.

Source: RRTIS 2001-2002. (Provided by the Pathology Department, Holy Family Hospital, Rawalpindi.)

ANNEX II

Differences in Background Characteristics between Women in the Total Sample and the Sub-sample Consenting for Medical Examination, and the Refusal Rate for Medical Examination

Background characteristics	Total Sample		Medical Sub-sample		Refusal Rate (%)
	Percent	Cases	Percent	Cases	
Total	100.0	508	100.0	311	38.8
Age of Woman					
<25	18.9	96	19.9	62	35.4
25-34	42.1	214	42.1	131	38.8
34<	39.0	198	37.9	118	40.4
Level of Education					
11 years or more	24.2	123	18.0	56	55.5
1-10 years	42.1	214	47.6	148	30.8
No education	33.7	171	34.4	107	37.4
Background Area					
Urban	76.8	390	75.6	235	39.7
Rural	23.2	118	24.4	76	35.6
Family Type					
Nuclear	71.5	363	71.7	223	38.6
Joint/extended	28.5	145	28.3	88	39.3
Economic Group					
Upper	22.8	116	13.5	42	63.8
Middle	46.3	235	50.5	157	33.2
Lower	30.9	157	36.0	112	28.7
Inter-spousal Age Difference					
Wife older	3.0	15	4.5	14	6.7
Same age	5.9	30	5.8	18	40.0
Husband 1-10 yrs older	78.9	401	76.8	239	40.4
Husband >10 yrs older	12.2	62	12.9	40	35.5
Duration of Marriage					
≤ 1 year	5.7	29	5.8	18	37.9
2-5 years	20.7	105	20.3	63	40.0
6-15 years	38.4	195	39.2	122	37.4
16 years or more	35.2	179	34.7	108	39.7
Number of Pregnancies					
None	4.5	23	5.1	16	30.4
1-2	28.7	146	26.7	83	43.2
3-4	29.1	148	28.3	88	40.5
5 or more	37.6	191	39.9	124	35.1
Number of Children					
None	8.1	41	7.4	23	43.9
1-2	36.4	185	35.4	110	40.5
3-4	32.2	164	32.8	102	37.8
5 or more	23.2	118	24.4	76	35.6
Currently Pregnant					
Yes	9.4	48	10.9	34	29.2
No	90.6	460	89.1	277	39.8
Ever Wanted to Get Pregnant and could not					
Yes	11.4	58	10.9	34	41.4
No	88.6	450	89.1	277	38.4
Gap between the Last Two Pregnancies					
<12 months	15.6	79	14.5	45	43.0
13-36 months	45.7	232	52.7	164	29.3
>36 months	22.1	112	16.7	52	53.6
None or only one	16.8	85	16.1	50	41.2

Continued—

Annex II—(*Continued*)

Background Characteristics	Total Sample		Medical Sub-sample		Refusal Rate (%)
	Percent	Cases	Percent	Cases	
Current Contraceptive Use					
Not using	51.2	260	50.8	158	39.2
Pills	4.1	21	4.2	13	38.1
IUD	7.5	38	7.7	24	36.8
Injections	3.0	15	2.9	9	40.0
Condom	14.4	73	14.1	44	39.7
Tubectomy	9.8	50	11.6	36	28.0
Rhythm	2.2	11	1.9	6	45.5
Withdrawal	7.9	40	6.8	21	47.5
Ever Wanted to Get Pregnant and could not					
Yes	11.4	58	10.9	34	41.4
No	88.6	450	89.1	277	38.4
Decision-making Authority					
No sat at all	7.1	36	7.1	22	38.9
Moderate say	18.5	94	20.6	64	31.9
Substantial say	47.6	242	40.8	127	47.5
Major say	26.8	136	31.5	98	27.9
Freedom from Threat					
Afraid and beaten *(Battered)*					
Afraid but not beaten *(Anxious)*	17.1	87	19.3	60	31.0
Not afraid but beaten *(Defiant)*	29.5	150	29.9	93	38.0
Neither afraid nor beaten	11.2	57	12.5	39	31.6
(Contended)	42.1	214	38.3	119	44.4
Freedom of Mobility					
Needs permission:					
Always	61.8	314	65.3	203	35.3
Never	27.6	140	26.7	83	40.7
Depends	10.6	54	8.0	25	53.7
Control over Household Income					
Has control	71.7	364	71.7	223	38.7
Does not have control	28.3	144	28.3	88	38.9

Source: RRTIS 2001-2002. Adapted from Nayab (2006a).

REFERENCES

Bhatia, J., and J. Cleland (2000) Methodological Issues in Community-Based Studies of Gynecological Morbidity. *Studies in Family Planning* 31:4, 267–273.

Bhatti, L. I., and F. F. Fikree (2002) Health-Seeking Behaviour of Karachi Women with Reproductive Tract Infections. *Social Science and Medicine* 54:1, 105–117.

Cassell, J. and S. E. Jacobs (eds.) (1987) Handbook on Ethical Issues in Anthropology. Washington, DC: American Anthropological Association.

De Vaus, D. A. (1995) *Survey in Social Research*. Melbourne: Allen and Unwin.

Desai, V. K., J. K. Kosambiya, H. G. Thakor, D. D. Umrigar, B. R. Khandwala, and K. K. Bhuyan (2003) Prevalence of Sexually Transmitted Infections and Performance of STI Syndromes against Aetiological Diagnosis in Female Sex Workers of Red Light Area in Surat, India. *Sexually Transmitted Diseases* 79:2, 111–115.

Detmer, W. M. and D. Nicoll (1994) Diagnostic Testing and Medical Decision Making. In L. M. Tierney, S. J. McPhee and M. A. Papadakis (eds.) *Current Medical Diagnosis and Treatment*. Connecticut: Appleton and Lange.

Filippi, V., T. Marshall, A. Bulut, W. Graham, and N. Yolsal (1997) Asking Questions About Women's Reproductive Health: Validity and Reliability of Survey Findings from Istanbul. *Tropical Medicine and International Health* 2:1, 47–56.

Fry, R. P. W., A. H. Crisp, and R. W. Beard (1997) Sociopsychological Factors in Women with Chronic Pelvic Pain: A Review. *Journal of Psychosomatic Research* 42:1, 1–15.

Garg, S., P. Bhalla, N. Sharma, R. Sahay, A. P. R. Saha, P. Sodhani, N. Murthy, and M. Mehra (2001) Comparison of Self-Reported Symptoms of Gynecological Morbidity with Clinical and Laboratory Diagnosis in a New Delhi Slum. *Asia-Pacific Population Journal* 16:2, 75–92.

Glense, C. A. and Peshkin (1992) *Becoming Qualitative Researcher: An Introduction*. New York: Longman Publishing Group.

Hawkes, S., L. Morison, S. Foster, K. Gausia, J. Chakraborty, R. W, Peeling, and D. Mabey (1999) Reproductive-Tract Infections in Women in Low-Income, Low-Prevalence Situations: Assessment of Syndromic Management in Matlab, Bangladesh. *Lancet* 354:9192, 1776–1781.

Hunter, M. (1990) Gynaecological Complaints. In C. Bass (ed.) *Somatization: Physical Symptoms and Psychological Illness*. Oxford: Blackwell Scientific Press.

ICPD (1994) *Programme of Action*. New York: UNICPD Secretariat.

Kaufman, J., Y. Liqin, W. Tongyin, and A. Faulkner (1999) A Study of Field-Based Methods for Diagnosing Reproductive Tract Infections in Rural Yunnan Province, China. *Studies in Family Planning* 30(Jun), 112–119.

Klitsch (2000) Two Approaches to Managing Vaginal Discharge Lead to Overtreatment, Missed Infections and Wasted Funds. *International Family Planning Perspectives.* 26:2, 89–90.

KRHP (Karachi Reproductive Health Project) (1997) Prevalence of Sexually Transmitted Diseases Amongst Women in Low-Income Communities of Karachi. *Infectious Diseases Journal of Pakistan* 4:2.

May, C. R., M. J. Rose, and F. C. W. Johnston (2000) Dealing with Doubt. How Patients Account for Non-Specific Chronic Low Back Pain. *Journal of Psychosomatic Research* 49, 223–225.

Mazhar, S. B., M. A. Agha, and M. A. Shaikh (2001) Knowledge and Misconceptions About Sexually Transmitted Infections in Married Women—Perspectives from Islamabad. *Journal of Pakistan Medical Association* 51:11.

Mohammad, R. (1998) *Pattern of Sexually Transmitted Diseases at a Referral Centre of Karachi.* Unpublished manuscript.

NACP (2002) *HIV/AIDS in Pakistan: A Situation and Response Analysis*. Islamabad: National AIDS Control Programme (NACP).

Nayab, D. (2005a) Reproductive Tract Infections Among Women in Pakistan: An Urban Case Study. *The Pakistan Development Review* 44:1, 131–158.

Nayab, D. (2005b) Health-seeking Behaviour of Women Reporting Symptoms of Reproductive Tract Infections. *The Pakistan Development Review* 44:2, 1–35.

Nichter, M. (1981) Idioms of Distress: Alternatives in the Expression of Psychosocial Distress. A Case Study from South India. *Culture, Medicine and Psychiatry* 5, 379–408.

Patel, V. (2003) *Depression, Dollars and Developing Countries*. Retrieved, 2007, from the World Wide Web: http://www.worldbank.org/wbi/B-SPAN/depression_disability/sub_depression_disability_index.htm.

Patel, V. and N. Oomman (1999) Mental Health Matters Too: Gynaecological Symptoms and Depression in South Asia. *Reproductive Health Matters* 7:14, 30–38.

PFFPS (1998) *Pakistan Fertility and Family Planning Survey 1996-97*. Islamabad: National Institute of Population Studies (NIPS) and Centre for Population Studies, London School of Hygiene and Tropical Medicine.

Ramasubban (2001) Weakness ('Ashaktapana') and Reproductive Health among Women in a Slum Population in Mumbai. In C. M. Obermeyer (ed.) *Cultural Perspectives on Reproductive Health*. New York: Oxford University Press.

Remez, L. (2003) Syndromic Diagnosis of Reproductive Tract Infections Leads to Substantial Unnecessary Treatment in Vietnam. *International Family Planning Perspectives* 29:1, 48.

Savidge, C. J. and P. Slade (1997) Psychological Aspects of Chronic Pelvic Pain. *Journal of Psychosomatic Research* 42:5, 433–444.

Singh, G., A. Avasthi, and D. Pravin (2001) Dhat Syndrome in a Female—A Case Report. *Indian Journal of Psychiatry* 43:4.

Sloan, N. L., B. Winikoff, N. Haberland, C. Coggins, and C. Elias (2000) Screening and Syndromic Approaches to Identify Gonorrhea and Chlamydial Infection among Women. *Studies in Family Planning* 31:1, 55–68.

van-Vliet, K. P., W. Everaerd, and F. J. van-Zuuren (1994) Symptom Perception: Psychological Correlates of Symptom Reporting and Illness Behaviour of Women with Medically Unexplained Gynecological Symptoms. *Journal of Psychosomatic Obstetrics and Gynecology* 15, 171–181.

Walraven, G., Nadeem Zuberi, and M. Temmerman (2005) The Silent Burden of Gynaecological Disease in Low Income Countries. *International Journal of Obstetrics and Gynaecology* 112:9, 1177–1179.

Wasti, S., M. K. Ashfaq, R. Ishaq, and R. Hamid (1997) Prevalence of Chlamydial Infection in Females Attending Antenatal and Family Planning Clinics in Karachi Pakistan. *The Australia and New Zealand Journal of Obstetrics and Gynaecology* 37:4, 462–465.

WHO (2000) *Sexually Transmitted Infections: Prevalence Study Methodology*: World Health Organisation.

Wood, D. P., M. G. Wiesner, and R. C. Reiter (1990) Psychogenic Chronic Pelvic Pain: Diagnosis and Management. *Clinical Obstetrics and Gynecology* 33:1, 179–195.

Zola, I. K. (1966) Culture and Symptoms. An Analysis of Patients Presenting Complaints. *American Sociological Review* 31:5, 615–630.

Zurayk, H., H. Khattab, N. Younis, O. Kamal, and M. el-Helw (1995) Comparing Women's Reports with Medical Diagnoses of Reproductive Morbidity Conditions in Rural Egypt. *Studies in Family Planning* 26:1, 14–21.