Chapter 3
Methods

Survey methodology was used to collect information on the current knowledge and practice base of medical practitioners regarding STI care in Australia. This chapter outlines the design of the study, recruitment of participants, development of study instruments, implementation, management and analyses of the survey data, and study limitations.

3.1 Study design

A cross-sectional self-administered postal survey of medical practitioners was designed to collect information about practitioner knowledge and skill base regarding STI care in Australia. The main focus of the present study was on management of STIs in general practice. While general practitioners (GPs) offer STI care in primary care, sexual health physicians (SHPs) play a key role in offering STI care in both primary and specialised settings. Evidence shows that there are variations in STI care offered by GPs and their specialist counterparts (Millstein *et al.* 1996; Marks *et al.* 1997; Hogben *et al.* 2002). The present study therefore extended its focus to exploring specialist knowledge and management practices regarding STIs in order to examine whether STI care in general practice differed from that of the 'benchmark' set in specialised settings.

3.2 Study Sample

This section describes sequentially the procedures used to draw the GP and SHP samples and the associated sampling procedures. The selection criteria used to define eligibility of practitioners to participate in the present study is also outlined.

3.2.1 GP sample

The GP sample for the present study was drawn from a database of medical practitioners maintained by the Australian Medical Publishing Company (AMPCo), a commercial subsidiary organisation of the Australian Medical Association. This database contained a comprehensive listing of all practising GPs in Australia. The rationale for using a commercial organisation such as AMPCo, *in lieu* of the Health Insurance Commission (HIC)[1], was that records maintained by AMPCo were updated on a regular basis from a range of sources, and thus were less likely to lead to missing responses due to incorrect postal address, a problem often faced by postal research. In addition, the HIC data cannot distinguish between types of medical practitioners, or how many are in fact mainly non-primary care practitioners, such as hospital doctors, or how

[1] The Health Insurance Commission (HIC) is an Australian Government statutory authority, which has been playing an integral role in improving health outcomes in Australia. It provides data on Medicare billing and includes all medical practitioners who have billed the HIC for at least one Medicare service during a financial year (White & Marsh 2001).

many are in other fields, such as sports medicine (Australian Medical Workforce Advisory Committee 2003).

At the time of sample selection (April 2002), there were 6 800 GPs listed on the AMPCo database practising in New South Wales (NSW), Australia. This distribution of GPs was markedly skewed in favour of metropolitan areas, and the number of male GPs was about twice that of females. A stratified random sample was used to draw the GP sample in order to ensure that the study sample was representative of currently practising male and female GPs across metropolitan and non-metropolitan areas of NSW. In this thesis, areas other than metropolitan zones are referred to as rural areas. Given the limitations of time and other resources, a 15% stratified random sample of GPs was selected for the present study, which yielded a total sample of 1 020 GPs practising in NSW (Table 3.1).

Table 3.1 Study sample of GPs selected by sex and area of practice in NSW

	Male	Female	Total
Metropolitan	420	249	669
Rural	247	104	351
Total	667	353	1 020

Source: AMPCo database, April 2002

3.2.2 SHP sample

The SHP sample for the present study was taken from a database maintained by the Australasian College of Sexual Health Physicians (ACSHP) of its Fellows and Associates[2]. At the time of sample selection (February 2003), there were 117 Fellows and 88 Associates affiliated with the College. To retain focus on STI care in the Australian context, it was decided to include only those members of the College who worked within Australia. Of the 205 College members, 47 worked overseas and one was involved with the study project in a supervisory capacity, and thus excluded from the study. The target population of SHPs consisted of 90 Fellows and 67 Associates of the College who worked across Australia. A full sample (100%) of the target population of SHPs (n=157) was considered for the present study. The rationale for taking the full sample of SHPs, instead of SHPs working in NSW (n=70), was to examine whether STI care in general practice differed from the benchmark practice of STIs offered by the members of the ACSHP in Australia. A complete list of the SHP sample including contact details (both postal and email address) was provided by the ACSHP to one of the supervisors for the PhD project, who is a Fellow of the College, and acted as a custodian of the mailing list on behalf of the College.

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[2] For the purpose of the present study, members (Fellows and Associates) of the ACSHP are referred to as SHPs. This SHP sample is known to have a special professional interest in sexual health.

3.2.3 Eligibility criteria

For both GP and SHP samples, practitioners were considered ineligible for the study if they were either not contactable, or no longer in clinical practice, or had retired, or were on extended leave (i.e. longer than eight weeks). In addition, GPs were considered ineligible if they had moved from NSW to another state or overseas.

3.3 Study instruments

3.3.1 STI questionnaire

Based on a number of previous surveys (Maheux *et al.* 1997; Mulvey *et al.* 1997; Haley *et al.* 1999; Cook *et al.* 2001) a draft version of a detailed questionnaire was developed to ascertain knowledge and skill base of medical practitioners for managing STIs. This draft questionnaire included questions on:

- demographic and practice characteristics (e.g. age, sex, place of graduation, postgraduate training, duration of practice, nature of practice, area of practice, number of patients seen per week, number of hours worked per week);
- awareness about STIs (e.g. knowledge about STIs, common signs and symptoms of selected STIs, specimen and site for sample collection for investigations, notification of STIs);

- clinical care of STIs (e.g. diagnosis and treatment of STIs, presumptive treatment, referral for STIs, dealing with STI patients with psychological distress, and contact tracing);
- style of practice and STIs (e.g. sexual history taking and barriers to that process, degree of comfort in dealing with patients with STIs, attitudes towards offering chlamydia testing, and priority role in STI management); and
- organisational issues in STI care (e.g. adequacy of sexual health training and professional literature on STIs, need for additional training in sexual health, STI material for patients and their adequacy and appropriateness, and barriers to sexual health promotion).

To improve the quality of the study instruments, development of the draft version was overseen by a group of professionals, comprising GPs, SHPs, and researchers from the University of New England and Deakin University, Australia. These professionals provided useful comments on the draft questionnaire, including practical issues associated with conducting a postal survey for medical practitioners, how to make the questionnaire more appealing to prospective participants and, more importantly, how to improve the response rate of the survey. A revised version of the draft questionnaire was made available for field-testing through a pilot study. This version of the draft

questionnaire included a total of 36 questions of which 27 were related to knowledge, attitudes, and practices regarding STIs, and nine were on background and practice characteristics of the study participants.

3.3.2 Non-response questionnaire

In conducting a postal survey that relies on a volunteer sample, one of the major potential problems is that the response rate can be low, especially when exploring sensitive topics (Dunne *et al.* 1997; Bates & Rogstad 2000; Purdie *et al.* 2002). Surveys with a low response rate may undermine the validity of study findings (Sibbald *et al.* 1994; McAvoy & Kaner 1996; Holt *et al.* 1997). A low response rate in surveys focusing on general practice has been acknowledged as a particular problem overseas (McAvoy & Kaner 1996; Templeton *et al.* 1997; Kaner *et al.* 1998) and has also been identified in general practice research in Australia (Peterson *et al.* 2002; Phillips *et al.* 2004).

Given this shortcoming, it was anticipated that the present postal survey might encounter a low response rate. Therefore, in addition to taking initiatives to improve participation in the survey, the present study also designed a one-page structured questionnaire for non-respondents to the STI study in order to explore possible reasons for their non-participation. Along with a list of possible reasons for non-response, based on earlier overseas research (MacPherson & Bisset 1995; McAvoy & Kaner 1996), the non-response questionnaire also had an open-ended comments section for additional input about non-participation in

the STI study. The potential non-respondents were also asked whether they would prefer to be interviewed by telephone for the STI study. The non-response questionnaire also included some demographic and practice characteristics of the non-respondents, including age, sex, place of graduation, postgraduate training in STIs, nature of practice, duration of practice, patient caseload and workload.

3.4 Ethical considerations

The main ethical issues pertaining to the present study included a full declaration of aims, objectives and possible uses of the survey data; voluntary participation; and maintaining confidentiality. The information sheet (Appendix A1) sent along with the questionnaire provided clear details about the nature and purpose of the study, methods to be used, voluntary participation, potential uses of the survey data, how the data would be stored, and what measures would be taken to maintain privacy.

The study instruments elicited only non-identifying demographic and practice information (e.g. age, sex, nature of practice) from the practitioner and a code number was assigned to each practitioner. This code number was only used to track incoming questionnaires and, as such, to identify non-responding practitioners for reminders in an attempt to increase the response rate. Study participants were reassured that the focus of the study was to identify general issues relating to STI care in clinical practice, and all data analyses and report

writing would be based on de-identified aggregated information. Participation in the survey was voluntary with returned completed questionnaires taken to imply informed consent. Practitioners were also informed that the study would be published in the form of a thesis, and the study findings would be disseminated in academic journals. All participants were asked whether they would like to receive any follow-up information, including a summary of the study findings.

Considerable effort was made to ensure anonymity and confidentiality of respondents. The mailing lists were maintained separately from the files containing the linked information for the mailing address and code number on the questionnaire. The completed questionnaires were kept in a separate locked filing cabinet at the University of New England after the survey data was entered into a computer database. These electronic data files did not contain any identifying information, and access to these files was limited to the researcher and the supervisors of the project. Ethical approval for the study was granted by the Human Research Ethics Committee of the University of New England, Australia (Approval No. HE01/129, Valid to 30 April 2003).

3.5 Pilot study

3.5.1 Pilot study implementation

To refine the study instruments, draft versions of the questionnaires (STI and non-response) were field-tested through a pilot study. This pilot study was

limited to 2% of GPs practising in NSW, which was additional to the 15% of GPs selected for the main STI study. The pilot study participants consisted of 136 randomly selected male and female GPs practising in metropolitan and rural areas of NSW.

The draft STI questionnaire, along with an invitation from the researcher, an information sheet, a covering letter from the president of the ACSHP and a self-addressed reply paid envelope, were sent together in an envelope to the GPs selected for the pilot study in May 2002. The invitation letter explained the purpose of the pilot study along with the importance of exploring STI care in general practice. One reminder letter was sent to non-responding GPs four weeks after the initial mail-out. Along with the reminder letter, a copy of the draft non-response questionnaire was sent to non-responding GPs. The 'non-responders' were informed about the objectives of the non-response survey and were asked to complete the one-page non-response questionnaire if they were unwilling to participate in the pilot STI study.

3.5.2 Pilot study findings

Of the 136 GPs initially selected for the pilot study, seven were excluded from the sample because they were either no longer in general practice (n=5), or were on extended leave (n=2). Within eight weeks of the pilot study period, a total of 37 GPs returned the completed STI questionnaire. Of the 37 GPs who completed the STI questionnaire for the pilot study, the majority (86%) were

aged under 55 years, and more than half (56%) were male. About two-thirds (67%) graduated in Australia and a quarter (25%) worked in solo practices. Of the non-responders to the pilot STI study, a total of 19 GPs completed the non-response questionnaire. Some of the common reasons for non-participation to the pilot STI study included: no time to participate, the topic is of secondary interest, the practice is 'swamped' by questionnaires, and always being asked for information with little or no return on the time invested. A draft summary of the results of the pilot STI study can be found in Appendix A2.

In July 2002, all GPs who returned the completed questionnaires were sent a thank-you letter for their participation in the pilot study. Along with the thank-you note, a copy of the Centers for Disease Control and Prevention *STD Management Guidelines 2002* and a draft summary of results of the pilot study were sent to GPs who requested them.

3.5.3 Finalising the study instruments

Based on the pilot study, the study instruments were revised. The final version of the STI questionnaire consisted of nine pages with two sections: the first section comprised 26 questions relating to STIs and clinical care, while the second section comprised nine questions on demographic and practice characteristics of the practitioners. In both the questionnaires, (STI and non-response), the term 'STI' was replaced by 'STD' (sexually transmitted disease) as the latter was more readily recognised among practitioners. However, the

term 'STI' will be used in the present thesis to describe the results of the study. Some minor revisions were made to the non-response questionnaire based on the findings of the pilot study.

3.6 Implementation of the study

The main STI study for GPs was conducted in late 2002 and that for SHPs in early 2003. The following sections describe recruitment of GPs and SHPs for the study, along with how the STI study was administered for the two groups of practitioners.

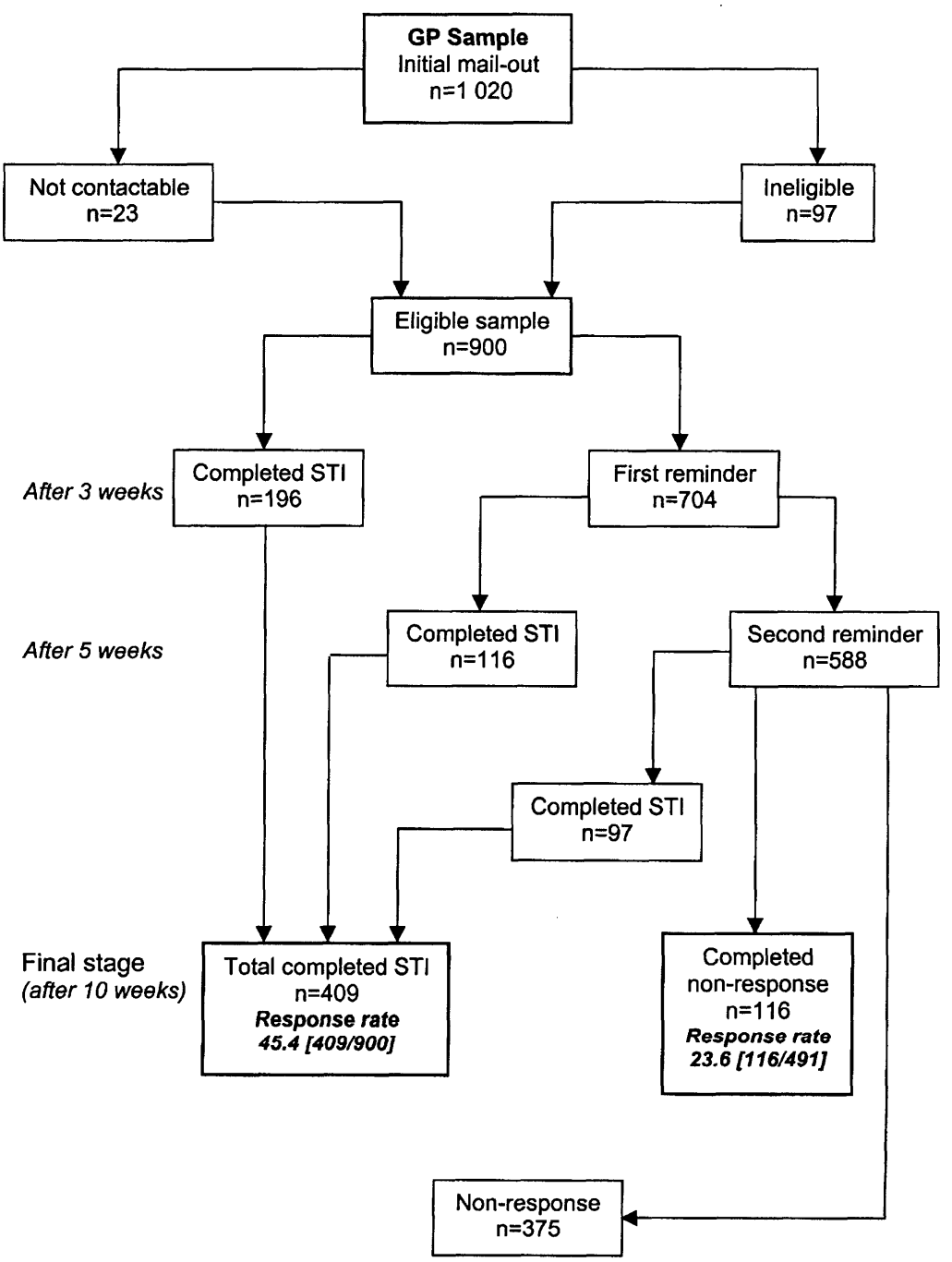
3.6.1 STI study for GPs

The final version of the nine-page STI questionnaire was mailed to 1 020 randomly selected GPs practising across NSW in October 2002. The mailing package contained an invitation letter from the researcher, a covering letter from the president of the ACSHP, a STI questionnaire, an information sheet (Appendix A1, A3 & A4), and a self-addressed reply paid envelope for the returning mail. The initial mail was sent to the practice address of each GP in the sample. For GPs who could not be contacted at their practice address, the questionnaire was forwarded to their other mailing address provided by AMPCo. Three weeks after the initial mail-out, non-responding GPs were sent the first reminder letter (Appendix A3) along with a copy of the STI questionnaire. Two

weeks later the non-responding GPs were sent another reminder. Along with this second reminder letter, a copy of the non-response questionnaire (Appendix A5) was sent to all non-responding GPs to offer them an alternative option if they did not want to participate in the main STI survey. The non-responding GPs were asked to return the completed questionnaire by December 2002.

Although the database used to draw-up the GP sample was updated on a regular basis, it was likely that some GPs might have stopped practising, might no longer be in general practice, or have moved to another state since the last update of the AMPCo database. In the cover page of the STI questionnaire, each GP was asked to return the unfilled questionnaire if s/he was not currently practising in NSW. Of the 1 020 randomly selected GPs initially considered for the study, a total of 97 were excluded from the study because they were either no longer in general practice (n=74), had retired (n=12), were on extended leave (n=8), or had moved to another state or overseas (n=3). An additional 23 GPs were not contactable (based on 'Return to sender' from the post office) either at their practice address or at their mailing address, and since no other forwarding address was available they were excluded from the study. Therefore, the final GP sample size for the STI study consisted of 900 GPs practising in NSW. Of these, a total of 409 GPs returned the completed STI questionnaire yielding a response rate of 45.4% [409/900], and a total of 116 GPs completed the non-response questionnaire yielding a response rate of 23.6% [116/491]. A flowchart of the overall implementation of the STI study for GPs is presented in Figure 3.1.

Figure 3.1 Flowchart of STI study for GPs, October-December 2002



At the end of the data collection period, a thank-you letter was mailed to all the GPs who participated in the STI study (Appendix A3). Along with the thank-you note, a draft summary of the study results, a recent journal article on new diagnostic approaches and treatments of STIs[3], a booklet on STI prevention, and a list of useful resources were sent to all participating GPs who agreed to receive them. These GPs were asked to forward their comments or suggestions, if any, about the preliminary findings of the STI study in order to improve interpretation of the survey results.

3.6.2 STI study for SHPs

The nine-page STI questionnaire with minor changes was used to explore how STIs are managed in specialised settings. The rationale for using similar instruments for both the GP and the SHP surveys was to enable the researcher to examine whether STI care in general practice differed to that in sexual health practice. The minor changes undertaken in the GP version of the STI questionnaire included: omitting question one, and adapting questions on postgraduate training in STIs and nature of practice (Appendix A6). The following sections describe how the STI study was administered to SHPs.

In February 2003, the adapted STI questionnaire was mailed to 157 SHPs who were associated with the ACSHP and were working across Australia.

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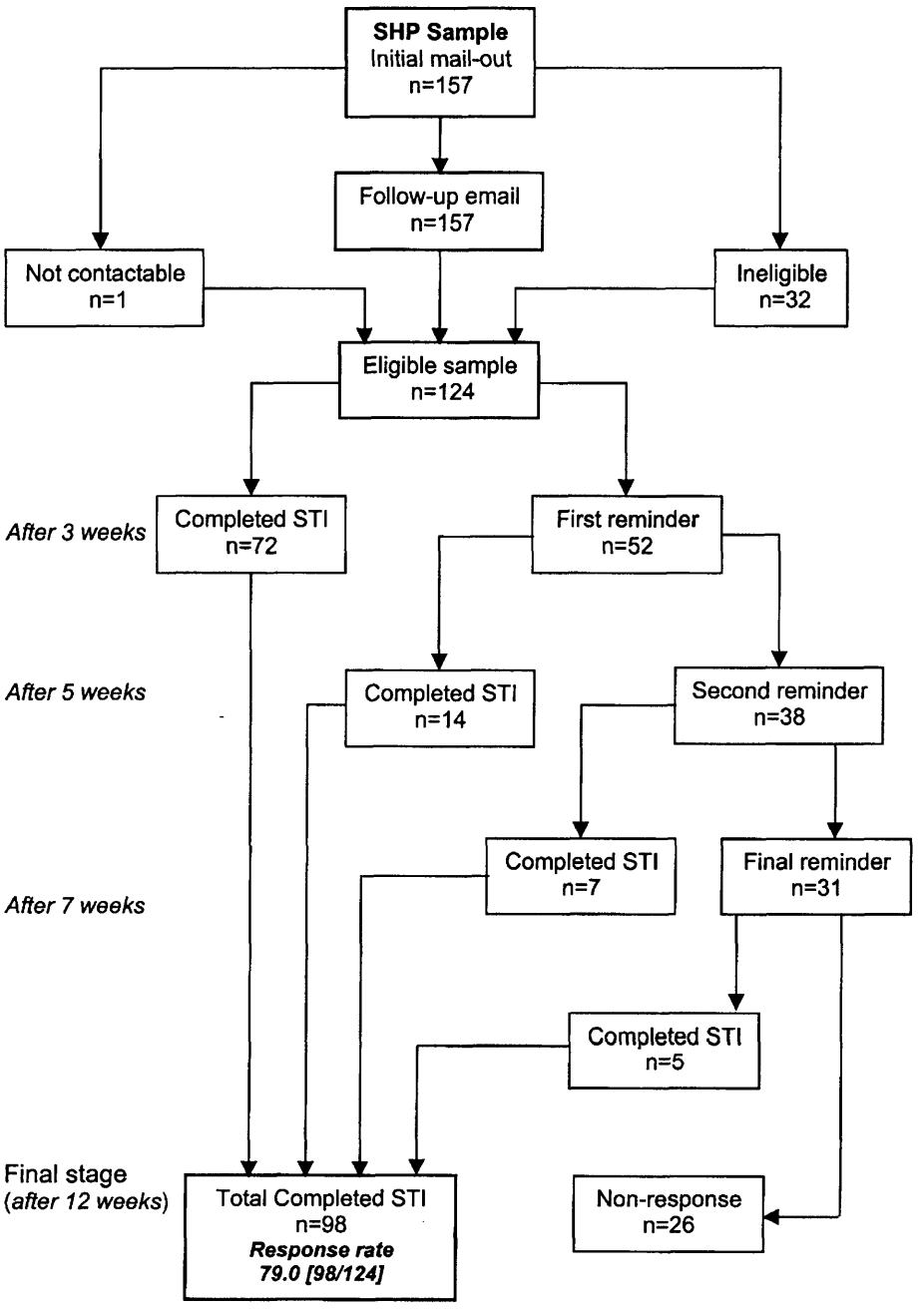
[3] Bowden, F., Tabrizi, S., Garland, S. and Fairley, C. (2002). Infectious diseases. 6: Sexually transmitted infections: new diagnostic approaches and treatments. *Med J Aust* **176**: 551-557.

Following the same protocol used in the STI study for GPs, the mailing package contained an invitation letter, a covering letter from the president of the ACSHP, an information sheet, a copy of the adapted STI questionnaire (Appendix A1, A3 & A6), and a self-addressed reply paid envelope. One week after the initial mail-out, an e-mail was sent to the SHPs stating that they also had the option of participating in the STI study electronically by completing the attached STI questionnaire. Three weeks after the initial mail-out, the non-responding SHPs were sent the first reminder letter along with a copy of the STI questionnaire. Two weeks later (i.e. five weeks after the initial mail-out), the non-responding SHPs were sent the second reminder letter. After two weeks (i.e. seven weeks after the initial mail-out), the final reminder letter was sent to the non-responding SHPs requesting their participation.

Of the 157 SHPs initially considered for the survey, a total of 33 SHPs were excluded from the study because they were not currently practising (n=19), no longer involved with STI care (n=10), had retired (n=2), had moved overseas (n=1), or could not be contacted at the available address (n=1). Thus, the final sample size for the STI study consisted of 124 SHPs practising across Australia. Of these, a total of 98 SHPs returned the completed STI questionnaire, with six completing the questionnaire electronically, which yielded a response rate of 79.0% [98/124]. A flowchart of the overall implementation of the STI study for SHPs is presented in Figure 3.2.

Figure 3.2 Flowchart of STI study for SHPs, February-April 2003



On completion of the STI study, a thank-you note was sent to all the participating SHPs. Along with the thank-you note, a draft summary of the study findings and a recent journal article on new diagnostic approaches and treatments of STIs were sent to the participating SHPs who consented to receive them.

3.7 Reasons for non-participation in the STI study

The non-response questionnaire was completed and returned by 116 GPs out of 491 GPs who did not respond to the main STI survey (Figure 3.1). An assessment of key demographic and practice characteristics of GPs who completed and returned the non-response questionnaire revealed that about 21% of GPs were female and 34% worked in rural areas. About three-quarters were employed in group practices and had practised medicine for more than 16 years (74% and 75%, respectively). The median number of patients seen by this subset of GPs was 128 per week, with a median of 40 hours work per week.

The self-reported reasons for non-participation by GPs are presented in Table 3.2. The most common reason for not responding to the STI survey was that GPs were busy and had no time for extra work requested for completion of the questionnaire (58%, n=67). The second most common reason was that GPs felt that they were being asked to participate in too many surveys (48%, n=56). Another common reason for not participating in the survey was that GPs rarely saw patients with STIs (44%, n=51), and so considered the survey not

particularly relevant. One-third (33%, n=38) of GPs did not complete the STI survey because they were disappointed at being continuously asked for information with little or no return on the investment of their time. The length of the STI questionnaire was another reason reported by nearly 28% (n=32) of GPs for not responding. One in ten GPs (11%, n=13) reported a secondary interest in STIs as a reason for not completing the survey. It is worth noting that despite being offered the opportunity for telephone interview none of the non-responding GPs indicated their willingness to participate in such an interview for the main STI study.

Table 3.2 Reasons given by GPs for not responding to the STI survey (n=116)

Self-reported reasons	n (%)
Very busy/no time for extra work	67 (57.8)
Too many surveys	56 (48.3)
Rarely see patients with STIs	51 (44.0)
Continuously being asked for information with little or no return on the investment of our time	38 (32.8)
The questionnaire requires too much work	32 (27.6)
The topic is of secondary interest	13 (11.2)
Not interested in research	4 (3.4)

Note: GPs were requested to provide as many responses as applicable

3.8 Strategies to improve the response rate

Available evidence suggests that medical practitioners are difficult to reach for research purposes in Australia (Ward *et al.* 1998; McLaren & Shelley 2000). A survey with a poor response may result in biased estimates, since it is

possible that there are real differences between individuals who respond and those who do not (Holt *et al.* 1997). Therefore, it is essential to achieve a reasonably good response rate. It has been suggested that GPs are more likely to respond to postal surveys should special incentives be included. A study, using a randomised trial among GPs in Victoria, revealed that GPs who were made aware of a prize draw (e.g. a weekend for two at a resort hotel) were significantly more likely to return their survey form in the first four weeks than their counterparts who were not told of the prize (McLaren & Shelley 2000). Another GP survey in Victoria revealed that the inclusion of a prize draw for a weekend away at a country resort, or the provision of Continuing Medical Education (CME) points for participating in surveys could act as incentives to improve responses to postal surveys among GPs (Temple-Smith *et al.* 1998).

In the present study, piloting of the draft STI questionnaire among GPs yielded a response rate of 28%. It is worth noting that only one reminder letter was used in the piloting with a study period of eight weeks. This relatively poor response rate in the pilot study raised concerns about response rate for the main STI study. In an effort to improve participation in the main STI study, attempts were made by the researcher to offer incentives that included a prize draw of a gift voucher for books worth A$ 500, and accreditation of the survey for award of Continuing Professional Development (CPD), formerly known as CME, points. The Ethics Committee of the University of New England did not approve the prize draw of a gift voucher for books without obtaining a prior formal permit from the Gaming Commission of NSW. Due to limitations of time

and other constraints, the option of including a prize draw as an incentive to participate in the present study could not be explored further.

In addition, due to changes to the CPD point system by the Royal Australian College of General Practitioners (RACGP) for the 2002-2004 triennium, participation in a survey was no longer considered sufficient for CPD points to be awarded (Clearihan & QA&CPD Staff 2001). Under this new system, the researcher was required to demonstrate that participation in the survey would improve both knowledge and management practice of practitioners in the research area. The proposed strategy of examining GP responses to the STI questionnaire (pre-test) with the model standard answers (post-test), and provision of current STI management guidelines to GPs, was not considered adequate for the award of CPD points by the RACGP. Changes in management practices could have been assessed by a pre-post evaluation study. At that stage, it was not feasible to alter the study design just for CPD points. As such, the incentive of CPD points could not be included in the present study.

Repeated reminder letters using a personalised approach were used to improve participation in the study. In addition, provision was made for feedback to the study participants about the findings at the end of the study. The study instruments were printed in different colour pages and different colour schemes were used for follow-up correspondence (e.g. yellow for the first mail-out, green for the second, blue for the third).

3.9 Data management

A database program was used to track incoming questionnaires as well as to generate prompts to send reminder letters to non-responding practitioners. After receiving a completed questionnaire, the first page of the questionnaire, which contained a code number for a practitioner, was removed prior to data entry, and was filed away securely. The completed questionnaires were edited and coded before entering them into a database template, using SPSS Win V.11.5 (SPSS 2003). While entering data, consistency checks were made on a regular basis to make sure that the data were entered properly. After entering the data, the completed questionnaires were kept in a separate locked filing cabinet at the University of New England. To maintain anonymity and confidentiality, de-identified data were used in the data analyses. Access to the survey data files was limited to the researcher and the supervisors of the project.

3.10 Data analysis

The main themes considered for data analysis included:

- awareness about STIs and their notification
- clinical care for STIs
- style of clinical practice and STIs
- organisational issues in STI care and
- comparison of STI care between general and sexual health practices.

Data transformations (e.g. recoding, computing) were performed on a number of explanatory variables to make them amenable to further analysis. For example, because of a small number of responses, the '65+' age category was collapsed with the preceding '55-65' category to make a '55+' category. Similarly, five categories of practice duration were recoded into three categories: '≤10', '11-20' and '21+' years. Number of hours spent on administration and patient care were summed to estimate overall hours worked per week by practitioners. Practitioners were classified as full-time if they worked 36 or more hours in an average week, and part-time otherwise, based on the RACGP definition of work patterns (Commonwealth Department of Health and Aging 2000). As the distribution of average number of patients seen per week was skewed, practitioner's patient caseload was transformed into four categories: '≤50', '51-100', '101-150', and '151+'.

Furthermore, an attempt was made to examine whether there were any differences between Fellows and non-Fellow Associates of the ACSHP in terms of knowledge and practice of STIs. The analysis revealed no statistically significant difference between the two groups of the SHP sample with respect to key indicators of STI knowledge and skill-base (Appendix A7). Therefore, the SHP sample that consists of Fellows and Associates will be treated as a single comparative group with a professional interest in sexual health for the remainder of the thesis.

Frequency tables were produced for background and practice characteristics of study participants to obtain a descriptive profile of study participants. Different practitioner groups (e.g. GPs who responded and those who did not, GPs and SHPs who participated in the study) were compared with respect to some selected background characteristics (Chapter 4).

Practitioner awareness about clinical issues concerning STIs was assessed using four outcome measures. The study participants were asked about: (a) potential for STIs to be asymptomatic, (b) common signs and symptoms of chlamydia and gonorrhoea in symptomatic male patients, (c) type of specimen and site for specimen collection for testing for chlamydia in women, and (d) notification requirements for some STIs in NSW (Chapter 5).

The clinical management of STIs in general practice was explored using six outcome measures. The study participants were asked about their clinical care of STIs: (a) diagnostic tests for STIs, (b) treatment regimens used for some common STIs, (c) presumptive treatment for suspected STIs, (d) referral of STIs to other care providers, (e) dealing with patients in psychological distress, and (f) contact tracing of STIs (Chapter 6).

Style of clinical practice that GPs use when caring for patients with STIs was examined using the following outcome measures: (a) sexual history taking and barriers to that process, (b) degree of comfort when dealing with patients with STIs, (c) attitudes towards offering chlamydia testing, (d) priorities in managing STIs, and (e) provision of patient education (Chapter 7).

Views on organisational issues in relation to different aspects of STI care in general practice were evaluated based on seven outcome measures, including: (a) views on the adequacy of sexual health training, (b) need for additional training in sexual health, (c) views on the adequacy of professional literature on STIs, (d) management guidelines for STIs, (e) availability of STI material for patients, (f) concerns about printed STI material for patients, and (g) perceived barriers to sexual health promotion in general practice (Chapter 8).

Different aspects of STI care offered by GPs and SHPs were compared in an attempt to examine whether STI care in general practice differed to that in specialised settings. The two groups of practitioners were compared in relation to a number of key issues: knowledge and skill base of STIs, practitioner style of clinical practice and STIs, and organisational issues associated with STI care (Chapter 9).

3.10.1 Statistical analysis

In the first phase, univariate analyses were carried out on the outcome measures of interest to explore practitioner knowledge and practice of STIs. These univariate analyses provided an understanding of GPs' attitudes and perceptions about different aspects of STI care, how they clinically manage STIs, along with organisational issues that facilitate or constrain practitioners from offering optimal care to patients with STIs.

In the second phase, an attempt was made to identify correlates of different aspects of STI care by GPs. Before conducting bivariate analyses, some of the outcome measures of interest were recoded in order to have reasonably large cell frequencies. For example, responses to sexual history taking were dichotomised into two categories: 'always' and 'not always' where the latter category included 'never' and 'sometimes'. Self-reported comfort level in dealing with STI patients was categorised into two groups: 'comfortable' and 'not so comfortable', where the latter included categories ranging from 'somewhat comfortable' to 'very uneasy'. Similarly, priorities of STI care were dichotomised into two categories: 'high priority' and 'moderate to low priority' (Chapter 7). The adequacy of sexual health training and professional literature on STIs were assessed based on two recoded response categories: 'adequate to reasonably adequate' and 'not very adequate to inadequate' (Chapter 8).

A set of explanatory variables were considered for the bivariate analyses throughout this thesis: age, sex, place of graduation, postgraduate training in medicine, postgraduate training in STIs, duration of practice, area of practice, nature of practice, type of employment, average number of patients seen per week, and diagnosis of an STI in the month preceding the survey. Pearson's chi-square tests were used to assess association between the outcome measures of interest, and the demographic and practice characteristics of GPs. In the case of small-expected cell frequencies, Fisher's exact chi-square tests were used. Mantel-Haenszel chi-square tests were used to examine trends in the associations. These chi-square tests were also used to assess differences, if

any, in STI care offered by GPs and SHPs. Only explanatory variables that were found to be associated with the outcome measures of interest at the $P \leq 0.10$ at the bivariate level are presented in this thesis[4].

Multivariate analyses were also carried out to identify factors that were independently associated with some outcome measures which were selected based on their clinical and public health significance in STI care. The outcome measures of interest considered for the multivariate analyses included: appropriate site and specimen for chlamydia testing in women (Chapter 5), contact tracing (Chapter 6), and reported barriers in eliciting a sexual history, perceived comfort in dealing with STI patients, offering chlamydia testing to young patients, and priorities in managing STIs (Chapter 7). As the outcome measures of interest had two response categories, the logistic regression (Hosmer & Lemeshow 2000) was used to identify factors that were independently associated with the outcome measures of interest after adjusting for other factors. Explanatory variables that were found to be associated with the outcome measures of interest at the bivariate level at 10% level of significance were considered for multivariate analyses. Prior to conducting multivariate analyses, the survey data was examined to assess the possibility of collinearity among the explanatory variables. In the case of significantly associated pairs of explanatory variables, only the variable that was strongly associated with the outcome measure of interest was considered for multivariate modelling. The

[4] A relatively higher significance level (α=10%) was considered to explore a broader spectrum of correlates of each of the outcome measures of interest.

final models are presented in the form of adjusted odds ratios (Adj-OR) and their 95% confidence intervals (CI). The analyses were carried out using SPSS V.11.5 (SPSS 2003).

3.11 Limitations of the study

The following limitations of the present study are acknowledged. Response rate of the present study was 45.4% for the GP survey and 79.0% for the SHP survey. The SHP component of the survey had a very good response rate, while the response rate for the GP component was reasonably good given the difficulties in reaching GPs for research. Different steps were undertaken in an attempt to improve participation; although, as explained earlier in the chapter, no incentive could be attached with the STI study to promote its response rate. Nevertheless, the response rate for the present study for GPs was higher than those reported by other recent studies from general practice in Australia (Peterson *et al.* 2002; Davidson & Schattner 2003; Phillips *et al.* 2004).

Random sampling of GPs improves the likelihood of the study sample being representative; however, it is possible that certain GPs within the study sample may be more likely to respond to the study than others, perhaps because of their interest in the research area. Thus the data presented are probably a "best case" scenario in STI care in general practice. In addition, the present study targeted only a proportion (15%) of GPs in NSW and, as such, the sample ultimately surveyed may not be representative of all GPs in Australia.

The study results may suffer from coverage error. The list used for drawing the GP sample may not be complete, as the AMPCo database does not contain information on GPs who do not approve publication of their details. Therefore, it is unlikely that the entire GP population in NSW was included in the sampling frame. However, the AMPCo database, which is widely used for surveying medical practitioners, is updated almost on a daily basis using a range of sources and is one of the best available options.

Although the mailing addresses provided by AMPCo were fairly accurate with a few exceptions (non-deliverable rate was 2.2%), a total of 74 GPs were found to be no longer in general practice, and another 12 had retired. These 86 were excluded from the study, and this might introduce coverage errors. One possible reason could be that it took about six months to implement the main STI study after receiving the GP mailing list from the AMPCo in April 2002 for some reasons, as outlined earlier. However, due to cost implications it was not feasible to obtain an updated list from the AMPCo at the time of the main STI study in October 2002.

The STI questionnaire has its own limitations. It is possible that some practitioners may have found the wording of some questions unclear although all efforts were made to clear ambiguities through pilot testing of the questionnaire. Finally, because of its cross-sectional design, this study cannot establish any temporal or causal relation between STI care, and demographic and practice characteristics of the practitioners.

Chapter 4
Profile of Study Participants

The present chapter describes demographic and practice characteristics of general practitioners (GPs) and sexual health physicians (SHPs) who participated in the present study. In addition, this chapter compares different groups of practitioners (e.g. respondent vs. non-respondent GPs, GP sample vs. GP population in NSW, GP sample vs. SHP sample).

4.1 Study participants

4.1.1 Background and practice characteristics of GPs

About 57% of GP respondents were male (Table 4.1). Half (51%) of GP participants were aged between 40 to 54 years, while nearly 25% were 55 years of age or over. The majority (73%) of GPs graduated in Australia, while 27% graduated overseas. About 51% of the participating GPs reported having postgraduate qualifications in medicine in Australia, while nearly 9% had the training overseas. However, postgraduate training in STIs was limited with only 20% of GPs having such training. This training included: a course of two weeks or less, postgraduate experience in sexual health services, diploma or fellowship. Some GPs reported other postgraduate training, such as family

medicine courses, a short course on HIV, and courses run by the Family Planning Association.

Table 4.1 Background characteristics of GP sample, 2002

Characteristics	n	%
Sex		
Male	232	56.7
Female	177	43.3
Age (years)[a]		
<40	101	24.9
40-54	205	50.5
55-64	68	16.7
65+	32	7.9
Place of graduation[a]		
Australia	295	72.8
Overseas	110	27.2
Postgraduate training in medicine		
None	167	40.8
Yes - from Australia	207	50.6
Yes - from overseas	35	8.6
Postgraduate training in STIs[a]		
No	321	79.9
Yes	81	20.1
Form of training in STIs[b]		
Course of two weeks or less	40	10.0
Postgraduate experience in sexual health services	19	4.7
Diploma or fellowship	8	2.0
Other	33	8.2

[a] Numbers do not add up to the study sample (n=409) because of missing values
[b] More than one answer was given and percentages are based on n=409

About two-thirds (65%) of GPs practised in metropolitan areas, while the remainder (35%) worked in rural and remote areas (Table 4.2). Just under three-quarters (72%) of GPs were employed in group practices and about 22% in solo

practices. The remaining (6%) worked in other settings including hospitals, women's health clinics, clinics run by the Family Planning Association, university, and other health care facilities. General practitioners who were in group practices (n=286) were also asked about other staff in their practice. About two-thirds (65%) reported that they had a nurse in their practice, while 11% worked with a counsellor. The remaining (23%) of GPs in group practices worked with other professionals, such as psychologists, physiotherapists, dieticians, radiologists, gynaecologists, skin specialists, naturopaths, osteopaths, dentists, and endocrinologists.

About 20% of GPs reported practising medicine for up to 10 years, while 47% had been in practice for more than 20 years. The median number of hours GPs spent per week on face-to-face patient consultations was 36. Administrative work took a median of four hours of GPs' time per week. Overall, each GP worked a median of 43 hours in an average week. About 33% of GPs worked up to 35 hours per week, considered as part-time, while 49% worked for 36-55 hours per week. It is worth noting that 18% of GPs reported working more than 55 hours per week. The median number of patients seen by GPs was 120 per week, with 24% seeing more than 150 patients per week. More than half (55%) of GPs reported that they had diagnosed an STI in the month prior to the survey. Of the GPs who had recent experience in diagnosing an STI (n=221), 41% diagnosed three or more cases of STIs. The median number of STI cases diagnosed in the month preceding the survey was two.

Table 4.2 Practice characteristics of GP sample, 2002

Characteristics	n	%
Area of practice		
Rural	142	34.7
Metropolitan	267	65.3
Nature of current practice[a]		
Group	286	72.4
Solo	85	21.5
Other (e.g. hospital, clinic)	24	6.1
If in group practices (n=286), associated staff in the practice		
Nurse	187	65.4
Counsellor	32	11.2
Other	67	23.4
Duration of practice (years)[a]		
≤10	79	19.5
11-15	76	18.7
16-20	59	14.5
21+	192	47.3
Hours worked in an average week[a]		
≤20	54	13.9
21-35	73	18.8
36-45	95	24.5
46-55	95	24.5
56+	71	18.3
Average number of patients seen/week[a]		
≤50	74	19.0
51-100	105	26.9
101-150	116	29.7
151+	95	24.4
Diagnosis of an STI in the month prior to the survey[a]		
No	184	45.4
Yes	221	54.6
If yes (n=221), how many?		
1	56	25.3
2	74	33.5
3-5	65	29.5
6+	26	11.7
Bulk billing		
All patients	185	46.2
Selective patients	126	31.5
No patients	89	22.3

[a] Numbers do not add up to the study sample (n=409) because of missing values

Participating GPs were also asked whether they used bulk-billing[1] in their practice. Forty-six percent of GPs used bulk-billing for all patient consultations, while nearly 32% used bulk-billing for selective patient consultations. Twenty-two percent of GPs reported not using bulk-billing for any patient in their practice.

4.1.2 Background and practice characteristics of SHPs

Just over half (52%) of SHP respondents were female (Table 4.3). Twenty-eight percent of SHPs were aged below 40 years, while 52% were in the age group 40-54 years. Three-quarters (75%) of SHPs graduated in Australia, and the remainder graduated overseas. Almost all (94%) had postgraduate training in STIs. About 39% of SHPs had a diploma in sexual health, while 21% had other postgraduate training in sexual health. About 62% had a fellowship of the Australasian College of Sexual Health Physicians (ACSHP), nearly 24% were trainee Associates, and the remainder were non-trainee Associates. A majority of SHPs were from New South Wales (45%), followed by Victoria (21%) and Queensland (16%).

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[1] Under bulk-billing arrangements people can see their doctors when they need without any out-of -pocket cost since their doctors accept the Medicare rebate as a full payment for their consultations. But when a doctor does not bulk-bill, patients are required to pay the gap between the fee charged by doctor and the Medicare schedule fee (Khan *et al.* 2004).

Table 4.3 Background characteristics of SHP sample, 2003

Characteristics	n	%
Sex [a]		
Female	49	51.6
Male	46	48.4
Age (years)[a]		
<40	27	28.1
40-54	50	52.1
55-64	14	14.6
65+	5	5.2
Place of graduation[a]		
Australia	72	75.0
Overseas	24	25.0
Postgraduate training in STIs		
No	6	6.1
Yes	92	93.9
Form of training in STIs[b]		
Diploma in sexual health	38	38.8
Other sexual health training	21	21.4
Other fellowship	19	19.4
Affiliation with ACSHP		
Fellow	60	61.9
Trainee Associate	23	23.7
Non-trainee Associate	14	14.4
State		
New South Wales	44	44.9
Victoria	20	20.5
Queensland	16	16.3
Australian Capital Territory	7	7.1
Western Australia	5	5.1
South Australia	4	4.1
Northern Territory	2	2.0

[a] Numbers do not add up to the study sample (n=98) because of missing values
[b] More than one answer was given and percentages are based on n=98

The majority (nearly 85%) of SHPs worked in metropolitan areas (Table 4.4). When asked about the nature of current practice, some SHPs indicated

that they worked in more than one setting. Sixty-two percent worked in sexual health clinics, while 19% worked either in general practices or hospitals. Ten percent of SHPs worked in family planning clinics. When asked about other staff in the practice, around 82% of SHPs reported having nurses, while 58% reported working with counsellors in their practice.

About 18% of SHPs reported practising medicine for up to 10 years, while 54% practised medicine for more than 20 years. Forty-three percent worked up to 35 hours per week, while nearly 26% worked 46 or more hours per week. The median number of patients seen by SHPs was 40 per week, with 33% seeing more than 50 patients per week. About 23% of SHPs diagnosed up to 10 STI cases during the month prior to the survey, while a quarter (25%) diagnosed more than 100 cases of STIs. The median number of STI cases diagnosed by SHPs in the month preceding the survey was 30. The participating SHPs were also asked whether they used bulk-billing in their practice. Over one-third (35%) of SHPs used bulk-billing for all patient consultations. Twenty-two percent reported not using bulk-billing for any patient, while nearly 30% reported seeing patients in public clinics free of cost.

Table 4.4 Practice characteristics of SHP sample, 2003

Characteristics	n	%
Area of practice		
Rural	15	15.3
Metropolitan	83	84.7
Nature of current practice[b]		
General practice	19	19.4
Sexual health clinic	61	62.2
Hospital	19	19.4
Family planning clinic	10	10.2
Other	22	22.4
Other staff working in the practice[b]		
Nurse	80	81.6
Counsellor	57	58.2
Other	32	32.7
Duration of practice (years)[a]		
≤10	17	17.7
11-15	13	13.5
16-20	14	14.6
21+	52	54.2
Hours worked in an average week[a]		
≤20	15	16.7
21-35	24	26.6
36-45	28	31.1
46-55	15	16.7
56+	8	8.9
Average number of patients seen/week[a]		
≤25	20	23.0
26-50	38	43.7
51-100	20	23.0
101+	9	10.3
Diagnosis of an STI in the month prior to the survey[a]		
≤10	18	22.9
11-20	15	19.0
21-50	13	16.4
51-100	13	16.4
101+	20	25.3
Bulk billing		
All patients	27	35.1
Selective patients	10	12.9
No patients	17	22.1
Public clinic-no fee	23	29.9

[a] Numbers do not add up to the study sample (n=98) because of missing values

[b] More than one answer was given and percentages are based on n=98

4.2 Comparisons of participating and non-participating GPs

In any sample study, it is important to examine the extent to which the final participating sample represents the initial sample in order to explore possibility of non-response bias. Available evidence suggests that the degree of non-response bias depends not only on response rate, but also on the extent to which the non-responders differ systematically from those who do respond (Barclay *et al.* 2002). A preliminary analysis of the respondents and non-respondents to the GP component of the STI study revealed that female GPs were significantly more likely to respond to the STI study than their male counterparts (P<0.0001) (Table 4.5). There was no significant difference between respondents and non-respondents in relation to area of practice (P=0.54). However, no other information was available for the non-responders to the STI study to explore the difference between the two groups further.

Table 4.5 Comparisons of participating and non-participating GPs in the STI study

Characteristic	Participants n (%)	Non-participants n (%)	*P*-value[Ψ]
Overall	409 (45.4)	491 (54.6)	
Sex			
Female	177 (43.3)	118 (24.0)	<0.0001
Male	232 (56.7)	373 (76.0)	
Area of practice			
Rural	142 (34.7)	161 (32.8)	0.54
Metropolitan	267 (65.3)	330 (67.2)	

[Ψ] Based on chi-square test statistic with 1 degree of freedom

4.3 Comparisons of GP sample with the GP population in NSW

Random sampling improves the likelihood that the findings of a study will be representative, as each participant has an equal chance of being selected into the study sample. However, there should be a comparison, wherever possible, between the final study sample and the population from which this sample was drawn in order to explore any differences that may impact on the study findings (Britt *et al.* 2001). An attempt was therefore made to compare the GP sample in the present study with the GP population in NSW, provided by the General Practice Branch of the Commonwealth Department of Health and Aging, Australia (A. Calcine, personal communication, 23 January 2004), using Pearson's chi-square test. The analysis revealed that there were significant differences between the two groups in relation to age, sex, and place of practice (Table 4.6). The surveyed sample had a significantly higher proportion of younger GPs (P=0.002). Male GPs were slightly under-represented in the study sample (P=0.001). A greater proportion of GPs who participated in the survey worked in rural areas (P<0.0001). However, there was no significant difference between the two groups with respect to their place of graduation (P=0.28).

Table 4.6 Comparisons of GP study sample with the GP population in NSW

Characteristics	Sample GPs n (%)	NSW GPs[§] n (%)	*P*-value
Age (years)			
<40	101 (24.9)	1 625 (20.6)	0.0016
40-55	205 (50.5)	3 667 (46.5)	
56+	100 (24.6)	2 596 (32.9)	
Sex			
Male	232 (56.7)	5 106 (64.7)	0.0010
Female	177 (43.3)	2 782 (35.3)	
Place of graduation			
Australia	295 (72.8)	5 546 (70.3)	0.28
Overseas	110 (27.2)	2 342 (29.7)	
Area of practice			
Rural	142 (34.7)	1 779 (22.5)	<0.0001
Metropolitan	267 (65.3)	6 109 (77.5)	

[§] Data provided by GP Branch, Commonwealth Department of Health and Ageing (A. Calcine, personal communication, 23 January 2004)
Note: There were 409 GPs participated in the STI study, while there were 7 888 GPs in NSW.

4.4 Comparisons of GP sample with the SHP sample

Before comparing different aspects of STI care between general and sexual health settings, GPs and SHPs who participated in the STI study were compared in relation to some of their background characteristics. An analysis of association revealed that there was no significant difference between GPs and SHPs in relation to age, sex, place of graduation (Australia vs. overseas) and type of employment (part-time vs. full-time) (Table 4.7). However, area of practice (metropolitan vs. rural) was found to be significantly different for the two groups, with a greater proportion of GPs working in rural areas.

Table 4.7 Comparisons of background characteristics between GPs and SHPs

Characteristics	GPs (%)	SHPs (%)	*P*-value
Age (years)			
<40	101 (25.3)	27 (28.1)	0.70
40-54	205 (51.2)	50 (52.1)	
55+	94 (23.5)	19 (19.8)	
Sex			
Female	117 (43.3)	49 (51.6)	0.14
Male	232 (56.7)	46 (48.4)	
Place of Graduation			
Australia	295 (72.8)	72 (75.0)	0.67
Overseas	110 (27.2)	24 (25.0)	
Type of employment			
Part-time (<36 hours/week)	127 (32.7)	39 (43.3)	0.057
Full-time (≥36 hours/week)	261 (67.3)	51 (56.7)	
Area of practice			
Rural	142 (34.7)	15 (15.3)	0.0002
Metropolitan	267 (65.3)	83 (84.7)	

Note: GPs were randomly selected from NSW while SHPs were from all over Australia.

4.5 Conclusions

A quarter (25%) of GP participants were aged below 40 years and 43% were female. Twenty-seven percent of GPs graduated overseas, while 20% had postgraduate training in STIs. About two-thirds (65%) of GPs worked in metropolitan areas and 72% were employed in group practices. Each GP worked a median of 43 hours in an average week with 33% working up to 35 hours per week. Over half (55%) of the GPs diagnosed an STI in the month preceding the survey. For the SHP sample, 52% were female and 28% were aged below 40 years. About 62% of SHPs were Fellows of the ACSHP and a

similar proportion worked in sexual health clinics. The vast majority (85%) of SHPs worked in metropolitan areas, with NSW having the highest proportion of SHPs (45%).

Although there was no difference between respondent and non-respondent GPs in relation to area of practice, female GPs were significantly more likely to respond to the STI study than their male counterparts. The surveyed GPs were more likely to be younger, female and working in rural areas compared with the GP population in NSW. A greater proportion of GPs than SHPs worked in rural areas; however, there was no significant difference between the two groups of practitioners with respect to age, sex and place of graduation.

Chapter 5
GP Knowledge of STIs

5.1 Introduction

To offer STI care, general practitioners (GPs) need to assess whether a patient is likely to have been exposed to an STI, given that many STIs can be asymptomatic for significant periods of time. Adequate knowledge about the type of specimen required for a particular test and the appropriate site for specimen collection is essential for practitioners, because the performance of a diagnostic test depends heavily on the quality of the specimen collected. In addition, greater accuracy can be achieved in interpreting test results when clinical findings are taken into account. Therefore, GPs should have a clear understanding of common signs and symptoms of STIs for their initial assessment and should be aware of specimen collection procedures to facilitate accurate diagnostic testing.

As discussed in Chapter 2, there are deficiencies in GPs' awareness of certain aspects of STIs. For example, practitioners are less aware of the asymptomatic potential for STIs and there is a lack of understanding about common symptoms and signs that indicate STIs. There are also uncertainties about specimen collection for diagnostic tests. Although notification of diagnoses has an important role in public health interventions, notifiable conditions are not

well known by many practitioners. Lack of awareness of signs and symptoms of STIs, and uncertainties about specimen and site for diagnostic tests, has the potential for misdiagnosis as well as inappropriate management.

This chapter describes GPs' awareness of clinical issues concerning STIs. In particular, it investigates knowledge about the asymptomatic nature of STIs, common symptoms of chlamydia and gonorrhoea, specimen and site of testing for chlamydia, and notification requirements of selected STIs. The demographic and practice characteristics of GPs associated with their awareness of STIs are also examined.

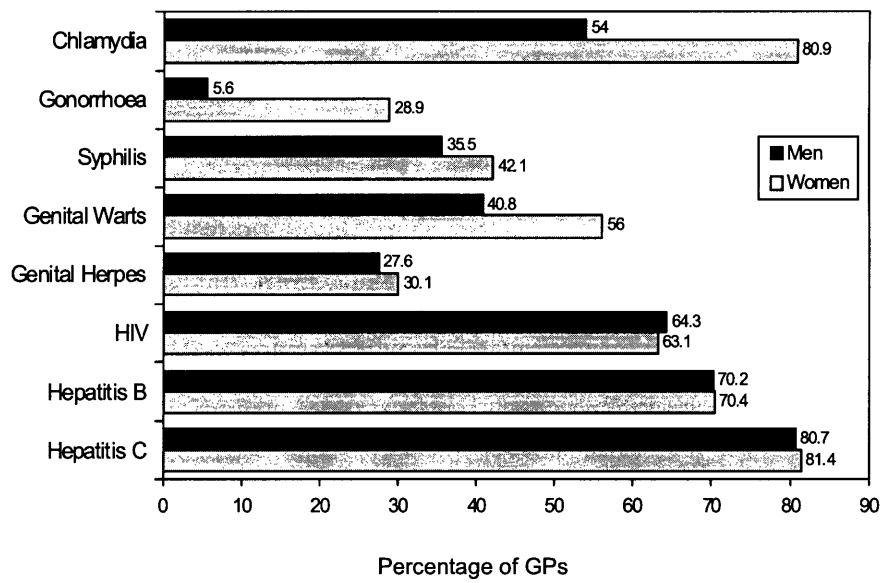
5.2 Results

5.2.1 Awareness of STIs

General practitioners were asked whether they were aware of the asymptomatic nature of some common STIs. Knowing that STIs are frequently asymptomatic was high, with 94% of GPs stating that a substantial proportion of STIs are commonly asymptomatic. However, a few GPs (6%) were uncertain about the asymptomatic nature of STIs. General practitioners were also asked to identify specific STIs that frequently produce no symptoms among women and men. The majority (81%) of GPs reported that chlamydia could be asymptomatic in women, while 54% reported that chlamydia could be asymptomatic in men (Figure 5.1). About 29% of GPs reported that gonorrhoea commonly has no

symptoms among women. Over half (56%) of GPs were aware that genital warts could be asymptomatic in women, and nearly 41% reported that genital warts could be asymptomatic in men. Just less than two-thirds of GPs acknowledged that people with HIV infection could be asymptomatic. Both hepatitis B and hepatitis C were recognised as asymptomatic infections by the majority of GPs (70% and 81%, respectively) for women and men.

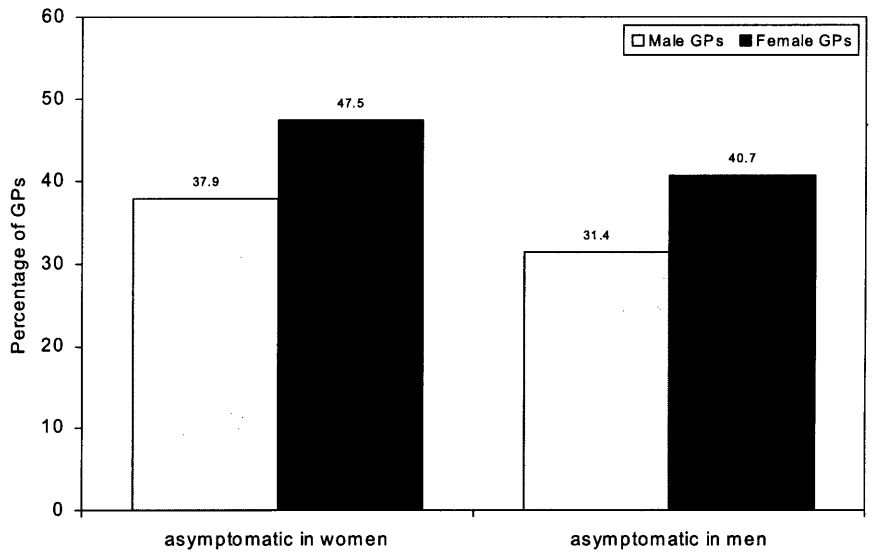
Figure 5.1 GP knowledge of the potential for STIs to be asymptomatic



An analysis of association between background and practice characteristics of GPs and their knowledge about the possibility that specific STIs can be asymptomatic revealed that female GPs, compared to their male counterparts, were more aware of the potential for syphilis to be asymptomatic in both women and men (Figure 5.2). For example, about 41% of female GPs

were aware that syphilis could be asymptomatic among men compared with 31% of their male counterparts.

Figure 5.2 GP knowledge by sex of the potential for syphilis to be asymptomatic

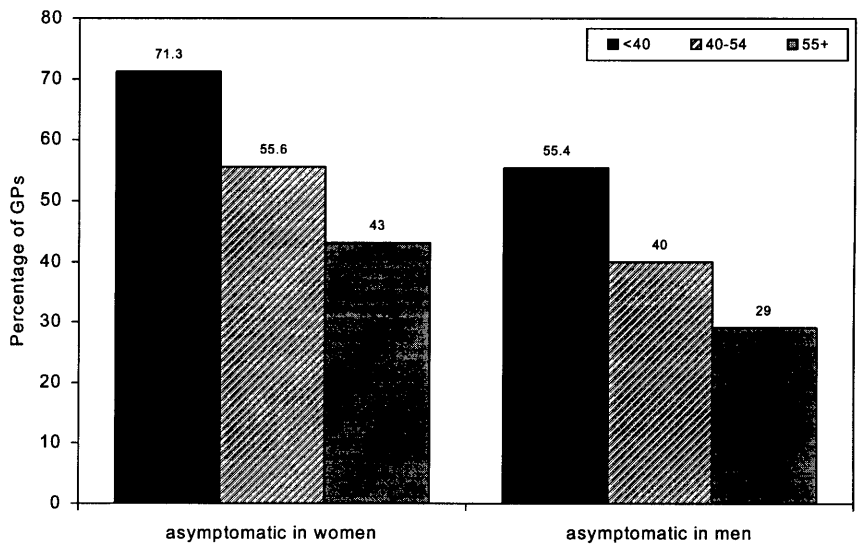


Similarly, awareness that genital warts may be asymptomatic in men was more common among female than male GPs (Appendix B Table 5.1a). Just over half (52%) of female GPs identified genital wart infection as commonly asymptomatic in men compared to 32% of their male counterparts.

Younger GPs were found to be more aware of the potential for genital warts to be asymptomatic in both women and men (Figure 5.3). Similarly, awareness that genital herpes and hepatitis C could be asymptomatic in both women and men was inversely associated with GPs' age (Appendix B Tables 5.2a & 5.3a). For example, about 37% of GPs aged <40 years were aware that

genital herpes could be asymptomatic among men compared with 19% of their older counterparts aged ≥55 years. Eighty-six percent of GPs aged <40 years reported that hepatitis C could be asymptomatic in women compared with 71% of GPs aged ≥55 years.

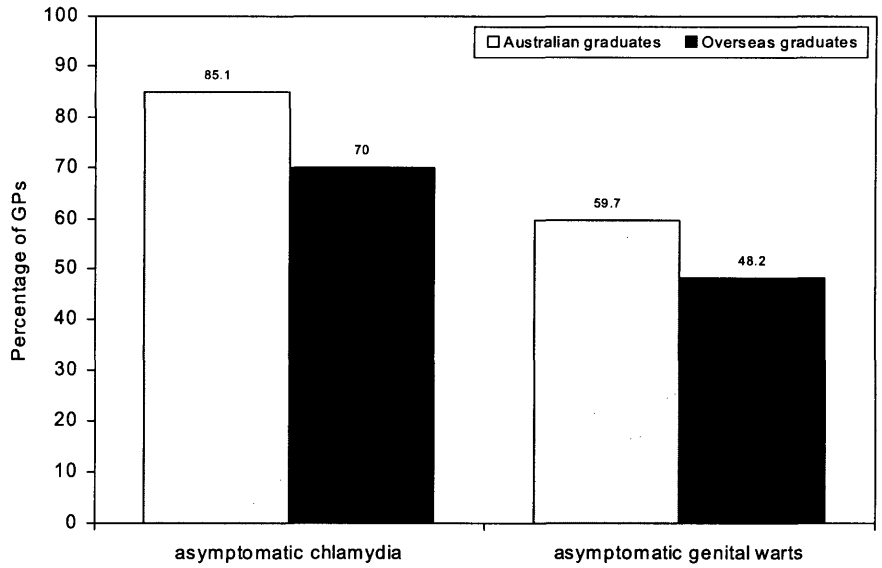
Figure 5.3 GP knowledge by age of the potential for genital warts to be asymptomatic



Like age, duration of practice was found to be inversely associated with GP awareness of the potential for genital herpes to be asymptomatic in both women and men (Appendix B Table 5.2a). Awareness of the possibility of genital warts being asymptomatic in men, and hepatitis C being asymptomatic in women decreased with an increase in duration of practice (Appendix B Tables 5.1a & 5.3a). For example, nearly 52% of GPs who were in practice for up to 10 years were aware that genital warts could be asymptomatic in men compared with 35% of their counterparts who were in practice for more than 20 years.

Australian graduates, compared with their overseas trained counterparts, were more aware of the possibility of asymptomatic chlamydial infection and genital warts in women (Figure 5.4). For example, 85% of GPs who graduated in Australia were aware that chlamydia could be asymptomatic in women compared with 70% of their counterparts who were overseas graduates.

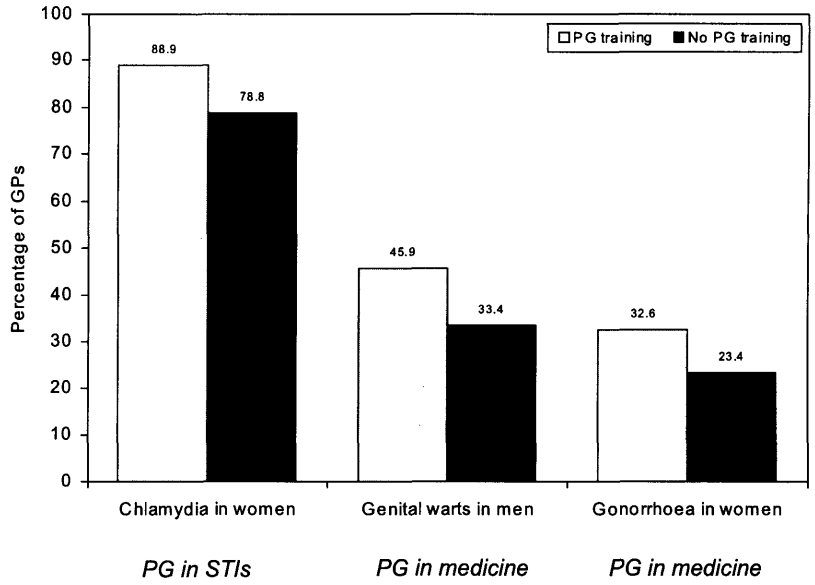
Figure 5.4 GP knowledge by place of graduation of the potential for chlamydia and genital warts to be asymptomatic in women



Postgraduate training was positively associated with knowledge of the asymptomatic potential of some STIs (Figure 5.5). Awareness that chlamydia is commonly asymptomatic in women was more common among GPs who had postgraduate training in STIs. General practitioners who had postgraduate training in medicine were more likely to be aware of the potential for genital warts to be asymptomatic in men and gonorrhoea to be asymptomatic in women. For example, about 46% of GPs with postgraduate training in medicine

were aware that genital warts could be asymptomatic in men compared with 33% of GPs with no such training. Solo practitioners were less aware of the possibility of genital herpes to be asymptomatic in both women and men than their counterparts who worked in group practices (Appendix B Table 5.2a).

Figure 5.5 GP knowledge that some STIs can be asymptomatic by postgraduate (PG) training

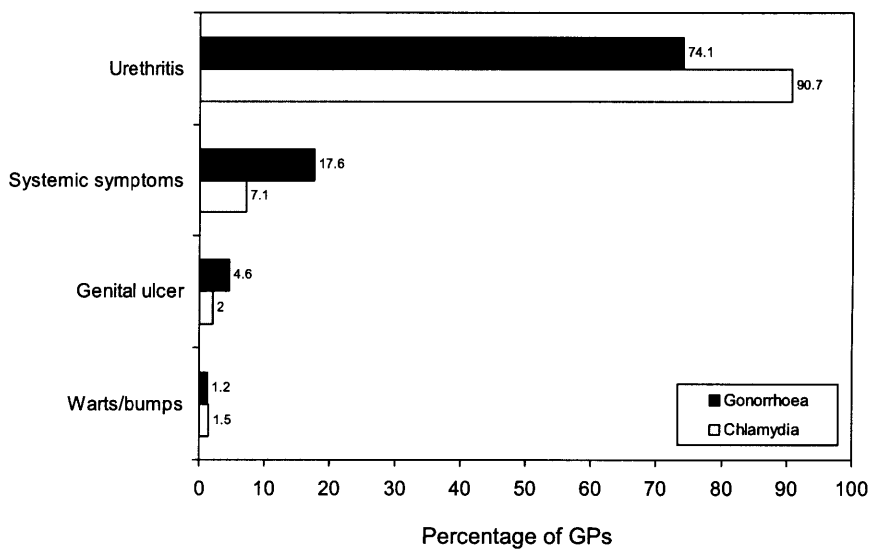


5.2.2 Modes of presentation of chlamydia and gonorrhoea

General practitioners in the present study were asked to identify the most common modes of presentation for two common STIs (e.g. chlamydia and gonorrhoea) in men. For symptomatic cases, nearly 91% of GPs identified urethritis as the most common symptom of chlamydia among male patients, while 74% identified urethritis as the presenting symptom of gonorrhoea (Figure 5.6). About 18% of GPs indicated that systemic symptoms were the clinical

presentation of gonorrhoea, while this percentage was only 7% for chlamydia in men.

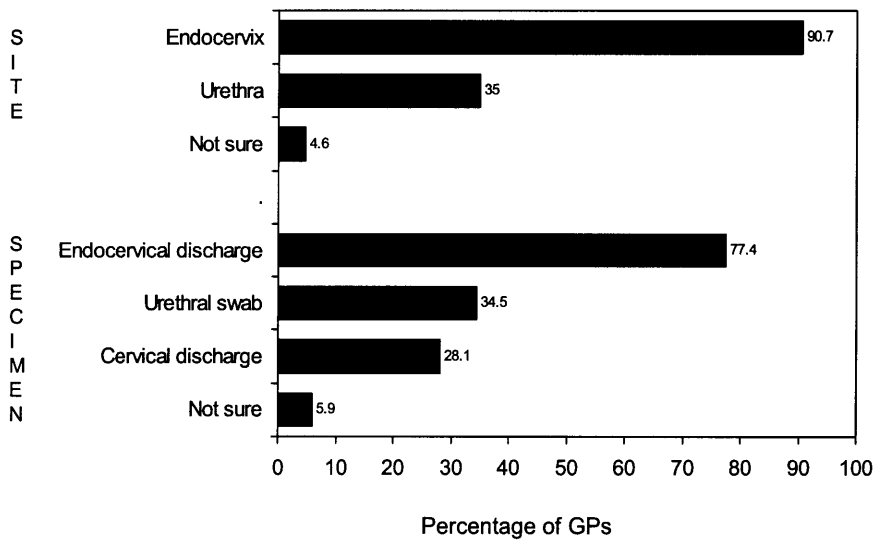
Figure 5.6 GPs knowledge of common modes of presentation for chlamydia and gonorrhoea in men



5.2.3 Specimen and site for genital chlamydia testing in women

Concerning testing for genital chlamydia in women, GPs were asked to identify the appropriate site for specimen collection [e.g. (a) endocervix, (b) urethra, and (c) not sure] for laboratory testing and the appropriate specimen [e.g. (a) cervical discharge, (b) endocervical discharge, (c) urethral discharge, and (d) not sure] for chlamydia testing. The vast majority (about 91%) of GPs identified endocervix as the appropriate site from which to collect a specimen, while 77% reported endocervical discharge as the appropriate specimen for testing for genital chlamydia in women (Figure 5.7).

Figure 5.7 GP knowledge about the appropriate specimen and site for chlamydia testing in women



Just over one-third (35%) of GPs indicated that a urethral swab is the appropriate specimen, and the urethra is the appropriate site for specimen collection. Cervical discharge was reported by 28% of GPs as the appropriate specimen to test for genital chlamydia in women. It is worth noting that some GPs were not sure about the specimen to be collected, and the site to be used for taking that specimen in order to test for genital chlamydia in women. A further analysis revealed that about 33% of GPs considered both endocervix and urethra as the appropriate site for chlamydia testing, while a few (2.2%) considered only the urethra. Of the GPs who did not consider endocervical discharge to test for chlamydia (n=92), 23% identified urethral discharge and 56% considered cervical discharge as the appropriate specimen for chlamydia testing.

Bivariate analyses identified four variables to be significantly associated with reporting the endocervix as the appropriate site for specimen collection to test for chlamydia in women (Table 5.1). Of the four variables initially considered significant at bivariate level, two were found significant in multivariate logistic regression analysis. General practitioners who were female and had postgraduate training in medicine had more than double the odds of reporting the endocervix as the appropriate site to test for chlamydia in women.

Table 5.1 Logistic regression estimates of factors associated with using the endocervix for chlamydia testing in women

Characteristics	%	Adj-OR (95% CI)
Age (years)		
<40	95.0[b]*	NS
40-54	91.7	
55+	85.0	
Sex		
Male	87.4[c]	Ref
Female	94.9	2.17 (1.01-4.82)[b]
Postgraduate training in medicine		
No	85.6[c]	Ref
Yes	94.2	2.79 (1.33-5.83)[c]
Type of employment		
Part-time	95.3[b]	NS
Full-time	88.9	

a: p<0.10; b: p<0.05; c: p<0.01; d: p<0.001; * Mantel-Haenszel (trend) chi-square p-value
NS=not significant; Ref=reference; Adj-OR=adjusted odds ratio; CI=confidence interval

Taking a specimen from the urethra to test for chlamydia was more common among male and rural GPs who were in practice longer (Appendix B Table 5.4a). For example, 25% of GPs who were in practice for up to 10 years

considered the urethra as a preferred site for taking specimens for chlamydia testing compared with 40% of their counterparts who were in practice for 21 years or more. Multivariate logistic regression analysis showed that male and rural GPs were more likely to use the urethra to test for chlamydia in women.

At bivariate level five variables were initially found to be significantly associated with reporting the endocervical discharge to test for chlamydia in women (Table 5.2).

Table 5.2 Logistic regression estimates of factors associated with using endocervical discharge for chlamydia testing in women

Characteristics	%	Adj-OR (95% CI)
Age (years)		
<40	87.1[c*]	NS
40-54	76.1	
55+	71.0	
Sex		
Male	72.4[c]	Ref
Female	84.2	1.86 (1.10-3.10)[b]
Place of graduation		
Australia	80.3[b]	NS
Overseas	70.0	
Postgraduate training in medicine		
No	69.5[d]	Ref
Yes	83.1	2.30 (1.40-3.77)[d]
Duration of practice (years)		
≤10	82.3[c*]	NE
11-20	83.7	
21+	71.4	

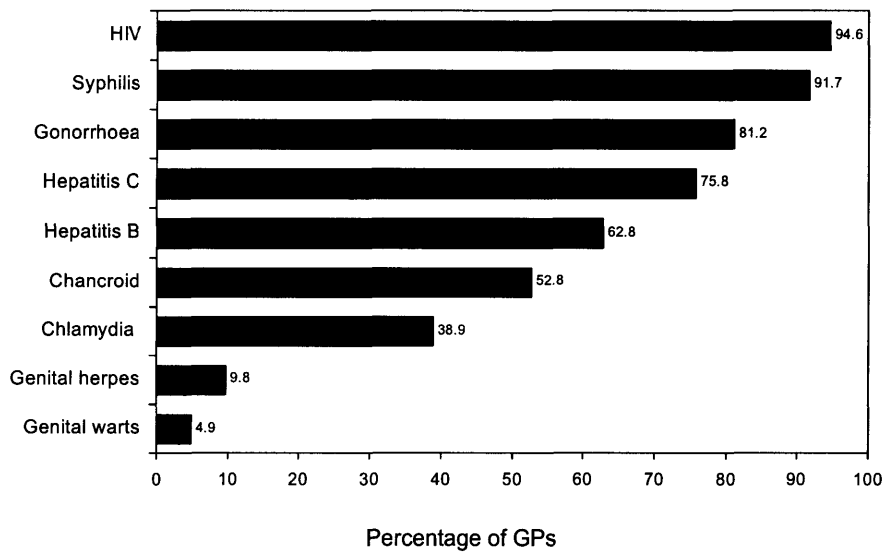
a: p<0.10; b: p<0.05; c: p<0.01; d: p<0.001; * Mantel-Haenszel (trend) chi-square p-value
NS=not significant; Ref=reference; Adj-OR=adjusted odds ratio; CI=confidence interval
NE=not entered into the base multivariate model because of colinearity with age

Use of endocervical discharge for chlamydia testing was more common among GPs who were young, female, graduated in Australia, relatively new in practice, and had postgraduate training in medicine. For example, 80% of GPs who graduated in Australia reported using endocervical discharge to test for chlamydia in women compared with 70% of their overseas trained counterparts. In multivariate analysis, female GPs compared with their male counterparts were found to be more likely to use endocervical discharge to test for chlamydia in women. Similarly, GPs with postgraduate training in medicine had double the odds of using endocervical discharge to test for chlamydia in women.

5.2.4 Notification of STIs

Since the study was limited to the GPs in NSW, the study participants were asked to identify specific STIs that are notifiable in NSW. Most GPs were aware of the notification requirements for most common STIs; however, about 39% knew that chlamydia is a notifiable condition in NSW (Figure 5.8). Although genital herpes and genital warts are non-notifiable in NSW, one in ten GPs identified genital herpes and one in 20 GPs identified genital warts as notifiable conditions in NSW.

Figure 5.8 GP knowledge about notification of STIs in NSW



An attempt was made to examine whether any background and practice characteristics were associated with GP awareness of STI notification in NSW. Younger GPs were more aware of chlamydia notification than their older counterparts (Table 5.3). Awareness of chlamydia notification was found to be more common among GPs who worked in rural areas and graduated in Australia. For example, about 48% of GPs in rural areas were aware of chlamydia notification in NSW compared with 34% of metropolitan GPs.

Awareness of syphilis notification was found to be positively associated with GPs' age and duration of practice. For example, 86% of GPs aged <40 years were aware of syphilis notification compared to 94% of their older counterparts aged ≥40 years. General practitioners who graduated in Australia were more aware of notification requirements for gonorrhoea than their overseas

trained counterparts (Table 5.3). Diagnosis of an STI in the month preceding the survey was positively associated with awareness of gonorrhoea notification in NSW. The analysis also revealed that 68% of GPs with postgraduate training in medicine were aware of notification requirements of hepatitis B compared with 55% of GPs who did not have this training (P=0.007).

Table 5.3 Correlates of notification awareness of selected STIs in NSW

Characteristics	Chlamydia	Syphilis	Gonorrhoea
Age (years)			
<40	44.6*[b]	86.1*[b]	80.2
40-54	40.5	93.7	82.0
55+	30.0	94.0	81.0
Place of graduation			
Australia	42.7[c]	92.2	83.7[b]
Overseas	28.2	90.9	74.5
Area of practice			
Rural	47.9[c]	91.5	85.2
Metropolitan	34.1	91.8	79.0
Duration of practice (years)			
≤10	43.0*[a]	82.3*[c]	78.5
11-20	43.0	93.3	81.5
21+	34.4	94.8	82.3
Diagnosis of an STI in last month			
Yes	40.2	94.0	85.3[b]
No	37.4	90.0	77.6

a: p<0.10; b: p<0.05; c: p<0.01; * Mantel-Haenszel chi-square p-value

5.3 Conclusions

Knowledge about the clinical features of STIs and their notification requirements was generally good, although there was evidence of a lower level

of awareness of some aspects of STIs. Almost all GPs were aware that a substantial proportion of STIs at a population level are commonly asymptomatic. However, awareness of some common STIs being asymptomatic was not very high. Just over half of the participating GPs reported that chlamydia could be asymptomatic in men, and genital warts could be asymptomatic in women. Less than one-third of GPs recognised the possibility that genital herpes could be asymptomatic in both women and men. Overall, awareness of the potential for STIs to be asymptomatic was more common among GPs who were female, young, graduated in Australia, and had postgraduate training.

Urethritis was identified as the most common mode of presentation of chlamydia and gonorrhoea in men. The endocervix was regarded as the appropriate site for testing for chlamydia in women. However, there were some variations in choosing the appropriate specimen for chlamydia testing in women. Younger and female GPs were more likely to consider the endocervix, and rural GPs were more likely to consider the urethra to be the appropriate site for specimen collection to test for chlamydia in women.

Awareness of notification requirements was good for many STIs. More than nine in ten GPs were aware of the notification requirements of HIV and syphilis. However, three out of five did not know that chlamydia is a notifiable condition in NSW. In general, notification awareness was more common among GPs who graduated in Australia, had postgraduate training in medicine, and had recent experience in diagnosing an STI.