Chapter 1
Introduction

1.1 Introduction

Sexually transmissible infections (STIs)[1] are a major public health concern throughout the world. There was an estimated 340 million new cases of syphilis, gonorrhoea, chlamydia, and trichomoniasis worldwide in 1999 in women and men aged 15 to 49 years (World Health Organization 2001a). Worldwide, STIs are a major global cause of acute illness, serious maternal and neonatal morbidity, preventable infertility, and anogenital cancers as well as long-term disability and death. The impact of these diseases is magnified by their potential to facilitate the spread of HIV infection. In addition, STIs have far-reaching psychosocial and economic consequences beyond morbidity and mortality. People with STIs are usually concerned about diagnosis of the disease, its potential impact on their lives, and their relationship with their partners. The economic burden of STIs is enormous when considering both direct (i.e. diagnosis and treatment of STIs) and indirect costs (i.e. lost productivity and disability due to STIs). For example, the annual cost of treating

[1] The term 'sexually transmissible *infection (STI)*' was introduced to replace the term 'sexually transmitted *disease (STD)*' as recommended by the World Health Organization (World Health Organization 2001b). The term STI has been adopted not only because many of the infections (e.g. scabies, public lice) transmitted through sexual contact are not diseases, but also because it better incorporates asymptomatic infections.

pelvic inflammatory disease (PID) and related ectopic pregnancy and infertility in the United States was estimated at US$ 3.13 billion in 1994 (Eng & Butler 1997).

In Australia, STIs have been identified as one of the major public health problems (Nuetbeam 1993). Although there was a decline in the reported incidences of STIs in the early 1990s, these infections have been on the increase in Australia during recent years. National surveillance data showed that reported diagnoses of chlamydia increased by 72% over a period of three years with 128.5 cases per 100 000 population in 2002 (National Centre in HIV Epidemiology and Clinical Research 2003). This increase may partly be due to increased testing and recent availability of urine-based tests. The estimated rate of gonorrhoea infection in 2002 was 32.9 per 100 000 population, a 13% increase over a period of four years. However, the notification system may not provide an accurate picture of STI distribution in Australia as it covers only bacterial STIs, many of which are asymptomatic. One community-based study has found far higher rates of chlamydia and gonorrhoea than would have been expected from previous notification data (Skov *et al.* 1997). A recent study examined herpes simplex virus (HSV) infections among women attending an antenatal clinic in Sydney between June 1995 and April 1998, and found that nearly 12.5% of the clinic attendees had antibodies against HSV-2 (Mindel *et al.* 2000). The rising trend of various STIs in recent years along with their adverse health implications makes it crucial to place the prevention and control of STIs high on the public health agenda in Australia (Fairley 1997).

As primary health care providers, general practitioners (GPs) have unparalleled access to a large cross-section of the Australian population with different risk profiles. About 85% of the population visit their GP at least once a year, with a median number of five visits per person (Royal Australian College of General Practitioners 1998). General practice services are more widely dispersed throughout the country than any other health services, covering most geographic regions including rural and remote locations. Also, GPs deal with a diverse range of conditions and offer services that include preventive, curative and palliative care (Commonwealth Department of Health and Family Services 1996). Therefore, GPs are well placed to provide effective sexual health care services through the opportunity provided by general medical encounters. The advances in diagnostic testing, screening, and treatment of STIs have allowed GPs to successfully contribute to the good health of the Australian population by controlling diseases at the individual level.

Available evidence suggests that there are inconsistencies and weaknesses in the management of STIs in general practice in Australia. A recent study reported substantial variation in the management of genital herpes in pregnant women by Australian physicians (Marks *et al.* 1999). A number of journal articles, based on a survey of GPs practising in Victoria, have suggested that GPs may have lower levels of awareness about the asymptomatic nature of many STIs, and play suboptimal roles in the clinical management of STIs (Temple-Smith *et al.* 1996; Mulvey *et al.* 1997; Temple-Smith *et al.* 1997; Keogh *et al.* 1998; Temple-Smith *et al.* 1999). In particular, sexual history taking did not

form a routine part of standard GP consultations and was perceived to be of little relevance to patients (Temple-Smith *et al.* 1996). Also, most GPs felt more confident in assessing sexual risks when the need to do so was obvious to the patients (Temple-Smith *et al.* 1999). High levels of uncertainty were observed among many GPs about how and when contact tracing for different STIs should be undertaken (Keogh *et al.* 1998). The GP survey on which these articles are based was conducted in 1995, so most of the above information is becoming dated. More importantly, the collected information, though valuable in the Victorian context, cannot be generalised to apply directly to general practice in New South Wales (NSW). Furthermore, little is known about how patients with STIs are managed by GPs in NSW. In particular, a clear understanding of the attitudes of GPs towards offering STI care to patients with different backgrounds, their role in sexual health promotion, and how they feel about sexual health training is yet to be adequately understood.

It is important to have an insight on how STIs are managed in general practice; what approaches are used by GPs for clinical care and prevention of STIs; what factors, if any, facilitate or constrain GPs from promoting sexual health in their practice; and whether sexual health education is adequate to meet the changing demands of STI care in general practice. It would also be useful to examine whether STI care in general practice differs to that in specialised practice staffed by sexual health physicians (SHPs), who are supposed to offer 'benchmark' STI care in Australia.

1.2 Aims of the study

Given the public health priority of improved STI control and the importance of the GP role in STI care, the present study aims to assess the current knowledge and practice base of GPs in STI care in New South Wales, Australia. It also explores whether there is any difference in STI care between general and sexual health practices in Australia. In particular, the present study aims to answer the following research questions.

i) What is the current knowledge and skill base of GPs in screening, diagnosis, and treatment of STIs?

ii) What are the characteristics of general practice that facilitate or inhibit more responsive sexual health care, with a particular focus on management of asymptomatic cases?

iii) How are prevention of STIs and the promotion of sexual health being implemented in general practice?

iv) How do practitioners feel about the adequacy of sexual health training and the need for additional training to offer optimal STI care?

v) How does STI care offered in general practices differ from that of sexual health practices?

1.3 Overview of thesis

This thesis consists of ten chapters. In addition to the introductory chapter (Chapter 1) that provides a context for the thesis, Chapter 2 reviews the literature in the area of STI care, especially in primary care settings. It starts with an exploration of the magnitude and consequences of STIs, and the general practice and sexual health services in Australia. This chapter provides a brief description of the steps involved in STI management. It also examines in more detail how STI care is offered in primary care settings, both in the global and Australian context.

Chapter 3 details the methods used to conduct the study. It describes the design of the study, development of study instruments, and recruitment of study participants. It also illustrates how the study is implemented for GPs and SHPs, and how the survey data is managed and analysed. Study limitations are also described.

Chapter 4 presents a profile of the study participants, including demographic and practice characteristics of GPs and SHPs. In addition, this chapter examines whether there are any differences with respect to background characteristics between: participating and non-participating GPs; the GP sample in this study and the GP population in NSW; and the GP sample and the SHP sample.

Chapter 5 describes the level of awareness of GPs about some selected issues concerning STIs. In particular, it assesses the knowledge of GPs about

asymptomatic potential for some common STIs, mode of presentation of chlamydia and gonorrhoea, and optimal specimen and site when testing for chlamydia. This chapter also explores whether GPs are aware of notification requirements of some selected STIs in NSW.

Chapter 6 explains how STIs are clinically managed in general practice. It addresses key issues relating to STI care including: investigations recommended for STI diagnosis, antimicrobial or antiviral treatment for STIs, and presumptive treatment for suspected STIs. This chapter also investigates how GPs manage patients with psychological distress, and to what extent GPs are involved in referral and contact tracing for STIs.

Chapter 7 reveals different styles of clinical practice that GPs use when caring for patients with STIs. In particular, this chapter illustrates to what extent GPs are involved in sexual risk assessment and whether they encounter any constraints. It also details their comfort in dealing with patients with STIs, their attitudes towards offering chlamydia testing, and their priorities in different components of STI care.

Chapter 8 explores organisational issues in STI care in general practice. It describes how GPs feel about the adequacy of sexual health training and educational resources for primary care providers, and whether additional training on sexual health could improve their practice. This chapter also examines whether GPs encounter constraints in offering sexual health promotion in general practice.

Chapter 9 examines whether STI care in general practice differs to that in sexual health practice. It highlights differences in STI care between the two groups of practitioners in relation to knowledge and skill base in STIs, style of clinical practice, and organisational issues in STI care.

This thesis concludes with Chapter 10 with the key issues in STI care identified by the present study and limitations of the study discussed. It also illustrates implications of this research, and the directions for further research in the area of STI care.

Chapter 2

Literature Review

2.1 Introduction

Sexually transmissible infections (STIs) are caused by about 30 pathogens which include bacteria, protozoa, fungi, and viruses (Jackson *et al.* 2004). These infections are spread mainly by sexual contact with an infected person. Many of the common STIs are asymptomatic, and individuals with STIs are potentially infectious to their sexual partners, even though they may have no signs or symptoms of infection. Some STIs, particularly those caused by viruses such as human papilloma virus (HPV), human immunodeficiency virus (HIV) and hepatitis B, are not reliably curable. On the other hand, most bacterial, fungal and parasitic infections (e.g. chlamydia, gonorrhoea, syphilis, and trichomoniasis) can generally be cured with antimicrobial agents (Aral 2001).

Sexually transmissible infections are endemic throughout the world. One recent study based on surveillance data found that new diagnoses of chlamydia and gonorrhoea doubled in the United Kingdom (UK) over a period of five years (1997-2002), while diagnoses of syphilis increased eight-fold (Brown *et al.* 2004). Another recent study estimated that approximately 18.9 million people in the United States became infected with one or more STIs in the year 2000

(Weinstock *et al.* 2004). In Australia, diagnoses of chlamydia increased more than three-fold over the past decade, while diagnoses of gonorrhoea doubled during the same period (National Centre in HIV Epidemiology and Clinical Research 2003). Globally, STIs have been recognised as a major public health concern with their severe medical and psychosocial consequences (World Health Organization 2001b). If untreated, STIs can cause serious consequences such as infertility, ectopic pregnancy, chronic disability, and cervical cancer. In addition, the presence of an STI can increase the likelihood of transmission of another STI, including HIV. Therefore, proper management of STIs is crucial for individual wellbeing and public health control of the infections.

The present chapter describes the magnitude and consequences of STIs along with their management in clinical settings. In particular, this chapter outlines incidence/prevalence of STIs in global and Australian contexts, their sequelae, basic steps involved in effective STI management, general practice and sexual health services in Australia and lastly, the existing practice of STI management in primary care settings.

2.2 Magnitude of STIs

2.2.1 Global burden of STIs

Although the exact magnitude of the burden of STIs is not precisely known, the World Health Organization (WHO) estimated 11.8 million new cases

of syphilis, 62.4 million of gonorrhoea, 92 million of chlamydia, and 173.5 million of trichomoniasis occurred worldwide in 1999 in adults (World Health Organization 2001a). The vast majority of new cases of STIs occurred in the less developed countries. In 1999, South and Southeast Asia contributed 48 million new cases of STIs, followed by Sub-Saharan Africa (32 million) and Latin America and the Caribbean (18.5 million) (World Health Organization 2001a). However, the industrialised countries also contributed considerably to the burden of STIs. For example, it was estimated that there were over 15 million new STI cases in the United States (US) in 1996: 5.5 million cases of HPV, 5 million of trichomoniasis, 3 million of chlamydia, 1 million of herpes, 0.65 million of gonorrhoea, 0.12 million of hepatitis B, and 0.07 million of syphilis (Cates 1999). A cross-sectional analysis based on a nationally representative sample of 14 322 young adults in the US revealed that chlamydia prevalence was 4.19% for young women and 3.67% for young men, while overall prevalence of gonorrhoea was 0.43% among young adults (Miller *et al.* 2004).

In the United Kingdom, there has been a gradual and sustained increase in the diagnosis of most common STIs (Public Health Laboratory Service 2001). Surveillance data showed that over the six years 1995 to 2000 diagnoses of genital chlamydia infection increased by 107% (30 877 to 64 000 cases), gonorrhoea by 102% (10 204 to 20 663 cases) and syphilis by 145% (136 to 333 cases) in the UK (excluding Scotland). There were 66 044 new diagnoses of anogenital warts in the UK in 2000; these were the most common STIs diagnosed in Genitourinary Medicine (GUM) clinics in the UK (Public Health

Laboratory Service 2001). One recent study based on surveillance data also found that new diagnoses of syphilis increased eight-fold and diagnoses of chlamydia and gonorrhoea doubled from 1997 to 2002 in the UK (Brown *et al.* 2004).

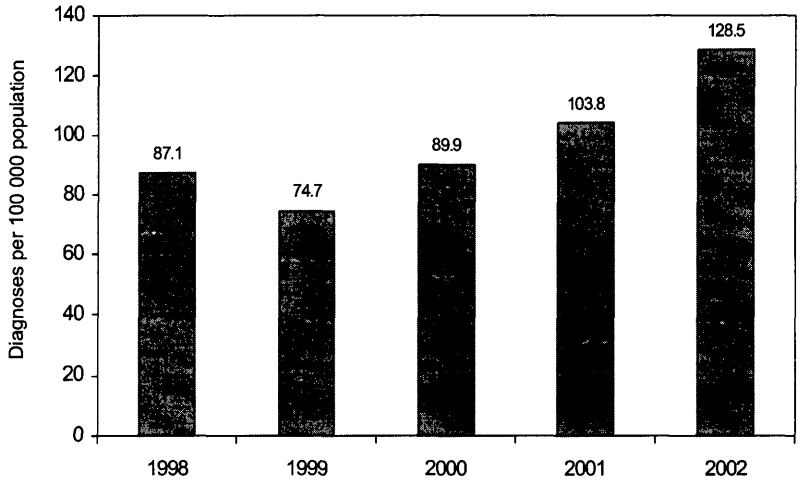
A recent study based on patients who attended particular clinics in the Netherlands reported a continued increase of STIs (van de Laar *et al.* 2003). This study showed that between 2001 and 2002 diagnoses of chlamydia increased by 17%, gonorrhoea by 22%, and syphilis by 78%. Laboratory surveillance of chlamydia and gonorrhoea infections in Denmark showed that the incidence rate of chlamydia was 367 per 100 000 women and 153 per 100 000 men in 1999 (Hoffmann 2001). Recent Swedish studies based on notification data revealed a chlamydia incidence rate of 250 cases per 100 000 population, which was a 59% increase over a period of four years (Berglund & Blystad 2002; Gotz *et al.* 2002).

2.2.2 STIs in Australia

Although Australia witnessed a significant decline in the reported incidence of STIs in the early 1990s, available evidence suggests that recent years have seen an increase in STIs. According to the most recent *Annual Surveillance Report on HIV/AIDS, Viral Hepatitis and STIs in Australia 2003 (National Centre in HIV Epidemiology and Clinical Research 2003)*, the population rate of reported diagnosis of chlamydia increased from 74.7 per

100 000 population in 1999 to 128.5 per 100 000 population in 2002. This is a 72% increase over a period of three years (Figure 2.1). The highest rates of chlamydia were recorded in the Northern Territory (664.7 per 100 000 population) in 2002. Although the state of NSW had the country's lowest reported diagnoses of chlamydia, the rate doubled over a period of four years, from 39.3 per 100 000 population in 1999 to 87.7 per 100 000 population in 2002. The majority of the reported cases of chlamydia were found among

Figure 2.1 Rate of diagnoses of chlamydia, 1998-2002, Australia



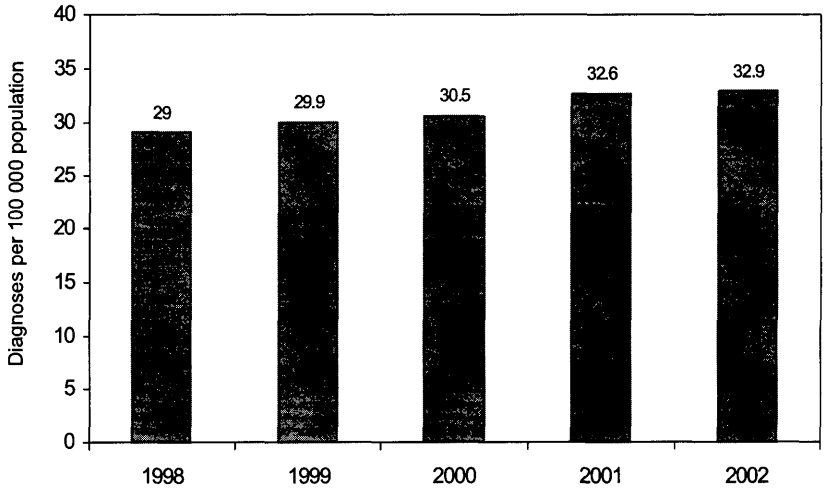
Source: National Centre in HIV Epidemiology and Clinical Research 2003

Indigenous Australians (957 per 100 000 population), while non-Indigenous Australians contributed a relatively smaller proportion of infections (137 per 100 000 population). The male to female ratio for chlamydia notifications was about 1:1.5 with over three-quarters (77%) of the notifications in the 15 to 29 years age range. However, chlamydia infection may be under-reported because of the asymptomatic nature of the infection (Cates & Wasserheit 1991;

Oakeshott & Hay 1995). It can be argued that increases in notification may reflect improved diagnostic technology.

Over the five years 1998 to 2002, the notification of gonococcal infections increased slightly. The rate of infection increased from 29.0 per 100 000 population in 1998 to 32.9 per 100 000 population in 2002 (Figure 2.2). The highest rate of notification of gonorrhoea was from the Northern Territory (704.2 per 100 000 population). In 2002, a total of 1 400 notifications of gonorrhoea cases were received in NSW with an infection rate of 21.8 per 100 000 population, while the infection rate was 16.8 per 100 000 in 1998. The infection was more prevalent among men than women; the male to female ratio for gonorrhoea infection was 2.1:1. The estimated rate of gonorrhoea infection among non-Indigenous Australians was 28 per 100 000 population compared

Figure 2.2 Rate of diagnoses of gonorrhoea, 1998-2002, Australia

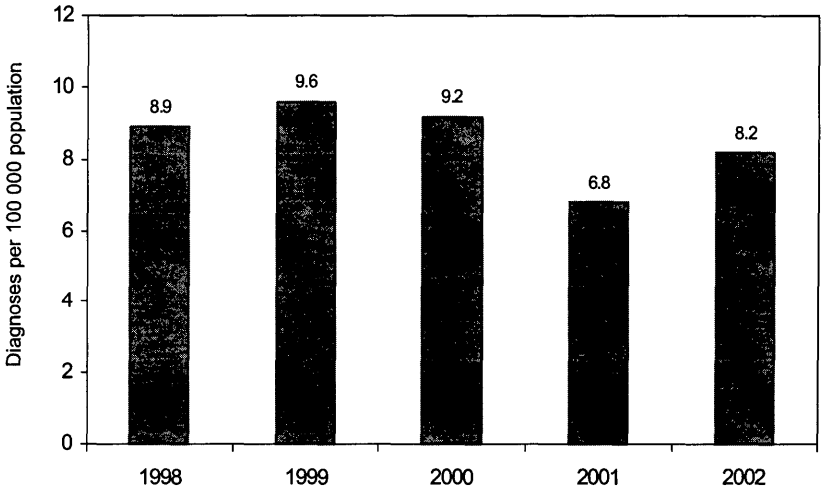


Source: National Centre in HIV Epidemiology and Clinical Research 2003

with a rate of 1 266 per 100 000 in the Indigenous population (National Centre in HIV Epidemiology and Clinical Research 2003).

There was no consistent pattern of change in the notification rates for syphilis cases during the period 1998 to 2000. However, the population rate for the diagnosis of syphilis increased slightly from 6.8 per 100 000 population in 2001 to 8.2 per 100 000 population in 2002 (Figure 2.3). The surveillance data also showed that most of the infections occurred among Indigenous Australians compared with their non-Indigenous counterparts (324 vs. 4 cases per 100 000 population). In 2002, the highest rate of syphilis diagnosis was recorded in the Northern Territory (190.1 per 100 000 population), followed by Queensland (9.3 per 100 000 population) and NSW (9.2 per 100 000 population).

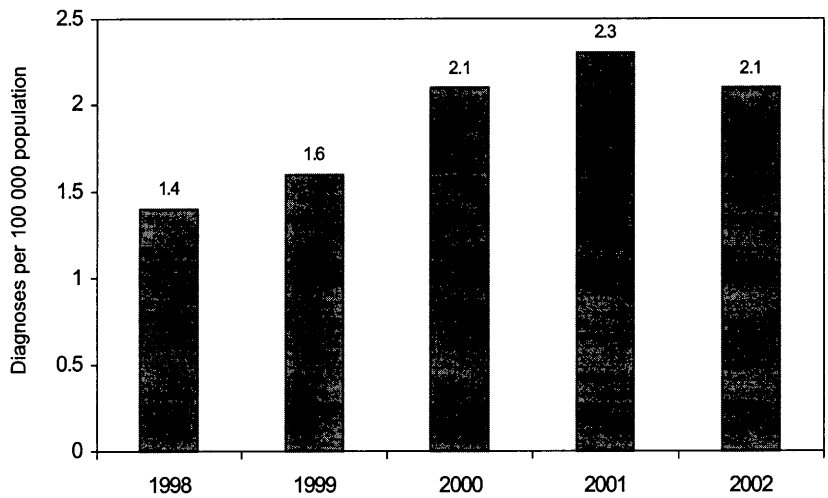
Figure 2.3 Rate of diagnoses of syphilis, 1998-2002, Australia



Source: National Centre in HIV Epidemiology and Clinical Research 2003

The reported diagnosis of newly acquired hepatitis B incident cases increased steadily until 2001, but there was a slight decline in the following year 2002 (Figure 2.4). As with other STIs, the rate of incident cases of hepatitis B was highest in the Northern Territory (9.2 per 100 000 population). Notification of newly acquired hepatitis B infection in NSW was 1.3 per 100 000 population in 2002. The highest rate of incident cases of hepatitis B (38.5%) occurred in the 20 to 29 year age group (National Centre in HIV Epidemiology and Clinical Research 2003).

Figure 2.4 Rate of diagnoses of hepatitis B, 1998-2002, Australia



Source: National Centre in HIV Epidemiology and Clinical Research 2003

Under the Australian disease surveillance system, information is routinely collected about some selected STIs along with some other diseases. Doctors, hospitals and/or laboratories diagnosing the infections are required to report each case diagnosed along with non-identifying information to local health

authorities. However, the surveillance systems may not provide the true magnitude of STIs in Australia where notification requirements vary in different states. A study compared the notification data with information collected through a questionnaire sent to practitioners dealing with STIs across the Northern Territory (Mein *et al.* 1995). While the notification data reported 36 cases of donovanosis in 1993, the survey identified a total of 115 treated cases of donovanosis during the same period. A community based study of Indigenous women in the Northern Territory showed that the prevalence of chlamydia and gonorrhoea was more than four times the official notification rate from the Northern Territory Health Services (Bowden *et al.* 1999). A population based cohort study conducted among 1 034 Aboriginal people of Central Australia reported higher incidences of bacterial STIs than indicated by the notification data, with gonorrhoea at 21.3 per 100 person years, chlamydia at 15.8 per 100 person years and syphilis at 1.15 per 100 person years among the study participants (Miller *et al.* 2001).

A recent report on Australia's notifiable diseases acknowledged under-reporting of notifiable conditions, and warned that notified cases were likely to only represent a proportion of the total number of incident cases (Roche *et al.* 2001). This report argued that under-reporting could be caused by many factors including differences in case definitions and different jurisdictions. In the case of STI notification, an additional reason could be that many STIs are asymptomatic. A patient without any symptoms of disease is unlikely to seek medical help and therefore to go undiagnosed. As such, the infection remains

unreported. Nevertheless, the surveillance systems provide valuable, though not complete, information on trends and baseline STI levels and is useful for planning and evaluation of prevention programmes.

Even though national estimates of some viral STIs (e.g. genital herpes and genital warts) are not available, clinical data suggest that these infections are very common in Australia (Donovan & Mindel 1995; Mulhall *et al.* 1995a; Donovan *et al.* 1998). Diagnoses of genital herpes and genital warts in Sydney and Adelaide Sexual Health Clinics over more than a decade (1982-1994) showed that both infections were common among clinic attendees (Donovan *et al.* 1998). A retrospective review of patient records from the Melbourne Sexual Health Centre between January 1994 and June 1995 reported that 11% of the clients had a diagnosis of genital warts over a 12-month period, while 5.5% were diagnosed with genital herpes (Pope & Smith 1997). Another study based on 300 gay men in a primary care setting in Melbourne reported that 43% had herpes simplex virus type II (HSV-2) antibodies (Russell *et al.* 2001).

A recent study examined medical records of patients attending a public STI/HIV service in Sydney between 1991 to 1998, and found that 20.9% of male commercial sex workers (CSWs) were found to have genital warts compared to 4.6% in female CSWs and 12.2% in non-CSW homosexual men (Estcourt *et al.* 2000). A retrospective evaluation of medical records found that 8% of women who had sex with women had genital warts compared with 11% of women who denied ever having sex with another woman (Fethers *et al.* 2000). Another

recent study conducted in 27 correctional centres across NSW found that 58% of female inmates had HSV-2 antibodies compared with 21% of their male counterparts (Butler *et al.* 2000). Using data from the Women's Health Australia study, a recent cross-sectional analysis based on a random sample of 14 762 young Australian women aged 18 to 22 years found that the self-reported incidence of genital herpes and warts was 1.1% and 3.1% respectively (Schofield *et al.* 2000). The rising trend in the diagnosis of various STIs in recent years underscores the need for STI control in Australia.

2.3 Consequences of STIs

Sexually transmissible infections are a major public health problem because of their potential to cause serious health consequences, which in turn have psychosocial and economic costs (Adler 1998).

2.3.1 Health consequences

Sexually transmissible infections constitute a major global cause of acute illness, long term disability, and even death (Gerbase *et al.* 1998). The vast majority of the disease burden from STIs results from the complications and sequelae that may follow infections. In addition, the presence of an untreated STI can increase the risk of both acquisition and transmission of HIV by a factor of up to 10 (World Health Organization 2001b).

When left untreated or unresolved in women, chlamydia and gonorrhoea can spread from the lower genital tract to the upper reproductive tract and can result in pelvic inflammatory disease (PID), which in turn often leads to complications including ectopic pregnancy, infertility, and chronic pelvic pain (Cates *et al.* 1990; Westrom & Mardh 1990; McCormack 1994; Simms & Stephenson 2000). Data from clinical studies indicate that 20% to 40% of women infected with chlamydia and 10% to 40% of women with gonorrhoea could develop PID if these infections are not adequately treated (Centers for Disease Control and Prevention 1995). One study conducted among 147 women who attended an inner city hospital in London found that 39% of PID cases were caused by chlamydia and 14% were caused by gonorrhoea (Bevan *et al.* 1995). Untreated infections in pregnant women with chlamydia, gonorrhoea, syphilis, genital warts, genital herpes and hepatitis B may result in a variety of serious to severe complications including foetal loss, stillbirths, low birth weight, and heart, eye and lung damage in the newborn (Eng & Butler 1997).

If untreated in men, chlamydia and gonorrhoea can cause epididymitis, which may result in infertility (Martin 1990; Fisher 1993; Centers for Disease Control and Prevention 2001). Evidence also exists that chlamydia is the most common cause of epididymitis in young men (Donovan 2004). Without prompt treatment, gonorrhoea can also affect the prostate and can lead to scarring of the urethra, making urination difficult (Berger 1990). Syphilis may cause serious damage to the heart, brain, eyes, nervous system, bones and joints (Gerbase *et*

al. 1998). People chronically infected with hepatitis B face an increased risk of developing chronic liver diseases, including cirrhosis and liver cancer (Ryu 2003). There is also evidence to suggest that certain types of HPV are linked with the development of cervical cancer (Walboomers *et al.* 1999; Franco *et al.* 2001), and are also considered to be a cause of cancers of the vulva, vagina, penis and anus (Brewster *et al.* 1999).

2.3.2 Psychosocial consequences

Sexually transmissible infections have far-reaching consequences beyond morbidity and mortality caused by the infections. A recent report, published by the Institute of Medicine, USA, identified stigma as a key element of the 'hidden epidemic' of STIs in the US (Eng & Butler 1997). Evidence exists that diagnosis with an STI is a stigmatising experience and can have serious psychosocial consequences (Bradford 1993; Duncan *et al.* 2001). Patients are often far more distressed by the diagnosis of an STI than they are by the accompanying pain or discomfort (Bradford 1993). This study also revealed that patients with a diagnosis felt that the disease had put them "beyond the pale" and they had become sexually and socially withdrawn.

Recent studies conducted to assess the psychological impact of the diagnosis of chlamydia and genital herpes revealed that receiving a diagnosis was a 'shock' with initial emotional reactions ranging from distress to denial, and participants were worried about disclosing their conditions to partners and others

(Duncan *et al.* 2001; Melville *et al.* 2003). Diagnosis of genital herpes resulted in persistent concerns that included fear of transmitting the infection to current or future partners, a reluctance to engage in future relationships, and transmission to the newborn (Melville *et al.* 2003). Due to the asymptomatic potential of the infection, women diagnosed with chlamydia were not sure about the length of time they had been infected. This, in turn, provided a source of continuing anxiety about the possibility of future infertility (Duncan *et al.* 2001).

Stigma may also influence individual health seeking behaviour. A study conducted among 2 593 gay/bisexual men in the US reported that 59% of men who had never been tested for HIV cited fear of negative social consequences as an important reason for not seeking testing (Stall *et al.* 1996). Pregnant women were also found to be reluctant to go for testing because of inherent stigma despite the benefits of treating such infections during pregnancy (Boyd *et al.* 1999). A more recent study found that stigma about STIs was inversely associated with adolescents' disclosure of their sexual behaviour to health care providers (Cunningham *et al.* 2002). Furthermore, fear of exclusion and disempowerment due to stigmatisation can impede access to preventive and care services, and in particular access to treatment that can cure or suppress the infection (Tillett & Tindall 1990; Scoular *et al.* 2001; Cunningham *et al.* 2002; Fortenberry *et al.* 2002).

2.3.3 Economic consequences

In addition to health and psychosocial consequences, the economic burden of STIs is considerable. The greatest costs associated with bacterial STIs accrue from the management of complications and the sequelae of untreated chlamydia and gonorrhoea. Antiviral drugs for viral STIs cannot cure the infection but can sometimes halt the progression or prevent the consequences of the infections; however, such treatments are often expensive.

Based on a report, commissioned by the US Institute of Medicine, the direct cost of chlamydia, syphilis, gonorrhoea, PID, chancroid, HSV, HPV, hepatitis B and STI related cancers was estimated to be over US$ 7.48 billion in the year 1994 (Eng & Butler 1997). This report also revealed that the total direct cost for PID and related ectopic pregnancy and infertility in the US was estimated at US$ 3.12 billion. Another study estimated the direct cost of treating STIs and their complications to be at least US$ 8.4 billion in 1997 with 1.97 billion for curable STIs, 1.88 billion for viral STIs, and 4.54 billion for HIV (American Social Health Association 1998). These estimates represent only a part of the total economic burden of STIs in the US, and do not include indirect nonmedical costs, such as lost wages and productivity due to STI-related illness, or out-of-pocket costs. A more recent study estimated cumulative projected total costs of incident HSV-2 infections in the US at between US$ 43 to 61 billion over the next 25 years (Fisman *et al.* 2002).

In Australia, recent cost analysis data are not readily available. An unpublished report estimated that total lifetime costs for a cohort of Victorian women aged between 16 and 34 years would be A$ 11.3 million for a chlamydia prevalence rate of 1%, and this cost would be A$ 33.8 million at a 3% prevalence rate (Rodger 1999). This report also predicted the number of PID cases for the same cohort of women at a varying prevalence of chlamydia, and reported that 1 621 women were likely to develop PID at a prevalence of 1% and this number would be 5 784 for a prevalence of 3%.

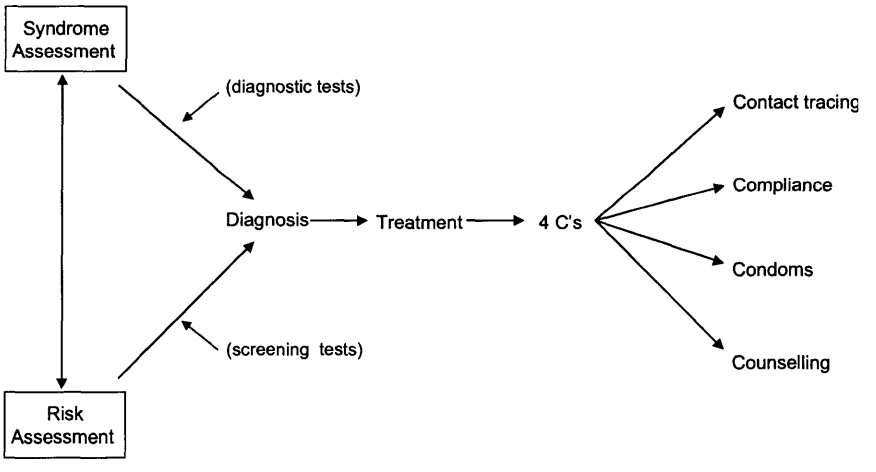
Furthermore, indirect costs of STIs can be measured in terms of lost productivity, and represent the value of output forgone by individuals with STIs and associated disability (Eng & Butler 1997). Unsafe sex, the main risk factor for STIs, alone bears worldwide the burden of 2.2% of deaths, 4.5% of Years Living with Disability (YLD) and 3.5% of Disability-Adjusted Life Years (DALYs) (Murray & Lopez 1996). Calculating Years Living with Disability (YLD) based on three common STIs (e.g. chlamydia, gonorrhoea and syphilis), this study reported a total of 12.1 million YLD globally for 1990. This burden was centred on the age group 15 to 44 years with women affected much more than men (7.78 and 2.3 million, respectively). One recent study revealed that STIs (excluding HIV) were the eighteenth cause of global disease burden in 1999, representing 1.37% of total DALY (Michaud *et al.* 2001). A recent study of burden of disease and injury in Australia reported that unsafe sex was responsible for around 1% of the total disease burden, with HIV/AIDS accounting for 58% of the total disease burden attributable to unsafe sex,

followed by cervical cancer (23%), and STIs other than HIV/AIDS (8%) (Mathers *et al.* 2001).

2.4 Management of STIs

Early detection and effective treatment of STIs is one cornerstone of control (Aral 2001). Such intervention involves managing patients with symptomatic and asymptomatic infections. The essential steps in effective STI management, as demonstrated in Figure 2.5, include: risk assessment and clinical evaluation, diagnostic or screening tests for diagnosis, treatments, and preventive measures including risk reduction counselling, identification and treatment of partners, condom promotion, and efforts to ensure compliance with treatment and prevention measures (Holmes & Ryan 1999).

Figure 2.5 Essential steps in STI management



Source: Holmes & Ryan 1999

An integrated approach to STI management starts with clinical assessment for specific signs and symptoms of STIs, and assessment of sexual risk by taking a sexual history. A real challenge of comprehensive risk assessment, however, lies with the detection of asymptomatic infections. The majority of curable STIs cause subclinical infections, especially in women, and, as such, these infections remain undiagnosed. Based on the results of clinical or risk assessment, the next step would be to offer confirmatory diagnostic tests for symptomatic patients or those with reactive screening tests, or screening tests for asymptomatic patients. Once a diagnosis of an STI is made, confirmed or presumptive, appropriate treatment should be administered without delay. After initiating treatment, STI care concludes with what has been termed as the 'four Cs': Contact tracing (notification and treatment of sexual partners), Condom promotion whenever needed, Counselling and education about reduction of future risk, and assurance of Compliance with treatment (Centers for Disease Control and Prevention 1998a; Handsfield 1999).

2.4.1 Risk assessments and clinical evaluation

Sexual risk assessment of patients has long been regarded as an important strategy for prevention and control of STIs (Curtis & Holmes 1999). Health care providers are well placed to offer such an assessment through their one-to-one encounter with patients. Sexual history taking ensures that the practitioners are not making unwarranted assumptions about patients. In

addition, it provides patients with an opportunity to discuss issues that they may not otherwise have raised and can allow for further identification of potentially risky behaviour.

If a patient with symptoms consults a practitioner, the practitioner assesses whether the presenting complaints can be linked with possible STIs. The basic examination for such an assessment cannot take place without the practitioner taking an adequate sexual history to determine what sites should be investigated further (Ross *et al.* 2000). In addition, risk assessment through taking a sexual history can aid in interpreting the presenting symptoms or signs, and be used to determine the probability that an STI is the cause of the symptoms. Such an assessment can also be used even prior to initiating treatment without confirmatory testing, especially when the probability of an STI is based on clinical assessment.

In the case of asymptomatic patients, risk assessment can help to decide whether to screen an individual for STIs and to use preventive or prophylactic measures. Routine risk assessment in asymptomatic patients can serve as a guide to selective clinical evaluation and laboratory testing for possible STIs. In addition, sexual risk assessment is now widely used to initiate counselling on behavioural risk reduction, managing certain STI syndromes, and offering presumptive diagnosis of STIs (Mindel *et al.* 1998).

Failure to assess risk predisposes patients to potential harm through under-diagnosis, misdiagnosis or inappropriate treatment. It is, therefore,

essential that a brief sexual history be taken from sexually active patients for screening purposes if there is an indication of suspicion, irrespective of signs and symptoms. If necessary, a detailed and accurate sexual history should be taken, which will then be used to assess the risk of the patients and to make a decision on suitable tests.

2.4.2 Diagnostic tests

When initial risk assessment along with the presenting signs and symptoms, if any, indicates the possibility of an STI, the next step is to offer screening or diagnostic tests. Symptomatic patients can be tested to establish the etiology of symptoms, using tests known as diagnostic tests (Morse *et al.* 1999). Tests can be offered to asymptomatic patients who may be contacts of an infected person or seeking care for non-STI related reasons (case finding tests), or who are identified through outreach to populations outside the clinics, (screening tests). Another approach used by practitioners is to make a presumptive diagnosis based on clinical findings (Handsfield 1999). However, presumptive clinical diagnosis has the potential to miss many infections as it relies on the practitioner's clinical experience to interpret symptoms and signs, and will not detect asymptomatic infections.

Since many people with STIs do not develop symptoms, case finding and screening tests are required to detect asymptomatic infections. There is evidence to suggest that early detection, through screening and individual case

identification, significantly reduces the prevalence of many STIs and their complications. For example, studies in the US revealed that screening has been shown to reduce the prevalence of chlamydia in women (Centers for Disease Control and Prevention 1997) and the incidence of PID (Scholes *et al.* 1996). The latter randomised trial revealed that at the end of 12 months of follow-up, there were 20.6 cases of PID per 1 000 women in the control group and 8.9 cases of PID per 1 000 women in the screened group, a 56% reduction in the incidence of the disease (Scholes *et al.* 1996).

As screening requires considerable resources, the decision to initiate any screening programme needs to be based on evidence that such an intervention will result in more good than harm. A cost effectiveness analysis of a population based screening programme in Amsterdam reported that systematic screening, using ligase chain reaction (LCR) on urine samples, of all women aged 15 to 40 years for asymptomatic chlamydia infection was not cost effective unless the prevalence was as high as 41.8% (van Valkengoed *et al.* 2001). However, a review of screening for chlamydia in general practice revealed that routine screening for chlamydia is cost effective when the prevalence is at least 6% (Stokes 1997). This study suggests that rather than screening all women for genital chlamydia, an alternative strategy could be to screen selectively. A study in the UK reported that a screening strategy based on testing all women aged 25 years or less and all women with two or more sexual partners in the past year would have detected 87% of chlamydia infections, but only required screening of 49% of their study population of general practice attendees (Grun *et al.* 1997).

Evidence also exists that screening of asymptomatic women in primary care who have common risk factors for chlamydia, such as age younger than 25 years, unplanned pregnancy, or reported change of sexual partner, is cost effective (Honey *et al.* 2002).

To date, most screening programmes have been opportunistic, aimed at patients attending various health care facilities or in specific 'high-risk groups' (van Valkengoed *et al.* 2002). Studies have shown that opportunistic screening is cost effective when prevalence ranges from 2% to 6% (Genc *et al.* 1993; Marrazzo *et al.* 1997; Howell *et al.* 1998). For example, opportunistic screening reduces the net cost by up to 75% for age groups 15 to 25 years and by approximately 50% for age groups 15 to 30 years based on a range of plausible assumptions (Postma *et al.* 2002). In addition, opportunistic screening is likely to offer greater opportunities for the young and individuals with high-risk behaviour to ask about diseases, their mode of transmission and the implications of positive test results (Pimenta *et al.* 2000). A study conducted in New Zealand revealed that opportunistic screening in general practice would potentially include only about half of the most sexually active men and three-quarters of such women over a 12-month period (Dickson *et al.* 1998). Nevertheless, the real challenge lies with persuading people to undergo screening when they are asymptomatic and are unaware of the extent of their risk (Dedicoat *et al.* 2000).

Although laboratory testing provides the strongest evidence for the presence of an infection, and justification for patient as well as partner treatment, establishing a diagnosis of an STI requires wider considerations.

Many STIs can present with similar symptoms and signs, while others are asymptomatic. Therefore, taking the appropriate specimen from the appropriate site is the key to establishing whether one or more infections have been acquired. However, specimen collection procedures, such as urethral swabbing, or pelvic examination for cervical samples, may discourage patients from seeking testing or be a disincentive for practitioners to collect specimens (Rietmeijer *et al.* 1997). The use of non-invasive samples, such as voided urine or even a self-collected vaginal introitus specimen, for highly sensitive nucleic acid amplification tests (NAATs) such as polymerase chain reaction (PCR) or LCR, may address some of these concerns (Morse *et al.* 1999). In addition, the use of postal samples obtained at home for PCR or LCR enables detection of infections beyond the traditional settings (Macleod *et al.* 1999; Bloomfield *et al.* 2002; Bloomfield *et al.* 2003).

2.4.3 Treatment of STIs

Curative antimicrobial therapy is available for all bacterial STIs and for those caused by protozoa and ectoparasites. In addition, the development of short-course single-dose curative therapies for major curative STIs (e.g. chlamydia, gonorrhoea, early syphilis, trichomoniasis, chancroid) has made STI treatment more effective by enhancing compliance (Handsfield 1999). For example, a single-dose therapy of azithromycin for chlamydia has an obvious compliance advantage over the standard seven-day multi-dose doxycycline

treatment, although the former is currently more expensive than the latter (Hillis *et al.* 1995). In contrast, in the case of viral STIs antiviral drugs are not curative but suppressive; they can alleviate symptoms and prevent or delay complications (Centers for Disease Control and Prevention 2002).

There are different strategies available to practitioners to treat STIs. *Etiologic* treatment, directed towards a specific pathogen usually identified by microbiologic tests, is commonly used for most STIs in industrialised countries (Handsfield 1999). *Epidemiologic* treatment is administered in a community or to a "core group" with a known substantial prevalence of STIs, regardless of any symptoms, where accurate screening is unaffordable or not feasible. This intervention may be suitable for sex partners of patients with a history of STIs (e.g. chlamydia, gonorrhoea, chancroid or syphilis).

In the case of high STI prevalence with inadequate laboratory facilities, *syndromic management* is possible (World Health Organization 1994). This approach requires identifying broad clinical symptoms and signs together with risk assessment, followed by the treatment of STI-related symptoms with a combination of antibiotics likely to cover the major causal agents. Treatment of those at high-risk with symptoms of possible STIs will break the chain of transmission, if any, and thus prevent complications that could develop between testing and the time that results become available. Syndromic treatment can ensure treatment compliance and offers treatment to patients who may not return for test results (Grosskurth *et al.* 2000).

While it is evident that syndromic management is effective for syndromes such as urethral discharge, it is less effective for managing vaginal discharge in women (Dallabetta *et al.* 1998; Vishwanath *et al.* 2000). Bacterial vaginosis and candidiasis are more common causes of vaginal discharge than are STIs (Donovan 2004). Also, there is a lack of understanding about the effectiveness of the syndromic approach for treating non-ulcerative infections among women (Grosskurth *et al.* 2000). As syndromes are often variables for the diagnosis of diseases, syndromic algorithms have the potential for misdiagnosis of STIs and indiscriminate use of antibiotics (Dallabetta *et al.* 1998). Most importantly, the sole focus of syndromic management on symptomatic infections limits the benefits of such an approach in controlling prevalent STIs (Amaral 1998).

2.4.4 Contact tracing

Contact tracing is the process of identifying the sexual partners of infected persons, locating those partners and ensuring their medical management (Rothenberg & Potterat 1999). In recent years the term "partner notification" has also been used synonymously with "contact tracing" in the context of HIV, although the latter term covers a broader category of partner services (Centers for Disease Control and Prevention 2002).

Through contact tracing, individuals with bacterial STIs who are asymptomatic can be identified and treated. This could reduce both the morbidity and duration of infectiousness, and thereby break the chain of STI

transmission (Cowan *et al.* 1996). A "before and after" comparison of the prevalence of genital chlamydia infection in women in Sweden reported a 50% reduction of infection in the study population over a period of seven years when each test positive patient was treated and their partners were traced and tested (Ripa 1990). In the case of viral STIs, including HIV, asymptomatic contacts may have less to gain from being notified. One benefit could be that they can be screened for coincident bacterial STIs for which they may also be at risk.

Although it is not clear whether the process of contact tracing effectively decreases exposure to STIs or whether it reduces the incidence or prevalence of infections, evidence exists as to the benefits of contact tracing (Centers for Disease Control and Prevention 2002). The recent CDC *Sexually Transmitted Disease Management Guidelines* suggest that health care providers should encourage their patients to make partners aware of potential STI risks and urge them to seek diagnosis and treatment for possible STIs. By fulfilling their duty to warn, practitioners through contact tracing serve the interest of the person at risk. However, the willingness and ability of practitioners to initiate contact tracing is crucial to the success of this approach (Seubert *et al.* 1999).

2.4.5 Counselling

Counselling is a recognised approach that contributes to better management and control of STIs in many ways, starting from diagnosis through to prevention of STIs. Diagnosis of an STI can be stressful for many patients,

especially those without any symptoms, who need counselling to cope with the adverse effects of a stigmatised illness, relationship pressures, and to develop and adopt strategies for maintaining physical and emotional health (Centers for Disease Control and Prevention 2002). Detection of infection also reinforces the need for counselling regarding high-risk behaviour, because such behaviour could lead to the acquisition of another STI, and transmission of the existing infection to sexual partners. Counselling is also needed to facilitate compliance with treatment regimens in order to prevent treatment failure. Patients need to be encouraged about treatment compliance to cure the infection and to alleviate its consequences.

It has been suggested that general practitioners (GPs) are regarded by many people as a credible source of advice (Fitzpatrick *et al.* 1994; Donovan *et al.* 1997), and their advice has been shown to improve population level risk behaviour (Ashenden *et al.* 1997; Mant 1997). General medical encounters have the potential to provide advice on a one-to-one basis with individualised information on the basis of a patient's stage of development and understanding of sexual issues (Curtis *et al.* 1995; Shrier *et al.* 2001). These encounters can also be the basis for an ongoing relationship that produces the mutual confidence necessary to discuss intimate issues and may encourage patients to modify their risk behaviour. Prevention counselling provides an opportunity to help patients to identify the specific behaviour that places them at risk of infection, and commit to behaviour change goals to reduce this risk (Centers for Disease Control and Prevention 1998b). When patients present with some

symptoms or concerns during a medical consultation they are more receptive to advice about how to minimise risk. Diagnosis of an STI presents a unique opportunity where messages of risk reduction counselling can have a substantial impact on changing risk behaviour (Holmes & Ryan 1999). Also, practitioners can discuss STIs in the context of other sexual and reproductive health issues, such as Pap smears, pelvic examinations or even with the use of contraceptives (Haley *et al.* 1999). General practitioners enjoy incomparable access to a majority of the population, including people at risk, and this presents a unique opportunity for sexual health promotion and care in general practice (Curtis *et al.* 1995; Johnson *et al.* 1996; Matthews & Fletcher 2001).

Available evidence suggests that interactive face-to-face counselling directed at a patient's personal risk, the situation in which risk occurs, and use of goal-setting strategies, are effective in reducing STIs (Centers for Disease Control and Prevention 1998b). Results from a randomised controlled trial demonstrated that compared with traditional approaches of providing information, certain brief risk reduction counselling approaches could reduce the occurrence of new STIs by 25% to 40% among STD clinic patients (Kamb *et al.* 1998). This trial showed that this quality of counselling could be successfully conducted in busy public clinic settings. Another randomised controlled trial on risk reduction intervention for African-American adolescents demonstrated significantly greater reduction in risk behaviour by a safe sex risk reduction intervention than by an abstinence-based intervention (Jemmott *et al.* 1998). Prevention counselling can be promoted through health education and safe sex

campaigns. Nevertheless, effectiveness of counselling depends on whether such consultation is offered in a non-judgemental way that is appropriate to the patient's culture, language, sex, sexual orientation, age and developmental level (Centers for Disease Control and Prevention 2002).

2.5 General practice in Australia

General practice, according to the Royal Australian College of General Practitioners (RACGP), is defined as:

> *... part of the Australian health care system and operates predominantly through private medical practices, which provide universal un-referred access to whole person medical care for individuals, families and communities. General practice care means comprehensive, coordinated and continuing medical care drawing on biomedical, psychological, social and environmental understandings of health* (Royal Australian College of General Practitioners 2001a).

A profile study of general practice estimated that there were approximately 5 965 general practices in Australia, with an average of three GPs per practice (Campbell Research and Consulting 1997). Over three-quarters (77%) of general practices were located in metropolitan regions, 21% in rural and three percent in remote regions. The study also revealed that 60% of practices comprised one or two GPs, 26% had three to four GPs and only 14% had six or more. According to the RACGP, a GP is defined as:

> *... a registered medical practitioner who is qualified and competent for general practice in Australia. A general practitioner has the skills and experience to provide whole person, comprehensive, coordinated and continuing medical care; and maintains professional competence for general practice* (Royal Australian College of General Practitioners 2001a).

In December 1998, there were 20 852 medical practitioners working in clinical practice whose main job was in primary care (Australian Medical Workforce Advisory Committee 2000). Compared with the national average of 110.6 GPs per 100 000 Australian population, there were 125.9 GPs in Tasmania, 124.5 in the Australian Capital Territory, 120.7 in South Australia, 115.1 in the Northern Territory, 113.5 in Victoria, 111.0 in NSW, 104.5 in Queensland and 98.7 in Western Australia. Nationally, 22.4% of GPs main practice location was in a rural or remote area. For every 100 000 population, there were 122.7 GPs in capital cities, 108.1 in other metropolitan areas, 111.4 in large rural centres, 93.6 in small rural centres, 77.3 in other rural areas and 66.1 in remote areas. One-third (33.2%) of the GP workforce was female. The average age of male GPs was 49.5 years and of female GPs it was 42.4 years. On an average, a GP worked 45.3 hours per week. Just over half (52.5%) of female GPs worked part-time compared with 13.6% of male GPs.

The role of GPs in Australia has changed over time, and currently GPs are under pressure to accommodate a shift of patients from tertiary and secondary sectors to primary care. The recent report on *General Practice in*

Australia has emphasised the need for GP involvement in the management of coordinated care within primary care and across other sectors of the health system to ensure integrated care and continuity, especially for those who need long-term care for chronic disease and disability (Department of Health and Aged Care 2000). In addition, the Government views primary health care initiatives as a cost effective way to deal with today's challenges of health and wellbeing of people, and encourages GPs to be increasingly involved in promoting population health and managing chronic illness (Productivity Commission 2003). As Australian GPs have traditionally been the gatekeepers for the health care system, they are best placed to provide continued and coordinated care.

As many STIs can be managed in ambulatory care settings, these infections can be adequately and appropriately dealt with by GPs. Evidence exists that GPs work as an essential component of the network by managing people with STIs and by addressing the bulk of the population's contraceptive needs (Donovan *et al.* 1995). The most important advantage of GP involvement in STI care is that they have incomparable access to a wide range of the population through routine medical encounters (Ward *et al.* 1998). In addition, a patient can see a GP without requiring a referral, and this makes GPs more accessible compared to other care services where a referral may be required. Also, GPs have unique and specific expertise in assessing the diversity of problems presented in primary care (Fugelli & Heath 1996).

2.6 Sexual health services in Australia

Australia has a fragmented STI control system with different facilities providing services for diagnosis, treatment, and follow-up of patients with STIs. Different agencies that provide STI services include: sexual health clinics (SHCs), family planning clinics, sexual health physicians (SHPs) in private practice, gynaecologists, Aboriginal Medical Services, and GPs (Marks *et al.* 1998; Mindel & Tenant-Flowers 1998; Johnston *et al.* 2004). In addition, there are sexual health nurses in Australia who provide selective care services to patients with STIs (Anderson *et al.* 1994; O'Keefe & Gardner 2003/2004). Australian sexual health services have evolved from a broad-based primary sexual health care model, which, in addition to providing sexual health care, offer basic contraceptive services, assessment of sexuality, sexual function and relationship issues (Donovan 1995; Stirland 1995; Mulhall *et al.* 1995b).

In Australia, STIs are largely managed under the auspices of the state and territory governments with fairly minimal coordination at the national level (possibly other than HIV). Most SHCs are state funded facilities and are staffed by people trained in diverse areas including sexual and relationship counselling, sexual assault, sexual dysfunction and the promotion of sexual health (Mulhall *et al.* 1995b). These clinics provide largely free and confidential services related to testing, diagnosis, and treatment of STIs (including HIV/AIDS). Family planning clinics, funded by the Federal Government, also provide services to many of their clients with regard to STIs and other sexual health problems in addition to

their main focus on providing contraceptive services. Sexual health physicians play a key role in the continuum of coordinated care between specialist urban inpatient services and suburban, rural and remote settings, particularly supporting practitioners with low caseloads of STIs (Australasian College of Sexual Health Physicians 1999). While SHPs usually work in sexual health clinics, there are instances where they are based in private practice.

Although most patients in urban areas have a choice of services, patients in rural and remote areas have access to limited sexual health services. Evidence exists that most patients with STIs are seen in general practice (Marks *et al.* 1997; Donovan *et al.* 1998) and that sexual health caseloads for GPs have increased in recent years (Dunne *et al.* 1995). Therefore, as a point of first contact with the health care system, GPs are well placed to help decrease the spread of sexually acquired infections (Dayan 2000).

2.7 STI care in primary care settings

The management of STIs has long been an essential part of medical practice, which is a combination of a series of activities (discussed in section 2.4). It is, however, important to develop an understanding about how STIs are managed in clinical settings, and what realities practitioners face in offering such care. A growing body of evidence suggests that there are difficulties in managing STIs in general practice.

2.7.1 Sexual risk assessment

To detect infections early, behaviour that places patients at risk of acquiring an STI needs to be assessed thoroughly, particularly if asymptomatic infections are to be detected and treated. However, there is evidence to suggest that practitioners sometimes fall short in their role in assessing a patient's sexual health risks, and in many instances, taking a sexual history is not a routine part of a general medical examination (Boekeloo *et al.* 1991; Boekeloo *et al.* 1993; Temple-Smith *et al.* 1996; Maheux *et al.* 1997; Wenrich *et al.* 1997; Haley *et al.* 1999; Maheux *et al.* 1999; Temple-Smith *et al.* 1999; Haley *et al.* 2000; Verhoeven *et al.* 2003b). For example, studies conducted across North America demonstrated that fewer than half of the physicians surveyed routinely took a sexual history during a general medical examination, and that only a minority of them reported assessing specific STI/HIV risk behaviour (Boekeloo *et al.* 1991; Maheux *et al.* 1995; Maheux *et al.* 1997; Haley *et al.* 1999).

In addition, the content of a sexual history has often been shown to be incomplete, with practitioners not being specific enough to identify accurately a patient's risks. A study of STI/HIV risk assessment among 961 physicians in the Washington DC metropolitan area reported that less than half of the physicians regularly asked about sexual "preference" and less than one-third regularly asked about anal or oral sexual practices or the number of sexual partners (Boekeloo *et al.* 1991). Another study on STI risk assessment conducted among 148 physicians in Quebec revealed that only a small proportion reported inquiring about high-risk sexual practices, such as sex with a drug user (32%),

anal sex (22%), or sex under the influence of drugs or alcohol (5%) (Maheux *et al.* 1995). A later study carried out among 1 086 GPs and 241 obstetrician-gynaecologists practising in Quebec found that less than half of the practitioners reported routinely inquiring about condom use and number of sexual partners during a general medical examination (Haley *et al.* 1999). The practitioners' inadequate involvement in taking a thorough sexual history can result in an incomplete assessment of the patients' sexual risks, which in turn could lead them to inappropriate decisions about diagnosis and treatment of infections.

In Australia, one qualitative study reported that sexual history taking did not form a routine part of the practitioner's standard consultation (Temple-Smith *et al.* 1996). Another study conducted among 444 Victorian GPs assessed sexual history taking practices, and found that most GPs (92%) took a sexual history from a person presenting as a sexual contact of an infected partner, while less than one-third would do so for a patient whose presenting complaint seemed unrelated to STIs (Temple-Smith *et al.* 1999). This study also found that 40% of GPs were reluctant to ask their patients, who were considered to be at risk of acquiring an STI, about sex with commercial sex workers.

There is also evidence to suggest that physicians are often uncomfortable in taking a sexual history (Gemson *et al.* 1991; Gerbert *et al.* 1991; Verhoeven *et al.* 2003b). Many practitioners are concerned that their patients may be embarrassed by questions related to sexual problems (Temple-Smith *et al.* 1996; Tomlinson 1998; Verhoeven *et al.* 2003b). Furthermore, some

physicians feel that sexual history taking is of little relevance to their asymptomatic patients, and therefore to attempt to take a sexual history is inappropriate (Temple-Smith *et al.* 1996).

2.7.2 Screening for STIs

Given the asymptomatic nature of many STIs in both women and men, screening is justified to identify and treat individuals who might be infected, but are not aware of their infections (Hogben *et al.* 2002). Although a general medical examination provides an opportune occasion for practitioners to offer screening to patients who are asymptomatic, GPs are often reluctant to use this opportunity (Joshi & Dixon 2000; Bennett *et al.* 2001; Hogben *et al.* 2002; Moses & Elliott 2002; St Lawrence *et al.* 2002). A study conducted in general practice in the UK reported that GPs were often unwilling to offer opportunistic screening for chlamydia, even though they had facilities for testing (Joshi & Dixon 2000). This study also revealed that only about two-fifths of GPs would offer opportunistic screening to women attending for cervical cytology screening, 7% would offer it to women attending for emergency contraceptives, and a few (2%) would be willing to offer chlamydia testing to women seeking family planning advice. Another study conducted among 541 Pennsylvanian primary care providers revealed that only one-third of physicians would screen asymptomatic sexually active teenage women for chlamydia during a routine gynaecological examination (Cook *et al.* 2001). A national study conducted among 4 226

physicians practising in five different medical specialities in the US reported that STI screening levels were virtually non-existent for men and were below best practice guidelines for women (St Lawrence *et al.* 2002). This study showed that just over one-third of physicians screened non-pregnant women for chlamydia, while only 13% screened their male patients.

In Australia, little is known about STI screening in general practice. In a study of selective screening in general practice in Northern Queensland, patients aged 18 to 24 years presenting to general practices for any reason were asked to participate in chlamydia screening using urine sample for LCR (Heal *et al.* 2002). Ninety-three percent of the target group consented to participate in screening offered by GPs, and about 5% of patients were found to be positive for chlamydia. With advances of diagnosis and treatment, chlamydia can now be easily detected using a non-invasive sample for PCR or LCR, and is treated with a single-dose antibiotic (Dayan & Ooi 2003). Given the increase in chlamydia diagnoses in recent years and their potential consequences if untreated, there are calls to encourage comprehensive chlamydia screening in Australian general practice (Chen & Donovan 2003; Dayan & Ooi 2003; Hocking & Fairley 2003).

2.7.3 Knowledge about the epidemiology of STIs

Practitioners should have a clear understanding of the common signs and symptoms of STIs for their initial assessment of whether a patient is likely to

have been exposed to infections. One study conducted in Canadian primary care settings revealed that many physicians were confused about the symptoms that are, or are not, associated with *Chlamydia trachomatis* infection (McDougall *et al.* 1992). This study showed that of the 79 physicians who completed the questionnaire, just under half (44%) failed to identify *C. trachomatis* as an important cause of epididymitis, while a quarter incorrectly associated the organism with vaginitis in adults. A recent postal survey conducted among 578 primary care providers in the UK revealed that practitioners were uncertain about the pathophysiology of genital chlamydia infection and many were uncertain on indications for testing asymptomatic patients (Kinn *et al.* 2000).

A more recent study among 183 GPs working in a metropolitan city outside London demonstrated a lack of knowledge in some areas of genital herpes (Narouz *et al.* 2002). For example, only two-fifths of GPs knew that most transmission of genital herpes occurs during periods of asymptomatic shedding, while a similar proportion did not know that the majority of infected individuals were unaware of their infections. Another study conducted among 444 randomly selected GPs practising in Victoria reported a poor level of GP awareness of the asymptomatic nature of most common STIs (Mulvey *et al.* 1997). About 44% of GPs believed that genital herpes might be present without causing any symptoms in male patients, and this percentage was 53% while considering female patients with genital herpes. This study also showed that just over a quarter (28%) correctly identified the main age group for genital chlamydia as being 15 to 24 years, and less than half (42%) correctly identified the main

population groups in whom gonorrhoea occurs. Failure to recognise the correct symptoms of STIs may lead to inappropriate testing and treatment decisions.

2.7.4 Knowledge about STI testing and notification

Performance of a diagnostic test depends heavily on the quality of the specimen collected. Recent research has documented that both sensitivity and specificity of diagnostic tests for *C. trachomatis* are directly related to the adequacy of the specimen (Riddell & Sherrard 2001). Analysis has also shown that specimen quality correlates with the chlamydia detection rate (Kellogg *et al.* 1996; Beebe *et al.* 1999). Therefore, GPs should have a clear understanding of the optimal type of specimen and the site for specimen collection for different diagnostic tests for STIs. Anecdotal evidence suggests that there is the potential for confusion among GPs about exactly what type of specimen is required for a particular test, what is the appropriate site for collecting the specimen, how it should be taken from the patient, and how it should be stored or transported to the pathology laboratory for analysis (Temple-Smith 2001). Overseas studies have documented inappropriate methods of specimen collection for STI testing (McDougall *et al.* 1992; Bates 1993). One study conducted among 290 GPs in Leicestershire, UK revealed that 19% of GPs surveyed used a high vaginal swab to test for genital chlamydia, an inappropriate method for chlamydia culture (Stokes 1997). A recent study conducted among 578 primary care providers in the UK revealed that the majority of the participating practitioners

were sampling cervical discharge for chlamydia testing despite the fact *C. trachomatis* is an intracellular organism (Kinn *et al.* 2000).

In Australia, a study conducted among 272 GPs working in the Melbourne metropolitan area revealed that half of GPs who often tested for chlamydia were unclear about correct specimen collection procedures (Westgarth *et al.* 1994). Of the 131 GPs who often tested for chlamydia and did their own specimen collection, one-third believed that cervical mucus (as opposed to endocervical cells) was a good source of diagnostic material for chlamydia culture or immunodiagnostic tests. A later study conducted among 444 GPs in Victoria documented that although most GPs knew the appropriate testing site for chlamydia in women to be the cervix, there was still uncertainty about the nature of the specimen to be taken for testing (Temple-Smith *et al.* 1997). This study also revealed that 61% of GPs knew that endocervical cells were the appropriate specimens for testing for chlamydia, while 26% tested cervical discharge.

Even with proper specimen collection and appropriate laboratory procedures, it is difficult to make a conclusive decision based on individual test results, as none of the diagnostic tests for STIs has 100% specificity and sensitivity (Schachter & Chow 1995). However, greater accuracy can be achieved in interpreting results when clinical findings and the epidemiology of the infection are taken into account. General practitioner knowledge about the possibility of a false positive test in various studies seems to be poor. One study reported that only 23% of 444 GPs surveyed believed that a positive result in a

low prevalence population may not mean that the patient has chlamydia (Temple-Smith *et al.* 1997).

While accurate diagnosis of an infection is essential for clinical management of the disease, timely notification of infections is important to identify situations that require public health responses. Notification helps in the control of infections by offering quick responses to certain conditions (e.g. treatment of contacts) or putting prevention programmes in place. In NSW, the GP as the attending practitioner has a legal responsibility to notify diagnosis of certain STIs to the Department of Health, or the local public health unit, under the NSW Public Health Act 1991 (Public Health Division 2002). Recent research on notification of infectious diseases documented a poor understanding of the process of notification by GPs, and a common preference among GPs to leave notification to the testing laboratory (Allen & Ferson 2000). Although chlamydia has been notifiable in Victoria since 1990, less than two-thirds (62%) of GPs in Victoria surveyed in 1995 were aware that genital chlamydia was a notifiable condition in the state (Temple-Smith *et al.* 1997). This study also revealed that of the GPs who said they had diagnosed chlamydia in the preceding month, over one-third (36%) were unaware of its status as a notifiable condition. Notifications almost always provide underestimates of actual cases (Public Health Division 2002), and lack of awareness of STI notification among practitioners might further exacerbate this situation.

2.7.5 Diagnosis and treatment of STIs

Clinical management of STIs continues to play a major role in STI control; however, there are variations in offering such care in general practice. Studies on the management of genital chlamydia in general practice in the UK reported that care was suboptimal, either because of a failure to trace and treat sexual partners or because of inappropriate antibiotic use (Mason *et al.* 1996; Ross *et al.* 1996). The latter study estimated that only 30% of the cases of chlamydia in general practice had been given appropriate antibiotics (Mason *et al.* 1996). Another study conducted among 1 260 GPs in the northeast of England revealed that just more than one-third managed patients with genital warts 'in-house' (Estcourt *et al.* 1996). This study showed that only over a quarter of GPs referred patients to GUM clinics, which might have costly medical and financial consequences. A study conducted among 290 GPs on the management of genital chlamydia in the UK reported that only two-thirds (66%) routinely used an appropriate method of testing for chlamydia (Stokes *et al.* 1997).

Based on a postal survey of 180 randomly selected GPs in Birmingham, one study documented that many patients in general practice underwent inappropriate investigations to test for *C. trachomatis* (Huengsberg *et al.* 1998). Another study showed that although the percentage of positive tests was highest in young women, the majority of the tests were preformed in women over 25 years who were statistically at a lower risk of chlamydia infection (Kufeji *et al.* 2003). A more recent study conducted among 242 GPs in UK primary care

revealed that 70% of GPs would treat chlamydia with an appropriate antibiotic of equal or greater dose and duration than is currently recommended, while 17% specified an inadequate treatment course (Cassell *et al.* 2003). One prospective cohort study conducted in UK general practice revealed that a large proportion of patients received unnecessary antibiotic treatment (Fahey *et al.* 2003). This study showed that GPs were far more likely to treat patients with symptoms of dysuria empirically and were far less likely to perform diagnostic tests.

A study on the management of urethral discharge in Scottish general practice demonstrated that the majority of 277 GPs who had not referred their patients to specialised services did prescribe antibiotics, and in half of the cases this would had been suboptimal therapy for chlamydia (Ross & Champion 1998). A recent study reviewed records of diagnosed STI cases between October 1997 and September 1998 in Manitoba, and found non-compliance with the recommended guidelines of presumptive treatment for chlamydia and non-recommended treatment for gonorrhoea (Moses & Elliott 2002). This study also identified a missed opportunity as only a quarter of women and 4% of men aged 15 to 24 years who visited a physician were tested for *C. trachomatis*.

Studies conducted in the UK and the USA revealed that a significant proportion of practitioners would not offer optimal management to patients with pelvic inflammatory disease (PID), a condition predominantly caused by genital chlamydia (Hessol *et al.* 1996; Huengsberg *et al.* 1998; Simms *et al.* 2000). A national assessment of PID diagnosis, treatment and management in general

practice in England and Wales revealed that only seven percent of 297 GPs reached the most effective level of PID case management (Simms *et al.* 2000). A study on the clinical management of recurrent genital herpes reported substantial variations in the management of the disease in pregnant women by Australian physicians (Marks *et al.* 1999). For example, this study found that some women would have been recommended for caesarean section irrespective of clinical circumstances, while others with obvious genital herpes during labour would have been allowed a normal vaginal delivery.

Studies in Scandinavia also demonstrated considerable variations in GP management of *C. trachomatis* infection (Aavitsland 1992; Andersen *et al.* 1998; Gustafsson *et al.* 2000). Of 201 Norwegian GPs who participated in a study on the treatment of chlamydia, a large proportion would prescribe an antibiotic in either smaller doses, or fewer daily doses or shorter duration to treat chlamydial cervicitis (49%), cervicitis in pregnancy (79%) and probable pelvic infection (43%) (Aavitsland 1992). This study concluded that standardised treatment could save resources and reduce discomfort to patients by avoiding unnecessary treatments. Another study conducted among 252 GPs in Denmark revealed great variations in the management of urogenital *C. trachomatis* according to treatment, follow-up and contact tracing (Andersen *et al.* 1998). Although 60% of the Danish GPs recommend examination of previous partners of male patients, in fact only 42% of male patients were actually asked to inform their previous partners about the possibility of infection.

Antimicrobials are sometimes offered presumptively in response to observing signs and symptoms consistent with STIs, without any confirmatory laboratory diagnosis, in order to avoid the spread of infection or co-infection (Centers for Disease Control and Prevention 2002). One study based on 4 226 randomly selected physicians across the US reported that more than half presumptively treated patients with gonorrhoea and chlamydia (57% and 54%, respectively), and about 40% presumptively treated patients with syphilis (St Lawrence *et al.* 2002). Studies conducted among GPs in Victoria revealed that just over one-third of GPs diagnosing chlamydia offered presumptive treatments in 1994 (Westgarth *et al.* 1994), while in 1997 a higher proportion (60%) always or mostly treated chlamydia presumptively (Temple-Smith *et al.* 1997).

2.7.6 STI referral and contact tracing

Referral to appropriate care facilities is an important strategy for STI care; however, there are variations in such practices in primary care. A study investigating referral patterns between primary care and GUM clinics in the UK revealed that there was a marked deficiency in diagnostic investigations performed in primary care (Champion & Ross 1999). This study showed 99 out of 965 patients who were referred to GUM clinics by GPs were diagnosed with acute genital herpes, none of whom had been investigated for HSV prior to their attendance to GUM clinics. However, poor referral rates for patients with STIs in general practice are well documented (Dryden *et al.* 1994; Estcourt *et al.* 1996;

Ross *et al.* 1996; Ross & Champion 1998), which is of particular concern when GPs have limited access to diagnostic tests, contact tracing and screening for other STIs (White & Radcliffe 1991). A recent US study revealed that although a majority (nearly 60%) of physicians who participated in the survey referred their patients with HIV elsewhere for treatment and management, only a few (7-12%, depending on condition) always referred their patients with gonorrhoea, chlamydia, and syphilis elsewhere for medical management (St Lawrence *et al.* 2002).

Contact tracing can play a significant role in controlling the spread of STIs, especially when others are at immediate risk, although priority given to each STI varies depending on individual context. However, wide variations have been observed in tracing contacts in general practice. A survey carried out in England and Scotland reported that less than one-third of GPs would have referred their patients to contact tracing services following diagnosis of chlamydia infection (Mason *et al.* 1996). A US study conducted to assess physicians' approaches to partner notification for STIs reported that few had direct contact with patients' partners, 46% relied on patients to notify their partners, and 40% reported notifying the local or state health department to contact patients' partners (Seubert *et al.* 1999). A recent study conducted among 242 GPs in Nottingham, UK reported that 61% considered partner notification not to be a GP's role (Cassell *et al.* 2003). This study also revealed that just over three-quarters (77%) of GPs considered partner notification to be the most difficult problem in managing chlamydia in their practice. Nevertheless,

willingness and ability of health care providers to initiate partner notification is essential for the success of such an approach (Seubert *et al.* 1999).

In Australia, a study conducted among 444 Victorian GPs reported a higher level of uncertainty about how and when contact tracing should be performed (Keogh *et al.* 1998). This study showed that 45% of GPs considered contact tracing to be their responsibility. Although the majority (88%) of GPs always asked their patients presenting with STIs to advise their contacts to seek medical treatment, 22% always checked whether patients had followed up their contacts. Given the circumstances, there have been calls to improve contact tracing of STIs in Australia (Kault 1996; Fairley 1997).

2.7.7 Prevention and health promotion

Although practitioners are well placed to offer preventive STI care, studies have generally found them to be insufficiently involved in such initiatives (Gemson *et al.* 1991; Gerbert *et al.* 1991; Rabin *et al.* 1994; Moran *et al.* 1995; Gunn *et al.* 1997). A study of the delivery of STI/HIV preventive services by primary care physicians in California demonstrated a lower level of preventive care in primary care settings (Millstein *et al.* 1996). Another recent study conducted among 541 primary care providers in Pennsylvania reported that about 57% of physicians believed they were responsible for STI prevention services, while only 30% believed that their STI counselling was effective (Ashton *et al.* 2002). A Canadian study conducted among GPs and obstetrician-

gynaecologists in Quebec found that only about one-third of physicians reported routinely discussing high-risk sexual practices during consultations about contraceptives with adolescents (Haley *et al.* 1999). This study showed that while 59% of GPs discussed the benefits of the consistent use of condoms, 40% discussed the consequences of STIs for women's health.

A more recent Belgian study among primary care providers documented substantial difficulties in STI counselling (Verhoeven *et al.* 2003b). This study showed that only 39% of GPs regularly (at least once a week) provided advice on safe sex to their patients, while 24% provided advice on STIs. In Australia, little is known about GP involvement in STI prevention activities. One study conducted among randomly selected GP surgeries in the Sydney metropolitan area documented GPs' lower level of routine identification of patients at risk and associated risk reduction counselling (Ward & Sanson-Fisher 1995). A case can be made here that when so many patients are unaware of the potential risk of their sexual activities, it should be physicians who help to increase their patients' awareness, and prepare them to avoid risks (Nusbaum & Hamilton 2002).

2.7.8 Attitudinal and organisational issues in STI care

People with STIs are stigmatised as such illnesses are often perceived to be associated with deviant sexual behaviour and are viewed negatively (Alonzo & Reynolds 1995). Many physicians are concerned that their patients may be embarrassed by questions relating to sexual problems (Temple-Smith *et al.*

1996; Tomlinson 1998; Verhoeven *et al.* 2003b), while some fail to find relevance in taking a sexual history from their asymptomatic patients (Temple-Smith *et al.* 1996). Also, sexual history taking is often an uncomfortable experience for many physicians (Verhoeven *et al.* 2003b). One study revealed that physicians were less comfortable and less skilled when obtaining a sexual history from patients of the opposite sex (Lurie *et al.* 1998). Studies also showed that physician bias could lead to prejudicial treatment (Gilmore & Somerville 1994; Green & Platt 1997; Bermingham & Kippax 1998). A study conducted to assess physician attitudes regarding STIs in the US found that more positive attitude scores towards STIs were significantly associated with performing STI-risk assessments and risk reduction counselling (Ashton *et al.* 2002). Another recent study, conducted among 541 randomly selected physicians in Pennsylvania, revealed that physicians were more likely to screen for STIs if they felt responsible for ensuring STI prevention for their patients, if they believed that chlamydia screening could prevent PID, or if they believed that most 18-year-old women in their practice were sexually active (Cook *et al.* 2001).

Even if a practitioner initiates a discussion about sexual health with some screening questions, some patients may still be reluctant to talk (Bachmann 2000). A US survey of 500 young adults revealed that just under three-quarters felt that their doctor would dismiss any concerns about sexual problems they might bring up (Marwick 1999). This survey also found that a substantial number of people who had problems with sexuality were reluctant to mention them to

their health care providers. Another recent study of 1 004 gay men recruited from one of five gyms in central London showed that less than one-third of these men had discussed safe sex with their GPs, while nine out of ten had discussed safe sex with their friends (Elford *et al.* 2000). Of the men who had injected anabolic steroids, only one-third had ever discussed this with their GPs. It has, however, been suggested that physicians can help to open sexual health discussions and assist patients to feel more comfortable talking with them about sexual concerns (Boekeloo *et al.* 1996).

Clinical features of many STIs have changed over the past two decades and practitioners need to be well equipped both in terms of skills and infrastructure facilities in order to meet the changing demands of the community. Available evidence suggests that practitioners are not well prepared by their training to manage the complexities of consultations about sexual matters and to carry out effective STI counselling (Maheux *et al.* 1995; Mindel & Tenant-Flowers 1998; Verhoeven *et al.* 2003b). Physicians may not be equipped with the basic skills or attitudes required to take an appropriate history from a patient with sexual problems (Lewis & Montgomery 1990; Tomlinson 1998; Verhoeven *et al.* 2003b). There continues to be minimal education about sexual health in many medical curricula (Harrison 1996). Undergraduate training in genitourinary medicine varies considerably, and it rarely provides a holistic and comprehensive view of sexual health (Matthews & Fletcher 2001). Recent studies also highlighted the need for professional education of GPs including further education about sexual health issues (Humphery & Nazareth 2001;

Poljski *et al.* 2003). In Australia, it has been found that medical curricula are generally deficient in educating future medical practitioners about sexual health issues and sexual history taking (Temple-Smith *et al.* 1996; Mindel & Tenant-Flowers 1998). It has been argued that a lack of sufficient in-service education programmes means that GPs have few opportunities to be updated in the field of sexual health, and would have little motivation to participate in such areas of medical care.

There are also structural constraints that practitioners encounter in offering STI care. Physicians are subject to time constraints, and have many routine tasks to complete in a relatively brief encounter (Lewis & Montgomery 1990; Temple-Smith *et al.* 1996; Presswell & Barton 2000). Lack of time and inadequate professional training were the two main reasons given for limited involvement of primary care providers in opportunistic sexual health promotion in general practice (Curtis *et al.* 1995). Fee-for-service structures may minimise health promotion and prevention activities by placing time pressures on practitioners. Inadequate funding arrangements for preventive care services, fragmentation of health care services and lack of time for practitioners to spend with patients to deliver preventive care services are some of the most common reasons for practitioner's inadequate involvement in prevention (Holmes & Ryan 1999; Ashton *et al.* 2002). Low priority given to disease prevention, perceived lower risk of STIs in patients, presence of a third party, concerns about confidentiality, issues related to culture and language, age and sexual orientation of patients are also considered by many physicians as constraints to

sexual risk assessment (Lewis & Montgomery 1990; Merrill *et al.* 1990; Temple-Smith *et al.* 1996; Haley *et al.* 1999; Temple-Smith *et al.* 1999). In addition, a recent paper on gonorrhoea screening in Australian general practice has identified that the "three test rule" of Medicare, Australia's universal health insurance system, is a common factor that inhibits practitioners from offering screening (Donovan *et al.* 2001). Under this rule, Medicare provides a rebate for only three pathology tests ordered by a GP for a patient on any one day.

2.7.9 STI care in general and specialised settings

Available evidence suggests that there are variations in STI care between primary and specialised settings. A study on the delivery of STI/HIV preventive services to adolescents by 1 217 physicians in California demonstrated that compared with family physicians, obstetrician-gynaecologists reported significantly higher rates of screening for sexual activities, educating about infections, and providing services to sexually active adolescents (Millstein *et al.* 1996). This study also showed that family physicians reported a significantly higher rate of service provision to sexually active adolescents compared to paediatricians. Another study conducted among 963 physicians (805 GPs and 158 obstetrician-gynaecologists) in Quebec reported a poor involvement of practitioners in assessing the number of sexual partners (23-25%), sexual orientation (14-19%) and STI risk (21-26%) (Maheux *et al.* 1999). A more recent study, based on a nationally representative sample of 4 223

physicians working across the USA, revealed that GPs and family physicians were less likely to screen non-pregnant women for bacterial STIs than were obstetrician-gynaecologists (67% vs. 96%) (Hogben *et al.* 2002). In particular, GPs and family physicians, compared with obstetrician-gynaecologists, were less involved in screening non-pregnant women for chlamydia (39% vs. 55%) and gonorrhoea (32% vs. 51%).

In Australia, a study conducted in 1994 among 49 specialist SHPs and 30 GPs who used to manage STI patients showed that both the specialists and GPs provided a broad range of STI care services, including on-site microscopy and contact tracing (Marks *et al.* 1998). This study identified a number of differences between services provided by the two groups. Specialists were more likely to use office-based laboratory techniques to establish a diagnosis, while GPs relied more on special laboratory tests. A lower proportion of GPs than SHPs provided contact tracing (70% vs. 98%). However, this study was conducted almost a decade ago and was based on a very small sample of GPs. In addition, the participating GPs were identified because of their interest in STIs, and represented a selected and knowledgeable sub-group of GPs.

2.8 Conclusions

Sexually transmissible infections are rising in Australia. If left untreated, STIs can cause serious consequences including PID, ectopic pregnancy, infertility, cancers and other chronic morbidity. Many of the most common STIs

are asymptomatic, and can potentially cause serious complications without initially developing symptoms. In addition, the presence of an STI can enhance both acquisition and transmission of other STIs, including HIV. Therefore, the rising trend of STIs along with their potential for serious consequences constitutes a major preventable public health problem.

Sexual health services are offered by a number of agencies in Australia. Sexual health physicians who usually work in sexual health clinics are responsible for setting STI management benchmarks. As primary care providers, GPs are well placed to offer optimal STI care through their incomparable access to the Australian population. In addition, general practices are widely distributed throughout Australia covering most geographic regions, including rural and remote locations, where access to specialised services is limited. Therefore, GPs can have significant impacts on STI prevention and control.

Ideally, practitioners should be proactive when consulted by a patient who either has symptoms of STIs or is at risk of an infection. In real life situations, however, there are gaps in the management of STIs in general practice. Both overseas and local studies have demonstrated a lack of understanding among some GPs about the common signs and symptoms of STIs. GPs often fall short in their role in assessing sexual risks, especially of asymptomatic patients. Some discrepancies are also found in diagnosing and treating STIs, including inappropriate use of antibiotics. Opportunistic screening is fairly uncommon in

general practice, while contact tracing is not a high priority for many practitioners. Despite the potential, many GPs are often reluctant to offer preventive services to their patients with STIs. Practitioners identified a number of issues to explain their suboptimal involvement in STI care. Also, there are some variations in STI care offered in general and specialised practices.

Given the circumstances, it is important to develop an understanding about how STIs are currently managed in general practice, and what factors facilitate or constrain GPs from taking a more proactive role in STI care. It would be useful to examine whether STI care in general practice differs from that of specialised practices staffed by SHPs. This will help in optimising STI care in general practice in Australia.