

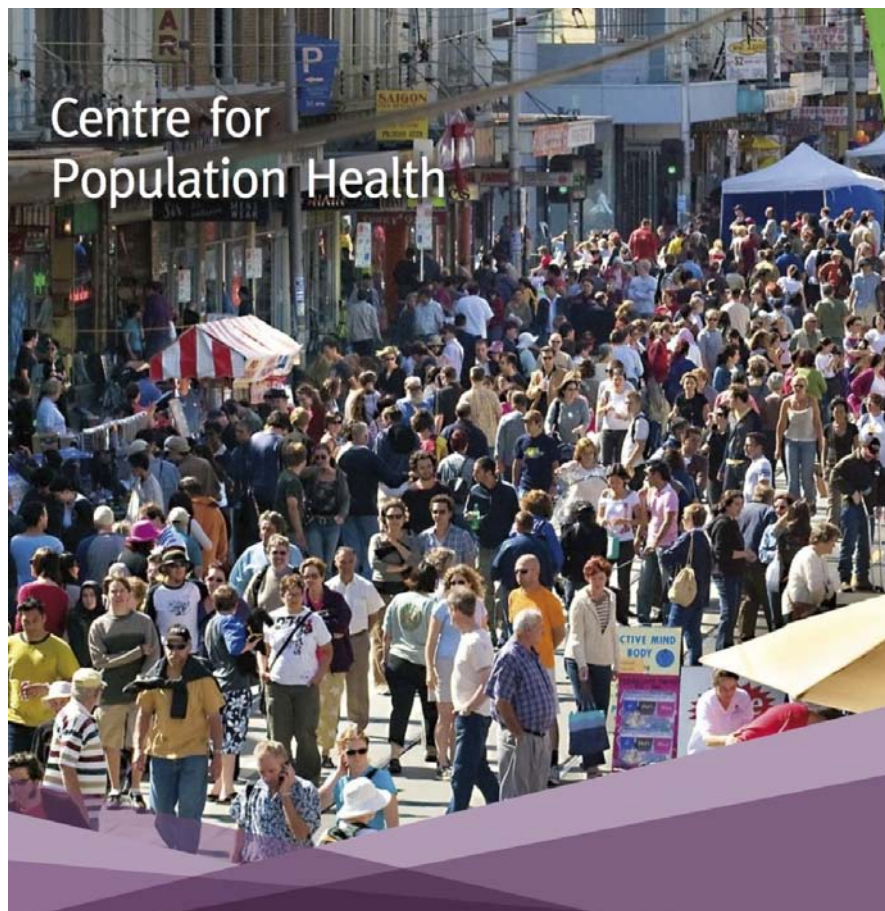


Burnet Institute
Medical Research. Practical Action.

PARTNER NOTIFICATION OF SEXUALLY TRANSMITTED INFECTIONS IN NEW SOUTH WALES:

AN INFORMED LITERATURE REVIEW

June 2010



GLOSSARY OF TERMS

AIDS:	Acquired immunodeficiency syndrome
ACT:	The Australian Capital Territory
ACTM:	Australasian Contact Tracing Manual
ASHM:	Australian Society for HIV Medicine
BEPR:	Booklet Enhanced Patient Referral
DOH:	Department of Health
GP(s):	General Practitioner(s)
HIV:	Human immunodeficiency virus
KI:	Information from Key Informant Interview
MSM:	Men who have sex with men
MTR:	Mid Term Review of the NSW Health Sexually Transmissible Infections and Hepatitis C Strategies 2006 – 2010
NI:	Notification Index
NSW:	New South Wales
PDPT:	Patient delivered partner treatment (AKA patient delivered partner therapy, accelerated partner therapy/treatment, expedited partner therapy/treatment)
PHU(s):	Public Health Unit(s)
PN:	Partner Notification
RCT(s):	Randomised Controlled Trial(s)
S100:	S100 medications are specifically to do with the treatment and management of HIV. S100 prescribers are doctors who have the right to prescribe these medications. Such doctors may include specially trained GPs.
SHC(s):	Sexual Health Clinic(s)
SMS:	Short Message Service
STD(s):	Sexually transmitted disease(s)
STI(s):	Sexually transmitted infection(s)

Yield: The number of newly diagnosed cases in partners divided by the numbers of partners elicited or investigated ('initiated')

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EXECUTIVE SUMMARY

Partner notification of Sexually Transmitted Infections (STIs) is a voluntary process by which sexual contacts of index cases are notified of their exposure to a disease. The STIs most relevant to the New South Wales (NSW) context are HIV, syphilis, gonorrhoea and chlamydia. Rates of HIV and gonorrhoea appear stable. However there is an ongoing epidemic of syphilis, most notably in HIV-positive highly sexually-active men who have sex with men (MSM). Chlamydia rates are climbing, as with the rest of the country, particularly in the younger age groups. Improved partner notification may be one method of reducing the impact of STIs on the community in NSW.

Partner notification has traditionally been called 'Contact Tracing' in Australia, but 'Partner Notification' may be more linguistically acceptable. The person responsible for initiating partner notification has traditionally been the diagnosing clinician. However the southern Australian states, other than NSW, also provide significant centralised support for tracing partners, particularly with HIV, syphilis and gonorrhoea.

There are two main types of partner notification. Firstly *Provider Referral* is when a trained health professional contacts sexual partners for the index case. *Patient Referral* is when the index case informs partners themselves. Both types of referral can be enhanced by various means.

The primary goal in the management of an STI is to appropriately treat the patient. For curable bacterial STIs, the treatment of the index cases' regular contacts is part of their clinical management, in order to prevent reinfection of the index case. For HIV, notification of regular partners may prevent disease transmission or diagnose the infection at an asymptomatic stage. With all the STIs a secondary goal is to reduce the burden of disease in the population. Combining partner notification with other population health interventions such as screening for chlamydia in younger age-groups, and for other STIs in high-risk groups, may also be an effective intervention at a population level. Targeting casual or ex-partners may increase the population effect.

VARIATION IN THE LEVEL OF PARTNER NOTIFICATION

The rates of partner notification are likely to vary considerably depending on the type of clinic; with general practice rates being lower than those from Sexual Health Clinics (SHCs). Conversely the data available suggest that general practitioners (GPs) are making almost half the diagnoses of HIV in NSW, as well as most chlamydia diagnoses. This is despite many GPs being unaware of their role in initiating partner notification or lacking the skills to undertake and fulfil their responsibility. Hence increasing both awareness of responsibility, in addition to providing information and support about how to undertake partner notification, will be essential in order to improve the level of partner notifications in the community.

In SHCs index cases with HIV are generally more intensively counselled about partner notification than for other conditions. For all diseases most patients are asked if they can notify their partners themselves. Certain SHCs in NSW routinely follow-up all STI patients whilst others do not. It is worth noting that most professionals performing *provider referral* suggest that the process is much less difficult than it may first appear.

Variation exists amongst the Public Health Units across NSW as to their involvement in partner notification for STIs with most not undertaking this work for the clinicians in their region. However there are exceptions to this which may have contributed to GP confusion regarding partner notification processes. Clarifying each regional system and providing clear and accurate information about available services is essential for

ensuring local support for partner notification. An additional regional issue is the potential for STIs diagnosed in Emergency Departments or Rural Peri-natal Clinics to be inappropriately managed, as rural areas frequently have short-term locum doctors. In some situations it is unclear who is responsible for following up the results as well as for initiating partner notification. Clarifying the appropriate process or person responsible in each hospital will diminish the likelihood of further serious errors in this area.

EFFECTIVENESS OF DIFFERENT TYPES OF PARTNER NOTIFICATION

There is limited published evidence to support the effectiveness of the different types of partner notification. In general, *provider referral* appears more effective than *patient referral*. However the evidence is not robust. The initial expense of *provider referral* is greater, but there is insufficient evidence to determine its cost-effectiveness over *partner referral* for the various STIs. Key informant opinion is that *provider referral* is likely to be more cost effective for the rarer and higher morbidity STIs such as HIV and syphilis than for chlamydia. Evidence from the literature suggests that *provider referral* should also be offered for casual partners, ex partners or incarcerated partners, as well as to index patients with repeat infections or reduced self efficacy (i.e. those who appear unsure about being able to successfully notify partners themselves). Males are also less likely than females to inform sexual partners of STI exposure. Therefore *provider referral* should be particularly considered for the non-regular partners of male index patients.

Clinicians report being concerned that by asking cases to notify partners they may risk the therapeutic relationship for the benefit of public health. For this reason it is important to clarify with GPs that partner notification is part of optimal clinical management of their patients. Whilst index cases sometimes voice concerns about the embarrassment and potential stigma associated with notifying their partners of STI exposure Australian data suggest that many patients often consider partner notification is ‘the right thing to do’ and that the experience is ‘much better than expected.’ There is little evidence regarding adverse effects such as abuse and violence with respect to partner notification. Any association appears to be minimal and is usually related to a previous history of violence in the relationship.

IMPROVING PATIENT REFERRAL

There are a variety of mechanisms to improve *patient referral* with varying evidence for their success. The utility of offering partners postal testing kits is variable, as is using community pharmacies to screen partners. Partner Delivered Patient Treatment (PDPT) may be suitable for heterosexual patients in some contexts, particularly in rural areas with poor health access. However PDPT is not popular with clinicians, as there is concern that it may be ineffective or may ‘miss’ more complex infections. Other enhancement strategies include follow-up phone-calls; providing educational material (including online resources); counselling; elicitation of partner(s) names; and the use of specific forms to aid the clinician.

The use of internet resources for partner notification is increasing. Using the internet enables high caseload clinics to offer to anonymous online notification of partners, particularly those who were sourced over the internet. For clinicians there are sites which provide instructions on how to manage STIs as well as resources for partner notification. Patients may also use the internet to access information about STIs, as well as for resources on how to inform patients, including the means by which to do this anonymously via SMS and email. Ensuring that clinicians are aware of the internet resources available to them as well as their patients may improve awareness and understanding of the intervention.

There is minimal evidence-based information regarding the effectiveness of partner notification processes for Indigenous Australians. Key informants and opinion pieces suggest that the increased stigma of STIs,

increased mobility and the potential for reduced confidentiality in this population are issues of particular concern. Employing Aboriginal Health Workers at an early stage of the process may help to address these.

IMPROVING PARTNER NOTIFICATION IN THE GENERAL PRACTICE SETTING

It is important to both increase awareness of community clinicians that they have a responsibility to undertake partner notification, and to improve their access to resources to ensure they can successfully perform that task. The means of achieving both of these goals are often one and the same. There is evidence that GPs should be provided with proactive support when they diagnose rarer STIs (such as HIV, syphilis and gonorrhoea). In NSW there is currently a pilot project assisting GPs who diagnose HIV, which has been generally well-received. There are also some very recent changes in support for certain syphilis diagnoses made in general practice. However, the diagnosis of any STI (including the more common chlamydia) is still a relatively rare event in general practice. Therefore information concerning partner notification is likely to be better-received and more effective if at point-of-care, or coupled with more general training on STI management. Such options include partner notification information printed on positive pathology results. Follow-up faxes to clinicians or practice nurses by PHU may also be effective. Easily digestible and practical 'how to' guides regarding partner notification, such as the NSW STI Program Unit's STI testing tool and the new Australasian Contact Tracing Manual are likely to be valuable resources in this setting.

Practice nurses may also be involved in partner notification processes, particularly now that their funding has moved away from specific item numbers in the last federal budget. Practice nurses could offer pre-test counselling or undertake a follow-up phone call of index patients. They may also be a conduit for increased awareness amongst GPs about the need for partner notification and the resources available. Evidence suggests that practice nurses may elicit more partners than when patients are referred to trained contact tracers at SHCs. Trained practice nurses could therefore undertake *provider referral* themselves, or they could provide a list of contacts to an appropriate SHC contact tracer.

There are numerous pre-vocational and vocational means to raise awareness of sexual health and partner notification for both general practitioners and practice nurses. Key informants suggest that overseas doctors are a group to target, as their experience with sexual health in general may be limited, as will be their understanding of their partner notification processes in each jurisdiction. Training of all clinicians, be they community or SHC based, should be at a regional level in order to clarify appropriate local resources and improve communication between providers.

SUMMARY

In summary partner notification is of value at both the case management and the population health level. There are various forms this can take and none are necessarily difficult if both patients and health providers are well informed and can access available resources. *Provider referral* should be explicitly encouraged for rarer STIs and casual or ex-partners in particular. It is vitally important to actively support GPs with appropriate services to ensure such *provider referral* occur. There are currently pilot projects supporting GPs with HIV and syphilis diagnoses in NSW, and these projects should be sustained. Online resources are increasingly important and it will be important to develop these further. Effective use of practice nurses are also another means by which partner notification can be improved in the primary care setting.

1 INTRODUCTION

This report is an assessment of partner notification of Sexually Transmitted Infections (STIs) in relation to NSW. The report includes a literature review of national and international published studies and abstracts, local projects and posters and online resources, as well as a series of key informant interviews from NSW and other states. Various forms of partner notification (PN) in the current NSW context are discussed. Evidence for the effectiveness, cost-effectiveness and preferences of the various strategies is also reviewed. Implications and potential areas of intervention to policy and practice are proposed based on the information obtained during the review.

Identifying strategies for improving contact tracing of STIs in NSW was a proposal emerging from the mid-term review (MTR) of the NSW Health HIV, Sexually Transmissible Infections And Hepatitis C Strategies 2006-2010 [1]. Contact tracing can be considered both a necessary component of good clinical management of STIs as well as means of case finding asymptomatic patients at a population level [2]. In terms of population health, whilst there have been significant achievements in NSW with respect to control of the various STIs, specific areas of concern remain which reflect national and international trends. Rates of chlamydia have continued to rise in NSW and other Australian states, as well as globally, reflecting a lack of success in containment of chlamydia world-wide. Chlamydia predominately occurs in heterosexuals with the highest rates found in the 20-24 age-group. Rates are also high in the age groups either side of this (Fig. 1 and 2).

There was a general consensus amongst mid-term review informants that the infectious syphilis notifications were increasing with the epidemic focussed within a cohort of multiple partner HIV positive men who have sex with men (MSM)(Figure 3) [3]. Rates of gonorrhoea have however been contained and stabilised, although they are significantly higher than those recorded for the mid-1990s (Figure 1). HIV rates appear stable with a predominance of new male infections compared to female (Figure 4). In terms of chlamydia and gonorrhoea the MTR informants noted that limited data has resulted in inadequate epidemiological profiles with respect to Aboriginal communities. Several key informants interviewed for this report also proposed that adequate data regarding infectious syphilis in the indigenous Australian population is lacking.

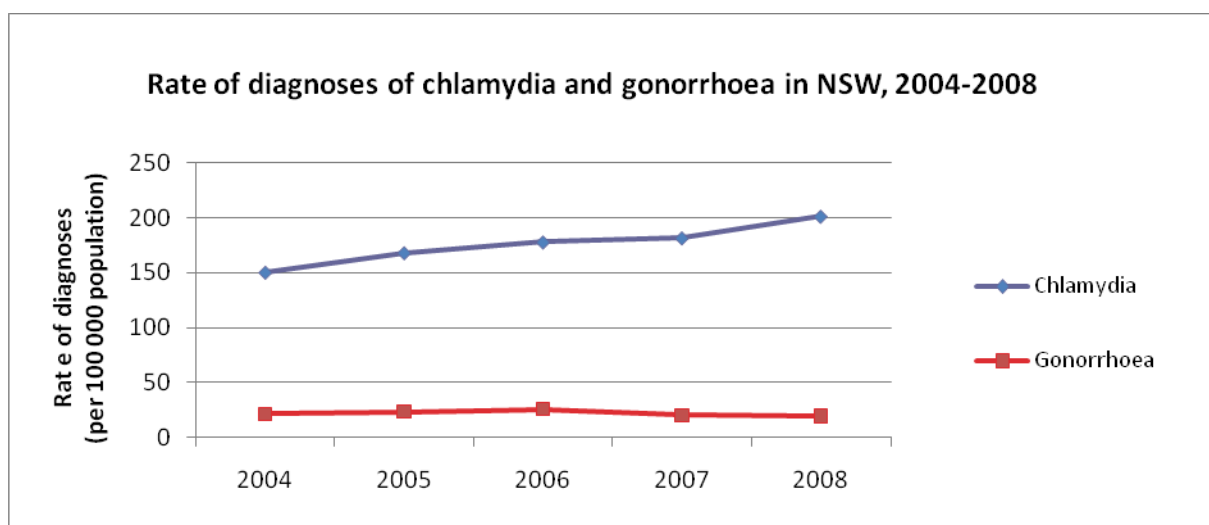


Figure 1: Rate of diagnoses of chlamydia and gonorrhoea in NSW, 2004-2008

Age standardised rate per 100 000 population. Population estimates by State/Territory and year from Australian Demographic Statistics (Australian Bureau of Statistics). (From 2009 Annual Surveillance Report: HIV/AIDS, Viral Hepatitis and Sexually Transmitted Infections, NCHECR – taken from National Notifiable Diseases Surveillance System.)

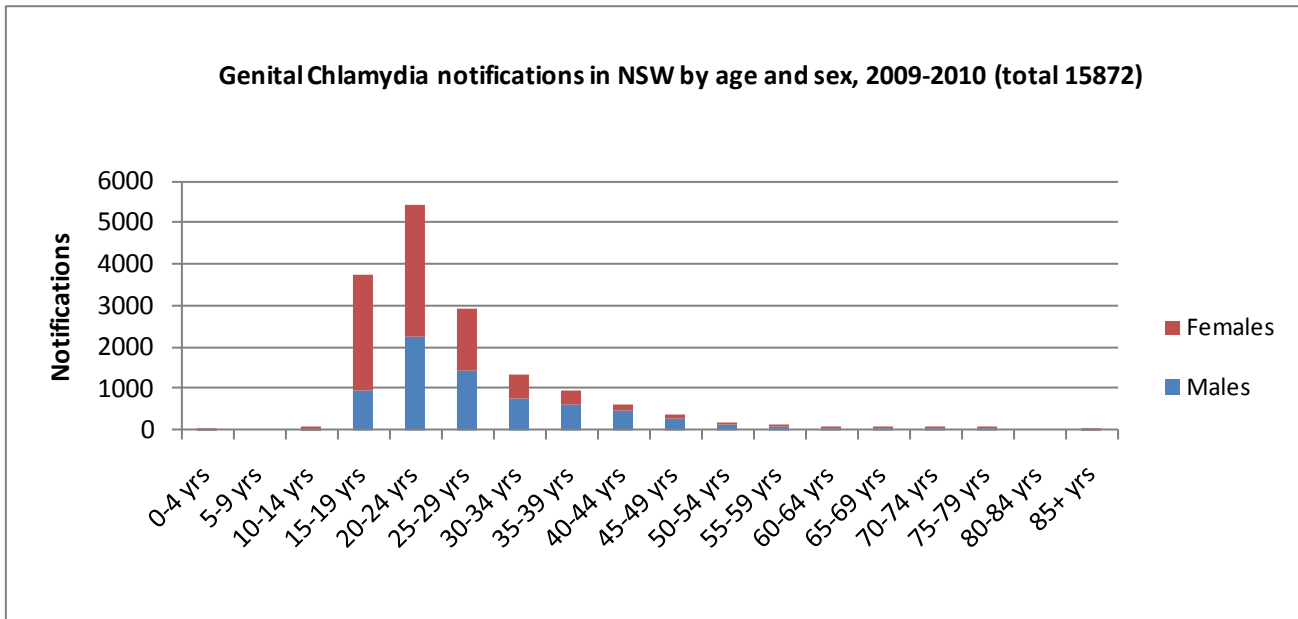


Figure 2: Genital Chlamydia notifications in NSW residents, by age and sex, 1 April 2009 - 31 March 2010
 (From the NSW Health Department Notifiable Diseases Database System (NDD)(HOIST), Communicable Diseases Branch and Epidemiology and Surveillance Branch, NSW Health Department.)

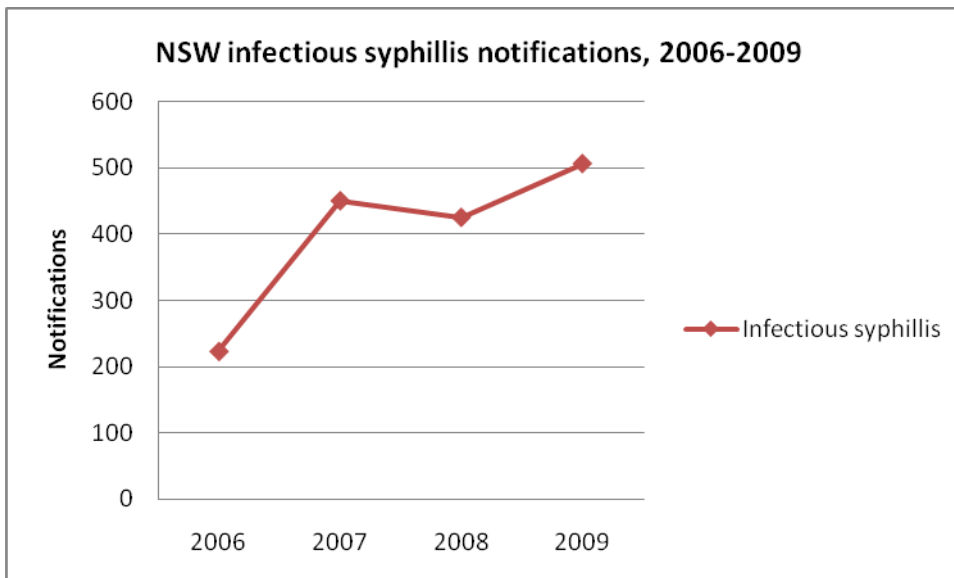


Figure 3: Infectious syphilis notifications in NSW residents 2006-2009
 (From the NSW Health Department Notifiable Diseases Database System (NDD)(HOIST), Communicable Diseases Branch and Epidemiology and Surveillance Branch, NSW Health Department)

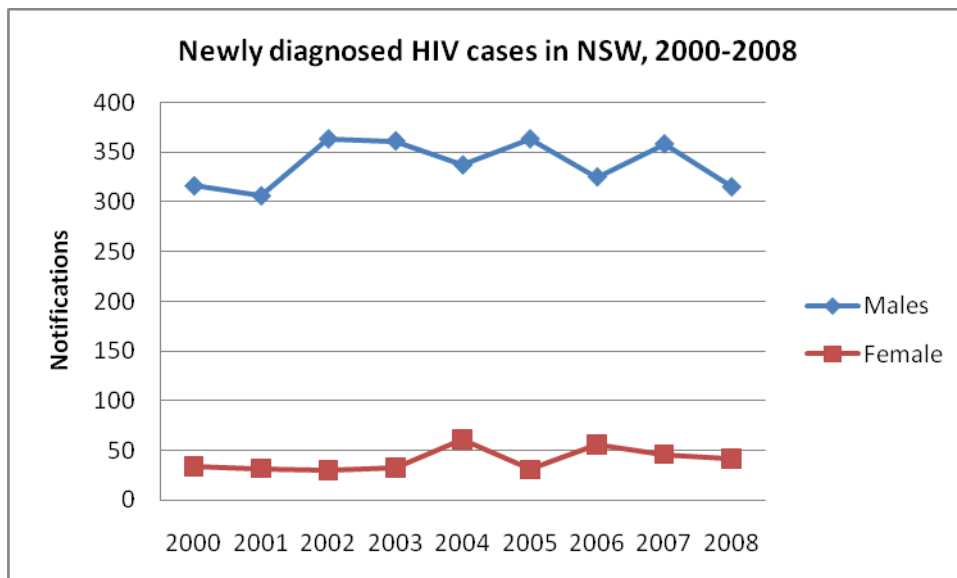


Figure 4: Estimated number of newly diagnosed cases of HIV in NSW, adjusted for multiple reporting by gender and year

(From the 2009 Annual Surveillance Report: HIV/AIDS, Viral Hepatitis and STIs, NCHECR – taken from the National Notifiable Diseases Surveillance System)

Rates of HIV are stable in NSW. Rates of gonorrhoea are also stable but higher than in the 1990s. There is an ongoing epidemic of syphilis, primarily amongst HIV positive MSM. Chlamydia rates are increasing, particularly in the younger age groups. Sound epidemiological data is lacking with respect to STIs in the indigenous Australian population.

1.1 METHODOLOGY

1.1.1 LITERATURE REVIEW

A literature search was conducted on English language studies as well as guidelines, reports and other grey matter. PubMed was searched using the MeSH terms Sexually Transmitted Diseases (STDs) and Contact Tracing for the years 2000-2010. Additional keywords employed were: patient delivered partner treatment/therapy, accelerated partner treatment/therapy, expedited partner treatment/therapy and sexual networks. A separate PubMed search using the MeSH terms Hepatitis and Contact Tracing was performed. To ensure inclusion of recent publications outside of systematic reviews Medline was crosschecked by employing all MeSH subheading terms for Contact Tracing in a keyword or subject-heading search from 2008-2010, the abstracts were then reviewed as to their relevance to sexually transmitted infections (STIs). Additional Australian-specific literature was accessed by an Australasian Medical Index search 1990-2010 using all the subheadings of the MeSH terms and the additional keywords described above. All the abstracts were assessed and papers selected to have likely relevance to the topic were reviewed in full. Key studies identified from the literature prior to these search dates were also reviewed.

Recent abstracts and online presentations from several conferences were reviewed including the 2009 London International Society for STD research (ISSTD) conference, the American 2010 STD National STD Prevention Conference and the 2009 Australian Society for HIV Medicine (ASHM) Contact Tracing poster exhibition. Unpublished data, projects and online resources were accessed from online sources including <http://internetinterventions.org> and websites reported in key informant interviews.

Twenty-five semi-structured telephone interviews each taking up to 70 minutes with 26 key informants were conducted, in addition to a number of shorter phone conversations. The informants included clinicians (physicians, clinical and practice nurses), public health professionals, researchers and social workers, sexual health counsellors and contact tracers. The majority of the interviewees were from NSW, with a selection from Western Australia, South Australia, Victoria and the Australian Capital Territory.

1.1.2 GENERAL LIMITATIONS IN THE REVIEW

The limitations in the review stem from several areas: Firstly there is a deficiency of relevant ‘high-quality’ evidence, in terms of randomised control trials (RCTs), for one type of partner notification intervention over another. In the majority of cases the existing trials are also underpowered. Moreover much of the RCT data is from the US where access to free sexual health care is far more limited than for urban NSW. However US access may be on par with more rural areas of the state. The various studies and trials also often used subtly different outcome measures, which has led to some different interpretations of results between the various systematic reviews. This is addressed where relevant below.

Secondly, there are problems with the external validity of many prospective studies of different approaches or enhancement strategies to partner notification. For example any follow-up of any sort may lead to improvement in all assessed trial arms, leading to less of an effect being shown for the intervention (KI)[4]. Similarly *patient referral* often leads to partners being referred elsewhere, which negatively biases the results of this type of intervention in clinic-based studies. This type of loss to follow-up can significantly affect rates of notification identified in clinic audits.

Thirdly there is a lack of evidence regarding contact tracing in sexually acquired hepatitis. No studies were found assessing this condition. In addition there was limited evidence for conditions that are considered low priorities for contact tracing: in particular genital warts and genital herpes [5]. Very rare conditions in NSW such as donovanosis and chancroid were not covered specifically in the literature.

Finally, although a number of key informant interviews were undertaken, and as many local projects as possible were assessed; this component of the literature review was not exhaustive. Hence the information obtained from these sources cannot be considered definitive. The information about local areas formed part of the interviews only, and was more intended to be a snapshot of how certain processes and responses may have evolved in various regions to account for the differing geographical and demographic challenges. This type of information was also employed to help interpret the evidence, given there are so few large trials on partner notification in its various forms. In addition data on state-by-state variation in rates of the different diseases have not been included, due to the number of potential confounding variables that make it impossible to draw any viable conclusions between contact tracing processes and STI outcomes.

2 PARTNER NOTIFICATION: THE BASICS

There are several principles underpinning partner notification services in most countries. Significantly the process is required to be confidential, voluntary and non-coercive [6-8]. Ideally the intervention should also be free; comprehensive; integrative; evidence-based; culturally, linguistically and developmentally appropriate and accessible and available to all [9, 10].

2.1 DEFINITIONS

Types of partner notification processes are traditionally divided into three groups:

PROVIDER REFERRAL

Provider referral is when a trained health care worker elicits contact details from the index patient and notifies their sexual partner(s) of exposure to an STI. This can be anonymous or not, depending on the wishes of the index case.

PATIENT REFERRAL

In *patient referral* index cases are asked to notify their sexual partner(s) themselves.

Patient referral can be enhanced in several ways. For example cases can be given information, letters, STI testing kits or medications to give to their partners. Patients can also be followed up with further appointments or phone calls to assess how the notification went. Online resources can be used, including those by which patients can notify partners anonymously themselves. Further, clinicians may elicit the names of partners to remind them of whom to contact, or provide counselling or motivational interviewing to aid them in the process.

CONTRACT REFERRAL

In contract referral index cases enter into a voluntary 'contract' with an appropriate health professional to notify their sexual partner(s) with the understanding that if the partners have not sought testing or treatment within a given time frame the provider undertake the notification [7, 11].

The possible enhancements of *patient referral* blur the distinctions between the three approaches. There are also variations in how partner notification is initiated in the first place. For example it may be the diagnosing clinician who discusses partner notification with the index patient themselves, or this may be a part of education and contact tracing services undertaken by someone else in the clinic. Moreover in *provider referral* diagnosing clinicians may elicit names and then provide that list to someone else to follow-up. Alternatively the provider doing all aspects of the partner notification may be employed in a different area, such as in a public health unit (PHU), and therefore be physically removed from immediate clinical environment. Further, professionals who undertake contact tracing may come from different professional backgrounds such as medicine, nursing, social work and counselling. These variations may influence the effectiveness of the partner notification process.

2.2 SEMANTICS: CONTACT TRACING VERSUS PARTNER NOTIFICATION

One of the first issues that this review highlighted was the various uses of the terms ‘Contact Tracing’ versus ‘Partner Notification’. Frequently these terms are used interchangeably in the literature, although there is a trend for more recent studies to employ partner notification. American Contact Tracers are ‘Disease Intervention Specialists’ (DIS), and the term contact tracing is used infrequently in the American literature [12]. In Australian states, where Contact Tracers exist as centralised formal positions (typically but not invariably in PHUs) they remain termed as such. Although it was indicated by two informants that they would not refer to themselves as contact tracers to a contact that they were tracing, preferring instead to be more general and refer to themselves as specially-trained nurses (KI). Patients requiring *provider referral* in NSW Sexual Health Clinics (SHCs) are usually referred to a Sexual Health Counsellor or Social Worker or a Sexual Health Nurse. The roles of these professionals incorporate contact tracing as part of their job description. On the other hand Contact Tracers in other states are usually professionally trained as nurses but consider important parts of their role to be in education, support and social assistance (KI). In parallel to this Partner Notification may be used in the literature to refer to the process of letting sexual partners know their risk status, whereas Contact Tracing is being employed more when an active involvement by a health care worker is taking place, particularly with reference to *provider referral* [13]. There is the sense that Contact Tracing implies more involvement by the person undertaking the intervention than does the term Partner Notification. This point may be of relevance when considering how to encourage initiation of partner notification to time poor clinicians. Partner notification also may linguistically signify a slightly less intrusive and more educative process. Again this is potentially a favourable point given that one of the barriers in contacting tracing from a clinician’s perspective appears to be concern of the patient-doctor relationship [14](KI). The two terms will be used interchangeably throughout the review, however taking these semantic overtones into account.

The term Partner Notification implies a less intrusive process than Contact Tracing. Referring to the intervention as Partner Notification may be of benefit in terms of reassuring patients and clinicians that it does not have to be an arduous or non-therapeutic process.

2.3 A CONSIDERED APPROACH

Information gathered in this review indicates that partner notification can be a challenging intervention to perform well; however despite the potential challenges the process does not have to be overly complicated or difficult. Although potential issues such as stigma, guilt, blame, possible relationship breakdown and violence need to be taken into account, newer evidence suggests that the experience of partner notification is often easier than patients expect (KI)[2, 15]. Means to facilitate the intervention will be discussed in this report, but the challenges of partner notification reflect the overwhelming consensus in the literature and from interviewees that there is not a ‘one-size-fits-all’ approach. Developing creative approaches with regards to anonymous partners was considered particularly important [16, 17]. It was suggested by a number of informants that the most appropriate partner notification format depends on the person in front of the clinician: with variables such as age, gender, sexual orientation, type of relationship with partner(s) and with the clinician influencing the types of partner notification that is undertaken. The methods used to undertake contact tracing also depend on cost and resources, which is particularly relevant in the fee-for-service general practice model in Australia. Informants also expressed the opinion that different forms of contact tracing were more appropriate for different partners [18]. The variability in appropriateness of methods probably explains the modest results in RCTs and meta-analyses that

generalise one form of partner notification to all partners of an index case. The literature needs to be interpreted with this in mind [15].

3 WHY CONSIDER PARTNER NOTIFICATION?

The reasons for undertaking contact tracing vary by disease, especially blood borne virus versus bacterial STIs. For chlamydia, gonorrhoea and syphilis the primary aim is to ensure effective treatment of contacts and to prevent re-infection of the index case. A secondary goal with all STIs is to reduce burden of disease in the population [19]. With HIV, behavioural change is the main prevention tool in terms of ongoing transmission. Therefore there is the need to ask the question, 'Does contact tracing change behaviour with respect to HIV?' There are also moral and increasingly medico-legal implications in partner notification, particularly with respect to HIV. These additional considerations can influence the value placed on the process as an intervention (KI)[20].

3.1 EVIDENCE OF CONTACT TRACING AS A CASE DETECTION STRATEGY

The literature reports several means of measuring the case finding effectiveness of contact tracing. One way (which can be termed Yield) is to divide the number of newly diagnosed cases in partners by the numbers of partners elicited or investigated ('initiated')[21]. This measure indicates the proportion of nominated partners who are subsequently found to be newly diagnosed cases. Hence yield is a product of notification rates as well as the likelihood of a sexual partner being newly diagnosed with the STI of the index patient.

Accurate information on contact tracing in terms of yield depends not only on the validity of data regarding notification of contacts, but also on being aware of where the follow-up occurred, so that results of testing can be obtained. In urban areas of Australia the majority of partner notification is performed by *patient referral* and there is usually a choice of clinics in which partners can follow-up (for example a sexual contact may prefer to go to their GP). Hence evaluating Yield from clinical audits undertaken in urban Australia may have limited usefulness as a measure of case-finding effectiveness. Alternatively one can simply assess the percentage of presenting contacts who are found to be newly positive for the STI of the index case. This variable will be dependent on transmission rates of the STI. It is also likely to be lower for non-curable STIs such as HIV, as some index patients will have partners that already know they are HIV positive. Partner notification rates are addressed further below.

Brewer [21] reviewed the evidence for contact tracing as a case detection strategy in developed countries, with data predominantly from the U.S where patients were followed-up by DIS. In this review it was reported that the median percentage of initiated contacts who were newly diagnosed cases for the following STIs were as follows: syphilis eight percent (range 1-23), gonorrhoea 18% (8-34) and chlamydia 18% (7-30). For HIV the rate was also eight percent (0.2-48).

There is limited equivalent data from Australia. England *et al* [22] conducted a retrospective audit of enhanced contact tracing in the ACT. This audit used combined data from provider notification performed by public health officers and partner or provider notification performed by SHC staff. They reported a Yield of 11.7% (95% CI 8.8-15.1) of nominated contacts testing positive for chlamydia. Analysis of data from a Gold Coast SHC audit reveals that during a period where 296 contacts were named for chlamydia there was a 10.1% (6.9-14.2) Yield. However a percentage of these contacts were partners of index patients

diagnosed elsewhere [23]. The percentage of partners presenting for follow-up to the clinics who tested positive for chlamydia was 47.6 (35.3-59.9) in the Gold Coast and 40.8 (32.1-49.9) in the ACT audit.

With the same caveat that contacts may not have been those for known index patients, the Yield from the Gold Coast Clinic for gonorrhoea during the audit period was 4.8% (1.3-11.7) from 84 nominated contacts of 19 cases. For early infectious syphilis one contact was found to be positive from 14 nominated contacts of two cases [24]. Alternatively four of the 11 presenting contacts of gonorrhoea tested positive for the disease (36.4% (10.9-69.2)) and one of the two presenting contacts of syphilis index patients was diagnosed with early syphilis.

An audit from the Kimberly in W.A, with predominantly *provider referral* follow-up of a mainly indigenous rural and remote population, a Yield of 24% (18.1-29.8) for chlamydia, 25% (18.5-32.4) for gonorrhoea and 7.0% (2.7-15.2) for syphilis was found [25]. The percentage of partners testing positive for the same disease as the index cases were 53% (40.8-64.2), 53% (42.7-63.4) and 13% (4.9-26.2) for each disease respectively. Some index cases and some partners had more than one infection. Significantly 17% (CI not calculable from the data available) of partners had either full or partial discordance in terms of their STI type with respect to the infection(s) of the index case.

In Victoria each HIV case is referred to central contact tracers, where patients are offered the choice of *patient, provider or contractual referral* if they agree to notify and are able to identify their partners [26]. In a 2002 audit a yield of 6.0% was found (3.3-10.1) (13 new diagnoses from 215 index cases). Significantly, nine of these 13 new cases (69%) were non-MSM partners, a group less likely to present for regular STI screening.

The Australian situation parallels the US in the sense that there is generally a higher Yield of newly diagnosed cases for gonorrhoea and chlamydia than HIV or syphilis. However partner notification of all STI is an effective means of finding new cases in the community. Whilst a significant proportion of people naturally clear bacterial STI or maybe resistant to contracting diseases such as HIV, there is also variation in transmission rates between the various diseases and modes of sexual intercourse [27]. In certain areas of Australia a case will remain 'open' until a contact with the same STI is located (KI). Recognising that partners may not be positive for various reasons is an important consideration in utilising contact tracing as a case finding strategy. Some partners may be at higher risk for any STI than the general community, as the Kimberly data shows. Partner notification can identify this group and enable targeted screening and treatment, adding to its effectiveness as a case finding strategy for the STI of the index case.

Although the Australian data are limited there is evidence for contact tracing as an effective case-finding strategy. It has particular relevance to partners who may not otherwise routinely screen for STI.

3.2 CONTACT TRACING AS A POPULATION LEVEL INTERVENTION

In considering the value of contact tracing at the population health level it is necessary to appreciate partner notification and its position in the wider framework of interventions to control STIs. The control measures required for STIs are dependent on the infection type and its epidemic phase. Population spread is therefore dependent not only on people and their networks but also on the virulence and the duration of infection [2]. Hence highly transmissible and symptomatic infections such as gonorrhoea in men will tend to

get treated quickly, and generally be only sustained in groups where individuals have a high probability of encountering another infected person. Alternatively chlamydia (which has a much higher percentage of asymptomatic infections whilst still being relatively transmissible) can spread more generally through a population, although infection rates will remain higher in those with frequent, unprotected sexual contact. HIV on the other hand is relatively difficult to transmit, although certain types of intercourse such as anal penetration increase this likelihood, which accounts for the predominance of MSM in newly acquired infections in Australia. These virulence and symptom profiles help to define the likely networks of the different STIs. In addition within sexual networks there are 'core' individuals whom by their sexual and social behaviour contribute disproportionately to infection rates in bridging populations and hence the general community [2, 28, 29]. Combining these two concepts enables understanding of why contact tracing may be more valuable from a public health perspective for conditions such as syphilis, HIV and gonorrhoea than for chlamydia (which has less well defined network relative to the other diseases).

The U.S Centers for Disease Control's (CDC) manual for partner services states that the value of partner notification in the control of syphilis and gonorrhoea is widely accepted. Moreover recent increases in the rates of infectious syphilis and gonorrhoea may be a reflection of burgeoning programmatic gaps in services for partner notification and disease control [30, 31]. Conversely a recent article modelling syphilis trends in MSM (based on Victorian data) suggests that contact notification of infected men should occur where possible, but that the rates of notification required to reverse the current epidemic would not appear feasible. Hence the authors argue that whilst important, partner notification should take second place to increased amounts of regular screening of at risk MSM [13].

The value of resource intensive partner notification services in preventing and controlling HIV in various countries has been proposed [18, 32]. HIV partner notification is undertaken more judiciously throughout most Australian states than for other conditions, which includes some recent changes to NSW policy that are discussed further below (KI). Partner notification of HIV in cases diagnosed in general practice may however be as much due to the perceived medico-legal implications as to the intervention's role in behaviour change of affected individuals (KI).

On the other hand the value of partner notification for control of chlamydia is less clear, and the increasing rates indicate that current forms of this intervention are not working to help control the epidemic. Although the studies are not extensive the CDC indicates that when used in the US, partner notification via *provider referral* seems to identify enough infected partners to decrease transmission and therefore promote infection control measures [30, 33, 34]. However the problem is that partner services are so rarely used for this condition.

In Australia the current background rate of chlamydia is about 3-5% [35, 36]. Despite the difficulty with the concept of Yield in the urban Australian context, England *et al* pointed out in the ACT chlamydia audit (which had a significant component of *provider referral*) that with a Yield of 11% only seven to 13 nominated contacts would have to be tested to detect one case. In terms of the general community 20 to 33 patients would need to be screened to detect one new case of chlamydia. The authors conclude that enhanced partner notification of chlamydia appears effective but is time consuming.

Nevertheless there is a comprehensive understanding between key informants and the literature that partner notification can only be one component of a bigger strategy in addressing the increasing population rates of chlamydia, and also for control of the other STIs in high risk groups [13, 21, 37-41]. At a practical level a non-NSW informant opined that in certain areas people may become obsessive about contact tracing of curable STIs. The same informant suggested that if contact tracing couldn't be performed

relatively rapidly then it was better to get the index patient back in for regular screening, which would itself enhance trust to improve contact tracing the next time should the need arise (KI). The idea of using regular screening as a means of gaining trust for further partner notification and treatment in certain populations, for example in indigenous Australians and youth, was independently voiced several times by informants.

The population effect of partner notification is likely to be higher for HIV, syphilis and gonorrhoea as opposed to chlamydia, by virtue of the nature and network profile of each disease. However incorporating effective partner notification into screening programs for all STIs will have an additional population health effect.

3.3 CORE TRANSMITTERS AND UPSTREAM AND DOWNSTREAM PARTNERS

Partner notification of regular partners is important from a clinical perspective to prevent infection or reinfection in the case of curable STIs. However such partners are much more likely to be ‘downstream’ in the sense that they are less likely to have other sexual partners, therefore being at less risk of transmitting the infection further (KI). However the notification of a downstream partner of an HIV index case is deemed of particular importance, given the high morbidity of the condition and the lesser likelihood of downstream contacts presenting regularly for screening. This is particularly the case if downstream partners are not from a demographic such as MSM who are encouraged to screen regularly [26].

Past or casual partners may remain important in terms of being ‘upstream’ or potential core transmitters [24]. From a population health perspective therefore, encouraging notification of such partners is potentially going to have a larger impact. This is particularly the case for the diseases that have more specific networks and pronounced epidemicity, such as gonorrhoea or syphilis currently in NSW. It may also be related to gender and the different disease profiles between these in less predictable networks such as chlamydia (KI). Recent modelling supports this hypothesis by suggesting that partner notification of male indices with gonorrhoea and chlamydia who have only casual partners reduces transmission by 30% more over one year relative to index cases with regular partners [42]. A different model by Gray on syphilis suggests that partner notification and treatment of 50% of regular partners and 5% of casual partners in an at-risk MSM population could lead to a relative decrease in peak prevalence of 29% (from 9.6% to 6.8%) whilst increasing the proportion of regular partners to 75% further decreased the peak prevalence to 6.0%. Doubling of the proportion of casual contacts treated to 10.0% had an additional effect of lowering the peak prevalence to 5.6% [13] (last figure from personal communication). As mentioned above, although partner notification may be an effective process in reducing the prevalence of syphilis in this population, Gray’s paper suggests that increased screening of the at-risk population will be required in order to reverse the epidemic trend. However the authors also note that encouraging men not previously tested for syphilis to be screened is important in arresting the epidemic. They also note that some people will not present for screening in response to community-wide educational messages. According to key informants it is such ‘golden people’ that upstream contact tracing can identify, as personalised messages of exposure or a positive diagnosis can be a means by which such people’s behaviour may be modified. Interestingly, although partner notification is one of the means to identify both core transmitters and networks, research has found that index cases (and specifically men) may avoid informing perceived transmitters if they believe that the partner knew that they had an infection in the first place [43]. Therefore assessing the evidence as to the effectiveness of different types of partner notification, with respect to the different

types of partners, is essential in comprehending the likely impact of this intervention at both the individual and the population level.

Limited evidence suggests that increasing the numbers of casual and ex partners notified will have a larger population impact. The effect is likely to vary between the different STIs and the demographics of the index patients. Partner notification may also entice high-risk people to test who may not otherwise attend screening. Hence focus on casual and ex-partners should be considered, particularly in certain communities such as MSM or in sexually active youth, and strategies for contacting such partners offered to index patients.

4 THE AUSTRALIAN CONTEXT

4.1 RATES OF NOTIFICATION: WHO IS DIAGNOSING WHAT WHERE?

Rates of notification of STIs are also related to case-finding effectiveness, because by increasing the rates of testing of partners (who are then subsequently notified) more new cases per index patient can be found. There is limited information regarding rates of partner notification for STIs in the NSW or Australian context. What information is available is from the perspective of SHCs. There are also some differences between rates reported by patients and those actually recorded at clinics (when contacts present for follow-up).

In the UK the ratio of index cases to contacts seen at the Genitourinary Medical Clinics (GUM Clinics) in major cities is around 1:0.4, and 1:0.6 in urban areas [44]. A pre-study audit from Hunter New England reported that the ratio of the mean number of partners who were reported to be treated was 1:0.64 [4]. The Gold Coast SHC audit cited earlier found a ratio of 1:0.26 for all bacterial STIs [24]. The authors however pointed out that there were a number of contacts followed up that were from index cases diagnosed elsewhere, such as by General Practitioners (GPs). Similarly it was likely that a number of their index cases' partners were followed up by their local doctor as well and not at the clinic. Thus they assessed the total index cases to total contacts seen for same period and found a ratio of 1:0.52. Assessing the SHC component of the ACT audit previously cited reveals a rate of index case to known partner being tested of 1:0.21. The paucity of NSW data makes it difficult to draw conclusions but it would appear that there is likely to be scope for improvement in contact tracing services at the SHC level in NSW.

There is also limited information available on the proportional rates of the various STIs being diagnosed in general practice versus more specialised SHCs in NSW and Australia. In terms of HIV a recent investigation by NSW Health revealed that 46% of HIV diagnoses were not made by SHCs or a prescriber of HIV medicine (S100 prescriber)[45]. For syphilis around 60% of cases are diagnosed by GPs, although a large percentage of these practitioners are known to have further training in sexual health (KI). In terms of chlamydia a recent review of NSW Greater Southern Area Health notifications for six months found that 83/96 (86%) of diagnoses were made by GPs (KI). In Western Australia around 90% of chlamydia diagnoses are made in general practice [46]. In the ACT the rate of general practice diagnoses for chlamydia is around 70% (KI). In Tasmania enhanced surveillance data suggests a rate of 71% of female and 84% of male diagnoses for chlamydia are made in the community [41]. These data suggest that a significant proportion of all STI and the large majority of chlamydia diagnoses are made in general practice.

Rates of partner notification from SHCs in NSW may be on par with those from the UK, but there is likely to be much poorer rate of notification from General Practice. Conversely the majority of STIs are diagnosed in General Practice, so effective development of partner notification capacity in the state will need to consider GPs as well as clinicians from SHCs.

4.2 PARTNER NOTIFICATION AWARENESS AND PROCESSES

4.2.1 PARTNER NOTIFICATION IN COMMUNITY MEDICINE: AWARENESS OF ROLES AND RESOURCES

Experience by Australian GPs of partner notification is mostly to do with *patient referral*. Index cases are generally encouraged to tell their partners, and in some cases provided with further information or a letter [47-50]. There are also few accounts of follow-up processes in general practice [51, 52].

The literature regarding the awareness of GPs throughout Australia regarding their responsibility for initiating partner notification is generally consistent [53]. Accordingly although most GPs are supportive of partner notification, numerous studies have indicated that they are largely unaware or misconceive their role in this process [50-52]. The general consensus is that a significant proportion of GPs believe that local health services will notify partners regardless of whether the state has a notification form or not for the condition [52]. Some self-report studies have suggested a higher awareness amongst GPs regarding their role in partner notification [14, 48, 54]. In particular the NSW Health-commissioned assessment of STI contact tracing conducted by McCarthy et al in 2004 found that 81% of respondent GPs undertook contact tracing [49]. However this study had a response rate of only 22%, and the results included additional questionnaires submitted at sexual health workshops and articles, so the generalisability of this level of knowledge to the GPs across state is limited.

One of the issues between comparing results of studies is the understanding of what it means to 'undertake' contact tracing. Key informants suggested that the question of awareness of responsibility will depend on how the question is asked. For example the differences between the questions, 'Do you think you should initiate partner notification?' as opposed to, 'Are you responsible for contact tracing?' None-the-less the general consensus from the interviews was that even if most GPs are aware that they have some role in partner notification, a significant minority are not aware of this responsibility. Moreover of those who are aware, the majority have a poor understanding of the processes and potential resources available to assist them. Hence GPs in Victoria have expressed confusion about which STIs are important to trace and which contacts to trace [50, 51]. This consensus is supported by a 2008 NSW assessment of GPs diagnosing HIV, where 5/15 (33%) who were giving a new diagnosis were not aware of their responsibility for partner notification, and all 15 wanted information on how to carry out the intervention [55].

4.2.2 PARTNER NOTIFICATION PROCESSES IN OTHER STATES AND TERRITORIES

In the ACT approximately ten new cases of HIV per year are diagnosed (KI). There is an arrangement with the ACT health department that the Canberra SHC staff will follow-up all non-medico-legal HIV cases and other rarer STIs as required. At the clinic the initial contact tracing information tends to be gathered by the clinician and then a clinic nurse performs follow-up. Most of the first interview with an index case is around

clinical implications of the diagnosis. Partner notification will be mentioned as something to discuss at a later date. As patients are invariably not lost to follow-up delaying the discussion on partner notification is considered appropriate. At the other end of the spectrum there are around 1000 cases per year of chlamydia diagnosed in the ACT with 300 of them being at the SHC. There is currently one full time equivalent (FTE) nurse at the Canberra SHC who is funded to contact trace all the chlamydia diagnosed at the clinic and any cases requested by GPs.

South Australia has a system similar to the ACT: contact tracers exist who follow up the rarer diseases for the entire state but they are employed via Clinic 275, the Adelaide SHC (KI). These contact tracing nurses also see all index cases diagnosed with a traceable STI, including chlamydia, as part of the patient's management. Education about the condition and contacts is supplied and *provider referral* is offered. *Provider referral* is accepted mostly for 'additional' partners. HIV and syphilis are followed up by face-to-face interviews with nominated partners. Partners of externally referred gonorrhoea are notified over the phone. Chlamydia patients were traditionally asked to come back one week after treatment, although currently a follow-up phone call after one week is made to assess the patient and ask if notification of partners has taken place. A repeated offer for *provider referral* at such time is 'rarely' accepted. For assistance with chlamydia notifications in the community a public health nurse used to be employed by the Department of Health (DOH) but this position is not longer current (KI). GPs can however still ask index patients to attend Clinic 275 where they will be assessed as a regular patient and offered contact tracing as part of this process.

Victoria maintains a centralised partner notification unit staffed by four contact tracers, who are geographically located upstairs from the Melbourne SHC but who are formally part of the Victorian DOH (KI). The role of the Victorian contact tracers is focussed around HIV partner notification and follow-up of index cases who have been assessed as putting others at risk. HIV partner notification is always done face-to-face by these contact tracers and '99.9%' are tested on the same day as notification as part of the interview (the contact tracing nurses take phlebotomy equipment with them). HIV notifications for the whole state are reviewed except for those partners of index patients diagnosed at high case-load clinics (unless requested). Traditionally syphilis notification was also performed face-to-face but with the current high rates of syphilis this is no longer possible and contacts may be informed by telephone. *Provider referral* of chlamydia index patients' partners can also be undertaken for GPs, if requested on the enhanced notification form, but it is difficult to pursue all of these.

In Western Australia there is a significant difference in partner notification processes between the more remote areas to the north, such as in the Kimberly, and in metropolitan Perth. In Perth there are two urban contact tracing units for the rarer STIs, one of which is currently undergoing policy change (KI). However in general terms contact tracers focus on HIV, syphilis and gonorrhoea. GPs may request assistance from the DOH for notification of the partners of a chlamydia case, but there is currently very little capacity for this to occur [53]. Western Australia is also presently undertaking a GP awareness campaign around partner notification of chlamydia. This campaign includes the delivery of a resource kit to all general practices (with posters, referral cards and fact sheets); a social marketing campaign to GPs and the community about the benefits of partner notification; a trial of the information on how to manage chlamydia on positive laboratory reports with an added web-link; and education sessions for GPs and practice nurses. The project is currently under evaluation.

In the Kimberley, which is reported to be similar to how partner notification takes place across the whole of the 'top-end' where STIs are more endemic in nature, the process is generally more proactive than that in other areas of the country. Thus all results are copied to a public health nurse in a central point who confirms the diagnosis with the clinician and ask about the need for assistance with contact tracing. All STIs and negative HIV results are handled in this way. Positive HIV results are followed up more definitively but the numbers are small. With syphilis, advice about treatment and contact tracing is more explicit than for the other STIs given the complexity of the condition (the type of treatment given is checked against the type of syphilis diagnosed). Because of the endemic nature of STIs in the region syndromic management is used. Therefore details about contacts are collected at the initial consultation with a patient. A specific form is used, with sexual history and symptoms on one side and a partner notification proforma on the other. Provider referral is a more frequent strategy in these endemic areas, and it was suggested by more than one informant that it may not always be clear to index patients that the process is voluntary (KI). In the Kimberley there also has to be a matched disease in a notified partner to the index patient or a reinterview must take place.

4.2.3 NOTIFICATION FORMS

There is a state-by-state variation regarding which STIs are medically notifiable and which diseases need only be notified only by the laboratory. In NSW the dually notifiable diseases in this category are AIDs (but not HIV), acute viral hepatitis and syphilis only [56]. In South Australia, Victoria and Western Australia HIV, acute viral hepatitis, chlamydia, gonorrhoea, HIV and syphilis (amongst others) are all notifiable by practitioners as well as laboratories. This variation in notification was suggested to reflect state tradition with regards to the social responsibility of medical practitioners, and in turn the process by which contact tracing has been traditionally undertaken in NSW relative to some of the other states.

For all singly or dually notifiable diseases all the states mentioned the laboratory report to the diagnosing clinician includes a small section indicating that this disease has been notified to the relevant PHU. On the additional notification forms for the clinician there have traditionally been areas where a box could be ticked indicating that the patient was aware that the DOH may follow-up potential contacts (KI). On the Western Australian general STI form there is a checkbox with the comment next to it: 'Client informed that DOH may investigate possible contacts/sources' [57]. Most GPs believe that in ticking this box the DOH in Western Australia will undertake contact tracing of partners for chlamydia (along with other conditions)[53]. More recently there have been changes to the cover of the notifiable disease hardcopy pad to address confusion about the role of GPs in following up chlamydia [58]. In S.A the specific chlamydia notification form now specifies that current follow-up by the STD surveillance unit will not include contacting index patients regarding their sexual partners [59]. In Victoria under the 'partner notification (contact tracing)' section of the current enhanced STI notification form (which is for all STIs) the clinician has the choice of ticking a *patient referral* box; a *provider referral* box; a box stating 'no I do not require assistance'; or a box where the message next to it asks the referrer to call a number if they require assistance with contact tracing [60].

In terms of potential priority groups for partner notification assistance, all the forms from these three states identified ask if the patient is Aboriginal or Torres Strait Islander [57, 59, 60]. In addition the Victorian enhanced (de-identified) form for bacterial STIs asks if the patient has HIV or not. The Victorian and South Australian forms also ask from where the infection is likely to have been contacted, including an option that the disease may have been contracted from a sex-worker.

The enhanced Victorian notification forms are sent to all STI laboratory notifications in the state of Victoria. Medical practitioners also routinely notify approximately 50% of chlamydia laboratory diagnoses, and a further 50% of enhanced notification forms are returned in that state. For gonorrhoea around two-thirds of cases are also initially notified by clinicians and then 50% of enhanced STI forms returned (KI). In W.A 99% of GPs report that they know chlamydia is notifiable and around 85% recount that they always lodged a notification form [61].

The differences in contact tracing processes and protocols are relevant because Australia has a reasonably mobile medical workforce, particularly in terms of doctors-in-training and overseas trained doctors [62]. Accordingly the variation in state by state notification requirements, as well as the fact that some states have traditionally followed up all STIs, is likely to have created confusion amongst some clinicians with respect to responsibilities regarding partner notification initiation (KI).

Western Australia, South Australia, Victoria and the ACT have centralised professionals who contact HIV, syphilis and gonorrhoea index patients to assist them with education and partner notification as required. Western Australia, South Australia and Victoria also require practitioner notification forms to be completed for all STI. Increased assistance for STI diagnoses in other states may have contributed to the perceived confusion about responsibilities and lack of awareness amongst GPs in NSW with respect to partner notification processes.

4.2.4 PARTNER NOTIFICATION PROCESSES IN NSW

SEXUAL HEALTH CLINICS

Differences in NSW partner notification approaches between SHCs, PHUs and general practice were reviewed by McCarthy in 2004 [49]. This study found all 35 SHCs in NSW 'undertake' contact tracing but in none is there anybody specifically employed to do so. In general terms it was reported that partner notification was performed by the individual doctor and nurses in most clinics, but more often by nurses than doctors outside of Sydney. Key informants in this review clarified that NSW staff who have a role in contact tracing at SHCs come from a variety of different professional backgrounds, including social work, counselling and nursing. Sexual health counsellors and social workers exist in SHC outside of Sydney but not in all areas, and if not available their role is often performed by sexual health nurses. Some services also have access to aboriginal health workers or sexual health workers. The increase in nurse-led notification in rural areas noted by McCarthy is likely to reflect the number of Clinical Nurse Consultant or Nurse Practitioner SHCs outside of urban areas.

The process of STI notification in NSW appeared to differ by disease as noted for the other states. There was a general recognition that HIV partner notification was important to pursue more intensely. HIV index cases may be referred to a counsellor or HIV nurse at a later date to review partner notification. If the HIV positive index patient was in a regular relationship the counsellor may ask to meet the partner together with the index patient, to share knowledge about the condition and address any relationship issues that may have arisen with the diagnosis. HIV follow-up with a counsellor was not universal however, and still depended on the clinicians' impressions of the index patient and their likely contacts. Asking that regular partners see a counsellor is sometimes employed if the clinician is concerned that such partners will not be informed about the HIV diagnosis. Several informants volunteered that being able to refer to a NSW health

committee, which assesses HIV patients who may be putting others at risk, was a valuable resource in the current setting.

For other STIs the majority of clinicians suggested that patients were encouraged to notify their own partners, with the offer of *provider referral* dependent on the circumstances of the individual patient and their identified willingness or ability to notify contacts. If *provider referral* was undertaken it was generally (although not universally) the case that the diagnosing clinician would elicit the names and details of contacts to be notified by the service, and then provide these details to a counsellor or other employee in the service whose role included such notifications.

As for South Australia, the consensus amongst key informants in NSW was that casual partners were more likely to be referred by index patients to SHC staff for provider notification. In all cases the majority of contact tracing appears to be performed by phone, with calls at different times of day if the first time is not successful. Messages are left if necessary and are fairly generic such as 'It's XX and I would like to talk to you about a health matter'. Whether or not the tracer would state that they were from a SHC was variable, but usually dissimulated (such as stating that they were from the local hospital if the clinic was attached to a hospital). In terms of informing partners, providers usually have general phrases such as, 'someone in the last six months has had a positive result and has named you as a partner'. Notably the feedback from those employed at SHC to actually trace contacts was that the process was not as arduous as it was usually made out to be. Moreover that the vast majority of people were relatively easy to contact by phone, and were almost invariably thankful to have been informed of their risk status. A number of 'contact tracers' (both in NSW and elsewhere) expressed the sentiment that they were initially reluctant about undertaking partner notification. However after training and experience found the process much easier and significantly rewarding in the terms of feedback from partners who might otherwise not have been identified. This was in contrast to a couple of clinicians who stated that the process was not generally done well because it was hard, even with experience (although difficulty was not considered universal amongst clinicians). The differences in these opinions about whether partner notification is a difficult intervention are likely to stem from the fact that clinicians most frequently undertake initiation of the process. It may be surmised that encouraging index cases to consider partner notification in the first place is likely to be the most difficult step in the intervention.

The emphasis on *patient* rather than *provider referral* for most STIs in SHCs was not universal amongst key informants. In particular a sexual health nurse in a more remote part of the state suggested that she offered *provider referral* to all patients and that given the health access and confidentiality issues of the smaller rural area this service was frequently accepted, even for regular partners. (I.e. patients were aware that partners may not be able to readily access their GP and/or be too embarrassed to do so.) (Lack of access to services for contacts has been shown to negatively affect partner notification in the UK [63].)

In terms of follow-up of bacterial STIs (and therefore the opportunity to ask about notification) there was reported variation between SHC, and also within the clinics, dependent on clinician. Some clinics regularly booked appointments for patients to follow-up all STI diagnoses, including chlamydia, with variable patient attendance. One urban clinic in Sydney has a system whereby all patients with positive chlamydia results are contacted initially over the phone by a social worker and contact tracing is discussed during this call. As a result some patients bring their regular partner in with them when they come for treatment. This process of notification was developed due to a delay in processing of results in the area (chlamydia can take up to two weeks) and it was noticed that a phone call was the most effective way of ensuring that patients who were infected actually returned to receive treatment. A consequence of this management technique is that when the patient arrives for treatment the clinician can follow-up if partners have been notified or not, and

offer *provider referral* if necessary. Another Sydney SHC recently introduced a follow-up phone call one week after treatment of index patients with bacterial STI: this phone call process is currently being evaluated as part of a larger study on the ways in which patients notify their partners.

Patient delivered partner therapy (PDPT) also appeared to be used for chlamydia infections more frequently in rural and remote areas of NSW. PDPT is discussed in further detail below, but it is noted here that the increased use of PDPT rurally would likely reflect both access issues as well as a higher proportion of indigenous patients in rural and remote areas.

McCarthy et al reported that there was little in the way of quality assurance of the contact tracing process amongst the SHC in NSW [49]. They also reported that the majority of SHC (69%) were recording contact-tracing data manually. At the time of the review, conducted in 2004, 11% of SHC were using the Sexual Health Information Program (SHIP), which has an internal contact tracing component. Notably one Sydney SHC contacted for this review and not using SHIP had recently introduced a specific form for contact tracing which was used as part of their clinical management. Quality assurance of *provider referrals* are regularly undertaken with this proforma, and it was also understood that the process in general has become better managed after the introduction and evolution of the system. A different urban unit has been using the contact tracing *provider referral* form since the mid-term review and reported subjective improvement in the way that contact tracing was being managed in the clinic since that point.

There was also a general consensus amongst the SHC based informants that additional provider partner notification could be undertaken by SHCs for cases referred by GPs, but that there was normally little demand for this. Sexual health support and training to local GPs was also frequently offered by clinicians from SHCs and contact tracing was a process reviewed in such training. Interestingly few SHCs undertook formal training of their own staff in contact tracing: mostly the skills were gained in an apprenticeship-like fashion with newcomers to the service being mentored into the role. One service had specifically developed a package aimed for professionals undertaking the actual contact tracing for patients in conjunction with the local PHU. This educational material was reported to have received good evaluations by professionals undertaking the training.

PUBLIC HEALTH UNITS

The McCarthy study also proposed that there is broad variation across the state particularly with respect to PHU involvement in contact tracing of STIs, and also their willingness to be involved [49]. In the key informant interviews undertaken for this review the same differences were reported. In terms of SHCs it was proposed that the relationship with between PHUs and SHCs was likely to be closer in rural areas due to traditional or geographical reasons (i.e. being in the same building). Therefore cooperation in partner notification processes for STIs might be a more viable option rurally. Some PHU were suggested to have increased involvement in sexual health by virtue of the background experience of their staff. In any case the confusion around this regional inconsistency in roles was clear: one key informant from an urban clinic mentioned that she had once sought help from her PHU for a complex notification case only to be referred back to the clinic that she worked in. A regional informant also suggested that certain statements on the NSW Health Site needed to be clarified as to what degree of assistance should be offered, such as the following on the chlamydia fact sheet: 'PHU's should work with Sexual Health Service Staff to assist if requested.'*(sic)*[64]

GPs' lack of awareness and skills in partner notification, as well as their need for knowledge of resources which might be available to them, is likely to be of particular concern in NSW where the availability of local

assistance and who might provide this (in terms of PHU or SHC) is not consistent from one region to another. Certainly a GP calling a local PHU for support could easily be directed to the appropriate SHC, as apparently occurs at the moment. However for the time-poor community clinician clear and appropriate access to available resources and information would be likely to lead to improved partner notification processes. Therefore it may be appropriate that as well as addressing GPs' awareness of their role in initiating partner notification, and how to approach the process, there is clarification about which service is the most appropriate in each region to support GPs in this intervention. This may not have to be a SHC if there is a local PHU with experience and enthusiasm in the region who can work closely with clinical staff (see below). Alternatively if the population does not support a SHC there may be a community sexual health nurse who can undertake appropriate support to GPs with the back-up support of an urban SHC.

ENHANCED SURVEILLANCE, NOTIFICATION FORMS AND CONTACT TRACING IN NSW

Variation in enhanced notification and follow-up by PHUs across the state appears to reflect both differences in disease by population group as well as the PHU's enthusiasm for involvement in STI notification. As an example, in Greater Southern Area Health Service the PHU contacts all gonorrhoea notifications although this is not state standard response. The area has recently introduced a follow-up one-page fax of all chlamydia diagnoses on the day of receipt of laboratory notification to the university towns of Albury and Wagga. This fax is addressed to both the practice nurse and the clinician and contains a check-list of whether treatment was with azithromycin, if education took place and if the patient was informed to contact partners. There is also an offer on the fax that the PHU will undertake contact tracing should this be required. Another trial under evaluation in Greater Southern is a postal enhanced chlamydia surveillance form for clinicians in Griffith. On the form is a section on contact tracing which includes an offer of follow-up by the PHU. The idea behind both these projects was how to prompt GPs about contact tracing whilst at the same time making them aware that there are resources available for them.

In central Sydney there has been a trial regarding increased support for practitioners making HIV diagnoses through two laboratories, which will be rolled out to the rest of the state over the next year. The program arose after the NSW Health assessment mentioned earlier determined that 46% of HIV diagnoses are not being made by S100 prescribers or in known sexual health interest clinics [45]. In real terms this equates to about 100 infections per year being diagnosed by a GP with little or no experience with diagnosing HIV [55]. After an acceptability assessment by the Australian Society for HIV Medicine (ASHM) a mentoring service was commenced, whereby at the time of diagnosis the laboratory (with the consent of the GP) passes the GP's contact details onto a clinical expert at ASHM who then speaks to the GP to provide advice as required, including information regarding partner notification. Of the first 18 GPs who have been part of the service 16 (89%) welcomed the assistance.

A similar proposal is being introduced as this report is finalised for syphilis laboratory notifications in men aged less than 60 years and women of child bearing age. With such index patients the relevant PHU will pass the details of the diagnosing doctor who is not known to have experience in the management of syphilis onto the local SHC (S100 prescribers will be considered experienced). Sexual health staff will then contact the doctor and provide relevant advice, including information regarding partner notification [55] (<http://www.health.NSW.gov.au/factsheets/guideline/syphilis.html>). This process aims to ensure prompt and appropriate management of a more complex bacterial STI, which has been recognised by other states and the literature as a difficulty if the diagnosis is made by practitioners without additional training in STIs [65].

There was considerable support amongst key informants for a greater emphasis on contact tracing in NSW. However attention was drawn to the need to find a balance between appropriate encouragements of partner notification and becoming inflexible about the process. Informants proposed that it's important to be mindful of why contact tracing is being done in the first place (I.e. both for clinical management as well as for a perceived population benefit). Recognising the underlying reasons for partner notification should entail the responsibility for provider notifications being shared, rather than people becoming 'hung-up' on whose actual job it is.

EMERGENCY DEPARTMENT AND ANTENATAL SCREENING IN THE NSW SETTING

Several informants expressed concern about patients 'falling through the gap' if diagnosed via Emergency departments or at community antenatal clinics, with respect to both ensuring appropriate treatment of STIs as well as follow up of partners. There was particular concern regarding rural areas where due to GP access and cost issues emergency departments are used more frequently as general outpatients, which means a higher number of STI presentations and testing. Moreover clinicians in such areas are more likely to be short term locums, and also potentially overseas-trained. Such clinicians may not see the results and/or be unaware of the need to, or how to follow them up. Similarly in some remote areas obstetric and gynaecological services are also intermittent, creating another potential area for inadequate clinical management, including that of partner notification. A confounder in this situation is that a hospital doctor may be reassured by asking that the results be forwarded to the patient's 'usual' GP, whom they will expect to follow them up. However the nominated GP may just be known to the patient: they may have never actually seen them before. It is also possible that the GP may assume that follow-up of a patient seen once many years ago was not their responsibility. Some recent cases of gonorrhoea and a case of peri-natal syphilis in the state were highlighted as examples of this gap.

Consequently there was a clear message of a need to formalise who is responsible for following up such cases, and if necessary modify local roles to accommodate this need. In Broken Hill there is an area sexual health community clinical nurse who undertakes to review the results of all STI testing done in the hospital, as well as for community aboriginal antenatal clinics and other STI testing ordered by non-nursing trained community health workers. She has access to case records at the hospital in order to be able to determine if treatment was initiated, and can also directly follow up on partner notification with the index patient. As for the case of general practice assistance, understanding which type of service in each region is in the position to follow up such results (be it SHC, PHU or community sexual health nurse) will be required to address this potentially serious gap in the system.

MORGUE

At the Glebe Morgue in Sydney HIV rapid testing is still undertaken on corpses. The coroner resolves on an individual case if the next of kin (who may not be a sexual partner) can be told. The responsibility for notifying this individual's kin, and then for anonymous sexual contact notification, is undertaken by the sexual health counsellors at Camperdown Royal Prince Alfred SHC, who have developed protocols for such notifications.

PRISONS AND JUVENILE JUSTICE

Prisons and the Juvenile Justice System sometimes use SHC for notification of sexual partners of inmates diagnosed with STIs. Two key informants suggested that the relationship between local services could be formalised and strengthened to optimise partner notification of diagnoses made in these services.

Partner notification processes in SHC vary throughout the state of NSW. On the whole *patient referral* is encouraged for most conditions unless index cases indicate that they cannot/will not undertake this follow up. Some clinics undertake regular follow-up of all STI diagnoses and others do not. Social workers, sexual health counsellors and nurses often take on the role of performing provider notification if necessary. Involvement in STI follow-up and partner notification varies between PHUs, but most do not offer this service. A gap has been noted in terms of whose responsibility it is to ensure that STIs which are diagnosed via Emergency Departments and rural peri-natal clinics are appropriately managed and followed up. The suggestion of developing more formal contacts between prisons and juvenile justice centres and staff able to undertake provider notification of STIs has also been raised.

5 EVIDENCE ON HOW FAR BACK TO TRACE STI

There is variation both within Australia and between countries on how far back to trace for the various STIs, with recommendations based on limited evidence.

In terms of HIV the Australian Contact Tracing Manual (ACTM) recommends tracing back contacts six weeks prior to the onset of a confirmed primary HIV illness. For late HIV infection or an infection of unknown duration it suggests as early as 1980 (depending on risk history and age of index case)[7]. The CDC partner services program (PSP) proposes that one to two years before diagnosis is a practical period to consider in terms of likelihood of being able to trace contacts, and also points out that a previous negative HIV blood result can also inform suggested partner notification periods [30]. Key informants suggested that an individualised approach is usually taken with priority to identify potential exposed previous partners who would be less likely to undertake screening themselves.

For syphilis the contact tracing timeframe depends on the disease stage at diagnosis and incorporates maximum incubation and symptoms periods. For primary syphilis this suggests a maximum traceable period of 125 days and 34 weeks for secondary syphilis. The CDC PSP further identifies that the maximum interview period for early latent syphilis is 12 months, unless a credible primary or secondary history can be established. 12 months is also the recommended period for syphilis of unknown duration [30].

For gonorrhoea the ACTM suggests tracing back according to sexual history and up to six months [7]. The current CDC guidelines propose that evaluation and treatment of any sex partners within 60 days of onset of symptoms or diagnosis is appropriate. For index patients without sexual contacts in the 60 days prior to diagnosis or symptoms the last sexual partner should be notified [66]. This guideline is based on an early (1983) US study which assessed the percentages of partners infected with gonorrhoea using cut-off trace-back periods of 30, 60 and 90 days [67]. With these periods the contact tracers notified 84, 96 and 99% of gonorrhoea positive reported partners respectively. Alternatively the British take into account the differing disease profiles between the genders and advise notification of all partners of males with symptomatic urethral infection in the last two weeks; partners of males and females with infections at other sites in the last three months; and all partners of males and females with asymptomatic infections in the past three months [68].

With Chlamydia the range of suggested partner trace-back is similar to gonorrhoea. The ACTM proposes up to six months according to symptoms and history and the CDC suggests 60 days with the caveat to contact the last known partner for people who have not had sex in 60 days [5, 69]. In the UK, mentioning that these are 'arbitrary cut offs', it is recommended that for symptomatic women, and asymptomatic women and men, partners should be traced for six months. Whilst in symptomatic men the partners of the previous four weeks require notification [68]. The authors go on to conclude that common sense needs to be used in assessing which sexual partners may have been at risk in these situations and that longer look-backs may be needed. An American study assessed the CDC guidelines in the late 90s and concluded that they were adequate in the sense that 88% of untreated sexual partners were likely to have been found [70]. However the majority of the 12% who were missed were asymptomatic males whose exposure to chlamydia had been with a female index partner many months previously: a group likely to contribute to entrenched chlamydia endemicity (given that males are less likely to screen for this than females). In Sweden, where contact tracing is compulsory, a study found that extended notification periods of 7-12 months were able to detect reasonably high rates of chlamydia amongst the nominated partners. Whilst 79% of partners from the previous two months of index cases had positive chlamydia results at 7-12 months this figure was still 30% [39]. In terms of the key informant interviews with clinical staff and another unpublished work from 11 Australasian SHCs, there appears to be a range of three and six months, or less if recently symptomatic with a partner change [71].

Variations in guidelines on how far back to consider notifying partners reflects a lack of evidence in this area. The differences between recommendations are particularly noteworthy for chlamydia and gonorrhoea. It is difficult to recommend changes to the current Australian process based on the limited evidence. Further studies are required to ensure the longer periods add sufficient value at the population health level for the effort expended in notification.

6 EVIDENCE FOR THE DIFFERENT TYPES OF REFERRAL STRATEGIES

Given the general limitations outlined above, what follows is a summary of relevant research findings for the three types of partner notification. The first two reviews, by Oxman and Macke respectively, included any comparison between two groups, whether or not there was randomisation.

Oxman et al (1994) [72] concluded that for **HIV** there is moderate to moderately-strong evidence that **provider referral results in more contacts notified than patient referral**, but that this relationship was less clear for other STIs.

Macke et al (1999) [12] analysed six high-quality studies on **HIV and bacterial STIs** and noted that the **highest number of infections detected per index case were from provider referral (0.23/0.24) whereas the lowest (0.03) was by patient referral.**

Hogben et al [32] evaluated nine studies assessing partner counselling and referral services for **HIV** and concluded that **provider referral identifies a high-prevalence target population for HIV testing**. They also found **relatively few studies on patient referral for HIV, although existing evidence suggested a similar proportion of new positive cases as those found for provider referral**. From a public health perspective there were two studies in this review which suggested that partner counselling and referral services may be effective in encouraging behaviour change to safer sexual practices but firm conclusions were not able to be drawn [73, 74]

Mathews and Coetzee have published two systematic reviews on contact tracing. The first of these was a Cochrane review in 2001 [75]. The second is an update published online under BMJ Clinical reviews based on a 2008 literature review [76]. In this update they refer almost entirely to the Cochrane paper and a more recent review by Trelle et al (2007) [77]. The Cochrane review included two studies from developing countries (one from Zambia and one from South Africa). The Trelle paper included an additional study from Uganda. The three reviews noted that all included papers had methodological weaknesses and were subject to selection bias. Many of the studies therein also lacked power to be able to show a significant difference, even when there were trends.

In terms of the different partner notifications strategies in people with different STDs Mathews and Coetzee [76] came to the following conclusions:

- **Contract referral may be more effective than *patient referral* at increasing the proportion of partners presenting for care in index patients with gonorrhoea** (based on the Cochrane review – very low quality evidence)
- **A form of contract referral, in comparison with *patient referral* alone, may be more effective at improving notification rates of people with HIV** (based on the Cochrane review from a single 1992 RCT – very low quality evidence)[78]
- ***Provider referral* appears to be more effective than *patient referral* at increasing the proportion of partners treated with non-gonococcal urethritis (NGU)** (mainly Chlamydia). The Mathews and Coetzee conclusion is based on one study by Katz [34] which **only enrolled men** with NGU (n=678). In this study *provider referral* appeared significantly better in terms of numbers of partners treated per index patient but could not take into account the partners of patient-referral index patients who may have been treated at other clinics or those did not declare that they were a partner in presenting to the study clinic.

In summary from the systematic reviews:

There is a trend to more effective notification of partners across the range of STIs with *provider* or *provider assisted referral*, as opposed to *partner referral*.

However the evidence is not comprehensive, particularly for bacterial STIs, and there are the various difficulties in comparing the types of partner notification that were outlined above. Given this the Cochrane review suggests that:

In the absence of compelling evidence people should be offered a choice between *patient* and *provider referral* services.

There is evidence for emphasising the option of *provider referral* services in more recent system analyses as well. For example a service evaluation of the UK National chlamydia screening program 2006-07 suggests that good partner notification outcomes were associated with an intensive process including regular uptake of *provider referral* [79]. The retrospective audit of enhanced chlamydia notifications in the ACT cited earlier found that the provider process by public health officers, despite eliciting less nominated partners per index case, was more successful in ensuring follow-up of these partners and therefore overall follow-up [22].

On the other hand Mathews and Coetzee also note that *patient referral* incurs less service costs [75]. Cost estimates are contained in many studies assessed by the reviews, and there is limited data on cost-

effectiveness of the various types of referral, but generally these are not comparable [12]. The likely cost-effectiveness of the various strategies would inevitably vary with disease and short-term and long-term sequelae in those positive partners who did not undergo regular screening. For example, given that lifetime costs of HIV run into the hundreds of thousands of dollars, the Victorian audit cited earlier suggested that the total cost of their partner notification program per annum was considerably less than the estimated cost of a single new HIV infection [26]. Similarly discussions with the key informant interviews revealed a general impression that broad-scale provider contact tracing may be cost-effective for diseases such as HIV and syphilis, although this is less likely to be the case for chlamydia [80].

In reality the vast majority of partner notification in NSW appears to be a form of *patient referral* both in SHCs and in general practice, and *provider referral* is offered if a patient indicates that they may have difficulty with the process [49]. Key informants suggest that this process is broadly considered the most feasible type of referral, particularly for chlamydia as a more common condition. However the choice of referral type for each index patient does not have to be dichotomous. Indeed the literature suggests it is important to have flexibility in offering *provider referral* as a choice depending on the types of partner(s) that an index patient has. This interpretation is consistent with the recommendations made in the Cochrane review and may also explain why the differences shown in RCTs are so modest [81, 82]. For example, although *patient referral* is most frequently preferred for index patients in an ongoing relationship, anonymous *provider referral* may be preferred for ex-partners, non-‘primary’ partners or casual partners [83-87]. Professionals undertaking contact tracing roles in the Australian context who were interviewed for this literature review were also unanimous in suggesting that casual and ex-partners, including sex-workers, were far more likely to be ‘handed-over’ for anonymous provider notification.

Evidence also suggests that past partners are generally very poorly notified by patients [23, 88]. The limited Australian data demonstrates that current regular partners are confirmed as treated much more often than past partners. In the Gold Coast audit the rate of regular partners being treated was twice that of the rate of past partners, despite patients reporting more past partners than regular partners (283 to 111) [24]. In addition, despite higher mean numbers of contacts for gonorrhoea and syphilis in the Gold Coast audit (4.4 and 7.0 versus 2.3 for chlamydia), the ratios of index cases to known treated were similar for the three bacterial STIs (1:0.69 for chlamydia, 1:0.79 for gonorrhoea and 1:1.0 for Syphilis).

Past partners may also be perceived by index patients as being transmitters (even though they may not have had symptoms) and there is evidence to suggest that index cases can avoid informing perceived transmitters [43]. Hence it is important to discuss with the index patient the likelihood that such partners did not know that they were infected, but also to offer alternatives to *patient referral* in order to maximise the likelihood of such partners being contacted. It is also essential for clinicians to be aware that contacts do not necessarily have a problem with being informed via *provider referral*: on the whole they would prefer to be told any way. One study from the UK suggests that although index patients prefer *patient referral*, partners prefer *provider referral* [89].

There are some other broad indicators of the probability of success of *patient referral* which clinicians need to be aware of when discussing partner notification with index patients. These include the index case being female, the relationship of the index patient and the partner being ‘steady’, the index patient having fewer partners, and increased self-efficacy of index case [18]. In particular men are half as likely as women to have their contacts satisfactorily treated within 28 days of diagnosis [90]. Besides perceived transmitters, other partners less likely to be contacted in patient referral settings are oral and anonymous contacts of MSM, casual partners of men and incarcerated partners of women [43].

There may also be disease-specific preferences in the sense that some studies indicate index patients appreciate additional support in informing partners about HIV [91, 92]. Observational research in people with HIV also suggests that continuous rather than one-off counselling services are best for addressing the difficulties that index patients have in disclosing to their partners [93]. There was also a consensus from key informants that GPs should be proactively supported in terms of management and partner notification of index patients with rarer STIs, and in particular HIV. This evidence validates the processes undertaken by the other states, as well as several NSW SHCs interviewed, in terms of follow-up of HIV positive index patients. It also reinforces the virtue of extending the new program of HIV follow-up currently being trialed in Sydney across the state, which would have the double advantage of enabling patients to link in with provider and counselling services whilst remaining in contact with their diagnosing clinician.

In terms of syphilis the evidence for *provider referral* is less clear. However it is the case in Australia that most cases appear to come from a group of MSM with multiple partners [3]. It follows from this line of reasoning that such index patients would benefit from encouragement by the diagnosing clinician to notify non-primary contacts by a provider service. This argument also validates the new PHU response for increased support of GPs diagnosing syphilis in the NSW context, as follow-up by a local sexual health resource could ensure transfer of this information and offers of assistance in notifying partners.

For gonorrhoea it is also less clear in terms of whether *provider referral* should be actively pursued or not. On the one hand this is still a relatively rare condition and therefore key informants have suggested that GPs also be provided with proactive support regarding partner notification, as is the case in other states. The new enhanced surveillance across NSW should be able to determine some further trends in risk factors of the population, in terms of whether they fit into those groups less likely to notify partners. At present evidence exists that partner referral is less likely to be successful when performed by gonorrhoea index patients as opposed to those diagnosed with chlamydia [18]. It may therefore be appropriate to follow-up community diagnosed index cases with proactive support for partner notification as for the other rarer STIs.

In the case of repeat infections it is possible that the partner of the index patient was not treated after the first diagnosis [94]. Repeat infections are also likely to be an indicator of higher risk sexual behaviour [40]. In any case such situations should be explored further and patients offered additional services which may include *provider referral*.

In summary, it is important for clinicians to be aware that more than type of referral mechanism may be appropriate for each index case. In particular index patients with the following profiles or partnerships should be explicitly offered the choice of *provider referral*:

- **Casual or ex-partners, oral or penetrative, of all index patients, including MSM**
- **Incarcerated partners**
- **Partnerships for less common diseases such as HIV, syphilis and gonorrhoea**
- **Partners of patients with repeat Infections (patient-delivered partner therapy (PDPT) may also be a suitable option in such cases – see below)[19]**
- **Index patients with reduced self-efficacy**
- **Male index patients (especially if any of the other factors above apply)**

‘Triaging’ in this way enables maximisation of resources in terms of provider notification. There is some preliminary evidence from the US that triaging chlamydia and gonorrhoea cases in MSM patients; index patients with more than two partners in 60 days; and index patients who don’t think that they will see the likely transmitter again, is an effective intervention in terms of population-health outcomes [95]. It is likely that experienced clinicians in the Australian context already ‘triage’ to some extent in this way, as this reflects the not-one-size-fits-all approach. It may however be important to formalise this information for less experienced clinicians, or those with less STI contact, and to ensure access to a variety of options for index patients if appropriate.

There does not appear to be any evidence in the literature which would suggest that regionalised resources for provider notification that are primarily based in SHC, such as is the case in NSW, have any intrinsic problems. On the contrary interstate key informants suggested that the reason centralised systems work in their states or urban locations is by virtue of their smaller size. They were also keen to highlight the importance that a contact tracer did not appear to be from ‘the government’ if delivering face to face diagnoses, and to focus on providing education and information rather than just results. The ACT audit of enhanced chlamydia contact tracing suggested that although public health officers ultimately notified more partners, the actual numbers of partners elicited per index case were higher in the SHC, possibly due to the patients being more relaxed with providing information to a clinical nurse than someone who was seen to be from the government [22]. The authors of the audit concluded that having contact tracers based in the clinic (as per the model now being practiced in the ACT and also in South Australia) would be likely to maximise both numbers of partners elicited as well as enable optimal notification of those partners. Of relevance is a trial in the U.S placing DIS in an HIV clinic to follow up on syphilis notifications. In the US study rates of partner notification were significantly improved compared to when the DIS were situated in an external location [96].

The regionalisation of NSW ‘contact tracers’, for the most part in SHCs, appears to provide an inherently increased capacity to support both provider partner notification in regional SHCs as well as *provider referral* and further information for community clinicians as required. An added advantage of regional health professionals informing partners of potential disease exposure is that they can also be there to provide ongoing access and counselling services if required, as the partner undergoes their own testing. This is particularly relevant with more serious diagnoses such as HIV, and examples of relatively intensive support were described during the key informant interviews. In terms of partner notification the main issue with the regionalised services of NSW will be clarification and ongoing training of the appropriate sexual health professionals who will be able to offer support for generalists in each area. Ensuring that local GPs are also aware of the regional supports available to them will also be required.

Regional Sexual Health Professionals who can undertake provider notification and support local GPs may have an inherent advantage over the more centralised model found in other states, particularly given the size of NSW. To maximise the benefits of regionalisation, clarification of who is able to support GPs in each area is required.

7 PARTNER NOTIFICATION IN THE CURRENT CONTEXT: PERCEIVED BARRIERS, EVIDENCE FOR ENHANCEMENT STRATEGIES, NEWER TECHNOLOGIES AND PRACTICAL IMPLICATIONS

In reviewing the evidence which suggests that *provider referral* is probably more effective than partner referral, particularly for certain types of partners, it must be noted that there are a number of different ways to enhance both the patient and *provider referral* methods. Enhancement strategies include newer technologies and accelerated partner therapies such as PDPT. It is also necessary to assess perceived barriers in the partner notification process and assess the evidence surrounding these. Adequate knowledge of perceived barriers, enhancement strategies and their evidence will provide further data on which to base proposals for improvement.

7.1 BARRIERS

7.1.1 CLINICIANS' PERSPECTIVES OF PROCESS AND PERCEIVED BARRIERS

Besides the very obvious barrier of being unaware that it is the responsibility of the diagnosing clinician to initiate partner notification, there are various other issues raised by Australian health professionals, and in particular GPs, around the partner notification process. For example GPs often consider privacy and confidentiality as a major barrier to carrying out partner notification, and this is especially noted in rural areas [14, 47, 48, 50]. In terms of GPs trying to provide anonymous *provider referral* this could certainly be an issue if the index patient was known to be one of their patients. Offering GPs, or their patients, easy access to appropriate third party notifiers, such as from a SHC, could help address this issue.

The relationship of the GP with the client is traditionally a longer-standing one than with that of a SHC consultant, so some GPs are concerned about alienating a patient if they 'encourage too hard' (KI). They may perceive a need to balance the importance of a public health action against primarily caring for their patient (KI). Similarly one key informant reflected on personal anxiety that they might feel as a GP with a distressed patient, in terms of how much partner notification would impact on relationship and how much it is actually going to help (KI). As has already been discussed, the reasons for contact tracing are complex but for the most part in terms of current partners and re-infection partner notification is considered part of good clinical management. In terms of casual or past partners the patients' reluctance is to be expected. However if patients are aware that past partners are usually unaware of their infection, the patients reluctance may be reduce, particularly if they can be reassured that there is the option of an anonymous partner notification process. Further, evidence suggests that patients don't necessarily mind thinking of contact tracing as a social duty, and many consider it 'the right thing to do' [97, 98]. Nevertheless giving GPs an opportunity to reflect on these issues and their feelings, as well as the potential for GPs to react negatively to perceived infidelity when addressing the issue of partner notification, was suggested to be part of any formalised training recommended (KI).

The issues of cost and time in General Practice have been raised, particularly in the Australian fee for service model [49, 99, 100]. One aspect of the problem is that if GPs have little skill and experience in an area it can be perceived to be onerous and more time consuming. Two key informants involved in raising

awareness of sexual health to general practice in rural areas suggested that an understanding of the process led to not only improved acceptance of the role of GPs in initiating partner notification, but also to an awareness that the process did not have to be particularly time consuming. From a different perspective there are many areas of general practice where practice nurses are being increasingly employed to assist time-poor GPs. Until recently their role was officially confined to various item numbers mainly around chronic disease and vaccination. However with the 2010 federal budget block-funding for practice nurses has been introduced, which could enable more involvement by practice nurses in the partner notification process [101]. The potential roles of practice nurses are addressed further below.

Some rural key informants raised access to GPs and/or bulk-billed consults in rural areas as an issue. In some areas this problem is addressed by the presence of a sexual health nurse run clinics via community health. Again, collating a list of local resources and raising awareness of such options for partners of index patients whose GP's books are closed could help with this problem. Online services, discussed later in the review, are being introduced for chlamydia testing in Western Australia and for STI testing for rural youth, indigenous or MSM in Victoria [102, 103]. These will be able to be used for partners and notification of partners as well.

GPs may report lack of contact details or the anonymity of partners being an issue in partner notification [49]. Completely anonymous partners can be an issue, particularly with MSM index patients. However informants suggested that anonymity of partners was often an indication of lack of motivation to inform, or to stem from emotional reasons [104, 105]. Lack of contact details for partners indicates casual or ex-partners, therefore providing the option of anonymous GP clinic provider or local SHC provider notification for contacts might address this perceived anonymity. Having only a mobile, email or website alias are not necessarily barriers to partner notification, and encouraging awareness of this fact amongst clinicians and index patients whilst offering contact methods for delivery of notification messages via these mediums could potentially address another aspect of perceived anonymity.

Another significant barrier raised by GPs is their perceived lack of written policies/clear guidelines, skills, & experience [49, 50]. Further it has been suggested both in the UK and Australia that screening programs will be disadvantaged if support for partner notification is not enhanced [106, 107]. Several GPs and a practice nurse who were already known to the STI Programs Unit (STIPU) were interviewed for this literature review. These practitioners came from a variety of settings including 'normal' general practice, indigenous health, youth-focussed medicine and a high case-load sexual health. One practitioner also worked in a regional SHC. Unsurprisingly given the connection with STIPU they were all aware of their responsibilities in terms of initiating partner notification. However not all had knowledge of the STIPU STI testing tool kit and for those not directly working in SHCs there was also a broad request for further guidance and information in the process, including from a GP in an inner-Sydney high case load clinic. It was also suggested by more than one informant that as part of development of a contact tracing package in the state a clarification from a medico-legal perspective on what a reasonable number of attempts to trace a contact should be made, particularly with respect to higher morbidity conditions such as HIV and syphilis.

Community clinicians may feel that partner notification is more of a public health issue, but in terms of regular partners it is part of good clinical management. Moreover patients may consider notifying partners as 'the right thing to do'. Optimising resources for anonymous partner notification and providing GPs with more resources may help to overcome some barriers perceived by community clinicians.

From a patient's perspective *patient referral* can be embarrassing and stressful [83, 97]. There are fears of negative reaction, gossip and rejection [15, 43, 83, 87, 98]. Fear of violent reactions from partners is also of concern for both patients and clinicians [43, 83, 97]. Some patients may be more reluctant to notify of certain STIs than others. For example syphilis may be conceived of as being 'rare' or 'dirty' [87, 108]. It is for these reasons as well actual or perceived anonymity of partners that patients find it more difficult to notify past or casual than present partners [43, 81, 98, 105, 109]. Notifying partners was most problematic for men who were in serially monogamous relationships, but these types of relationships have also received the least attention in the literature [15, 97]. In contrast women are more likely to assume responsibility and express guilt and blame, whilst they are also more likely to notify partners despite higher rates of expressed fear [83, 110].

Some of these concerns are also related to *provider referral*, especially when confidentiality of the source is difficult to attain. Other issues pertinent to *provider referral* include the possibility of some mistrust in indigenous populations where partner notification may have been done under coercion in the past, or less rapport with providers perceived as coming from 'the government' [22, 111].

In terms of partnership dissolution, there are reports of significant loss of family, friends and breakdown of social structures with HIV disclosure to partners by African American women [112, 113]. On the other hand Kissinger et al reported that partnership dissolution related to notification of HIV status in both genders was not higher than for notification of syphilis status, and also not necessarily higher than for background rates in the same population and relationship types. This suggests that partner notification for HIV may not have an effect on partnership dissolution [74]. Hoxworth et al also found that partner notification was not associated with increases in partnership dissolutions or acquisition of new sex partners [73].

There is little evidence for violence as an outcome of partner notification and what is known tends to be from developing countries or from African American communities with HIV in the US [75]. Hence Gielen et al noted some violence associated with HIV status disclosure, but this was minimal, and related to prior history of sexual or physical violence [112]. A study on disclosure of gonorrhoea and chlamydia in a minority ethnic urban US community reported that 33% of those notifying suggested that there had been an argument or fight related to partner notification and four percent reported physical violence [114]. American literature also suggests that there was no difference in terms of women declining and accepting HIV test with respect to their perceived fear of partner violence, but 16 % reported violence in the last year [92]. All of these studies pointed to high rates of background violence in the communities under assessment.

In terms of Australian literature the association of violence with partner notification are minimal. Bilardi et al found that 9/169 (5%) of their study's participants reported adverse effects from notifying their partners of a chlamydia diagnosis, with eight of these nine reporting verbal abuse and one patient reporting physical abuse [15]. There were five heterosexual men, three heterosexual women and one MSM in this group. The same study suggested that 50% of participants described the experience of telling their partners as 'better than expected', 45% 'neither better nor worse than expected' and only five percent 'worse than expected'. Many partners in this study were found to be caring, grateful, relaxed or 'cool' about it [105]. In general, despite apprehension most fears of partner notification are generally overcome [83].

Consequently the available data suggest that rate of violence attributable to partner notification is low but additional study is needed. Where higher rates are noted there appears to be a higher rate of background domestic violence. This may equate to differences in risk of violence within different cultures that clinicians should be aware of when considering how to approach partner notification and treatment of their index patient.

On the whole the experience of Australians telling their partners about STI exposure appears to be better than expected. Moreover violence is not significantly associated with partner notification, although it may be an issue if there is background domestic violence in the relationship.

7.1.3 ACCELERATED PARTNER THERAPY

There are various options for accelerating partner therapy. Patient-delivered partner therapy (PDPT) and home/postal testing kits are the best researched, although PDPT is a legal grey area in terms of Australian medical practice. On the other hand the UK is currently assessing various forms of clinician accelerated partner therapy, which may be more acceptable to practitioners. PDPT, as discussed with informants who occasionally practice this in Australia, is often a mixture of the various methods.

HOME/POSTAL TESTING KITS

The rationale behind home and postal testing kits (PTKs) involving a urine sample for PCR testing for *chlamydia trachomatis* is to provide a more appealing option to increase the testing rate of partners [115, 116]. A randomised study based in Denmark, and reviewed by Trelle et al (2007), found that more partners were tested through PTKs compared to contact slips requiring partners to see a doctor for a urethral swab (68% of those contacted vs 28%; $p < 0.01$) and there was a trend for partners receiving PTKs to be treated earlier (5.1 days difference, 95% CI -1.6 - +11.8). However subsequent UK -based studies have shown that home/postal testing kits are no more effective than contact slips alone at increasing treatment of male partners of female patients [116]. Nor are they more effective than *patient referral* at reducing chlamydia reinfection in females [117]. Although both studies may have been underpowered to detect a difference, the evidence does not support a benefit of postal or home testing kits. In fact, Cameron et al (2009) demonstrated a two-fold increase in index patient reinfection rates with PTK, probably because of the delay to return of test results and treatment [117]. Consequently, PTK should only ever be considered in conjunction with PDPT. Health professionals responding to a questionnaire in the UK established that PDPT combined with PTK was the most popular choice of novel interventions for partner notification, and nearly all pharmacists would be willing to supply free PTKs and offer testing and treatment services [118]. In contrast, in a different questionnaire representing potential patients, respondents expressed a very low preference for PTK compared to PDPT and *patient referral*. However, a number of women volunteered that they would prefer PDPT and PTK combined, which was not an option on the questionnaire. There is the possibility that more respondents would have selected this as an option, if it were available [119].

In Victoria the combination of postal kits and online or phone assessment are being trialled for primary investigation of STI in rural youth, MSM and indigenous patients, which could be feasibly be used to follow-up partners as well [103]. Western Australia is also offering a similar model for patients both rural and urban older than 16 years [102].

CLINICIAN ACCELERATED PARTNER THERAPY

Clinician accelerated partner therapy assumes assessment of a sexual partner by a health care professional without clinic attendance. Choices include a phone call or online assessment from a clinician based health care worker and/or assessment at a local pharmacy. Treatment in the UK is legal if a health professional has assessed whether therapy is suitable and the prescribing doctor takes responsibility [18]. A feasibility study there suggested that the option of a community pharmacist assessing a partner for suitability to therapy was more popular than a phone-call from the clinic nurse whilst the index patient was at the clinic, particularly as in the latter option the index patient would have already had to tell their partner that they were attending the clinic [120]. The full outcomes of this study are awaited but an exploratory trial suggested that, although a less popular choice than routine partner notification, more partners were treated in both intervention arms [121, 122].

There is currently little evidence for postal testing kits or phone/online/pharmacy assessment however this situation should be reassessed when current UK trials and online resources from Victoria and Western Australia are evaluated.

PATIENT-DELIVERED PARTNER THERAPY

Patient delivered partner therapy is when the index patient is given medication and instructions for their sexually exposed partner(s). Most of the PDPT literature is from the U.S. This is a population with very different health access to urban NSW areas. However health access in the US may not be so different from that of regional and rural NSW. Consequently from key informant interviews it appears that the use of PDPT is higher in areas with more difficult access to health services in NSW, as well as amongst practitioners working in indigenous health. Also in terms of infections Australia does not have a first-line oral treatment for gonorrhoea, so PDPT cannot be used for this infection.

THE SITUATION OVERSEAS

Many American states have changed legislation to allow for the introduction of PDPT [123-125]. For example in California PDPT is now legal for the treatment of chlamydia and gonorrhoea, and as of Jan 2007 there had been no reports of adverse effects of PDPT for chlamydia (with azithromycin as in Australia) [126].

In the UK PDPT has been found to be acceptable in to a majority of patients and clinicians, but it is not legal. Moreover the support is not overwhelming and generally more people would prefer it for their partners than to have this given to them from their partners (this is particularly the case for female partners of male indices) [119, 127-129]. The majority of GPs in the UK are cautiously prepared to practice PDPT if there is no other choice but some remain adamantly opposed [130].

THE EVIDENCE

There is moderate evidence for the effectiveness of PDPT as an enhanced form of *patient referral* as assessed by various systematic reviews. Mathews and Coetzee [76] conclude that compared with *patient referral* alone supplementing *patient referral* with PDPT may be more effective at reducing the proportion of index patients with resistant or current infections. They state that this is applicable to chlamydia, gonorrhoea and trichomonas and quote the Trelle [77] review for evidence. Trelle undertook a meta-analysis that included five trials and concluded that **the rate of persistent or recurrent infections were**

lower in the PDPT group for chlamydia and gonorrhoea but not for trichomonas [77, 131-134]. The trichomonas evidence came from one study from Louisiana which assessed whether PDPT was more effective in women than Booklet-enhanced *patient referral* (BEPR) or routine *patient referral*. The persistent infection rates of women with BEPR were significantly lower than both for PDPT or routine *patient referral*, which had similar outcomes [133]. Interestingly one key informant suggested that the long term use of PDPT for trichomonas in Australia was one reason for the original reduction in urban rates. Notably current urban rates of this condition (which is not notifiable in NSW) are difficult to judge [135].

In the same 2007 review Trelle meta-analysed four trials which showed **an increase in numbers of partners treated with PDPT over standard *patient referral* for the three STIs**. However there was significant heterogeneity in the trials.

THE ISSUES

These studies reveal that the beneficial effects of PDPT are modest and susceptible to selection and measurement bias [136, 137]. Moreover whilst efficacy has been established effectiveness (or real-world applicability) remains understudied [138]. In terms of effectiveness there have been some recent evaluations of community outcomes after the introduction of this option in various US states. Hence Bernstein concluded that in San Francisco after adjusting for the fact that higher risk patients were more likely to be offered PDPT, the practice was not more effective than routine partner referral in terms of index patients presenting at a later date with reinfection of chlamydia, although there was marginal improvement with gonorrhoea [139]. Similarly when Muvva compared historical controls with current patients being treated with PDPT, although there were fewer reinfections with gonorrhoea and chlamydia combined, or for gonorrhoea alone, there was no significant difference in terms of reinfections for chlamydia alone [140].

Other issues include the fact that PDPT does not appear to be associated with increased disclosure to casual partners [141]. In addition when it is used to treat chlamydia alone, there is the possibility of missing other diseases in the traced partners and not effectively treating pelvic inflammatory disease in women, which has an incidence of around four percent in affected partners (and requires more extensive and longer lasting antibiotic treatment)[142-145]. This risk is reduced if the intervention is confined to heterosexual people in the Australian context [146]. PDPT could also lead to missing contacts of contacts: In one study from Scotland additional cases identified through partner notification amounted to 22% [147]. However in a Sydney study the upper limit of missed secondary contacts was lower at 7.3% [144].

A further difficulty is that although in Australia, as in the UK, there is grudging support for the practice amongst GPs if no other choice exists, it is not a practice that such practitioners are particularly positive about [51, 148]. Some clinicians have expressed the concern that PDPT could be used to give a partner medication without their knowledge, whilst many are concerned about adverse effects.

THE REALITY

In reality key informants suggest that PDPT has been practiced for some years by prescribers in Australia, albeit sometimes reluctantly [18]. It is more likely to be used in rural areas and is not infrequently used with indigenous communities. In such areas sometimes the clinician already knows the partner or a phone call might be made to assess them first, which makes the practice more like a form of clinician APT (KI). The literature supports the use of PDPT in communities where female index patients do not think that their

male partners will present for follow-up [149]. Moreover another study reported that the provision of PDPT was associated with increased disclosure of STI to the partners of male index cases [141]. (This is important given men generally have lower rates of disclosure than women, as this study also showed, so exploring ways to increase this are essential.) To this extent the presence of medication may increase the reality of the condition, particularly if the partner has no symptoms, and therefore make it easier for some people to disclose [105].

From clinicians practising PDPT the idea that patients could be delivering partners medication without disclosing the condition was seen as a real possibility. It was mentioned however that in reality sometimes patients and partners really don't want to acknowledge certain conditions: particularly STIs if there is sufficient community stigma surrounding these. Therefore, although by no means ideal, the delivery of medication for an STI to a partner with the generic explanation that the index case has 'an infection' that the doctor doesn't want them to catch may address this otherwise catch22 situation. There are also anecdotal reports that young indigenous partners recipient of PDPT in the past were more likely to present in the future with symptoms of an STI, as they were familiar with the treatment and aware that it was both free and easily accessible.

THE AUSTRALASIAN CHAPTER OF SEXUAL HEALTH MEDICINE POSITION STATEMENT

This chapter has produced a position statement for consideration by the Royal Australasian College of Physicians [150]. The draft policy reflects the evidence and the issues and suggests that PDPT can be used for partners of heterosexual people diagnosed with confirmed chlamydia (= 1g azithromycin stat) for each partner for the last 6 months. To avoid complications in partners the policy recommends education for partners and the index patient. It also recommends referral of the partner for testing and retesting after 3 months. If approved some assistance from the Commonwealth will be required in terms of writing prescriptions for partners.

In summary:

PDPT may be a future option for regular partners of heterosexual index patients should alternatives not be suitable.

PDPT is less likely to be successful with casual or ex-partners.

PDPT is not suitable for MSM.

It is unclear if PDPT is suitable for index cases with trichomonas.

It may be particularly relevant for males who might have difficulty informing their female partners or female index cases who feel that their male partners are unlikely to present to a doctor despite being informed of their STI exposure. (Patients in these two groups may be identified if presenting with recurrent infections.)

It will be necessary to evaluate any move towards PDPT in the Australian context, particularly with respect to impact on repeat infections and complications. What the literature shows however is that whilst PDPT and home sampling alone improve *patient referral* to a certain extent, further strategies that promote and assist disclosure to partners are needed as part of a comprehensive approach to *patient referral* [136]. Thus PDPT should be just one of a suite of available resources to assist patients tell partners about a diagnosis of chlamydia [105].

7.2.1 TELEPHONE REMINDERS/FOLLOW UP OF PATIENTS

Based on a single small RCT by Montesinos (1990), Oxman's systematic review concluded that telling patients they will receive a reminder telephone call is effective in increasing the number of contacts presenting for care [72, 151]. This was also the most cost-effective model of partner notification when compared with standard care and a small financial incentive for the index patient when the partner presented. Mathews and Coetzee [76] reanalysed the data using the ratios of 16/19 patients following up in the control group (normal counselling) versus 19/19 in the intervention arm (who were told that they were going to receive a follow-up phone call) and concluded that this difference was not significant. It is unclear where the 16/19 figure arises from, and according to an analysis of the Montesinos study for this literature review that figure is actually 13/19 partners notified in the control arm¹. In any case using the methods employed by Mathews and Coetzee these numbers are still too small to show a difference (95% CI -0.27 – 0.90) However it is important to look at the raw ratios of 13/19 versus 19/19 as trends and review other studies and evaluations to assess the benefit of follow-up by telephone or otherwise.

A more recent RCT from the US assigned patients with chlamydia or gonorrhoea to either standard care or a group that was counselled at the time of diagnosis and given additional follow-up contact approximately four weeks (range two to ten) after the initial counselling [114]. Intervention participants were more likely to report sexual partner notification at one month than controls (92% versus 86% adjusted odds ratio (AOR) 1.8 (95% CI 1.0-3.0)) and were more likely to report no unprotected sexual intercourse at six months (48% versus 38% AOR 1.5 (1.1-2.1)). At six months repeat testing was undertaken and gonorrhoea or chlamydia infection was detected in six percent of the intervention and 11% of control participants (AOR 2.2 (1.1-4.1)). Notably when divided by gender there were no differences for females between the intervention and the control group, which reflects the consensus views earlier that females are more likely to undertake partner notification in the normal instance than males. Conversely the intervention was much more effective in male index patients.

What these studies suggest is that a form of follow-up can assist in addressing the inertia that surrounds partner notification, and that this may be more effective in male index patients. There are numerous other non-randomised studies which indicate that the follow up of index patients with STIs enhances partner notification [152]. Telephone follow-up of patients with a reminder about partner notification has been trialled in the UK as an alternative to clinic re-attendance, in order to minimise the clinic time required [153]. Three UK-based studies, including a national audit, support that telephone follow-up is at least as successful as re-attendance in ensuring partner notification and treatment of contacts of patients with chlamydia [63, 152, 153]. One of these studies, a retrospective review following a change in guidelines from re-attendance to telephone follow-up, demonstrated an increase in the number of patients and contacts treated satisfactorily with telephone follow-up (51% versus 30%; $p=0.0001$) and identified a reciprocal association between satisfactory patient management and satisfactory patient notification [153]. Although this clinic was urban-based, there may be added benefit is using telephone follow-up in remote areas with limited accessibility (KI).

¹ The authors have been contacted to ask for clarification.

Key informants suggested that tactful follow-up was considered one of the most simple and effective interventions in the partner notification process. Interestingly it is possibly by virtue of the fact that prospective studies need to enrol patients to determine results that differences between interventions and 'normal care' have been difficult to show for these types of assessments. For example simple enrolment of a patient in a study can motivate them to follow instructions more clearly than in the normal clinical environment. Moreover if patients are aware that they will be actively followed up (i.e. receive a phone call) it is likely that in general they will try harder to comply with instructions than if follow-up was occurring by other means (for example if the partner was presenting with a slip stating their exposure to an STI). Thus Edmiston and Ooi (in press 2010) recently trialled the intervention of a new chlamydia card in the Hunter New England region which incorporated disease information and a website address on a small card [4]. Both arms were informed that they were receiving a follow-up phone call after two weeks (personal communication). The notification index (NI) or number of contacts divided by the number of index patients was similar in both arms of the study (1.83 versus 1.91) however the authors also undertook a pre-study audit where the NI was 1.02. In comparison with the pre-study audit both arms of the intervention were significantly higher (1.83 versus 1.02 $p = 0.00$). Similar significant differences were noted for the intervention arm and the pre-study audit figure of partners per index case known to be treated (0.64 versus 0.95 $p=0.05$).

The various forms of evidence can be used to conclude that:

Follow-up in the form of scheduled telephone calls is an effective intervention in increasing rates of partner notification with *patient referral*.

Follow-up may also give an opportunity for index case who has previously opted for *patient referral* to take up *provider referral* as well, as is offered in South Australia [154]. For this type of intervention to be effective it requires a system where follow-up is a routine part of the clinical management. Many SHC have a form which prompts the clinician to ask about partner notification when the patient returns for a follow-up visit, but this will be ineffective if patients do not return for another appointment. An alternative model is to call all positive cases of bacterial STIs with the result and discuss partner notification over the phone, with in-clinic follow-up, as occurs in one SHC in Sydney. Follow-up in terms of partner notification is also not a routine component of general practice managed STI, including from some high-case-load clinics (KI). Given that a phone-call reminder is neither a difficult nor an expensive intervention, and could be incorporated into an enquiry about the success of the treatment in terms of symptoms or otherwise, assessing models about how this might be incorporated more generally into clinical practice are warranted. There is no evidence regarding how long after treatment a call should be made but between 1-2 weeks was the norm in practice in Australia and in the UK. The point is that scheduling this follow-up call is potentially more important than actually performing it.

7.2.2 CONTACT SLIPS/INFORMATION PAMPHLETS

As for telephone calls there are some differences between the systematic reviews as to whether contact slips and/or information pamphlets appear to be effective in increasing the number of contacts presenting for care compared to routine *patient referral*. Hence Oxman [72] suggests that referral cards appear to be effective, whilst Mathews [75] and Trelle [77] were unable to show an improvement with information pamphlets, but submitted that these conclusions are based on few studies.

Conversely a meta-analysis found that **supplementing *patient referral with information for partners was as good as PDPT in reducing persistent infection of index patients with a bacterial STI*** (chlamydia, gonorrhoea, and trichomoniasis) even if more partners were reported by index patients to be treated with PDPT [77].

Contact slips are proposed to facilitate the referral and monitoring of partner notification for identified contacts of patients with a STI. Even if the contact attends a different clinic to the index patient, they can be managed appropriately and their attendance noted at the original clinic. Numerous studies support contact slips as a means of increasing the number of sexual contacts seen. Furthermore, they provide evidence that contact slips that name the specific STI potentially exposed to, rather than using a code, are equally acceptable and more effective [155-157].

In Australia partner notification letters have been popular in the past as a means of enabling patients to give their partners some written advice, as well as something to take to their own doctor for appropriate management. At the Melbourne SHC, after patients were assessed on their preferences, there has been a move away from giving letters *per se*, instead patients are given a card with directions to the centre's website where letters are available along with information and other forms of contacting partners thus providing the index patient with a choice [158]. Index patients also have the option of notifying their partners on the spot with the clinician via the website (KI). Moreover GPs show support for printable and website sources to give to patients for their partners [47-50, 52]. Having easy access to such resources to give to patients is likely to increase the numbers of patients receiving additional information.

Hence supplementing verbal information with some form of written resource or easy to access information (such as via a website address) is likely to improve partner referral notification rates.

It must be highlighted however that contact slips, letters and information should be used to supplement routine counselling and information about STIs. There is evidence that written information that replaces routine counselling may not be as effective [72], which is supported by key informant feedback.

7.2.3 SKILLS & EDUCATION TO IMPROVE CONTACT TRACING OUTCOMES

EXPLORING PATIENT CIRCUMSTANCES

There is no blanket solution to partner notification; instead it needs to be tailored to individual patient circumstances. Consequently, it is important to engage patients in dialogue to elucidate their personal fears, apprehensions and perceptions of STIs [87, 109]. Willingness and ability to notify partners is particularly dependent on the type of relationship (e.g. regular, casual, or anonymous partner) and thus flexibility to offer different types of partner notification for the one patient should be explored [43, 81, 87, 109]. It is important to be clear that more than one partner is acceptable, and that they can all be treated. Key informants suggested that most people were happy to give names if a non-judgemental approach was used in the spirit of helping people, with the offer of confidential support.

COUNSELLING

Key informants with significant experience in contact tracing were consistent in suggesting that patients are more likely to inform partners if they were well informed themselves, and to never underestimate the value of explaining to an index case the reasons why it is appropriate to inform partners.

The Cochrane review reported on a large unpublished four-arm RCT from South Africa with 1719 people diagnosed syndromically with an STD [75, 159]. In this study patients were randomised to *patient referral* supplemented with either individual patient-centred counselling (of index patients) by lay counsellors, nurse-delivered verbal health education, or education plus counselling, or to simple *patient referral*. The Cochrane review found that, **compared with *patient referral* alone, counselling plus education significantly increased the number of partners treated per index patient** (106/417 [0.25 partners per index patient]) with education plus counselling versus (77/433 [0.18 partners per index patient]) with *patient referral* alone; difference 0.07, 95% CI 0.01 to 0.13.

Counselling skills to improve patients' self-efficacy and partner communication skills can help overcome barriers and enhance patient notification [160]. Kuyper demonstrated that motivational-based counselling may be more effective than educational counselling. Consistently, more partners were notified after motivational-based counselling, although the difference was not statistically significant [104].

INTERVIEWING TECHNIQUES: PARTNER ELICITATION AND TRAINING

It is noted that clinicians also require specific training and support in counselling skills as well as training and practise for discussing sexual behaviour with patients [104, 161]. Training increases both partner elicitation as well as follow-up [100]. However as previously noted partner elicitation may be hampered if providers doing the contact tracing are associated with a more governmental and less clinical role [22].

The success of partner notification, whether by patient or provider, is ultimately limited by the number of partners identified by the index case. Patients may misjudge or bias which partners they mention, or may not be able to remember all partners [75]. Two studies have demonstrated a cumulative benefit of using variety of cues (role, location, timeline, chronological, network and alphabetic) to prompt patients. Simple non-specific prompting and reading back a list of names each increased the number of additional partners elicited by 3-5% on average [162]. More specific prompting of location and alphabetic cues each increased the number of sexual partners elicited by around 10-12% and were the most time-efficient to apply [163]. Contact tracers interviewed for this review agreed that with a few cues people could often remember whom it is who needs to be notified. More recently the service evaluation of partner notification for the UK National Chlamydia Screening Program 2006-7 also found that good partner notification outcomes were associated with recording partner names in UK program [79].

Therefore whilst educating an index patient about their STI is an important component of clinical management, exploring a patient's personal circumstances, self-efficacy and motivation to inform a partner may be useful adjuncts in improving rates of partner notification. Techniques for eliciting partner counts or names in people with multiple partners could also be incorporated into training of professionals routinely involved in partner notification. Further, reminding all clinicians that simply exploring whom it is who needs to be contacted with a patient is also likely to be of benefit.

The European Partner Notification Study Group [164], which studied outcomes of partner notification in index patients with HIV, recommend a specific worksheet to guide clinicians in defining the partner notification period in order to know which partners need to be advised of their risk of being infected. In Australia, a study of GPs found a wide range in the periods used to trace back potentially exposed partners, from less than three months to more than a year [48]. More recently a UK review reported that there was a slight improvement in the percentage of chlamydia contacts notified as treated after the introduction of a proforma (80.7% from 77.9%) and dramatic increases in demographic and contact tracing details [165]. These are not significant changes but it is noteworthy that the area is poorly studied. It is also important to appreciate that the Sydney SHC which introduced specific contact tracing sheets within the last two years has noted a subjective improvement in the follow-up of partner notification after this change. In addition a GP interviewed for the literature review reported that he felt a lot more comfortable about asking partner notification questions using the supplied proforma where he was currently based (in a high STI population) than when he was normally practising in an urban-based Sydney clinic. Similarly a practice nurse interviewed suggested that when taking a sexual health history from a patient she always clearly followed a written check-list based on a STIPU model, reporting that this made her feel more comfortable in asking such questions of patients since they could see that this was routine rather than being particularly about them and their sexual experiences. As mentioned, the evidence suggests that GPs feel under-skilled in contact tracing, which is part of the reason that they may not initiate this [49].

Specific proforma may increase the comfort level of GPs and other clinicians in eliciting names of partners and exploring methods of partner notification with index patients.

The benefits could be in both helping initiate contact tracing in the first place (the step most likely to have a major impact since this appears to be the rate-limiting step in practice) as well as improving the process of partner elicitation and follow-up.

Utilising online services effectively has been proposed as a means by which to increase the number of partners being contacted by both patient and *provider referral*. It is difficult to compare this form of notification with others due to the fact that it is often employed when other forms of contacting a partner are not feasible. In general terms however using online forms of notification provide a wider choice for those inclined to use such methods and are likely to be particularly useful for targeted populations [166]. Evaluations of internet services for partner notification are often limited because they do not measure actual outcomes in terms of partners seeking testing and care. Traditionally recruitment of acceptability studies were also generally through internet sites, and as such were positively biased by people with access and who were comfortable using the internet [167]. However recent Australian studies have looked at wider populations of patients to determine acceptability [168, 169].

PATIENT ACCEPTABILITY

In an online survey of 1848 people, Mimiaga et al (2008) reported that 92% of respondents would use internet partner notification in some capacity (either send an email themselves, or have the department of health notify partners using a partner notification email), and approximately two-thirds reported that they would use the DOH to send notification emails to some or all partners [166, 167]. Patient preference was for the internet to be used for casual partners, with the respondents electing to notify regular partners themselves [166, 170].

In broader based studies, including from Australia, internet and short message service (SMS) notifications were seen as too impersonal, and patient preference was for face-to-face or telephone notification, as well as hand written letters by either patient or doctor [15, 158, 169, 171]. If *provider referral* was chosen a significant percentage of younger people also found letter, email or texts to be reasonable options [84]. In addition men appear more likely to accept an SMS or email as a form of contact whereas women prefer being informed directly or by letter [82]. However as above, patients considered that online services were reasonable for casual partners, or if they were worried about their regular partners' reactions [15]. One recent Australian study suggested that young people were particularly savvy when it came to new technologies and expressed avoidance of written forms of notification as these could become evidence of a person's STI infection, leading to shame and embarrassment [169]. This study notably had minimal population of MSM.

Bilardi et al. (2010) found that MSM and women were considerably more likely than heterosexual men to elect that they would use web-based resources for partner notification if they were available. Anonymous E-cards would be considered by 2271/2932 (77%) of MSM in a multi-city based assessment in the U.S. [172]. In the same study only eight percent stated that they would not use the E-cards because they considered them too impersonal. Subsequently, the suitability of partner notification methods, and particularly the use of web-based resources, may be somewhat dependent on the relationship type and patient circumstances, as has been demonstrated for the suitability of patient versus *provider referral* methods.

In general the acceptance and use of internet based resources, be they for directly contacting partners or for exploring techniques of how to tell partners more directly, is increasing with improved ease of access to the net and incorporation of online information into daily lives. Hence in a recent Australian-based

telephone survey of 202 males and females recently diagnosed with chlamydia, 47% expressed that they would find a website with an anonymous email or SMS notification service useful, 61% would appreciate a website with suggested wording for a conversation, letter or SMS to notify partners, and 34% of participants would have contacted more partners had web-based tools been available [15].

PROVIDER-FOCUSSED ONLINE SERVICES

There are numerous examples of the internet being used to implement provider partner notification. It is particularly useful for tracing contacts of internet-initiated sex, including STI outbreaks arising out of internet-based sexual networks. In an outbreak of 759 MSM with early syphilis in the US, 23% reported using the internet to meet sex partners [173]. Such contacts are generally 'anonymous' in the sense that real names and other contact details may not be known, and therefore the internet may be the only means by which to contact them. Anonymous sex partners are more common amongst MSM than heterosexual men and women, and generally people who seek sex over the internet are at higher risk for STIs [166, 174-176].

USA and UK providers have reported many instances when contact tracers successfully contacted sex partners via emails or screen names. Notifications such as these can have a high yield in terms of numbers of partners contacted per index case. They are also useful for contacting people who might otherwise not present for screening, yet maintain a high-risk sexual lifestyle. For example in one case in the US, a patient named 134 partners he had met over the internet, and was able to provide online details or emails for 111 to public health authorities. Of these, 29 (26%) persons responded and were contacted [173]. In another example from the US 18 partners reported being notified from three index syphilis cases [177].

In a case-control study of six outbreak cases in 1999 of early syphilis among MSM in San Francisco, 42% of named partners were notified and testing confirmed [178]. This case was controversial in the sense that the public health authorities also sent out general online warnings on the site about the syphilis outbreak (so-called 'tsunami' notifications) and placed advertisements in a local paper which led to a significant amount of anti-MSM hate-mail on the site. The repercussions point to the fact that online and media services should be employed sensitively.

Through an audit of contact tracing through ManHunt (an MSM sexual networking site) in which partners of infected MSM were sent a standardised SMS and instructed to call a DIS, 29% had a confirmed medical follow-up, and an additional 28% stated their intention to seek medical follow-up [174]. In the UK an evaluation of provider notification services of a GUM clinic from 2004 -2008 concluded that although uptake of internet *provider referral* was low, the yield was high in terms of partners traced and new infections found per index patient (0.7 (8/11)) [179]. They concluded that this service should routinely be offered to MSM with an STI and internet partners.

In a case-control comparison of being contacted by email through provider-initiated partner notification, controls' (who did not have pseudonymous email sexual partners) partners were more likely to be notified than cases' partners (69.7% vs. 49.7%). However, the cases' partners could not otherwise be notified without email, and thus email notification was still considered to be beneficial [175].

USING THE INTERNET AS A PROVIDER TO CONTACT PATIENTS

Important features of internet partner notification proposed include: using professional language; wording the subject line to promote urgency; continuous updating of the subject line to keep e-cards out of spam filters; specific details about the possible STI infection; providing a phone number or web link for the recipient to verify the identity and authenticity of the sender; utilising read receipts; and multiple contact attempts [166, 170, 173, 175, 180].

Although including STI-specific information may increase risk of breaching confidentiality [166], in cases such as internet-initiated contacts where pseudonymous email addresses are used the addresses are often quite explicit and less likely to be shared, and subsequently provide reasonable assurance of confidentiality [175]. Similarly in a study of 53 cases with pseudonymous emails, only 16.4% emails were invalid [175].

US Guidelines on using the internet for provider-based partner notification suggest that emails and messages should be sent from designated and not personal accounts. Experiences in the state of Massachusetts support the use of a single person per centre to have charge of internet notifications of partners [181].

NSW APPLICATION OF PROVIDER BASED INTERNET PARTNER NOTIFICATION

Provider use of the internet to contact partners in NSW is likely to be most beneficial for addressing partner notifications of index MSM cases with multiple partners based on the NSW STI disease profile. The potential for accessing sexual networks is apparent, as would be the potential for accessing partners who may otherwise be perceived as 'anonymous'. In terms of other states, the ACT reports that a clinic log-on to a MSM sexual networking site has been used in the past, however whether this was a successful option or not is less clear. Two Victorian informants reported responses of 70% or higher when contacting patients in this way, noting that providing their name and a contact phone number on the message appeared to improve responses by partners.

This system could be trialled in SHCs with a larger clientele of MSM in NSW. The evidence suggests that having one person responsible for the clinic log-on would be preferable. In some areas of the state there are MSM sexual health workers employed who would conceivably be appropriate for the role and/or one of those professionals normally responsible for *provider referral* in the clinics. There was some key informant interest about having clinic log-ons to sexual networking sites; however it was noted that patients are not generally asked about whether they would like the clinic to anonymously contact partners for them in this fashion. Incorporating education regarding this potential access point to partners would be required in educational sessions targeting clinicians involved in high caseload STI diagnosis.

There is evidence for the benefit of providers offering to notify partners via emails or online aliases, particularly if partners have been sourced through the internet

OTHER ONLINE SERVICES FOR CLINICIANS

- The **Silver Book** (<http://silverbook.health.wa.gov.au>):
The Silver book is an online STI management resource for clinicians produced by the Western Australian Department of Health that includes a section on partner notification and letters for clinicians.

- **Could I have it?** (<http://www.couldihaveit.com.au/>): Chlamydia specific information for clinicians and patient letters are also available in Western Australia via a link to the ASHM site on 'Could I have it?' (One of the two governmental chlamydia information sites targeting the community.) The link leads directly to ASHM resources for the Chlamydia Screening and partner notification in Western Australia General Practice Training Session, which is part of the education package currently being evaluated in the state outlined previously. There is a further link to access the chlamydia resources including patient letters.
- **GP Assist** (<http://www.mshc.org.au/Default.aspx?alias=www.mshc.org.au/gpassist>): This site run by the Melbourne SHC has direct links to resources for six non-HIV STIs including patient letters. Only absolutely essential links and resources are on each page with minimal wording, in keeping with the observation that GPs require clear, concise and easily digestible information in point of care resources (KI).
- **Drama Down Under** (www.thedramadownunder.info): Alongside its other patient-centred partner notification services, Drama Down Under includes a new service for clinicians to forward an URL to their patients newly diagnosed with syphilis, which the patients can then forward on to their contacts. The URL links to a specific page on the DramaDownUnder website which has a link to a letter intended for contacts to pass on to their doctor, outlining the exposure, required treatment, that and further contact tracing required. This service is currently being implemented and had not yet been evaluated (KI).

Internet resources are available for clinicians that include information on how to undertake contact tracing. Direct and clear instructions and links without superfluous information on the page are preferred by GPs.

OTHER DIRECTIONS

In a recent US conference presentation about Internet Provider based services in New York State it was reported that sexual-networking sites such as Adam4Adam accounted for 80% of HIV, 50% of syphilis and 35% of gonorrhoea internet provider services investigations [182]. Of note however social-networking sites such as Facebook and Myspace were the means to contact 90% of chlamydia and 50% of gonorrhoea infections (noting that gonorrhoea has a different demographic in the US with a lot more heterosexual infection). There does not appear to be any information on using social-networking sites in Australia for STI follow-up by providers at this date, but this may be important as an area to consider in the future as internet use evolves.

PATIENT-FOCUSSED ONLINE SERVICES

Existing online services for partners are generally in the form of preformatted emails, E-cards, and SMS messages that an infected patient can send to his or her sexual partners. Patients may be referred to these services through the treating clinician, but many exist as independent, searchable websites with links from other sites, including networking sites such as Manhunt and Gaydar [183]. These services usually provide links for the recipient to seek extra information and locate testing and treatment services. Just as internet-notification may be more acceptable for some partnerships but not others, evidence from inSPOT suggests

that the type of STI may factor into the choice. Through inSPOT, syphilis accounted for the second most notifications (15%), but only accounted for 1.3% of nationally reported STIs, and chlamydia was linked to nine percent of E-cards but accounted for 73% of nationally reported STIs. It has been suggested that users selectively choose which STIs to use inSPOT for, although it could equally be a reflection of the types of patients using the service and their predilection for various infections [180].

In another US-based study of the acceptability of internet-partner notification, HIV-positive men were less inclined than HIV-uninfected men to use internet services for partner notification [167]. The latter experience may be due to fears of confidentiality, criminalization, or willingness to take personal responsibility for disclosure. A small Victorian RCT found that adding a website to a standard letter given to patients to give to their partners was acceptable but did not significantly change rates of contacts. However a log-on was required (in order to determine hits), and as previously noted this is likely to negatively affect any follow-up of online resources [184].

EXAMPLES OF PATIENT FOCUSED ONLINE RESOURCES FOR PARTNER NOTIFICATION

- **Let Them Know** (www.letthemknow.org.au):
An online service from the Melbourne SHC targeted at heterosexual men and women, including personal or anonymous email and SMS notification services, chlamydia fact sheets, FAQs, tips for telling partners, and advice for talking to GP. There are also video vignettes on how to approach the subject of STI contact with partners. The site includes a program to protect against spam.
 - An evaluation of Let Them Know identified a significant increase in the number of new users and SMS/emails sent each month, from December 2008 to October 2009 [185]. As for other online notification services, there is no information available on the proportion of notified partners who are tested. Judging on the number of each type sent, SMS notifications were much more popular than email (2727 versus 108). There were four hoax messages reported, but the full extent of misuse is not known [185]. A Victorian key informant noted that around 20% of hits came from NSW. Other key informants in NSW suggested that they often directed patients to this site whilst lamenting that the phone numbers available for support were Victorian.
- **InSPOT** (<http://www.inspot.org/>):
InSPOT is an online e-card service which has been replicated across ten US cities and two other countries. Features include continuous updating of the subject line to keep the E-cards out of spam filters and up-to-date information on clinic locations and services. In 2006, 16,983 E-cards were sent from all sites, but evaluation did not extend to the proportion of notified contacts who are actually tested [180]. Another evaluation showed minimal benefits from inSPOT, and inappropriate use of the service, including using it to seek partners [186].
- **Why Test** (www.whytest.org):
This site is produced by STIs in Gay Men Action Group (STIGMA), and is aimed at MSM. It was developed in 2003, and in 2006 was modified to include an anonymous SMS and email notification service.
 - Between March and August 2007, there was an average of 228 notifications per month, which was almost double of the same time in 2006. The increase in visits between January and July 2007 is attributed to internet banner advertisements on Gaydar, specifically

promoting the notification feature [183]. However, even before concentrated advertisements it had a high level of monthly visits, possible due to high recognition with MSM arising from its length of establishment [183].

- One key informant noted that the actual SMS from WhyTest looked like spam and it was important to avoid this as people may just delete such messages without reviewing them.

- **Drama Down Under** (www.thedramadownunder.info):

The Drama Down Under website is a sexual health social marketing campaign aimed at MSM. It consists of a number of resources, including a website with a “Let him know” link. This offers an anonymous or personal e-card and SMS notification service.

- 79 users commented on the general feedback section of the website. Nine comments provided positive feedback on the “Let him know” service, while seven users provided negative feedback, including recipients of hoax emails [183]. The full extent of misuse of online notifications is not known, and warrants further monitoring.
- An evaluation of SMS notifications between July 2007 and June 2008 saw a very large unexplained increase in notifications in April 2008, with notifications jumping from an average of 43 to 597. No information was available to determine if the notifications resulted in an increase in clinic attendances [183].
- A focus group responded that they would not use the notification feature themselves, because they would rather inform their partners personally. However, they recognised that it would be useful for those who would not contact their partners otherwise. They also indicated that they would rather told that they may have an STI, even anonymously, than not be informed at all [183].

Several websites exist to support patients with notifying their partners of STI exposure.

Negotiating with Melbourne SHC about the modification of ‘Let Them Know’ to provide a more national focus would be one means of providing additional online support to NSW heterosexual STI cases and their partners. SMS notifications to partners have been increasing on these sites and there are minimal reports of abuse of the resource in terms of hoax notifications.

8 DEMOGRAPHIC CONSIDERATIONS IN PARTNER NOTIFICATION

Many demographic issues have already been addressed in this review. This section will briefly appraise particularly relevant points with respect to ethnic groups (including indigenous Australians), age and rurality.

8.1 ETHNICITY

Data on ethnic preferences for partner notification in the Australian context are lacking. One key informant suggested that using counsellors for partner notification could be difficult for patients from some cultures, namely Chinese, as to be asked to see a 'counsellor' may be associated with significant stigma.

Data on ethnic preferences for partner notification in Australia are lacking.

8.2 INDIGENOUS AUSTRALIANS

There are no studies comparing different partner notification processes in relation to indigenous Australians. Existing information is from audits of clinics with predominantly indigenous patients, key informants and opinion pieces by people working in the field.

Firstly it is noted that indigenous Australians, including in NSW, are often situated in remote areas where there are barriers to access & communication between patients, contacts, and health care providers [187]. There is also a high stigma associated with STIs amongst aboriginal people and therefore an increased need for confidentiality, which can be a problem in small communities [187]. *Provider referral* is often chosen as a means to contact partners due to the stigma surrounding STIs in indigenous communities (KI). Means to address these issues include the need for face-to-face or direct phone contact notification when *provider referral* takes place. Letters, if written, should be hand delivered but the provider must be aware of potential illiteracy in the partner [188]. Importantly mobile phones were not considered a particularly good form of notification in indigenous populations in general, particularly not for *provider referral*, as phones are more likely to be shared or handed from one person to another.

Another issue raised was the necessity of accurately determining whom the actual partner was as many indigenous people share names and even nicknames. Recording the names of patients' relatives, their jobs and their ages can help clarify the partner. It was also mentioned in this context that named partners may not actually be sexual partners but may be part of a social or drinking circle, although solutions as to how to address this issue without breaching confidentiality of the index patient were not elicited from key informants.

It is essential that partner notification remains voluntary and fostered under an arrangement of mutual trust [189, 190]. It is also important that the interviewer be acceptable to the partner in *provider referral*: in some cases this might mean that the partner would prefer to see a non-aboriginal health worker, or one working in cooperation with a non-aboriginal clinician, as this might mean an increased perception of confidentiality [191]. It is preferable that contactor and contacted partner are the same gender [188, 191]. However a key informant reported female health workers to be generally acceptable to male patients.

A mobile and transient aboriginal patient base was one reason given as to why GPs did not undertake partner notification in the McCarthy study [49]. It is worth noting in this context that key informants

considered aboriginal health workers as generally 'very good at locating people'. Others have suggested involving health workers early, if acceptable to a patient, so that a relationship could be fostered and maximum benefit be obtained from the contact, including location of nomadic partners.

Several key informants mentioned that PDPT was used more frequently with their indigenous patients. Reasons for this included general difficulty in access to health care in general, as well as the perceived increased reluctance of indigenous partners to access available services, particularly if asymptomatic. The potential for adverse responses from partners was mentioned as well, and PDPT was sometimes employed as a way to avoid explicitly mentioning that an infection was sexual in nature whilst also treating the partner to ensure effective management of the index patient.

Cultural competency packages have been developed in some parts of the state that incorporate information on how to address sexual health issues in indigenous patients (KI). Ensuring incorporation of some key suggestions about partner notification in these and adequate distribution to clinicians working in Aboriginal health, particularly if they have limited previous exposure would likely be of benefit. Access to online screening for rural indigenous patients in Victoria is being offered via 'Test Me' (see below).

There is limited evidence-based information regarding partner notification process effectiveness for indigenous Australians. Opinion suggests that *provider referral* or PDPT may be appropriate and that involvement by aboriginal health workers should be offered sooner rather than later. Clarifying partners using other identifiers besides names and avoiding using letters or the phone to notify were also considered important.

8.3 YOUTH

There are higher rates of chlamydia in the younger age groups. Younger people also have poorer access to health care in terms of both cost and trust of services compared with older people [192]. There is limited data available on age-specific solutions but key informants who are researching in this area suggest that targeted screening and notification programs will be required to make any in-roads into STI transmission in the younger age groups. It was considered that partner notification alone would be likely to be ineffective as at a young age heterosexuals were having sex with different people more frequently than their older peers, and although they wouldn't generally tell their ex-partners they may end up having sex with them again. This reinforces the need to encourage *provider referral* and/or anonymous notifications for casual partners of youth as much as for anybody. It also suggests the need for improved access to be able to screen oneself as both an index patient and as a contact.

Western Australia has a new online service for chlamydia screening called '**Get the Facts**' (http://www.getthefacts.health.wa.gov.au/1/146/1/new_online_chlamydia_testing.pm). This is aimed at youth but available to anyone over the age of 16. As one of the questions on this website's risk assessment checklist asks about having a partner with chlamydia or an STI it will be informative to assess the evaluation of this project when available [102].

High rates of chlamydia in the younger age groups reflect the need to offer *provider referral* for casual and ex-partners in this demographic.

8.4 RURAL VS URBAN

The difficulties concerning health access in rural areas, bulk-billed or otherwise, have been mentioned before and are not unique to partner notification for STIs. It is important to emphasise the requirements for greater discretion and collaboration in rural regions [193] and the greater concern about negative impact of notification amongst patients and clinicians in these areas [48]. The viability of using practice nurses to aid in follow-up of patients and contact of partners might also be a challenge in rural environments. Indeed one rural GP interviewed for this literature review did not use her practice nurse for precisely this reason. On the other hand having easier access to sexual health nurses, which was well advertised to both the community and GPs as a form of follow-up, could address both this issue as well as potentially improve rates of partner notification by offering ‘free’ appointments to those requiring follow-up. Practically, having better access to free treatment for both index patients and partners may be beneficial in terms of effectively managing STIs in rural areas. This is pertinent because at SHC and community based clinics medications for STI are generally funded, whilst via GPs they are on prescription. In Tamworth GPs can access supplies of azithromycin through local SHC for patients where they felt the script might not be filled (KI). The demand has not been large and awareness of this option waned then rose again after local announcements in division newsletters.

‘**Test Me**’ is a Victorian online STI testing service that has recently been updated (<http://www.testme.org.au/>).

As per the Western Australian model this service is primarily aimed at accessing index patients with symptoms or wanting screening. Free online or phone consultations are available to youth under 25, MSM or indigenous patients living 150km or more from Melbourne. Testing kits can be sent out and medication can be arranged. This site would be feasible for rural partners or index patients to access as well. The original site had a limited uptake but around 30% of those tested were positive for an STI, suggesting that the right population were being targeted (KI). Monitoring the evolution and uptake of service offered on sites like this will be important for planning future directions of STI management and partner notification services in NSW.

Increased discretion is required in rural areas, and there is also reduced access to sexual health services in country areas. Therefore efforts should be made to support rural GPs and patients in particular. Access to free medication may be important for poorer or younger patients and their partners. Development of rural internet resources could be another means to aid this population.

9 ADDRESSING CLINICIAN AWARENESS AND BARRIERS AND ASSISTING PARTNER NOTIFICATION PROCESS (PARTICULARLY IN GENERAL PRACTICE)

The means to address barriers, improve awareness and facilitate the process of partner notification in community medicine are often one and the same, and as such they are addressed together. Evidence suggests that the basic message to GPs should be that initiation of partner notification does not have to be arduous, and that there are supports available for them if necessary. This message is particularly important considering that diagnosing an STI in general practice, including chlamydia, remains a relatively rare event. The rarity of these conditions will limit the value of specific partner notification training around STIs for GPs who have so many other time pressures (KI).

So saying GPs have expressed their interest in receiving further guidance regarding partner notification and in one study 80% of GPs felt that they could improve partner notification if there was more support [194]. Additionally, effective partner notification and knowledge of options will be an essential component of any successful chlamydia screening campaign [79, 106, 185].

GPs have expressed the opinion that partner notification processes could be improved with more support.

9.1 PROACTIVE SUPPORT FOR RARER DISEASES

Key informants suggested that people frequently self-select for practitioners who will be more open to appropriate management of STIs. However such selection is not inevitable, and sometimes there is not a choice of practitioner. Consequently, as previously mentioned, there is considerable support in the literature that *provider referral* is preferable for rarer STIs. Given the difficulties with ease of access to *provider referral* and information about how to manage more complex STIs, key informants were uniform in suggesting that GPs required tactful proactive assistance in managing these conditions, including the partner notification aspects. The new NSW Public Health Responses for HIV and syphilis should be able to achieve this requirement. It may be appropriate to extend this service to gonorrhoea in the future. These new responses will potentially also address the gap in STI follow-up from the perspective of rural emergency outpatient and peri-natal clinics. However it will necessary for PHUs to be aware that positive tests ordered from rural hospitals may not indicate that the provider is experienced in managing STIs and/or may not still be at the hospital to be able to follow these up.

GPs should be provided with active support when diagnosing rarer STIs such as HIV, syphilis and gonorrhoea.

9.2 NOTICE ON LABORATORY RESULTS

The benefits to having links to websites and disease specific information on positive laboratory results have been assessed in some small studies [48, 52]. 46-84% of responding GPs indicated that they value the reminder to talk about contact tracing on the pathology results. Actual usage of web-links studied in

Victoria showed clinicians followed between 8-25% of links on results. However this study was challenged by the requirement for a log-in, and there were problems with one log-in which were felt to limit validity of results (personal communication) [194]. Another study showed that there were significant increases in use of partner letters from 10/78 (13%) to 28/78 (36%) ($P = 0.00$) and brochures from 26/78 (33%) to 42/78 (54%) ($P = 0.00$) amongst GPs exposed to a website which had links to online resources [54].

Key informants generally support the idea of laboratory results based treatment and partner notification reminders and links to websites with the following caveats:

- GPs tend to call rather than go online if they want more information, particularly as the NSW health site is considered difficult to negotiate. Therefore having a number of a local service able to assist with *provider referral* would be important.
- Any website links should lead to clear, concise and 'digestible' information on web pages. Multiple links required to access patient letters and log-ons would not be appropriate.

Information about partner notification and online links on positive pathology results can be used to inform GPs. A local telephone number for assistance is often preferred. Online links should not contain log-ons or require multiple clicks to access information.

9.3 FOLLOW-UP FAX TO PRACTICE NURSE/CLINICIAN

As noted, Southern Area Health service is following up all chlamydia notifications in Wagga and Albury with a checklist fax to the diagnosing clinician and/or the practice nurse. This type of quick follow-up has the potential for providing an easy form of reminder to the most appropriate people in the clinic and should be evaluated further.

A follow-up fax from the local PHU for chlamydia results could be trialled. Directing this to both the practice nurse and the clinician may be of benefit.

9.4 PRACTICE NURSES

The recent changes in the federal budget mean that practice nurses' income will no longer be solely linked to item numbers under Medicare. In rural areas there is a larger shortage of GPs and conversely a higher proportion of practice nurses involved in partner notification [52]. Practice and clinical nurses are doing more sexual health care work in rural areas, where anecdotally less partner notification takes place (KI). In this sense practice nurses are considered to be well placed to support partner notification and therefore lessen time constraints on GPs, particularly in rural areas (although there may be some issues regarding confidentiality in smaller places) [53].

A UK study suggested patients are more comfortable discussing partner notification with a practice nurse directly after seeing doctor, in comparison to being referred to a SHC for assistance with partner notification [195]. In this study trained practice nurses elicited 1.7 partners per index case as opposed to 1.4 per case elicited by health advisors at the SHC. The same study showed that after partner elicitation, general counselling and a scheduled follow-up phone-call, 0.74 partners per case were classified as treated,

which was 45% of all reported partners. The process was considered to be as equally effective as *provider referral* from the GUM clinic in terms of percentage of partners notified, and was cheaper. (Provider referral from the GUM clinic notified more partners per patient than enhanced *patient referral* by practice nurses, but many patients did not follow-up at the clinic, resulting in the similar outcomes.)

In reality practice nurses could be utilised via several means: They may be able to offer pre-test counselling including raising the issue of partner notification prior to STI testing. They could undertake *provider referral* for a patient by calling partners themselves, or referring the names of exposed partners on to the local sexual health services. Alternatively practice nurses could undertake post-diagnosis counselling, elicit names and make a follow-up reminder phone-call to index patients opting for *patient referral*. Practice nurses could also ensure partner notification by being the recipient of faxes from the local PHU, as is being trialled in Greater Southern Area Health service. In areas of difficult access a GP could inform an index patient that their partner would be rapidly treated if they came into see a practice nurse, or the nurse could triage the appointment when the partner rang the clinic.

In terms of accessing practice nurses the Australian Practice Nurses Association is willing to sponsor training resources on their website and articles about partner notification in their newsletter. The association website is accessed by many practice nurses in addition to those who are members (KI). Primary Times is a well-read practice nurse magazine and Medical Observer has an issue devoted to practice nursing a couple of times per year. Many divisions are now running practice nurse development training.

Recent changes to federal funding of practice nurses may mean that their involvement in partner notification can increase. Practice nurses are well situated to assist in the partner notification process and there is evidence that they may elicit more partners than SHC based contact-tracers. Practice nurses could provide pre-test counselling, post-test partner elicitation and counselling, make reminder phone calls and undertake *provider referral* as necessary. They could also be a conduit by which information reaches GPs, in the form of faxes from PHUs or via their own STI training.

9.5 DISTRIBUTION OF APPROPRIATE RESOURCES

Launch of the new addition of the Australasian Contact Tracing Manual was proposed by several informants as being an ideal time to review partner notification at general practice educational settings, particularly for high-case load clinics. Redistribution of the STIPU STI testing tool throughout the state may be warranted and/or another proforma for use when taking a history and pre-test counselling a patient about partner notification.

When it becomes available a review of the evaluation of the current Western Australia GP chlamydia campaign will provide information regarding the reception of the resources kit contained within this.

The new edition of the Australasian Contact Tracing Manual is anticipated. The STIPU STI testing kit is well received and could be redistributed. Western Australia is currently evaluating a GP chlamydia awareness campaign.

9.6 TRAINING AND EDUCATION

For generalist medical providers there are many opportunities available for improving awareness and skills surrounding partner notification. However given competing priorities for generalists' time it is likely to be better combining such information in the larger context of STI diagnosis and management. Opportunities include at medical school, during GP registrar training and via divisional GP educational evenings. Online educational training with accredited Continuing Professional Development points could be negotiated with the Royal Australian College of GPs (RACGP) or the Australian College of Rural and Remote Medicine (ACCRM). An important group to target would be overseas trained doctors going into rural areas, who may have had minimal sexual health training in their own country (KI).

Training for all clinicians and particularly those who regularly diagnose or manage STI should include the evidence that *provider referral* is preferable for certain partnerships; eliciting partners names with patients may improve outcomes; the potential advantage of motivational interviewing and the value of scheduling a routine follow-up phone call. Regional non-medical SHC staff were generally keen for more training but expressed the wish that any instruction be offered regionally or online given the distances.

Partner notification training for generalists should be part of broader STI management training. Many pre-vocational and vocational possibilities exist. Overseas trained doctors should be targeted. Training for all clinicians should be regionally focussed.

10 OTHER

10.1 REPEAT OR MULTIPLE INFECTIONS

Patients with repeat or multiple infections are potentially a higher public health risk. Alternatively they may require support in informing regular partners of their infection. Although SHC systems are generally able to determine if patients have repeated infections of STI, traditionally there was not the capability in PHU to assess this. According to key informants a new name based system is being implemented shortly, which would enable assessment of both multiple infections in the one patient and also repeat infections of bacterial STI. Although it is possible that patients with repeat or multiple infections are likely to present to SHC or the same SHC this is not certain. Extraction of information concerning high-risk patients such as this by Public Health epidemiologists, and then referral of such patients to SHC for intensive management, may be a means of improving outcomes in individuals previously unrecognised to be at high risk.

Patients with repeat infections may have higher risk behaviour. The new name-based database being introduced in NSW PHUs will enable such patients to be identified. A plan by which such patients are identified on a regular basis via this system is recommended. Local SHCs could offer their services to clinician involved in the most recent diagnosis.

10.2 COMMUNITY AWARENESS

The current chlamydia campaign in Western Australia includes social marketing for health professionals and posters for general practices [46]. Several key informants suggested that the benefits of partner notification should be made more apparent to the community and proposed a wider campaign to support partner notification.

A health professional and community awareness campaign about partner notification could be considered.

10.3 AREAS FOR RESEARCH

This is a complex social area for research. In terms of current projects the Western Australian chlamydia campaign, the Greater Southern Area Health Service chlamydia follow-up fax and a Sydney Sexual Health Service study which is evaluating how people contact their partners with respect to demographic variable will all add information to where very little is currently known. The large accelerated partner therapy trial in the UK will also be of interest.

Further areas to research include confirmatory studies regarding the appropriateness of trace-back periods, given the current variation in guidelines and their noted arbitrariness. Another issue more relevant to changing practices in NSW is the viability of follow-up phone calls by practice nurses in the Australian setting (they are currently being used in a chlamydia screening trial in Victoria)(KI). There is also a lack of information regarding the yield of partners per contact with respect to if the index patient is symptomatic or not, which may ultimately affect the value of partner notification efforts as a component of routine screening. Knowing if patients really do self select for conditions such as chlamydia (i.e. do female GPs

really diagnose more chlamydia than males) would also be of value, as this could benefit targeted information campaigns about partner notification.

11 CONCLUSIONS AND RECOMMENDATIONS

Partner Notification is a component of good clinical management of STIs, in addition to having a population health role in increased case-finding of asymptomatic individuals. There is a general consensus amongst NSW key informants that improvements can be made in the way that partner notification is undertaken in the state, although some individual sexual health workers, SHC and PHU have made considerable efforts to progress the processes occurring in their areas.

Despite the fact that that evidence suggests *provider referral* should at least be offered in many situations, no form of partner notification will be of use if it is not initiated by the diagnosing clinician. In terms of community diagnoses there is a considerable body of evidence and expert opinion that suggests that a significant proportion of GPs may not be aware of their responsibility in initiating partner notification, or if they are aware are not clear as to how to address this in their day to day practice.

Recommendation: Increase GPs' awareness of their responsibilities in initiating partner notification and the resources available to them.

In addressing clinician awareness a multifaceted approach is suggested taking into account that due to the relative rarity of STI diagnoses in general practice any training or information should be incorporated into general STI/Sexual health education or screening program information, or be at point of care in the form of attachment to laboratory results or follow-up clinic faxes. The main aim would be to both encourage awareness in general practice whilst also indicating that the process does not have to be arduous and that support is readily available. Involving practice nurses may also be a route to increasing awareness and support for partner notification.

Professionals able to supply support for GPs around STI management and partner notification are likely to already exist in most regional and rural areas. It would be appropriate to expand their roles to ensure that STIs identified in Emergency outpatients or rural antenatal clinics are suitably managed. Such professionals could also supply support and training in sexual health, including partner notification, to clinicians arriving in rural areas, particularly overseas trained doctors.

Recommendation: Expand the roles of professionals working in the STI field in regional and rural areas to ensure follow up of patients accessing clinics such as Emergency Outpatients and antenatal clinics. Consider using these people to train and assist clinicians in the local area regarding partner notification for STIs.

For the rarer STIs a proactive response in terms of assistance for GPs is recommended. It is also supported by potential medico-legal implications of insufficient follow-up of HIV, and the evidence that *provider referral* should be offered with this disease. The system of enhanced surveillance that will be rolled out throughout the state this year for HIV and syphilis will address this need. It may be worth considering for gonorrhoea in the future also.

Recommendation: Consider including gonorrhoea in the enhanced surveillance system being developed for HIV and syphilis.

Provider referral is often 'split' between two groups in SHCs: those that elicit partner names and those that actually undertake the contact tracing. Both parts of this provider notification require different skill sets. All

clinicians undertaking regular provider notification or seeing significant amounts of STIs should be aware that casual and ex-partners, incarcerated partners, partners of men, partners of index patients with repeat STIs and partners of index patients with reduced self-efficacy are less likely to inform their partners themselves. Index patients in these partnerships should therefore be explicitly offered *provider referral*.

Recommendation: Develop guidelines or recommendations about which index patients should routinely be offered *provider referral* for their partner notifications.

Enhancing partner notification by patients can be performed by eliciting partner names from index patients and by ensuring that cases are adequately informed and supplied with appropriate resources to inform their partners. These resources include letters or website addresses which have information and tools on how to go about informing contacts, including free online anonymous notification resources using email and SMS. Informing index patients that they will receive a follow-up phone call also appears to be a means of increasing partner notification. Having a system in place whereby patients can be followed up, including by practice nurses in general practice, could incorporate both a clinical assessment of the need for further treatment as well as a further offer of support for partner notification to the index case.

The internet can also be employed as a means to locate pseudo-anonymous partners of index cases who meet casual partners on sexual networking sites. At this point in time in NSW such practice is likely to be most beneficial in clinics with a high caseload of MSM patients. Being aware of the means by which younger people are increasingly meeting and socialising with people via social networking sites may mean that this service could be offered to different demographic groups in the future.

Recommendation: Develop various region-specific ‘tool boxes’ of resources for PHUs, SHCs and general practices. These are likely to vary between urban and rural areas. Information could include local contact numbers, website addresses for clinicians, cards or handouts with websites and resources for patients, practice nurse information and resources, partner notification guidelines (in terms of patient or provider referral appropriateness) and instructions on how to set-up notification of partners via sexual networking sites.

12 KEY POINTS AND IMPLICATIONS FROM THE REVIEW:

12.1 KEY POINTS

12.1.1 BACKGROUND

- Partner Notification is a term for the process by which sexual contacts are notified of their exposure to an STI.
- In NSW rates of HIV are stable. Rates of gonorrhoea are also stable but higher than in the 1990s. There is an ongoing epidemic of syphilis, primarily amongst HIV positive MSM. Chlamydia rates are increasing, particularly in the younger age groups. Sound epidemiological data is lacking with respect to STIs in the indigenous Australian population.
- The term ‘partner notification’ implies a less intrusive process than ‘contact tracing’. Referring to the intervention as partner notification may be of benefit in terms of reassuring patients and clinicians that it does not have to be an arduous or non-therapeutic practice.
- There are three main types of partner notification:
 - *Provider referral*: the patient’s partner(s) are informed of STI exposure by a health professional.
 - *Patient referral*: the patient informs their partner(s) themselves.
 - *Contract referral*: the patient contracts with a health professional to inform their partner(s) by a certain time or the health professional will do so.
 - Types of referral can be enhanced and modified in various ways.
- In general partner notification is both a component of sound clinical management as well as having a potential population health benefit:
 - Despite limitations with the Australian data there is evidence that contact tracing is an effective case-finding strategy. It has particular relevance to partners who may not otherwise routinely screen for STI.
 - The population effect of partner notification is likely to be higher for HIV, syphilis and gonorrhoea as opposed to chlamydia, by virtue of the virulence of each disease and its network profile. However incorporating effective partner notification into screening programs for all STIs will have an additional population health effect.
 - Limited evidence suggests that increasing the numbers of casual and ex partners notified will have a larger population impact. The effect is likely to vary between the different STIs and the demographics of the index patients. Partner notification may also entice high-risk people to test who may not otherwise attend screening. Hence focus on casual and ex-partners should be considered, particularly in certain communities such as MSM or in sexually active youth, and strategies for contacting such partners offered to index patients.
- Rates of partner notification:

- Rates of partner notification from SHCs in NSW may be on par with those from the UK, but there is likely to be much poorer rate of notification from general practice. Conversely the majority of STIs are diagnosed in general practice, so effective development of partner notification capacity in the state will need to consider GPs as well as clinicians from SHCs.
- Awareness of responsibility for initiating partner notification:
 - Many GPs are unaware of their responsibilities with respect to partner notification and if aware may lack the skills with which to commence this intervention.
- Partner notification processes in some Australian states and territories:
 - Western Australia, South Australia, Victoria and the ACT have centralised professionals who contact HIV, syphilis and gonorrhoea index patients to assist them with education and partner notification as required. Western Australia, South Australia and Victoria also require practitioner notification forms to be completed for all STI. Increased emphasis for STI diagnoses in other states may have contributed to the confusion about responsibilities and lack of awareness amongst GPs with respect to partner notification processes in NSW.
 - Partner notification processes in SHCs vary throughout the state of NSW but on the whole *patient referral* is encouraged for most conditions unless index cases feel that they cannot undertake this. Some clinics undertake regular follow-up of all STI diagnoses and others do not. Social workers, sexual health counsellors and nurses often take on the role of performing provider notification if necessary. Involvement in STI follow-up and partner notification varies between PHUs, but most do not offer the intervention.
- How far back to trace partners:
 - Variations in guidelines on how far back to consider notifying partners reflects a lack of evidence in this area. The differences between recommendations are particularly noteworthy for chlamydia and gonorrhoea. It is difficult to recommend changes to the current Australian process based on the limited evidence. However further studies are required to ensure the longer periods add sufficient value at the population health level for the effort expended in notification.
- STI management in NSW emergency departments and rural peri-natal clinics:
 - A gap has been noted in terms of whose responsibility it is to ensure that STIs which are diagnosed via emergency departments and rural peri-natal clinics are appropriately managed and followed up. The suggestion of developing more formal contacts between prisons and juvenile justice centres and staff able to undertake provider notification of STIs has also been raised.

12.1.2 EVIDENCE FOR TYPES OF PARTNER NOTIFICATION REFERRAL STRATEGIES

- Provider or provider assisted referral appears to be more effective than *patient referral* (in terms of numbers of partners notified) across the range of STIs. However the general evidence is not robust.
 - So in the absence of compelling evidence people should be offered a choice between patient and *provider referral* services.

- However clinicians should be aware that more than one option might be appropriate for each index case. In particular index patients with the following profiles or partnerships should be explicitly offered the choice of *provider referral*:
 - Casual or ex-partners, oral or penetrative, of all index patients, including MSM.
 - Incarcerated partners.
 - Partnerships for less common diseases such as HIV, syphilis and gonorrhoea.
 - Partners of patients with repeat infections (patient-delivered partner therapy (PDPT) may also be a suitable option in such cases).
 - Index patients with reduced self-efficacy.
 - Male index patients (especially if any other factors above apply).

12.1.3 THE NSW SETTING

- Regional sexual health professionals who can undertake provider notification and support local GPs may have an inherent advantage over the more centralised model found in other states, particularly given the size of NSW.
 - To maximise the benefits of regionalisation clarification of who is able to support GPs in each area will be required.

12.1.4 PERCEIVED BARRIERS TO PARTNER NOTIFICATION

- Community clinicians may feel that partner notification is more of a public health issue, but in terms of regular partners it is part of effective clinical management. Moreover patients may consider notifying partners as ‘the right thing to do’.
 - Optimising resources for anonymous partner notification and providing GPs with more resources may help to overcome some barriers perceived by community clinicians.
- On the whole the experience of Australians telling their partners about STI exposure appears to be better than expected. Moreover violence is not significantly associated with partner notification, although it may be an issue if there is background domestic violence in the relationship. Clinicians will need to assess for this possibility.

12.1.5 ENHANCEMENT OF PARTNER NOTIFICATION TYPES

ACCELERATED PARTNER REFERRAL

- Accelerated *partner referral* includes postal kits or online/phone/pharmacy assessment and/or patient delivered partner therapy:
 - There is currently little evidence for postal testing kits or phone/online/pharmacy assessment however this situation should be reassessed when current UK trials and online resources from Victoria and Western Australia are evaluated.
 - In summary for Partner Delivered Patient Therapy:
 - PDPT may be a future option for regular partners of heterosexual index patients should alternatives not be suitable.

- PDPT is less likely to be successful with casual or ex-partners.
- PDPT is not suitable for MSM.
- It is unclear if PDPT is suitable for trichomonas infections in the index case.
- It may be particularly relevant for males who might have difficulty informing their female partners or female index cases who feel that their male partners are unlikely to present to a doctor despite being informed of their STI exposure. (Patients in these two groups may be identified if presenting with recurrent infections.)

PATIENT REFERRAL

- *Patient referral* can be enhanced in several other ways:
 - Follow-up in the form of scheduled telephone calls is an effective intervention in increasing rates of partner notification with *patient referral*.
 - Supplementing verbal information with some form of written resource or easy-to-access information (such as via a web link) is likely to improve partner referral notification rates.
 - Exploration as to a patient's personal circumstances, self-efficacy and motivation to inform a partner may be useful adjuncts in improving rates of partner notification.
 - Techniques for eliciting partner counts or names in people with multiple partners may improve the numbers of partners notified.
 - Reminding all clinicians that simply exploring whom it is who needs to be contacted with a patient is also likely to be of benefit.
 - Specific proforma may increase the comfort level of GPs and other clinicians in eliciting names of partners and exploring methods of partner notification with index patients.

ONLINE RESOURCES AND PROCESSES

- Protocols could be developed for SHC access to sexual networking sites, so that casual sexual partners found online can be informed anonymously by SHC professionals.
- Internet resources are available for clinicians that include information on how to undertake contact tracing. Direct and clear instructions and links without superfluous information on the page are preferred by GPs.
- Websites exist to support patients with notifying their partners of STI exposure. Negotiating with Melbourne SHC the modification of 'let them know' to provide a more national focus would be one means of providing additional online support to NSW heterosexual STI cases and their partners. SMS notifications to partners have been increasing on these sites and there are minimal reports of abuse of the resource in terms of hoax notifications.

FURTHER CONSIDERATIONS IN PARTNER NOTIFICATION

- Partner notification amongst different ethnic groups:
 - Data on ethnic preferences for partner notification in Australia are lacking.

- Indigenous Australians:
 - There is limited evidence-based information regarding partner notification process effectiveness for indigenous Australians. Opinion suggests that *provider referral* or PDPT may be appropriate and that involvement by aboriginal health workers should be offered sooner rather than later. Clarifying partners using other identifiers besides names and avoiding using letters or the phone to notify were also considered important.
- Youth:
 - High rates of chlamydia in the younger age groups reflect the need to offer *provider referral* for casual and ex-partners in this demographic.
 - Online resources may be particularly useful for rural youth in the future.
- Rural areas:
 - Increased discretion is required in rural areas, and there is also reduced access to sexual health services in country areas. Therefore efforts should be made to support rural GPs and patients in particular. Access to free medication may be important for poorer or younger patients and their partners. Development of rural internet resources could be another means to aid this population.

12.2 IMPLICATIONS FROM THE REVIEW

12.2.1 SUPPORT FOR GPs AND GAPS IN STI MANAGEMENT AND PARTNER NOTIFICATION IN THE STATE

- Ensure that supports are available to GPs for partner notification and clarification of who can provide these in each health division:
 - Identification of appropriate person/people for each area.
 - Proactive support for rarer diseases including provider notification: particularly HIV, syphilis and possibly gonorrhoea.
- Ensure each emergency outpatient department and community antenatal service has structure in place to follow-up on all STIs ordered (and also partner notification of these):
 - Identification of appropriate person/people for each area (+/- role modification).

12.2.2 DIFFERENT TYPES OF PARTNER NOTIFICATION AND HOW TO ENHANCE THESE

- Clinicians offering sexual health services need to be flexible and have the option of offering provider notification. Important points to consider:
 - Investigate the patient's situation in terms of ex, casual or regular partners.
 - Ensure that patients are aware oral sex may also be relevant.
 - Offer *provider referral* particularly with HIV, syphilis, gonorrhoea, >1 recent partners, repeat infections, male index case, lack of self efficacy in index patient.
 - Offer *provider referral* particularly in areas of difficult access to GPs.
 - Techniques for improving *patient referral*:
 - Proformas,
 - Eliciting partner names,

- Counselling including motivational interviewing,
- Follow-up phone calls,
- PDPT,
- Awareness and adequate use of written material including online resources.

12.2.3 ENHANCING GP AND COMMUNITY CLINICIAN AWARENESS OF ROLE AND AVAILABLE SUPPORTS

- Increase awareness of GPs of both role in initiation of partner notification and that *provider referral* services are available. Options of how to achieve this:
 - Follow up 'checklist' fax from PHUs,
 - Information and website links on lab reports (including local phone number),
 - Distribution of new ACTM/STIPU STI testing tool,
 - Training and other exposure:
 - GP continuing education: meetings or online options with CPD points,
 - GP registrar sexual health,
 - GP registrar indigenous health,
 - Overseas trained doctor orientation to rural communities including indigenous sexual health cultural competency packages,
 - Medical students,
 - Practice nurses: APNA, journals, division training.
 - Practice nurses:
 - Pre-test counselling.
 - Post-test counselling with name elicitation and:
 - Provider referral for index cases,
 - Follow-up reminder phone call to index cases undertaking *patient referral*.
 - Contact for follow-up check-list fax from PHU.
 - Avenue for information to reach GPs.

12.2.4 ONLINE SERVICES

- Areas to consider:
 - SHC profiles for provider notification of partners met through online sites.
- Online Australian resources for clinicians:
 - The silver book (<http://silverbook.health.wa.gov.au>),
 - Could I have it? (<http://www.couldihaveit.com.au/>),
 - GP assist (<http://www.mshc.org.au/default.aspx?alias=www.mshc.org.au/gpassist>),
 - Drama down under (www.thedramadownunder.info).
- Online resources for patients:
 - Let them know (www.letthemknow.org.au),
 - Inspot (<http://www.inspot.org/>),
 - Why test (www.whytest.org),
 - Drama down under (www.thedramadownunder.info).

- Interstate primary online testing services for youth/or rural youth/MSM/indigenous index patients: models to be considered in terms of youth / rural access:
 - Get the facts (http://www.getthefacts.health.wa.gov.au/1/146/1/new_online_chlamydia_testing.pm),
 - Test me (<http://www.testme.org.au/>).

12.2.5 OTHER

- Index patients with repeat or multiple infections:
 - Patients with repeat infections may have higher risk behaviour. The new name-based database being introduced in NSW PHUs will enable such patients to be identified. A plan by which such patients are identified on a regular basis via this system is recommended. Local SHCs could offer their services to clinician involved in the most recent diagnosis.
- Community awareness:
 - A health professional and community awareness campaign about partner notification could be considered.

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