

Sexually Transmitted Infections in Travelers: Implications for Prevention and Control

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Sexually transmissible diseases (STDs), the most common notifiable infectious conditions, remain major threats to reproductive and public health worldwide. Travelers are particularly vulnerable to STDs, because of voluntary or involuntary sexual behavior while abroad, and are significant vectors who introduce new pathogens and resistant strains to unaffected parts of the world. This article outlines some key issues that travel medicine specialists and other clinicians should revisit when providing services to travelers. We discuss obstacles to promoting sexual health, including the diversity of the target group, unanticipated opportunities for sexual risk, ambivalent cooperation by the travel and tourism industries, poorly developed travel health sectors, illegal migration and sex tourism, and lack of research about the association between travel and STDs. We also outlined some programmatic aspects of public health that should be identified and addressed for the promotion of sexual health among travelers.

Over the past 25 years, renewed interest in the pathogens of sexually transmissible diseases (STDs) and their associated sexually transmitted infections (STIs) has been prompted by the HIV epidemic, new diagnostic and treatment methods, new models of prevention, and growing anxiety about the reproductive and public health implications of these infections. The number of known sexually transmissible pathogens is now >30 [1]. Moreover, STDs enhance the risk of HIV acquisition and transmission [2]. In developed countries, however, control efforts have helped to keep the incidence of most STDs at very low levels, and episodic outbreaks and continually emerging infections have compelled such countries to strengthen their STD control efforts. In developing countries, competing public health priorities have relegated STD control to low-priority levels, and STDs have remained endemic. Rapid cultural and economic change in developing countries explosively accelerates STD prevalence, and control efforts usually lag far behind. Globally, at a policy and practice level, consensus is emerging on the need for tackling STDs as an integral step toward improving primary health care and overall development. Despite

its potential for contributing to STD control, we found that the field of travel medicine is less involved in creating the agenda for controlling STD transmission than was anticipated.

In most developing countries, where 90% of the world's STDs and HIV infections occur, primary care clinicians absorb much of the service burden due to STDs. Although it is debatable, there is evidence that increased population mobility makes travel a major risk marker for STD and HIV transmission [3, 4]. Travelers—defined as people journeying temporarily, permanently, or episodically for recreational or occupational reasons or as forced or voluntary migrants—are key vectors for spreading virulent and resistant strains associated with STI to unaffected regions and for causing the reemergence of these pathogens elsewhere [5, 6]. In this article, we review the epidemiology, management, and prevention of travel-associated STD and STI transmission. Given the increasing trend of STDs among travelers, we emphasize the importance of travel medicine practitioners as integral partners in the prevention and management of STDs.

EPIDEMIOLOGY

Over the past few decades, various terminologies have been used for describing diseases attributed to sexual behavior. “Venereal disease” and “STD” refer to the transmission dynamics of the underlying etiology, “STI” refers to the pathogens that cause STDs, and “reproductive-tract infection” is a term that

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is based on the system affected. STDs may be defined as diseases in which sexual behavior plays an epidemiologically significant role in transmission of the causative pathogen. Because such diseases may be transmitted via nonsexual routes, the term “sexually transmissible disease” is used. For instance, not all infections due to HIV or hepatitis B virus (HBV) are transmitted sexually. In this article, we use the term “STD” to capture a broad range of conditions in which sexual behavior plays a significant role.

Travelers are known to spread infections, including STDs [7]. Syphilis was introduced to Europe by Iberian sailors [7], and the spread of STDs and measles in the Pacific Islands was due to Cook’s sailors. Elsewhere, STDs spread by traders and exploratory and military expeditions had devastating consequences [8]. A more recent example is the spread of fluoroquinolone-resistant *Neisseria gonorrhoea* across national borders [9, 10].

Statistics on the travel-attributable proportion of STDs and information on sexual behavior indicators and risk aversion and/or prevention practices during travel are not available by country or in general. Such statistics are difficult to obtain because of various reporting biases and incompleteness of STD records or research or surveillance methods. More than 200 studies about STDs and travel have been published. Because of a variety of reasons, including study methodology, traveler representation in general or by major demographic characteristics, sample size, and methods of STD assessment, most such studies are of poor quality. Also underscored is the fact that research on travel-related STDs is underdeveloped and has not been a priority in the travel and public health fields. In the absence of well-conducted studies, the available reports provide a broad sense of the burden, risk, and prevention practices associated with travel-related STDs.

It is estimated that 5%–50% of short-term travelers engage in casual sex while abroad [11]. For example, in a study involving 599 Norwegian travelers, 41% admitted to having had casual sexual contacts while abroad, and the rate of consistent condom use was low [12]. In London, 19% of 757 outpatient respondents had ≥ 1 new sexual partner while abroad, and 64% never used condoms or used them inconsistently [3]. Higher frequencies of sexual relationships with new partners during travel were also reported for European expatriates in Africa [13], American Peace Corps volunteers [14], and young travelers in Australia [5].

Travel-related HIV infection is currently the most notable STI. In Europe, an increasing proportion of new AIDS cases has been identified among immigrants [15]. In Asia, India, and Africa, migrant laborers, long-distance truck drivers, and commercial sex workers (CSWs) maintain STD and HIV epidemics. Economic-induced migration and commercial sex work lead

the resurgence of syphilis and other STDs in Russia [16] and, in South Africa, have helped spread HIV since the end of apartheid.

Literature on sexual risk aversion during travel is scarce and limited to scant surveys of nonrepresentative samples. Available evidence suggests that travelers who take sexual risks are less likely to engage in safer sex practices, irrespective of their country of origin or travel destination. In a questionnaire-based survey of 386 persons who visited a genitourinary medicine clinic in London, 25% reportedly had had a new sexual partner during their most recent trip abroad, and two-thirds of respondents never used condoms or used them inconsistently with their new partners [17]. Condom use decreased as the frequency of visits to the same partner increased. Among 383 air travelers departing Hong Kong, 44% who had traveled during the previous year reported having had sexual contact with a stranger while abroad, and 37% did not use condoms [6]. Elsewhere, 17% of a community sample of 1508 Chinese respondents reported having had sexual contact with strangers while traveling, but only 24% of the respondents reported consistent condom use [18]. Significant associations were also found between travel, sexual behavior, and HIV infection [13, 19]. For example, in a study involving 258 heterosexual travelers attending the Hospital for Tropical Diseases in London, the rate of locally acquired HIV infection was much lower (1.8%) than that of foreign-acquired (i.e., outside of the United Kingdom) HIV infection (33.2%) [19].

FACTORS ASSOCIATED WITH STD ACQUISITION IN TRAVELERS

Travel per se may not always increase sexual promiscuity. Instead, the sexual behaviors of travelers reflect those of the general population. Among Chinese business travelers from Hong Kong, those who changed partners more frequently and participated in unprotected sex while abroad behaved similarly when in Hong Kong [20]. Among those who are at risk, STD transmission is affected by deficits at many levels of socioeconomic development and STD control, including macro- and microeconomics, individual behavior, perceptions of sexual health in the population, capacity of the public health system, and recognition of sexual-health issues in the tourism sector. Common reasons for deficits in STD control include low perceived importance, moralistic perspectives on funding, competing priorities for limited funds, stigma and other barriers to case identification and contact tracing, low education levels in the community, low profile of STD prevention practiced in travel clinics, and low perception of risk among travelers.

STD risk among travelers varies by the category of traveler. Among leisure and recreational travelers, those with the highest STD risk are young, single adults on packaged or self-arranged

journeys and older, married men traveling in groups or alone on shorter trips [6]. Increasing opportunities for low-cost holidays bring large numbers of young people together. Moreover, risky sexual behavior is associated with substance abuse [4, 6]. Poverty and low educational levels among CSWs in developing countries who have sexual contact with wealthier tourists also play an important role in maintaining a high STD prevalence.

Business travel often presents unanticipated opportunities for sex and behaviors associated with a high-risk for STD acquisition. In many parts of the world, particularly Asia, sexual “entertainment” of prospective business clients is common. Elsewhere, long-distance truck drivers were key vectors for HIV spread in both Africa [21] and India [22]. People who migrate because of economic pressures are primarily at risk to become CSWs. This is particularly the case for young women and for children [23], many of whom, as illegal migrants, are under the control of organized crime syndicates [24] and, therefore, cannot seek legitimate employment or report or seek treatment for STDs. Likewise, refugees and asylum seekers may have less access to STD care and STD interventions. The sexual behavior of soldiers posted away from their homes in their own or other countries also poses a risk for the transmission of STDs. Rape by soldiers or combatants in opposing factions during civil war to intimidate communities, which has occurred in recent Balkan and African wars, and abduction of girls and young women in east Africa to “sustain” troop morale are not uncommon.

Travelers are vulnerable to STDs for several reasons: the frequency of casual sexual contact is higher during travel [3]; travelers’ sexual relations are more likely to be with persons who have a higher number of partners than usual and a higher prevalence of STDs [11]; travelers are less likely to adhere to safe sex practices during travel, because of unexpected or unplanned sexual opportunities [6]; and, because travelers may be economically compromised, the ready demand for sexual services can be an economic source of support [25]. Male travelers commonly have sexual contact with CSWs, who have a higher incidence of STDs than that observed in the general population [25]. Female recreational and business travelers seldom have sexual contact with CSWs but may engage in sexual activity with local or other traveling males who themselves have had sexual contact with CSWs. Women traveling specifically to provide sexual services in prosperous countries, such as Japan, the United States, and Europe, as well as those traveling from rural to urban regions for these purposes, serve as another vector for STD transmission.

At the socioeconomic level, population pressure, conflict, economic opportunities, and poverty have prompted unprecedented population movements, greatly increasing sexual mixing among people. Organized crime syndicates pair illegal migration with forced prostitution in destination countries [23,

24]. On the other hand, illegal entrance bypasses health controls, such as frequent STD evaluation for CSWs, which significantly influences STD spread worldwide [24].

At the individual level, predictors of STD risk in travelers include (1) pattern of travel (alone, or with friends, colleagues, or family; place; and duration of stay) [3]; (2) reasons for travel [5]; (3) availability, accessibility, and affordability of sexual services at the travel destination [26]; (4) social norms at the travel destination [5]; (5) alcohol and illicit drug availability [25]; (6) sexual activity (orientation and commercial basis) [6, 26]; (7) sex partners (locals, prostitutes, or fellow travelers) [6]; (8) inconsistent condom use [6, 18]; and (9) male circumcision status [7]. Limited STD knowledge, low perceived risk, low level of religiosity, and negative attitude toward safe sex practices or condom use are associated with having sex while abroad and with STD infection [26]. Behavioral factors include past behavior of the traveler [11], male sex [6], young age [27], single marital status [27], and low perceived threat from STDs [4]. Pathogen characteristics (efficiency of transmission during STD exposure, strain, and drug resistance) and host characteristics (exposure, duration of infectivity, nutritional status, comorbidities, and treatment compliance) can also contribute to infection [8]. The asymptomatic nature of many STDs (especially in women), complacency regarding STDs, previous uneventful sexual encounters during travel, and poor treatment compliance facilitate microorganism resistance.

IMPORTANCE OF STD PREVENTION AND CONTROL IN TRAVELERS

From the perspective of infection control, travelers are major vectors of established, new, and drug-resistant strains of pathogens. Unprotected sex can result in STDs and unintended pregnancies, which may increase the need for abortion services. Untreated STDs can cause major complications, including AIDS, cancer of the cervix, pelvic inflammatory diseases and their sequelae, complications of pregnancy and puerperium, and congenital infections of the fetus, and can be transmitted to unsuspecting sexual partners. Untreated STDs significantly impact reproductive and neonatal health and impose significant long-term societal cost. The asymptomatic stage of many STDs and the complexity of partner notification further extend the risk of contact with and spread of STDs to domestic partners. Moreover, in current health care settings in most countries, there is a lack of collaboration between travel health clinics and clinics providing STD services. Many travelers do not go to the STD clinics for help because travel health clinics are their primary contact. This increases the chance of missing STD cases, because many travel health professionals have not specialized in STD services. Collaborative efforts between STD and travel clinics would be useful for rapid referral and evaluation.

OBSTACLES TO PROMOTING SEXUAL HEALTH IN TRAVELERS

Obstacles to promoting healthy sexual activity among travelers can be summarized as follows:

Traveler diversity. Diverse populations require a range of approaches [11].

Unanticipated opportunities for sexual risk. Most consultations with travel medicine practitioners before travel are for prophylaxis, and most after travel are for symptomatic illness. Sexual advice may be unwelcome.

Industry and governmental ambivalence. Neither tour operators nor most destination governments emphasize the risks of travel STDs because of potential economic losses. The promotion of sex through advertising and the media (e.g., newspapers, magazines, television) encourages sex tourism, whereas STDs are ignored. Paradoxically, stigma surrounding sexual issues also inhibits the promotion of sexual health by recreation industries [28]. Legislation and control practices can reduce the STD prevalence, as happened in China following the cultural revolution or in Thailand during the more recent proactive 100% condom campaign. Legislating against exploitative sex tourism, which has been considered by some European countries [29], can help minimize the number of people exploited.

Poorly developed travel health policy. Policy makers were disinterested in travel health until the recent severe acute respiratory syndrome epidemic showed the potential of international travel as a vector for infection. However, STD prevention remains a low priority, and implementation of travel health research conflicts with travel industry economics.

Social denial. Communities that benefit from tourism usually deny the presence of sex tourism. The denial of pedophilia is a typical example [29].

STD PREVENTION AND CONTROL

Primary, secondary, and tertiary strategies to prevent travel-related STDs must use a multilevel, multisectoral approach by policy makers, health care and travel health service workers, clinicians, public health officials, and travel medicine and general practitioners. Primary strategies should generate safer sexual behaviors among travelers by means of risk behavior modification. However, examples of effective prevention intervention targeting travelers are scarce. Most of the current effectiveness literature is focused on patients with STDs, CSWs, people with HIV infection, and the general public. In a review of interventions to prevent transmission of STDs and HIV among travelers, Elwy et al. [30] reported mixed outcomes. They found that 5 of the 8 interventions were successful, that 2 were unsuccessful, and that 1 had equivocal results. The in-

terventions included were on-site individual counseling and HIV testing, mass communication regarding risk reduction, and multiple-component motivation (e.g., advertising campaigns) and skills education in STI clinics. In another study, reported by Gehring et al. [31], safer sex information that was provided in the airport was not effective in modifying the behavior of Swiss travelers. However, intensive education and counseling on HIV was effective in reducing STD infections among Peace Corps Volunteers from the United States in Africa in the mid-1980s [32].

STD prevention programs should include traveler-based health education within existing service frameworks. Policy makers must view travel health clinicians at home and at the travel destination as partners in STD control efforts. STD awareness in both communities could be increased [33]. Legislation and enforcement to curtail criminal-controlled population movements could facilitate STD control efforts [23].

Secondary prevention curtails STD onset and transmission through early diagnosis and treatment. Accessibility to rapid and confidential diagnostic and curative services encourages individuals to undergo STD screening and receive early health care. Risk-reduction counselors must screen for infection, discourage risky sexual activities before infection is cured, and encourage partner notification. Attempts to notify partners should at least reach regular domestic contacts. Patient-initiated partner notification may encourage partner referral for STD evaluation and treatment but may be unreliable, because of the consequences of admitting infidelity. When appropriate laboratory facilities for investigations are unavailable, syndromic management approaches recommended by the World Health Organization (WHO) and respective public health departments are valuable [34].

Each country should develop prophylaxis for use after sexual exposure. Guidelines for prophylaxis against STDs after sexual exposure vary by country and disease and are dependent on the capacity to conduct laboratory tests, the likelihood of returning for follow-up if a laboratory test was offered, the knowledge about the presence of STDs in a suspected contact, and the availability of rapid diagnostic testing. Vaccines for hepatitis B only are currently available (administration should follow national guidelines). Prescription of antibiotics to all suspected contacts may contribute to the continued development of antibiotic-resistant strains of pathogens associated with STDs.

Tertiary prevention should reduce local complications (e.g., urethral stricture) or systemic complications (e.g., pelvic inflammatory diseases and AIDS) and sequelae associated with untreated or incompletely treated infections. Recipients of primary treatment for the most common STDs in a country may have other asymptomatic STDs (e.g., chlamydial infection). Patients should be asked about previous treatment received while abroad, and recipients should be urged to follow-up with their

domestic care physicians to ensure optimal care and to identify and treat concomitant asymptomatic conditions [35]. Clinicians should ensure other periodic assessments to detect longer-term sequelae of STDs (e.g., Papanicolaou smear for cervical cancer). Because laboratory diagnostic criteria and medical management of various STDs may vary by country and are changing rapidly, the reader is advised to refer to respective national guidelines or to Centers for Disease Control and Prevention (CDC) and WHO recommendations [34].

WHAT IS THE CLINICIAN'S ROLE?

It is important that clinicians keep abreast of new interventions available for the treatment and prevention of STDs through continuing medical education. Specialty organizations, such as those involved with travel medicine, community health, and family health, and public health departments can play a leading role in providing continuing education about STDs. In addition to the national guidelines in each country, STD treatment and laboratory diagnostic guidelines can be obtained from the CDC (<http://www.cdc.gov/std/>) and the WHO (<http://www.who.int/health-topics/std.htm>).

A detailed travel history can quickly identify at-risk individuals and the need for appropriate measures before and after travel. Travel history should include the destination, mode, duration, and reasons for travel, as well as details about accompanying persons, planned and/or performed activities, and a confidential, detailed sexual history. Age, occupation, marital status, and sexual behavior before, during, and after travel are also important. Printed material about STD risk and protection should be available to take for reference. Condom use should be emphasized. Travelers suspected of having had unprotected sex with a new partner while abroad should be offered STD screening [36] so that asymptomatic infections can be detected and treated and the chain of transmission interrupted. However, on the basis of available evidence, it is difficult to suggest the type of STDs to be screened and the time at which screening should be performed. For some STDs (e.g., chlamydial and gonococcal infections), early diagnostic tests would be desirable, whereas for viral infections (e.g., those due to HIV and HBV), screening should be considered a few months after travel [11].

The decision on whether to provide postexposure prophylaxis to travelers who had unprotected sexual intercourse with partners with known or unknown infection status should be based on many parameters included in the STD treatment recommendations of each country [37]. Linkage between travel health clinicians and specialized STD clinics can improve appropriate laboratory investigation and treatment. Appropriate counseling will facilitate compliance. Patient compliance with STD evaluation is improved by making rapid diagnostic tests

with acceptable performance rates available in the physicians' office.

Providing individuals with information on STD prevalence, risk in the target country of travel, and prevention together with other general health information before travel can introduce the topic with minimal embarrassment, which makes it more likely that the information will be read. There is an urgent need for readily available, comprehensive, and comprehensible STD information, along with other travel health literature, at clinics and at points of embarkation. Travel clinics can also provide literature and hang posters in waiting areas. Such literature should provide information on the nature, signs, symptoms, and consequences of STDs and the importance of practicing safer sex, with emphasis on universal and consistent condom use during casual sex, the risk associated with substance abuse before sex, and the value of hepatitis B vaccination. Pamphlets, posters, and Web sites can be developed by public health departments or by specialty organizations. Travel-related health consultations should be viewed as unique opportunities to advise patients and provide services about STD prevention. Notification, legislation, and enforcement will increasingly be needed to protect vulnerable traveling groups, such as minors and forced migrants. Travel health practitioners can play a crucial role in initiating such actions in collaboration with other colleagues working in the STD service and law-enforcement agencies. The impact of STDs on travelers can be reduced significantly if each travel medicine practitioner makes an effort to identify patients at risk for sexual risk taking and to offer appropriate counseling, disease-detection options, and treatment. A complete travel history should include sexual risk history.

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