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Authors

Gaydos, Charlotte
Geller, Amy
Garges, Eric
[et al.](#)

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COMMENTARY

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Sexually Transmitted Infections in the U.S. Military: A Sexual Health Paradigm to Address Risk Behaviors, Unintended Pregnancy, Alcohol Use, and Sexual Trauma

Cherrie B. Boyer, PhD^{*},[†]; Charlotte A. Gaydos, MS, DrPH[‡],[†]; Amy B. Geller, MPH[§],[†]; Eric C. Garges, MD, MPH, COL, USA^{||}; Sten H. Vermund, MD[¶],[†]

ABSTRACT To address the ongoing epidemic of sexually transmitted infections (STIs) in the United States, the National Academies of Sciences, Engineering, and Medicine (National Academies) conducted a consensus study on STI control and prevention in the United States to provide recommendations to the Centers for Disease Control and Prevention and the National Association of County and City Health Officials. The culminating report identified military personnel as one of the priority groups that require special consideration given the high prevalence of STIs and their associated behaviors (e.g., concurrent sexual partners and infrequent condom use) that occur during active duty service. Universal health care access, the relative ease and frequency of STI screening, and the educational opportunities within the military are all assets in STI control and prevention. The report offers a comprehensive framework on multiple and interrelated influences on STI risk, prevention, health care access, delivery, and treatment. It also provides an overview of the multilevel risk and protective factors associated with STIs that could be applied using a sexual health paradigm. The military context must integrate the multilevel domains of influences to guide the effort to fill current gaps and research needs. The Department of Defense, with its large clinical and preventive medicine workforce and its well-established universal health care system, is well positioned to enact changes to shift its current approach to STI prevention, treatment, and control. STI control based on highlighting behavioral, social, cultural, and environmental influences on service members' sexual health and wellness may well drive better STI care and prevention outcomes.

In response to the alarming increasing rates of sexually transmitted infections (STIs) in the United States, the Centers for Disease Control and Prevention (CDC) through the National Association of County and City Health Officials (NACCHO) commissioned the National Academies of Sciences, Engineering, and Medicine (National Academies) to conduct a consensus study on the state of STIs in the United States

and to provide recommendations for addressing the increasing morbidity, barriers in the health care system, and economic burden of STIs. After concluding its work, the National Academies released *Sexually Transmitted Infections: Adopting a Sexual Health Paradigm* in March 2021, highlighting military recruits and active duty service members as one of the priority groups that require focused consideration.¹

^{*}Department of Pediatrics, Division of Adolescent and Young Adult Medicine, University of California, San Francisco, CA 94118, USA

[†]Committee on Prevention and Control of Sexually Transmitted Infections in the United States, National Academies of Sciences, Engineering, and Medicine, Washington, DC 20001, USA

[‡]Johns Hopkins University Center for Development of Point-of-Care Tests for Sexually Transmitted Infections, Division of Infectious Diseases, Medicine, Johns Hopkins University, Baltimore, MD 21205, USA

[§]National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Population Health and Public Health Practice, Washington, DC 20001, USA

^{||}Department of Preventive Medicine and Biostatistics, Uniformed Services University, Bethesda, MD 20814, USA

[¶]Yale School of Public Health, New Haven, CT 06510, USA
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STI PREVALENCE, SCREENING, AND TREATMENT

STIs are the most prevalent reportable infectious diseases among U.S. military recruits and active duty service members with rates consistently surpassing those identified in civilians of a comparable age, race, and ethnicity. Chlamydia and gonorrhea are the most commonly diagnosed STIs across all military branches, which are comprised mostly of healthy, sexually active, and highly mobile young men and women. The CDC cites adolescents and young adults, aged 15–24 years, as being disproportionately affected by STIs in the United States, which is a further element of risk for military personnel. Similarly, a higher density of STIs in the southern U.S. region aligned with greater military presence in this region increases military population risk.

Many attributes of the military support STI screening and treatment. For example, STIs are more frequently screened in

military medicine than in civilian life due largely to increased access to free primary care. When identified in military personnel, STIs are universally treated. Another asset is that the Department of Defense (DOD) has an effective passive reporting system that benefits from centralization and a unified system of care. However, in this healthy group of young people, the sequelae of unidentified and untreated STIs may result in significant reproductive morbidity (e.g., human papillomavirus-related genital warts and cervical, vulvar, anal, and oropharyngeal cancers) and other long-term health consequences (e.g., pelvic inflammatory disease, infertility, ectopic pregnancy, and congenital syphilis). These conditions are particularly problematic for women, with many of the adverse reproductive health outcomes being unapparent until long after they have left military service.

STI-related health consequences often incur substantial health care costs and result in untold personal loss or stigma for many service members. Viral STIs, such as HIV infection and chronic hepatitis, may additionally interfere with service members' readiness to perform their daily duties and restrict their availability for deployment. Although women are frequently screened for asymptomatic STIs, primarily during the first year of service and annually during reproductive health care visits, there is a comparative lack of STI screening and surveillance data on male recruits and active duty service members. This is particularly worrisome since it is unclear the extent to which young military men acquire and transmit asymptomatic STIs.

SEXUAL RISK BEHAVIORS

Risk, acquisition, and prevention of STIs are the result of interrelated sexual and reproductive health behaviors and substance use that are influenced by psychosocial factors that occur within the social and environmental contexts in which individuals live and socialize. The behaviors that are associated with increased risk for STIs, including sex with new or casual partners, sex with multiple concurrent individuals, and infrequent and inconsistent use of condoms during sexual encounters are more prevalent among military service members than among similar civilian groups.² Given the high prevalence of both STIs and their associated behaviors, there is a clear need for continuing comprehensive STI screening, surveillance, and sexual health assessments of military service members irrespective of gender. Moreover, the youngest age groups of recruits and early career active duty service members warrant particular focus because of their increased risk for STIs due both to elevated baseline STI risk, as well as increased STI risk due to selected social dynamics of military service.

CONTRACEPTIVE USE AND UNINTENDED PREGNANCY

Other factors within a sexual health paradigm associated with STIs in the military include the lack of effective contraceptive use and unintended pregnancy, defined as mistimed,

unwanted, or unplanned pregnancy. Although contraceptive use among women service members is a deeply personal matter, it is also inextricably connected to their military service. Despite universal access to contraceptives in the military, service women report many barriers to contraceptive use uptake and adherence during active duty³ that may pose increased risk for an unintended pregnancy. Despite the obvious connections among contraceptive use, unintended pregnancy, and STIs, there is a dearth of recent available data focused on these salient factors among military service members. As such, there is a clear need for a more holistic approach to sexual and reproductive health education for all military personnel, including one that empowers and promotes informed sexual and reproductive health decisions. This can reduce unintended pregnancies and decrease the risk of exposure to STIs whether service members are in training or on active duty service stateside or overseas.

EXCESSIVE ALCOHOL USE

Alcohol has long been an acceptable part of military culture and is easily accessible and affordable on military installations. Alcohol use, including the problem of excessive use (i.e., binge drinking and heavy use) is pervasive among military recruits and active duty service members.⁴ This widespread use is particularly problematic because of its association with sexual risk behaviors and STIs,⁵ including inconsistent condom use,⁶ multiple sexual partners,⁷ condomless sex,⁸ and ineffective contraceptive use.⁹ Beyond current DOD-wide surveillance data on alcohol use, there is a critical need for more recent in-depth military-specific data to better understand the social and environmental context in which sexual health decisions and behaviors occur relative to when alcohol is used. Importantly, new data are needed to plan and implement military-specific evidence-based education and skills training interventions and other prevention strategies to reduce behavioral risk for STIs in the military. Structural changes should also be considered given the ubiquity of alcohol in military social events.

MILITARY SEXUAL TRAUMA

Military sexual assault is defined as physical contact of a sexual nature without voluntary consent that occurs while serving in the military, and military sexual trauma, including both sexual harassment and sexual assault in an ultramasculine social culture, has been a longstanding problem.¹⁰ Among active duty service members, military sexual assault is estimated to have occurred in 1.0% of men and 4.9% of women. Over a 1-year period, there are approximately 2.5 incidents of military sexual assault per 100 men and 9.6 incidents per 100 women with the highest rate occurring among the most junior enlisted men and women and lower ranking women officers.¹¹ Military sexual trauma has been documented to have a significant negative impact on service members' mental (e.g., posttraumatic stress disorder and depression) and physical health (e.g., pelvic pain, headaches, and chronic fatigue)

and compensatory stress- and health-related behaviors (e.g., smoking, substance use, and alcohol misuse).¹⁰

Less is known about the impact that military sexual trauma has on service members' sexual and reproductive health. Findings from research on lifetime sexual assault among active duty personnel and women veterans indicate that unwanted sexual contact is associated with a greater frequency of casual and multiple sexual partners, binge drinking, and illicit substance use.¹² Sexual trauma among service members has been associated with both STIs¹³ and sexual risk behaviors, including sex in exchange for goods or services.¹⁴ Based on these limited available data, further research can help to better understand the impact that both military-specific and lifetime sexual trauma have on the sexual and reproductive health of military service members and veterans. These data are critical for the development of sustained effective strategies to eliminate future occurrences and for building evidence-based support programs that are implemented in recruit training and continued into and beyond active duty service.

CURRENT GAPS AND RESEARCH NEEDS

The military is a microcosm of our society. The high rates of STIs identified within the military are reflective of the unprecedented high rates occurring nationally, particularly among adolescents and young adults.¹⁵ The young men and women who elect military service are products of their personal, familial, and community experiences, reflecting diverse racial and ethnic groups, geographic regions, socioeconomic statuses, health behaviors, and sexual preferences. In addition, wearing the uniform provides expansion into military social and sexual networks unique to this population and provides greater opportunities for bridging both socially and geographically, which may also influence STI risk. These factors must be considered in order to effectively address service members' risk for and acquisition of STIs. In this vein, the National Academies report on STIs proposes a holistic sexual health approach that emphasizes and addresses the interrelated and mutually reinforcing social and structural determinants of health and health inequities.¹ Sex is part of love, pleasure, and building of families and a sexual health paradigm is the best starting point for preventing and mitigating harms like STIs and trauma. The report also indicates that a comprehensive perspective is necessary in order to fully understand and address the multiple and interrelated influences on STI risk, prevention, health care access, delivery, and treatment. The report also provides an overview of the multilevel risk and protective factors associated with STIs, which may provide a framework that could be applied to the military context. Such factors account for and integrate individual, interpersonal, institutional, community, and structural facilitators to overcome barriers to STI prevention, control, and treatment within the military. The framework proposed within the report may also serve as a guide for addressing current needs in surveillance, health care, and research.

STI surveillance is one among many topics of special interest to military medicine. Current surveillance for reportable STIs such as gonorrhea and chlamydia are monitored by each branch of service with an annual surveillance report generated yearly by the Armed Forces Health Surveillance Branch, Defense Health Agency. While definitive recommendations were beyond the scope of the National Academies STI report, there are possibilities for improving military medicine. Changes to improve STI surveillance data and their analysis may include the use of social media and military-serving chatrooms for early awareness of trends or outbreaks. Expanded screening can make active surveillance a valued addition to the current passive systems across the armed services, as can additional laboratory-based surveillance and surveillance of outpatient reports and hospitalizations. In addition, increased participation in the CDC's focused STI surveillance programs, such as the gonococcal isolate surveillance program, would be mutually beneficial. Similarly, the DOD Global Emerging Infection Surveillance Program provides gonococcal resistance surveillance at multiple sites outside the United States. Coordination with global stakeholders in antimicrobial resistance surveillance would provide a similar mutual benefit. These enhanced measures would directly improve force health protection and readiness, as well as directly support the Military Health System's Quadruple Aim initiative.

RECOMMENDATIONS

The DOD, with its large clinical and preventive medicine workforce and its well-established universal health care system, is well positioned to enact changes that are necessary for shifting its current approach to STI prevention, treatment, and control to one that also considers behavioral, social, cultural, and environmental influences on service members' sexual health and wellness. In partnership with its civilian public health counterparts (i.e., local, state, and tribal departments of health and the CDC), the DOD should dedicate resources to sustain efforts that are needed to develop contemporary programs and systems for reducing STIs within the military.

An overarching goal is the development and implementation of sustained psychosocial and behavioral, informatics, technological, and health services interventions that could be implemented in clinical practices and in training settings across all branches of the military. Specific programmatic and research needs include: (1) providing cost-effective STI screening of male recruits and active duty service members to complement existing screening approaches used for women; (2) improving DOD-wide STI surveillance systems; (3) improving adherence to clinical practice guidelines and benchmarks to ensure consistent delivery of recommended sexual health services; (4) applying a holistic approach for sexual health education and STI prevention in all military personnel; (5) developing and implementing expedited partner-delivered STI treatment to prevent reinfection in service members; (6) standardizing ongoing continuing education and resources for clinicians to engage in

culturally competent sexual health and STI risk assessments; (7) addressing barriers to sexual health, including contraceptive use uptake and adherence among service women and men; (8) attaining military-specific data to better understand and address the social and environmental context in which excessive alcohol use occurs relative to sexual behaviors; (9) developing evidence-based risk prevention intervention programs to address the social and cultural climate within the military that increases the risk of sexual trauma; and (10) understanding and mitigating the impact of trauma on the sexual and reproductive health and wellness of service members, veterans, families, and affected populations, such as sex workers in proximity to military installations.

The historic commitments to the research and development of biomedical tools and interventions for STI prevention need revitalization. Military research partnerships with the National Institutes of Health and the CDC may be needed to improve point-of-care diagnostics, antimicrobials, and vaccines for treatment and/or prevention of STIs. We hope that the complete National Academies' report on STIs can be helpful in these deliberations, accessed free of charge at: <https://www.nationalacademies.org/preventSTIs>.

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CONFLICT OF INTEREST STATEMENT

None declared.

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