

**United States Military STI Screening:
Policy Analysis and Implications**

by

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ABSTRACT

Problem: Serving in the United States armed forces can often expose individuals to high stress situations, which has been shown to negatively impact decision making. Increased high risk sexual behaviors, is one of the manifestations reported that may result in the acquisition of a sexually transmitted infections (STIs). Undetected STIs within a highly mobile military population poses a significant public health concern, which threatens military readiness. U.S. armed forces screening policies have the potential to influence the incidences of STIs/HIV within the military population and surrounding communities.

Methods: United States Department of Defense, Air Force, Army, Navy and Marine Corps STI/HIV screening policies and prevention programs were examined. Population specific considerations were gathered from a literature search conducted through PubMed, Medical Surveillance Monthly Report and Military Medicine (Oxford's International Journal of AMSUS). Limitations identified in current policies and population specific characteristics guided the development of screening recommendations, which are provided in a programmatic framework.

Results: In alignment with medical advances and the simplification of STI treatment, the U.S. military has significantly reduced transmission of STIs within service members. Nevertheless, STIs continue to be the among the highest reported communicable diseases within the armed

forces. The incidence rates have increased in the recent years. The allowance of fluidity among STI screening policies may not adequately reduce the spread of STIs.

Conclusions: Standardized screenings and health education could increase the detection of asymptomatic STIs, reducing the spread of infections within the military population.

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Preface

I would like express my sincerest gratitude to my advisor, Dr. Linda Rose Frank, for her continuous support and guidance. Her level of dedication to my success and the success of all of her students is appreciated. I would also like to thank my committee members, Dr. Elizabeth Felter and Dr. Mackey Friedman, for their comprehensive feedback and direction. Lastly, I would like to acknowledge the provision, sustenance and unconditional love demonstrated by my family, which was essential to the achievement of this degree.

1.0 Introduction

This essay will present a policy and program analysis, which aims to (1) examine sexually transmitted infection (STI) screening policies mandated by the U.S. armed forces, (2) discuss the intersection of policies and population specific considerations regarding their possible impacts on the spread of STIs and (3) provide recommendations geared towards reducing transmission within the military population.

STIs threaten U.S. military readiness due to frequent global mobility and high rates of infections found within the population. Undetected STIs may result in increased vulnerability to Human Immunodeficiency Virus (HIV), pelvic inflammatory disease, ectopic pregnancy, infertility, cervical cancer and epididymitis lymphogranuloma venereum [3]. This essay will focus on HIV and bacterial STIs, including *Chlamydia trachomatis* (chlamydia), *Neisseria gonorrhoeae* (gonorrhea) and *Treponema pallidum* (syphilis). The STIs mentioned are classified as Armed Forces Reportable Medical Events, which are defined as significant threats to military operations due to transmission risks in the population, and having potential to disrupt trainings and deployments [4].

As outlined below in Figure 1, this essay will examine the limitations and opportunities of screening policies, educational programming, population-specific considerations and reporting tools. This process will provide a clarified understanding of measures that are being taken to prevent and detect STIs in the military population, and guide the development of supplementary measures. Understanding the true burden of disease and frequency at which they occur will highlight the U.S. military community's unique needs, regarding prevention programming and detection strategies. In alignment with the Department of Defense (DoD) mission of maximizing

mission readiness through the capacity of rapid mobility of personnel, it is imperative to prioritize the health of service members by preventing and detecting STIs.

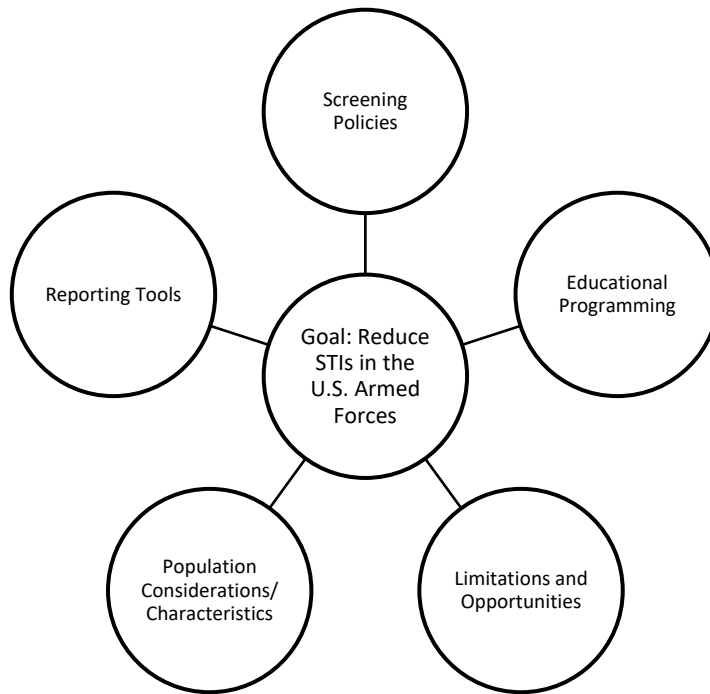


Figure 1 Mechanisms of understanding and reducing STIs/HIV in the military

1.1 Historical Overview

Historically, the U.S. armed forces have always had a primary interest in preventing the spread of STIs. Various implemented measures by the U.S. armed forces had a common goal, which was to reduce the rate of STIs found within its’ population through varying approaches [5, 6]. Withholding pay and member funded STI treatment during the Revolutionary War era, are early illustrations of applied control measures [5]. Advancements in modern medicine has strongly influenced policies, screening procedures, treatments and recovery time. As

treatment became more effective and readily available, preventative measures have reduced significantly within the U.S. military.

Gonorrhea and syphilis were the primary cause for enlistment rejection during pre-accession screening in World War I (WWI) and World War II (WWII) [5]. In response to the high rate of observed infections, several prevention strategies were launched [6]. During WWI, General Order Number 215 sought to influence service members to abstain from high-risk sexual behaviors while deployed [5]. This method consisted of prolonging a member's deployment, following an STI diagnosis during out-processing [5]. President Woodrow Wilson and The Commission on Training Camp Activities, implemented a social hygiene campaign during WWII, which promoted a high moral code in and around military installations [6]. This included the May Act, which banned supporting or engaging in prostitution near military installations [6, 7]. Social hygiene campaigns placed an emphasis on risk reduction by promoting avoidance of pre-marital sexual intercourse, abstinence, prophylaxis and condom usage [5, 6]. Nevertheless, the above-mentioned strategies were unsuccessful at decreasing the spread of STIs within the military population [6, 8].

During WWII, Army researchers demonstrated 99.6% efficacy in sulfathiazole's capability to prevent venereal diseases (syphilis, gonorrhea and chancroid) when used as a post exposure prophylaxis [6, 9, 10]. Following this development, resources areas referred to as "Pro-stations", were made accessible to service members [10]. Pro-stations were areas in which military personnel could visit to obtain condoms and prophylaxis kits containing an ointment mixture of 30% calomel and 15% sulfathiazole [10]. Although highly efficacious, post-exposure prophylaxis use of sulfathiazole only prevented 55% of infections when utilized by service members [6]. Poor sanitation, human behavior and logistical inadequacies led to lower than

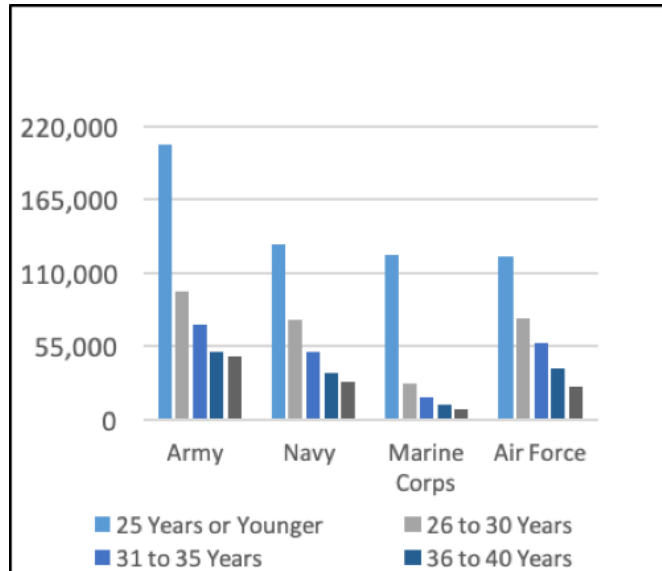
anticipated prophylactic success rates within the U.S. armed forces [6, 10]. Nearing the end of the WWII, a large-scale trial conducted by the Army, demonstrated the effectiveness of penicillin use for gonorrhea treatment and reduced recovery time from an average of 38-50 days to 6.4 [9, 11].

The spread of STIs remained persistent within the military, despite the development of more effective treatments [6, 10, 11]. Within five years following WWII, STI rates doubled and continued to rise [8]. Gonorrhea rates were reported at 300 cases per 1,000 person-years, during the Vietnam War [9]. High-risk behaviors, such as sexual engagement with sex workers, were reported in deployed locations [8]. However, unsuccessful outcomes associated with WWII's social hygiene campaigns, discouraged military leaders from implementing similar approaches during the Vietnam War [8,10]. Alternatively, the primary prevention strategy focused on education [8]. Policy outlined control measures during the Vietnam War, which included three prevention education encounters in deployed settings [8]. There were major shortfalls fulfilling the intended reach of the educational policy, as most personnel did not receive the required sessions [8]. STIs have remained prevalent within the U.S. military.

The emergence of HIV in military personnel occurred in unison with the civilian population in the continental U.S. [12, 13]. In response to the epidemic, the DoD employed countermeasures, which included the authorization of routine HIV testing and the formation of the U.S. Military HIV Research Program (MHRP) [12, 13]. Studies conducted within the MHRP provided evidence supporting heterosexual HIV transmission and examined the natural history of seroconversion [9]. Presently, the U.S. military continues to contribute towards the eradication of HIV, through ongoing vaccine research and standardized personnel screening [9].

1.2 Current U.S. Military Demographics

Approximately 2,109,300 military personnel serve in the Air Force, Army, Navy and Marine Corps — males representing the largest proportion at 83.8% and female representing 16.2% of the total armed forces [14]. Eighteen to 25-year-olds represent approximately 51.7% of the active duty U.S. military population and 90% of accessed members [4].



Data in graph derived from 2017 Demographic Report [15]

Figure 2 U.S. Armed Forces Age Demographics by service branch, 2017

Lesbian, gay, bisexual and transgender (LGBT) service members represent 6.1% of U.S. military personnel [16]. However, prior research suggests that the true population of men who have sex with (MSM) within the military is higher than reported self-identifying figures [1, 15].

Total	6.1%
Male	4.2%

Table 1 Continued

Female	16.6%
Ages 17-24	9.30%
Ages 25-34	6.40%
Ages 35-44	2.60%
Ages ≥ 45	2.80%

2015 Department of Defense Health Related Behavior Survey [16]

1.3 U.S. Military and General U.S. Populace STI Incidence Rates

Fifteen to 24-year-olds account for 50% of all newly reported STI cases in the United States [17]. Approximately 50% of those serving in U.S. armed forces fall within the 18-24-year-old age demographic [14, 17]. The military follows a similar age and gender distribution of newly diagnosed STIs when compared to the civilian population (see Appendix A).

The CDC has noted an overall 22% increase of chlamydia infections since 2013 [17]. As reflected in Figures 3 and 4, there is a paralleled increase of reported chlamydia infections within the U.S. population and armed forces, with the strongest correlations existing among women between the ages of 20-24 (see Appendix A) [2, 17, 18]. Surveillance bias likely affects the reported incidence rates for STIs, as females receive screenings at a higher frequency than males [17-19].

According to the CDC, reported gonorrhea rates have increased by 67% among the general population [17]. As reflected in Figure 6, there is a noticeable increasing trend, most significantly among men in the U.S. [17]. However, females receive gonorrhea diagnoses more frequently than males in the U.S. armed forces [2, 17]. Surveillance bias noted within the military could be an explanatory cause of the contradictory trend [19]. Nevertheless, the CDC

estimates the true gonorrhea incidences within the general population is two times the reported rate, due to low screening frequencies [17].

As reflected in Figures 7 and 8, reported primary and secondary syphilis has increased by 76% since 2013 [2, 17]. MSM are most frequently diagnosed with syphilis in both populations [2, 17]. Newly diagnosed cases of HIV occur at a lower rate in the U.S. armed forces than in the U.S. population [1, 20]. From 2010-2016, the DoD averaged 25 new HIV diagnoses per 100,000 members tested [20].

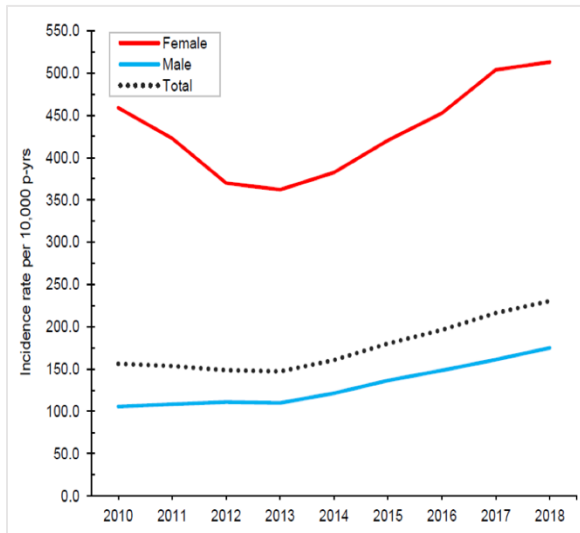


Figure 3 Incidence rate of chlamydia infections, military (by sex, U.S. armed forces- active duty 2010-2018) [2]
Graph obtained from Stahlman and Oetting, 2019¹

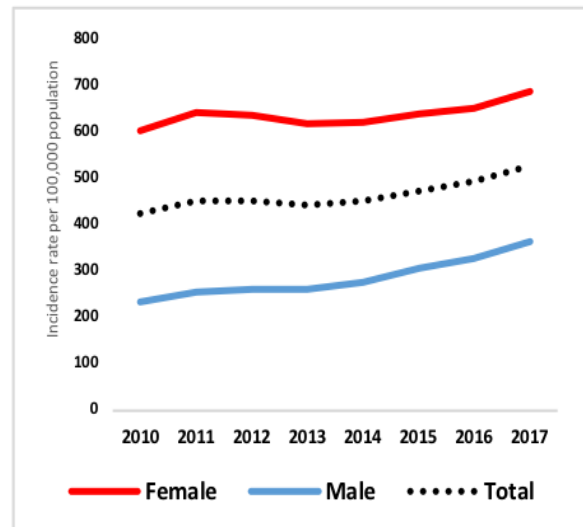


Figure 4 Incidence rate of chlamydia infections, U.S. (by sex, 2010-2017) [1]
Data within graph derived from CDC²

¹ Data in graphs referencing military incidence rates were obtained from 2.Stahlman, S. and A.A. Oetting, *Sexually transmitted infections, active component, U.S. Armed Forces, 2010-2018*. MSMR, 2019. **26**(3): p. 2-10.

² Data in graphs, which reference U.S. population incidence rates obtained from the following source 17.*Sexually Transmitted Disease Surveillance 2017*. 2018, Centers for Disease Control and Prevention, Division of STD Prevention.

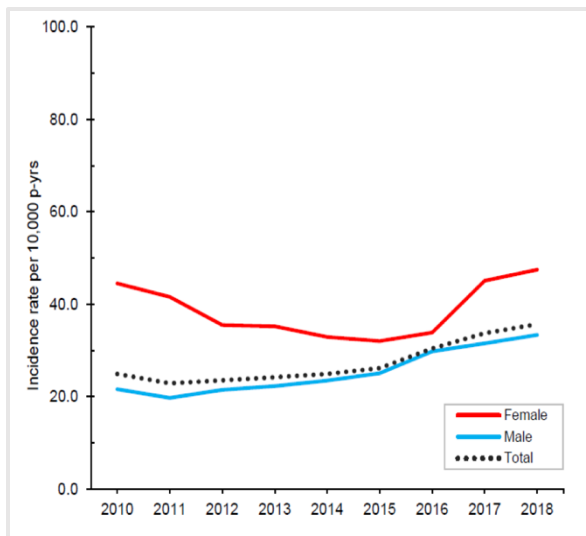


Figure 5 Incidence rate of gonorrhea infections, military (by sex, U.S. armed forces- active duty 2010-2018) [2]
Graph obtained from Stahlman and Oetting, 2019³

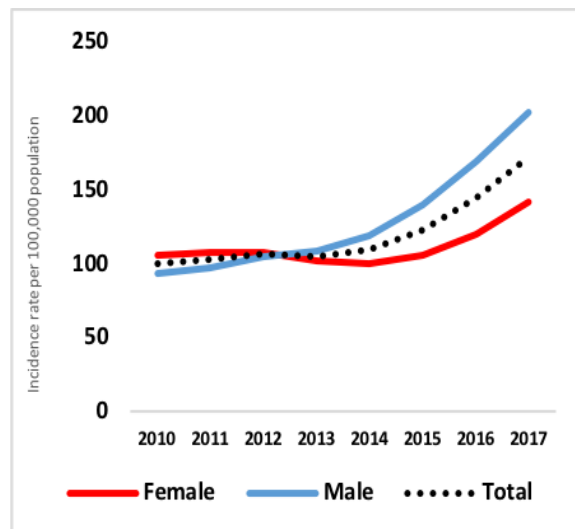


Figure 6 Incidence rate of gonorrhea infections, U.S. (by sex, 2010-2017) [1]
Data within derived from CDC⁴

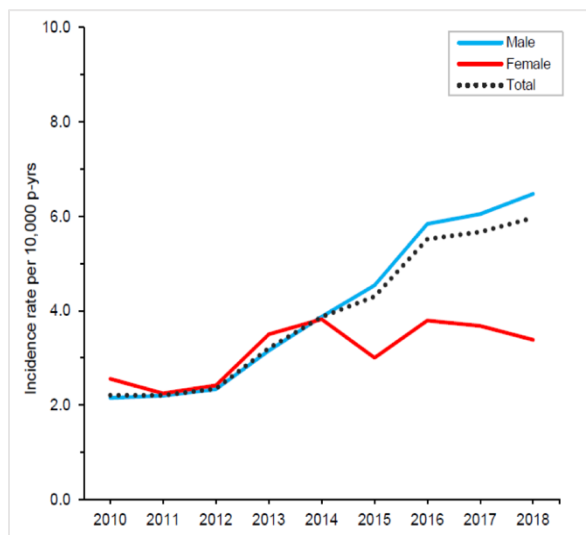


Figure 7 Incidence rate of syphilis infections, military (by sex, U.S. armed forces- active duty 2010-2018) [2]
Graph obtained from Stahlman and Oetting, 2019³

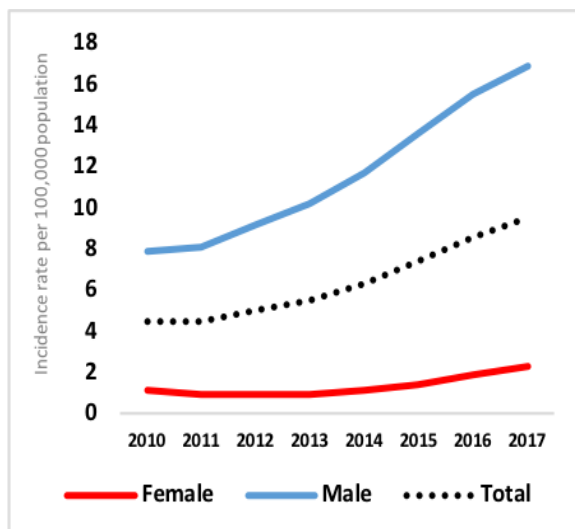


Figure 8 Incidence rate of syphilis infections, U.S. (by sex, 2010-2017) [1]
Data within graph derived from CDC⁴

³ Data in graphs referencing military incidence rates were obtained from 2.Stahlman, S. and A.A. Oetting, *Sexually transmitted infections, active component, U.S. Armed Forces, 2010-2018*. MSMR, 2019. 26(3): p. 2-10.

⁴ Data in graphs, which reference U.S. population incidence rates obtained from the following source 17.*Sexually Transmitted Disease Surveillance 2017*. 2018, Centers for Disease Control and Prevention, Division of STD Prevention.

2.0 Methods

DoD doctrine databases were searched for STI and HIV military screening regulations. Databases included the Executive Services Directorate, Air Force E-Publishing, Army Publishing Directorate, the Navy Personnel Command and official military websites [21-24]. Available Memorandums for Record were included, if pertinent to mandatory prevention programs or screening policies [23, 25]. Screening and program inclusion criteria consisted of the explicit requirement of the particular item within current policy or confirmation from military medical personnel. A small number of inconsistencies regarding STI screening standards and programs were identified between policies and information listed on governmental websites. These inconsistencies were assessed through key informant interviews with military medical personnel and included if suitable [24, 26].

Population specific considerations were assessed through various methods. The 2015 Department of Defense Health Related Behavior Survey provided military specific risk information [16]. A literature search was conducted through PubMed and Military Medicine (Oxford's International Journal of AMSUS), which utilized a combination of search terms and phases. Terminology and phrases included United States military, STIs, asymptomatic infections, extragenital STIs, chlamydia, gonorrhea, HIV, high-risk sexual behaviors, prevention programming, routine and cost-effectiveness of STI screening. Additionally, the index of the Medical Surveillance Monthly Report was examined and articles were reviewed based on relevancy determined by article titles. Title relevancy included the mention of STIs, HIV, chlamydia, gonorrhea, surveillance, reporting and secondary STI related conditions [27].

Information from these sources were considered for inclusion based upon military screening implications.

Recommended screening frequencies were obtained from the Centers of Disease Control and Prevention (CDC) and United States Preventative Services Task Force (USPSTF) [28, 29]. U.S. population incidence rates were obtained from the 2017 Sexually Transmitted Disease Surveillance report published by the CDC [1, 17]. Data in the report derived from state health departments, whom are required to report all laboratory confirmed cases of chlamydia, gonorrhea, syphilis (primary and secondary cases) and HIV to the CDC's National Notifiable Diseases Surveillance System [1, 17]. Air Force, Army, Navy and Marine Corps STI incidence rates were collected from articles published in the Medical Surveillance Monthly Report, "*Sexually Transmitted Infections, Active Component, U.S. Armed Forces, 2006-2017 and 2010-2018*" [2, 18]. Reported military incidents originated from administrative health data, reported medical events to the Armed Forces Health Surveillance Branch and medical encounters documented in the Medical Data Store [2].

This essay will analyze DoD, United States Air Force, Department of the Army and Department of the Navy (Navy and Marine Corps) STI and HIV screening polices. The essay will identify military policies, specific characteristics and issues of the military population, and provide programmatic recommendations aimed to reduce transmission of STIs and related stigma within the military.

3.0 Department of Defense Policies

3.1 HIV Screening Policies

Department of Defense Instructions (DoDI) and Directives establishes protocols and outlines accountability of designates entities, which are tasked to ensure the proper implementation of the mandated guidelines. DoDI 6485.01, *HIV in Military Service Members*, is a discourse of screening requirements and implications associated with positive findings [30]. Initial HIV screening occurs during the pre-accession phase, when civilians are screened before appointments, enlistments and inductions [30]. Presence of HIV or serological evidence⁵, and false-positive screenings with ambiguous results on confirmatory immunological testing leads to rejection of military service [21]. Within 72 hours of reporting to officer candidate programs, applicants are screened and if laboratory evidence of HIV is discovered they are denied entry [30]. Candidates in the Reserve Officer Training Corps are screened during their commissioning physical examination and denied entry if laboratory evidence of HIV is detected [30].

DoDI 6485.01 requires that all military personnel receive serologic HIV testing every 24 months. Members are required to receive additional screening when tasked to deploy to predetermined locations for greater than 30 days. Serum collected for HIV screening must occur

⁵Serologic Evidence of HIV infection is a reactive result given by a FDA approved serologic test for HIV detection. The U.S. military uses the standard HIV diagnostic algorithm: (1) Immunoassay (IA) initial screen (2) reactive specimens are duplicated using the same IA (3) Western Blot, Multispot or Geenius serologic supplemental confirmatory testing. Fourth-generation IA is the preferred initial screening; detection of markers of HIV infection begin to occur 5-7 days' post HIV transmission. The first detectable marker is HIV ribonucleic acid followed by an early HIV antigen, p24 (HIV-1), then anti-HIV immunoglobulin M antibody, followed by anti-HIV IgG antibody. 20. Okulicz, J.F., et al., *Review of the U.S. military's human immunodeficiency virus program: a legacy of progress and a future of promise*. Msmr, 2017. **24**(9): p. 2-7. 31. *Army Regulation 600-110 Identification, Surveillance, and Administration of Personnel Infected with Human Immunodeficiency Virus*. 2014, Department of the Army.

within 120 days prior to deploying and again within 4 days of returning [32]. If seroconversion is detected while serving in the military, members are medically evaluated to determine the continuance of service [30]. Members found medically fit are allowed to continue service, in a capacity that is conducive to on-going treatment [30]. Members deemed unfit for duty or medically incapable of military service will receive medical separation [30].

3.2 LGBT Regulations

The first official document prohibiting homosexual conduct in the U.S. military was published in 1982 [22]. The guidance outlined the terms of dismissal for any service member that engaged in, attempted to engage in, had a propensity to engage in or intended to engage in homosexual acts [22, 33]. “Don’t Ask, Don’t Tell”, a directive issued in 1993, allowed homosexual activity and relationships among service members [34]. Conversely, members were still discharged from service in the event that information regarding homosexuality was obtained by military leadership [34]. Public Law 111–321 repealed “Don’t Ask, Don’t Tell” in 2010, which allowed unrestricted homosexual activity and relationships [35]. Additionally, the DoD established the acceptance of transgender service members and outlined protocols related to transitioning while actively serving in the U.S. armed forces in 2016 [25, 36].

3.3 Pre-Exposure Prophylaxis

The Defense Health Agency released provisional guidance in 2018, which requires that HIV pre-exposure prophylaxis (PrEP) is accessible to all high-risk military service members and their dependents [23]. The memorandum mandates the designation of clinical staff and providers whom are culturally competent in the areas of risk related to the HIV transmission, risk reduction, PrEP evaluation, ongoing monitoring and adherence. A qualified PrEP provider⁶ must be available at all military treatment facilities in non-hostile locations [23]. Furthermore, the memorandum prohibits PrEP usage as a reason for denial of entry into the military or denial of reenlistment [23]. Additionally, members taking PrEP are now eligible to deploy [23]. Routine STI and HIV screening is mandatory for service members taking PrEP [23].

3.4 Air Force, Army, Navy and Marine Corps Screening Policies

Service branches and individual military installations are allowed to develop more stringent HIV screening policies, as long as they do not reduce or override DoD policy. Table 2 is a compilation of supplemental policies pertaining to STI and HIV screening requirements, programs and reporting protocols sanctioned by the Air Force, Army, Navy and Marine Corps.

⁶ “The Qualified HIV PrEP provider must have knowledge of obtaining a detailed sexual history, providing HIV risk reduction counseling, identifying indications for HIV PrEP, knowledge of eligibility criteria, knowledge of PrEP contraindications, knowledge of clinical considerations for HIV PrEP, knowledge of current guidelines for lab and clinical evaluation, knowledge of follow-up screening for HIV and sexually transmitted infections.” 23. *Interim Procedures Memorandum 18-020, Guidance for the Provision of Human Immunodeficiency Virus (HIV) Pre-Exposure Prophylaxis (PrEP) for Persons at High Risk of Acquiring HIV Infection*. 2018, Department of Defense, Defense Health Agency.

The DoD recommends that service branches follow CDC and USPSTF recommendations, which are outlined in Appendix 2.

Table 2. Active Duty Air Force, Army, Navy & Marine Corps Screening Policies

	STI Screening and Programming	Supplemental HIV Policies
<p>Air Force <i>AFI-44-178</i></p>	<ul style="list-style-type: none"> • STI interviews with risk reduction counseling [24] • STI contact investigations [24] 	<ul style="list-style-type: none"> • HIV screening is required when the following indicators are present [31]: <ul style="list-style-type: none"> — newly diagnosed tuberculosis — recent STI diagnosis — entry into drug/alcohol treatment program
<p>Army <i>DA PAM 40-11</i> <i>AR 600-110</i></p>	<ul style="list-style-type: none"> • Female are required to receive annual chlamydia screening until 25-years-of-age [19, 37] • Community/unit health education [37] • STI case interviews [37] • STI contact investigations [37] • Patient education [37] 	<ul style="list-style-type: none"> • HIV screening is required when the following indicators are present [31]: <ul style="list-style-type: none"> — recent STI diagnosis — unexplained enlarged lymph nodes — depressed white cell count — depressed platelet count — neurological disease — adult oral candidiasis — intravenous drug use — evidence of an opportunistic infection • New members who received their accession HIV screening more than 6 months after beginning basic training, will receive an additional HIV screening within 29 days of reporting to training [31] • Sexual partners of HIV infected individuals are required to receive additional HIV screening [31]
<p>Navy and Marine Corps</p>	<ul style="list-style-type: none"> • Enlisted recruits receive chlamydia and gonorrhea screening during boot camp [38, 39] • Females are required to receive annual chlamydia screening until 24-years-of-age [19, 38, 39] • STI case interviews [39] • STI contact investigations [39] 	<ul style="list-style-type: none"> • HIV screening is required when the following clinical indicators are present [41]: <ul style="list-style-type: none"> — diagnosis of an STI — entry into drug or alcohol treatment — diagnosis of active tuberculosis

Table 2 Continued

<p>BUMEDINST 6222.10C</p> <p>SECNAVINST 5300.30F</p>	<ul style="list-style-type: none"> • Syphilis screening is performed during the following circumstances [39]: <ul style="list-style-type: none"> — following a chlamydia or gonorrhea diagnosis — if symptoms are noticed by a medical provider — if listed as a sexual contact during a STI interview • Personnel on PrEP are screened STIs semi-annually [23, 38] • Sexual Health and Responsibility Program⁷ (SHARP) implementation [40] 	<ul style="list-style-type: none"> • Personnel on PrEP receive quarterly HIV screenings [23, 38]
<p>Disease Reporting</p>	<ul style="list-style-type: none"> • The Disease Reporting System internet (DRSi) is the established incidence-reporting tool for the U.S. military which is designated to track Armed Forces Reportable Medical Events. Chlamydia, gonorrhea and syphilis are reportable events [4] 	<ul style="list-style-type: none"> • Air Force: United States Air Force School of Aerospace Medicine and Armed Forces Health Surveillance Branch [31] • Army: Armed Forces Health Surveillance Branch [31] • Navy and Marine Corps: Navy and Marine Corps Public Health Center and Armed Forces Health Surveillance Branch [39]

⁷ The Navy and Marine Corps Public Health Center has established SHARP with intent to prevent HIV, STIs and unplanned pregnancies. SHARP’s risk reduction educational and training materials are available to all service branches. These materials include films, program guidelines, lectures, courses, factsheets and posters. Medical personnel receive specialized training in assessing sexual risk factors and developing risk reduction plans. 40.MacDonald, M.R., *Sexual Health and Responsibility Program (SHARP): Preventing HIV, STIs, and Unplanned Pregnancies in the Navy and Marine Corps*. Public Health Reports, 2013. **128**: p. 81-88.

4.0 Discussion

Population specific considerations within the U.S. armed forces suggest that a significant proportion of the group is at an increased risk of STI acquisition. Infrequent screening amplifies the risk of acquiring an STI primarily due to the age demographic, reported high-risk behaviors, mobility and cultural influences [15, 16, 42, 43]. Additionally, current screening regulations present the opportunity of incessant STI circulation throughout the population [44]. One-in-five service members are at an increased risk of HIV and STI acquisition which is defined as in the past year: having more than one sexual partner, lack of condom use with a new partner, STI diagnosis or MSM [16]. High risk behaviors were most frequently reported among service members between the ages of 18-24-years-olds and lower enlisted [16]. Furthermore, a retrospective study reported that 36% of females and 18% males with over 20 years of service had at least one STI recorded between 1997-2010 [44].

High rates of STI acquisition have been reported during the deployment phase [44]. Approximately 60% of service members reported having deployed at least once during their military career [16]. The deployment phase is defined as the 120-day time period prior to departure, time spent in theatre and 3-months following the return to home station [44]. Psychological stress and interpersonal relationship changes, reported during the deployment phase, could have an influence on high rates of binge drinking, substance abuse and low rates of condom usage [16, 19, 42]. A study conducted by Lieutenant Colonel Aldous concluded that a significant amount of STIs reported during deployments could have been detected prior to the departure, at the member's unit [45]. Rates of STIs diagnosed in personnel under 30 were similar to the U.S. population [45]. However, higher rates of STIs among older service members were

detected while in theater when compared to reported rates in the continental U.S. [45].

Nevertheless, the literature suggests the necessity of increased STI surveillance before, during and after deployments [42, 44, 45]. Missed screening opportunities during the deployment phase encourages the further spread of infections and the development of secondary conditions [45].

DoD, Air Force, Army, Navy and Marine Corps policies, have been continuously progressive in reducing the transmission of HIV [12, 13]. Routine and supplemental HIV screening policies have likely contributed to the relatively low HIV incidence rates within the military as compared to the U.S. population [20]. However, 30% of service members who reportedly engaged in high-risk behaviors, do not receive annual screening in accordance with the CDC's and USPSTF recommendations [16, 29]. Similarly to the U.S. population, MSM in the military are disproportionately diagnosed with HIV [20]. However, a recent policy developed by the DoD has aimed towards expanding PrEP accessibility and further investing in healthcare provider education [23]. Members that engage in high-risk behaviors can greatly benefit from the U.S. armed forces PrEP policies. Increasing the frequency of HIV screening could potentially capture early infections among high-risk groups and further reduce transmission rates.

A study conducted by Gurung, et al., has reflected the presence of sexual orientation discrimination resulting from previously restrictive policies [41]. The literature also emphasizes the importance of medical providers receiving specialized education regarding screening and providing care to LGBT service members [41, 46]. Addressing stigma and enhancing medical providers knowledge could increase the likelihood that LGBT service members seek STI prevention and detection services when necessary.

The DoD recommends that service branches implement STI screening, in accordance with CDC and USPSTF guidelines (see Appendix B) [26, 28]. This approach allows flexibility,

which may result in inadequate STI screening and surveillance among the military population. Additionally, the CDC and USPSTF does not support routine chlamydia or gonorrhea screening for men, based on their lack of sufficient evidence reflecting associated benefits [28]. The Navy and Marine Corps are the only service branches currently requiring both males and females to receive STI screening during accession [38, 39]. Furthermore, they are the only entities that currently have a standard screening requirement for males at any point throughout their military careers [38, 39]. The Army, Navy and Marine Corps requires that females receive annual chlamydia screening until 25-years-of-age [38, 39]. However, there is no evidence suggesting that the Air Force conducts mandated STI screenings. The platform in which service branches have, affords them the opportunity to increase surveillance efforts through policy. Although there are different policies in existence, standardizing protocols could be beneficial to this population.

Cost-effectiveness associated with female STI screening is frequently mentioned throughout literature, and acknowledged by the DoD [19, 28, 47, 48]. Although not commonly recognized, cost-effectiveness has also been associated with universal STI screening among males [28, 49]. A statistical analysis and financial model, developed by Nevin, et al., demonstrated economic efficiency linked to routine chlamydia screening conducted among military male recruits, aged 24-years and younger [50]. Additionally, a study evaluating STI screening amongst job-training program entrants, provided evidence supporting the cost-benefit of male and female chlamydia screening, utilizing urine-based nucleic acid amplification tests [49]. The previously mentioned study, also examined the relationship between cost and asymptomatic chlamydia infections, finding that 84% of infections were asymptomatic in females and 29% in males [49]. Screening males in high-risk demographics, such as the military, has the potential to decrease the spread of infections, and avert PID and chronic pelvic pain in

females [49, 50] Acknowledgment of cost-effective male and female STI screening could solidify justification required to standardize screening protocols within the U.S. armed forces policies.

The existing STI prevention and detection strategies within the U.S. military relies on elective male screening. This is problematic considering the potential of asymptomatic infections, inaccurate incidence rates and the continued spread of infections [51, 52]. A study conducted by Army researchers diagnosed 4.9% of participating male recruits receiving obligatory screening with either gonorrhea or chlamydia [52]. However, only 0.5% of the infected participants reported symptoms [52]. Previous studies have demonstrated the benefits of routinized STI screening in male populations, such as, the detection of asymptomatic infections and increased surveillance accuracy [51, 53, 54]. New York City jails implemented universal chlamydia and gonorrhea screenings among male inmates in New York City jails [54]. Following the programs implementation, New York City experienced a 59% increase in reported chlamydia infections and a 4% increase in reported gonorrhea infections, among males [54]. Conversely, the transition from universal STI screening to symptom-based screening, among male a study cohort, was associated with a 91.7% decrease in reported chlamydia infections and 90.5% decrease in gonorrhea infections [53]. The U.S. armed forces could benefit from routine screening to treat asymptomatic infections found in males and females that would otherwise go undetected.

There is a gap in screening policies and available incidence rates addressing extra genital screening and STI rates among the U.S. armed forces. A recent study conducted by Dukers-Muijers et al. observed anorectal infections occurring at rate similar to genital infections, found in women and MSM (Table 2) [55]. While pharyngeal chlamydia infections were low,

pharyngeal gonorrhea infections were similar to genital infections, which occurred as a single-site infections in 53% of MSM and 73% of women [55]. The literature suggests the extra genital infections are frequently asymptomatic and risk behaviors are not always indicative of anorectal or pharyngeal infections [25, 55]. Establishing policy that includes opting out of extra genital screening has the potential to capture single-site asymptomatic infections that remain undetected and untreated.

Table 3. Prevalence of extra genital chlamydia and gonorrhea in women and MSM				
	Women		MSM	
	Chlamydia	Gonorrhea	Chlamydia	Gonorrhea
Pharyngeal	1-3%	1-2%	1-3%	4-12%
Anorectal	7-17%	0-3%	1-18%	6-21%
Genital	5-13%	1-2%	3-8%	3-11%

Chart derived from Dukers-Muijers et al. study [55]

Due to data and reporting limitations, obtaining accurate rates of STIs within the armed forces is a challenge. U.S. military data limitations identified in the literature include the absence of standard reporting procedures; inconsistency in medical code usage; incomplete health data from deployed medical treatment facilities; and members failing to self-report STIs diagnosed from civilian medical providers [2, 18, 56]. Creating standardized STI reporting protocols could contribute to an accurate and comprehensive representation of STIs diagnosed within the U.S. military population. Furthermore, this process could provoke dialog directed towards the cultivation of a culture that prioritizes proactive STI detection and prevention methods.

5.0 Recommended Programmatic Framework

The DoD has a unique opportunity to capitalize on existing entities within the organization which possess the capacity to reduce STIs within the population and strengthen detection efforts. Historically, the military has been supportive in public health efforts aimed at preventing STI infections. Studies have provided evidence supporting benefits, feasibility and cost-effectiveness of STI screening programs among young populations which are similar to the U.S. armed forces demographic [44, 49, 50, 55, 57].

Behavioral change interventions implemented in military populations have been effective in reducing high-risk behavior associated with STI transmission, such as, increased knowledge of STI/HIV transmission and condom use [58, 59]. A study conducted by the Army demonstrated overall programmatic effectiveness, which consisted of detecting asymptomatic chlamydia and gonorrhea infections in male recruits, and increased intent to utilize condoms and confidence in condom usage [52].

There is an increasing amount of reported STIs within the U.S. armed forces, which could be indicative of a programmatic need addressing the spread of infections. Nevertheless, there is no mention of force-wide universal STI screening or prevention strategies throughout the DoD’s policies. Beneficial and negative impacts of current policies, programs and population considerations are outlined in Table 4.

Table 4. Beneficial and Negative Impacts of Current Policies	
Strengths	Negative Impacts
<ul style="list-style-type: none"> • Routine and supplemental HIV screening • STI interviews & contact screening 	<ul style="list-style-type: none"> • Overall increase in STI incidence rates since 2014 • 1/5 service members report high-risk behavior

Table 4 Continued

<ul style="list-style-type: none"> • Established reporting tools • PrEP expansion & medical provider education • DoN: male and female accession STI screening • DoN & Army: routine chlamydia screening for females under 25-years-old • Male and female STI screening is cost effective • Asymptomatic infections can be detected through routine STI screening 	<ul style="list-style-type: none"> • Population contains 50%, 18-24 year-olds, who are in a “high risk” age demographic • Overall missed STI screening opportunities during accession, deployment and routinely • Lack of standardized screening and educational policies between branches • Infrequent gonorrhea screening among females • Overall lack of male STI screening • Unclear reporting procedures • Previously restrictive policies contributing to stigma • Undetected asymptomatic STIs • No indication of extra genital infection incidence data • 30% of high risk individuals do not report annual HIV screening
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To address deficiencies, a pilot program imposing screening and prevention strategies has been developed that is outlined within the Logic Model located in Table 5. The impacts the developed strategies are intended to provide an understanding of benefits related to the standardization of prevention and detection measures. The long-term goal of the pilot’s framework is to cultivate a culture in which proactive STI prevention and detection strategies are normalized within the U.S. armed forces and their policies.

Table 5. Logic Model

Inputs	Outputs		Outcomes		
	Activities	Participants	Short	Medium	Long
<ul style="list-style-type: none"> • Established leadership with the authorization to implement mandatory screening • Proficient medical and public health personnel • Office/clinical space • Established accession and deployment medical processing • Disease Reporting System internet (DRSi) • Partnership with the RAND Corporation • Subject matter experts at the NMCPH • Developed STI prevention trainings (SHARP) 	<ul style="list-style-type: none"> • Standardized STI screening • Opt-out and self-administered extra genital screening • SHARP Training Development • Training implementation (Peer Educators, Risk Reduction Experts, STI Program Managers, medical personnel) • Installation sexual health promotion events 	<ul style="list-style-type: none"> • All males and females during accession • Male and female service members 18 to 24-year-old • Deployers • General population at navy installations • Designated peer-educators, risk reduction experts and STI program managers • Medical personnel 	<ul style="list-style-type: none"> • 100% of designated entry points screen accessed members for STIs by year 2 • 100% of deployers are screened for STIs prior to deployment by year 2 • 100% of medical personnel have completed designated online training by year 2 • 80% of all installations have trained program implementers by year 3 (Peer Educators, Risk Reduction Experts, STI Program Managers) • 80% of personnel have attended at least one peer-education session annually by year 3 	<ul style="list-style-type: none"> • Increased detection of STIs • Increased understanding of STI infections among members • 20% increase in elective STI screening by year 3 • 40% self-efficacy increase in members that received peer education (regarding intention to engage in healthy behaviors and seek necessary health care) • 15% decrease in reported high-risk behaviors reflected by year 4 • 50% decrease in stigma associated with STIs and screening by year 5 	<ul style="list-style-type: none"> • Effective policy developed and enforced throughout the U.S. armed forces • Culture of normalized proactive STI detection strategies
<p>Assumptions/Theoretical Constructs:</p> <ul style="list-style-type: none"> • Understanding the true burden of infections will provide evidence supporting the development effective prevention and detection policy • Routinized screening will normalize STI testing and reduce associated stigma. • Increased provider knowledge will increase provider patient dialog. • Peer-education will raise levels of self-efficacy of reducing risk and seeking screening with necessary. • Overall STI programming will provide risk reduction tools and normalize prevention, which will increase healthy behaviors, such, elective screening and risk reduction counseling (Information-Motivation-Behavior Skills Model [60]) • Training peer education will create the opportunity for service members to feel comfortable discussing risk behaviors and strategizing plans to reduce risk in an everyday environment. 			<p>External Factors:</p> <ul style="list-style-type: none"> • Medical processing presently occurs during accession and within the deployment phase. Cost-effecting mandatory screening will occur seamlessly. • Standardizing STI screening within 18 to 24-year-old will occur during birth months, which will create a routine with the potential to continue beyond the age of 25. • The established partnership with the RAND Corporation will allow for convenient and budget-friendly evaluations. • Hesitation could surface from leadership regarding the cost associated with standardized screening. • As the military is not a closed population, rates of STIs among members will be affected by national trends, which the DOD has no control over. 		

5.1 Implementation Strategy

The mobile nature of military personnel associated with frequent reassignment of duty stations, deployments and discharge from service, presents major issues in assigning cohorts to the interventions and their comparative groups [40]. Therefore, to off-set turnover, the intervention pilot will consist of an entire service branch, as opposed to an assigned cohort of specified individuals or installations. For the purpose of this essay, the proposed approach would be Navy pilot implementation. Selection was based on the high level of subject matter expertise regarding STI prevention programming at the Navy and Marine Corps Public Health Center. For evaluation purposes, the remaining branches will serve as the comparison groups. The pilot initiatives will remain in place for a duration of 5-years. Following evaluation, medical leadership from all branches will gather to review the effectiveness of protocols. As outline in Figure 9, following evaluation, development of a DoD instruction will occur. The policy will mandate force-wide protocols, which aims to develop a culture that emphasizes the importance of proactive STI prevention.

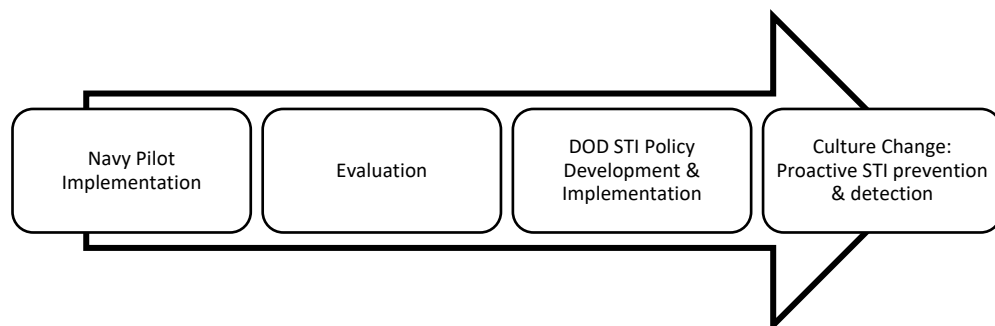


Figure 9 Implementation and Program Strategy

5.2 Theory: Information-Motivation-Behavioral Skills Model

Information-Motivation-Behavioral Skills Model applies a three-dimensional structure, focusing on separate constructs with an intersecting pathway leading to behavior change [60]. Designated Navy personnel will receive risk reduction education, routinized STI screening and activities aimed towards reducing social and cultural stigma related to STI screening and prevention. It is hypothesized that such an intervention will lead to reduced STI incidence rates, normalization of STI screening, increased levels of risk-reduction knowledge and reduced high-risk behaviors.

5.3 Programmatic Framework

The programmatic framework outlined in Table 6, are recommended requirements in which the pilot program will impose. The protocols are intended to provide the understanding of impacts associated with routinized STI screening and prevention programming within the U.S. Navy.

HIV Screening	Annual HIV screening will occur on an annual basis for all personnel.
Accession	All new members will receive urine-based chlamydia and gonorrhea screening within 30 days of all routes of accession, which includes basic training sites, officer training schools and commissioning physicals.
Deployment	In alignment with HIV screening, urine-based chlamydia and gonorrhea screening will occur for all deploying members.

Table 6 Continued

Annual Screening	Annual urine-based chlamydia and gonorrhea screening will occur for all members under 25-years-of-age. Screening will occur during the members birth month.
Follow-up	All members who have a positive chlamydia or gonorrhea screening will require syphilis testing.
Opt-out Extra genital	During all elective and required STI screening encounters, members will be prompted with self-administered, opt-out pharyngeal and anorectal screening.
Annual Health Education	Unit level peer-led sexual health education, which will occur in a group setting. All members will be required to attend at least one session, per calendar year.
Medical Personnel Education	All medical personnel will receive annual training, which will consist of STI prevention strategies, screening and reporting requirements.
Installation Health Promotion	All installation must host at least two sexual health promotion events each calendar year
Reporting	All healthcare providers on military installations, ships and deployed sites must report all diagnosed and self-reported STIs, location of infection site and presence of symptoms into the Disease Reporting System internet.

Recommended roles and responsibilities described within Table 7, are designated to ensure the compliance of pilot implementation, evaluation and expansion. The expansion strategy and evaluation roles are discussed in a later section within this essay.

Table 7. Program Roles and Responsibilities	
Armed Forces Health Surveillance Branch, Public Health Office	<p>The Public Health Office will:</p> <ul style="list-style-type: none"> • Ensure that program evaluation materials are presented to Air Force, Army and DoN Surgeon General Offices. • Ensure the development of an evidence-based DoD policy addressing the standardization of prevention and detection strategies.
Navy and Marine Corps Public Health Center-SHARP office	<p>The SHARP office will:</p> <ul style="list-style-type: none"> • Serve at the pilot program headquarters. • Ensure evaluation components are complete. • Provide program support to installations. • Ensure program trainings and materials are developed and modified in accordance with programmatic guidelines.
Installation Commander	Installation Commanders will ensure that their respective installation complies with program guidelines.

Table 7 Continued

<p>Medical Treatment Facility Commander</p>	<p>Medical Treatment Facility Commanders will:</p> <ul style="list-style-type: none"> • Ensure that medical personnel are aware of mandated screening and reporting requirements. • Ensure that adequate supplies are available to perform screenings. • Assign the role of the installations STI Program Manager to a service member attached to Preventative Medicine or Public Health. • Report compliance to Installation Commander.
<p>STI Program Manager</p>	<p>STI Program Managers will:</p> <ul style="list-style-type: none"> • Provide program oversight at the installation level. • Serve as liaison between program headquarters and respective location. • Ensure evaluations are collected and provided to headquarters. • Serve as the installations subject matter expert in proper DRSi reporting and provide technical assistance. • Ensure that E1-E5 service members fulfill the (2) roles of Risk Reduction Experts, with at least one member from Preventative Medicine and one from Public Health. • Communicate with MTF Commander and Medical Personnel Leadership annual and screening and medical personnel training requirements
<p>Risk Reduction Expert</p>	<p>Risk Reduction Experts will:</p> <ul style="list-style-type: none"> • Serve as STI subject-matter experts for respective location. • Host at least two health promotion events focused on risk reduction • Ensure that each work area has an assigned peer-educator and conduct associated training. • Provide one-on-one risk reduction counseling as requested. • Modify peer-education presentation materials.
<p>Peer Educator</p>	<p>Peer Educators will:</p> <ul style="list-style-type: none"> • Conduct semi-annual peer education in respective work areas • Conduct peer education on an as needed basis
<p>Medical Personnel Leadership</p>	<p>Medical Personnel Leadership will:</p> <ul style="list-style-type: none"> • Ensure appropriate personnel have completed annual training. • Provide STI detection training, assistance or resources when appropriate. • Ensure that all positive screenings and associated characteristics are reported to the STI Program Manager weekly.
<p>Unit Health Monitor</p>	<p>Unit Health Monitors will:</p> <ul style="list-style-type: none"> • Ensure that respective unit members are aware of upcoming screening requirements on a rolling basis. • Notify unit leadership if members are past due on screening requirements.

5.4 Training Development and Implementation

Within this recommended framework, the Navy and Marine Corps Public Health Center’s (NMCPHC), Sexual Health and Responsibility Program (SHARP) office is primarily responsible for training development. SHARP has established trainings that will receive modification or guide the development of training implicated within this intervention. Table 8 summaries designated roles of trainings that will occur during the pilot program.

Table 8. Training Implementation Roles	
SHARP	<ul style="list-style-type: none"> • Initial STI Program Training (in person)– Trainer • STI Program Refresher Course (online)– Trainer • STI Program Training for Medical Personnel (online)–Trainer • HIV PrEP Lecture (online)– Trainer
STI Program Manager	<ul style="list-style-type: none"> • Initial STI Program Training– Trainee • STI Program Refresher Course annually– Trainee • Peer Education Training– Trainer (if, Risk Reduction Experts are not available)
Risk Reduction Expert	<ul style="list-style-type: none"> • STI Program Training– Trainee • STI Program Refresher Course annually– Trainee • Education Training– Trainer
Peer Educator	<ul style="list-style-type: none"> • Peer Education Training– Trainee • Annual (unit-level) Peer Education– Trainer
Medical Personnel	<ul style="list-style-type: none"> • Annual STI Program Training for Medical Personnel– Trainee • HIV PrEP Lecture– Trainee

STI Program Training: The SHARP office will develop and implement STI Program Training. This training will serve as the initial guidance for STI Program Managers and Risk Reduction Experts. STI Program Training is intended to prepare participants to train peer educators, train

medical personnel, provide risk reduction counseling, promote sexual health and provide programmatic support. The training will consist of a condensed version of previously developed NMCPHC-SHARP tools, listed in Table 9. The training for all new implementers will take place at the NMCPHC, over the course of five days. NMCPHC will provide attendees with preparation materials, which will assistance in proficiently providing training at respective installations.

Table 9. Previously developed STI trainings, SHARP ⁸	
STI Basics for Non-Clinicians (4 hours) ⁹	Increases basic knowledge of sexually transmitted infections
Promoting Sexual Health in Military Populations (4 hours) ¹⁰	Provides skills required to plan and execute effective community strategies to reduce sexual risk behavior within military communities.
HIV-STI Prevention Counseling Course (8-16 hours) ¹¹	Improves the ability of healthcare providers (doctors, physicians assistants, nurses, medical technicians, etc.) in a variety of settings, to support individuals in making behavioral changes that will reduce their risk of acquiring or transmitting HIV or other STIs.
HIV PrEP Lecture (1 hour) ¹²	Familiarizes health care providers and health care support professionals with the HIV prevention strategy of PrEP. Participants learn the basics of HIV PrEP, HIV risk profiles, patient eligibility for PrEP, patient management, operational and clinical challenges and HIV PrEP promotion

⁸ A full listing of SHARP trainings offered by the Navy and Marine Corps Training Center can be located using the following link: <https://www.med.navy.mil/sites/nmcphc/health-promotion/training/Pages/SHARP.aspx>

⁹ STI Basics for Non-Clinicians program information: https://www.med.navy.mil/sites/nmcphc/Documents/health-promotion-wellness/reproductive-and-sexual-health/sti_101_info.pdf

¹⁰ Promoting Sexual Health in Military Populations program information: <https://www.med.navy.mil/sites/nmcphc/Documents/health-promotion-wellness/reproductive-and-sexual-health/promotesexhealthinfo.pdf>

¹¹ HIV-STI Prevention Counseling Course program information: <https://www.med.navy.mil/sites/nmcphc/Documents/health-promotion-wellness/reproductive-and-sexual-health/ccinfo3.pdf>

¹² HIV PrEP Lecture program information: <https://www.med.navy.mil/sites/nmcphc/Documents/health-promotion-wellness/reproductive-and-sexual-health/sharp-hiv-prep-info.pdf>

STI Program Refresher Course: The SHARP office will develop an annual computer-based training (CBT), which emphasizes competencies learned during the initial STI Program Training. Additionally, the training will cover new findings, and updated best practices and program protocols (if appropriate).

Peer Education: The SHARP office will develop a peer education-training tool, consisting of a condensed version of the STI Basics course and Promoting Sexual Health in Military Populations. They will also develop peer-education facilitation materials. Risk Reduction Experts will update the provided peer-education presentation template annually, which is to include installation specific concerns.

STI Program Training for Medical Personnel: The SHARP office will develop a CBT for medical personnel, which will cover screening requirements, basic risk reduction information and components of STIs that are required for reporting within the DRSi.

5.5 Evaluation Outline

The results of the pilot program evaluation will heavily influence the expansion plan, which will guide policy development. Therefore, formative, process, outcome, and impact evaluations of the prospective program components will occur, which are summarized in Table 10. Installations will complete detailed annual reports covering designated evaluation components and send results to the SHARP office. The SHARP office will complete designated internal evaluations. A detailed compilation of all evaluation components will be compiled by the

SHARP Office and received by the Armed Forces Health Surveillance Branch. The final report will guide policy development.

Table 10. Evaluation Components	
Surveillance	<ul style="list-style-type: none"> • DRSi- screening encounters (process) • DRSi- provided STI information (process) • Opt-out screening (process) • Program training (process) • Elective screening (outcome) • Characteristics of STIs (outcome) • STI incidence rates (impact)
Training	<ul style="list-style-type: none"> • STI Program Training (process) • Peer Education Training (process) • Peer Education (process) • Health Promotion events (process)
Culture/Behavior	<ul style="list-style-type: none"> • Behavior impacts (outcome) • Climate survey (impact) • Program Feedback (formative) • Selective forum (formative)

Process Evaluation:

- Screening Encounters: Screening Encounters: Tracking the compliance of screening requirements promote maximum program reach. The statuses of medical requirements are tracked, in real-time, through the Medical Readiness Reporting System (MRRS)¹³.

The screening and educational components outlined within the presented framework will be integrated into the MRRS. Medical personnel will update the member’s record to

¹³ MRRS is the Navy, Marine Corps and Coast Guard’s tool designed to record and track Individual Medical Readiness (IMR) elements to include immunizations, dental status, laboratory tests, and physical exams such as periodic health assessments, deployment health status, pregnancies, illnesses, and injuries. MRRS is a web-based, real-time application with a central aggregating database, which links with existing authoritative data systems for personnel tracking including the Navy Standard Integrated Personnel System (NSIPS) and Marine Corps Total Force System (MCTFS). MRRS gives headquarters staffs and leadership a real-time view of Force Medical Readiness and immunization status. <https://www.health.mil/Military-Health-Topics/Health-Readiness/Immunization-Healthcare/Immunization-Tracking-Systems>

indicate completion after screening is accomplished. Risk Reduction Experts will enter the completion of annual peer education sessions with MRRS. STI Program Managers (SPMs) will track the installations monthly compliance, and include these figures in the annual report, which is sent to the SHARP office. Additionally, SPMs will address compliance concerns with the Medical Treatment Facility Commander. Multi-level management of compliance will increase the likelihood that the pilot is conducted its intended manner.

- **Opt-out Screening:** The purpose of this evaluation measure is to assess the offering of opt-out screening by medical personnel. While entering screening encounters within MRRS, personnel will indicate if opt-out screening was presented. The SPM will track monthly compliance of opt-out screening and address concerns with the Medical Treatment Facility Commander.
- **Program Training:** The SHARP office will create an online spreadsheet, incorporating a listing of current Risk Reduction Experts (RREs) and SPMs, and their respective training status. The final report will include this figure, which highlights the reach of program training.
- **Peer Education Training:** To capture the number of members who were trained as Peer Educators, RREs, at each installation, will annually report the participant count to the SHARP office.
- **Peer Education Sessions:** During peer education sessions, the facilitator will capture attendance. SPMs will annually report the number of individuals, to capture the reach of the peer education component.

- DRSi: Weekly, SPMs will confirm STI incidence data accuracy. SPMs will address concerns regarding inaccurate data to the Medical Treatment Facility Commander. Additionally, SPMs will annually provide a count of incomplete reports the SHARP office.

Outcome Evaluation

- Elective Screening: This measure is intended to evaluate the impact of programming on elective screening encounters. Elective and mandatory screening encounters are recorded within the MRRS. Medical personnel will indicate the type of screening (mandatory or elective) and screening site (anorectal, penile, pharyngeal or vaginal). The MRRS Report Menu will include annual counts of STI screening encounters and supplementary information. The SHARP office will compile and analyze data for presentation in the annual report.
- Characteristics of infections: As an effort to understand the characteristic of infections that occur with the population, DRSi will receive an update prior to program implementation. This update will include the addition of STI incidence information (see below). Weekly, medical providers will gather STI incidence information and provide it to the SPM. The SPM is responsible for entering STI occurrences into DRSi.
 - absence or presence of symptoms
 - type of screening: mandatory, elective or opt-out
 - infection site: anorectal, penile, pharyngeal or vaginal
 - concurrent infection detected: yes or no; if yes, site of concurrent infection
- Behavior Measure: The RAND Corporation conducts the randomized Military Health Behaviors Survey every three years. The program office will use the 2018 dataset as baseline information and compare the findings to the data obtained through the 2021 and

2024 surveys. The areas of focus will include sexual behaviors and level of comfort seeking health care services.

Impact Evaluation

- **STI incidence rates:** An increase of reported STIs are expected, due to the increased surveillance and education strategies. The SHARP office will request DRSi incidence data from the Armed Forces Surveillance Branch. SHARP will evaluate STI incidence rates and the characteristic of infections prior to and during program implementation. Further evaluation will include a comparison of rates between the Navy and other service branches. This measure is intended to evaluate the impact of routinized screening and serve as a guide to implement future policies. The overall areas of concerns include the rate of asymptomatic infections, impact on STI detection frequency, and single-site or concurrent extra genital infections.
- **Climate Survey:** Under the direction of SHARP, the RAND Corporation will develop and evaluate a climate survey. The purpose of the survey is to understand the levels of stigma related to STI prevention and detection services. This survey will undergo randomized distribution to members of all service branches, with the intention to measure possible differences among the Navy and other branches. The specification on an evaluation tool is beyond the scope of this essay.

Formative Evaluation

- **Program Feedback:** The SHARP office will elicit program feedback from Navy personnel. SHARP personnel will create a compilation of feedback, listed in the annual reports and presented during the policy development process.

- Policy Development: Formative evaluation will primarily occur through the Interprofessional Advisory Committee. Committee members will offer feedback and analyze the annual report to guide the policy development process.

5.6 Expansion Strategy

Expansion of the program and finalized DOD policy development should occur within one calendar year upon completion of the 5-year pilot program. Figure 10 represents the recommended offices of programmatic responsibility and implementation rollout. In the expansion plan, the Armed Forces Health Surveillance Branches- Public Health Division will create a STI Prevention Office. The STI Prevention Office will manage the overall program and establish an Interprofessional Advisory Committee. The committee will incorporate designated members of varying ranks within appropriate occupational specialties. The Interprofessional Advisory Committee will serve as counsel to the STI Prevention Office and contribute to policy building process. The Air Force, Army, Navy and Marine Corps public health entity will report to the STI Prevention Office. Additionally, program directors will provide overall branch oversight and ensure uniformity of program execution.

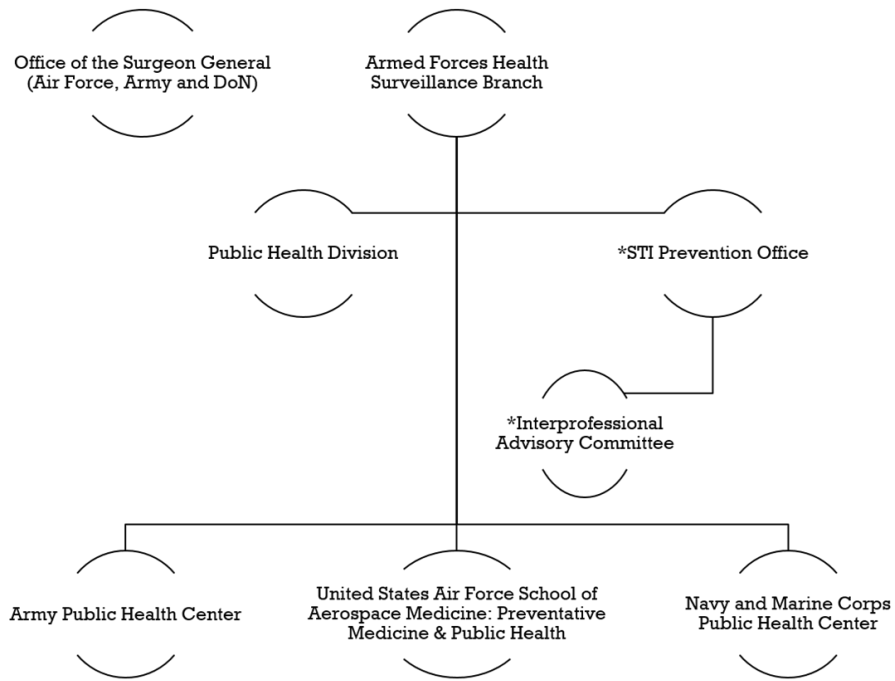


Figure 10. STI Prevention Office Organizational Chart
 *denotes proposed new entities accompanying the expansion plan

6.0 Limitations

Governmental officials have the capacity to produce, modify or terminate policy at any given time. The memorandums and policies reviewed within this essay were gathered between January-February 2019. Items that were not published on military doctrine websites, within the aforementioned timeframe, were not included. The changeable nature of policies, presents limitations regarding currency of items reviewed within this essay. Furthermore, the enforcement and compliancy levels of mandated screening and educational items included within the policy review of this essay are unknown. Additionally, due to lack of access, it is undetermined if individual installations impose supplemental guidelines, requiring STI screenings or prevention programs.

Screening protocols, which had conflicts between policies and key informant interviews, were not included in the compilation of screening and programming items. This process potentially limited the full scope of understanding pertaining to measures being taken to prevent and detect STIs by the military. For example, Air Force screening protocols were identified during the literature search, which included chlamydia screening for females, during basic training and annually if under 25-years-of-age [19]. However, the identified measures were not located within policy and could not be confirmed by Air Force medical personnel [24].

A request, for military STI incidence rates and characteristics of infections, was submitted to the Armed Forces Health Surveillance Branch. The request was not fulfilled; alternatively, the use of incidence data contained in a recent epidemiological study published in the Medical Surveillance Monthly Report was encouraged [2]. The available military incidence data, presented limitations within the scope of this essay. STI reporting tool modifications,

proposed in the presented programmatic framework, are based on the assumption of limited reporting capabilities. Incomplete descriptions of STIs within available military incidence data and lack of access to the reporting tool, limited the understanding of reporting and screening capabilities. Such as, sites of infection, simultaneous infections and the rates of asymptomatic infections.

Throughout available DoD documents, explicit insight pertaining to the selection method of current STI screening strategies was not provided. Therefore, the discussion within this essay focuses on public health implications of current policies, and providing evidence to support additional screening. The unidentified explanation of current policies, limits the ability to concisely discuss the selection protocols and compile resolutions in which support the standardization of STI screening and education.

7.0 Conclusion

This essay has (1) assessed current screening policies and their possible impacts towards the STI prevalence in the military, (2) discussed specific characteristics and issues of the military population potentially contributing to the spread of STIs and (3) presented an STI reduction intervention guideline. To accomplish a decrease in STI and HIV transmission within the U.S. armed forces, Figure 11 outlines recommended universal screening frequencies.

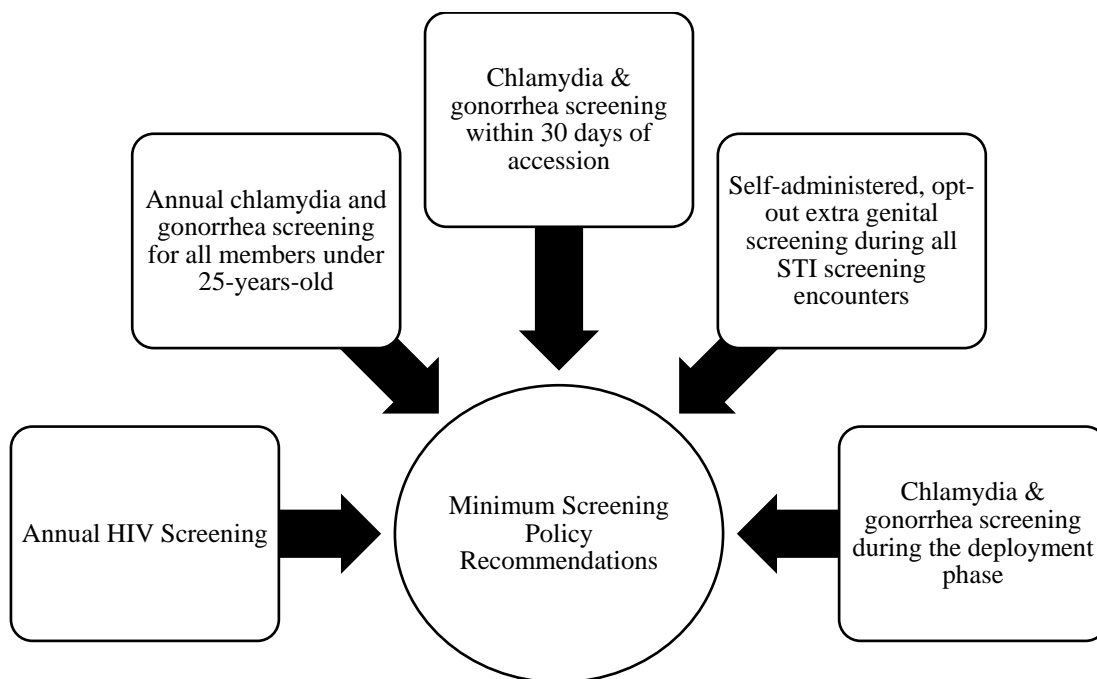


Figure 11. Minimum Standardized Screening Recommendations

Since 2013, there has been a steady increase in reported STIs in the continental U.S. and armed forces. The implementation of policies requiring designated STI screenings should occur in response to the high-risk age demographic, behavioral concerns and observed rates of infections within the military. Consistently detecting and treating previously undetected STIs will benefit

military personnel and the surrounding community through decreasing of the overall transmission risks. Creating screening opportunities during initial training will further instill fitness standards and disrupt asymptomatic STIs that would have otherwise been undetected. In the event of STI acquisition during the deployment phase, presenting an immediate detection and treatment opportunity offers protection to service members, their families and surrounding communities.

The educational component of the recommended framework concentrates on increased base-wide promotion of sexual health, peer-led educational sessions and increased provider-patient dialog. The educational strategies are to intended to (1) increase service members likelihood of identifying high-risk behaviors, (2) equip service members with necessary tools to reduce risk of infection and (3) increase the likelihood of members seeking preventative and screening services when necessary. Furthermore, stigma and risk reduction programming have the potential to improve the cultural experience at military installations, allowing members to feel more comfortable discussing their risks with a medical provider and receiving appropriate support.

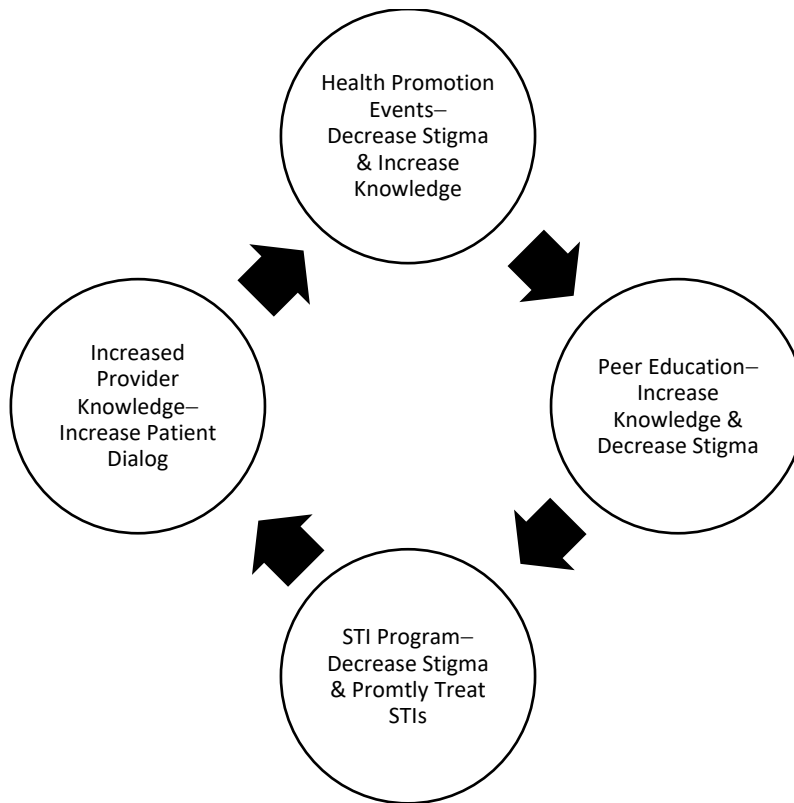


Figure 12. Educational Strategy Objectives

Military personnel are accustomed to an environment defined by structured leadership, which includes specific and delegated medical and training requirements. By improving upon previously established requirements, the execution of inclusive prevention and screening strategies have the potential to cost-effectively detect STIs at a higher frequency, and reduce the incidence of infections within the U.S. armed forces.

Appendix A Supplementary Figures

U.S. Armed Forces and U.S. Populace STI incidence distribution, by age

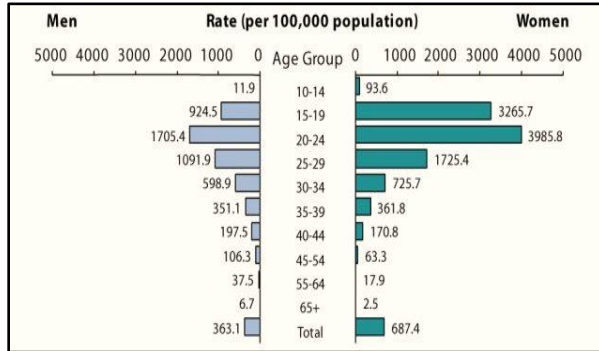


Figure 13 Chlamydia incidence rates, U.S. (2007-2016: by age, sex)
Graph obtained from CDC¹⁴

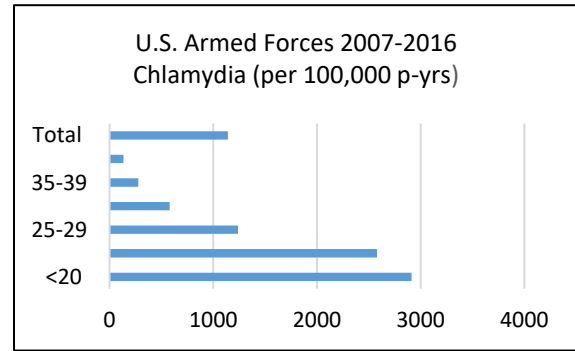


Figure 14 Chlamydia incidence rates, military (2007-2016: by age)
Data within graph derived from Stahlman and Oetting, 2017¹⁵

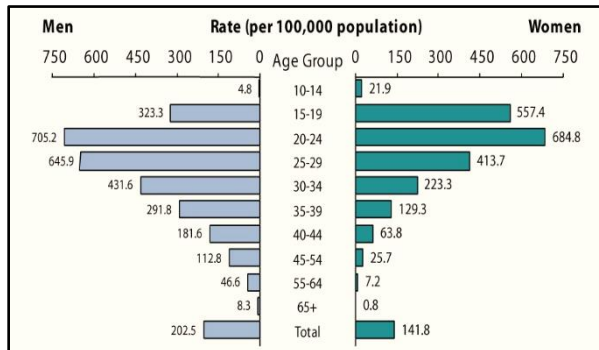


Figure 15 Gonorrhea incidence rates, U.S. (2007-2016: by age, sex)
Graph obtained from CDC¹⁴

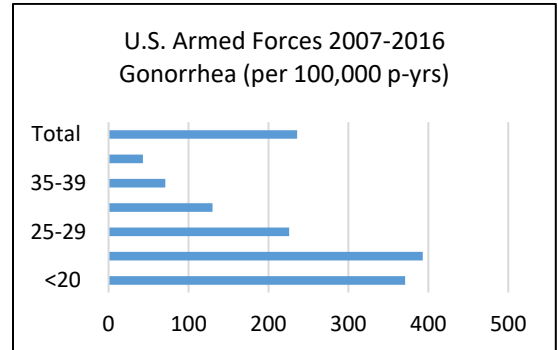


Figure 16 Gonorrhea incidence rates, military (2007-2016: by age)
Data within graph derived from Stahlman and Oetting, 2017¹⁵

¹⁴ Graphs containing U.S. incidence rates obtained from 17. *Sexually Transmitted Disease Surveillance 2017*. 2018, Centers for Disease Control and Prevention, Division of STD Prevention.

¹⁵ Data in graphs containing military incidence rates derived from 18. Stahlman, S. and A.A. Oetting, *Sexually transmitted infections, active component, U.S. Armed Forces, 2007-2016*. *Msmr*, 2017. **24**(9): p. 15-22.

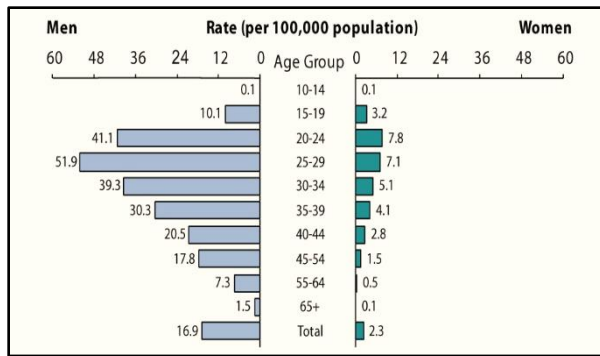


Figure 17 Syphilis incidence rates, U.S.
(2007-2016: by age, sex)
Graph obtained from CDC¹⁶

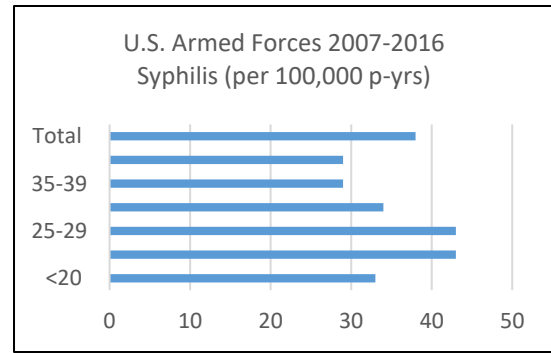


Figure 18 Syphilis incidence rates, military
(2007-2016: by age)
Data within graph derived from
Stahlman and Oetting, 2017¹⁷

¹⁶ Graphs containing U.S. incidence rates obtained from 17. *Sexually Transmitted Disease Surveillance 2017*. 2018, Centers for Disease Control and Prevention, Division of STD Prevention.

¹⁷ ¹⁷ Data in graphs containing military incidence rates derived from 18. Stahlman, S. and A.A. Oetting, *Sexually transmitted infections, active component, U.S. Armed Forces, 2007-2016*. *Msmr*, 2017. **24**(9): p. 15-22.

Appendix B Supplementary Table

CDC¹⁸ and USPSTF¹⁹ STI Screening Recommendations

Table 11. CDC and USPSTF STI Screening Recommendations	
Chlamydia & Gonorrhea	<ul style="list-style-type: none"> • All sexually active females 24-years-of-age and younger should receive annual screening • All sexually active females over 25-years-old at an increased risk of infection should receive annual screening • Pregnant females 24-years-of-age and younger should receive screening regardless of risk • Pregnant females over 25-years-old at an increased risk of infection should receive screening • All sexually active MSM who are at an increased risk of infection should receive screening at sexual contact sites on an annual basis or every 3-6 months. • (Chlamydia only) Males in high prevalence areas should receive consideration for screening
Syphilis	<ul style="list-style-type: none"> • During pregnancy, females should receive syphilis testing at least once • MSM at an increased risk of infection should receive syphilis testing annually or every 3-6 months • All asymptomatic individuals who are at an increased risk of infection should receive screening
HIV	<ul style="list-style-type: none"> • All individuals between 13 and 64-years-of-age should receive an HIV screening at least once in their lifetime • Sexually active MSM should receive screening on an annual basis if their sexual partners' HIV status is unknown or if they have more than one sex partner since their most recent HIV screening • Individuals with the following indicators should receive HIV screening: <ul style="list-style-type: none"> — More than one sexual partner since last screening — Recent STI diagnosis — Injection drug use — Hepatitis or tuberculosis diagnosis — Sexual intercourse with a partner diagnosed with HIV — Anonymous sexual partner(s) — Sexual intercourse in exchange for money or drugs

¹⁸ CDC recommendations obtained from *2015 Sexually Transmitted Diseases Treatment Guidelines*. 2015 June 4, 2015; Available from: <https://www.cdc.gov/std/tg2015/screening-recommendations.htm>.

¹⁹ USPSTF recommendations obtained from LeFevre, M.L., *Screening for Chlamydia and Gonorrhea: U.S. Preventive Services Task Force Recommendation Statement* *Screening for Chlamydia and Gonorrhea*. *Annals of Internal Medicine*, 2014. **161**(12): p. 902-910.

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