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ABSTRACT

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FEATURES OF CLINICAL PRESENTATION, DIAGNOSIS, AND PREVENTION OF HIV INFECTION AMONG THE GENERAL POPULATION AND MILITARY PERSONNEL UNDER WAR CONDITIONS

Relevance. Timely detection of HIV infection remains a key factor in reducing incidence and preventing transmission. In the military context, this means combining screening at mobilization, periodic testing for individuals at increased risk, and testing in case of characteristic symptoms or after high-risk exposures. Since the beginning of the full-scale Russian invasion of Ukraine, the displacement of large numbers of people has caused problems with treatment and prevention, which may have led to the spread of infection to new regions. Military personnel and veterans may face increased risks of infection due to combat injuries, specific features of medical support in field conditions, and challenges in ensuring confidentiality and continuity of antiretroviral therapy (ART) during rotations and combat operations.

Objective. To summarize current clinical, epidemiological, and diagnostic features of HIV infection and existing and prospective prevention measures among the general population and military personnel under wartime conditions, as well as to identify key directions for improving diagnosis, treatment, and prevention.

Materials and Methods. A systematic analysis of scientific publications, official reports, and recommendations from international organizations (EUCALB, CDC, ECDC) from 2013 to 2025 was conducted. Both original studies and systematic reviews and meta-analyses were analyzed.

Results. Practical recommendations for military medical services should include HIV testing within routine examinations using “opt-out” algorithms to reduce stigma. Rapid linkage to care for positive cases should be ensured - initiation of etiotropic therapy and virological

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assessment (CD4 count and viral load) immediately after confirmation. The expansion of rapid test (RDT) use in standard protocols during mobilization and in field medicine is justified. Implementation of self-testing algorithms, use of dried blood spot (DBS) methods, and point-of-care (POC) platforms for rapid diagnostics directly at the patient is recommended, which is critically important in areas with disrupted infrastructure. This approach reduces decision-making time and ensures patient routing in case of a positive result.

Conclusions. It has been demonstrated that adapting HIV response systems to wartime conditions requires decentralization of diagnostics through the implementation of the "opt-out" model, use of rapid tests, and deployment of POC platforms in field conditions. The expansion of access to biomedical prevention post-exposure prophylaxis(PEP)/pre-exposure prophylaxis (PrEP), with priority for long-acting injectable forms, is justified. Implementation of the proposed organizational and technological solutions will ensure confidentiality, continuity of treatment, and preservation of operational readiness of personnel during prolonged martial law.

Keywords: HIV infection, epidemiology, clinical features, diagnostics, ART, prevention, population monitoring, migration, Ukraine, the impact of the war, military personnel.

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ОСОБЛИВОСТІ КЛІНІКИ, ДІАГНОСТИКИ, ПРОФІЛАКТИКИ ВІЛ-ІНФЕКЦІЇ СЕРЕД НАСЕЛЕННЯ ТА ВІЙСЬКОВИХ В УМОВАХ ВІЙНИ

Актуальність. Своєчасне виявлення ВІЛ-інфекції залишається ключовим чинником зниження захворюваності та запобігання передачі вірусу. У військовому середовищі це передбачає поєднання скринінгу під час мобілізації, періодичного тестування осіб із підвищеним ризиком інфікування та обстеження за наявності характерних симптомів або після ризикованих контактів. Від початку повномасштабного вторгнення Росії в Україну переміщення значної кількості населення спричинило труднощі із забезпеченням лікування та профілактики, що могло призвести до поширення інфекції в нові регіони. Військовослужбовці та ветерани можуть мати підвищені ризики інфікування внаслідок бойових поранень, особливостей медичного забезпечення в польових умовах, а також труднощів із дотриманням конфіденційності та безперервності антиретровірусної терапії (АРТ) під час ротацій і бойових операцій.

Мета. Узагальнити сучасні клінічні, епідеміологічні та діагностичні особливості ВІЛ-інфекції, наявні й перспективні заходи профілактики серед загального населення та військовослужбовців в умовах воєнного часу, визначити основні напрями вдосконалення діагностики, лікування та профілактики.

Матеріали та методи. Проведено систематичний аналіз наукових публікацій, офіційних звітів і рекомендацій міжнародних організацій (EUCALB, CDC, ECDC) за 2013–2025 рр. Проаналізовано оригінальні дослідження, систематичні огляди та метааналізи.

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Результати. Практичні рекомендації для військово-медичної служби повинні передбачати тестування на ВІЛ у межах рутинних медичних оглядів із використанням алгоритму «opt-out» для зниження рівня стигматизації. Необхідно забезпечити швидке залучення пацієнтів до медичної допомоги («linkage to care») у разі позитивного результату тестування – призначення етіотропної терапії та проведення вірусологічного обстеження (визначення рівня CD4-лімфоцитів і вірусного навантаження) одразу після підтвердження діагнозу. Обґрунтовано розширення використання швидких тестів (RDT) у стандартних протоколах під час мобілізації та в польовій медицині. Рекомендовано впровадження алгоритмів самотестування, використання методів сухої краплі крові (DBS) і платформ діагностики біля пацієнта (POC) для швидкого виявлення ВІЛ безпосередньо в місці надання допомоги, що є критично важливим у районах із порушеною інфраструктурою. Такий підхід скорочує час ухвалення клінічних рішень і забезпечує належну маршрутизацію пацієнтів у разі позитивного результату.

Висновки. Адаптація системи протидії ВІЛ до умов війни потребує децентралізації діагностики шляхом впровадження моделі «opt-out», широкого використання швидких тестів та розгортання POC-платформ у польових умовах. Обґрунтовано необхідність розширення доступу до біомедичної профілактики – постконтактної профілактики (PEP) та доконтактної профілактики (PrEP), з пріоритетом для ін'єкційних препаратів пролонгованої дії. Впровадження запропонованих організаційних і технологічних рішень забезпечить конфіденційність, безперервність лікування та збереження боєздатності особового складу в умовах тривалого воєнного стану.

Ключові слова: ВІЛ-інфекція, епідеміологія, клінічні особливості, діагностика, антиретровірусна терапія, профілактика, моніторинг населення, міграція, Україна, вплив війни, військовослужбовці.

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INTRODUCTION

The Russian invasion of Ukraine in February 2022 ignited the largest armed conflict in Europe since World War II. The indirect health consequences of the war likely caused even greater morbidity and mortality among the civilian population. The war led to the displacement of over 11 million people [1, 2]. Russian armed forces caused significant damage to civilian infrastructure. The war devastated Ukraine's economy and reduced food and energy security in many countries. The war caused environmental damage estimated at over 56.4 billion dollars [1]. Chemical pollution of air, water, and soil is observed, and 30% of Ukraine's territory is contaminated with mines and unexploded ordnance. Most of these environmental impacts threaten human health. Furthermore, the Russian invasion and the war in Ukraine caused a severe humanitarian crisis among Ukrainian citizens and particularly affected the diagnosis and provision of HIV care [1]. Ukraine has one of the highest HIV prevalence rates in Europe [2]. According to UNAIDS estimates, the total number of people living with HIV in Ukraine in 2023 was approximately 240,000, with a significant proportion (about one-quarter) unaware of their status, although about 157,000 were officially registered [3]. The war forced millions of Ukrainians to leave their homes and become internally or externally displaced persons. The national healthcare system was severely weakened: facility infrastructure was destroyed, human resources were lost, and logistical supply routes for essential medicines were disrupted. This places the country among those with the highest percentage of

undiagnosed infections in the region. Despite the war, national healthcare systems and international partners made efforts to ensure ART: in 2022–2023, measures were implemented for resource mobilization, medicine reserve supply, and the deployment of mobile clinics. HIV testing and counseling services initiated by healthcare providers were strengthened in primary healthcare facilities across 12 regions. Furthermore, PrEP services were expanded, and a new long-acting injectable form of cabotegravir was introduced for this purpose, reaching over 12,350 people in 2023 [2, 3].

More than 230,000 women received inter-agency emergency reproductive health kits for use in humanitarian settings. Additionally, thousands of women gained access to sexual and reproductive health services through 108 newly established service points (SPs) in 23 regions. Official operational reports from Joint UNAIDS/partners indicate that programs in many regions resumed operations thanks to humanitarian support, although full recovery to pre-war capacity is not yet complete. 165 million USD has been mobilized from the Global Fund for the national fight against HIV and tuberculosis for the 2024-2026 grant period [3, 4].

The war in Ukraine and the COVID-19 pandemic severely disrupted the work of HIV prevention, care, and treatment services: healthcare facilities providing services to people living with HIV were damaged or completely destroyed in several regions. Laboratories in the Donetsk and Luhansk regions suspended their activities. All this led to the destabilization of the healthcare system and limitations in medical care provision or the availability of antiretroviral treatment [5–8].

Military personnel traditionally belong to high-risk groups for sexually transmitted or parenteral infections. Systematic studies and meta-analyses show that the prevalence of sexually transmitted infections (including HIV) among the military often exceeds the levels in corresponding civilian cohorts due to behavioral factors (mobility, temporary contacts, potential substance use), organizational features of service, and changes in social structure during conflict [9, 10].

Thus, Ukraine maintains a high HIV burden during the war; a large portion of patients requires continued access to diagnosis and ART, and the proportion of undetected infections remains significant. Military personnel are in a high-risk group due to specific combat and behavioral factors, making specialized screening measures, PEP/PrEP, and prevention critically important. Military operations significantly complicated access to HIV treatment and prevention services, although thanks to the efforts of the government, international organizations, and the public sector, it has been possible to partially restore and adapt service delivery. Further focus should be on systemic restoration of testing, continuity of ART, access to PEP/PrEP, and targeted programs for the military [2, 9, 10].

MATERIALS AND METHODS

To prepare this review, a systematic analysis of publications, official reports, and recommendations from international organizations (EUCALB, CDC, ECDC) from 2013 to 2025 was conducted. Information sources included the PubMed, Scopus, and Web of Science databases, as well as other open-access resources from scientific publishers. We used keywords such as “HIV, epidemiology, war, military, HAART, symptoms, manifestation, Ukraine, diagnostics”. Particular attention was paid to works concerning clinical symptoms, diagnostic methods, therapy, and the epidemiology of HIV infection in Ukraine and worldwide. Both original research studies and systematic reviews and meta-analyses were analyzed.

RESULTS AND DISCUSSION

Epidemiology of HIV Infection in Ukraine

According to the Public Health Center of the Ministry of Health of Ukraine, as of October 1, 2025, there were 133,382 PLHIV under medical supervision in healthcare facilities [2, 11]. The highest number of HIV cases was registered among the 30–49 age group (67.3%). In the gender structure of newly diagnosed cases, men predominate (63.6%). On average, 22.3 cases of HIV infection, 7.6 cases of AIDS, and 2.5 deaths were registered daily in Ukraine. Regarding the modes of transmission, the majority of cases occur through sexual contact (83.4%); however, the parenteral route via drug injection remains significant (15.5%). As of October 1, 2025, the number of individuals receiving ART stands at 115,457 [11].

An analysis of HIV infection dynamics in Ukraine over the last decade (Table 1) reflects the qualitative transformation of the healthcare system and the significant impact of large-scale external factors. In the period leading up to 2022, there was a gradual increase in the number of individuals under medical supervision alongside a steady decline in mortality rates.

At the same time, the sharp decline in all statistical indicators starting from 2024 does not signify a genuine improvement in the epidemic situation; rather, it reflects the objective challenges of the war. The primary factors for this dynamic are mass population migration – resulting in a significant portion of patients moving abroad and transitioning to the medical systems of EU countries – and the lack of reporting from temporarily occupied territories and zones of active combat.

According to international reports and scientific assessments, the war in Ukraine has led to multifaceted disruptions in the healthcare system. As of October

2025, the Ministry of Health of Ukraine reported damage or destruction to 2,481 facilities within 800 medical institutions, which also affected HIV response programs: attacks on medical facilities, infrastructure damage, drug supply problems, internal displacement of the population, and a mass exodus of refugees [12, 13].

Table 1. Operational information on officially registered cases of HIV infection, AIDS, and the number of AIDS-related deaths in Ukraine

Year	Number of PLHIV under medical supervision	Number of patients with AIDS	New cases of HIV infection	Deaths
2015	127377	32999	15808	2935
2016	132714	37912	17064	3249
2017	139394	42666	18193	3313
2018	144633	46443	18099	3448
2019	136849	47224	16257	2979
2020	144089	47778	15689	2112
2021	150005	47652	15360	1993
2022	157510	49074	12212	1293
2023	157435	48541	11653	1474
2024	137780	43020	10038	1169
9 months of 2025	133382	41995	6106	675

All of this caused: temporary or permanent disruptions in access to ART for individual patients; a reduction in prevention programs (PrEP, harm reduction programs for people who inject drugs); and disruptions to the testing and early detection system (interruptions in laboratory services, reduced availability of rapid tests during evacuations) [14, 15].

Studies show that HIV prevalence among the military in various countries generally fluctuates within ranges similar to or slightly higher than those of corresponding civilian populations, depending on behavioral and systemic factors (screening, access to prevention). In the US, a long-standing screening system results in a relatively low rate of new diagnoses, but serious challenges remain (regular testing, access to PrEP/ART) [16-18].

Systematic reviews emphasize variability: in some regions, military personnel face significantly higher risks due to mobility factors and risky behavior (e.g., injection substance use, casual sexual contacts), whereas in professional armies with implemented screening and prevention programs (some US and NATO units), the risk is better controlled [16, 17].

The epidemiology of HIV in the military is context-dependent: effective screening programs, PrEP, and rapid initiation of ART reduce intra-military transmission and complications. Aiming to reduce HIV incidence - including the introduction and scaling of PrEP in 2012, the repeal of the "Don't Ask, Don't Tell" (DADT) policy in 2011, and "test and treat" initiatives aligned with the 2019 "Ending the HIV Epidemic" initiative – annual HIV incidence rates in the US Armed Forces remain practically at the same level. Official Pentagon data for 2022–2024 reflected changes related to scientific progress (ART, PrEP, testing) [17-20].

In allied NATO countries, the focus is on preventive measures (educational programs, PrEP in risk groups), mobile health services during deployments, and the integration of HIV services into the medical support of units. At the same time, high-risk units receive priority for PrEP and rapid testing. The experience of various armies (including EU countries) shows: successful management of HIV-positive military personnel is based on rapid diagnosis, continuity of ART, access to PrEP, and the absence of discrimination/stigmatization. Networked experience-sharing programs (NATO Health) facilitate the implementation of best practices [17].

Prior to 2022, Ukraine had one of the highest HIV prevalence rates in Europe, with notable concentrations among key groups (MSM, people who inject drugs, sex workers), as well as a significant number of people who were unaware of their status. National reports from the Public Health Center demonstrated a stable national testing program and ART coverage, but with regional gaps in access and outreach. Key points prior to 2022 included: ART coverage was growing, but regional gaps still existed; the close link between HIV, tuberculosis, and viral hepatitis was a major co-infection issue; harm reduction programs (OST, syringe exchange) were in place, but their availability was inconsistent in certain regions [21, 22].

Military operations have radically changed healthcare logistics and the availability of HIV services:

the risk of HAART interruptions – UNAIDS/partners estimated the scale of possible disruptions (tens of thousands of people could have been left without access to treatment if external funding stopped completely), emphasizing the need for humanitarian supply chains and stockpiles [6, 23, 24]. Attacks on medical infrastructure: WHO and other sources document numerous attacks and damage to healthcare facilities, complicating the continuity of services. This affected both inpatient services and laboratory diagnostics [12, 15]. Adaptations and assessments: mobile clinics, NGOs, ART delivery by all possible means, and the deployment of mobile clinics allowed some services to remain operational; Joint UNAIDS reports large-scale humanitarian support and service restoration in many regions in 2022–2024 [21, 23]. Epidemiological data indicate that the military is a potential high-risk group; however, with systemic screening and prevention programs, this risk is significantly reduced (experience from the US and NATO) [16, 17]. Prior to 2022, Ukraine had a high HIV burden with uneven ART coverage; the war significantly impacted service accessibility, but thanks to humanitarian aid, critical supply chains were maintained [21, 23]. For the military, a targeted policy is required: regular screening, provision of PEP/PrEP, mechanisms for ART continuity during movements and deployments, mobile testing services, and integration with humanitarian programs [18].

Timely detection of HIV infection remains a key factor in reducing morbidity, decreasing illness severity, and preventing infection transmission. In a military context, this means a combination of screening during mobilization, periodic testing for high-risk individuals, and testing upon the appearance of characteristic symptoms or after high-risk contacts. Early diagnosis allows for the rapid initiation of ART and the reduction of viral load to undetectable levels, which is critical for both individual prognosis and public health.

The 2021 UN Political Declaration on HIV introduced the 95-95-95 targets to be achieved by 2025: 95% of all people living with HIV (PLHIV) should know their status; 95% of those diagnosed should receive antiretroviral therapy, and 95% of those on treatment should achieve viral suppression. In practice, for all people with HIV infection in a country, this target means that 95% should be diagnosed, 90% should be on antiretroviral treatment (i.e., 95% of those diagnosed), and 86% should be virally suppressed (i.e., 95% of the 90% on treatment). By 2025, any country achieving a 95-90-86 ratio for all PLHIV will reach the targets [24–26].

War in Ukraine creates many risks for the spread of HIV, tuberculosis, and related diseases, including a possible increase in the number of people who inject drugs or engage in sex work [27].

The post-war period will create significant economic and social hardships for Ukrainians, including large groups of people with physical and/or mental injuries and pain, who may become people who inject drugs. There is a serious risk of a large-scale resurgence of the HIV/AIDS epidemic and related epidemics during the war and in the post-war period [28]. Previous studies have shown that seeking medical care – including HIV testing for those at risk of infection and treatment for those living with HIV – holds a lower priority than meeting basic needs such as food, shelter, and employment in war-affected areas [29].

This demonstrates the scale of the problem and the necessity of integrating testing and monitoring into the medical support system of the Armed Forces of Ukraine. Timely detection of HIV infection among service members is a key element in preventing further spread of the virus and reducing the individual and societal consequences of the disease [30].

According to estimates by the Joint United Nations Programme on HIV/AIDS, as of 2020, nearly 38 million people worldwide were living with HIV, and more than 36 million people had died from HIV-related illnesses since the start of the epidemic. Data suggest that HIV prevalence in the military is highly variable and, as a rule, higher than in the comparable civilian population in settings of high prevalence [10].

It should be noted in particular that due to the growing potential for military aggression, Ukraine has the second-highest HIV incidence rate in Europe, surpassed only by Russia. The United Nations Security Council (UNSC) recognized HIV as an international security issue; it adopted Resolution 1308 in July 2000, marking the first time a health issue was recognized as a threat to peace and security. In June 2011, the UNSC adopted Resolution 1983, recognizing the impact of HIV in conflict and post-conflict environments [10].

Clinical Presentation of HIV Infection

After infection, a significant proportion of patients develop acute retroviral syndrome (ARS), which typically manifests within 2–6 weeks of exposure. These signs are often non-specific and mimic other viral infections (influenza, mononucleosis), which complicates early diagnosis without targeted testing. Estimates of ARS prevalence in various studies fluctuate across a wide range: from approximately 40% to over 90% of cases with documented symptoms during the seroconversion period. According to global reviews and prospective studies, the proportion of individuals with clinically manifest ARS is often estimated within the range of 50–80%, depending on the cohort and definitions [31, 32].

According to global reports from UNAIDS/WHO, by the end of 2024, there were approximately 40 million people living with HIV worldwide; a significant portion of these patients is covered by HAART, but a substantial number of unrecognized infections remains [33, 34].

Direct, large-scale assessments of ARS frequency specifically among Ukrainian service members are absent in open sources. Studies in other armies (e.g., the US and international cohorts of veterans/military personnel) note: the frequency of seroconversion and clinical manifestations depends on the epidemiological background, behavioral risks, and access to testing. Research in various military contexts has shown incidence rates lower than or comparable to those in civilians, depending on the cohort and service conditions; certain cohorts identified both symptomatic and asymptomatic seroconversions. Due to the lack of publications specific to the Armed Forces of Ukraine, it is recommended to use the following to estimate ARS frequency in the military: local screening/reporting data from the Ministry of Health/Public Health Center; and international comparative studies as a benchmark for interpretation [29, 32].

Nature of infection progression: asymptomatic and progressive variants. After the acute phase, most individuals enter a period of clinical latency – asymptomatic or mildly symptomatic – which can last for years. Without treatment, the disease progresses to symptomatic immunodeficiency (AIDS) with an increased risk of opportunistic infections. The introduction of early and continuous ART changes the natural course of the disease: it reduces viral load, prevents immune exhaustion, and transforms HIV into a chronic, manageable condition [34, 35, 36].

Impact of comorbidities (hepatitis, tuberculosis, sexually transmitted infections (STIs)) on the clinical course and diagnosis

Tuberculosis (TB): HIV/TB co-infection significantly increases the risk of active TB; the risk of the latter increases dozens of times. Viral hepatitis (HBV, HCV): co-infection increases the risk of liver complications, affects the choice and tolerability of ART regimens, and raises overall morbidity. This is particularly relevant for groups at risk of parenteral contact (injection drug use), as well as in conditions where access to safe medical procedures is compromised [10, 28, 29, 30]. STIs (syphilis, chlamydia, gonorrhea) increase the risk of HIV transmission and acquisition through inflammatory mucosal lesions [28, 29].

Overall, co-infections impair immune status, can accelerate the progression of HIV infection, and complicate treatment; therefore, timely diagnosis and treatment of comorbid infections are of paramount importance [37, 38].

War increases the risks of treatment interruption, which may contribute to irregular ART adherence and worsened viral suppression [29, 35]; service conditions (migration, stress, risky behavior, injuries with potential parenteral contact) heighten transmission risks. Integration of screening for HIV, TB, HBV/HCV, and STIs into military medical protocols is necessary, along with mechanisms for the continuous provision of ART during movements or evacuation [13, 29, 36].

The frequency of symptomatic cases in military varies according to research data (approximately 40–90%); therefore, the Armed Forces of Ukraine require systemic monitoring of incident cases and early detection, integrated with the diagnosis of TB, hepatitis, and STIs - especially under war conditions when access to services may be limited [29, 33, 34].

Diagnosis and Monitoring

The widespread use of RDTs and the launch of self-testing programs enable the rapid scaling of screening, even in areas with limited access to the medical network. Self-testing should be accompanied by clear support algorithms and a rapid referral system for confirmation and treatment initiation. The use of samples suitable for transport without a cold chain – such as DBS and dried plasma spots – facilitates the collection and transportation of samples for PCR and viral load determination in conditions where the cold chain is disrupted. This allows for the centralization of molecular studies even if local laboratory capacities are limited. Using portable platforms for on-site viral load determination and PCR simplifies obtaining critical information without the need to deliver samples to remote reference laboratories, thereby reducing the time from testing to treatment. Protocols should include referral pathways for HIV-positive service members to civilian or military facilities capable of providing treatment and support [11, 39, 40].

Early diagnosis provides the opportunity to promptly start ART, which, according to WHO data, leads to a reduction in viral load to undetectable levels, decreases the risk of developing opportunistic infections, and improves the patient's quality of life [39, 40]. In war conditions, the integration of HIV testing into the military medical system takes on particular importance. An effective approach, recommended in both international and Ukrainian guidelines, is the use of the "opt-out" testing model, where the test is offered to everyone without the need for a specific request, minimizing stigma and increasing screening coverage [38, 39].

The primary stage of diagnosis, especially in field conditions, is the use of RDTs, which provide high sensitivity and specificity when the usage protocol is followed. Additional value lies in the implementation of self-testing programs, which allow for screening without the need for a direct visit to a medical facility [38–40].

Positive RDT results are subject to mandatory confirmation using tests based on a different principle or laboratory methods, such as enzyme-linked immunosorbent assay (ELISA), in accordance with approved national algorithms [38].

Molecular biological methods, particularly PCR for viral load determination, are used to monitor the course of the disease and serve as the primary indicator of ART effectiveness [38]. CD4 lymphocyte count determination is used to assess the degree of immunodeficiency and identify patients who require prophylaxis for opportunistic infections, especially in cases of late presentation or treatment interruption [34, 38]. Modern recommendations provide for the widespread implementation of POC technologies, which allow for both viral load determination and PCR testing directly at the POC, reducing the time between testing and the start of treatment [38, 39].

In conditions of active combat, HIV diagnostics face a series of logistical and organizational constraints. Key challenges include the disruption of the cold chain during sample transportation, shortages of test systems and reagents and lack of qualified laboratory personnel. One effective way to overcome these challenges is the implementation of mobile laboratories and portable POC platforms. Equally important is ensuring a continuous "testing – confirmation – treatment" chain, even in crisis conditions, with guarantees of confidentiality and protection of the rights of service members [38–40].

Thus, it is advisable to integrate a multi-level HIV diagnostic model into the military medicine system. This model should include regular screening using rapid tests, laboratory confirmation, molecular and immunological methods, as well as innovative approaches to maintain access to diagnostics during combat operations.

Prevention Among the Military

HIV prevention among military personnel must be multi-level, combining individual measures, pharmacological pre- and post-exposure prophylaxis, and organizational interventions within the healthcare chain. In many countries, screening is conducted to exclude HIV-infected individuals from conscription or enlistment; therefore, detected infections most likely occur after entering service, suggesting that service members often face a significantly increased risk of infection and subsequent possible HIV transmission [11].

Research and development of HIV countermeasures offer both operational and diplomatic advantages and are foundational goals of the Military HIV Research Program (MHRP) at the Walter Reed Army Institute of Research (WRAIR). HIV poses a threat to US military interests for two primary reasons: the direct biomedical threat of infection to service members, along with the associated costs and consequences, and the destabilizing impact HIV can have on socio-political systems. The MHRP employs a multifaceted strategy to counter these biomedical and socio-political threats arising from HIV. In the US, HIV incidence rates vary significantly between groups, with the virus disproportionately affecting African Americans, Latinos, people living in the American South, and increasingly those aged 25 to 34 - all groups heavily represented in the US military [10]. Similarly, HIV incidence rates vary significantly across the globe, with particularly high infection rates observed in many African and some Asian countries, all of which are potential theaters of future military operations. Prevention is the most cost-effective and efficient approach to combating the threats posed by HIV. Significant progress has been made in using medications to reduce the risk of HIV infection, known as PrEP [10].

Targeted information interventions for the military should be concise, contextual, and adapted to the realities of war (mobile messages, offline materials in field medical posts, and training for commanders on maintaining access to prevention). Such programs increase awareness of risks – including those associated with mobility, accidental injuries, and injection substance use under stress – and have demonstrated effectiveness in maintaining healthcare-seeking behavior during conflicts [28, 36, 41].

PEP – an early course of antiretroviral therapy after a suspected exposure – must be available within the military medical system as an emergency measure within the recommended window (typically 72 hours after exposure). Maintaining stocks of antiretroviral drugs for PEP and staff training are critical elements [28, 35].

PrEP, whether as a daily or other recommended regimen, effectively reduces the risk of transmission during sexual exposure and in cases of risk through injection practices. Implementing PrEP in military contexts requires the identification of individuals at increased risk, a system for monitoring tolerability, and guaranteed access to HIV testing to avoid prescribing PrEP to individuals with an existing infection. Data on PrEP coverage in the armed forces show that this approach can be scaled; however, it requires targeted efforts from the healthcare system [35, 42].

Regular screening (targeted and/or opportunistic) in wartime conditions must be combined with mobile services and expanded use of rapid tests to promptly detect new cases and ensure the early initiation of therapy or prophylaxis. Mobile clinics and digital solutions have helped maintain the patient's link to care during displacement and infrastructure destruction [43, 44].

Training for military medics on primary prevention, PEP/PrEP, and blood safety protocols, alongside the integration of HIV services into existing field medical protocols, increases response speed and reduces the risk of nosocomial (in-hospital) transmission [28, 45].

Barriers to implementing prevention during the war

Logistical and resource constraints, infrastructure destruction, disruptions in the supply of medications and test systems, as well as dependence on external funding, complicate the continuity of prevention and treatment programs [46, 47].

Stigma regarding HIV, the stigmatization of key groups (LGBT, injection drug users, sex workers), as well as legal barriers, reduce the likelihood of seeking help. In the military environment, the risk of disciplinary consequences or discrimination may additionally deter access to services [28, 45, 48].

Frequent movements of military personnel and the civilian population complicate the provision of continuous preventive support and monitoring of PrEP or PEP adherence. Digital registries, mobile services, and cross-sectoral coordination of support organizations have shown their utility in maintaining access [43, 44].

Thus, to implement timely diagnosis and prevention during the war, the following should be done: ensure a minimum set of drugs for PEP at all medical points and develop clear algorithms for the rapid initiation of PEP. Include PrEP in the list of available preventive measures for the military with identified risk factors; establish patient support and laboratory monitoring. Deploy mobile and remote services for testing and drug distribution; utilize the experience of non-governmental organizations and international partners for logistical support. Conduct regular information campaigns and training for personnel and medical staff with a focus on reducing stigma and protecting confidentiality [28, 39, 42, 45].

Since a significant percentage of healthcare organizations are implementing artificial intelligence for research, healthcare delivery, and use it in areas such as testing, risk prediction, clinical decision-making, and HIV interventions, it is necessary to seek and engage partners with industry and technology experts to ensure safe and effective support for this issue [44, 49].

Treatment

In war conditions, HAART coverage and screening programs in affected regions decrease, creating conditions for the increased identification of late-stage disease among the military, whereas in peacetime, most detected cases reach the primary prevention and support system. The European Centre for Disease Prevention and Control (ECDC), in partnership with the European AIDS Clinical Society (EACS), has developed standards of medical care in the areas of HIV testing and PrEP. Additional standards in the following areas are under development and expected for publication: prenatal screening; initiation of HAART; and HIV and comorbidities [28, 44, 50].

The medical care standard "HIV Infection" in Ukraine was approved in June 2025 by Order No. 916 of the Ministry of Health of Ukraine [37]. Treatment regimens include currently available antiretroviral drugs and the latest developments in therapy. Particular focus is placed on new antiretroviral agents acting on known and unidentified antiviral targets, prophylactic therapy aimed at improving available drug combinations, and research into new long-acting drugs, including those involving new candidate drugs such as lenacapavir or islatravir. The development of new and improved antiviral drugs has led to an improvement in the life expectancy and quality of life for patients with viral infections [24, 37, 51].

UNAIDS will continue to support countries and partners in advancing HIV response measures to ensure that everyone, everywhere, has access to necessary HIV services and that AIDS is eradicated as a public health threat by 2030. Ensuring a functioning healthcare system that guarantees the health, safety, and well-being of people, including those affected by HIV, is impossible if conflict continues, despite the immense humanitarian efforts of governments, humanitarian organizations, and civil society [52, 53].

CONCLUSIONS

War alters the epidemiological landscape of infectious diseases and creates additional risks for the spread of HIV. Healthcare instability, internal displacement, the disruption of prevention programs, and impaired access to antiretroviral therapy heighten the vulnerability of both the civilian population and service members. The situation in Ukraine following the 2022 full-scale invasion has led to significant challenges in maintaining the continuity of HIV services and an increased burden on the healthcare system. Military units primarily consist of a young, working-age population, where HIV detection predominantly occurs during the primary infection stage or the early chronic period, when the clinical presentation may be subtle or asymptomatic. Wounded service members often present with a combination of infectious complications (secondary bacterial infections, purulent wounds) and potential co-infections (hepatitis, tuberculosis), which alter the clinical picture of HIV and lead to more rapid progression and more complex management. Stress, prolonged deprivation, the disruption of social ties, and other wartime factors contribute to risky behaviors (unprotected sexual contact, injection substance use), altering transmission patterns and potentially leading to

outbreaks within military collectives. Mobilization, internal displacement, and infrastructure destruction have resulted in decreased testing coverage and delays in identifying new cases. This reduces the likelihood of early detection and HAART initiation. Interruptions in opioid substitution therapy programs and reduced access to PEP and PrEP occur. Logistical problems, shifts in funding, and drug access issues lead to supply instability and decreased coverage of preventive measures. Effective HIV prevention among the military during wartime requires a combination of individual measures (barriers, information), pharmacological prophylaxis (PEP/PrEP), and organizational solutions (screening, mobile services, staff training).

PROSPECTS FOR FUTURE RESEARCH

Future research should aim at adapting HIV prevention, testing, and treatment programs for the military environment during wartime. This includes developing both operational software solutions (mobile points, telemedicine, PrEP) and systemic studies to evaluate their effectiveness, safety, and acceptability.

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1.Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work;

2.Drafting the work or revising it critically for important intellectual content;

3.Final approval of the version to be published;

4.Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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The authors have no conflict of interest to declare.

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The use of AI is limited to areas that do not affect the scientific novelty or validity of the research, specifically for proofreading, text editing, translation, creating visualizations, or technical formatting of materials.

ETHICAL CONSIDERATIONS

The study was conducted without involving human subjects.

REFERENCES

1. Hryhorczuk D, Levy BS, Prodanchuk M, et al. The environmental health impacts of Russia's war on Ukraine. *J Occup Med Toxicol*. 2024;19(1). https://doi.org/10.1186/s12995-023-00398-y
2. Parczewski M, Boesecke C, Khaykin P, et al. Provision of care for people with HIV migrating from Ukraine: preparing for a long-term response. *Aids*. 2025;39(6):629-638. https://doi.org/10.1097/qad.0000000000004147
3. Two years on: UNAIDS supports Ukraine's commitment to the HIV response | UNAIDS. UNAIDS. Accessed January 5, 2026. https://www.unaids.org/en/resources/presscentre/featurestories/2024/february/20240223_hiv-response-ukraine
4. GF project 2024-2026 | public health center. Public Health Center of the MoH of Ukraine. Accessed January 5, 2026. https://phc.org.ua/pro-centr/proekti/proekt-gf-2024-2026
5. Massmann R, Doležalová K, Soják L, et al. Demographic, epidemiological and clinical characteristics of Ukrainian war refugees with HIV infection in the Slovak Republic. *Travel Med Infect Dis*. 2024:102764. https://doi.org/10.1016/j.tmaid.2024.102764
6. Trykhlib VI, Zadorozhna VI, Antoniak SM, et al. HIV infection among military personnel during the ATO/JFO /

VIL-infektsiia u viiskovosluzhbovtsiv pid chas ATO/OOS. *Ukr J Mil Med*. 2024;5(1):45-58. https://doi.org/10.46847/ujmm.2024.1(5)-045
7. HIV/AIDS | public health center. Public Health Center of the MoH of Ukraine. Accessed January 5, 2026. https://phc.org.ua/kontrol-zakhvoryuvan/vilsnid
8. Neduzhko O, Kiriazova T, Zeziulin O, et al. The effects of COVID-19 pandemic on HIV service provision in Ukraine. *J Int Assoc Provid AIDS Care (JIAPAC)*. 2024;23. https://doi.org/10.1177/23259582241277649
9. Anulus A, Murt B, Prasetya H. Risk factors of HIV among male military personnels: a meta analysis. *J Health Promot Behav*. 2019;4(3):178-188. https://doi.org/10.26911/thejhpb.2019.04.03.03
10. The purpose and impact of the U.S. military HIV research program. National Defense University Press. Accessed January 5, 2026. https://ndupress.ndu.edu/Joint-Force-Quarterly/Joint-Force-Quarterly-110/Article/Article/3450084/the-purpose-and-impact-of-the-us-military-hiv-research-program/
11. Statistical reports on HIV/AIDS | public health center. Public Health Center of the MoH of Ukraine. Accessed January 5, 2026. https://phc.org.ua/kontrol-zakhvoryuvan/vilsnid/statistika-z-vilsnidu/statistichni-dovidki-pro-vilsnid
12. More than 2,400 medical infrastructure facilities damaged or destroyed as a result of full-scale war. Ministry of Health of Ukraine. Accessed January 5, 2026. https://moz.gov.ua/uk/ponad-2400-ob-yektiv-medichnoyi-infrastrukturi-poshkodzheni-abo-zrujnovani-vnaslidok-povnomasshtabnoyi-vijni
13. Barsukova A, Shvab M, Puttkammer NH, et al. Impact of war on HIV-related healthcare services and health workers in eastern Ukraine: a qualitative study. *AIDS Care*. 2024:1-9. https://doi.org/10.1080/09540121.2024.2332445
14. Neduzhko O, Kovtun O, Dumchev K. *Analysis of the HIV Infection Situation in Ukraine in the Context of a Full-Scale War: Research Results Report*. The Alliance for Public Health; 2025. Accessed January 5, 2026. https://aph.org.ua/wp-content/uploads/2025/09/GF_HIV-and-War_Report_ukr.pdf
15. *Ensuring the HIV Response and Healthcare Stability: From Crisis to Prospective Recovery (Situation Report)*. UNAIDS; 2025. Accessed January 5, 2026. https://www.unaids.org/sites/default/files/2025-02/Ukraine-SitRep.pdf
16. Yan LD, Rouzier V, Dade E, et al. Treatment of early hypertension among persons living with HIV in Haiti: protocol for a randomized controlled trial. *Plos One*. 2021;16(8). https://doi.org/10.1371/journal.pone.0254740
17. *Department of Defense HIV/AIDS Prevention Program. Program Announcement*. Defense Health Agency; 2023. Accessed January 5, 2026. https://bi.usembassy.gov/wp-content/uploads/sites/163/2024/10/W81XWH-22-DHAPP-10.11.2024.pdf
18. Aumakhan B, Eick-Cost AA, Oh GT, Stahlman SL, Johnson R. Four decades of HIV antibody screening in the U.S. military: a review of incidence and demographic trends, 1990-2024. *MSMR*. 2025;32(4):13-20. https://pmc.ncbi.nlm.nih.gov/articles/PMC12091956/
19. Crowell TA, Hsieh HC, Wang X, et al. Antiretroviral therapy within two years of HIV acquisition is associated with fewer viral blips: A retrospective analysis of over 20 years of data from the U.S. military HIV natural history study. *Clin Infect Dis*. 2025. https://doi.org/10.1093/cid/ciaf103
20. *Policy Regarding Human Immunodeficiency Virus-Positive Personnel Within the Armed Forces. Memorandum.* U.S. Department of Defense; 2022. Accessed January 5, 2026. https://media.defense.gov/2022/Jun/07/2003013398/-1/-1/1/POLICY-REGARDING-HUMAN-IMMUNODEFICIENCY-VIRUS-POSITIVE-PERSONNEL-WITHIN-THE-ARMED-FORCES.PDF
21. Antonenko Z, Martsynovska V. *HIV Infection in Ukraine: Information Bulletin*. Public Health Center of the MoH of Ukraine; 2022. Information bulletin. 53rd ed. Accessed January 5, 2026. https://phc.org.ua/sites/default/files/users/user90/HIV_in_UA_53_2022_EN.pdf
22. *UNAIDS Global AIDS Update 2022*. UNAIDS; 2020. Global report. Accessed January 5, 2026. https://www.unaids.org/sites/default/files/media_asset/2022-global-aids-update-summary_en.pdf
23. *Ukraine 2022-2023: Summary of the Joint Programme's Support to the National HIV Response*. UNAIDS; 2024. Country Factsheet. https://open.unaids.org/sites/default/files/2025/Ukraine_2022-2023.pdf
24. Menéndez-Arias L, Delgado R. Update and latest advances in antiretroviral therapy. *Trends Pharmacol Sci*. 2022;43(1):16-29. https://doi.org/10.1016/j.tips.2021.10.004
25. Kirby T. Steady but variable progress towards global HIV targets. *Lancet*. 2024;403(10421):16-17. https://doi.org/10.1016/s0140-6736(24)00002-3
26. Bekker LG, Alleyne G, Baral S, et al. Advancing global health and strengthening the HIV response in the era of the sustainable development goals: The international AIDS society—lancet commission. *Lancet*. 2018;392(10144):312-358. https://doi.org/10.1016/s0140-6736(18)31070-5
27. War in Ukraine | UNAIDS. UNAIDS. Accessed January 5, 2026. https://www.unaids.org/en/War-Ukraine-special
28. Lopatina Y, Żakowicz AM, Shabarova Z, et al. Safeguarding HIV prevention and care services amidst military conflict: Experiences from Ukraine. *BMJ Glob Health*. 2023;8(12). https://doi.org/10.1136/bmjgh-2023-014299
29. Nwoga HO, Igweagu CP, Umeh GC. Prevalence and determinants of TB/HIV coinfection: The double tragedy of infectious disease burden – a 5-year retrospective study in a tertiary health facility in Enugu State, Nigeria. *BMJ Open*. 2024;14(11). https://doi.org/10.1136/bmjopen-2024-088287
30. World Health Organization. *Consolidated Guidelines on Person-Centred HIV Strategic Information: Strengthening Routine Data for Impact*. World Health Organization; 2022. https://www.who.int/publications/i/item/9789240055315

31. *The Urgency of Now: AIDS at a Crossroads. 2024 Global AIDS Update*. Joint United Nations Programme on HIV and AIDS (UNAIDS); 2024. https://www.unaids.org/sites/default/files/media_asset/2024-unaids-global-aids-update_en.pdf
32. Peters PJ, Marston BJ, Weidle PJ, Brooks JT. Human immunodeficiency virus infection. In: *Hunter's Tropical Medicine and Emerging Infectious Disease*. Elsevier; 2013:217-247. https://doi.org/10.1016/b978-1-4160-4390-4.00027-8
33. Crowell TA, Colby DJ, Pinyakorn S, et al. Acute retroviral syndrome is associated with high viral burden, CD4 depletion, and immune activation in systemic and tissue compartments. *Clin Infect Dis*. 2017;66(10):1540-1549. https://doi.org/10.1093/cid/cix1063
34. Joint United Nations Programme on HIV and AIDS. *People Living With HIV: 2024 Global AIDS Update Thematic Briefing Note*. Joint United Nations Programme on HIV and AIDS; 2024. Thematic briefing note. https://www.unaids.org/sites/default/files/media_asset/2024-unaids-global-aids-update-living-with-hiv_en.pdf
35. HIV and TB overview: Ukraine. global HIV and TB. Accessed January 5, 2026. https://www.cdc.gov/global-hiv-tb/php/where-we-work/ukraine.html
36. Friedman SR, Smyrnov P, Vasylyeva TI. Will the Russian war in Ukraine unleash larger epidemics of HIV, TB and associated conditions and diseases in Ukraine? *Harm Reduct J*. 2023;20(1). https://doi.org/10.1186/s12954-023-00855-1
37. HIV infection. State Expert Center of the Ministry of Health of Ukraine. 2023. https://www.dec.gov.ua/mtd/vil-infekcziya/
38. *Consolidated Guidelines on Person-Centred HIV Strategic Information: Strengthening Routine Data for Impact*. World Health Organization (WHO); 2024. Technical guideline. https://www.who.int/publications/i/item/9789240055315
39. Clinical testing guidance for HIV. HIV Nexus: CDC Resources for Clinicians. Accessed January 5, 2026. https://www.cdc.gov/hivnexus/hcp/diagnosis-testing/index.html
40. Ochodo EA, Olwanda EE, Deeks JJ, Mallett S. Point-of-care viral load tests to detect high HIV viral load in people living with HIV/AIDS attending health facilities. *Cochrane Database Syst Rev*. 2022;2022(3). https://doi.org/10.1002/14651858.cd013208.pub2
41. *Consolidated Guidelines on HIV Prevention, Testing, Treatment, Service Delivery and Monitoring: Recommendations for a Public Health Approach*. World Health Organization; 2020. Technical guideline. https://differentiatedservicedelivery.org/wp-content/uploads/who-consolidated-guidelines-2021.pdf
42. Mancuso JD, Ahmed AE. Coverage of HIV pre-exposure prophylaxis (prep) within the active duty U.S. military. *Med Surveill Mon Rep*. 2024;31(3):13-16. https://pubmed.ncbi.nlm.nih.gov/38621257/
43. Antonenko Z, Martsynovska V, Pohorielova O, Zubko M. *HIV Infection in Ukraine: Information Bulletin*. Public Health Center of the MoH of Ukraine; 2023. Information bulletin. 54rd ed. Accessed January 5, 2026. https://phc.org.ua/sites/default/files/users/user90/HIV_in_UA_53_2022_EN.pdf
44. Aleksandrenko H, Shevchenko M, Chervak O. Digital health intervention reconnects war-affected people living with HIV to healthcare: ukraine case study. *Oxf Open Digit Health*. 2025. https://doi.org/10.1093/oodh/oqaf001
45. *National Response of HIV, TB, Viral Hepatitis and SMT Programmes in the Context of Full-Scale Russian Invasion*. Public Health Center of the MoH of Ukraine; 2023. Annual report. https://phc.org.ua/sites/default/files/users/user90/National_response_HIV_TB_VH_SMT_war_2023_ENG.pdf
46. Impact of US funding cuts on HIV programmes in Ukraine | UNAIDS. UNAIDS. 2025. Accessed January 5, 2026. https://www.unaids.org/en/resources/presscentre/featurestories/2025/april/20250422_ukraine
47. *Ukraine. Fifth Year of War: Deepening Humanitarian Needs and Impact on the HIV Response*. UNAIDS; 2026. https://www.unaids.org/sites/default/files/2025-02/Ukraine-SitRep.pdf
48. *European Standards of HIV Prevention and Care: Module on HIV Testing*. ECDC; 2025. Technical report. https://www.ecdc.europa.eu/sites/default/files/documents/European-Standards-of-HIV-prevention-and-Care-Module-on-HIV-testing.pdf
49. Young SD. Artificial intelligence in HIV research, policy, and clinical care. *Lancet HIV*. 2025. https://doi.org/10.1016/s2352-3018(25)00264-4
50. Mody A, Sohn AH, Iwuji C, Tan RK, Venter F, Geng EH. HIV epidemiology, prevention, treatment, and implementation strategies for public health. *Lancet*. 2023. https://doi.org/10.1016/s0140-6736(23)01381-8
51. Mocanu E, Drakeley A, Kupka MS, et al. ESHRE guideline: medically assisted reproduction in patients with a viral infection/disease. *Hum Reprod Open*. 2021. https://doi.org/10.1093/hropen/hoab037
52. The Lancet HIV. Fate of people with HIV in jeopardy in Ukraine. *Lancet HIV*. 2022;9(4). https://doi.org/10.1016/s2352-3018(22)00074-1
53. Transforming our world: the 2030 agenda for sustainable development | department of economic and social affairs. United Nations | Department of Economic and Social Affairs. Accessed January 5, 2026. https://sdgs.un.org/2030agenda

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