# Opportunities and Challenges for HIV Prevention in Iranian Prisons

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Vrije Universiteit Amsterdam (VU)

August 2021

A thesis submitted in partial fulfilment of the requirement for the degree

of Master of Science in Public Health

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Country Participant: **Iran**

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57th Master of Public Health/International Course in Health Development (MPH/ICHD)

14 September 2020 – 3 September 2021

KIT (Royal Tropical Institute)/Vrije Universiteit Amsterdam

Amsterdam, The Netherlands September 2021

Organised by:

KIT (Royal Tropical Institute)

Amsterdam, The Netherlands

In co-operation with:

Vrije Universiteit Amsterdam (VU)

Amsterdam, The Netherlands

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## Acknowledgements

At first, I should thank all advisors and tutors in KIT Royal Tropical Institute who made a unique experience for me in this wonderful program and despite the special circumstances in the COVID pandemic, they did their best to educate and support us.

Many thanks to my thesis advisor and academic advisor for their valuable guidance, comments and support during this research.

Furthermore, my colleagues in Iran for providing me access to some reports and kinds of literature which without this, the study would not have been possible.

And finally, my thanks to my wife and my son for their patience and support during this program.

## List of abbreviations

| | |
|---|---|
| AIDS | Acquired Immune Deficiency Syndrome |
| ART | Antiretroviral Therapy |
| FSW | Female Sex Worker |
| HIV | Human Immunodeficiency Virus |
| HTC | HIV Testing and Counselling |
| IDU | Injecting Drug User |
| IEC | Information, Education and Communication |
| MENA | Middle East and North Africa |
| MMT | Methadone Maintenance Treatment |
| MOH | Ministry of Health |
| MSM | Men who have Sex with Men |
| MTCT | Mother-to-Child Transmission |
| NSP | Needle and syringe Programs |
| OST | Opioid substitution treatment |
| PLHIV | People Living with HIV |
| PrEP | Pre-Exposure Prophylaxis |
| PWID | People who inject drugs |
| STI | Sexually Transmitted Infection |
| TB | Tuberculosis |
| UNAIDS | the Joint United Nations Programme on HIV/AIDS |
| UNDP | United Nations Development Programme |
| UNODC | United Nations Office on Drugs and Crime |
| VCT | Voluntary Counseling and Testing |
| WHO | World Health Organization |

## Abstract

**Introduction:** HIV is a serious public health issue, and HIV infection rates in prison populations are often higher than in the general population worldwide. Although the prevalence of HIV in Iranian prisons is below one percent, studies have shown that HIV can spread rapidly in prisons unless effective measures are taken to prevent its transmission. This study aims to critically analyze challenges and opportunities for HIV prevention in the Iranian prisons system in order to give recommendations to improve programs that address HIV in prisons according to evidence-based interventions.

**Method:** This is descriptive research based on a review of the literature. The data were collected from different resources, including peer-review literature and reports from national and international organizations.

**Results:** The current situation of HIV prevention gaps and opportunities in Iranian prisons was evaluated. Many factors influence the transmission of HIV in prisons, and the findings showed that these factors were consistent with the findings of other countries. Despite some gaps in Iranian prisons, positive measures have been taken to prevent HIV.

**Conclusion:** Prisoners in Iran are vulnerable to HIV. Although Iran's National AIDS Strategic Plan sets out policies and measures to control HIV in prisons, the findings showed that the Iranian prisons health system lags behind these plans, and many positive interventions have not been sustainable. Lack of attention to the health of prisoners can endanger the health of society.

**Keywords:** HIV, Prison, Iran, Prevention, Challenges, Opportunity, Policy, harm reduction, risky behaviours

Word count:12646

# Chapter 1: Country Background

## 1.1 Geography

The Islamic Republic of Iran is located in West Asia and the Middle East region. Iran is the world's 17th largest country. It is surrounded on the north by Azerbaijan, Armenia, the Caspian Sea, and Turkmenistan, on the south by the Oman Sea and the Persian Gulf, on the west by Iraq and Turkey, on the east by Afghanistan and Pakistan. There are 31 administrative provinces in Iran. The capital and largest city of Iran is Tehran (Figure 1) (1).


Figure1. The map of Iran

*Source: https://www.indexmundi.com/iran*

## 1.2 Demographic and socio-economic characteristics

Iran's population in 2021 is almost 85 million (the world's 16th most populous country), and the current growth rate is at 1.1 %, which has slowed in recent decades (2). Nearly 99 % of all Iranians are Muslims; 90% follow the Shi'a branch of Islam, which is the official religion, and 9% follow the Sunni branch. Iran has one of the largest numbers of refugees, with over one million refugees, the majority of them are from Iraq and Afghanistan (3).

More than 74% of Iran's population lives in urban areas. From the whole population, the young population (15-29 years old) is 23.9%, and the elderly population over 65 years old is 6.1%. The population pyramid of Iran in 2020 showed in Figure 2 (4).

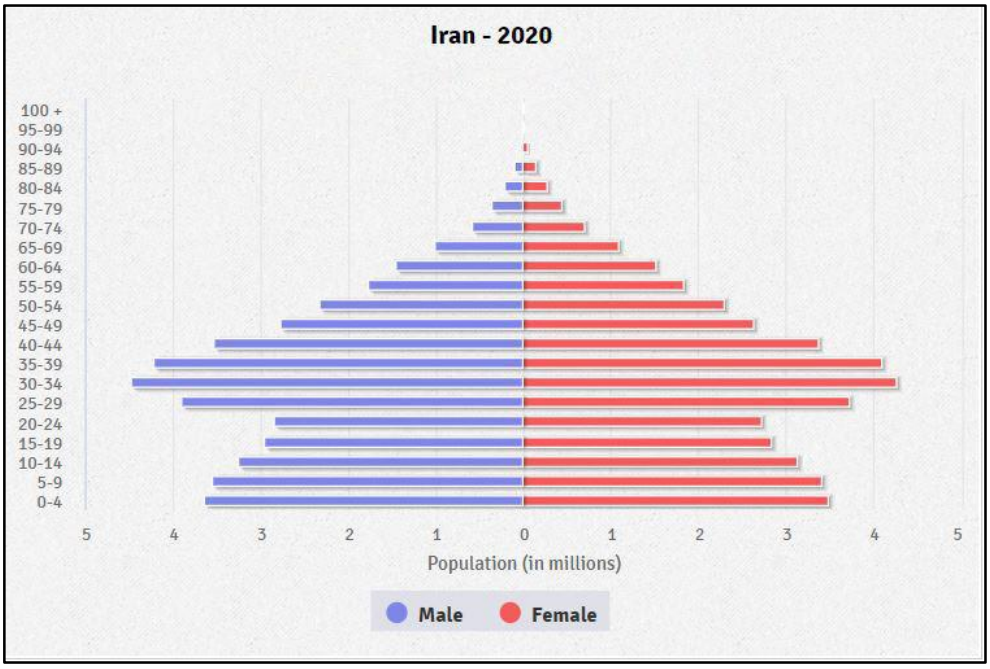


Figure2. Population pyramid of Iran

*Source: https://www.wpmap.org/map-of-iran*

According to the United Nations Development Program (UNDP) reporting 2020, Iran was ranked 70th in the world for the Human Development Index (HDI) index (5). In 2017, the country's GNI (gross national income) was $12,447 per capita. The Unemployment Rate (% of the labour force) in 2020 was 11.4. The literacy rate, according to the UNDP report in 2020, was 85.5% (5). According to the NUMBEO website, the level of crime in Iran is moderate but the indicator for crime increasing in the past three years is high (6).

### 1.3 Health status and healthcare system

In the latest report of the World Health Organization (WHO) in 2020, Iran's health system performance ranked 58th among the world's countries (7). Many of the health indicators in Iran has improved compared to two decades ago (7). Iran has been able to provide public health prevention services through the establishment of an extensive network of primary health services, resulting in a significant reduction in maternal and child mortality and an increase in life expectancy (8). For example, the maternal mortality ratio declined from 47 to 16 from 2000 to 2017 (9). The Health system chart in Iran is mentioned in Annex1. In 2020, Life expectancy at birth was 76.7 years, and current health expenditure was 8.7$ of GDP (10). According to the WHO data in 2020, the main burden of diseases in Iran were related to traffic accidents, cardiovascular diseases, major depressive disorders, substance use disorders, cerebrovascular accidents (11).

Cardiovascular diseases, motor vehicle accidents, and cancers appear to be the leading causes of death among Iranian in 2020 (12). According to some research, around 11 % of Iran's adult population has taken the illegal substance at least once in their lives, and furthermore, 14% and 9% of the individuals, respectively, were current smokers and had a history of alcohol use (13, 14). Iran encounters COVID 19 pandemic like other countries in the world. Despite all the measures taken, Iran has experienced five waves so far (15). About 90,000 people have died in Iran due to this disease (Figure 3) (16). Covid 19 pandemic has affected countries' health systems, including Iran, and measures against other diseases are affected.

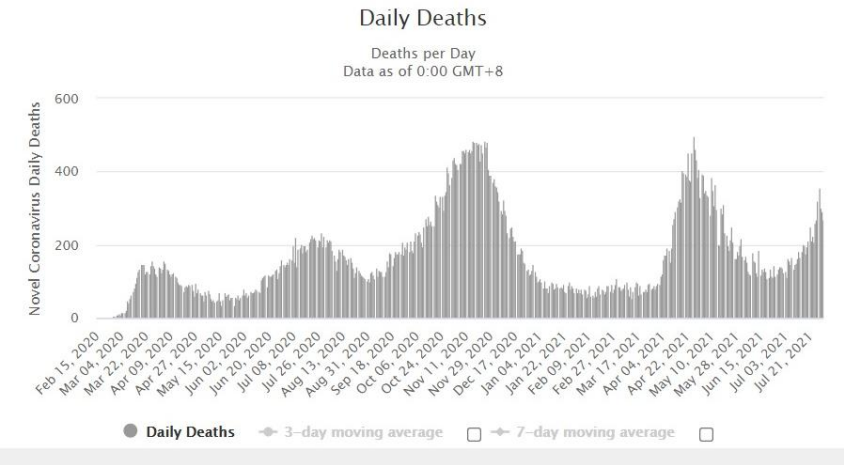


Figure3. Daily New COVID 19 Deaths in Iran

*Source: https://www.worldometers.info/coronavirus/country/iran/*

## 1.4 Iranian prisons

Prisons in Iran are part of the country's prisons and security and correctional measures organization. In 2020, the population of prisoners in Iran was 226,000, which ranks eighth in the world. About 3% of prisoners in Iran are female, and 64% of prisoners are married. There are currently 253 prisons in Iran (17). The prison population rate in 2020 was 228 people per 100,000 national population, and It has increased by 8% in the last ten years (18). Prisons in Iran are usually highly populated (Prisons density 4-8 times the actual capacity), and according to the United Nations Office on Drugs and Crime (UNODC) report, in 2017, the occupancy level of Iranian prisons was 153.0% (19).

In Iran, almost 38% of offenders have been convicted of drug-related offences, and 46% of those who enter prison have a history of imprisonment (Figure 4) (20). In this country, male and female prisoners are kept in separate wards; in the male ward, all staff is male, and in the female ward, all staff is female (17).

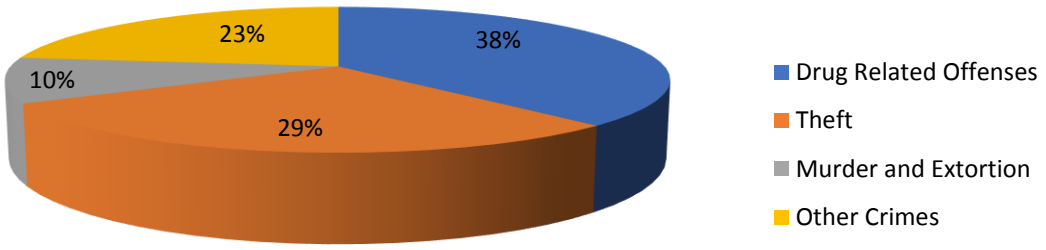


**Figure 4. Differenet Crimes in Iranian prisons in 2019**

There are health centers in all prisons of the country, and health services are provided to prisoners. These centers provide primary services, and prisoners are often sent to out-of-prison centers for secondary services. One of the significant problems in providing health services to prisoners is pretending to have a problem to reach a gain. Healthcare specialists evaluate all people entering prison at the entrance before being assigned to a part of the prison. The purpose of the health assessment conducted in reception upon arrival is to investigate the person's health to identify any physical or mental health issues and ensure the proper care or their previous medication continues. Infectious diseases such as tuberculosis, Hepatitis B, C, HIV, respiratory and gastrointestinal diseases, poisoning and substance abuse, and behavioural diseases are the most common burden of diseases in Iranian prisons (21).

There is much emphasis on vocational training programs of prisoners in Iranian prisons. In prison, vocational training programs attempt to empower prisoners with the skills they need to find work and earn a living wage after release (21). Prisoners are divided and kept separately based on various factors such as age, type of crime and number of incarcerations. Prisoners in Iranian prisons live in groups and do not have solitary confinement (17).

# Chapter 2: Problem statements, Objectives

## 2.1 HIV/AIDS

The human immunodeficiency virus (HIV) attacks the immune system, weakening people's defenses against various illnesses and cancers that healthy immune systems can fight. Acute immunodeficiency syndrome (AIDS) is the advanced stage of HIV infection. HIV/AIDS is one of the world's most serious public health issues (22). Globally, 1.5 million people were newly infected with HIV in 2020, according to UNAIDS data. At the end of 2020, there were an estimated 37.6 million HIV-positive people. It is having claimed the lives of 34.7 million people worldwide (23). In 2020, 84% of all living with HIV (PLHIV) understood their HIV status, and 73% of them accessed treatment. Since 2010, AIDS-related mortality has decreased by 42%. In 2020, women and girls accounted for nearly half of all new HIV infections (23). Globally in 2019, distribution of new HIV infection by the key population groups showed sex workers (8%), people who inject drugs (PWIDs) (19%), men who have sex with men (MSMs) (23%), transgender people (2%), clients of sex workers and sex partner of other key population (19%), and other remaining population (38%) of all cases (23).

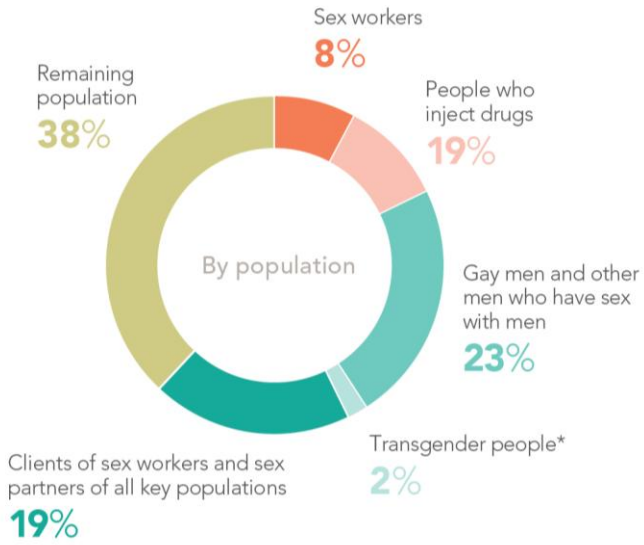


**Figure 5. New HIV cases by population distribution, Global, 2019**

Source: www.aidsinfo.unaids.org

### 2.1.1 HIV/AIDS in Iran

According to the official statistics, in 2020, the number of people living with HIV (PLHIV) was 22406; among them, 82% was male. 50% of people living with HIV are in the 20-35 age group (24, 25). In 1986, a hemophilic child in Iran was diagnosed with HIV for the first time (25). During the early stages of the HIV epidemic in Iran, those who inject drugs had the highest rate of HIV infection (4). In 1996, the first notable HIV infection outbreak occurred among PWIDs in Iran (26). In 2020, the usage of shared needles was shown to be the most common mode of HIV transmission (59.8%), followed by unprotected sexual contact (23.2%) and mother-to-child transmission (MTCT) (1.5%) (25). Injecting drug users (IDUs) can transmit HIV to their healthy sexual partners (27, 28). Many PWIDs reported having multiple unprotected sexual relationships without using condoms in a study in Tehran (29).

Iran has been faced with the usage of illegal substances for decades. The most commonly used substances are opium, heroin and methamphetamine. It is considered the world's highest rate of opiate users (30). Iranian government reported that in 2019, at least 1.5 million people suffering from substance abuse. Injecting drug users accounted for about 22% of this population. As a result, it appears that there are around 230,000 PWIDs in the country (30). Various studies in Iran have shown that between 2004 and 2007, the prevalence of HIV among IDUs was between 23.1-27.9% (31, 32). According to the Iranian ministry of health (MoH) report, in later years, this rate decreased (14.3%-17.1%) due to the implementation of harm reduction programs, including the Needle and Syringe Program (NSP), as well as Opioid Substitution Treatment (ORT) (28, 33). Iran is a leader in harm reduction programs in the Middle East and North Africa (MENA) region, with the most significant number of PWIDs obtaining free needles and syringes and Methadone Maintenance Treatment (MMT) (34, 35).

In Iran, over 120,000 Female Sex workers (FSWs) were confirmed in 2018 (36). Because of the very stigmatized and illegal characteristics of sex work and extramarital sex in Iran, the epidemiology of HIV and high-risk behaviours among FSWs has not yet been thoroughly investigated (37). In 2018, HIV was detected in around 2.1 % of FSWs in Iran (24). Because of cultural issues, it is challenging sex education for the general population in Iran and almost non-existent (37). In Iran, the average age of first marriage has risen over the previous decade for both men and women (38). As a result, individuals may engage in premarital sexual practices that are often unprotected. Homosexuality is prohibited in Islamic countries like Iran, and it is severely stigmatized among the general community. As a result, there is a lack of information regarding MSMs in Iran (39). According to some research, 5-10% of PWIDs have had intercourse with other men at some point in their lives (40, 41). In the Iranian health system, all persons in need of ART receive it for free (42). Psychological and social support for these people is provided in a center called Positive Club. In Iran, there are around 80 positive clubs (24). Like other countries in the MENA region, Iran is located significantly below the world average to achieve the 90-90-90 goals. The percentage of individuals who have been diagnosed is about 52%. Approximately 67 % of individuals diagnosed with HIV/AIDS get ART, and viral suppression occurs in about 53% (43).

## 2.2 Problem Statement and Justification

Each year, about 30 million people are kept for a period of time in prisons or other closed settings (44). Since the year 2000, the percentage of individuals in prisons has increased by approximately 20% globally. Over this time, the percentage of women in prison has risen by 50% (45). Worldwide, in comparison to the general population, the prevalence of HIV infection among inmates is higher. While the majority of inmates living with HIV in prison contract the disease outside of institutions before incarceration, the risk of infection in jail, mainly through the sharing of contaminated injecting equipment and unprotected sex, is high (Table1) (46). According to the data, inmates are five times more likely than the general population to contract HIV (46). In some settings, it may be up to 50 times higher (46).

Table1. Prevalence of HIV and the correlations among prisoners in some parts of the world (44)

| Region | Country-City Name | Authors | Target Group | Prevalence | Correlations |
|---|---|---|---|---|---|
| Sub-Saharan Africa | Ghana, Nsawam and Accra [23] | Adjei AA, *et al.* | 281 inmates | 19.2% | Used illicit drugs, especially marijuana (83.2%), practiced homosexuality (30.8%) and lesbianism (22.7%) |
| | Zambia [22] | Simooya, *et al.* | 1596 inmates (46 women) | 421 (27%) | Age, marital status, the number of irregular lifetime partners or pick-ups |
| | Uganda [24] | UNODC | 459 prisoners from 34 prisons and 85 health workers | 11% | History of STD |
| | Burkina Faso [14] | Diendéré EA. *et al.* | 300 prisoners in Burkina Faso | 5% | Razor blades (20%), toiletries blades (18.7%) and drug abuse (14.6%) |
| Middle East and North Africa | Iran [27] | Navadeh S, *et al.* | 5,530 prisoners from 27 prisons | 2.1% | History of drug injection, tattooing and age over 30 years |
| | Iran, Bandar Abbas and Roodan [29] | Davoodian P, *et al.* | 252 IDU prisoners | 15.1% | Duration of imprisonment and drug use |
| | Iran, Gorgan [30] | Khodabakhshi B, *et al.* | 121 IDU prisoners | 5.8% | IDU, tattooing and shared syringes, promiscuous heterosexuality and homosexuality |
| | Iran, Isfahan [31] | Dibaj R, *et al.* | 970 IDU prisoners | 6.4% | Needle sharing |
| | Iran, Tehran [32] | Kheirandish P, *et al.* | 459 male IDU arrested by police | 24.4% | History of using opioid in jail and older age |
| Asia and Pacific | Australia, Victoria [11] | Crofts N, *et al.* | 3627 prison entrants (3429 male and 198 female) | 0.47% | HIV prevalence was higher among IV drug users. |
| | India [36] | Dolan K and Larney S | Indian prisoners | 1.7% | Sex between inmates was reported common. |
| | Pakistan [34] | Salman S, *et al.* | 4897 prisoners | 1% | - |
| | Pakistan, Sindh [35] | Baqi, S, *et al.* | 3525 prisoners | 1 of 3441 male and 1 of 84 female | Multiple contacts with commercial sex workers, donating blood, injecting drug with re-used syringes |
| | Thailand, Bangkok [37] | Thaisri H, *et al.* | 689 male inmates | HIV incidence: 4.18 per 100 p/y among all inmates, and 11.10 per 100 p/y among the IDUs | History of injection, positive urine opiate test, history of attendance to drug withdrawal clinics and the presence of tattoos on the body |
| Eastern Europe and Central Asia | Greece, Patra [9] | Malliori M, *et al.* | 544 drug users imprisoned for drug related offences | 0.19% | Injecting drug use and needle sharing |

Furthermore, HIV-positive people in prisons are not just known as patients but also as wrongdoers and sinners, and they are isolated from others. HIV infection outbreaks have happened in various prison systems, indicating how quickly HIV can spread in prison if appropriate measures to prevent transmission are not taken. Despite the lack of data, it is estimated that 3.8 % of the worldwide prisoners live with HIV (47).

In 2020, the population of prisoners in Iran was 226,000, and the HIV infection trend in Iranian prisons is relatively steady, with an estimated prevalence of 1%. There have been many scattered studies on the health of prisoners in Iran, but these studies need to be concluded, and practical results should be extracted from them. HIV is also considered a significant health problem in Iranian prisons, and its association with other common diseases in prisons, including tuberculosis and hepatitis C, makes it even more critical. Many prisoners return to the community after a period of imprisonment, and the cycle of HIV transmission from inside to outside the prison continues.

Various international experiences have shown that without a good prevention program in prisons, the prevalence of HIV increases significantly. This study aims to identify the opportunities and challenges of existing HIV prevention programs in Iran's prisons in order to help promote these programs.

## 2.3 Objectives

### 2.3.1 General Objective

To critically analyze challenges and opportunities for HIV prevention in the Iranian prisons system in order to give recommendations to improve programs address HIV in prisons

### 2.3.2 Specific Objectives

- To identify and analyse the HIV prevalence risk factors among prisoners in Iran
- To review the national policies, programmes, interventions to HIV among prisoners in Iran and to identify the existing gaps and opportunities in comparison with international standards
- To review the existing national and international evidence-based practices on HIV prevention among prisoners
- To provide recommendations to prisons organization of Iran and stakeholders for improving the response to HIV among prisoners

# Chapter 3. Methodology

## 3.1 Methodology

The review literature method was used in this research. Search engines like PubMed, Scopus, Google Scholar, VU library and databases such as Cochrane were utilized. Besides, grey literature such as Iranian ministry of health reports and prisons organization's reports and guidelines were also used. Resources of websites like UNAIDS, WHO, UNODC, UNDP, World Bank and Iranian Prison's organisations were also used. English and Persian literature were reviewed. Snowballing was used to find additional literature. The publications limit from 20 years ago was reviewed. The following are the keywords that were used:

**Keywords:** The keywords used in this study are listed in Annex two.

## 3.2 Conceptual framework

The relevance of social and structural factors of HIV transmission is becoming better recognized. Because combination HIV prevention strategies emphasize biological, behavioural, and structural components, a theoretical framework is needed to guide data collecting to identify HIV risk factors at each of these levels (48, 49). To analyze factors that influence HIV transmission and prevention, the modified socioecological model (MSEM), which was developed by Baral et al., was employed (figure 6) (50). Individual, network, community, policy, and stage of the HIV epidemic are the five layers of risk for HIV infection in the MSEM. The MSEM changes the Social Ecology Model by modifying risk levels and adding the stage or level of the HIV epidemic to this model (50). It is based on the assumption that although individual-level risks are essential for infection transmission, they are inadequate to describe epidemic dynamics at the population level.

Because of its comprehensiveness, the MSEM was utilized in this research. It considers all of the factors that impact HIV risk and susceptibility among prisoners in Iran. It is worth noting that several aspects of the MSEM were slightly changed to make them more applicable to Iranian prisons.

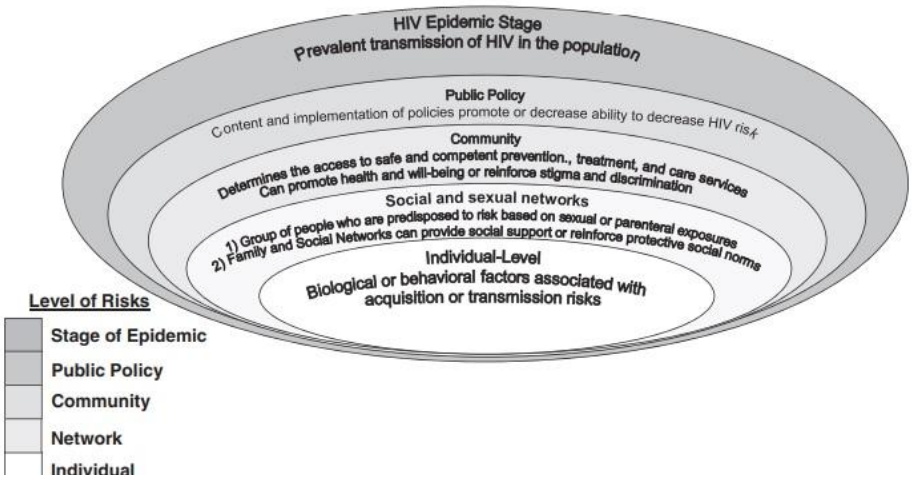


*Figure 6: Modified Social Ecological model for HIV risk in vulnerable populations (48)*

### 3.3 Limitations of the study

In general, there have not been many studies on prisoners. Various studies have been conducted primarily on large prisons in the country, and detailed information on the status of small prisons has not been reported. Due to cultural issues, information on some high-risk behaviours of prisoners, such as unprotected sex with homosexuality, has been published with many restrictions. Some prison's data is confidential, and it is not possible to make it public. In addition, no complete data on the efficiency and effectiveness of the HIV preventative program in Iranian prisons are available. Prospective studies that examine the impact of various harm reduction interventions on prisoners have been less done. Some data about prisoners' behaviour is not up to date and may have changed over time. Studies on prisoners due to their fear of punishment or loss of their position in prison, as well as ethical issues, have considerations and biases that are inevitable, and sometimes some studies do not give an accurate picture of the realities inside the Prison. Many studies on Iranian prisoners have been conducted by the Research Center of the Prisons Organization, some of which are confidential, and some have not been published on the Internet and have not been accessible.

# Chapter 4: Results

This chapter focuses primarily on HIV risk and susceptibility factors among Iranian prisons. Several factors put Iranian prisoners at risk for HIV. The components of the five layers of the conceptual framework (individual, network, community, public policy, and the epidemic stage) will be assessed in the following. Because policies and strategies are so important in preventing HIV in prisons, the results are presented separately in Chapter 5.

## 4.1 Individual Factors

Individual factors are biological or behavioural features linked to the risk of contracting or transmitting disease or infection (51). Infection with HIV has been associated with: Frequency and duration of imprisonment, drug use, sexual risk factors (unprotected sex, frequency and number of sexual partners), tattooing, psychiatric co-morbidities, age and sex.

### 4.1.1 Drug Use

The great majority of persons in Iranain prisons are men between the ages of 19 and 35, and many of them for drug offences (52). Before entering prison, young men who have a history of drug use are already at a greater risk of contracting HIV (53). Some prisoners had a history of drug use before entering prison, and studies showed that more than 60% of new incoming prisoners in Iran had this history (54, 55). This statistic is about 68% in United States's prisons (56). In one study in 2015 that was conducted in 26 Iran's prisons, 74.0 % of all prisoners had used drugs at some point in their lives, and 16.6% of drug users were IDUs (57). Male sex, age between 24 and 45, prior incarceration, and history of lifetime high-risk sexual conduct were all significant risk factors for drug use (57). In exchange for high-priced drugs, certain prisoners may be sexually abused. Given the high cost of illegal drugs and the lack of sterile syringes and needles in the prison, some inmates may be tempted to share their syringes and needles (58). Several studies have found a link between injection drug usage and HIV infection (59). In Iran, the most prevalent transmission route of HIV infection is through shared needles among injecting drug users (24). Imprisonment is a usual event for most of IDUs. Almost 80% of 25,000 IDUs in national research in the United States reported they had been imprisoned at some point (60).In Iran, the statistic is almost the same (78%) (57).

A study between 2007 and 2017 found that the rate of drug injections in Asia-Pacific prisons was higher than anywhere else, at about 20 %, followed by Eastern Europe at about 17 % and Latin America at 11 %, and in Africa, the lowest in all has been seen. Keeping any sharp and winning tools in prison will result in punishment. For this reason, prisoners often use hand-made, non-sterile, shared equipment for injections (61). A national rapid assessment and response survey of Iranian prisoners in 2017 reported that 15.08% of inmates have ever injected drugs (62).

Certain drugs, such as methamphetamines, enhance high-risk sexual activities. The methamphetamine trade between prisoners is available in Iranian jails. These drugs induce mucosal dryness, which raises the risk of HIV transmission during sexual contact, in addition to psychological issues.

Due to psychological problems such as anxiety and depression, as well as peer pressure, some people start using drugs in prison (39, 63). With a few exceptions, the rate of drug use in Iranian prisons has decreased over time. This is due to increased awareness of the harmful effects of drug use, a relative increase in performance in prisons' welfare and sports facilities, the establishment of addiction treatment centers, and the use of replacement methods such as MMT (64). The intravenous addiction rate of Iranian prisoners in published research ranged from 3.2 % in Nokhodian's study (40) to 6.1 % in Kheirandish's (65), 37.0 % in Khani (65), and 37.4 % in Kazerooni (66). Some studies evaluated HIV prevalence in inmates with a history of IDU. It was different from 0 to 24.4% in different prisons (67).

**Table2. HIV and STIs prevalence among prisoners with injecting drug use history in different prisons in Iran in different studies**

| Author (resource) | Place of study performance | Year of performance | Sample volume | Prevalence STI (%) | HIV prevalence among women (%) | HIV prevalence among men (%) | HIV prevalence (%) |
|---|---|---|---|---|---|---|---|
| Jahani et al. | Tehran | 2006 | 499 | N/A | N/A | N/A | 24.40 |
| Hosseini et al. | Tehran | 2006 | 417 | 7.40 | N/A | 24.40 | 24.40 |
| Shahbazi et al. | Iran | 1997 | 2022 | N/A | N/A | N/A | 0.15 |
| Shahbazi et al. | Iran | 1998 | 2367 | N/A | N/A | N/A | 0.30 |
| Shahbazi et al. | Iran | 1999 | 1670 | N/A | N/A | N/A | 0.48 |
| Shahbazi et al. | Iran | 2000 | 2553 | N/A | N/A | N/A | 3.17 |
| Shahbazi et al. | Iran | 2001 | 4556 | N/A | N/A | N/A | 2.17 |
| Shahbazi et al. | Iran | 2002 | 5881 | N/A | N/A | N/A | 4.01 |
| Shahbazi et al. | Iran | 2003 | 4515 | N/A | N/A | N/A | 3.39 |
| Shahbazi et al. | Iran | 2004 | 3824 | N/A | N/A | N/A | 4.11 |
| Shahbazi et al. | Iran | 2005 | 4920 | N/A | N/A | N/A | 4.86 |
| Shahbazi et al. | Iran | 2006 | 5226 | N/A | N/A | N/A | 2.99 |
| Shahbazi et al. | Iran | 2007 | 4571 | N/A | N/A | N/A | 2.34 |
| Azarkar and Sharifzadeh | South Khorasan | 2008 | 358 | 16.80 | 0 | 0 | 0 |
| Kazerooni Afsar et al. | Shiraz | 2007 | 363 | N/A | N/A | N/A | 6.60 |
| Mir-Nasseri et al. | Tehran | 2001 | 392 | N/A | N/A | N/A | 17.00 |
| Rahbar et al. | Mashhad | 2001 | 101 | 28.60 | N/A | 7.00 | 7.00 |
| Farhoudi et al. | Tehran | 2003 | 740 | N/A | N/A | 23.20 | 23.20 |
| MENA report | Iran | 2003 | N/A | N/A | N/A | N/A | 24.00 |
| MENA report | Iran | 2009 | N/A | N/A | N/A | N/A | 24.40 |
| MENA report | Hamedan | 2005 | 427 | N/A | N/A | 0.90 | 0.90 |
| Khodabakhshi et al. | Golestan | 2002-2003 | 121 | N/A | N/A | N/A | 5.80 |
| Khani and Vakili | Zanjan | 2001 | 346 | N/A | N/A | N/A | 1.20 |
| Ilami et al. | Yasooj | 2009-2010 | N/A | N/A | N/A | N/A | 9.90 |
| Pourahmad et al. | Iran | 2003 | 1431 | N/A | N/A | N/A | 6.40 |
| Davoodian et al. | Bandarabbas | 2002 | 252 | N/A | N/A | N/A | 15.10 |

STI: Sexually transmitted infection; MENA: Middle East and North Africa

### 4.1.2 Sexual risk factors

Unprotected sex is another influential factor in HIV infection, including unprotected homosexual activities or sexual intercourse with a spouse in a conjugal visit. Sexual activity between prisoners is common (68). Since sexual intercourse between homosexuals is a major taboo and contrary to the laws of Islam, this intercourse is hidden as much as possible in Iran. Homosexuality is prohibited in Islamic countries like Iran, and it is widely stigmatized among the general population. Therefore, few studies have been conducted on sexual relations between men and men in Iran (69). Many inmates are reluctant to participate in studies that ask them about their sexual relationships in prison. Those who participate also report much less sexual contact than they actually do because

of fear of other inmates and prison staff (70, 71). Only a small percentage of rape or other forms of sexual abuse in jail are ever reported to the authorities. The majority of males who have sex in prison do not consider themselves as homosexuals, and before their incarceration, they may not have had any same-sex relationships (68).

According to some research, 5-10% of PWIDs have had intercourse with other men at some point in their lives (40). Numerous studies have been conducted in different world countries on the level of sexual activity (both consensual and non-consensual) inside prisons. Those showed the percentage of these activities in Europe and North America 12%, West and Central Africa 14% and middle east 1.5% (69). Studies have shown that the prevalence of male-to-male sex in Iranian prisons is 5.4% (40) and 5.8% (72). Because of denial, fear of stigma and homophobia, and the criminalization of same-sex conduct, the prevalence of sexual activity in prisons is mostly unknown and assumed to be vastly underreported (44). Some studies have shown that prisoners engage in sexual intercourse in some prisons worldwide in exchange for food, drugs, sleeping accommodation, and social support (73).

In approximately 58 countries (30% of all countries), condoms are available in prisons. Some Western European Countries, Australia, Iran and North America, are among them (74). Although in some countries, there are condoms inside prisons, there is no precise information about how they are distributed and how much they are covered. In order to obtain condoms, prisoners frequently must make an appointment, which may threaten their right to privacy regarding their sexuality or HIV status. In prisons, sexual activities are frequently prohibited, and some believe that providing condoms encourage such behaviour and can lead to an increase in such behaviour. Of course, various studies have shown that this can not be true (75). Sexual violence and rape are also part of what happens inside prisons, although they are very limited in Iranian prisons. Some studies have focused on sexual violence among prisoners (76). Some of the most important findings are as follows: Several studies in the USA found high rates of "sexual violence" (11 to 28 percent) but low rates of "completed rape" (one to three percent) out of all prisons population (77). Surveillance systems in Iranian prisons have reduced the likelihood of rape and sexual violence (78).

There are few studies on the prevalence of sexual coercion among female inmates (79). Studies in the United States on male and female prisoners have shown that coerced sex is less common among women than men (80). Younger inmates without experience, inmates with substance abuse, and first-time offenders, physically weak, prisoners with disabilities and prisoners who have been identified as homosexuals are more likely to be sexually abused (81).

The transmission of HIV is another potentially fatal effect of prisoner-on-prisoner rape. In one study, 44 % of male inmates who had been sexually abused expressed concern about contracting HIV(82).

Conjugal visits, during which prisoners can have sexual relations with their spouses, are permitted in some prison systems. In some prisons around the world, these visits are banned due to security issues. In most Iranian prisons, prisoners have regular sexual intercourse with their legal spouses in conjugal visits (67).

### 4.1.3. Tattooing

Tattooing is part of the prison culture in most prisons around the world. Prison tattoos are a means of expressing prisoners' feelings and inner thoughts, a way to spend time together, a reminder of prison, a way to show each other power. It seems that the ban on tattoos in prison has not been very effective, and despite that, many prisoners want to try it. In Asian countries, about 21% of prisoners have tattoos, part of which they tattooed inside the prison and some before entering the prison (69). Percentage of inmates who obtained a tattoo while incarcerated in various countries: Russian Federation 26% (83), Armenia 33.4(84), Canada 45% (85), Thailand 44.4% (86), Australia 41% (87), USA 68% (88), France, Germany, Italy, The Netherlands, Scotland and Sweden 18% (89).

Inside the prison, they do not have tattooing tools and use pen ink with shared and non-sterile needles to tattoo (90). People who got tattoos inside the prison reported inconsistent use of tattoo equipment (8-37%). Many prisoners share tattooing equipment, posing a risk of infection (91). Despite the increased risk, there is no clear evidence that tattooing in prison leads to increased HIV transmission (92). Only a few cases of HIV transmission in prison have been reported through this route (92). However, one research of Iranian prisoners found an apparent link between HIV and tattooing (67). A study of Thai prisoners found an independent link between tattooing and HIV positivity, while another study found two cases in which HIV was apparently spread by tattooing in prison (86). People who have ever injected drugs are twice as likely as those who have never used drugs to get tattooed in prison (89). Tattooing could serve as a link between non-injecting and injecting prisoners, allowing blood-borne illnesses to spread. According to a French research, 8.9% of inmates had a tattoo within the first three months of their incarceration (93).

In recent years, people who get tattoos have become more stigmatized among prisoners, and the tendency to get tattoos has decreased among Iranian prisoner (69).

### 4.1.4 Psychiatric disorders

A high prevalence of psychiatric disorders (especially mood and anxiety disorders), substance abuse and suicidal behaviours were reported in prisoners (94). Prison is expected to be an unhealthy social and detention center that differ from healthy centers designed to reform maltreated people. Imprisonment causes psychological trauma that threatens inmates' mental health due to living in an unusual and unhealthy environment with constrained physical space and high walls, a long stigmatic history, mandatory imprisonment, loss of freedom, and detachment from society and family (95). The most common disorders are borderline personality disorder, secondary to antisocial personality disorder. The prevalence of mood disorders (e.g. anxiety and depression disorders) was also high among prisoners (96). Depressive disorders, bipolar disorders, trauma-related disorders, stress factors, and anxiety disorders have the highest prevalence among Iranian prisoners (97, 98). In a study, some of the main psychiatric disorders in prisons of Iran showed in Table3 (97).

According to studies, individuals with severe chronic psychiatric disorders have a high seroprevalence of HIV infection. Between 5% to 23% of mentally ill inpatients and outpatients have been HIV infected, compared to 0.3 % to 0.4 % in the general population of the USA during similar periods (99). According to some research, 30%-60% of individuals with severe mental disorders have behavioural risk factors for HIV transmission. High rates of multiple partner sexual contact and unprotected sex and poor condom use, injecting drug use, sexual contact with injecting

drug users are some of the risks (100). Aside from these behavioural concerns, mental illnesses may make it difficult to get and/or utilize HIV knowledge, making it difficult to practice safer behaviours or increasing the probability of circumstances where risky behaviours are more prevalent. Various studies in Iranian prisons showed that prisoners' rate of mental disorders is about 3-7 times higher than the general population (97).

Table3. prevalence of psychiatric disorders among prisoners in Iran (97)

| Specific disorder | Total sample ($n$=351) | |
|---|---|---|
| | Current prevalence % (95% CI) | Lifetime prevalence % (95% CI) |
| Any Axis I disorder | 57.2 (52.0–62.4) | 88.4 (85.1–91.9) |
| Psychotic disorder | 3.1 (1.3–5.0) | 3.9 (1.9–6.0) |
| Mood disorder | 30.6 (25.8–35.5) | 48.7 (43.2–53.8) |
| Anxiety disorder | 7.7 (4.9–10.5) | 15.7 (12.0–19.7) |
| Substance use disorder | 11.2 (7.8–14.5) | 78.0 (73.6–82.4) |
| Somatoform disorder | 0.4 (0.0–1.0) | 0.5 (0.0–1.3) |
| Adjustment disorder | 12.6 (9.2–16.1) | |
| Psychopathy | | 23.5 (19.1–28.1) |

#### 4.1.5 Sex

Sex is closely linked to other health determinants (101). It also increases the risk of HIV infection and consequently reduces access to effective HIV treatment in women who are biologically more vulnerable to HIV than men (102). Other economic and social problems also increase the risk of HIV infection in women (103).

Women make up almost 7% of the global prison population (104) (Iran' female prison population is almost 3% (105)). HIV prevalence is higher in female prisoners. It varies in different parts of the world (106). HIV prevalence in female prisoners is double that of men in Central Africa and, whereas it is three times higher in male prisoners than female prisoners in Central and Western Asia and the Middle -East (107).

Some Iranian female prisoners are involved in illegal sex work activities. They might have multiple sexual partners, have acquiesced to unprotected sex in exchange for more money or were coerced into having unprotected sex by male partners, and have experienced rape and violence before incarceration (108).

### 4.1.6 Age and Length of imprisonment

Most inmates are within the 26-32 age groups in Iran (109). HIV prevalence varies in different age groups. Nearly 59% of all new cases of HIV infection in Iran in 2019 were within the 15-30 age group (24). Young inmates are often involved in high-risk sexual behaviours, substance and alcohol abuse, and behaviours associated with inmates, including self-injury and tattoos. A study in a large Iranian prison showed that most HIV-positive prisoners were within the 25-34 age group (36).

Length of imprisonment is also an influential factor in HIV prevalence and increases the risk of HIV infection. Studies carried out in Iranian prisons have also found a higher prevalence of HIV in inmates imprisoned for a longer time (110).

### 4.1.7 HIV transmission Knowledge

An important factor in preventing HIV is having information about the ways of transmission and then changing the appropriate behaviour. There are many misconceptions about HIV among prisoners all around the world (111). There is no apparent link between HIV awareness and the risk of contracting the infection among Iranian prisons. However, various studies have shown that people with more risky behaviours had lower awareness of HIV (112, 113). It has been found that jail prisoners had lower average HIV knowledge scores than the general population (114). So without proper information, behaviour change cannot be done.

One study in Kerman prison in Iran showed the knowledge of prisoners on what is HIV/AIDS and the modes of transmission was high, but the level of knowledge on HIV prevention was low (Table 4-Table 5 ) (111).

Table 4 – Knowledge and correct answers of Iran-Kerman prisoners on HIV transmission modes (114)

| Item | % of correct answers |
|---|---|
| By blood transfusion | 98.3 |
| Intercourse with infected homosexuals | 99.1 |
| Intercourse with infected heterosexuals | 84.3 |
| Sharing syringes | 95.2 |
| Sharing plate and spoon | 79.4 |
| Sharing shaving devices | 96.4 |
| By tattooing | 97.9 |
| By contaminated dentistry tools | 94.3 |
| Maternal transmission | 94.3 |
| By breastfeeding | 77.7 |
| Mosquito bites | 51.7 |
| Touching and kissing patients | 85.7 |
| Eating contaminated foods | 72.6 |
| Breathing contaminated air | 83.7 |
| Through patient's clothes | 71.6 |

| Characteristic | Mean score | *P*-value |
|---|---|---|
| *Sex* | | 0.07 |
| Female | 86.9 | |
| Male | 83.4 | |
| *Age (years)* | | 0.0007[a] |
| ≤ 25 | 88.6 | |
| 26–35 | 85.9 | |
| 36–45 | 82.6 | |
| ≥ 46 | 75.6 | |
| *Education* | | 0.001[a] |
| Illiterate | 77.7 | |
| Below high-school diploma | 87.1 | |
| High-school diploma | 84.6 | |
| Graduate degree | 91.4 | |
| *Length of prison stay (months)* | | 0.06 |
| ≤ 12 | 86.2 | |
| 13–24 | 82.0 | |
| 25–36 | 79.5 | |
| 37–48 | 88.8 | |
| 49–60 | 84.7 | |
| ≥ 61 | 77.6 | |

Table 5 – Knowledge and correct answers of Iran-Kerman prisoners on HIV prevention (114)

| Item | % of correct answers |
|---|---|
| Isolation of infected persons from society | 12.5 |
| Public health education | 96.0 |
| Protection from imported contaminated blood | 97.6 |
| Prohibition of unusual sexual behaviours | 97.9 |
| Being loyal to spouse | 91.3 |
| Using disposable medical devices | 94.6 |
| Education of intravenous drug users | 93.6 |
| Contraception for infected women | 97.3 |
| Recognizing patients or infected persons | 92.5 |
| Immunization by vaccine | 26.9 |
| Control people coming from infected areas | 96.7 |
| Protection from imported contaminated foods | 15.6 |
| Drug treatment in infected areas | 13.3 |
| Admitting AIDS patients to hospital | 17.0 |

| Characteristic | Mean score | *P*-value |
|---|---|---|
| *Sex* | | 0.2 |
| Female | 66.5 | |
| Male | 68.0 | |
| *Age (years)* | | 0.4 |
| ≤ 25 | 65.7 | |
| 26–35 | 68.5 | |
| 36–45 | 67.9 | |
| ≥ 46 | 66.7 | |
| *Education* | | 0.0002[a] |
| Illiterate | 65.2 | |
| Below high-school diploma | 68.8 | |
| High-school diploma | 67.2 | |
| Graduate degree | 74.3 | |
| *Length of prison stay (months)* | | 0.95 |
| ≤ 12 | 66.9 | |
| 13–24 | 67.5 | |
| 25–36 | 67.7 | |
| 37–48 | 67.3 | |
| 49–60 | 67.9 | |
| > 61 | 65.1 | |

**4.2.2**

## 4.2 Network Layer

### 4.2.1 Prison population and condition

In the correctional setting, overcrowding or overpopulation is a common issue. Despite the reality that overcrowding or overpopulation is a legal and political issue, it is indeed a social and health one. It raises the incidence of some illnesses, particularly infectious and mental ones (112). Overcrowding in prisons causes a lack of support network between prisoners, less supervision of prison officials to prevent high-risk behaviours of prisoners, and thus increase the chances of contracting HIV (113). The occupancy level of Iranian prisons is about 153.0% (20). Although the direct relationship between the prevalence of HIV and the prison population has not been appropriately established, epidemiological studies of HIV in Iranian prisons have shown that the prevalence of HIV is higher in prisons with a higher density of population (46). There is usually a shortage of human resources for health, education, and security measures in crowded prisons (8).

The term "prison culture" refers to the beliefs, values and norms of inmates. Inmates go through prisonization while separated from the rest of society to reintegrate into society, and jail culture has a major impact on their lives. For example, tattooing is accepted as a culture in many prisons, and the use of shared needles and syringes to inject is a culture in some prisons, and a sign of friendship between prisoners is considered (114). If HIV-related behaviours in prison be as part of the prison culture, the prevalence of HIV there would be higher.

Due to psychological issues and peer pressure, some prisoners began using drugs following their imprisonment. In more populous prisons, there will be less supervision, and it will be possible to buy and sell drugs. This cannot be denied in any of the world's prisons (115). According to one study, the main reason was given by inmates for their reduced drug use in prison was (116): The relative unavailability in prison (stated by 61% of those who lowered their use), desire to quit drug addiction (14%), being unable to pay for drugs (13%), as well as worries about punishment (6%) (117).

### 4.2.2 Peer Pressure

Because prisoners live together for long periods, their behaviour is greatly influenced by their peers. Under the influence of their peers, some inmates use drugs or engage in risky sexual relationships while they have not had such experiences before (58). In some prisons around the world, prisoners are kept in solitary confinement, but in Iranian prisons, prisoners live in groups, which increases the influence of each other and the risk of transmitting HIV increases (78).

### 4.2.3 Prisoners' Family

The family of the prisoners (especially the prisoner's spouse) have an essential role in the psychological problems of the inmates. Prisoners who have lost family support are more vulnerable to risky behaviours (118). Prisoner's spouses can also transmit HIV to their spouses during a conjugal visit if they engage in risky behaviours such as injecting drugs or unprotected sex (119).

## 4.3 Community layer

### 4.3.1 Employment in prison

Employment in prison might considerably enhance the physical, mental and social health of inmates. It might be a source of income for prisoners that promotes their social relationship, self-confidence, mental health, reduces mental and emotional stress, increases life expectancy, prevents risky behaviours, and increases their acceptance in the family. These factors reduce the risk of HIV infection and progression. Employment in prison helps the inmates to associate with healthier people and live in a healthier environment (120).

Vocational training during imprisonment helps the inmates to find a job after their release quickly. It also reduces the risk of risky behaviours and re-imprisonments. A survey showed that the rate of high-risk behaviours decreased by 32% after employment in prison (121).

### 4.3.2 Stigma and discrimination

Within the prison system, stigmatizing views among both prisoners and correctional personnel may play a role in determining whether or not prisoners seek HIV services like prevention, HIV testing and treatment for prisoners living with HIV. Stigma makes it difficult to extend and improve HIV services (122, 123). Inmates with HIV may dread being stigmatized twice: once for their HIV status and once for being a prisoner.

When a prisoner's HIV status is revealed, he or she is subjected to HIV discrimination. Because of the absence of confidentially that is prevalent in prisons, a prisoner cannot conceal their HIV status, which frequently results in a push of discrimination against the HIV-positive prisoner. Access to health care and treatment is one of the most common forms of discrimination in prison, with HIV positive inmates being disallowed sufficient HIV treatment and appropriate medical care. Prisoners who may not understand their HIV status but suspect they are infected with HIV may be hesitant to seek HIV testing for fear of being stigmatized (124).

### 4.3.3 Prevalence of STIs

The synergy between HIV and STI is thought to be caused by several biological factors. The higher the prevalence of sexually transmitted diseases, would be the greater the chance of contracting HIV (123). Infections that affect the genital epithelial surface may cause ulcers and these, increase the chance of acquiring HIV (125). Several research has shown that individuals who enter correctional institutions have greater rates of STIs than similar nonincarcerated community peers, and rates have consistently been higher among imprisoned women than incarcerated males, especially for Chlamydia and gonorrhoea (126).

## 4.4 Public policy layer

### 4.4.1 Punitive law in Prisons

There are laws and punishments in prisons to control the behaviour of prisoners. Keep and use of drugs, devices such as needles, syringes and pipes, keeping condoms in Iranian prisons are accompanied by penalties (127). These punishments sometimes conflict with some preventive measures, including the use of condoms, sterile needles and syringes. However, studies have shown that the rate of high-risk behaviours is higher in less strict prisons. Fear of punishment also partially controls behaviours such as sexual violence and rape among prisoners (128).

### 4.4.1 Coverage of Harm reduction measures in prisons

The existence of harm reduction programs in prisons dramatically impacts the rate of HIV transmission among prisoners (78). Harm reduction measures in Iranian prisons are described in detail in Chapter 5.

### 4.4.2 Human rights

All human beings, including prisoners, have certain inalienable rights that are recognised by internationally recognised treaties. Inmates have the right to health care and a healthy environment (129). According to human rights, prisoners must have all the facilities and services for HIV prevention that exist outside the prison. The results of the studies confirmed that human rights are respected in Iranian prisons based on religious beliefs, and these rights are also mentioned in the regulations of the Iranian Prisons Organization (130).

### 4.4.3 National prison organization program for HIV

In Iran, HIV control measures are implemented according to Iran's National Strategic Plan of HIV/AIDS, which has run for four years and is currently running its fifth program. There are many stakeholders involved in preparing and implementing this plan, which are mentioned in Annex 3 (131). One of the most important stakeholders is the Prisons Organization, and based on this program, policies and measures to control HIV among prisoners have been identified. Studies have shown that the measures taken do not comply with the facilities and conditions of prisons and in some cases, are not enforceable. The policies of the Iranian Prisons Organization, especially in recent years, are to use all facilities and human resources to promote prisoners' health (132). Various studies around the world have shown that prison policies have had a major impact on HIV control (133).

## 4.5 Stage of the epidemic

No behaviour, laws or policies, community factors, network characteristic, or individual features can cause infectious disease; instead, they can only create a situation that increases or decrease the possibility of onward or acquisition transmission of a disease that is already prevalent. HIV incidence and HIV prevalence are two ways to measure the stage of the pandemic. Mean and total population viral load have been utilized as indicators of HIV transmission at the population level (50).

This means that the impact of each of the factors mentioned above is strongly influenced by the prevalence and incidence of HIV in that prison. For example, the probability of transmitting HIV through injecting drug use is higher among inmates of the Great Tehran Prison, where the prevalence of HIV is higher than in Mashhad Prison in Iran (40).

# Chapter 5: Harm reduction, An Iranian strategies and international evidence-based intervention for HIV prevention in prisons

**Harm Reduction**

Harm reduction is a term to describe policies, programs, and activities intended to decrease the adverse health, economic and social impacts of drug use, such as HIV transmission (33). Harm reduction has several components, which we will discuss below.

## 5.1 Needle and Syringe Programs

NSPs (needle and syringe programs) give drug users access to sterile injecting equipment such as needles and syringes, swabs, sterile water. Along with them, counselling, health education, and referrals are provided to minimize the number of times they inject using contaminated equipment. The efficacy of NSP in reducing HIV transmission has been extensively documented (134). The legal basis of this program is that prisoners should have the right to access health and preventive services like the rest of society. Some prison authorities were initially concerned that the programs would increase injection drug use and that the availability of syringes and needles would be unsafe for staff and other inmates. A meta-analysis of more than 10 NSP in prisons showed no rise in drug use or injection and more safety of prisoners staff, and other prisoners (135). Having an NSP program in prisons helps people become more willing to participate in other harm reduction programs such as OST (136). According to all available reviews, sharing of injecting equipment either stopped or considerably decreased once the NSP was implemented (137). The studies were unable to offer convincing evidence of the effect of NSPs on the incidence of blood-borne viral infections because ethics committees opposed comparing separate groups with and without access to NSPs (137).

HIV seroprevalence fell by 5.8% per year in cities with needle and Syringe Programs (NSPs), whereas HIV prevalence rose by 5.9% per year in places without NSPs, according to an international study of cities with large populations of individuals who inject drugs (18). People who inject drugs in prisons exchange needles and syringes (typically homemade ones) more often than the IDUs in the community due to insufficient injecting equipment. Needles and syringes are very limited in the absence of programs, and a single needle or syringe will often circulate around a considerable number of inmates who inject drugs, being shared by ten or more prisoners (138, 139).

NSPs have been found to reduce needle sharing in prisons, lower drug abuse, and, as a result, decrease HIV transmission rates (140). Switzerland, Luxembourg, Spain, Macedonia, Moldova, Armenia, Germany, Canada, Kyrgyzstan, Iran, and Tajikistan were the ten countries that provided NSPs in at least one prison in 2018 (141), but in 82 countries, NSP was established in the community (142). In Iran, The first NSP program was piloted in several prisons in 2006, with positive results, and has so far been implemented in a limited number of prisons, and many prison officials have disagreed (143).

There is evidence that the implementation of NSPs has additional benefits. The assessment of Germany's first needle exchange pilot programs found a substantial decrease in overdose occurrences and deaths (144). One reason was that those who had personal injection equipment

used fewer substances per injection and that these harm reduction programs had a more significant supportive behavioural effect on them (145). NSPs were shown to improve prisoner interaction with drug treatment programs in Spain, according to evaluations (146). Other advantages were found in several studies in Iran, including a decrease in abscesses, a decrease in stress, better relationships between inmates and staff, and increased knowledge about disease transmission and risk behaviours (143, 147).

### 5.2 Opioid Substitution Therapy

Another harm reduction strategy is opioid substitution treatment (OST), which attempts to decrease heroin usage by giving a replacement throughout the methadone or buprenorphine. Because the effectiveness of substitution treatment for cocaine and amphetamine-type stimulants has not been confirmed, agonist pharmacotherapy programs are only accessible for mainly opioid-dependent individuals. This program can reduce injecting drug usage and needle sharing while also benefiting the health of both prisoners and the general population (115). OST is widely regarded as the primary preventative strategy for decreasing infections caused by drug injection in prisons, and it plays an essential role in reducing new HIV cases in prisons (148). Although this kind of treatment does not entirely stop drug abuse, it enhances drug users' social function and reduces withdrawal symptoms, guilt, criminality, psychological impacts such as depression, and social and family problems. It also provides an opportunity for HIV prevention education (149). MMT was shown to be associated with a decrease in drug and sex-related HIV risk behaviours among IDUs in all of the trials evaluated (150-152). When it is used in conjunction with psychological support, it is more effective (153). According to the different research findings, significant decreases in injecting drug usage occur within the first six months (149, 154). OST also provides significant possibilities for enhancing anti-retroviral treatment delivery to drug users who live with HIV (155).

In 2018, 54 countries made OST available in specific prisons. Despite this improvement, OST is still very restricted, and it is still banned in certain countries even the demand is high (141). Iran currently has one of the most significant profiles within prisons globally for executing this program, with about 38000 people receiving MMT (156). According to initial estimates, this approach may save more than $100,000 for each prevented HIV case and decrease state expenses (157).

### 5.3 Provision of condoms

The correct and appropriate use of a condom has substantially decreased exposure to sexually transmitted diseases; in certain studies, the rate reduction has been as high as 80% or more (158). Due to the high risk of disease transmission associated with sexual activity in prisons, condoms plus water-based lubricants have been extensively suggested. In prison, condom distribution is one of the most effective harm reduction strategies for controlling STIs such as HIV/AIDS and viral hepatitis (73, 159). Condoms should be made accessible to inmates during their incarceration period, according to WHO Guidelines on HIV Infection and AIDS in Prisons from 1993 (160). Condom distribution programs in jail have been reviewed just in a few research (161, 162).

Globally, approximately 58 countries have reported providing condoms in jails, with little information about the program accessibility, coverage, availability, or quality in these countries (74). Condoms may not be available in prisons because of infrastructure problems such as a lack of financial or a lack of clear political will among correctional system policymakers. One of the major reasons may be because prison officials believe condoms encourage inmates to have sex. It is also believed In prisons, condoms enhance the risk of rape and sexual assault, and they are also used to hide drugs and other forbidden items. It may give this impression that the majority of inmates are homosexuals and reinforce the idea that a prison is a place where promiscuity and homosexuality are encouraged (74, 163). On the opposite side, a study of the long-term effects of condom distribution in Australian prisons found that: condoms seem to be more likely to be used in intercourse among prisoners when it is available, condom availability does not increase sex in prisons, and condom provision reduces the presence of STIs among prisoners (75, 164). It is believed that the distribution of condoms alone does not prevent infections. Condom programs should be provided with other services as part of a comprehensive package of harm reduction strategies in prisons to reduce the burden of sexually transmitted diseases. One of the essential initiatives that must be combined with condom distribution in jail is education (75, 165). In prisons, condoms may be distributed in various ways; however, due to the stigma associated with homosexuality, inmates may be afraid of asking for condoms. This may endanger the program's continuation. Condoms should be provided anonymously with as little face-to-face contact with prison personnel as much as possible. Because of that, condom vending machines are one of the most effective ways of condom distribution among inmates (166). In certain countries, Condoms are only provided in conjugal visit rooms, not for sex among male inmates (74).

According to one research in the USA, 12.10 % of inmates had sexual intercourse, but only 15.4 % of them used condoms (167).In some prisons in Iran, condoms are distributed by prison clinics. However, it is limited, and there is no public access. In a 2001 study of 5530 inmates in 27 Iranian prisons, 24.7 % had not used a condom in their most recent sexual relationship (168). Condoms are offered in almost all conjugal visit rooms of Iranian prisons (67). No studies have been conducted on the effectiveness of condom distribution in Iranian prisons.

### 5.4 HIV testing and counselling (HTC)

Counselling and testing are essential for two main reasons: as part of an HIV prevention strategy (i.e., it provides information and support for individuals who may be involved in risky behaviours) and as a method to identify HIV patients early and provide appropriate support, care, and treatment. Early detection of HIV-positive inmates leads to faster medical attention and more time to engage individuals in secondary prevention measures like education, harm reduction, and referral to drug addiction treatment. Testing also provides an excellent chance to give essential health information to inmates during post-test counselling (169).

According to research, HIV testing and counselling (HTC) uptake increases when available at the time of admission to jail and during imprisonment. In certain jails, compulsory or mandatory testing (which forces all inmates to take an HIV test) is used to detect HIV-positive inmates (170). Prisoners who participate in voluntary HIV testing are more likely to be tested and obtain their results before being released or transferred to another facility (171). When voluntary HIV testing is accessible in the community, it should be made available in prisons, along with appropriate pre- and post-test counselling. Rapid testing allows offenders to know their status of HIV in a

few minutes(172). HTC programs have been more cost-effective when combined with other preventive measures like condom distribution and testing for STIs. For ethical reasons, the World Health Organization (WHO) opposes mandatory HIV testing (173).

Multiple factors might explain the vast variability in HIV testing acceptance; however, these factors' nature and relative significance are challenging to identify based on the available research. The structure of the program may be responsible for the low acceptance rate. Acceptance rates for HIV testing may be especially low when done in front of other inmates, with insufficient counselling services and confidentiality, insufficient follow-up care, treatment, and support for individuals whose test is positive (174). Some inmates may postpone or reject testing because of some fear of needles and blood (175). The rate of acceptance of testing in VCT during various studies in Iranian prisons ranged from 13% to 78% (176).In general, the number of HIV tests in Iranian prisons is not high, and in addition to the low level of test acceptance of prisoners, there is a lack of human resources and equipment (67). Despite the insufficient number of tests conducted, it is feasible to do it in most Iranian prisons (67).

### 5.5 HIV Information, Education and Communication (IEC)

Education is a requirement for HIV preventive strategies to be implemented. Offenders and prison personnel must be educated about HIV and AIDS, as well as how HIV transmission can prevent, with a focus on the risks of transmission in prison settings and the requirements of inmates following release (54). Niveau (2005) states that health education in prisons should contain knowledge about diseases, transmission routes, risk factors, prevention methods, symptoms of disease, and available therapies (177). Only 20.50 % of Iranian offenders in one study had an acceptable level of knowledge and were aware of HIV/AIDS (176). Another study of Mazandaran prisons in Iran reported that the average answering correctly was 17.8%, and many of them had misconceptions (178). American studies into the behaviour of IDUs in jail and the community have shown that mere awareness about AIDS is insufficient for risk reduction (179). It is not well understood to what extent education and information enhancement ultimately lead to prisoners' behaviour changes.

Information, education, and communication programs for inmates on HIV and other STIs have had little effect on the number of new infections, even in high-income countries (73).In addition, high levels of illiteracy among inmates may make IEC programs more challenging to implement. For instance, in Iran, 65% of inmates have literacy levels equivalent to nine years old (180). As a consequence, many prisoners are unable to understand the information about HIV prevention. So the written materials should be appropriate for prisoners and also should be understandable, attractive, and clear. In Iranian prisons, It seems that knowledge and attitudes of HIV need to be developed and promoted, as well as the use of appropriate training techniques and the expansion of training opportunities.

Prisons are recommended to use the peer strategy to HIV education as the most efficient and effective method of encouraging inmates to alter risky behaviours (181). Since most of the risky behaviours related to HIV are illegal and forbidden, and stigmatized, such as injecting drug usage, same-sex activity, peer education has a significant role in educating prisoners. Offenders receive HIV prevention training in an informal environment and by their peers. For years a peer education project was implemented in some prisons in Iran, and the results showed that peer education had

been introduced as a cost-effective, rapid-progressive, and broad-coverage strategy for HIV education (182).

### 5.6 HIV treatment, care, and support

According to the literature, more than 95% adherence to ART is needed to avoid viral proliferation (183, 184). One study in the main center in Tehran-Iran showed that ART adherence was about 59.6% among PWHIV (183). Since more than half of all HIV-positive people in Iran have a history of imprisonment, Prison is an excellent opportunity to provide medical care and support to people living with HIV, including anti-retroviral therapy (67). The World Health Organization's Guidelines on HIV and AIDS in Prisons stated that inmates have the right to health care equal to that provided in the society with no discrimination(160). The availability of ART for inmates varies significantly between countries. In South Africa, for example, 97 % of HIV-positive inmates were receiving treatment in 2016. In Russia, however, just 5% of HIV-positive offenders are receiving antiretroviral therapy (ART) (185). A systematic analysis of 11 research on ART adherence in inmates published in 2018 showed that 54.6 % of the studies' offenders effectively adhered to ART (186). Confidentiality must be ensured, and good connections with prison health professionals are important to increasing treatment adherence in jails. Poor prison conditions, mental health problems, and lack of proper HIV education reduce prisoners' adherence to treatment (74). Non-adherence to ART in PWHIV has been linked to several variables, including drug abuse (187, 188), health attitudes (180), mental state (189), demographic features (190), social factors (191), family factors, pharmaceutical side effects, and cognitive functioning (118). A qualitative study in Prison in Tehran showed barriers to adherence to treatment among inmates (192) (Table 3):

**Table 6. ART adherence barriers in HIV Infected prisoners at Ghezel-Hesar Prison (Tehran) Based on FGD Findings**

| Factors | |
|---|---|
| Medical Factors | Anti-retroviral medication side effects: Especially with Efavirenz. Lethargy, dizziness, loss of appetite, hallucination, and nightmare |
| | Interrupted treatment: concurrent use of medication for co-infections such as TB and HCV |
| | Opiate substitution therapy (OST): Fear of hangover when the Methadone dosage is not adjusted |
| | CD4 levels and Physical circumstances: reduced CD4, weight loss, and weakness |
| | Complementary medicine accessibility: Willingness to access other complementary medicines |
| Social Factors | Stigma: Feeling ashamed and stigmatized by other prisoners and being isolated from others |
| | Patient-physician relationship: Patients' morale and confidence may be improved by physician suggestions for medication adherence. |
| Psychological Factors | Mental issues: Depression, anxiety |
| Others | Conditions of Prison: overcrowding, diet condition, movement's law within the Prison |
| | Education: Low knowledge on the importance of adherence to treatment |
| | Substance abuse: Methamphetamine has an adverse effect on adherence |

It has also been shown that, particularly for women, getting released from jail may disrupt ART. Relapse to drug use, insecure housing, and unemployment, inability to obtain ART in the community due to limited access to healthcare are all factors that contribute to this. Moreover, worse HIV treatment results (such as elevated viral load and reduced CD4 cell count), more

significant risks of mortality related to HIV, and drug overdose have all been linked to the first few weeks following release (173). In Iran, ART is free for all people who need it, as well as for prisoners living with HIV (193).

The prevalence of co-morbidities, including chronic viral hepatitis, TB, and mental disorders, which often accompany HIV infection in this environment, is a significant problem for treated inmates (194).

## 5.7 Prevention of Hepatitis B, C co-infection with HIV

Although hepatitis used to be a neglected disease, it is now one of the Sustainable Development Goals (SDGs) (195). In Iran, newborns have been vaccinated against the HBV virus since 1994. Based on a systematic review, the HBV prevalence in the general population of Iran has decreased throughout the decades and is now estimated to be 1.79 %(196); the HCV prevalence has been reported as 0.4% (197). Despite the low prevalence of HCV in Iran's general population, a significant outbreak of the virus has been recorded among high-risk groups, with a prevalence of about 45 % among injecting drug users (PWID) (198).

Increases in the frequency of incarceration, the length of each incarceration, and the interval between discharge and re-incarceration raise the risk of HCV infection (199). The prevalence of hepatitis B was reported in the range of 3.4%-8.7%, and the prevalence of hepatitis C was in the range of 8.9%-33.3% in different studies in Iranian prisons (200, 201). HCV infection was found in 10% of the prisoners' population and almost 43% of PWID inmates in Iran. Given that the general population's HCV prevalence is 0.4 %, these statistics are 25 to 100 times greater in prisoners than in the general population (202). Because the incidence of HBV among inmates in Iran is twice the general population, they should be regarded as a high-risk population for HBV, requiring immunization and prolonged harm reduction programs (200).

Numerous studies in different parts of the world have shown that many people who have a simultaneous infection with hepatitis and HIV have a history of imprisonment (88, 203). People living with HIV who contract HBV and HCV have a higher risk of mortality and morbidity of liver-related diseases (204, 205). If hepatitis and HIV infection occur simultaneously, their care and treatment will be much more complicated, and this person will face more problems, especially in the prison environment.

## 5.8 Prevention of tuberculosis co-infection with HIV

Globally, HIV-positive people are 10 to 30 times more likely than HIV-negative people to develop active tuberculosis, and TB accounted for one out of every four deaths among HIV-positive people in 2018 (206). The risk of TB transmission between prisoners is increased by issues such as overcrowding and poor ventilation (207). One study in Tehran's Prison reported that the incidence of tuberculosis in Prison was 30 times higher than in the general population (208).

# Chapter 6. Discussions, Conclusion, and Recommendations

## 5.1 Discussions

In several countries, the people most vulnerable to HIV are also at a high chance of criminalization and incarceration since some of those socio-economic statuses that raise HIV vulnerability also increase imprisonment vulnerability. We assessed different determinants that contribute to HIV transmission in Iranian prisons.

Among those who enter Iranian prisons, more than 60% have a history of substance abuse. Opioid Substitution Therapy (OST) is widely regarded as the primary preventative strategy for decreasing infections caused by drug injection in prisons, and it plays an essential role in reducing new HIV cases in prisons. OST is currently implemented in most prisons in Iran and has the highest coverage population in the world's prisons. These services are free of charge and part of the National Health Program of the Iranian Prisons Organization. Various researches in Iranian prisons have shown the effects of implementing the MMT program in reducing prisoners' high-risk behaviours and the chances of contracting HIV. OST best practice evidence around the world has shown that in addition to medication, special attention should be paid to psychotherapy, but often due to many covered prisoners, this intervention is less done in Iranian prisons. Given the large population of prisoners who have a history of drug abuse in Iranian prisons, the existence of this program is a positive strategy to control HIV in Iranian jails. The provision of medicine and human resources required to provide OST services is one of the major concerns of Iranian prisons, and in order for these measures to be sustainable, there must be more specific planning. The findings in Iranian prisons showed that in recent years, with the increase in coverage of OST treatments, prisoners, in addition to methadone use, have turned to illegal use of methamphetamines. International studies have shown that the chances of high-risk behaviours associated with HIV transmission increase with the use of these substances. Several qualitative studies and interviews with prisoners in Iran reported that the price of drugs inside the prison was high and that prisoners were sometimes forced to have sex to obtain them, increasing the chance of HIV transmission among prisoners. The OST program is attractive to inmates because it removes them from a hangover and drug withdrawal symptoms and can be a tool to motivate prisoners to participate in other harm reduction and prevention programs in prisons.

Due to the high cost and scarcity of drugs inside prisons, drug users tend to inject them because they can be high with a smaller amount of drugs. Prisoners often use hand-made tools as well as shared tools to inject drugs. Since injecting drugs in prisons is a crime, the current injection among prisoners has not been directly questioned in various studies conducted in Iran. Only the history of injecting drugs has been investigated; therefore, the rate of drug injection in Iranian prisons is not apparent in the existing studies. Prisoners in Iranian prisons seem to have access to drugs not too hard, and one challenge is how to smuggle drugs into prisons, where prisons have a problem and advanced equipment such as body scans are available only in ten Iranian jails. Injecting drugs in Iranian prisons is not culturally acceptable to other prisoners, and these people are usually excluded from others, so this help to reducing the tendency to inject drugs. Based on best practices, one of the strategies to prevent HIV in prisons is the needle and syringe program. Due to the lack of access to syringes in prisons, they are more likely to be used shared than outside prisons. One of the major concerns of implementing this program in most prisons worldwide has been that the

tendency to inject drugs among prisoners may increase. The NSP has been implemented in Iranian prisons for a short period and has been severely limited due to strong opposition from prison officials. Studies conducted in Iranian prisons during the implementation of this program have been shown Its positive effects on reducing the shared use of syringes as well as being more willing to participate in other harm reduction programs.

Unprotected sex, such as unprotected homosexual activities or sexual intercourse with a spouse during a conjugal visit, is another important factor in HIV transmission in prisons. Few studies have been conducted on sexual relations between men and men in Iran, especially in prisons, as this kind of relationship is a crime and strongly stigmatized. Further studies on the sexual relations of prisoners in Iranian prisons are needed. Only two studies have examined the rate of sexual relations between male and male prisoners in Iranian prisons, with a prevalence of about 5%. Sexual violence and rape are also seen in prisons around the world but are rarely reported in Iranian prisons. Because homosexual intercourse of female prisoners is much more stigmatic, no study has been conducted on the sexual intercourse of female prisoners in Iranian prisons. Reports from the Iranian Prisons Organization refer only to the issue of sexual intercourse between prisoners and their spouses in conjugal visit rooms, and there is no mention of sexual intercourse between prisoners within prisons. Concealing this issue keep it impossible to make specific plans to reduce the risk of HIV transmission among prisoners. The correct and appropriate use of a condom has substantially decreased exposure to sexually transmitted diseases. In many prisons around the world, there is resistance to the distribution of condoms in prisons, and it is thought that this increases sexual relations between prisoners and encourages them to have sex. In Iranian prisons, there is no official program for distributing condoms, and only in some cases is it provided to some inmates through prison clinic staff. In the conjugal visit rooms of Iran prisons, condoms are provided for prisoners and their spouses in order to prevent pregnancy and STIs. Several studies in Iranian prisons have shown that some sexually transmitted diseases are high among prisoners. The chances of contracting HIV increase with the presence of these diseases. There is no clear and comprehensive program for the identification and treatment of STIs in Iranian prisons.

In most prisons across the world, tattooing is a part of the culture. No studies showed that prisoners become infected with HIV just by getting tattoos. However, it is generally considered a potential risk factor. Various researches in Iranian prisons have shown that the desire for tattoos among prisoners has decreased in the last ten years, and its culture is changing.

Psychiatric problems are 3-7 times higher among Iranian prisoners than among the general population. These problems lead to substance abuse, tattoos, unprotected sex, and other high-risk HIV-related behaviours in prison. Creating a personality profile for prisoners is one of the country's prison programs that help identify and treat their psychological problems.

Only 3% of Iranian prisoners are female, and very few studies have been conducted on the risks of HIV transmission among women prisoners in Iran yet, and given the importance of women, this gap exists.

In 2019, more than 45% of new HIV cases in Iran were young people aged 15-30, and on the other hand, the largest age group of prisoners in Iran is the age group of 26-32 years, which is showing the importance of paying more attention to preventive measures in prisoners. An appropriate measure taken in Iranian prisons is for juveniles under the age of 25 to be kept separate from other prisoners, allowing for much preventive intervention and further planning, mainly to prevent sexual abuse.

Another problem that has been seen in various studies of Iranian prisons is the high level of misconceptions about HIV among prisoners. Various studies have shown that the HIV knowledge of prisoners in Iran about HIV and the ways of its transmission is to some extend acceptably, but the knowledge about HIV preventive ways is low. Because a large percentage of prisoners are low-educated or illiterate, appropriate HIV prevention training is needed. Based on the best practices, peer education is one of the best educational methods to change key population's knowledge, attitude, and behaviour, especially prisoners. Findings have shown that successful peer education projects have been carried out in Iranian prisons, but that continuation is currently in doubt.

Prison conditions and population are influential factors in the transmission of HIV. Most of Iran's prisons are overcrowded, and this situation makes it impossible to provide adequate education, provide standard health services, and closely monitor inmates' behaviours. The classification of prisoners based on their criminal record and age is one of the positive features of the conditions in Iranian prisons, where prisoners with multiple histories of imprisonment are not placed next to new people, and the possibility of high-risk relationships is reduced.

There is no mandatory HIV test in Iranian prisons, but due to the lack of laboratory facilities and human resources, VCT is not accessible to all prisoners who apply. Studies on HIV testing in Iranian prisons have shown a long distance to reach international standards and even an Iranian strategic plan to control HIV in Iran. The findings also show that there are no appropriate post-release measures for released individuals, and many of these individuals quickly return to both the criminal cycle and the cycle of risky behaviours.

Research in prisons must be accompanied by many rules and ethical considerations, so the number of these researches is small. On the other hand, due to the High dispersion of Iran's prisons, research has often been conducted in large prisons, while the results may be different in small prisons. However, this study had its limitations, and some facts inside the prisons are not clearly shown in the literature. Nevertheless, despite these restrictions, efforts were made to highlight the opportunities and challenges of HIV prevention in Iranian prisons.

## 5.2 Conclusion

The threat of contracting HIV in prisons is a significant issue, and health officials, including the government, should take practical steps to address it. Although the prevalence of HIV is not currently high in Iran and its prisons, the transmission of HIV inside prisons can always be a potential threat to public health.

Iran’s National Strategic Plan of HIV/AIDS has identified various policies and programs to control HIV in Iranian prisons. However, the results of various studies reviewed in this research showed that there is a large gap between these programs and the measures taken in Iranian prisons. However, there are good opportunities to prevent HIV in these prisons. Screening prisoners at the beginning of their arrival and filling a health profile, as well as filling a prisoner personality profile, is one of the positive points of these measures. Overcrowding in prisons and lack of physical space are one of the major problems affecting many health interventions. The findings also showed that there are insufficient financial and human resources to implement harm reduction and HIV prevention programs. HIV control programs within prisons are sometimes intermittent and not sustainable. Since prisons have a security environment, the research findings showed that in Iran, there is not enough relationship between the health system of prisons and other sectors of public

health. Compared to some international strategies that have been successful in preventing HIV in prisons around the world, the actions of Iranian prisons have shown that some programs, such as OST, have been implemented very well, but in some programs, such as NSP and condom distribution program performance has been poor. Reports indicate that some HIV prevention activities in the country's prisons have been supported by international donors such as the Global Fund, which has declined in recent years. Post-release actions are also essential, for which there is no complete planning.

Finally, it can be concluded that due to a large number of prisoners in Iran, positive measures have been taken to control HIV in Iranian prisons, but it is not enough, and this issue needs to be pursued and planned at the national level with more sensitivity.

## 5.3 Recommendations

This study, after evaluating the current situation, gaps, and opportunities, and comparing it with successful international programs and experiences, offers the following recommendations for promoting HIV prevention programs in Iranian prisons:

### 5.3.1 Reinforcement of laws, policies, and strategies

Target groups: PO, MoH, Iranian governmental organizations

- The findings showed that stigma and discrimination are barriers to prisoners' trust in HIV prevention programs. According to that, prison staff should receive the necessary training at the beginning of their employment to prevent stigma and discrimination against prisoners, especially for those with risky behaviours.
- There is no specific monitoring and evaluation system in the Iranian Prisons Organization programs to implement these programs. So, to ensure the success of policies and strategies, a system of monitoring and evaluation should be developed. Internal and external supervisors should perform the M&E system.
- There should be a clear strategy for inter-sectoral cooperation and coordination between the health systems and the judiciary system regarding the planning and implementing HIV prevention programs in prisons. This connection is currently weak.
- According to data, one of the main problems of Iranian prisons in providing better services is the high prisons population. By holding advocacy meetings with the officials of the country's judicial system, criminal laws and penalties should be changed to reduce the number of prisoners. This policy must be seriously pursued at the highest levels of the country.
- Various studies have shown that health services inside and outside prisons are not the same in terms of quantity and quality. The goal of legislation and policy of prisons should be to guarantee that all measures outside of prison in HIV prevention and care and drug addiction treatment be available to prisoners
- One of the gaps in Iran's prisons is the lack of the required number of health professionals. Jails should have enough experienced and certified medical personnel as well as adequate healthcare facilities. The implementation of some specialized programs, including OST, increases this need. The policies of the Iranian Prisons Organization should be such that it

pays special attention to the development of facilities and human resources in the prison health system.

- Although studies have shown that in prisons in Iran, attention is paid to the confidentiality of prisoners' information, sometimes these cases are not observed. So, the establishment of policies to guarantee the confidentiality of prisoners' medical information is a solution.

#### 5.3.2 Improvement of HIV prevention programs in Iranian prisons

Target groups: PO, MoH, Iranian governmental organizations, NGOs

- According to the research findings, there is the only treatment for opium abuse in Iranian prisons, and there is no specific program for the use of other substances. So, in addition to OST, prison authorities should offer a variety of additional drug addiction treatment choices for inmates who have a problem with drugs addiction, particularly methamphetamine.
- Successful international experience has shown that NGOs can play an important role in prison health. Prisons can ensure that non-governmental organizations and specialists from outside of prison, be engaged in the creation and delivery of drug treatment programs.
- Various studies have shown that NSP is an effective harm reduction program in prisons. NSP can be implemented in more prisons in Iran urgently as this program runs in limited prisons.
- In addition to the male condom, there should be a female condom in the conjugal visiting rooms in prisons because studies have shown that some men are reluctant to use condoms.
- Prisoners should be able to access condoms easily in different parts of the prisons without being questioned. Studies have shown that this program is very limited in Iranian prisons.
- Prisoners who have been sexually assaulted should have accessibility to post-exposure prophylaxis. Iran's prison program is not clear in this regard.
- International studies have shown that the rate of high-risk sexual behaviours is lower among inmates who use Conjugal visit rooms. These rooms should be developed to support the normal sexual relationships of prisoners with their spouses.
- Some research has shown the positive effects of peer education on increasing the level of knowledge of prisoners and changing their attitudes and behaviours. This program is not implemented in all prisons in Iran. The use of peer education as one of the essential educational strategies for HIV prevention among prisoners is recommended.
- Findings of some studies showed that prisoners in drug-free wards and with psychological interventions had less risky behaviours. However, the number of these wards is low in all prisons in the country. So we recommend that Drug-free units should be developed, and psychotherapy interventions in these units performed with more outstanding quality and quantity.
- Findings have shown that with the proper division of prisoners, special programs can be designed. So, inmates should be appropriately classified and separated depending on characteristics, including age, the legal basis for imprisonment, and security level.
- The finding showed the there is no specific policy for preventive measures after release. So authorities of prisons, in collaboration with other parts of the community health system, should pay special attention to providing therapy and social support services for inmates upon their release and collaborate with other organizations to ensure complete aftercare services are provided.

### 5.3.3 Ensuring a sustainable response to HIV in prisons

Target groups: PO, MoH, NGOs, National, and International Donors

- Findings show that prisons can only be successful in preventing HIV if they have a comprehensive national plan. The comprehensive HIV prevention program for prisoners should be integrated into the National Prisoner Health Program and implemented as a national guideline.
- The financial and human resources required to implement prevention programs should be included in the national programs of the Ministry of Health and the Prisons Organization, and the program and financial resources should not be short-term.
- Given that some HIV prevention programs in Iranian prisons are funded by international donors such as The Global Fund, it is necessary to plan for their exit and anticipate their integration into the national programs of the Prisons Organization.

### 5.3.4 Resources and funding

- Allocating adequate and consistent financing for initiatives that address HIV/AIDS and related problems such as hepatitis and tuberculosis, STIs.
- Ensure that national funds are used to support policies and activities that enhance prison health, enhance the prison system, and address HIV/AIDS to the most significant degree possible.
- When allocating domestic and international resources to address HIV/AIDS, identify inmates as a major vulnerable group.
- Ensure that NGOs receive adequate financing from regional and international sources to play an effective and comprehensive role in HIV/AIDS services and programs in prisons.

### 5.3.5 Research area

Target groups: PO, MoH, NGOs, Social Researchers

- Further studies are needed on the effectiveness of the NSP program in Iranian prisons.
- The sexual relations of prisoners in Iran have not been properly and transparently investigated, and further research is needed.
- There is limited evidence that alternative types of substance addiction therapy other than MMT are beneficial as an HIV preventive strategy. So more studies are needed.
- The cost-effectiveness of various interventions in HIV prevention programs in Iranian prisons should be assessed.
- HIV epidemiological data like incidence the prevalence in prisons in different parts of Iran should be studied and updated.
- Stricter rules for conducting research in Iranian prisons should be reduced to be more willing to be present in the prison environment.
- Allocate more financial and human resources for HIV-related research in prisons.
- Behavioural changes after educational measures in prisons should be evaluated according to self-reporting of the prisoners

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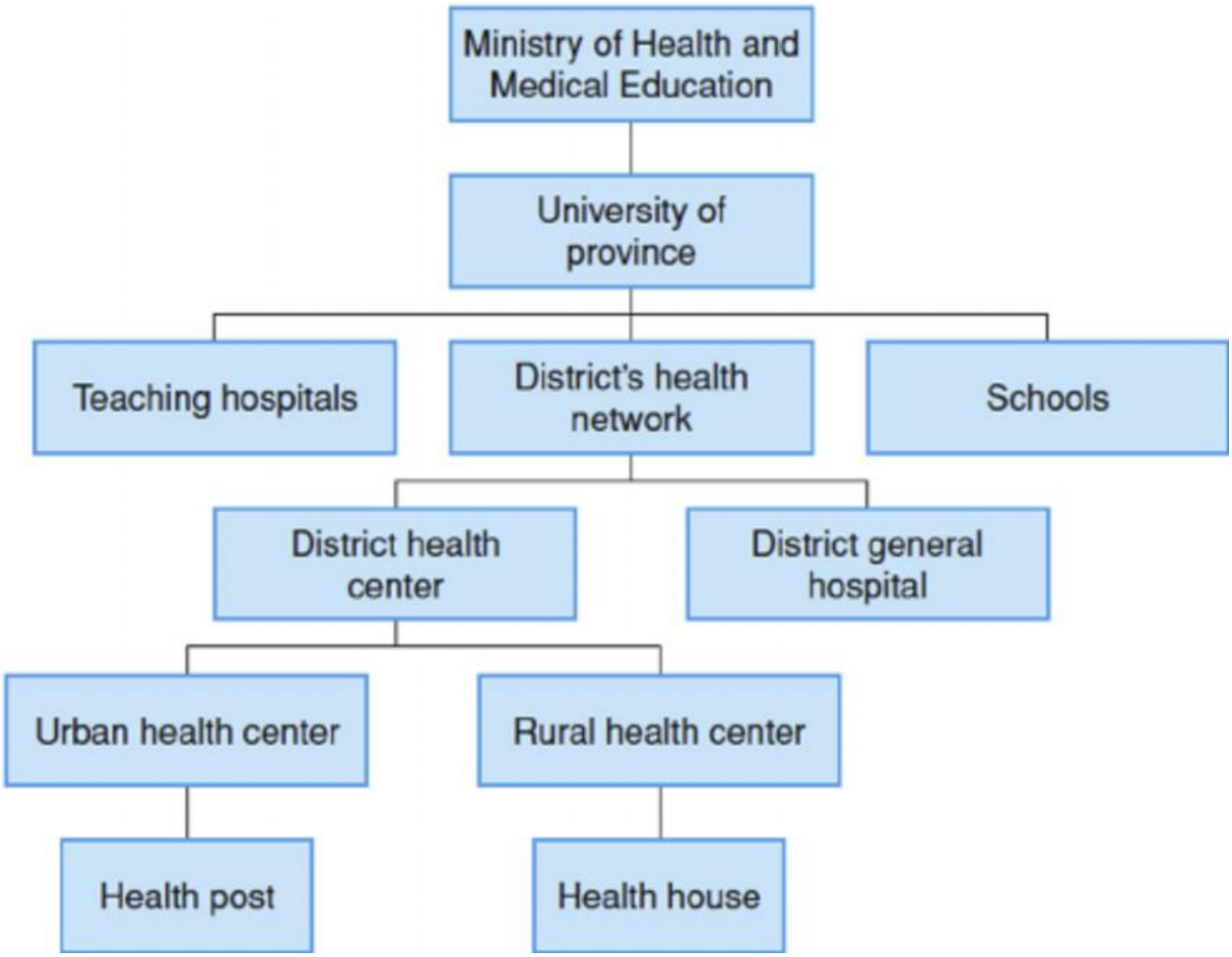
# Annexes

## Annex 1: Health system chart in Iran



## Annex2. Research Keyword

| Search Term | factors | Place | Country |
|---|---|---|---|
| HIV | AND determinants | And Prisons | AND Iran |
| HIV | AND Risk factors | And prisons | AND Iran |
| HIV/AIDS | IN | Detention Centers | IN Iran |
| Human Immunodeficiency Virus | AND Risks | And Prisons | IN Iran |
| HIV/AIDS | AND determinants | And prisons | IN the world |
| HIV | AND Risk Factors | And Detention Centers | IN the Middle-East |
| HIV | AND Epidemiology | -- | IN Iran |
| HIV | AND age | AND Prisons | IN Iran |
| HIV | AND Ethnicity | AND Prisons | In Iran |
| HIV/AIDS | AND Educational Level | AND Prisons | In Iran |
| Substance Abuse | IN | Prisons | IN Iran |
| Injecting Drug Users | IN | Prisons | IN Iran |
| Sex work | In | AND prison | In Iran |
| HIV | AND Injecting Drug Users | AND Prisons | IN the world |
| condom distribution | In | Prisons | In Iran |
| needle and syringe programs | In | Prisons | In Iran |
| HIV | AND Risky Behaviors | And Detention Centers | IN Iran |
| Tattooing | IN | Prisons | IN Iran |
| HIV | AND Mental Status | Prisons | IN Iran |
| Employment | IN | Prisons | IN Iran |
| Sexual Behaviors | AND HIV | AND Prisons | IN Iran |
| HIV | AND Men sex with men | AND Prisons | IN Iran |
| HIV | Peer Pressures | AND Prisons | IN Iran |
| HIV | AND Family Of Prisoners | AND Prisons | IN Iran |
| Methadone Maintenance Therapy | -- | AND Prisons | IN Iran |
| HIV | AND Condom | AND Prisons | IN the world |
| Health Services | Best practice | AND Prisons | IN Iran |
| Anti-Retroviral Therapy | AND HIV | AND Prisons | IN Iran |
| HIV | AND Stigma | AND Prisons | IN Iran |
| Policy | AND HIV | AND Prisons | IN Iran |
| Prisons Organization | AND Health Services | AND Prisons | IN Iran |

## Annex3. Level of Participation of key stakeholders in HIV and AIDS policy making in Iran