Country Case Studies

2. HIV and Hepatitis C in China

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1. Epidemiology of HIV in China

Development of the HIV Epidemic in China

In 1985, Peking Union Medical College Hospital in Beijing recorded the first instance of acquired immunodeficiency syndrome (AIDS) in China. Since then, the HIV/AIDS epidemic in China has escalated rapidly, particularly within the last decade. Over the past 35 years, the development of human immunodeficiency virus (HIV) infection in China has evolved significantly. Initially, HIV infections were concentrated among people who inject drugs (PWID). This was followed by outbreaks due to contaminated plasma collection in the mid-1990s, and today the virus is primarily spread through sexual contact. The annual count of newly diagnosed cases and HIV-related deaths has risen consistently since 2004, coinciding with a substantial expansion of both HIV testing and the introduction of antiretroviral therapy. The proportion of cases diagnosed at advanced disease stages has remained consistent throughout this period (Cao et al. 2020, p. 26).

The HIV/AIDS epidemic in China has unfolded in three distinct phases: 1) sporadic cases (1985–1988), involving 24 cases imported from overseas and four cases resulting from infected blood products; 2) endemic outbreaks (1989–1994), marked by incidents among injecting drug users (IDUs) in various border regions of Yunnan province; and 3) the expansion phase (1995 to the present day), characterised by increasing prevalence and broader geographical impact. Since the beginning of the third phase, the number of HIV/AIDS cases surged significantly. The annual number of newly reported cases in China soared from 2,705 in 2005 to 42,406 in 2019, a 15-fold increase. Meanwhile, HIV/AIDS-related deaths increased by only 25% from 40,711 in 2005 to 51,250 in 2019. Between January and October 2020, 112,000 individuals were diagnosed with HIV in China. By October 2020, the total reported cases of people living with HIV in China reached 1.045 million, representing a prevalence rate of less than 0.075% (Xu et al. 2021, p. 2800).

Epidemic patterns can be classified into two main categories. Initially, during the HIV/AIDS epidemic in southern and south-western China between 1989 and 1995, injecting drug use was the primary mode of transmission, accounting for the majority of infections. However, the situation has evolved, and currently, over 70% of newly reported HIV cases result from heterosexual contact. Male-male sexual contact has also emerged as a rising method of HIV transmission in present-day China, particularly in major urban centres like Beijing, Shanghai, Tianjin and other parts of Northern China (Wu et al. 2019, p. 463).

Vulnerable Groups

(1) People Who Inject Drugs (PWID)

Ruili County is a rural region in Yunnan province, which is in south-western China and is adjacent to Myanmar. In October 1989, in detoxification centres located in Ruili, Chinese scholars Ma and his team obtained blood samples from 175 individuals who were using drugs. Their objective was to screen for viral Hepatitis infections, which were spreading at that time due to the sharing of heroin injection equipment. Furthermore, they examined the residual specimens for HIV infections and detected 79 cases, resulting in an HIV prevalence rate of 45%. This study marked the initial confirmation of a significant HIV outbreak among PWID in China (Wu et al. 2019, p. 459).

Following the initial discovery of HIV cases among PWID in Ruili, Yunnan in 1989, the majority of early-phase HIV infections were concentrated within this specific region. Yunnan, located in southern China and positioned along a drug trafficking corridor known as the 'Golden Triangle', serves as a significant gateway for opiates and other illicit substances entering China from the China/Myanmar border. It's estimated that about one third of the drugs originating from this area were trafficked through China. Consequently, the increased availability of drugs in this region triggered a substantial surge in drug abuse. This, in turn, created an environment conducive to the spread of HIV infections, primarily through unsafe sexual practices and the sharing of injection equipment. During this period, the prevalence of HIV infection among PWID reached alarming levels, surpassing 80% in certain areas of Yunnan province (Wu et al. 2019, p. 461).

In 1995, new cases of HIV emerged within the community of PWID in Sichuan and Xinjiang provinces. Subsequently, the HIV/AIDS epidemic

among PWID grew rapidly, particularly along the drug trafficking routes adjacent to the China/Myanmar border at first and later extending to the entire expanse of China. By 2002, every province in China had reported cases of HIV infection among PWID. It took less than 15 years for the virus to spread from Yunnan to all provinces in the nation, spreading from rural to urban areas and from border communities to central regions of the country (Wu et al. 2019, p. 461).

Between 2003 and 2005, there was a notable peak in both HIV prevalence and the number of newly diagnosed cases among PWID. However, since that period, HIV infections among PWID have consistently decreased across all provinces. Nationally, the prevalence of HIV infection among drug users fell from 7.5% in 2005 to 2% in 2018. The number of newly reported HIV cases among drug users also declined significantly, dropping from nearly 20,000 cases annually in 2005 to fewer than 4,000 cases per year by 2018. This sustained reduction in HIV infections among PWID can largely be attributed to the widespread implementation of harm reduction programmes on a national scale. These programmes include initiatives such as methadone maintenance treatment (MMT) and needle and syringe exchange programmes (NSP) (Wu et al. 2019, p. 461).

(2) Heterosexual Contact

In 2007, for the first time since the initial HIV outbreak among PWID in 1989, the number of newly diagnosed HIV infections resulting from heterosexual transmission exceeded the cases attributed to injection drug use. Since then, the proportion of HIV cases linked to heterosexual contact has continued to rise, reaching 50% in 2010, over 60% in 2011, and exceeding 70% in 2018.

Concurrently, the number of new infections among HIV-positive couples, where one partner is HIV-positive (people living with HIV, PLWH for short) and the other is not, also saw an increase. A study conducted among HIV-positive couples in Yunnan reported that the risk of HIV transmission was reduced by one third in uninfected partners of PLWH who were receiving antiretroviral therapy (ART), compared to those not receiving ART. Following the implementation of treatment as prevention among HIV-positive couples, the incidence of HIV transmission through marital sexual contact notably decreased, dropping from 2.6% in 2011 to 1.1% in 2018 (Wu et al. 2019, p. 462).

(3) Men Who Have Sex with Men (MSM)

Unlike many other countries where the HIV epidemic initially emerged within the men who have sex with men (MSM) community, China reported very few HIV cases among MSM until 2005. However, since then, the rate of HIV infections among this group has been significantly and continuously rising. In 2005, the reported prevalence was just 1.4%. Yet a national survey conducted in 61 cities across China from 2008 to 2009 revealed a national-level HIV prevalence of 5% among MSM. This prevalence continued to escalate to 8% in 2015, with some individual cities reporting even higher rates.

More recently, the estimated national HIV prevalence among MSM has reached 6.9%. The proportion of newly diagnosed cases among MSM also saw a drastic increase, rising from 0.3% in 2005 to 12% in 2010, reaching a peak of 28.2% in 2015, and then slightly declining to 23.3% in 2018. Since 2010, the prevalence of HIV among MSM has consistently been the highest infection rate among all key populations in China (Wu et al. 2019, p. 462).

(4) Female Sex Workers

Working at the National Center for AIDS/STD Control and Prevention (NCAIDS) in China, Cui and colleagues (2016, p. 1ff.) analysed sentinel surveillance data from 2010 to 2014 and discovered that the national HIV prevalence remained relatively stable during this period, fluctuating between 0.17% and 0.24%. Delving into the specifics, they surveyed all 499 surveillance sites catering to female sex workers (FSWs) in 2014. Their findings indicated that the prevalence at 473 of these sites remained below 1%, while 26 sites exhibited a higher prevalence, ranging from 1% to 5%.

In a separate study, Wang and associates (2014, p. 1ff.) conducted comprehensive nationwide cross-sectional surveys from 2008 to 2012, involving 827,079 FSWs. Their research revealed a national decline in HIV prevalence among FSWs, decreasing from 0.6% in 2008 to 0.3% in 2012. Notably, FSWs in lower-tier venues, characterised by fees less than 50 Chinese yuan (approximately 7–8 US dollars) per client and constituting 28.1% to 41.5% of all FSWs, demonstrated a higher HIV prevalence compared to their counterparts in higher-tier venues, such as karaoke bars, hotels, or nightclubs, where clients typically have a higher socioeconomic status (0.8% vs. 0.4% in 2008; 0.6% vs. 0.1% in 2012).

(5) Plasma Donors

Between late 1994 and early 1996, HIV outbreaks surfaced within impoverished rural communities across various provinces in central and eastern China, mainly among individuals who had previously donated plasma. The emergence of HIV infections among these former plasma donors (FPDs) in the mid-1990s caught the nation off guard. Initial epidemiological investigations suggested that this outbreak spanned the time period from late 1994 to early 1996 and had affected a considerable number of plasma donors and blood recipients. A 1996 survey conducted in a rural area in China revealed that the HIV prevalence among former commercial plasma donors stood at 12.5%. Regrettably, due to the sensitive nature of the issue, no comprehensive national surveys were undertaken during this period to assess the full extent of the HIV epidemic among commercial blood plasma donors in China. Occasional epidemiological studies with limited sample sizes indicated alarming rates of HIV infection among FPDs. For instance, out of 96 donors involved in underground plasma donation activities from 1998 to 1999, a staggering 74% tested positive for HIV infection.

The prevalence of HIV infection among FPDs, as revealed during the national HIV testing campaign, turned out to be significantly lower than anticipated. Just prior to the 2003 testing campaign, a scientific epidemiological study conducted in Shanxi yielded similar results. The study encompassed a substantial sample size, providing a reliable estimate of HIV prevalence. Among the 3,062 villagers who participated, 29.5% reported a history of selling whole blood or plasma. The overall HIV prevalence was estimated at 1.3%, with a slightly higher rate of 4.1% observed among plasma donors. Once again, these figures were much lower than previously assumed. The full scope of the HIV outbreak among former commercial blood plasma donors only became evident during the national HIV testing campaign conducted in 2004 and 2005. Approximately 69,000 HIV infections were linked to contamination during blood plasma collection or the transfusion of tainted blood products in China during the mid-1990s.

Following the HIV testing campaign, there was an expectation that most individuals infected through blood or plasma contamination had been identified and diagnosed, and that the remaining number of infected donors would be limited. However, the number of newly diagnosed HIV-positive individuals attributing their infection to blood or plasma contamination remained alarmingly high in the subsequent years, with over 7,000 new cases reported in 2006, 2007, and 2008, separately. After that, however,

newly diagnosed HIV infections related to blood or plasma contamination became almost non-existent. Since 2015, nearly two decades after the initial HIV outbreak, no cases resulting from blood or plasma contamination have been reported (Wu et al. 2019, p. 460f.).

(6) Mother-to-Child Transmission (MTCT)

The HIV prevalence among pregnant women in China receiving antenatal care (ANC) is notably low, standing at less than 0.1%. Effectively managing the HIV epidemic in pregnant women and reducing the risk of mother-to-child transmission relies heavily on the reach and effectiveness of Prevention of Mother-to-Child Transmission (PMTCT) programmes. Statistics show that there has been significant progress in the coverage of HIV testing among pregnant women attending ANC and HIV-exposed infants at the age of 18 months. These rates have increased from 62.4% and 22.1% in 2003 to 90.3% and 82.8% in 2011, respectively.

According to national sentinel surveillance data, the prevalence of HIV infection among pregnant women was 19.8 per 100,000 in 2011. It subsequently saw a slight decrease to 9.1 per 100,000 in 2016. However, a recent study that screened 15 million pregnant women in China for HIV infection reported a higher overall prevalence of 34.0 per 100,000.

In 2005, China launched its first PMTCT programme in eight cities, and by 2015 it had expanded this effort into a nationwide Integrated Prevention of Mother-to-Child Transmission of HIV, Syphilis, and Hepatitis B programme (iPMTCT Programme). This expansion has led to significant improvements in access to care and treatment for HIV-positive mothers and their children. The uptake of antiretroviral therapy (ART) prophylaxis among HIV-infected pregnant women and their infants has seen substantial growth, rising from 35.2% and 26.9% in 2003 to 86.2% and 90.3% in 2011, respectively. Consequently, the rate of vertical transmission of HIV has notably decreased, plummeting from 31.8% before the commencement of PMTCT programmes to just 2.3% in 2011. The continued expansion of PMTCT programmes remains vitally important in the ongoing management of HIV among pregnant women and their children (Wu et al. 2019, p. 462f.).

Comorbidities

The 2019 Covid-19 pandemic has significantly impacted efforts related to HIV prevention, treatment, and healthcare services. In Wuhan, China, from 1st January to 16th April 2020, 35 out of 6,001 people living with HIV (PLWH) (0.58%) experienced Covid-19 and 197 (3.3%) had to discontinue ART, despite extensive support from both government and non-governmental organisations. In Jiangsu province, HIV testing rates saw a sharp decrease of 49.0% (919,938 tests) in the first three months of implementing Covid-19 measures. Out of an estimated 1,555 new HIV diagnoses expected during the same period, only 63.0% were actually recorded. Additionally, access to HIV healthcare services like CD4 testing and ART was severely affected (He 2021, p. 1022ff.).

To address these challenges during the Covid-19 pandemic, alternative methods of accessing HIV healthcare have been considered. For instance, research by Jiang and colleagues (2021, p. 2) indicated that more MSM self-tested for HIV (52.1% vs. 41.6%), but fewer used facility-based HIV testing (42.9% vs. 54.1%) during the time when Covid-19 measures were in place compared to before. Furthermore, compared to PLWH in other countries and the general population worldwide, PLWH in China expressed relatively low willingness to receive the Covid-19 vaccination. Among PLWH, perceptions towards the Covid-19 vaccine and willingness to receive it appear to be influenced by the internet, social media, and interpersonal communications, which has important implications for immunisation programmes targeting this population.

Between 2010 and 2018, the annual number of newly reported PLWH aged 60 years or older saw a substantial increase, surging by over five times from 5,946 to 31,541 in total. This increase was seen in both older men (from 4,751 to 24,465) and older women (from 1,195 to 7,076). Consequently, the proportion of newly reported PLWH aged 60 years or older rose from 9.27% in 2010 to 21.22% in 2018, according to statistics from the Chinese NCAIDS (Ding et al. 2019, p. 425). Most of these individuals were infected through heterosexual contacts, likely due to limited knowledge of HIV/AIDS and a low awareness of HIV risks among the older population in China. To summarise, the HIV epidemic has been increasingly affecting older people, particularly older men, over the past decade. These older PLWH also contend with chronic diseases such as cardiovascular diseases, diabetes mellitus, kidney disease, liver fibrosis, neurocognitive impairment, malignant tumours, and more. Those on HIV treatment continue to exper-

ience much higher rates of chronic kidney disease (CKD) compared to HIV-negative individuals, elevating their risks for cardiovascular diseases, end-stage renal disease, and premature mortality (He et al. 2019, p. 439ff.).

Aunon and colleagues (2020, p. 362ff.) found that while men undergoing HIV treatment did indeed report higher levels of depression and anxiety, their data did not align with their initial hypothesis, which was informed by the minority stress theory. The researchers had expected that MSM would display greater psychological distress compared to men who have sex with women (MSW). Surprisingly, their findings indicate that the sex of sexual partners was not significantly associated with increased levels of depression or anxiety symptoms. Instead, the research suggests that higher levels of depression were linked to maladaptive coping strategies and a lower physical quality of life. Moreover, younger, more educated men with poorer physical quality of life and more adaptive coping skills were more likely to report symptoms of anxiety. These findings offer a nuanced perspective on the factors that contribute to psychological distress among men receiving HIV treatment.

Regional spread of HIV

While the overall pattern of HIV infection in China is now primarily driven by sexual contact, particularly heterosexual contact, it is important to note that the distribution of HIV cases varies significantly across the country. Initially, the HIV epidemic was concentrated in rural areas of south-western and western China, as depicted in Figure 1a. Over time, it began to spread into cities and urban areas in all provinces.

According to sentinel surveillance data, in 1998 over 1,000 cases were identified in both Yunnan and Xinjiang provinces, while the remaining provinces reported significantly fewer cases. However, as discussed earlier, these new infections did not remain confined to south-western China. Instead, due to increased drug use and unsafe sexual behaviours, the epidemic started to spread, and by the following decade, it had reached all provinces across the nation. While the largest number of PLWH continued to be in southern and south-western China, there was also a growing number of cases identified in central China, as depicted in Figure 1b.

In 2008, Yunnan remained the epicentre of the HIV epidemic in China, with over 100,000 PLWH. Following Yunnan were Xinjiang, Sichuan, Guangxi, Guangdong, and Henan, each reporting more than 50,000 cases

during that year. Along the eastern coast of China, there was a noticeable increase in new cases, with numerous provinces in this region reporting more than 10,000 cases (as shown in Figure 1b). This trend has persisted, and as of 2018, south-western China still reports the highest number of HIV cases.

In 2018, Yunnan and Sichuan had over 100,000 PLWH, followed by Guangxi, Guangdong, and Henan, each with more than 50,000 cases that year (as depicted in Figure 1c). The HIV epidemic has continued to expand in eastern and northern China, while regions such as Inner Mongolia, Qinghai, Hainan, and Tibet reported the lowest number of PLWH, each with fewer than 5,000 cases in 2018 (Wu et al. 2019, p. 458ff.).

Figure 1a: Geographic distribution of PLWH in China in 1998
Figure 1b: Geographic distribution of PLWH in China in 2008
Figure 1c: Geographic distribution of PLWH in China in 2018
(Wu et al. 2019, p. 463)

The regions in south-western and south-central China, including provinces like Yunnan and Sichuan in the south-west, have historically been associated with drug abuse. Additionally, some of these regions are in close proximity to the 'Golden Triangle' and serve as trafficking routes for drugs to Hong Kong. The HIV epidemic initially emerged in the late 1980s to 1990s among drug users in these areas and has since become firmly established among FSWs (Zhang et al. 2020, p. 151ff.).

Zhang and colleagues (2020, p. 151ff.) conducted a thorough literature search and identified 51 publications that reported HIV prevalence rates among FSWs in Guangxi during the period from 2008 to 2018. These rates varied widely, ranging from 0.13% to 6.78%, with a median and interquartile range (IQR) of 1.08% (0.64%, 1.80%). Similarly, in Yunnan,

Zhang and colleagues identified 29 articles reporting HIV prevalence data among FSWs. These rates ranged from 0.13% to 10.12%, with a median of 1.50% (0.51%, 2.75%; as shown in Figure 2).

In regions with lower prevalence rates, there were fewer publications available. However, in economically developed eastern regions, encompassing seven provinces and municipalities, including Shanghai, the researchers found a substantial number of publications. These publications indicated extremely low HIV prevalence rates identified through sentinel surveillance. Nonetheless, it is worth noting that these studies did observe relatively high rates of syphilis among FSWs in these areas, with rates ranging from 0% to 10.12% (Zhang et al. 2020, p. 151ff.).

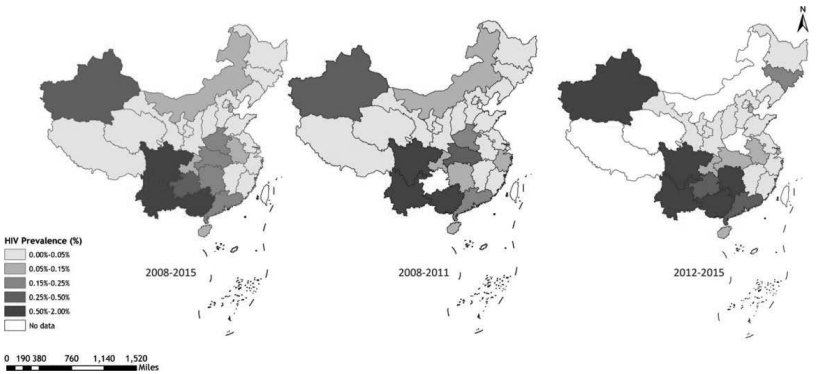

Figure 2: Median HIV prevalence among FSWs in China by province (Zhang et al. 2020, p. 158)

The prevalence of HIV among pregnant women was notably higher in southern China compared to northern China, with the highest prevalence observed in western China, reaching 93.5 cases per 100,000 individuals. Conversely, eastern Beijing had the lowest prevalence among pregnant women, with 8.6 cases per 100,000 individuals. This stark difference means that HIV prevalence in western China was approximately 11 times higher than in eastern China.

Among the 31 provinces, six had a prevalence rate exceeding 50.0 cases per 100,000 individuals. These provinces included Yunnan, Xinjiang, Sichuan, Guangxi, Guizhou, and Chongqing. Remarkably, even though these six provinces accounted for only 21% of all pregnant women in the country, they represented a staggering 76% of all HIV cases diagnosed

among pregnant women in mainland China. Further analysis revealed that 30 cities reported an HIV prevalence rate among pregnant women exceeding 100.0 cases per 100,000 individuals, with 28 of these cities located in the south-west of China (Wu et al. 2019, p. 462f.).

Data availability

Data were collected from various sources, including survey reports, national publications, journal articles, and other less widely distributed literature. The scarcity of available data has significant implications for HIV prevention efforts and has the potential to impede a globally effective response to the epidemic. It is of utmost importance to closely monitor recent HIV infections in order to gain a comprehensive understanding of the epidemic's trajectory and effectively allocate resources. Urgent attention is required to establish robust surveillance systems that regularly track new infections using validated methodologies to estimate incidence rates. Ideally, these systems should also have the capacity to collect information about the risk factors associated with recent infections. Identifying the specific locations and demographics of new infections, as well as how these factors evolve over time, is crucial for guiding our response to the HIV epidemic and making optimal use of increasingly scarce resources (Dokubo et al. 2013, p. 67ff.).

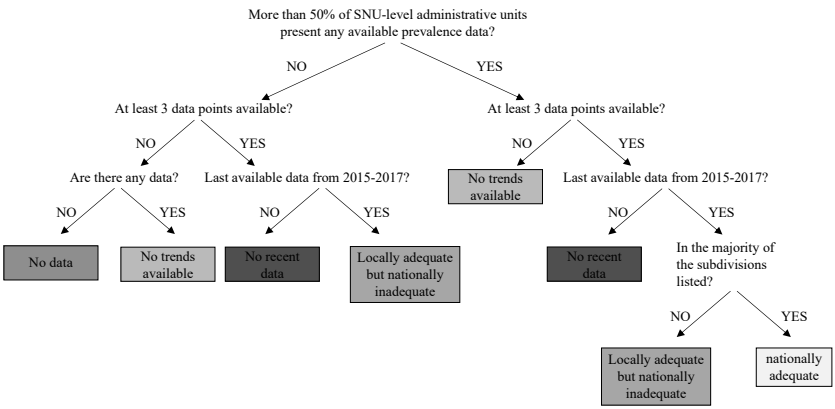

Figure 3: Decision tree depicting the categorisation of the subnational HIV prevalence data by key population (Arias Garcia et al. 2020, p. 4)

Access to treatment

Over the past two decades, China has invested substantial efforts in expanding access to ART regimens through the gradual expansion of the National Free Antiretroviral Treatment Program (NFATP). The country has also been dedicated to evaluating and optimising these regimens specifically for Chinese patients. Several domestic multicentre studies have consistently demonstrated the effectiveness and tolerability of available antiretrovirals in Chinese patients. They have also identified variations in the toxicity profiles of certain agents, proposed innovative strategies to reduce the occurrence of known adverse events, and identified cost-effective regimens suitable for low-resource settings, especially when patients are not suitable candidates for first-line regimens.

These achievements have led to a significant reduction in HIV/AIDS-related mortality in China. The number of patients receiving long-term ART has now surpassed 800,000. Nonetheless, challenges persist, particularly concerning late diagnosis and linkage to care. Additionally, long-term non-AIDS comorbidities have emerged as a new area of concern in HIV care. In response to these challenges, there have been proposals for the establishment of comprehensive 'all-in-one' HIV care centres. These centres would aim not only to physically integrate diagnosis and treatment but also to involve a trained, multidisciplinary team of healthcare professionals in the provision of HIV care.

Looking ahead, future priorities include the ongoing surveillance of drug resistance patterns, particularly acquired drug resistance (ADR), within China. Furthermore, research into innovative therapies to reduce chronic immune activation associated with HIV will be a key focus in the evolving landscape of HIV care in the country (Cao et al. 2020, p. 26ff.).

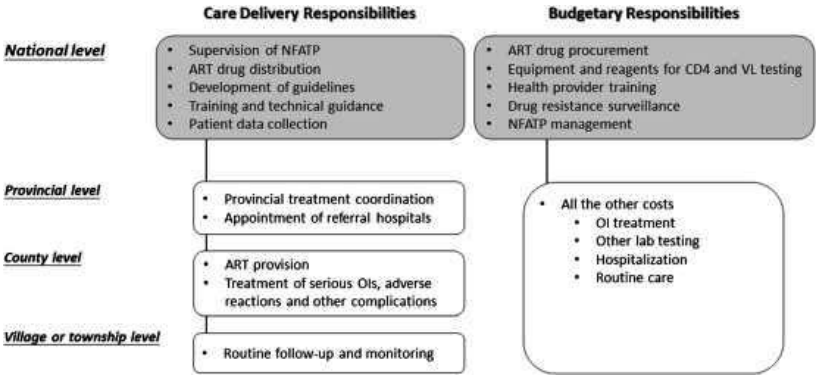

Figure 4: The structure of care delivery and budgetary responsibilities at different administrative levels of the National Free Antiretroviral Therapy Program (NFATP; Cao et al. 2020, p. 30)

2. HIV Policy in China

Legal Regulations

In 1998, China took a significant step towards halting the transmission of HIV via contaminated blood products by implementing its first blood safety law. Under this law, blood donation was allowed only if it was voluntary and repeated commercial donations were prohibited. Recognising the potential reluctance of individuals most likely infected with HIV to undergo testing, especially considering the absence of available treatment in China at that time, government officials took action. This was a period marked by severe stigma and limited awareness of HIV/AIDS within Chinese society. In response, the Chinese government introduced the 'Four Frees and One Care' AIDS policies as a comprehensive strategy to address the HIV/AIDS crisis (Wu et al. 2019, p. 460).

Main State Institutions Responsible for HIV

The introduction of MMT for PWID took place in early 2004, beginning in provinces such as Sichuan, Zhejiang, Guangxi, Yunnan, and Guizhou. By 2005, this pilot programme had expanded to include more than 30 MMT

clinics spread across eleven provinces. The success and insights gained from this pilot initiative played a crucial role in shaping national policies related to NSP and MMT in China.

In 2019, there were over 760 MMT clinics catering to approximately 150,000 clients, along with 700 NSP sites serving around 40,000 PWID annually. The implementation of MMT and NSP programmes has become a cornerstone of China's response to HIV/AIDS, significantly curbing the spread of the virus among drug users. Studies have demonstrated a reduction in needle-sharing behaviours among PWID since the introduction of these programmes. However, a persistent challenge remains in ensuring that PWID continue to engage with and benefit from these programmes, as their retention poses an ongoing challenge for effectively controlling the HIV epidemic (Wu et al. 2019, p. 461).

HIV policy in China

In 2003, the Chinese government introduced the 'Four Frees and One Care' initiative. This programme included offering free ART to all PLWH, providing free voluntary counselling and testing, delivering free services to prevent mother-to-child transmission (PMTCT), granting free education to children who had lost parents to HIV or AIDS, and extending economic support to households affected by PLWH. This policy has notably alleviated the health and financial challenges associated with HIV, leading to increased HIV screening, better access to medical care, and enhanced well-being for those living with the virus (Wu et al. 2019, p. 458).

In response to the challenge of preventing ongoing HIV transmission among MSM, the government has taken proactive measures. They have developed national guidelines aimed at controlling HIV within this high-risk group. China is also collaborating with community-based organisations (CBOs) to introduce innovative strategies for HIV testing among MSM. These efforts include exploring the feasibility and acceptability of HIV self-testing, making testing kits available in vending machines on college campuses, and utilising social networking applications for HIV counselling and testing services. Innovative initiatives, in partnership with public health agencies and CBOs, leverage the internet and WeChat to enhance care efforts. Moreover, there is a strong emphasis on scaling up condom promotion campaigns and outreach services using novel techniques like social networking applications to combat rising HIV prevalence among MSM.

Despite these endeavours, the need for additional interventions, such as the potential rollout of pre-exposure prophylaxis (PrEP) for this group, is under consideration (Wu et al. 2019, p. 462).

Despite having supportive policies in place since 1998, there was a notable absence of former plasma or blood donors seeking HIV screening. As a result, no cases of HIV infection linked to plasma donation or blood transfusion were reported. It became evident that without HIV testing, no infections could be identified or documented. Consequently, the Ministry of Health initiated a nationwide HIV testing campaign during 2004 and 2005, specifically targeting individuals who had previously been involved in commercial plasma donation in the mid-1990s. Each province actively sought out these former donors and encouraged them to undergo HIV screening. Additionally, each province had the choice to extend testing to other key populations, such as PWID, MSM, sex workers, and patients attending sexually transmitted diseases (STD) clinics. This comprehensive HIV testing campaign was conducted throughout China from July 2004 to June 2005. Over the course of this twelve-month period, nearly one million former plasma donors were tested for HIV, resulting in approximately 23,000 diagnoses. The prevalence of HIV infection among former commercial plasma donors was found to be 2.3% (Wu et al. 2019, p. 462).

Major Changes or Reforms in HIV Policy

Over the past two decades, China has made remarkable strides in the battle against HIV/AIDS. According to a progress report by the NCAIDS of the China CDC, as of the end of 2017, a total of 610,000 individuals living with HIV were receiving ART in China, representing 80.4% of all reported cases. Impressively, more than 90% of those on ART had successfully achieved virologic control. The mortality rate among HIV/AIDS patients in China has seen a significant decline, dropping from 22.6 per 100 person years in 2003 to 3.1 per 100 person years in 2014. Moreover, the increasing availability of data from research networks like the China HIV/AIDS Clinical Trial Network (CACT) has directly informed the development of treatment guidelines tailored to the unique biology of Chinese HIV patients and the healthcare landscape in China. The 2018 Chinese National Guidelines for HIV/AIDS Diagnosis and Treatment marked the third update of these guidelines within a decade. Despite these tremendous achievements, it's

important to acknowledge that potential challenges and risks still persist in the ongoing fight against HIV/AIDS (Cao et al. 2020, p. 30).

(1) Late Presenters and Delayed Diagnosis

Regularly monitoring key populations is a vital aspect of the national strategy for detecting HIV/AIDS cases. However, the issue of delayed diagnosis remains significant, especially in regions with limited healthcare access. The period between HIV acquisition and the onset of AIDS can be lengthy, and initial symptoms are often non-specific, posing challenges to early diagnosis without routine screening programmes. To effectively address this challenge, it's imperative to increase awareness about HIV infection and its varied clinical presentations among healthcare providers across different medical fields. At the same time, there's an equal need to enhance education and awareness among high-risk populations, particularly in areas with a high prevalence of HIV. This multi-faceted approach is essential for improving early diagnosis and ensuring that those affected by HIV/AIDS have access to appropriate care (Cao et al. 2020, p. 31).

(2) Drug Resistance

The emergence of HIV drug resistance poses a significant challenge to the effectiveness of ART. China has traditionally been considered a country with a low prevalence of transmitted drug resistance (TDR), also known as primary drug resistance, in comparison to some industrialised nations. TDR refers to a situation in which a person becomes infected with a strain of a virus, such as HIV or Hepatitis, that is already resistant to certain antiretroviral or antiviral drugs. This resistance can potentially limit the effectiveness of standard treatments from the outset. TDR is a concern in the management of infectious diseases, requiring continuous monitoring and adaptation of treatment strategies. Additionally, these rates have remained relatively stable over time. To address this issue, it is crucial to prioritise enhanced education and monitoring, particularly regarding treatment adherence. Moreover, maintaining adequate intervals for viral surveillance, especially during the initial year of treatment, is essential for controlling ADR. Furthermore, a key strategy in managing HIV drug resistance involves expanding access to antiretroviral drugs that target various virus–host interaction sites. This diversified approach will continue

to be instrumental in combating the development of drug resistance and ensuring the efficacy of ART (Cao et al. 2020, p. 31f.).

(3) Novel Strategies for Unresolved Immune Activation

Despite the remarkable successes achieved with modern ART, completely eradicating HIV remains a challenging objective for researchers worldwide. Even after years of suppressive treatment, there are lingering levels of viral replication, along with unresolved low-grade immune activation. This creates a problematic cycle leading to incomplete immune recovery and an elevated risk of non-AIDS-related health issues. *Tripterygium wilfordii Hook F* (TwHF) is a well-documented immune-modulating agent approved by the China Food and Drug Administration (CFDA). It has been widely employed in China for treating autoimmune diseases like rheumatoid arthritis, showing effectiveness in controlling inflammation. Building on insights from the field of rheumatology, researchers have been exploring the hypothesis that TwHF may have a role in reducing residual immune activation in individuals with HIV infection (Cao et al. 2020, p. 32).

Cooperation of State Institutions with International Organisations (UNAIDS, Global Fund, Private Donors, etc.)

UNAIDS has established ambitious treatment targets to be met by 2030, crucial for the global elimination of HIV. These objectives entail diagnosing 95% of people with HIV (PHIV), providing treatment to 95% of those diagnosed, and achieving viral suppression in 95% of those under treatment. However, in a study featured in the AIDS journal, Shen and colleagues (2023, p. 1137ff.) analyse the transmission dynamics of the HIV epidemic in China, where the actual achievement of these targets stands at 71%, 80%, and 65%, respectively. Their study emphasises that a substantial rate of attrition poses a significant obstacle to achieving these goals. The authors of the study forecast the repercussions of attrition, particularly when expanding treatment, on various aspects, including HIV transmission, the risk of developing drug-resistant strains (acquired resistance), the transmission of drug-resistant strains (transmitted resistance), and HIV-related mortality. These insights shed light on the complex dynamics surrounding HIV control and management in the Chinese context (Blower et al. 2023, p. 1175f.).

Enhanced HIV detection can be achieved using various approaches. These include implementing more comprehensive testing programmes that specifically target high-risk groups, engaging in partner notification and testing initiatives, and providing increased education to primary care providers regarding the significance of routine HIV testing within primary care settings to identify undiagnosed individuals. Both primary care and specialised care providers play a pivotal role in improving patient follow-up. This involves tasks such as ordering and interpreting results of HIV RNA viral load tests and assessing immune surrogate markers like CD4 cell counts. Viral load levels continue to be the most reliable indicator of medication efficacy, and an effective treatment regimen is likely to boost adherence and reduce attrition rates among patients. These combined efforts contribute to more effective HIV management and care (Blower et al. 2023, p. 1175f.).

3. NGOs Working in the Field of HIV in China

Services for People Living with HIV, Provided by NGOs

Non-governmental organisations (NGOs) have played an invaluable and irreplaceable role in HIV/AIDS prevention and control efforts in China. These organisations serve as essential service providers and are actively engaged in various aspects of HIV/AIDS initiatives, including education, service delivery, and the provision of other critical services. Their contributions are instrumental in complementing government efforts and ensuring a holistic approach to addressing the HIV/AIDS epidemic in the country (Wang et al. 2016, p. 418).

Community Organisations (as a Special Type of NGOs)

In China, there are two main types of NGOs: actual NGOs and 'government-organised' NGOs (GONGOs). Actual NGOs are organisations that originate at the grassroots level and often have limited size, capacity, and access to political and financial resources. They are typically more independent from government influence. GONGOs are NGOs that receive government sponsorship and support. They are generally larger in size, have staff who have undergone extensive professional training, and often adopt a bureaucratic structure. Examples of GONGOs in China include

organisations like the Family Planning Associations, Women's Federation, Red Cross, Youth League, trade unions, and various academic associations. These distinctions reflect the diverse landscape of NGOs in China, with varying levels of independence and resources based on their origin and relationship with the government (Wang et al. 2016, p. 418f.).

Advocacy by NGOs

NGOs have been acknowledged as a crucial social force in driving health initiatives, and their role in the response to AIDS has become increasingly vital. Their adaptability and popularity among HIV/AIDS patients have positioned them as more accessible providers of HIV/AIDS services. This has effectively supported the Chinese government in addressing the needs and demands of individuals affected by HIV/AIDS. NGOs play a significant role in complementing government efforts and ensuring a comprehensive response to the HIV/AIDS epidemic in China (Wang et al. 2016, p. 419).

Participation of NGOs in International and Regional Networks

The concept of civil society, known as '*minjian shehui*' in Chinese, was not traditionally a part of the political system in pre-modern China. The emergence of a relatively independent civil society is a product of modern China. This transformation was driven by changing socio-economic relations, largely influenced by the 'Open Door Policy', which resulted in the recognition and growth of civil society for the first time in Chinese history. However, the Chinese government's perspective on civil society underwent a significant shift after the 1999 *Falun Gong* incident. This event highlighted, in the eyes of the government, the potentially destructive power of civil society and raised concerns that a robust, well-organised, and uncontrollable civil society could threaten the ruling position of the Chinese Communist Party (CCP).

Simultaneously, authorities recognised that NGOs could play a supplementary role in policy implementation. To address this dilemma, the Chinese government adopted a 'state-led' approach to managing civil society in China. This approach, based on Frolic's concept of 'state-led civil society', views civil society as being created by and belonging to the state. As a result, the independence and autonomy of civil society are always con-

strained by the state's influence. The state legitimises social organisations and expects a disciplined partnership. In this authoritarian regime, any form of antagonism inherent in the Western concept of civil society is not permitted in state–society relations. Any alternative force that challenges the state is viewed as an attempt to undermine its political legitimacy and authority. This approach underscores the complex and controlled nature of civil society in contemporary China (Lo 2018, p. 4f.).

The Chinese state apparatus has implemented various legislative measures to manage and control the growth of both international and grassroots NGOs. These measures allow NGOs to operate openly but also aim to restrict their expansion. For international non-governmental organisations (INGOs), their operations in China are regulated by the 1989 Interim Procedures on Foreign Chambers of Commerce (*waiguo shanghui guanli zhanhang guiding*). According to this law, INGOs are limited to establishing only one branch office in China. This restriction effectively confines the geographic scope of INGOs' activities within the country, which, in turn, limits their potential political or social influence.

Additionally, to regulate the rapid influx of foreign funding into China, particularly in the field of HIV/AIDS interventions, the State Council introduced the Regulations on the Management of Foundations (*jijin guanli tiaoli*) in 2004 (Lo 2018, p. 5). These regulations are designed to oversee and control the activities of foundations and organisations that receive foreign endowments, including NGOs involved in HIV/AIDS work. These legislative measures reflect the Chinese government's dual approach of permitting NGO activities while simultaneously keeping a tight rein on their growth and influence, especially when it comes to foreign-funded NGOs and their potential impact on Chinese society and politics.

Indeed, when contrasted with grassroots NGOs, the Chinese authorities had historically granted relatively more autonomy to INGOs operating within its borders. This approach allowed the government to tap into international expertise and access foreign funding to address emerging social issues in China. However, the situation changed significantly with the introduction of the Foreign NGOs Management Law (*jingwai fei zhengfu zuzhi guanli fa*) in April 2016. Under this law, INGOs operating in China are required to register with public security officials and are prohibited from engaging in political or religious activities that could be perceived as damaging 'China's national interests' or 'ethnic unity'. The implementation of this law was perceived by the international community and Western governments as a reinforcement of restrictions on the numbers and scope

of foreign entities operating within China's authoritarian regime (Lo 2018, p. 5). It marked a shift in the government's stance towards INGOs, bringing them under tighter scrutiny and control. This change in policy has raised concerns about the ability of INGOs to continue their work in China and has implications for their autonomy and the nature of their activities within the country.

Grassroots NGOs in China are subject to regulation under the Regulation on Registration and Administration of Social Organizations (*shehui tuanti dengji guanli tiaoli*). According to the 1998 regulation (amended in February 2016), in order to register with the Ministry of Civil Affairs (MOCA), a grassroots NGO must meet specific requirements, including having a minimum asset of 100,000 yuan and establishing a 'professional management unit' (*zhuguan danwei*) to serve as a supervisory body for the organisation.

Meeting these two requirements can be quite challenging for grassroots NGOs, as many of them face financial difficulties due to limited sources of funding. The majority of grassroots NGOs receive limited financial support from the government, especially if they lack political connections. Additionally, these organisations often struggle to secure donations from local communities for two main reasons: first, newly established NGOs may not have a track record that instils trust among the local population, and second, donors may not receive tax benefits for their contributions to unregistered NGOs (Lo 2018, p. 5). These financial challenges pose significant obstacles for grassroots NGOs in China, affecting their ability to operate effectively and sustainably.

Many government departments in China tend to reject the registration applications of grassroots NGOs out of concern for the potential consequences and responsibilities associated with officially recognising and supporting these organisations. Consequently, numerous grassroots NGOs either remain unregistered or register as business entities with the Ministry of Industry and Commerce (MOIC) to navigate these challenges. Furthermore, the Regulation on Registration and Administration of Social Organizations imposes restrictions by prohibiting the coexistence of 'similar organisations' at various administrative levels. This provision facilitates government management and control over the legal status of grassroots NGOs in China. Official registration is vitally important for the survival of these organisations. Legal status grants NGOs official recognition and the eligibility to receive legal and financial support from the government. By contrast, unregistered NGOs are viewed as illegal entities and are subject to

potential prosecution and coercion by the state apparatus (Lo 2018, p. 5). This legal status distinction underscores the challenges faced by grassroots NGOs in China and the potential risks associated with their work.

Given the restrictive environment for grassroots NGOs in China, early responses to HIV/AIDS at the societal level were primarily carried out by GONGOs. Notable GONGOs involved in HIV/AIDS efforts included The Chinese Association of STD and AIDS Prevention and the Chinese Preventive Medicine Association. However, a limited number of NGOs focused on HIV/AIDS began to emerge in response to the growing number of infections in China during the 1990s. One such organisation was AIDS Action (*aizixing*), founded in 1994 by Dr. Wan Yanhai. Based in Beijing, AIDS Action became one of the earliest and most prominent NGOs dedicated to addressing HIV/AIDS-related issues in China (Lo 2018, p. 5). Despite the challenging environment for NGOs in the country, these organisations played a crucial role in raising awareness and providing support for individuals affected by HIV/AIDS in China.

However, there has been a notable surge in the quantity of HIV/AIDS-focused NGOs in China since 2003. According to data from the 2009/2010 China HIV/AIDS NGO Directory (*zhongguo aizibing shehuizuzhi minglu*), the number of both registered and unregistered NGOs dedicated to HIV/AIDS matters in China grew significantly, rising from 52 before 2003 to over 600 by 2010. Given the relatively low priority of health policies in the context of economic reforms, the restrictions on 'third sector' activities allowed in China's authoritarian system, and the political sensitivity surrounding the HIV/AIDS issue in the country, it is intriguing to delve into the underlying factors contributing to the expansion of HIV/AIDS-focused NGOs in China since 2003 (Lo 2018, p. 5).

Cooperation of NGOs with State Institutions

Many countries in Asia have established formal local networks for HIV/AIDS-related NGOs or civil society groups; however, such a coordination mechanism among non-state actors is largely absent in China. During interview sessions, it was observed that the HIV/AIDS NGO community in China is fragmented. Among the interviewees, the majority of NGO respondents believed that cooperation had significantly increased between the government and NGOs working on HIV/AIDS, particularly in the areas of treatment, care, and prevention. Only a few interviewees mentioned that

communication and coordination among NGOs in policy implementation were lacking. A nationwide NGO respondent stated, 'We rarely collaborate with other NGOs or INGOs; we have our own teams to handle the work' (national NGO-3). Some grassroots NGO respondents in Shanghai and Kunming expressed their reluctance to cooperate with what they referred to as 'unauthentic' NGOs or NGOs with a 'government background' (Lo 2018, p. 11).

Cooperation of NGOs with International Organisations

Considering the emerging HIV/AIDS epidemic in China, the Chinese government readily embraced the international securitisation of HIV/AIDS in 2000. China was among the 189 signatories to the 2001 Declaration of Commitment on HIV/AIDS, demonstrating its dedication to aligning with the global consensus framework in response to the HIV/AIDS challenges. Significantly, the 2001 Declaration outlined a series of goals that national governments pledged to accomplish within specified timeframes, with most targets set to be achieved by either 2003 or 2005.

Table 1: Global Fund Grant Portfolio for HIV/AIDS in China (Lo 2018, p. 8)

Table 1 Global Fund Grant Portfolio for HIV/AIDS in China

Round	Grant title	Requested amount (in USD)	Lifespan
3	China CARES (China Comprehensive Aids Response): A Community- Based HIV Treatment, Care and Prevention Program in Central China	97,888,170	2004–2009
4	Reducing HIV transmission among and from vulnerable groups and alleviating its impact in seven provinces in China	63,742,277	2005–2010
5	Preventing a new wave of HIV Infections in China	28,902,073	2006–2011
6	Mobilizing Civil Society to Scale Up HIV/AIDS Control Efforts in China	14,395,715	2007–2012
8	Reaching vulnerable migrants with HIV/AIDS prevention and care services in seven provinces in China	61,413,199	2009–2014
RCC[a]	China Global Fund AIDS Program	509,000,000	2010–2015

[a]RCC stands for Rolling Continuation Channel Program

The role of NGOs in China's national HIV/AIDS programmes gained significant prominence during Round 6 of the Global Fund. This was particularly evident in the grant proposal submitted by the CCM, which directly emphasised the development of civil society groups (as indicated in Table 1). During interviews, a director of an NGO based in Hong Kong underscored the profound impact of Round 6 on NGO development, stating, 'Round 6 of the Global Fund serves as a catalyst for the government to engage more grassroots NGOs in HIV/AIDS interventions' (national

NGO-1). This perspective aligns with Kaufman's argument that Round 6, in particular, was widely perceived as a mechanism to further institutionalise the roles of HIV/AIDS NGOs in China's response to HIV/AIDS (Lo 2018, p. 8f.).

The Role of Social Work in Dealing with the HIV Epidemic

Social work courses impart essential skills encompassing psychosocial diagnostics, counselling, crisis intervention, intervention planning, case management, motivational interviewing, social group work, and street work. Social workers primarily engage in addressing mental health disorders and substance abuse, and play a pivotal role in HIV prevention and guidance. Moreover, social work is a profession that facilitates discussions at a local level to ensure the provision of adequate healthcare and social services for individuals living with HIV. This includes access to and support for adherence to antiretroviral therapy, housing initiatives, qualifications, and occupational opportunities. These achievements hinge on collaborative efforts involving diverse disciplines, professions, and policymakers.

In the context of both mental health and HIV/AIDS prevention, social work has contributed significantly to containing the HIV/AIDS epidemic. The profession has established a framework for harm reduction services, empowering individuals who use drugs to safeguard against viral transmission. Key interventions include ensuring clean needles for those with HIV, providing psychosocial support, and offering assistance to individuals living with HIV, including gay men and other populations (Henrickson et al. 2017, p. 106f.).

4. Epidemiology of HCV in China

Development of the HCV Epidemic in China

Chronic hepatitis C presents a significant global medical challenge, with China being home to one of the world's largest populations affected by this condition. In China, approximately 200,000 new cases of hepatitis C arise annually, resulting in 360,000 liver cancer-related deaths. Hepatitis C is responsible for 37.48% of liver cancer cases in China, contributing to at least 133,000 fatalities each year (Mei/Lu 2021, p. 270).

Earlier research indicated that the reported cases of hepatitis C in China exhibited a gradual increase from 1997 to 2003, with an annual growth rate of 27.89%. Subsequently, from 2004 to 2011, there was a substantial and rapid increase, averaging 48.79% annually. According to the Chinese Center for Disease Control and Prevention, one study showed a significant rise in cases from 52,927 in 2005 to 201,622 in 2012, with a more stable trend observed from 2012 to 2017. These findings are consistent with previous studies. Additionally, it was noted that the number of new cases displayed seasonality, with a peak in March each year, and a similar pattern was observed in the incidence rate. The data on deaths caused by hepatitis C showed fluctuations, with an average of ten deaths reported monthly. In a 2006 epidemiological survey of serum specimen testing in China, the prevalence of HCV infection in the total population was found to be 0.43%. However, the actual reporting rate for that year was only 5.41 per 100,000, suggesting that only one out of ten individuals potentially harbouring an HCV infection might be identified and officially reported (Zhao et al. 2022, p. 2).

Vulnerable Groups

The age distribution of reported HCV incidence displays variability. A prominent characteristic is that HCV incidence tends to affect younger individuals, while the prevalence remains elevated in older adults, particularly those aged 60 and above. In 2004, the prevalence was higher in people aged 25–44 and those aged 55 or older. However, by 2017, the prevalence was more evenly distributed across all age groups above 25. The incidence of HCV infection in infants (0–1-year-olds) showed a pattern of increase and subsequent decline, peaking in 2012 (11.71 cases per 100,000) during the period from 2004 to 2017. Mother-to-infant transmission became the most common route of hepatitis C virus infection. Risk factors for this transmission included the titre of HCV RNA, IgM positivity, high viral load, active drug use, and HIV coinfection in the mother. There was a notable upward trend in prevalence between 2004 and 2012, with a smoother trend in prevalence observed among people aged 85 and older after 2012. Starting in 2012, the incidence of hepatitis C experienced a clear upward trend among people aged 50–55, reaching its highest incidence rate (37.061 cases per 100,000) in 2017. Moreover, previous studies have consistently shown that the prevalence of hepatitis C generally increases with age, with

seropositivity being strongly correlated with higher age, particularly in individuals aged 60 and older (Zhao et al. 2022, p. 4).

A study conducted in Liaoning province revealed that the seropositivity for hepatitis C was significantly higher in men than in women. Detection rates ranged from 0.18% to 2.40% for men and from 0.20% to 2.07% for women. Another study reported a prevalence ratio of 1.6:1 between men and women. This gender difference is closely associated with risk behaviours, including unprotected sex among MSM, syringe sharing, and tattooing (Zhao et al. 2022, p. 4).

Hepatitis C is found across various occupational groups in China, with retirees, farmers, and workers representing the largest proportion. Among female sex workers, the prevalence ranged from 0.32% to 1.14%, and it was even higher among those with lower socio-economic status. For male truck drivers and passengers, the prevalence was in the range of 0.3% to 0.5%, while it was 0.2% for pregnant women and young students (Zhao et al. 2022, p. 4).

The use of infected syringes is currently one of the primary modes of HCV transmission in China. The prevalence of HCV was 66.97% among IDUs and 18.30% among non-injecting drug users. Research has underscored a substantial disease burden of HCV infection among IDUs in China, with a high seropositivity rate of 71.6% (95% CI: 65.7%–77.6%; confidence interval [CI] is a statistical concept used to quantify the uncertainty or precision associated with a particular estimate). Another study reported a prevalence of 60.1% (95% CI: 52.8%–67.0%) among outpatients on methadone maintenance treatment. Importantly, the prevalence of HCV infection among IDUs in China surpasses that of general drug users. This discrepancy is primarily attributed to the sharing of needles, syringes, or other drug-related equipment, resulting in cross-contamination. Consequently, effective interventions are imperative for the prevention and control of HCV infection among IDUs (Zhao et al. 2022, p. 4f.).

Blood transmission represents another significant route of HCV infection in China, with a prevalence of 166.56 per 100,000 among first-time blood donors and 15.21 per 100,000 among regular blood donors. Hepatitis C prevalence in haemodialysis patients stood at approximately 10%, exceeding that of the general population. China's economic transformation and the introduction of the National New Urbanization Plan (2014–2020) have encouraged the orderly growth of the agricultural transfer population. Consequently, the scale of domestic migration in China has continued to expand. Rural workers have been migrating to urban areas in pursuit of

better job opportunities, often engaging in 3D (dirty, dangerous, and difficult) occupations. Migrants, as a socially vulnerable group, face elevated health risks. One study indicated that the prevalence of hepatitis C among Chinese internal migrants reached 0.45%, which is 3.8 times higher than in the general population (Zhao et al. 2022, p. 5).

Among various high-risk groups for HCV infection, MSM exhibit a notably higher prevalence, ranging from 0.7% to 1.2%, compared to the general population. Additionally, HCV prevalence among clandestine sex workers falls within the range of 0.7% to 0.9%, while it ranges from 0.8% to 0.9% among men attending STD clinics (Zhao et al. 2022, p. 5).

Comorbidities

Both HIV and HCV share the same modes of transmission and common risk factors. Immunocompromised individuals are particularly vulnerable to HCV infection, and high active antiretroviral therapy (HAART) is associated with hepatotoxicity, making HIV/HCV co-infection common. A prior study discovered a 24.7% HCV prevalence among HIV-infected individuals. As of October 2020, a cohort study of HIV patients in Guangxi Zhuang Autonomous Region, China, revealed that 8.1% of these patients were co-infected with HCV. In a cross-sectional survey conducted in Yunnan province, 6.5% of a total of 5,922 HIV/AIDS cases were found to be infected with HCV. With the number of people living with HIV in China reaching 1.14 million as of October 2021 and continuing to increase, it suggests that there might be between 74,100 and 281,580 cases of HIV/HCV co-infection in China (Zhao et al. 2022, p. 5).

Data Availability

Data on hepatitis C infection is accessible through the national surveillance system as well as investigator-driven studies, and these resources are available in both Chinese and English languages.

Access to Treatment

In 2021, the Chinese Medical Association introduced the 'Process of In-Hospital Screening for Hepatitis C in China'. This process includes recom-

mendations for the establishment of a multidisciplinary team (MDT) and suggests that clinical departments, laboratory services, and infection control at healthcare facilities should strengthen their efforts in referring and treating patients who test positive for anti-HCV antibodies. Furthermore, it encourages the screening, diagnosis, and antiviral treatment of patients with chronic hepatitis C (Mei/Lu 2021, p. 273).

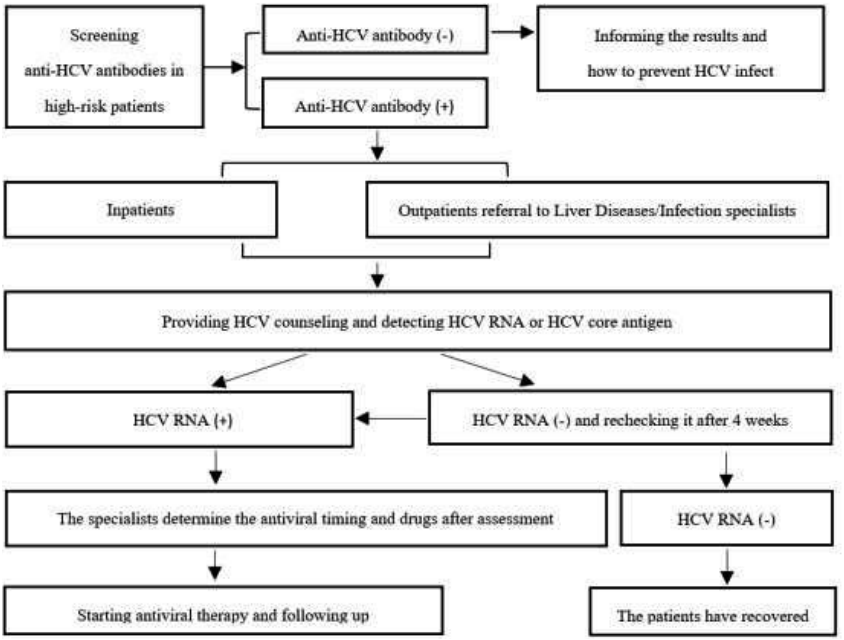

Figure 5: Flow chart for the process of in-hospital screening for hepatitis C in China. Abbreviations: HCV, hepatitis C virus; (+), positive; (-), negative (Mei/Lu 2021, p. 273)

5. HCV Policy in China

Legal Regulations

In 2019, the Chinese Medical Association updated its hepatitis C guidelines to align with international standards. The government is making concerted efforts to fully implement a range of comprehensive prevention and control measures. These include extensive health promotion and education,

reinforced comprehensive intervention for key populations, standardised implementation of measures such as epidemic monitoring and response, hospital infection prevention and control, and supervision and inspection. Moreover, there's a comprehensive drive to implement clinical hepatitis C virus nucleic acid testing, ensure safe injections in medical institutions, consistently enhance patient detection, and establish standardised treatment protocols. The authorities are also actively exploring community management for chronic Hepatitis patients and working towards the inclusion of hepatitis C treatment drugs in the list of medications covered by medical insurance in China (Mei/Lu 2021, p. 272).

Main State Institutions Responsible

In China, the extensive promotion of HCV-infected patient screening and management has been facilitated through the establishment of several information technology platforms. Notable examples include the HCV community-self-management system for liver disease patients and the HCV Screening and Management Information Platform at Shengjing Hospital of China Medical University. The HCV Screening and Management Information Platform is designed to integrate screening, alerting, reporting, and management intervention functions. These platforms are closely linked with hospital information systems, enabling regulatory tracking of HCV-infected patients and significantly enhancing management efficiency (Zhao et al. 2022, p. 7).

HCV Policy in China

China has implemented proactive strategies to bolster the prevention and control of HCV infection. The goal of HCV infection elimination has been integrated into the 'Healthy China 2030' plan, as outlined by the State Council of the People's Republic of China in 2016. In 2017, China established the HCV Infection Elimination Alliance and initiated pilot programmes to offer free HCV screening in high-incidence counties, as reported by People's Daily Online in 2017. Furthermore, the government issued guidelines for HCV infection prevention and treatment in 2019. These comprehensive policies underline the determination and commitment to eliminating HCV infection in China (Zhao et al. 2022, p. 7).

Major Changes or Reforms in HCV Policy

In 1993, the Chinese government implemented a policy to screen all blood donors and enacted corresponding laws to test them for anti-HCV antibodies. Beginning in 2015, China expanded its screening procedures to include HCV RNA testing for blood donors who initially tested negative for anti-HCV antibodies. Moreover, the methods of recruiting blood donors have evolved over time. In addition to these measures, China has developed and enforced standards for disinfection, nosocomial infection control, and hepatitis C prevention and control guidelines to enhance safety and reduce HCV transmission (Mei/Lu 2021, p. 271).

Before 2017, the primary treatment for hepatitis C in China involved interferon and ribavirin (PEG/RBV) for durations of 24 or 48 weeks, depending on the genotype. However, since 2017, China's health authorities have made significant advancements in the prevention and treatment of hepatitis C. Multiple direct-acting antivirals (DAAs) have received approval for use in the Chinese market. These DAAs, administered orally for 8–16 weeks, have demonstrated a sustained virological response (SVR) in over 90% of patients infected with any HCV genotype. Additionally, adverse reactions are rare, and patients exhibit improved tolerance and compliance with these newer treatments (Mei/Lu 2021, p. 272).

Lately, China has started to employ AI and information technology to identify patients through their medical data, which represents a significant step in managing HCV. However, challenges persist, including low general awareness of hepatitis C, low screening rates, and insufficient connections to medical care. In the future, it's essential to further refine the existing prevention and control strategies and strengthen coordination among public health departments, centres for disease control, and tertiary medical facilities. Promoting more cost-effective screening and treatment for HCV within the population could pave the way for the successful elimination of Hepatitis C in China by 2030. Efforts in this direction are crucial to address the remaining issues in the management of HCV and achieve the goal of eliminating the disease (Mei/Lu 2021, p. 273).

Cooperation of State Institutions with International Organisations

In 2016, the World Health Organization (WHO) unveiled its initial global strategy aimed at eliminating viral hepatitis as a public health threat by

2030. This strategy's definition of elimination entails an 80% reduction in HCV incidence and a 65% decrease in mortality compared to 2015. It also established targets for diagnosing 90% of HCV patients and treating 80% of those eligible for treatment. This prompted international efforts to identify gaps in the existing research landscape and to create country-specific strategies to achieve this objective. However, as of 2016, it was estimated that only 18% of the HCV-infected population in China had been diagnosed. Even though 25% of the ten million patients with chronic hepatitis C required urgent treatment, fewer than 1.3% had actually received treatment, highlighting the need for substantial progress in diagnosis and treatment to meet the WHO's elimination targets (Li et al. 2019, p. 763).

Drawing from international experiences and acknowledging the distinctive demographic and socio-economic factors in China, a micro-elimination approach appears to be a more practical path towards achieving the WHO targets. This strategy could involve the prioritisation of high-risk populations, including PWIDs, haemodialysis patients, individuals co-infected with HIV and HCV, and women of child-bearing age or pregnant women (Li et al. 2019, p. 770). By focusing on these specific at-risk groups, China can take targeted measures to combat HCV transmission more effectively and improve access to diagnosis and treatment, ultimately working towards the goal of hepatitis C elimination.

6. NGOs Working in the Field of HCV in China

Services for People Living with HIV

The Center for Liver Health of The Chinese University of Hong Kong (CUHK) is one of the largest centres in Hong Kong dedicated to combatting hepatitis, including HCV. The centre offers the public up-to-date knowledge and information on liver diseases, along with a variety of tests to detect viral hepatitis and its associated complications. Caritas Lok Heep Club is another esteemed organisation in Hong Kong that caters to the needs of drug abusers. With shared objectives, CUHK and Caritas Lok Heep Club launched the New Life New Liver programme in 2009. This programme is specifically aimed at ex-intravenous drug users (IVDU), who represent a population at the highest risk of HCV infection. The programme's primary focus is on preventing the transmission of hepatitis, preserving liver function through early screening, and offering counselling

and referrals to specialist clinics for prompt treatment (Lai et al. 2021, p. 283).

Community Organisations and Advocacy

Through the dedicated efforts of these two pioneering centres, the programme has gradually transformed into a collaboration between CUHK and numerous other NGOs that support the rehabilitation of ex-IVDUs. These NGOs offer a range of services, including substance abuse counselling and various rehabilitation treatment programmes. Examples of such organisations include Operation Dawn, The Society of Rehabilitation and Crime Prevention in Hong Kong, The Society for the Aid and Rehabilitation of Drug Abusers, Rehabilitation Centers of the Christian Zheng Sheng Association, Evangelical Lutheran Church Social Service, Ling Oi Centre, Pui Hong Self-Help Association, Barnabas Charitable Service Association Limited, St. Stephen's Society, DACARS Limited, and Glorious Praise Fellowship (Hong Kong) Limited. Some of these NGOs also provide religious guidance and support in addition to the services mentioned above (Lai et al. 2021, p. 284).

New Life New Liver programme

The New Life New Liver programme is a specialised initiative that focuses on individuals who were previously PWID in Hong Kong. This programme was launched in 2009, initially as a collaborative effort between Caritas Lok Heep Club and the CUHK. Over time, it has expanded into a collaborative endeavour involving CUHK and numerous other NGOs dedicated to the rehabilitation of ex-PWID. This programme is designed as a targeted screening and assessment programme for ex-PWID. It accepts referrals from social workers and requires confirmation of abstinence from intravenous drug use for at least one year. The programme includes educational talks and utilises point-of-care anti-HCV testing, employing the HCV Rapid Card from Bio Focus Company in Ui-Wang, Korea. The objectives of this programme are outlined in Table 2 (Lai et al. 2021, p. 284).

Table 2: Objectives of New Life New Liver Programme (Lai et al. 2021, p. 284)

Icon	Objective
	Provide education on HCV infection and its complications.
	Screen for HCV infection and other liver diseases (*e.g.* HBV, HIV).
	Refer for antiviral treatment for those who are HCV infected.
	Support the social and psychological aspects of patients before, during and after antiviral treatment.
	Promote the avoidance of drug abuse to the public.

HBV, hepatitis B virus; HCV, hepatitis C virus; HIV, human immunodeficiency virus.

In the New Life New Liver programme, a diverse group of professionals collaborates within a multidisciplinary team to care for patients. This team includes hepatologists, psychiatrists, psychologists, social workers, project coordinators, and laboratory technicians. The programme has three main components. First, educational talks about HCV infection, its complications, and available treatments are provided to PWID and their family members. Adequate time is allocated for participants to ask questions following the presentation. Many PWID express concerns, particularly about the side effects of treatment. This was especially the case during the era when peginterferon-alpha and ribavirin were the only reimbursed antiviral treatments. The second phase entails a risk assessment for HCV infection, which involves blood tests and transient elastography examinations to measure liver stiffness. These assessments are typically scheduled within three months of the educational session. Due to the referral policy of the

Hospital Authority in Hong Kong, HCV patients are referred to their respective regional hospitals based on their residential address for long-term follow-up and social worker support provided by the relevant NGOs (Lai et al. 2021, p. 284).

7. Conclusions

The HIV/AIDS epidemic in China has undergone significant transformations over the past 35 years. China has implemented a multitude of laws, policies, and guidelines to support the response to HIV/AIDS, demonstrating a strong commitment both politically and economically in the battle against HIV/AIDS. Domestic multicentre studies conducted over the years have confirmed the effectiveness and tolerability of available antiretroviral treatments in Chinese patients. These studies have also revealed variations in toxicity profiles for certain medications, proposed innovative strategies to minimise known adverse events, and identified cost-effective regimens suitable for low-resource settings when patients are not eligible for first-line treatments. These achievements have led to a remarkable reduction in mortality from HIV/AIDS over the past two decades, and the number of patients on long-term ART now exceeds 800,000. Nevertheless, challenges such as late diagnosis and linkage to care continue to be significant barriers, and the emergence of non-AIDS comorbidities represents a new area of concern in HIV care. This has spurred the concept of comprehensive 'all-in-one' HIV care centres, which would not only streamline the diagnosis and treatment process but also involve a trained, multidisciplinary team of healthcare professionals providing comprehensive HIV care. Looking ahead, future priorities include the ongoing monitoring of drug resistance patterns, particularly ADR, within China. Additionally, research into innovative therapies to mitigate HIV-related chronic immune activation is on the agenda to further advance the field of HIV care (Cao et al. 2020, p. 32).

The most significant challenge in eliminating HIV in China lies in identifying currently undiagnosed infections and ensuring that infected individuals are rapidly linked to treatment. Approximately 30% of HIV infections in China go undetected. Since 2003, China has offered free HIV counselling and testing, along with free antiretroviral therapy for those meeting specific eligibility criteria based on CD4 cell count. In 2016, these criteria were aligned with the WHO's policy of treating all PHIV. However, at present, many high-risk individuals do not seek testing, and among those

who do, a substantial number do not follow up on their diagnosis. Multiple strategies can be employed to enhance HIV detection, such as implementing more intensive testing programmes that target high-risk groups, partner notification and testing, and providing greater education for primary care providers on the importance of routine testing in the primary care setting to identify undiagnosed individuals. Both primary care and specialised care providers play a crucial role in improving patient follow-up, which includes ordering and interpreting results of HIV RNA viral load and immune surrogate markers like CD4 cells. Viral load levels continue to be the most effective indicator of medication efficacy; an effective regimen is likely to promote adherence and reduce attrition. Consequently, the most plausible scenario is that by 2030, treatment coverage will have significantly increased, HIV transmission rates will have decreased, drug resistance will remain at low levels, and China will be on the verge of realising UNAIDS' second and third treatment targets. However, the foremost challenge will likely revolve around achieving UNAIDS' first treatment target by 2030 (Blower et al. 2023, p. 1175f.).

The primary challenge in HCV management in China is a complex issue that involves identifying HCV-infected patients, ensuring their access to treatment options, and making these treatments affordable. Furthermore, patient adherence and physician guidance could introduce additional variability in the eventual therapeutic outcomes. The absence of a comprehensive epidemiological monitoring system in China also presents additional hurdles in enhancing HCV management at a national level (Li et al. 2019, p. 770).

Enormous progress has been made in the management of HCV in China over the past five years. Healthcare communities and governmental bodies in the country have been actively working towards increasing public awareness, enhancing access to healthcare, and providing more extensive training for healthcare professionals. Despite these recent efforts, the challenge of achieving the WHO's 2030 goals for HCV elimination in China remains formidable due to the extensive scale, complexity, and cost of implementation. Given that China is the most populous country globally, there may be significant variations between different Chinese cities and even counties concerning factors like the epidemiology, transmission routes, and the composition of HCV-infected patient groups. Variabilities may also arise in the availability of healthcare resources, reimbursement policies, and the financial capabilities of municipal governments, impacting the provision of HCV care (Li et al. 2019, p. 770).

In early 2018, the 'Seek and Cure Hepatitis C' patient assistance programme, launched by the China Primary Health Care Foundation, was introduced on a national scale. This initiative aims to offer free DAA drugs to patients who live on the minimum subsistence level and provide a half-course of medication free of charge to individuals with low incomes. Such endeavours represent a positive step forward, contributing to the enhancement of the accessibility of HCV management (Li et al. 2019, p. 770).

To bring it all together, China has undoubtedly made substantial strides in HCV management, but there is still a significant journey ahead. Over the next five years, it is anticipated that both the healthcare community and governmental stakeholders will place growing emphasis on the accessibility and affordability of HCV medications, specifically DAAs. Furthermore, more patients are expected to benefit as DAAs become the established standard of care within an enhanced HCV management framework that relies on micro-elimination strategies. With any luck, a well-informed HCV management coalition will allocate essential funds and resources to areas with the most pressing needs, thus accelerating the nation's progress towards achieving the WHO's HCV elimination goal (Li et al. 2019, p. 770).

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