Indian J Med Res 156, August 2022, pp 203-217
DOI: 10.4103/ijmr.ijmr_1453_22

Quick Response Code:

**Rapid Review**

# HIV epidemic in Mizoram, India: A rapid review to inform future responses

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Received June 30, 2022

***Background & objectives*: Mizoram, a northeastern State of India bordering Myanmar, is home to several tribal clans under the ethnic group Mizo: *Renthelei*, *Ralte*, *Paite*, *Lai*, *Hmar*, *Lusei*, *Mara*, *Thado* and *Kuki*. Mizos also reside in the neighbouring northeastern States of Tripura, Assam, Manipur and Nagaland. The majority of Mizo people outside India live across the border in the neighbouring Chin State and Sagaing Region of Myanmar. Over the last decade, Mizoram witnessed a concerning level of rise in HIV prevalence among the general population. The present rapid review was conducted to identify various interventions that could help curb this rising trend.**

***Methods*: An electronic search strategy with broad domains of 'HIV/AIDS', 'key population', 'community engagement' and 'interventions in Mizoram' using PubMed, Embase and Cochrane was adopted; grey literature were also accessed. Evidence, thus gleaned, were synthesized.**

***Results*: Twenty eight resource materials comprising articles, reports and dissertations contributed to the current review. Changing tribal social support structure, early initiation of drugs, sexual debut at an early age and drug–sex interface were identified as factors associated with the progression of HIV epidemic in the State. Issues pertaining to the migration of people across the borders and easy access to drugs continue to be of concern. Churches and youth leaders have a strong influence on the society, at times even constraining access of key population groups to HIV prevention and care services. Tackling stigma and discrimination, ensuring uninterrupted HIV services and creation of an enabling environment in this context seems urgently needed. Incarcerated people in the State have been found with a high level of HIV infection and their linkages with prevention and care services need strengthening.**

***Interpretation & conclusions*: This review underscores the importance of drawing upon successful intervention examples from the past such as 'Friends on Friday' and Red Ribbon Clubs. Active engagement of community-based organizations in programme planning, implementation and monitoring is essential. Establishment of harm reduction interventions for general and key populations paired with strategic communication appear to be the need of the hour.**

**Key words** Community engagement - generalized HIV epidemic - *Mizo* tribes - strategic communication - youths

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Mizoram, a northeastern State of India bordering Myanmar, is home to several tribal clans under the ethnic group Mizo: *Renthelei*, *Ralte*, *Paite*, *Lai*, *Hmar*, *Lusei*, *Mara*, *Thado* and *Kuki*. Mizos also reside in the neighbouring northeastern States of Tripura, Assam, Manipur and Nagaland. The majority of Mizo outside India live across the border in the neighbouring Chin State and Sagaing Region of Myanmar. Globally, the HIV epidemic has been witnessing a declining trend, and a similar observation is evident from within India as well[1]. Inception of the National AIDS Control Programme in India and establishment of the National AIDS Research Institute (NARI), one of the premier organizations under the Indian Council of Medical Research (ICMR), in 1992 contributed in a big way to achieve such a feat[2]. Since then, HIV-targeted interventions (TIs) in the country have predominantly focused on these key population groups such as female sex workers (FSWs), men having sex with men (MSM), transgenders and people who inject drugs (PWID)[3]. Despite TI programmes since more than three decades and adoption of the 'test and treat' strategy some population groups yet remain unreached[4]. Some of the key population groups such as FSW and MSM are shifting from physical locations to virtual platforms[5]; hence, the need for innovative outreach intervention.

In recent times, annual upsurges in new HIV infections have been recorded in the northeastern States of Tripura, Arunachal Pradesh and the northern State of Chhattisgarh, which did not have a significant presence of HIV in the early years of the epidemic[6]. Importantly, Mizoram has been witnessing an increasing trend of HIV prevalence not only among PWID and FSWs but also among the general population[7]. The HIV prevalence among FSWs and PWID in this State, compared to the national averages, continues to be higher at 24.7 and 19.8 per cent, respectively, which are highest in the country[8]. Nearly a decade ago, the jail inmates in the State of Mizoram were mostly drug users[9]. The HIV prevalence among the prisoners in Mizoram has been recorded as high as 21 per cent[10]. On the other hand, the present adult HIV prevalence in Mizoram is 2.3 per cent, nearly ten folds higher than the national average[6]. The HIV prevalence among antenatal clinic attendees has also surpassed one per cent[7].

The reasons behind the current situation of HIV in Mizoram are multiple, the commonly cited one being sharing of needles and syringes leading to nearly 39 per cent of the new HIV infections in Mizoram[11]. It is also on record that the proportion of regular sex partners of people living with HIV (PLHIV) undergoing HIV counselling and testing has been less than a third in Mizoram[11].

The standalone integrated counselling and testing centres (ICTCs), and double the number of facility-based ICTCs including community-based screening sites, have been located across the State of Mizoram in line with the guidelines issued by the National AIDS Control Organization (NACO)[12]. In order to cater to the key population groups, TI sites have been established, which are concentrated mostly in Aizawl district[13]. Six centres across the Mizoram State deliver ART medications[14]. Despite such programmatic interventions, there is a rise in HIV incidence.

Against this backdrop, we conducted a rapid review of the HIV epidemic situation and responses in Mizoram, which, along with two other northeastern States of India, namely Manipur and Nagaland, documented the presence of HIV amongst PWID for the first time in India in 1990[15]. The overall purpose of this review was to inform future interventions to halt and reverse the HIV epidemic in the State. In the process, the epidemic and responses in early 1990s were contrasted against the situation and mitigation measures of recent times.

## Material & Methods

This review was conducted as a rapid assessment of evidence on policy and practices pertaining to HIV situation and responses in Mizoram. Being guided by the current understanding[16], a systematic review-based strategy was deployed to search and critically appraise existing research where a 'quick but not dirty' approach was followed[17]. The systematic search of literature was conducted within a short span of eight weeks with a pragmatic mix of rigorous and explicit inquiry and thus being systematic, yet making concessions to the breadth or depth of the process by limiting particular aspects such as exhaustive assessment of the article/report quality unlike the usual practices[18]. This review was approved as a part of a larger study (NARI/EC Approved/20-21/409).

*Search strategy*: Articles published in peer-reviewed journals and reports under grey literature were included in the current review. The bibliographic databases, namely PubMed, Embase and Cochrane Library, were searched for accessing published literature. Simultaneously, different development partners and stakeholders such as Family Health International (FHI-360), Centre for Disease Control

(CDC), International Training and Education Centre for Health (ITECH), Joint United Nations Programme on HIV/AIDS (UNAIDS) and North East Technical Support Unit (NETSU) were contacted to access reports not available through the aforementioned searches.

Three broad domains were considered under our search strategy: 'HIV/AIDS', 'target population/key population' and 'intervention activities, community engagement and geographical space/centres/institutions/stakeholders in Mizoram' to reflect upon various aspects of HIV epidemic in the State. Keywords representing each of these domains were carefully selected following detailed discussions with subject experts and members of the investigation team from the ICMR-National AIDS Research Institute, Pune. Finally, the selected keywords were strung together using boolean operators to effectively search the PubMed database. Similar strategies were used to search the other two databases, namely Embase and Cochrane Library. No time restriction was applied while navigating through published literature. Reports obtained from various development partners and stakeholders constituted grey literature and were juxtaposed alongside the information synthesized from peer-reviewed articles gleaned through database search.

*Data screening*: Publications identified through bibliographic database searches and the internet were de-duplicated and then screened initially by title and abstract for their relevance. Subsequently, full texts of the articles were downloaded and assessed for their eligibility for inclusion. The flow of work is explained by the schema presented in Fig. 1. Bibliographies were managed and screened using web-based *Rayyan (https://www.rayyan.ai/)*, a tool to conduct systematic reviews.

Twenty four articles were accessed by searching databases: PubMed, Embase and Cochrane. After title, abstract and full-text screening conducted independently by two authors, 11 of them were selected for data synthesis. Any discrepancy, pertaining to screening of an article and its inclusion in data synthesis, was resolved by the two authors jointly. In case of further discrepancy and conflict, resolution was achieved with the help of research supervisor. In addition, we accessed six relevant records from Google Scholar. Table depicts the overview of the articles.

With efforts to access grey literature, we could obtain seven reports from various stakeholders who worked or are currently working for the cause of HIV in Mizoram. Moreover, we included four dissertations/theses that were relevant to our review.

*Synthesis*: Evidence synthesis followed a descriptive approach to characterize the attributes extracted from peer-reviewed articles and reports under grey literature. The evidence was grouped into major themes, and this required an iterative process of referring back to the original studies and reading and re-reading them to be able to capture the context and the findings. The unpublished reports and interactions held with the stakeholders further contributed to the construction of this review.

## Results

*Retrieved articles and reports*: The systematic search revealed that the published articles on the topic of HIV epidemic and responses in Mizoram were limited. However, by reaching out to various experts and stakeholders, ultimately we were able to compile 28 source materials comprising articles, reports and dissertations contributing to the current review.

*HIV and the youths in Mizoram*: Three studies focused on the youths in Mizoram; early initiation of drug use was highlighted in these investigations. The reasons for such initiation were cited as increase in nuclear families (as opposed to the tradition tribal culture of commune-based living and support), poor self-esteem, advertisements promoting smoking and alcohol use and peer pressure[19-21]. Most of the youths in this investigation reportedly initiated drugs, especially heroin, during adolescence and a few were even inducted in such a practice at an early phase of life during 7-12 yr of age[19]. Drug use by children and adolescents led to absenteeism from schools, while among college-going youths, it interfered with their academic performances. The association of drug use with vulnerability to HIV also emerged as a concern[19].

Kenyon[20] evaluated the data on circumcision prevalence and sexual practices generated through the National Family Health Survey 2015 and examined their association with HIV prevalence. Individuals belonging to the age group of 15-49 yr and representing general population had more than one per cent HIV prevalence in the State of Mizoram and it was further documented that about a fifth reported high-risk sexual practice. Men reportedly had a greater number of sexual partners compared to women. Only 2.9 per cent of the respondents in this study reported using condoms during their last sexual act.

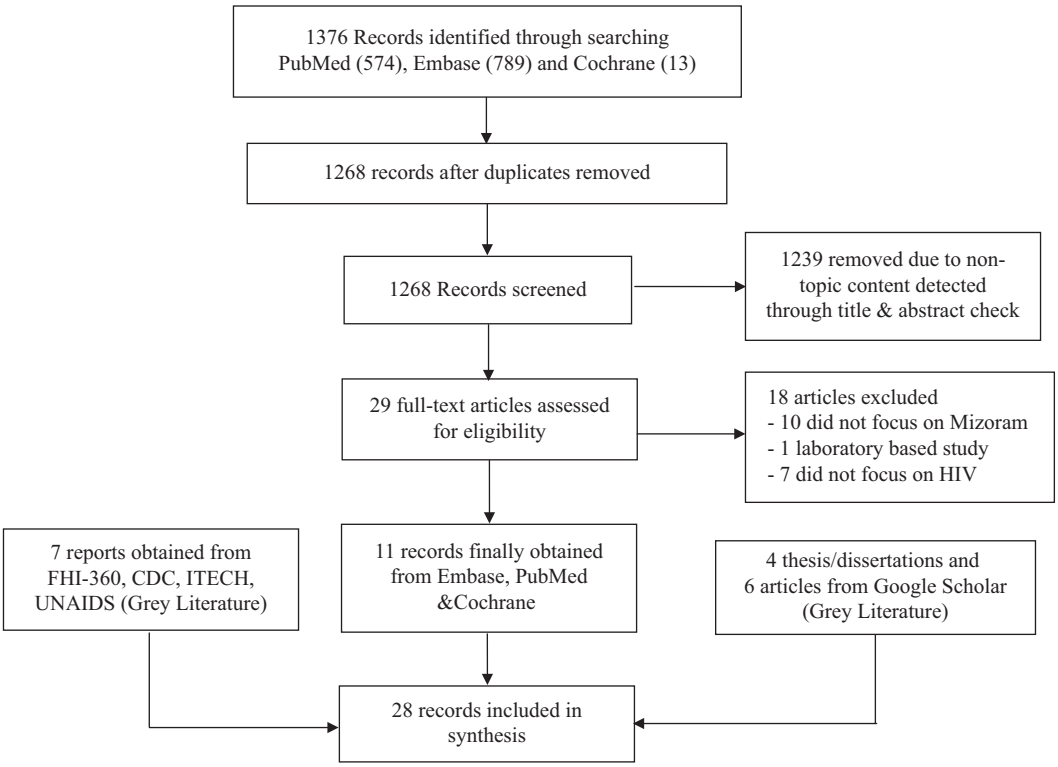


**Fig. 1.** Schema of workflow.

Awareness programmes conducted through multi-media channels such as television, distribution of leaflets for creating awareness and competitions organized among youths through music and sports aimed towards dissemination of information on HIV/AIDS across all eight districts of Mizoram[21]. Red Ribbon Clubs and churches belonging to different denominations were engaged by the United Nations Office on Drugs and Crime in such awareness initiatives[21]. Forty two church leaders across eight denominations attended these discussion sessions on HIV from October 2009 to March 2010. Nuances around HIV testing and vulnerabilities of individuals engaged in same-sex sex to HIV across Mizoram constituted part of these intervention discourses. This reportedly had a positive influence on the youths; some of them volunteered for HIV testing and encouraged their peers to get tested as well. The report of this advocacy campaign underlined the importance of the engagement of church leaders and coordination between different denominations to help address issues around HIV in Mizoram[21].

*HIV transmission, co-infections, substance use and social studies*: Most of the studies retrieved during the current review focused on injection drug use practices in Mizoram. Biswas *et al*[22] highlighted that in the National Integrated Biological and Behavioural Survey (IBBS) conducted by the NACO in 2014-2015, Mizoram featured as the only State where 65 per cent of the drug users were <20 yr old. The most commonly used drug was heroin, locally known as 'number 4'. In Mizoram, young PWID, belonging to the age group of 18-24 yr, reported injecting drugs in groups at less frequented public places such as graveyards, abandoned buildings and lonely riverside. Some of the shooting galleries were also reportedly used for sex work, reflecting upon HIV transmission through drug–sex interface. Medhi *et al*[23] highlighted the issue of injecting drug users not getting enrolled in the Needle–Syringe Exchange Programme (NSEP) due to stigma and discrimination experienced by them. Studies[24,25] further revealed the existing disconnect between awareness about safe injection practices among PWID and sharing of needles and syringes by a considerable proportion of them. This was consequently associated with the rise of HIV infection as well as hepatitis B and C co-infections in them. Synthetic opioid injection such as dextropropoxyphene use was reported in these studies, particularly at the time of crackdown on heroin smuggling.

Factors associated with HIV and co-infections of hepatitis C and B virus among young PWID[26]

**Table.** Peer-reviewed articles from PubMed, Embase, Cochrane and Google

| Author and reference number | Aim | Study duration and site | Study participants | Study design | Outcome |
|---|---|---|---|---|---|
| Kenyon[20] | Exploring ecological-State-level association between risk factors for HIV and its prevalence | 2014 NFHS data Mizoram | | Secondary data analysis (IBBS) | Men were more likely to report multiple partners (3.8%) in the past 12 months. Men/ women; condom usage in last sex (9.1/2.9%) & lifetime partners (3.39/1.12%) |
| Biswas *et al*[22] | Exploring PWID behaviour profile and their variation across the different States of NE region, India | 2014-2015 Manipur, Mizoram, Nagaland | 1084 PWID from Mizoram | Secondary data analysis of IBBS | The only State where as high as 65% PWIDs below 20 yr injected drugs for the first time. Heroin as the most frequently consumed drug in the past three months |
| Medhi *et al*[23] | To map and assess the characteristics of locations of PWIDs | 2004, northeastern States in India | 255 PWIDs in Mizoram | | PWID in outdoor/public places than private residences Graveyards, riverside and abandoned buildings were shooting galleries and also preferred location for sex work |
| Sarkar *et al*[24] | Prevalence of PWID, their HIV status, demographic profile, risk behaviour, spread of infection | Manipur, Mizoram, Nagaland | PWID | Comprehensive review | Cleaning of needles not practiced by 77% of PWID in Mizoram. HIV prevalence stabilized between 6% and 10% in Mizoram (1990-1991) |
| Singh *et al*[25] | Speculations on how the HIV/AIDS epidemic has spread so rapidly amongst the PWIDs in Manipur compared to other North East States | North-East States of India | - | Perspective | HIV prevalence amongst PWIDs - 8%-10% (ICMR study in 1991) STD clinic attendees at Aizawl site - 2% (sentinel surveillance 2000), antenatal clinic attendees - 0.37% (2000) |

*Contd...*

| Author and reference number | Aim | Study duration and site | Study participants | Study design | Outcome |
|---|---|---|---|---|---|
| Mahanta *et al*[26] | To know the prevalence of co-infection as well as the associated risk variables in this setting to tackle them together in a cost-effective manner | October 2004 and September 2006 Kohima (Nagaland) and Aizawl (Mizoram) | 177 PWID from Aizawl | Cross-sectional | Significantly high prevalence of all the HIV, HBsAg and HCV among PWID Common drug injected is heroin |
| Biswas *et al*[31] | To describe socio-demographic and sex work characteristics and to identify the risk factors for HIV infection | November 2014-February 2015 Manipur, Mizoram, Nagaland | 1327 FSW | Secondary data analysis (IBBS) | Sex work initiated below the age of 20 yr. Reasons for inconsistent condom use by FSW-client unwillingness, non-availability and higher payments for sex without a condom |
| Bhatnagar *et al*[33] | To examine the feasibility and performance of intensified case-finding strategy for tuberculosis/ HIV case detection amongst inmates of Central Jail | April-July 2017. Central Jail, Aizawl (Mizoram) | 738 inmates; 626 males and 112 females | Cross-sectional study | Prisoners inject drugs outside and inside the prison, inmates - sex with multiple partners without condoms During screening, new HIV infection was detected amongst prisoners and only a few linked to ART centres |
| Ralte *et al*[36] | Sensitizing local communities to basic information on HIV in a faith-based community | February 2011-February 2012 Grace Home, Aizawl | 10 local youth Christian and 21 women fellowships | Cross-sectional study | Sensitizing key leaders of churches all over Aizawl through 'Friends on Fridays' and subsequently the general population, has been encouraging |
| Ralte[37] | To explore attitudes of church leaders on HIV prevention among the Presbyterian | | 293 church leaders | A cross-sectional study | Majority of the church leaders felt they should intervene for HIV prevention. Biblical disobedience leads to HIV infection and almost 80 per cent felt homosexuals deserve HIV infection |

*Contd...*

| Author and reference number | Aim | Study duration and site | Study participants | Study design | Outcome |
|---|---|---|---|---|---|
| Ralte[38] | To explore attitudes of church leaders on HIV prevention among the Presbyterian | | 293 church leaders | Cross-sectional study | Few willing to promote condom use<br>90.4% - HIV/AIDS should be discussed in church services<br>70% of the church leaders - biblical disobedience leads to HIV infection and almost 80% felt homosexuals deserve HIV |
| Vanrozama *et al*[19] | The impact, cause of drug usage, the need for intervention and the methods of prevention of drug addiction among youths | Mizoram | | Review | Killer drug in Mizoram was Proxyvon/Parvon Spas<br>Impact on academics, health and safety, mental health, peers and family.<br>Intervention counselling, psycho-education.<br>Drug use from 7 to 12 years emphasized the importance of providing education to youth |
| Ralte[39] | To outline and examine the various roles undertaken by YMA and to highlight the nature of relationship that exists between YMA and state | | | Perspective | Pressure from civil society organizations to control alcoholism. SRS and later on changed to CADS, to deal with illegal trading in drugs and alcohol |
| Lalmalsawmzauva[43] | To explore spatial variation of healthcare facilities from the lowest level sub-centre to district hospital as well as temporal changes of the same | Mizoram | | Spatio-temporal analysis of secondary data | State hospitals are concentrated in Aizawl district hospital<br>Mamit and Serchhip do not have non-government hospitals. Districts such as Mamit, Serchhip, Kolasib and Saiha fall under the category of better-served districts compared to Aizawl, Lawngtlai, Champhai and Lunglei |

*Contd...*

| Author and reference number | Aim | Study duration and site | Study participants | Study design | Outcome |
|---|---|---|---|---|---|
| Ghosh *et al*[32] | To understand gender inequality and discrimination experiences amongst FIDUs and its impacts on their abilities to access health services | August 2019, Champhai | Key informants - health service delivery and FGD-HIV-positive FIDUs | Qualitative study | The non-availability of NSEP with safer injecting practices knowledge. Stigma around HIV positive FIDU. Young people sale and distribute smuggled drugs to make money. FGD participants - distance of health centres and their navigation to various sections pose problems for accessing HIV services |
| Report on the Red Ribbon Youth Icon Multimedia campaign[21] | Disseminating specific information on drugs and HIV/AIDS to the youth through music and sports | 15 October-15 December 2009 Nagaland, Manipur and Mizoram | Youth and 42 church leaders | Intervention | Successful in garnering political commitment. Coordination from churchleaders from different denominations on HIV/AIDS needed. Issues of MSM discussed with the church |
| Community needs assessment on HIV/AIDS in Mizoram[40] | The purpose of the study is to assess the needs of community in terms of information and communication for HIV/AIDS prevention | All the eight districts of the State of Mizoram | Leaders of NGOs and personnel working in the field and community leaders, women and youth | Qualitative and quantitative approach | Lack of awareness around HIV and AIDS, existence of stigma and discrimination around HIV and PLHIV<br>Social media platforms for creating awareness, condom use for family planning<br>The respondents preferred interpersonal channels like peer or project worker, health centre workers as means of communication |

STAR, Sustained and Timely HIV/AIDS Response- community engagement in Mizoram; IBBS, integrated biological and behavioural survey; PWID, people who inject drugs; NE, North-East; ICMR, Indian Council of Medical Research; STD, sexually transmitted disease; FSW, female sex worker; ART, antiretroviral therapy; YMA, Young Mizo Association; SRS, Supply Reduction Service; CADS, central anti-drugs squad; FIDU, female injection drug user; MSM, men having sex with men; PLHIV, people living with HIV; FGD, focus group discussions; NSEP, Needle–Syringe Exchange Programme; NFHS, National Family Health Survey; NGOs, non-government organization

were injection of multiple drugs rather than a single one, having been an injection drug user (greater than five years) and sharing of needles and syringes. Early 1990s[24-26] witnessed stabilization of HIV prevalence in Mizoram between six and 10 per cent among PWID, while the neighbouring State of Manipur witnessed a rapid rise from one to 16 per cent and finally 64 to 80 per cent during the same period among PWID. Later studies[27,42] (personal communication) identified the progression of HIV epidemic in the general population of Mizoram in the early 2000s. The authors underlined the need to address macro-social and development issues as well as existing sociocultural and religious practices for the development of effective interventions The folklore-based community sensitization activities with the engagement of community leaders and youths were suggested as helpful strategies.

In the dissertation 2010, from the department of Social Work, Mizoram University, Fambawl defined broken families as those experiencing a marital breakdown or those where respondents had remarried. The most common reason for marital discord and divorce was addiction to smoking and alcohol followed by domestic violence[28]. Another dissertation from the same department by Vanlalhriati[29] in the year 2013 focused on injection drug users in K-Ward, Synod Rescue Home and Tawngtai Bethel Camp Centre in Aizawl district. The most common reasons revealed through this study for re-use of injection equipment were non-availability of sterile syringes and needles (73%) and stigma associated with accessing them (11%). Further, some of the injection drug users reportedly (8%) were engaged in high-risk sexual practices such as unprotected sex with multiple sexual partners. While peer influence and broken family were identified as factors responsible for youths getting into drug use, self-discipline and family support were identified as important for success of de-addiction initiatives[29].

*Vulnerability of women to HIV*: The dissertation by Sailo[30] reported that most of the female injection drug users (FIDUs) engaged in sex work before attaining the age of 18 yr. Majority of them reportedly entered into sex work because of financial constraints and operated from streets. Substance use in any form was reported before transactional sex act, and this often resulted in inability of women to negotiate condom use with their clients. More than half of these respondents reported injecting drugs. Most of the female sex workers reported migrating to the capital city of Aizawl from other districts before getting into sex work. Some of the women also reported their native place being in Myanmar revealing the porous nature of the international border. In-depth analysis of primary data from the National IBBS highlighted that most of the non-home-based sex workers were younger compared to their home-based counterparts in Mizoram[31]. The report by the NETSU based on IBBS 2014-2015 revealed that the consistent condom use among FSWs was lower compared to the national average (*Report on The Epidemiology of HIV in Mizoram*; Unpublished report shared by NETSU, personal communication).

Issues pertaining to FIDU in Champhai, an eastern district of Mizoram bordering Myanmar, were explored recently through a qualitative investigation. The participants in this assessment reported discrimination from healthcare workers while accessing sterile needles and syringes under NSEP. This was in contrast with the experience of their male counterparts. This study further highlighted the lack of interministeral coordination and non-availability of opioid substitution therapy (OST)[32].

*HIV and prisoners*: The feasibility of intensified case detection initiative for HIV and tuberculosis among inmates of Central Jail, Aizawl, was studied in the year 2019[33]; 738 inmates were screened for HIV and tuberculosis over a period of four months. Sharing of needles was reported by injection drug users both inside and outside of prisons, with men being more involved. Male prison inmates also reported having multiple sexual partners compared to the female inmates, and condom use was reported by only half of them. Among the inmates who undertook an HIV test, 9.5 per cent were newly detected as having HIV during the study period. Of these only 34 per cent were linked with HIV care and treatment services, while others were released from prison and the outcome of a few could not be traced.

*Role of community leaders in HIV response*: The United Nations Development Programme supported an exploratory study during 2010 to examine the attitude of church members towards HIV/AIDS, across six different Christian denominations in Mizoram. Most of the respondents were in 14-20 yr age bracket and were aware about sexual route being the most common mode of HIV transmission. They mentioned that issues around HIV and AIDS were not openly discussed in the churches although church leaders were

expected to play important role in the dissemination of information on this issue[34] (personal communication). In a mixed-method study[35,36], in-depth interviews and focus group discussions were conducted in Aizawl engaging Presbyterian church leaders, pastors, women, youths and men. Despite expressing willingness to discuss HIV related issues, the church leaders were hesitant to do so with local youths. However, they felt that the involvement of churches would play a key role in improving the HIV situation in Mizoram. Homosexuality was viewed as a taboo, and most of the church leaders were resistant to accept such a sexual orientation. In addition, 80 per cent of the church leaders felt that homosexuals deserved to get HIV, while nearly 65 per cent of the church leaders supported NSEP[37]. This contrasted with advocacy efforts around condom use[35,36]; a few church leaders acknowledged the role of condoms in HIV prevention[38].

The programme 'Friends on Friday' was conducted among church leaders, local networks of PLHIV and youths at Grace Home (hospice care), Aizawl, during 2011-2012[36]. Sensitization on HIV, dealing with stigma and discrimination and condom demonstration were carried out as intervention activities under this programme. The results of this innovative intervention were encouraging[36]. Another study conducted by Ralte[39], aiming to understand the relationship between the State and the civil societies in Mizoram, underlined that the Young Mizo Association (YMA) and church leaders were strong influencers in the community. Noticeably on different occasions, YMA and church raised strong resentment towards alcohol and substance users and even organized repressive and discriminatory measures against them.

*Service-related challenges*: The Centre for Peace and Development, an NGO, in the district of Aizawl, Mizoram, documented prevailing myths and misconceptions around HIV across different population groups in 2006 and brought them to the notice of the State AIDS Control Society (SACS)[40]. A few NGO leaders highlighted the lack of advocacy around HIV prevention and care services. Concerns about the way privacy and confidentiality of patients were handled by the hospital staff were also flagged. Recommendations emerging from this work included innovative measures for communication, introduction of mobile blood testing facility and installation of condom vending machines[40].

A rapid assessment conducted across five northeastern States, namely Assam, Meghalaya, Manipur, Nagaland and Mizoram in the early 2000s, mapped the vulnerability of key population groups and local youths to HIV infection. Poverty and lack of access to sterile syringes and needles in rural areas of Mizoram were identified as factors associated with HIV risk in this investigation; opposition faced by HIV intervention workers from local activist groups was another highlight[41] (personal communication). A monograph published in 2006 also narrated about inhibitory forces making dents in the ongoing HIV prevention and care services in the community and underlined the need for reducing stigma and discrimination faced by PLHIV in Mizoram[42].

A spatiotemporal analysis of all healthcare services, such as sub-district/sub-divisional hospitals, community health centres, primary health centres and sub-centres in Mizoram, revealed glaring differences in their geographical distribution across the districts; while Mamit, Serchhip, Kolasib and Saiha were better-served districts, the remaining four, namely Aizawl, Lawngtlai, Champhai and Lunglei, were poorly catered[43]. The report from NETSU highlighted the disruption in programme interventions, especially in 2015. This affected both the quantity and quality of HIV prevention and care services; the supply of the sterile needles and syringes became irregular leading to a surge in unsafe injection practices among PWID and consequent rise in the HIV epidemic (*Report on The Epidemiology of HIV in Mizoram*; unpublished report shared by NETSU, personal communication). Under the project 'Sunrise' in 2019, FHI-360, an international NGO, conducted a scoping exercise to characterize the prevailing services and identify existing gaps, barriers and challenges. Key population groups in three districts - Mamit, Lunglei and Kolasib in Mizoram - were in focus. The study revealed that the key populations remained distanced from service outlets - reasons being non-availability of OST, condoms, antiretroviral treatment (ART), fear of being recognized by known people while accessing NSEP, difficult access to the services, stigma and discrimination and non-availability of CD4 cell count and viral load testing facility at ART centres. Despite HIV awareness, there was some reluctance among the community leaders to accept the key population groups in the State and acknowledge their specific needs (*FHI 360. Scoping Report for Three Districts in Mizoram*; unpublished report shared by FHI-360, personal communication).

Due to the rising HIV/AIDS scenario in Mizoram, FHI-360 in collaboration with the Mizoram SACS

implemented a mentoring model during April 2015-September 2020 to enhance the capacity for strategic intervention and introduce innovations for improving HIV intervention coverage. Innovative service delivery outlets for needle–syringe exchange such as grocery shops, volunteer homes and public bathrooms as satellite vending sites were introduced. Community-based screening for HIV among the key population groups was also introduced through camp approach and this reportedly increased HIV test uptake. Importantly, satellite OST centres helped linking more PWID to HIV prevention and care services. This programme was successful in drafting and implementation of a revamped and revised TI strategy and development of an integrated AIDS action plan for Mizoram (*Project Sunrise End of Project Report FHI 360 & NACO*. Report shared by FHI-360; personal communication).

## Discussion

This rapid review, with its focus on HIV situation and responses in the State of Mizoram, has synthesized evidence from 28 source materials comprising articles, reports and dissertations. Various issues pertaining to the HIV epidemic in the State, including socio-economic vulnerabilities and measures taken to address them, have been highlighted. We may have missed some of the grey literature, which is a limitation of the study. However, the present synthesis lends valuable public health insight for future programme planning and mitigating the impact of HIV in Mizoram (Fig. 2).

Despite scarcity of published literature, this review has been able to trace the HIV epidemic in Mizoram since early 1990s to the recent times. Moreover, it delved upon the vulnerabilities of key population groups and general population including youths to HIV. Intervention projects, which successfully addressed the challenges on ground through innovation, were showcased.

Almost all the studies retrieved under this review focused on key population groups except a few that dealt with HIV in youths. Therefore, looking back and critically examining the innovative community awareness campaigns with behaviour change communication among the youths such as Red Ribbon Clubs merit immediate attention. Usage of social media platforms as means of behaviour change, dispelling myths around HIV and increasing access to prevention and care services repeatedly featured as key considerations under successful intervention initiatives. In addition, the role of YMA should be strengthened not only to help create awareness around HIV and other sexually transmitted diseases but also to create an enabling rather than stigmatizing environment. Examples can be drawn from other countries in this regard such as sub-Saharan Africa where youths played a critical and positive role in HIV programme[44].

Mizoram shares its border with adjacent countries and States, and the issue of migration has been a concern for past many years. This revolves around illegal migration across the international border and movement from the neighbouring States of Manipur[45]. The vulnerability of migrant women to HIV due to poverty, engagement in unsafe injecting practices and sex work is on record[30] and needs to be addressed from the perspective of rights of migrants to health.

Stock-outs and non-availability of sterile syringes and needles, condoms and OST have been identified as other core concerns. The policymakers and programme personnel[46] therefore need to ensure uninterrupted services related to HIV prevention and care. Examples of community-led interventions from other parts of India with active engagement of underserved population groups such as sex workers and PWID in programme planning, implementation and monitoring[47,48] could be drawn upon in this regard. However, adapting such approaches to the local sociocultural, religious and policy context would remain crucial.

High HIV prevalence among incarcerated population in Mizoram is another issue of great public health urgency[10]; which might not have featured as a priority during the initial phase of epidemic management planning in the northeastern States of India. It is important to note that among those prisoners who were detected with HIV; linkage to care and preventive services could be traced only in one-third of them. Strengthening of such linkages therefore appears crucial[33]. Noticeably, Scotland and Australia reported extensive injecting drug use among the prisoners[49,50] and Switzerland was the first country to introduce the NSEP in prisons and this was soon followed by others[51]. In India, the operational guidelines[52] are drafted and examining their implementation at State level is urgent.

As religious leaders have strong influences in Mizoram, lessons from the past such as ‘Friends on Friday’ should be re-examined for their relevance in today’s Mizo society[38]. Further, it would be important to draw sustainable action plans with such influencers in the community with a focus on

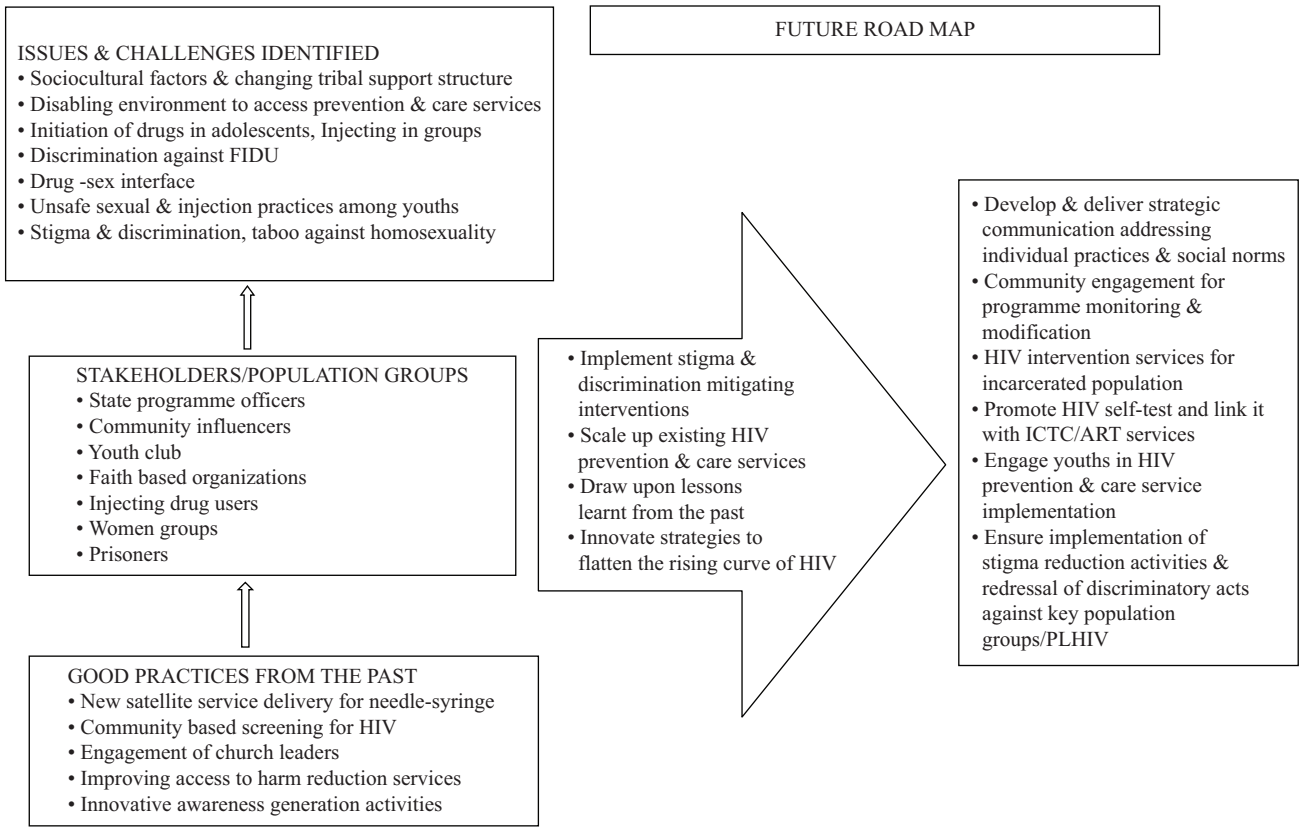


**Fig. 2.** Roadmap for future HIV mitigation plan in Mizoram.

macro-social and structural interventions[53,54] to bend the rising curve of HIV infections downwards in Mizoram. Noticeably, examples are available from Kenya where church leaders were an integral part of HIV containment programme[55]. Taboo around homosexuality remains yet another unaddressed issue in Mizoram, as literature focussing on MSM population are spare and more evidence need to be generated around effective HIV prevention in them. Active engagement of faith-based organizations[56] across religious denominations, civil societies, prison authorities as well as community-based organizations by the Mizoram State AIDS Control Society would be critical in overcoming such obstacles. This rapid review has critically examined HIV scenario and responses in Mizoram which will help inform future intervention planning.

Overall, this review identified key determinants of rising HIV infection in Mizoram. Drawing upon good practice examples from the past, it has also been able to glean out core considerations for future intervention planning where active community engagement will play a critical role. Supportive policies and practices against stigma and discrimination, especially towards MSM, PWID (male and female), FSWs and PLHIV, would facilitate better linkages between HIV prevention and treatment services and key population groups. Furthermore, new innovative interventions such as HIV self-test and linking newly identified PLHIV with treatment services will add required momentum to the ongoing HIV control programme. Importantly, in recent times, HIV self-test is gaining popularity and acceptance among various population groups including youths in other parts of India[57-59]. Macro-social and structural interventions along with strategic HIV risk communication, ensuring uninterrupted availability of testing and treatment services across the State of Mizoram appear crucial.

*Secondary data access declaration*: All the grey literature and unpublished reports which have been cited in the text can be made available through appropriate request to the corresponding author.

***Acknowledgment*:** Authors acknowledge the help of stakeholders and development partners: Ms Nandini Kapoor-Dhingra from UNAIDS-India; Drs Bitra George, FHI-360; Melissa Nyendak, CDC; Anwar Parvez Sayed, Sampath Kumar, Technical Advisor (prevention), I-TECH India; and Mr Pankaj Kumar Choudhury, NETSU, in accessing unpublished reports from

where we pulled out information for the present review along with the systematic search.

***Financial support & sponsorship*:** None.

***Conflicts of Interest*:** None.

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