

The Burden of HIV/AIDS in India and its Cost of Services in Mizoram

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By

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30th June, 2021
Hyderabad

Juliet F Lalzarzoliani

DEDICATION

This thesis is dedicated to all those whose lives are affected by HIV/AIDS.
*The pain and stress may be overwhelming beyond my comprehension, but so are
your strength and bravery for fighting.*

**Dedicated, as well, to everyone providing care and support to the HIV/AIDS
affected. Your dedication, compassion and sacrifice are appreciated.**

The Burden of HIV/AIDS in India and its Cost of Services in Mizoram

Abstract

HIV/AIDS is one of the leading causes of death in India among the productive age groups (30 to 49 years). It is an alarming issue in the Northeast States of India. Mizoram is the second smallest state in population size in India, but it has the highest adult HIV prevalence rate since 2017. In this context, the present study aimed to examine the burden of HIV/AIDS in India and the supply response of providing HIV/AIDS services by the vulnerable state, Mizoram. The study employs a top-down approach by looking at the problem at all India level and examining the data for possible solutions at the micro-level in Mizoram State, applying quantitative analysis. Primary and secondary data were used in the analysis. Secondary data from the Institute for Health Metrics and Evaluation (IHME), World Bank, Sample Registration System (SRS), National AIDS Control Organisation (NACO), Mizoram States AIDS Control Society (MSACS) and other macro-level data sources were used. A structured schedule was employed to collect primary data from the 13 Integrated Counselling and Testing Centres (ICTC) and 36 Antiretroviral Therapy Centres (ARTC) staff members. The burden of HIV/AIDS is calculated using the Disability-Adjusted Life Years (DALYs) approach to measure the health gaps. The cost accounting method is used to examine the distribution of costs to various activities and arrive at the unit cost of providing AIDS services.

The HIV/AIDS burden analysis showed that the expansion of HIV/AIDS services during 2000-2019 greatly influenced the burden of HIV/AIDS, during which HIV/AIDS deaths have declined by 54 per cent for all age groups. The analysis showed that HIV/AIDS contribute more to mortality losses than healthy life losses due to disability. In 2019, seven-tenths of the DALYs lost were caused by disability among the 70 years and above age group. The expansion of free antiretroviral treatment to People Living with HIV (PLHIV) has saved and prolonged their life. During 2000-2019, the average burden of HIV/AIDS in India was Rs 27,080 crore (\$ 5,4670 Million) per year. The burden accounted for 109.7 Billion USD (at constant prices, 2010) during 2000-2010. The average burden of HIV/AIDS is Rs 14703 crore (\$2970 Million) for males and Rs 12309 crore (\$2485 Million) for females per year. The average share of the HIV/AIDS burden in the economy is below 0.4 per cent during

the two decades. Further, it was found that the Northeast states accounted for an average of 3.3 per cent of the national burden of HIV/AIDS. These burden share increased to 11 per cent in 2017. In 2017 and 2019, Manipur, Nagaland, and Mizoram states have a higher HIV/AIDS burden share in the economy than the national average.

The analysis during 2012-2018 in Mizoram showed that out of the total Rs 11,489 lakhs of the HIV/AIDS programmes expenditure, almost four-fifths is spent on recurring and one-fifth on capital expenses. Of this total expenditure, one-half is spent on personnel costs such as staff salary. Of this, one-half of the funds are from the Government of India source. The National AIDS Control Programme IV (NACP-IV) in Mizoram prioritises prevention services focusing on High-Risk Groups (HRGs) and vulnerable populations, which is the right strategy for controlling the HIV/AIDS spread. Almost two-fifths of the expenditure accounts for Injection Drug User (IDU), Opioid substitution therapy (OST), and core composite (female sex workers and IDU) components. These outcomes indicate the high concentration of spending on HRGs-IDU strategies.

ICTC and ARTC provide essential free HIV testing, counselling services, and treatment care for HIV patients. These services are the cornerstone of the NACP-IV. The ICTC and ARTC services are calculated separately for the following clients/patients: clients screened for HIV and resulted in HIV negative; clients screened for HIV and resulted in HIV positive; Pre-ART patients and ART initiated patients. During 2017-18, data analysis on unit costs showed that the average unit cost of providing services in Mizoram for HIV screening is Rs 215, and screening HIV positive is Rs 431, the pre-ART patient is Rs 104 while ART initiated patient is Rs 22457. The cost of ART drugs accounted for nine-tenths of the total expenditure.

The study provides insight into the economic burden of HIV/AIDS and the urgent need to provide quality, equitable and affordable healthcare delivery for HIV/AIDS in northeast India. Manipur, Mizoram and Nagaland required specific attention where the ongoing HIV prevention, testing and treatment services should be fast-tracked. Policies should target expanding IEC, Social mobilisation and mainstreaming services. Therefore the government should prioritise expanding HIV prevention and treatment along with universal access to health care and provide proper health care education and practice for society.

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ABBREVIATIONS AND ACRONYMS

AEP	Adolescence Education Programme
AIDS	Acquired Immuno-Deficiency Syndrome
AIR	All India Radio
ALE	Active life expectancy
ANC	Antenatal Care/Clinic
APAC	AIDS Prevention Control Project
ART	Antiretroviral Therapy
ARTC	Anti-retroviral Therapy Centres
ARV	Antiretroviral
AVBD	Association for Voluntary Blood Donation
AZT	Azidothymidine/ Zidovudine
BCSU	Blood Component Separation Units.
BIDPA	Botswana Institute for Development Policy Analysis
BMGF	Bill & Melinda Gates Foundation
BOD	Burden of disease
BS	Blood Safety
BSC	Blood storage centres
BSDU	Blood Safety Division Unit
BSS	Behaviour Sentinel Surveillance
CAOC	Co-located ART and OST centre
CB	Capacity Building
CBNAAT	Cartridge Based Nucleic Acid Amplification Test (CBNAAT)
CBO	Community-Based Organisation
CC	Core Composite
CD4	Cluster of Differentiation 4
CDC	Centres for Disease Control and Prevention
CGE	Computable General Equilibrium
CHAN	Churches founded Community Health Action Network
CHC	Community Health Centers
CID	Crime Investigation Department
CIDA	Canadian International Development Agency
CMIS	Computerized Management Information System
CoE	Centre of Excellence
COI	Cost of illness
CPF	Contributory Provident Fund
CPFMS	Computerized Project Financial Management System

CPT	Co-trimoxazole preventive therapy
CRA	Comparative Risk Factor Assessment
CSC	Care and Support Centre
CSR	Corporate Social Responsibility
CST	Care Support and Treatment
CSW	Commercial sex workers
DADU	Data Analysis and Dissemination Unit
DALE	Disability-adjusted life expectancy
DALY	Disability Adjusted Life Years
DAPCU	District AIDS Prevention & Control Unit
DBS	Domestic Budget System
DBS	Dried blood spot testing
DFID	Department for International Development
DFLE	Dementia-free life expectancy
DFLE	Disability-free life expectancy
DIC	Drop in Centres
DLBB	District Level Blood Banks
DMC	Designated Microscopy Centre
DOT	Directly Observed Therapy
DPCO	Drug Price Control Order
DSRCs	Designated STI/RTI Centers
EAC	Externally Aided Component
EAT	Expenditure, Advance and Transfer
EID	Early Infant Diagnosis
EPF	Employee Provident Fund
EQAP	External Quality Assessment Programme
EQAS	External Quality Control System
FDA	Food and Drug Administration
FI-ART	Facility Integrated ART Centers
FIWCD	Ferrando Integrated Women Development Centre
FSW	Female Sex Workers
FY	Financial Year
GBD	Global Burden of Disease
GC	General Component
GDP	Gross Domestic Product
GFATM	Global Fund for AIDS, Tuberculosis and Malaria
GHDx	Global Health Data Exchange
GIPA	Greater Involvement of People living with HIV/AIDS
GIS	Geographic Information System

GOI	Government of India
GSDP	Gross State Domestic Product
GSVA	Gross State Value Added
GVA	Gross value added
HAAT	Highly Active Antiretroviral Therapy
HCA	Human Capital Approach
HCTS	HIV counselling and testing services
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
HLY	Healthy life years
HMIS	Health Management Information System
HRG	High Risk Groups
HSS	HIV Sentinel Surveillance
IBBS	Integrated Biological & Behavioural Surveillance
IC	Integrated Counselling / Intensified Case / Infection Control
ICMR	Indian Council of Medical Research
ICTC	Integrated Counselling and Testing Centre
IDU	Injecting Drug Users
IEC	Information, Education and Communication
IHME	Institute of Health Metrics and Evaluation
ILO	International Labour Organization
IMS	Inventory Management System
IPD	Indoor Patient Department
IS	Institutional Strengthening
ISPM	Institutional Strengthening and Project Management
KTP	Kristian Thalai Pawl
LAC	Link ART Centre
LWS	Link Workers Scheme
M&E	Monitoring and Evaluation
MARPs	Most at-risk population
MBB	Major Blood Banks
MBSE	Mizoram Board of School Education
MDGs	Millennium Development Goals
MIS	Management Information System
MO	Medical Officer
MoHFW	Ministry of Health and Family Welfare
MoSPI	Ministry of Statistics and Programme Implementation
MSACS	Mizoram State AIDS Control Society
MSD&RB	Mizoram Social Defence & Rehabilitation Board

MSDS	Migrant Service Delivery System
MSM	Men who have Sex with Men
MTCT	Mother-to-child transmission
NACO	National AIDS Control Organisation
NACP	National AIDS Control Programme
NAPHA	National Access to Antiretroviral Program for People Living with HIV/AIDS
NBTC	National Blood Transfusion Council
NDAP	National Data Analysis Plan
NDBS	New Domestic Budget System
NERO	North East Regional Office
NFHS	National Family Health Survey
NGO	Non-Government Organisation
NHRP	National HIV/AIDS Research Plan
NIMS	National Institute Of Medical Statistics
NNRTI	Non-nucleoside Reverse Transcriptase Inhibitor
NPA	Non-productive activities
NPPA	National Pharmaceutical Pricing Authority
NRHM	National Rural Health Mission
NSEP	Needle/Syringe Exchange Programme
NSO	National Statistical Office
NSP	National Strategic Plan
NSS	National Sample Survey
NSS	National Service Scheme
NVBDD	National Voluntary Blood Donation Day
OI	Opportunistic Infections
OPD	Out Patient Department
OST	Opioid Substitution Therapy
OVP	Other vulnerable populations
PALS	PLHIV ART Linkage System
PCoE	Paediatric Centres of Excellence
PFMS	Project Financial Management System
PHC	Primary Health Centre
PITC	Provider-Initiated Testing and Counselling
PLHA	People living with HIV/AIDS
PLHIV	People Living with HIV
PLWHA	People living with HIV/AIDS
PMTCT	Prevention of mother-to-child transmission
PPP	Public-Private Partnership

PPTCT	Prevention of Parent to Child Transmission
PS	Prevention Services
PYD	Pentecostal Youth Department
QALE	Quality-adjusted life expectancy
QALY	Quality-adjusted life years
RBTC	Regional Blood Transfusion Centres
RCH	Reproductive and Child Health
RRC	Red Ribbon Club
RRC	Regional Reference Centres
Rs	Rupees
RTI	Reproductive Tract Infections
SACS	State AIDS Control Society
SACs	State AIDS Cells
SA-ICTC	Stand-alone Integrated Counseling and Testing Centres
SAY	Salvation Army Youth
SBTC	State Blood Transfusion Council
SCM	Supply Chain Management
SDGs	Sustainable Development Goals
SHADES	Society for Health Action Development & Environmental Services
SIMS	Strategic Information Management System
SMO	Senior Medical Officer
SMPH	Summary measures of population health
SRC	State Reference Centers
SRL	State Reference Laboratory
SRS	Sample Registration System
SRS	Supply Reduction Service
STCC	State TB-HIV Coordination Committee
STD	Sexually Transmitted Diseases
STI	Sexually Transmitted Infections
STRCs	State Training Resource Centers
SWG	State Technical Working Group
TB	Tuberculosis
TGs	Transgenders/Hijra
TI	Targeted Interventions
TKP	Thalai Kristian Pawl
TRG	Technical Resource Group
TSU	Technical Support Unit
TTI	Transfusion-transmitted infections
UD&PA	Urban Development & Poverty Alleviation

UN	United Nations
UNAIDS	United Nations Programme on HIV and AIDS
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Emergency Fund
UNODC	United Nations Office on Drugs and Crime
US\$	US Dollar
USAID	United States Agency for International Development
USD	United State Dollar
USG	United States Government
UTs	Union Territories
VBD	Voluntary Blood Donation
VCT	Voluntary Counselling and Testing
VS	Versus
WAD	World AIDS Day
WBDD	World Blood Donation Day
WBS	Whole blood specimen
WHO	World Health Organization
YHL	Years of healthy life
YLD	Years of life lived with disability
YLL	Years of life lost due to premature death
YMA	Young Mizo Associations

Chapter 1

Introduction and Literature Review

1.1 Background

Human Immunodeficiency Virus (HIV) infection attacks the immune system by weakening the white blood cells called the T-helper or CD4 cells. It destroys the CD4 cells by replicating more viruses to infect them, weakening to fight off disease and infection. A person can get infected through its transmission to bodily fluids like blood, semen, breast milk, and vaginal secretion. The severe phase of HIV infection is called Acquired Immunodeficiency Syndrome (AIDS). HIV/AIDS is an incurable but manageable chronic disease; it can be treated using Antiretroviral (ARV) medicines. Antiretroviral treatment or antiretroviral therapy (ART) stops HIV to replicate and protect the immune system. As a result, it lessens the amount of HIV in the body, which reduces the risk of transmission. People living with HIV (PLHIV) can have a long and healthy life like ordinary people by taking proper ART treatment.

Ever since the first reported cases in 1981, the HIV/AIDS epidemic becomes a major global public health threat and development challenges. Since the beginning of the HIV epidemic, the number of people infected currently stands 75.7 million, out of which 32.7 million have died. The number of PLHIV has progressed by 58 per cent since 2000 (UNAIDS, 2020a). According to WHO, HIV/AIDS became the eighth leading cause of death globally in 2000 and nineteenth in 2019. Despite the significant fall in HIV/AIDS deaths during the last two decades, in lower-income countries, it remains one of the leading causes of death. The GBD 2017 Causes of Death Collaborators (2018) reveals that 15 to 49 years and under-five years are the most at risk. The under-five year's infection has resulted from the mother-to-child transmission.

Generally, poor health status reduces economic productivity; this has an adverse impact on economic growth (WHO, 2001; Bloom et al., 2004). The HIV/AIDS epidemic has affected the working-age population extensively at their productive ages. It has enormously affected the economically active population, shredding the

breadwinner of the family. It associates affecting economic growth due to its marked increase in mortality and morbidity. It results in low factor productivity due to the loss of skilled and unskilled labour and a decline in savings due to increased medical consumption (Ojha et al., 2006). Its impact includes an increased orphanage, decreased reproduction, increased management costs and hampers educational attainment.

The rapid spread of HIV threatened the existing health service by enhancing demand for medical, psychological, social and programmatic care and support. The consequences of HIV/AIDS in the economy are highlighted through the costs associated with the disease, such as detecting, screening, care, treatment, research, Information Education and Communication (IEC), and prevention services (Godwin, B., 1997). Investment in the health system and services is crucial to strengthening universal access to HIV/AIDS prevention, care, support, and treatment to achieve improved health and well-being for the present and future generations. In the low and middle-income countries, the economic returns of the AIDS-related services have shown a massive decline in AIDS-related deaths and new HIV infection cases (Lamontagne et al., 2019).

India is the third-largest country with an HIV epidemic globally in 2017, with 2.1 million people living with HIV after South Africa with 7.5 million and Mozambique with 2.2 million (UNAIDS, 2018; 2020b; CIA, 2021). Due to its enormous population of 1.3 billion people, India has an adult HIV prevalence of 0.2 per cent below the global threshold of 0.8 per cent. However, the prevalence of HIV among adults is above the national threshold for two-fifths of the Indian states. Since 2007, HIV/AIDS has been an alarming issue in the Northeast States of India. In 2017, three states topped the highest prevalence rate, which is higher than the national average; Mizoram (2.04%), Manipur (1.43%), and Nagaland (1.15%). According to the Global Health Estimates (WHO, 2020), HIV/AIDS remains one of the leading causes of death among the productive age group (30 to 49 years) from 2000 to 2019 in India.

The National AIDS Control Organisation (NACO) formulates the policy and implement programs for the prevention, control, and treatment of HIV/AIDS under the Ministry of Health and Family Welfare, the Government of India (MoHFW, GOI). NACO formed the State AIDS Control Society (SACS) to monitor its National AIDS Control Programme (NACP) at the state level. In 2012, the GOI started the National

AIDS Control Programme IV (NACP-IV) to expedite the reversal process and reinforce its HIV epidemic response. During the past decade, AIDS-related mortality has significantly declined by 49 per cent, and new HIV infections have dropped by 32 per cent due to the above programmes.

The above achievements have increased the demand for prevention and treatment services. In 2007, 3.79 lakh people were estimated to need antiretroviral therapy, compared to 14.88 lakh people in 2015 (NACO & NIMS, 2015). In May 2017, India introduced the 'Test and Treat Policy for HIV' to strengthen its aim to detect the remaining population and treat all people infected with HIV. Despite the efforts, PLHIV still have difficulty accessing ART treatment. Till March 2018, 55 per cent of all PLHIV in India have accessed HIV treatment. In 2019, 62 per cent of the PLHIV were on ART treatment, where the global average is 67 per cent. The services required to prevent mother-to-child HIV transmission was 52.81 thousand in 2007, 22.26 thousand in 2017 and 20.52 thousand in 2019. However, the resources needed for prevention and treatment services are still not up to the mark. Due to these gaps in HIV/AIDS services, 69.11 thousand and 58.96 thousand people died from HIV/AIDS in 2017 and 2019 (NACO & NIMS, 2018; 2020).

A comprehensive study on the burden of HIV/AIDS in the economy and the provision costs of HIV/AIDS services is essential. The present research attempts to quantify the burden of HIV/AIDS in India, covering all the HIV infected age groups in the country during 2000-19. The burden of HIV/AIDS was presented for aggregate India. The DALYs were calculated for all HIV infected age groups, and the burden was calculated for the working-age groups, 15-49 years. It distinctly calculates the burden of HIV/AIDS during 2007-2019 for the working-age groups (15-49 years) in eight states of Northeast India, such as Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. The study converges on the cost of HIV/AIDS services with special reference to Mizoram state. It describes the state response to the HIV/AIDS epidemic. The State AIDS Control Society (SACS) under the National AIDS Control Programme-IV was examined to study the cost from the supply-side perspective. The ICTC and ART centres from Aizawl East district, Aizawl West district, Champhai district, Lunglei district, and Kolasib district were selected to study the unit cost.

1.2 The Global Scenario of HIV/AIDS

UNAIDS (2019) estimates 38 million [31.6 million– 44.5 million] people living with HIV globally, with an average of 0.7 per cent adult prevalence. Adults (aged 15+) account for 36.2 million (95 %) of the HIV infected population, while 1.8 million (5%) are children (aged 0-14 years). In 2000, approximately 2.7 million people were newly infected with HIV, compared to 1.7 million people in 2019. It was estimated that about 5000 new infections per day in 2019, where 48 per cent were females. In 2000, approximately 1.4 million people died from AIDS and related diseases than 6.9 lakh people in 2019. During the past two decades, AIDS-related mortality has significantly reduced by 51 per cent, and new HIV infection has dropped by 37 per cent. In 2000, 590000 people received antiretroviral therapy, compared to 25.4 million in 2019 (Table 1.1).

Table 1.1 Global HIV Epidemic Statistics during 2000-2020 (In million)

Year	People living with HIV	New HIV Infections (total)	New HIV Infections (aged 15+)	New HIV Infections (aged 0-14)	AIDS-related deaths	People accessing antiretroviral therapy
2000	24.0	2.7	2.2	0.48	1.4	0.59
2005	27.3	2.4	1.9	0.44	1.7	2.0
2010	30.7	2.1	1.8	0.31	1.1	7.8
2015	34.9	1.9	1.7	0.19	0.83	142
2016	35.7	1.8	1.6	0.18	0.8	19.3
2017	36.5	1.8	1.6	0.17	0.76	21.5
2018	37.3	1.7	1.5	0.16	0.73	23.1
2019/2020*	38.0	1.7	1.5	0.15	0.69	25.4

Source: Data from UNAIDS (2020b)

Note: *Included till 31st June 2020

In 2019, 67 per cent of all PLHIV in the world accessed HIV treatment; adults (68%), children (53%), female adults (73%), male adults (61%) and pregnant women (85%). Of all HIV infections, 30.9 million (81%) people were aware of their HIV status, while 7.1 million (19%) were unaware. Four-fifths of the people aware of their HIV status received HIV treatment (UNAIDS, 2020b). The world most severely HIV affected regions are Eastern and Southern Africa, with 54 per cent of the world PLHIV found

in this region, followed by Asia and the Pacific (15%) and Western and Central Africa (13%), as shown in Table 1.2. Southern African countries have the highest adult HIV prevalence; Eswatini (27%), Lesotho (22.8%), Botswana (20.7%) and South Africa (19%).

Table 1.2: Summary of Global HIV Epidemic by Region in 2019

Regions	No. of PLHIV				New HIV Infection (In lakh)			Adult HIV Prevalence (%)
	In million	In %	Deaths (in lakh)	On ART (In million)	All Aged	Aged 15+	Aged 0-14	
Eastern and Southern Africa	20.7	54.5	3.0	15	7.3	6.6	0.74	6.7
Asia and the Pacific	5.8	15.3	1.6	3.5	3.0	2.8	0.15	0.2
Western and central Africa	4.9	12.9	1.4	2.9	2.4	1.9	0.52	1.4
Latin America	2.1	5.5	0.37	1.3	1.2	1.2	0.034	0.4
The Caribbean	0.33	0.9	0.069	0.21	0.13	0.12	0.0096	1.1
Middle East and North Africa	0.24	0.6	0.08	0.092	0.2	0.18	0.014	<0.1
Eastern Europe and central Asia	1.7	4.5	0.35	0.73	1.7	1.6	-	0.9
Western and central Europe and North America	2.2	5.8	0.12	1.8	0.65	0.65	-	0.2
Global totals	38.0	100	6.9	25.4	16.58	15.05	1.5	0.7

Source: Data from UNAIDS (2020a;2020b)

Note: the sign (-) represents that the respective data were not available

1.2.1 Global Timeline

Granich et al. (2017) categorized the complex history of the HIV pandemic into three phases; devastation (1980-1994), discovery/action (1995-2009), and end of AIDS (2010-2020). The initial phase marked root causes, stigma, the struggle of the affected communities and the health crisis. During the first decade of the epidemic (1981-1989), the needle or syringe exchange programme (NSEP), blood sample screened for HIV test, the National AIDS Control Programme (NACP), prevention of mother-to-child transmission and an antiretroviral drug AZT (zidovudine) approval was introduced in some countries and around the world. In 1989, the first antiretroviral

drug for adults, zidovudine (AZT), was approved by the USA Food and Drug Administration (FDA). Later, AZT was approved for children (1990) and pregnant women (1994). In 1995, protease inhibitor drugs were discovered and found to be the key component of antiretroviral treatment as it prevents HIV from replicating and multiplying in the human body. Finally, in 1996, a combination of three drugs, Highly Active Antiretroviral Therapy (HAAT), was introduced among the rich nations. On 21st June, the first HIV home testing and collection kit, NNRTI drug (nevirapine) and viral load test were approved by the FDA. WHO highly recommended 'Nevirapine' to bring down the mother-to-child transmission, which was found cost-effective. The development of drugs showed an immediate decline in AIDS-related mortality (60%) and in-patient stay (80%) in the USA. However, even after one decade of drugs development, less than 5 per cent of those in need have access to this treatment in low-income countries. After the clinical trials, confirm that antiretrovirals' early use keeps PLHIV healthier and reduces the risk of HIV transmission. In 2015, the World Health Organization declared new guidelines recommending that anyone infected with HIV should start antiretroviral treatment irrespective of their CD4 count.

1.2.2 Global Response

In 1987, the World Health Organisation (WHO) responded six years after the first AIDS case and established special programmes called the 'Global Programme on AIDS'. The plan focuses on preventing HIV transmission, treating HIV-infected persons, and strengthening the national and international efforts for global AIDS control (Mann, 1987). The efforts raised HIV/AIDS awareness, formed evidence-based strategies, contributed technical and financial support to countries, initiated relevant research, promoted NGO's participation, and support the rights of the PLHIV (Merson, 2006). In 1990, the Joint United Nations Programme on HIV/AIDS (UNAIDS) reestablished the program. It operates closely with global and national partners toward achieving zero new HIV infection, discrimination, and AIDS-related mortality by 2030.

The Bill and Melinda Gates Foundation initiated in 2000 and became the world's largest private philanthropic foundation focusing on health and HIV. The foundation has committed more than US\$3 billion to HIV projects worldwide and more than

US\$1.6 billion to the GFATM by 2016. On 22 January 2002, the UN General Assembly Special Session on AIDS established the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM). It provides grants as an independent international financial institution addressing HIV, TB and Malaria to the countries.

Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs): In 2000, the UN adopted the Millennium Development Goals with eight target goals to reduce extreme poverty by 2015. The sixth goals focus specifically on HIV, targeting to stop the spread of HIV/AIDS by 2015 and providing universal access to HIV/AIDS treatment for all who require it. In 2015, the UN adopted the 17 Sustainable Development Goals to achieve a sustainable future by 2030. SDGs is the follow-up to the MDGs where three health-related MDGs were substituted by one comprehensive health goal. It includes universal access to HIV prevention, drug treatment and services relating to harm reduction, sexual and reproductive health. Under the SDGs framework, other measures associated with HIV response includes quality education, gender equality, reduced inequalities and peace, justice and strong institutions.

UNAIDS Targets: In 2014, UNAIDS started the 'Fast-Track' Strategy and set the '90-90-90 Treatment for All' target at ending AIDS as a threat to public health by 2020. The three targets are: nine-tenths of every HIV infected person should be aware of their status, nine-tenths of all people diagnosed with HIV should access ART treatment, and nine-tenths of all people accessing ART treatment should have a suppressed viral load. In addition, it aimed to reduce the annual HIV infection to fewer than 500,000 and 200,000 by 2020 and 2030, respectively. In December 2020, the 'Fast-Track' strategy (2014-2020) was replaced by a new five-year plan, called the '2025 AIDS Targets' with 95-95-95 testing and treatment targets achieved among PLHIV by 2025. The target includes 95 per cent of; all reproductive-age women should meet their needs for HIV, sexual and reproductive health services, all pregnant and breastfeeding women living with HIV have their viral loads suppressed, all HIV exposed children should be tested by 2025.

**Table 1.3: India Adult (15-49 years) HIV Prevalence by States/UTs
(In per cent)**

Regions	States/UTs	2007	2009	2011	2013	2015	2017	2019
North	Chandigarh	0.20	0.26	0.29	0.31	0.35	0.20	0.19
	Delhi	0.18	0.20	0.22	0.22	0.23	0.30	0.41
	Haryana	0.11	0.12	0.12	0.13	0.13	0.18	0.21
	Himachal Pradesh	0.14	0.13	0.13	0.12	0.12	0.05	0.12
	Jammu & Kashmir	0.03	0.04	0.04	0.04	0.03	0.03	0.06
	Punjab	0.15	0.16	0.17	0.19	0.19	0.18	0.27
	Rajasthan	0.22	0.24	0.24	0.23	0.23	0.10	0.11
	Uttarakhand	0.08	0.10	0.10	0.11	0.11	0.11	0.13
	Mean	0.14	0.16	0.16	0.17	0.17	0.14	0.19
Central	Chhattisgarh	0.22	0.19	0.18	0.18	0.19	0.13	0.20
	Madhya Pradesh	0.12	0.11	0.10	0.10	0.09	0.09	0.10
	Uttar Pradesh	0.13	0.12	0.12	0.12	0.12	0.09	0.10
	Mean	0.16	0.14	0.13	0.13	0.13	0.10	0.13
East	Bihar	0.26	0.27	0.27	0.26	0.25	0.16	0.18
	Jharkhand	0.13	0.16	0.17	0.17	0.17	0.14	0.09
	Odisha	0.30	0.30	0.29	0.27	0.25	0.13	0.14
	West Bengal	0.29	0.27	0.24	0.22	0.21	0.20	0.09
	Mean	0.25	0.25	0.24	0.23	0.22	0.16	0.13
Northeast	Mizoram	0.80	0.79	0.79	0.80	0.80	2.04	2.32
	Nagaland	0.98	0.92	0.87	0.82	0.78	1.15	1.45
	Manipur	1.94	1.76	1.55	1.34	1.15	1.43	1.18
	Meghalaya	0.06	0.06	0.06	0.06	0.06	0.11	0.54
	Tripura	0.15	0.18	0.21	0.26	0.31	0.09	0.10
	Assam	0.04	0.04	0.05	0.06	0.06	0.06	0.09
	Sikkim	0.10	0.12	0.15	0.19	0.23	0.05	0.07
	Arunachal Pradesh	0.06	0.07	0.07	0.07	0.07	0.06	0.06
	Mean	0.52	0.49	0.47	0.45	0.43	0.62	0.73
West	Dadra & Nagar	0.08	0.08	0.12	0.15	0.18	0.17	0.23
	Daman & Diu	0.06	0.08	0.09	0.12	0.14	0.17	0.17
	Goa	0.60	0.53	0.48	0.43	0.40	0.42	0.27
	Gujarat	0.41	0.40	0.40	0.41	0.42	0.19	0.20
	Maharashtra	0.60	0.51	0.44	0.40	0.37	0.33	0.36
	Mean	0.35	0.32	0.31	0.30	0.30	0.26	0.25
South	Andaman & Nicobar	0.11	0.10	0.08	0.08	0.07	0.14	0.14
	Andhra Pradesh	0.94	0.85	0.77	0.71	0.66	0.63	0.69
	Karnataka	0.68	0.59	0.53	0.49	0.45	0.47	0.47
	Kerala	0.15	0.13	0.12	0.11	0.11	0.08	0.08
	Puducherry	0.19	0.18	0.17	0.16	0.15	0.15	0.35
	Tamil Nadu	0.37	0.33	0.31	0.30	0.28	0.22	0.23
	Telangana	0.94	0.85	0.77	0.71	0.66	0.70	0.49
	Mean	0.48	0.43	0.39	0.37	0.34	0.34	0.35
	India	0.34	0.31	0.29	0.27	0.26	0.22	0.22

Source: Data from NACO & ICMR-NIMS (2015;2018;2020)

1.3 The Scenario of HIV/AIDS in India

According to HIV estimates 2019 (NACO & NIMS, 2020), 23.49 lakh [17.98 lakh – 30.98 lakh] people are living with HIV in India, with an adult prevalence of 0.22 per cent. Adults (aged 15+) account for 22.70 lakh (97%) of the HIV infected population while 0.79 lakh (3%) are children (aged 0-14 years). In 2007, approximately 127.58 thousand new HIV infection was reported, compared to 69.22 thousand people in 2019. It was estimated that about 190 new infections per day in 2019, where 40 per cent were females. In 2007, approximately 148.31 thousand people died from AIDS-related disease, then 69.22 thousand people in 2019. Since 2007, the estimated number of PLHIV has increased to 6 per cent in 2019.

Following the National Family Health Survey grouping, the 35 States/UTs are classified into six regions; north, east, west, south, central, northeast (Table 1.3). The Northeast regions have the highest HIV prevalence above the national average since 2007, followed by the West and South regions. The national HIV prevalence rate continues to be low, but the prevalence rate for 14 states/UTs is higher than the national average. The states are Mizoram, Nagaland, Manipur, Andhra Pradesh, Meghalaya, Telangana, Karnataka, Delhi, Maharashtra, Puducherry, Goa, Punjab, Dadra and Nagar Haveli and Tamil Nadu. Since 2015, the HIV prevalence has increased in Mizoram, Nagaland, Meghalaya, Delhi, Haryana, Punjab, Andaman and Nicobar, Dadra and Nagar Haveli and Daman and Diu.

In 2019, the South regions accounted for 9.3 lakh (39%) of the people living with HIV and 25.72 thousand (44%) people of AIDS-related deaths in India (Table 1.4). Among the states, Maharashtra had the highest number of PLHIV with 3.9 lakh (17%) and the highest number of new HIV infection with 8.54 thousand (12%), and Andhra Pradesh has the highest AIDS-related deaths with 11.43 thousand (19%) cases in India. There were 15 states, ranging between 2000-3000 new HIV-infection in 2019, accounting for four-fifths of its annual HIV infection. The Northeast regions that account for only 5 per cent of the total PLHIV in India have the highest HIV incidence per 1,000 uninfected population and AIDS-related deaths per 100,000 population. In 2019, 20.52 thousand women required treatment services to avert mother-to-child HIV transmission. Maharashtra, Bihar and Uttar Pradesh each have more than 10 per cent of the national PMTCT need.

Table 1.4: Summary of HIV Epidemic in Indian States/UTs by Regions, 2019

Regions	States/UTs	In thousand				In per cent				HIV incidence per 1000 uninfected population	AIDS-related mortality per 100,000 population
		No. of PLHIV	No. of annual infection	No. of annual AIDS-related deaths	No. of PMTC Needs	No. of PLHIV	No. of annual infection	No. of annual AIDS-related deaths	No. of PMTC Needs		
Northeast	Mizoram	20.05	1.37	0.34	0.27	0.85	1.98	0.58	1.32	1.18	28.34
	Nagaland	22.55	1.55	0.57	0.4	0.96	2.24	0.97	1.95	0.73	26.2
	Manipur	28.56	0.96	1.08	0.36	1.22	1.39	1.83	1.75	0.34	36.86
	Meghalaya	11.28	0.73	0.36	0.28	0.48	1.05	0.61	1.36	0.23	11.08
	Tripura	2.86	0.45	0.02	0.03	0.12	0.65	0.03	0.15	0.11	0.46
	Assam	21.22	1.33	0.57	0.33	0.9	1.92	0.97	1.61	0.04	1.67
	Sikkim	0.35	0.02	0.004	0.004	0.01	0.03	0.01	0.02	0.03	0.64
	Arunachal Pradesh	0.66	0.07	0.02	0.01	0.03	0.1	0.03	0.05	0.05	1.14
	Total	107.53	6.48	2.964	1.684	4.58	9.36	5.03	8.21	2.71	106.39
East	Bihar	134.49	8.04	2.33	2.53	5.73	11.62	3.95	12.33	0.07	2.04
	Jharkhand	22.75	1.3	0.43	0.35	0.97	1.88	0.73	1.71	0.04	1.17
	Odisha	49.15	2.17	1.74	0.49	2.09	3.13	2.95	2.39	0.05	3.88
	West Bengal	74.2	3.97	1.37	0.68	3.16	5.74	2.32	3.31	0.04	1.4
	Total	280.59	15.48	5.87	4.05	11.95	22.36	9.96	19.74	0.2	8.49
North	Chandigarh	2.36	0.12	0.09	0.01	0.1	0.17	0.15	0.05	0.08	5.74
	Delhi	67.94	2.99	1.1	0.57	2.89	4.32	1.87	2.78	0.15	5.21
	Haryana	44.76	2.62	1.95	0.42	1.91	3.79	3.31	2.05	0.09	6.83
	Himachal Pradesh	7.05	0.16	0.07	0.05	0.3	0.23	0.12	0.24	0.02	0.96
	J&K & Ladakh	6.04	0.32	0.13	0.05	0.26	0.46	0.22	0.24	0.02	0.97
	Punjab	65.83	2.37	1.42	0.46	2.8	3.42	2.41	2.24	0.08	4.75
	Rajasthan	62.98	2.77	0.71	0.86	2.68	4	1.2	4.19	0.04	0.93
	Uttarakhand	10.96	0.49	0.34	0.1	0.47	0.71	0.58	0.49	0.04	3.08
	Total	267.92	11.84	5.81	2.52	11.41	17.1	9.85	12.28	0.52	28.47
Central	Chhattisgarh	42.52	2.83	1.48	0.58	1.81	4.09	2.51	2.83	0.1	5.25
	Madhya Pradesh	59.3	2.89	1.82	0.61	2.52	4.18	3.09	2.97	0.04	2.23
	Uttar Pradesh	160.6	6.72	3.87	2.21	6.84	9.71	6.56	10.77	0.03	1.71
	Total	262.42	12.44	7.17	3.4	11.17	17.97	12.16	16.57	0.17	9.19
West	Dadra & Nagar	0.75	0.07	0.01	0.01	0.03	0.1	0.02	0.05	0.17	1.89
	Daman & Diu	0.47	0.02	0.01	0.004	0.02	0.03	0.02	0.02	0.07	1.67
	Goa	4.53	0.06	0.17	0.02	0.19	0.09	0.29	0.1	0.03	9.68
	Gujarat	103.51	3.37	1.57	0.99	4.41	4.87	2.66	4.82	0.05	2.37
	Maharashtra	396.35	8.54	9.69	3.01	16.87	12.34	16.43	14.67	0.07	7.81
	Total	505.61	12.06	11.45	4.034	21.53	17.42	19.42	19.66	0.39	23.42
South	Andaman&Nicobar	0.49	0.02	0.02	0.01	0.02	0.03	0.03	0.05	0.05	4.05
	Andhra Pradesh	313.73	2.82	11.43	1.39	13.36	4.07	19.39	6.77	0.05	21.76
	Karnataka	269.47	1.57	6.39	1.39	11.47	2.27	10.84	6.77	0.02	9.72
	Kerala	24.21	0.8	0.53	0.16	1.03	1.16	0.9	0.78	0.02	1.5
	Puducherry	4.77	0.26	0.26	0.03	0.2	0.38	0.44	0.15	0.16	15.33
	Tamil Nadu	154.61	2.62	3.01	0.85	6.58	3.79	5.11	4.14	0.04	4.01
	Telangana	157.51	2.82	4.08	1.03	6.71	4.07	6.92	5.02	0.08	10.79
	Total	924.79	10.91	25.72	4.86	39.37	15.76	43.62	23.68	0.42	67.16
	India	2348.86	69.22	58.96	20.52	100	100	100	100	0.05	4.43

Source: Data from NACO & ICMR-NIMS (2020)

1.3.1 National Response

In 1986, the first HIV case in India was identified among the commercial sex workers in Chennai, Tamil Nadu. In response, the GOI formed the National AIDS Committee headed by the Secretary, Ministry of Health and Family Welfare (MoHFW) in the same year. In 1987, the first initial AIDS programme was launched to monitor HIV infection among the high-risk population and focusing on blood screening and health education. The Medium-Term Plan (1990-92) was started in few selected states (Maharashtra, Tamil Nadu, West Bengal, Manipur) and metropolitan cities (Mumbai, Chennai, Kolkata, Delhi). In 1992, the GOI formed the National AIDS Control Organisation (NACO) and launched the first National AIDS Control Programme (NACP).

The MoHFW consists of AIDS Control, Health and Family Welfare, Ayush and Health Research Departments headed by a secretary to the GOI. On 7th August 2014, the Department of AIDS Control and the Department of Health & Family Welfare join together and form the National AIDS Control Organisation (NACO). NACO is the nodal organisation that formulates policy and implement a program to prevent, control, and treat HIV/AIDS in India. NACO provided free Antiretroviral Therapy (ART) to PLHIV and took measures to ensure equal use of quality health facility and services. Under NACO, the State AIDS Control Society (SACS) was formed in the States/Union Territories (UTs) to measure and ensure its programme at the state. There are currently 35 HIV/AIDS Prevention and Control Societies under the leadership of NACO. With the discovery of the new HIV case and its rapid increases all over the states, NACO started the NACP-I (1992-1999), NACP-II (1999-2006), NACP-III (2006-2012), and the NACP-IV (2012-17) to combat the epidemic. The fundamental pillars of the NACP are prevention and treatment.

The National AIDS Control Programme Phase-I (1992-1999): In 1992, the first programme called NACP-I was initiated to slow down the HIV infection and the AIDS impact with support from the World Bank. Its key strategies were to monitor HIV infection by setting up a surveillance system, awareness, blood safety, and services for the high-risk groups (HRGs). The NACP-I has set up State AIDS Cells (SACs) in 25 States and seven Union Territories, strengthening the HIV/AIDS response at the national as well as state level. It established a partnership with WHO and other

international agencies such as USAID, DFID, and CIDA. The achievement includes an improved and expanded blood safety program, public awareness of HIV, condom promotion program, sentinel surveillance, data coverage, STI control and ANC clinics. The national HIV testing policy was formed and disseminated under the first phase by setting up around 154 zonal blood testing sites.

The National AIDS Control Programme Phase-II (1999-2006): In 1999, the second programme called NACP-II was launched to strengthen the existing objectives and adopted key initiatives on HRGs intervention, blood policy, a strategy for HIV/AIDs patients, introducing basic services (counselling and testing) and an ART programme. NACP-II focuses on high-risk population, such as commercial sex workers (CSWs), men who have sex with men (MSM), injecting drug users (IDUs) and bridge population (migrants and truckers) and provided a package consisting of targeted interventions (TIs). The packages include behaviour change communication or peer education, STI treatment, condom promotion, condom provision, needle/syringe provision, with a conducive environment and community. Within the district level, 1033 TIs among HRGs, 875 Voluntary Counselling and Testing (VCT) Centres and 679 STI clinics were set up. In addition, the Behaviour Sentinel Surveillance (BSS) surveys were conducted at the national and state levels. NACP-II achievement includes an expanded and strengthened programme of its prevention of parent-to-child transmission (PPTCT) and free antiretroviral therapy initiation. During NACP-II, a Computerized Management Information System (CMIS) was started with a Computerized Project Financial Management System (CPFMS).

The National AIDS Control Programme Phase-III (2006-2012): In 2007, the third National AIDS Control Programme (NACP-III) was introduced to halt and reverse the epidemic by expanding prevention services among the HRGs and general population along with the treatment services for PLHIV. NACP-III also aim to strengthen the Strategic Information Management System (SIMS) in the management and technical aspects. In India, the two main pillars of all HIV/AIDS services are prevention and treatment. During the NACP-III, the Targeted Intervention projects have expanded to 1,821 projects during 2007-2012. In 2011, it covered 59.3 lakh population, which includes; FSWs (81%), IDUs (80%), MSM (67%), Migrants (47%) and Truckers (57%). Under NACP-III, 159 blood component separation units, 355 ART centres, 253

community Care Centres, and 10,515 Integrated Counseling and Testing Centres (ICTC) were set up. In 2008, the universal access of the second-line ART was started, and in 2009, it was scale-up to 10 centres. The achievements include treating 5.2 lakh PLHIV with ARV drugs. In 2010, the Condom Social Marketing Programme was launched, where the number of districts that came under the programme scale up to 370. Such a scale-up covered almost 80 per cent of the adult population. The distribution of condom had risen from 11 crores to 36 crores in 2008-09 and 2010-11 respectively. Between 2008-09 to 2010-11, the number of condom stocking outlets have expanded from 2.4 lakh to 6.55 lakh. During 2007-2011, the estimated annual AIDS-related deaths have reduced by 29 per cent, and the new HIV infection declined by 57 per cent.

The National AIDS Control Programme Phase-IV (2012-2017): In 2012, the fourth called NACP-IV was started to expedite the reversal process and reinforce its epidemic response. This programme aimed to bring down the new infection by 50 per cent and provide comprehensive care, support, and treatment to all PLHIV. The NACP-IV focuses on five key strategies; prevention, treatment, institutional strengthening, IEC and SIMS. During 2012-2017, the NACP-IV achievement includes an improved and expanded Opioid Substitution Therapy (OST), migrant interventions, transgender's interventions, Employer-Led Model, female condom programme, PPTCT and social protection programme through mainstreaming. Under NACP-IV, the Metro Blood Banks and Plasma Fractionation Centre were established, and the third-line ART was launched. A new policy called '*Test and Treat Policy for HIV*' was launched by the Union Minister for Health and Family Welfare, Government of India, on 28th April 2017. In September 2015, WHO had announced a global policy to treat all people with HIV. The new policy commits to reaching out to all community to find all people infected with HIV and provide effective treatments to improve their longevity and quality of life.

The National AIDS Control Programme Phase-IV (Extension), 2017-2020: The current NACP-IV extension is under implementation for 2017-20 through 37 State/District AIDS Control Societies. The main components are prevention, IEC services, HIV counselling and testing services (HCTS), treatment services, laboratory services, strategic information and mainstreaming and partnership to strengthen the

multisectoral response. The Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome (Prevention and Control) Act 2017 came into effect on 10 September 2018. The Bill was introduced to prevent and control HIV/AIDS transmission and protect people living with HIV and its affected minors. In addition, the GOI developed the National Strategic Plan (NSP) for HIV/AIDS and STI (2017-2020) to meet the 2030 SDG towards ending AIDS as a threat to public health by 2030. The fast track target by 2020 was to achieve a 75 per cent reduction in new HIV infections and 90-90-90 treatment targets, viz., eliminating nine-tenths of the mother-to-child HIV transmission, syphilis, stigma and discrimination. NACO vision of an AIDS-free India, to be met through universal coverage of HIV prevention and treatment services, targets an 80 per cent reduction in new HIV infections and 95-95-95 treatments targets by 2024.

Table 1.5: In-patient Expenditure of All Diseases vs. AIDS Disease (July 2017-June 2018)

Cases	Expenditure and Loss of Income	Amount (In Rs.)
ALL Diseases	Medical	15448
	Non-Medical	1321
	Total Expenditure	17419
	Loss of Household Income	1951
AIDS Disease	Medical	9824
	Non-Medical	811
	Total Expenditure	11087
	Loss of Household Income	728

Source: Computed from NSS 75th Round Data

1.3.2 National Hospitalisation Cases

According to the National Sample Survey (NSS) 75th Round, it was found that out of 93,924 hospitalisations, only 42 were AIDS hospitalisation cases in all of India. Nine-tenths of the hospitalisation cost accounts for medical expenses. Table 1.5 showed that from July 2017 to June 2018, the average medical expenditure was Rs 15,448 for all diseases and Rs 9824 for AIDS disease cases. The average household income loss accounts for Rs 1951 and Rs 728 for all diseases and AIDS disease cases.

1.4 Review of Literature

HIV/AIDS epidemic has affected every facet of human life by imposing substantial burdens on individuals, household, communities and nations (UN, 2004). The literature review part of this chapter discussed the various aspects of HIV/AIDS directly or indirectly linked with the economic burden. The literature includes the management and cost of HIV/AIDS services. Callen et al. (2004) examined HIV/AIDS as one factor causing demographic changes; increasing mortality, affecting households, societies, and economic growth. The impact of HIV/AIDS can be broadly classified into the following:

1. Demographic and health
2. Socio-economic
3. Health Sector and Public Sector
4. Economic growth

1.4.1 Impact on Demographic and Health

HIV/AIDS impact on demographics and health is addressed on its mortality and morbidity outcomes, particularly life expectancy and disability-adjusted life years (DALYs). The WHO Global health estimates show that in 2000, HIV/AIDS was the eighth global leading cause of death; approximately 1.4 million people died from AIDS-related disease. Nine-tenths of the HIV/AIDS deaths have been among the working-age group (15-49 years). The current burden of HIV/AIDS and its consequences, such as death and orphanhood, is likely to be a dilemma worldwide for the foreseeable future (Epstein, 2004). In a cohort study in Iran, Mohammadi-Moein et al. (2013) found that HIV/AIDS infected patients have about 38 years less than the standard life expectancy at the age of 20. The years of life lost due to premature death was 1597 years during 2001-2011. Yaghoobi et al. (2017) estimated that HIV/AIDS infected patients in Nepal have about 46 years less than the standard life expectancy at the age of 20. The years of life lost due to premature death was 8839 years during 2005-2015. Bor et al. (2013) studied adult life expectancy changes in South Africa during 2000-11. They found that the adult life expectancy increased from 49.2 years to 60.5 years since the availability of ART treatment in the public health services from 2003. Since the initiation of ART treatment, HIV-positive life expectancy has

increased during the past decade in both high and middle-income countries as well as the low-income countries (May et al., 2011; Samji et al., 2013; Johnson et al., 2013; Nsanzimana et al., 2015; May et al., 2015; Patterson et al., 2015). However, HIV positive life expectancy was not yet close to the standard life expectancy due to ART's initial start (Wandeler et al., 2016). The United Nations (2017) projected that between 2010-2015 to 2045-2050, the global life expectancy at birth increases from 71 years to 77 years. The gains are contingent on HIV/AIDS reductions and other non-communicable diseases.

Murray and Lopez (2013) reviewed the epidemiological transition between 1990 and 2010 and highlight that HIV/AIDS became the top 5 global causes of DALYs in 2010. The DALYs lost due to HIV/AIDS increase from 18,118 thousand DALYs in 1990 to 81,549 thousand DALYs in 2010. Ortblad et al. (2013) calculated the burden of HIV/AIDS using DALYs at the global and country levels. They estimate that HIV accounts for 2.8 per cent of the global deaths and 3.3 per cent of the global DALY during 2010. Regardless of the decrease in HIV/AIDS mortality, they found that it continues to be the top causes of mortality and burden globally and ranked the most common DALY cause for both sexes for 30–44 age groups. WHO (2013) estimated 91.9 million DALYs were lost due to HIV/AIDS globally in 2012; Africa (73%), South-East Asia (13%), Europe (5%), Eastern Mediterranean (2%), Western Pacific (4%), and the Americas (4%). Since 2000 DALYs lost due to HIV/AIDS has decreased by 19.2 per cent. However, HIV/AIDS remains the major cause of mortality across African countries. The decline in DALYs lost is mainly due to a decline in AIDS deaths (Wang et al., 2016). However, morbidity reduces by only 9.6 per cent, while mortality reduced by 18 per cent (UNAIDS, 2016).

Danforth et al. (2017) highlight the need for improved surveillance systems and techniques for effective treatment and other prevention interventions regarding the micro-epidemic and cost of illness in India, East and Southern Africa, and the United States countries. The Global Burden of Disease Study 2017 (IHME, 2018) reports that the age groups 15 to 49 years and under-five years are the most at risk of HIV/AIDS-related death. Since the past four decades, there has been 32.7 million global AIDS-related death. HIV/AIDS has been one of the leading global cause of death, and Eastern and Southern Africa have been the hardest hit. Gona et al. (2020) conducted the

HIV/AIDS burden study on sixteen Southern Africa Development Community (SADC) countries. The estimates show 336,175 death due to HIV/AIDS in 2017, causing more than 20 million DALYs. The overall burden of HIV/AIDS had increased three-fold compared to 1990. Five countries (Botswana, South Africa, Lesotho, Eswatini and Mozambique) has the highest HIV/AIDS burden, around 14 times higher than the global average.

1.4.2 Impact on Socio-economic Conditions

The enormous increase in HIV/AIDS mortality and morbidity has led to a circle of poverty or development trap due to its contribution to productivity loss and income loss/reduction. HIV/AIDS contributed an enormous burden in the households due to its economic, social and psychological consequences. Different studies in Zambia, Uganda, United Republic of Tanzania, India, Burundi, Haiti, Core d'Ivoire, Sri Lanka, and Thailand between 1989 to 1998 revealed a rapid shift in the socio-economic conditions of the AIDS-affected households (Haworth et al., 1991; Baier, 1997; Basu et al., 1997; Bloom et al., 1997; Béchu, 1998; Janjaroen, 1998; Menon et al., 1998). This rapid transition is caused due to decrease in labour quality and quantity, crops and livestock, income and an increase in disposable income such as medical bills and funeral expenses. Booysen (2003) examined HIV/AIDS impact on the household level's socio-economics condition using a cohort study. The findings show that HIV/AIDS affected households were more presumably to be twice poorer than unaffected households.

The United Nations (2004) classified the household impact of AIDS into three kinds; loss of income of the breadwinner in the family, increased household expenditure such as medical costs, and the opportunity cost of taking care of AIDS patients. In 2002, ILO (2004) conducted a study in four states having the highest HIV prevalence, viz; Delhi, Maharashtra, Manipur and Tamil Nadu. The study showed that expenditure on medicines increased by 38 per cent after the advent of HIV in the household. During 2005-06, few studies in India's six high HIV prevalence states showed that HIV household has medical expenses four times higher than the non-HIV households. They also found that absenteeism contributes to significant income loss among HIV households (Pradhan, Sundar & Singh., 2006; Pradhan, Sundar & Mondal., 2006;

Pradhan, Sundar & Natesh., 2006). The HIV affected household cope with these direct impact of income loss and medical expenditure by selling assets, borrowing, using savings, reduction of food and non-food consumption such as health care, withdrawal from schools and joining the labour force to uplift the financial crisis (Booysen et al., 2002; Mahal & Rao., 2005; Duraisamy et al., 2006; Taraphdar et al., 2011; Falleiro, 2014; Bhavsarl et al., 2015; Poudel et al., 2017). These coping strategies have a substantial negative impact on the socio-economic condition in the long run.

HIV/AIDS mortality also has an enormous effect on children into orphanhood with significant implications in the households, well-being and living arrangements. Studies on the dimension of orphan due to AIDS in different countries/regions found more paternal orphans than maternal orphans. Moreover, orphanhood has a significant association with lower educational attainment (Ainsworth et al., 2002; Bicego et al., 2003; Busingye et al., 2003; Monasch et al., 2003; Case et al., 2004). Since 2000, at least 10 million under 18 have lost one or both parents due to HIV/AIDS (UNICEF, 2015). In 2009 and 2015, UNICEF estimated that around 15 million and 13 million children lost one or both parents due to the deadly HIV/AIDS and its related death (UNAIDS, 2016). Hence, HIV/AIDS has still tremendously affected the livelihood of children across the globe.

1.4.3 Impact on Health Sector and Public Sector

The HIV/AIDS crisis forced a substantial burden on the health care system by increasing the demand for prevention and treatment services. Developing countries with highly affected regions were hit the hardest; they struggled to provide primary health care even before the HIV/AIDS crisis. The public sector is keen to face a trade-off through different dimensions on HIV/AIDS treatment, prevention, expenditure and other diseases or interventions (Bollinger & Stover, 1999). From 1991 to 1996, the annual treatment costs of an AIDS patient equals the cost of providing education to ten primary school students (World Bank, 1997). Therefore, HIV/AIDS and its related illness is costly to treat than other diseases. Due to the high cost of HIV/AIDS treatment and prevention, the government subsidises HIV/AIDS services by reducing their subsidies on other services.

Many studies showed that HIV/AIDS services expenditures are a hefty burden since the beginning of the epidemic. Kongsin et al. (1998) found that \$95.5 million was spent solely on AIDS prevention and treatment during 1995 through its public and private sources in Thailand. Izazola et al. (1998) estimate that \$79.1 million was spent on AIDS and its related health care and prevention during 1995 in Mexico. This spending adds up to 1 per cent of the total Mexican health expenditures. More than three-fifths of this expenditure accounts for treatment services. Kone et al. (1998) study in 1995 revealed that AIDS expenditures in Côte d'Ivoire accounted for 8.5 per cent of its total health expenditures. More than nine-tenths of this expenditure accounts for treatment services. In 1994, Shepard et al. (1998) conducted a study in Brazil, Côte d'Ivoire, Mexico, Thailand and the United Republic of Tanzania. They found that HIV/AIDS health-related expenditures have increased in all the countries. The AIDS expenditure escalates with the rise in HIV prevalence and gross national product per capita. In Tanzania, Tibandebage et al. (1998) found that 84 per cent of the HIV/AIDS financial resources were earmarked for prevention. Despite that, 60 per cent of its total HIV/AIDS expenditure was spent on treatment services.

The World Bank (1999) estimated that even in the absence of antiretroviral therapy, the health care expenditure for HIV/AIDS services increases by over 40 per cent. In India, Anand et al. (1999) estimated that during 1986-95 the total annual cost of HIV/AIDS was Rs 20.16 billion, which accounted for about 1% of the GDP. The cost of treatment and productivity loss were the significant components in their study, while the costs of ARV drugs were excluded. In Canada, Dodds et al. (2000) estimated that in 1999 the economic cost of HIV/AIDS was more than \$2 billion. The direct healthcare costs accounted for \$600 million, and the indirect cost of premature death accounts for \$1446 million. Despite the enormous burden of HIV/AIDS, the study highlighted that education, prevention strategies and HAART treatment are highly cost-effective and long-term cost saving in lessening the new infection and death cases.

HIV/AIDS is the underlying cause of absenteeism and illness among health workers in highly affected countries. During 1991-1992, the HIV prevalence was found more than 39 per cent among the health workers in Zambia (Whiteside, 2002). HIV/AIDS continue to increased the demand for public health sector services. Callen et al. (2004) highlight that a 5 per cent HIV prevalence rate could result in 26 per cent increase in

demand for opportunistic infection treatment alone. The HIV/AIDS impact in the health sector prompt to shortage of health professional, an increase in demand for health care, an increase in its health expenditure and its consequences on human capital investment of working age groups and children (United Nations, 2004).

The HIV/AIDS impact on the health sector can be estimated using the burden of disease approach. The cost of HIV/AIDS services is calculated in monetary terms from the provider perspective, i.e., the public sector. In India, Ramesh and Somen (2006) calculated that the unit cost of providing ART services in 2005 was Rs 668 per month under the NACP-III. They found that the recurrent cost added up to 78 per cent of its total cost, of which ARV drugs accounted for 55 per cent and CD4 regimen for 20 per cent. Gupta et al. (2006) estimated the provision cost of ART services in India from the public sector, individual and societal perspectives. They calculated that the monthly average cost of ART services was \$30 (Rs 1264) per clients. The monthly cost of assessing ART services incurred by the clients was \$21 (Rs 900), and the societal cost was Rs 2064 per month. In Thailand, Over et al. (2007) estimated that the average annual cost of ART first-line therapy was US\$840 per patient in 2006 prices under the '*National Access to Antiretroviral Program for People Living with HIV/AIDS*' (NAPHA). They found that the antiretroviral drugs and laboratory monitoring costs together accounted for almost three-fifths of the total ART expenditure.

In five European countries, the impact of HIV/AIDS treatment costs was studied, indicating that the economic burden of the total health care cost was relevant despite its low HIV prevalence (Trapero & Olivia, 2014). The study suggested the need for cost studies based on its social perspective. The WHO recommendation of immediate ART initiation on the patient was cost-effective in South Africa, Nigeria, Uganda and India. In India, Kuznik et al. (2016) showed that immediate initiation result with a cost per disability-adjusted life years averted \$78 (2014 USD). They estimated that the annual ART drug and management cost was \$221, pre-ART was \$73, and ART initiation was \$28 (2012 US\$). Agarwal et al. (2017) calculated the annual cost for ART services in India during 2013-14 FY at US\$ 133.89 (Rs 8032) per patient, of which 66 per cent of the expenditure was spent on antiretroviral drugs and 34 per cent on non-ART recurrent. They estimated the annual cost of pre-ART care at US\$ 33.05

(Rs 1983) per patient. However, the study did not include indirect costs, capital costs, and cost incurred for the ART's functioning. In India, Sharma et al. (2019) estimated that the per capita cost of ART services in the Centre of Excellence (COE) was US\$738 (Rs 48,975) and US\$376 (Rs 24,954) in the ART centre during 2014-15 FY. They found that the costs of antiretroviral drugs accounted for around seven-tenths of the total ART expenditure.

1.4.4 Impact on Economic Growth

The HIV/AIDS epidemic affects the economy by adversely impacting households, firms, and the government. Its diverse impact on social, public and living standards causes a severe impact on macroeconomic indicators such as economic growth, income per capita, savings and investment. HIV/AIDS mortality and morbidity slowed down the labour supply, reduced savings and investments due to increases in HIV/AIDS-related expenditure, and affected the rate of investment return due to increased HIV/AIDS public spending. As a result, it deepens poverty by decreasing the per capita income growth rate. The economic impact of HIV/AIDS were commonly analyzed in social research using the macro-econometric models, macro-simulation models, and Computable General Equilibrium (CGE) models. However, much of the available literature emphasising the economic impact of HIV/AIDS was concentrated mainly on the southern part of Africa due to its high HIV adult prevalence.

In Cameroon, Kambou et al. (1992) studied the economic impact of the HIV/AIDS epidemic during 1986-1991 using computable general equilibrium models. They found that during a year, the GDP growth rate had dropped by 1.9 per cent. During 1990-2025, Over et al. (1992) projected the macroeconomic impact of AIDS on thirty sub-Saharan African countries. They found that the average annual GDP growth reduced by 0.9 per cent, where it reduced up to 1.5 per cent in the ten most affected countries. Studies in the early 1990s used macro-simulation models to predict economic growth during 1985-2010. It was found that in Tanzania and Malawi, the GDP growth had decreased by 1.1 per cent and 1.5 per cent, respectively. (Cuddington, 1993a; Cuddington, 1993b; Cuddington & Hancock, 1994). Bloom & Mahal (1997) studied the impact of the AIDS epidemic on economic growth during 1980-1992 in

fifty-one developing countries. The study highlighted that statistically, the epidemic has an insignificant effect on income growth.

Using the simulation model by generating no-AIDS and AIDS scenarios, Arndt and Lewis (2000) found that during 1997-2010 AIDS lower the annual average growth rate of GDP per capita to 0.7 per cent in South Africa. Using cross-country macro-level regressions, Bonnel (2000) found that in sub-Saharan African countries, the GDP per capita dropped to 0.7 per cent in a year, while it reduced by 1.2 per cent for a country having 20 per cent HIV prevalence during 1990-1997. In South Africa, Quattek (2000) forecasted the average GDP growth rate for the next fifteen years and found that it reduced by 0.3-0.4 per cent per year. BIDPA (2000) used a two-sector three-factor equilibrium model and projected Botswana's economy from 1996 to 2021 and found that AIDS decreased the annual growth rate of GDP by 1.5 per cent, where the shortage of skilled workers increased. Sackey and Raparla (2000) analysed the development impacts of HIV/AIDS on Lesotho's economy during 1999-2015 using demographic and economic models. They projected that the average annual growth rate of GDP dropped to 1.4 per cent, and the average annual growth rate of GDP per capita dropped to 0.3 per cent.

World Bank (2001a; 2001b) studied the developmental impact of HIV/AIDS in Southern Africa. They projected that during 1991-2015 the average annual growth rate of GDP dropped to 0.8 per cent and 1.3 per cent in Namibia and Swaziland, respectively. Meanwhile, the average annual growth rate of GDP per capita increased by 0.1 per cent and 0.2 per cent in Namibia and Swaziland. Dixon et al. (2001) analysed the impact of the HIV epidemic in 41 African countries economic growth during 1960-1998. They found that the GDP growth rates dropped from 4 per cent to 2 per cent per year. A study in Caribbean countries found that in 2005 the HIV/AIDS epidemic reduced the GDP by 2.1 per cent in Saint Lucia, 4.9 per cent in Jamaica and 5.6 per cent in Trinidad and Tobago, where the per capita treatment cost of HIV/AIDS was estimated at \$4000 (Theodore, 2001). In the Russian Federation, a study on the HIV economic consequences in 2010 projected that GDP was reduced by 4.5 per cent (Ruehl et al., 2002). A study in Algeria, Djibouti, Egypt, Iran, Jordan, Lebanon, Morocco, Tunisia and Yemen projected that without AIDS, the annual growth rate of GDP decreased by 0.3 to 0.4 per cent in 2000-2025. Ojha and Pradhan (2006) analysed

the macro-economic sectoral impacts of HIV/AIDS in India during the FY 2002-16. They found that in the '*with-AIDS*' scenario, the annual GDP growth rate was 0.86 percentage point lesser, and the growth of per capita GDP decreased by 0.55 percentage points.

A handful of studies applied the Human Development Index (HDI) introduced by the United Nations Development Programme (UNDP) as a benchmark to measure the HIV/AIDS impact. It was found that the HDI can be highly affected through the HIV/AIDS crises outcomes on the life expectancy rate (Cohen, 1998; Gaigbe, 2001). In other approaches, '*the economic value of health*' is quantified as an aspect of welfare. Jamison et al. (2001) found that the AIDS epidemic in Botswana, Kenya, Malawi, Zambia and Zimbabwe had an immense impact on the annual growth rate in economic welfare; it declined between 5 and 8 per cent per year from 1985 to 2000. Some studies have found a positive relationship between health and GDP growth. Swift (2011) found a long-run relationship between life expectancy and GDP in thirteen OECD countries. In South Africa, Crafts and Haacker (2003) projected the impact of HIV/AIDS on GDP and found that welfare losses correlated with increased mortality at around 80 per cent of GDP. WHO (2019) estimated the GDP losses due to DALYs in the African region and found that 27 per cent of the total productivity losses were due to infectious diseases such as AIDS, Tuberculosis (TB), and Malaria.

1.4.5 Summary

It can be summarised that HIV/AIDS has drastic economic implications at the national, sectoral, and individual levels. The increase in HIV/AIDS-related mortality has a severe impact on the life expectancy of children (under-five age group) and the working-age groups (15-49 years). Despite the expansion in treatment and prevention, HIV/AIDS remained among the major causes of DALYs. HIV/AIDS causes a rapid shift in the socio-economic conditions of the affected households, chiefly due to income loss and increasing medical expenditures. The epidemic weighs down the health care system and public sector due to its increasing demand for prevention intervention and treatment services. It further affects economic performance due to its loss of human capital. Beyond its reduction in GDP growth, the epidemic projected to worsen income inequalities and poverty.

1.5 Research Gaps

The existing literature is abundant, with studies on HIV/AIDS and its implications in different spheres. Many studies have covered medical, clinical, public health, demographic, political, social and economic aspects. It is indeed a successful narrative looking back on how the epidemic evolves over the last 40 years. It can be forecasted that the global goals to reverse the epidemic will be awarded in the near future. However, the resource needs to tackle the problem is still a far cry in developing and less developed countries. Accordingly, the literature available on HIV/AIDS is not enough with the ongoing interventions and development. There is a need for a study that would restore the existing models or patched the hole in the operations. Therefore, it is not merely a public health issue as it associates with different factors and consequences at the micro and macro levels under a diverse society. Likewise, there is ample literature on HIV/AIDS from different perspectives at the international level. Within the diverse culture, education and economic status, there is a need to explore the missing links or divergence towards reversing the epidemic within the regional, national or community level.

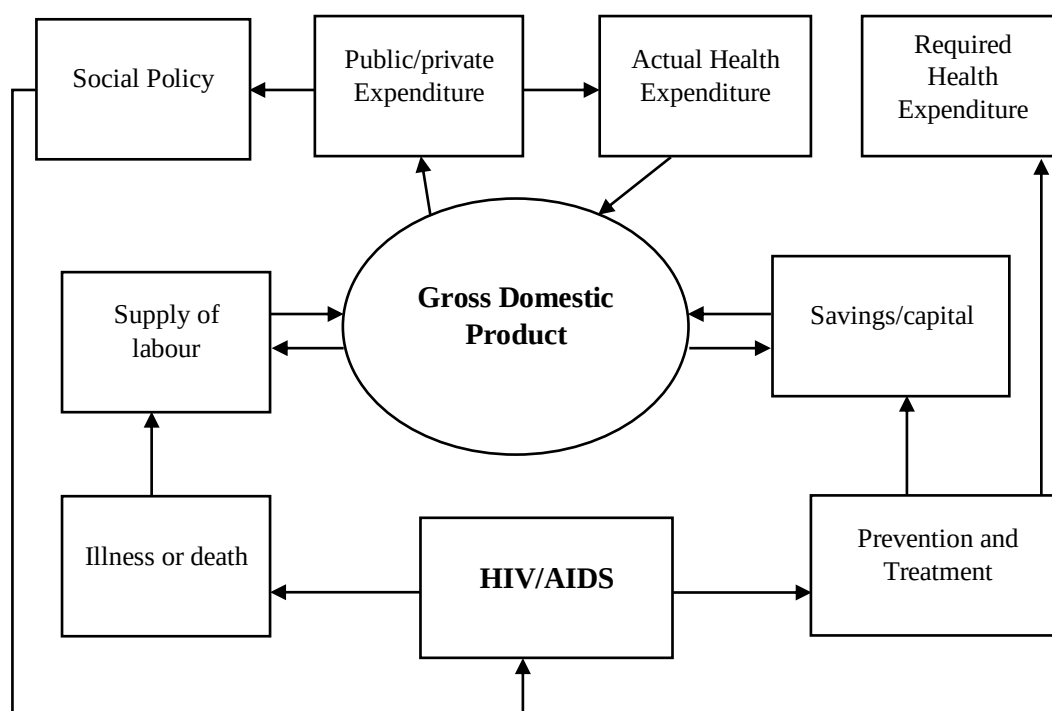
In India, studies on HIV/AIDS mainly focussed on different aspects: medical, knowledge attitude behaviour and practice, socio-economic impact, economic costs and its consequences on the macroeconomy. Available studies that comprised the prevention and treatment services are mainly from the social-work point of view. The available cost studies on HIV/AIDS services have a limitation in their cost components and scope. Studies on macroeconomic projection are uncertain due to its varied methodology leading to an extensively different outcome. Many costs of illness studies on HIV/AIDS are based on the impact on the household sector. In a nutshell, studies on HIV/AIDS are mainly based upon the demand side, such as individual, household and social prospects. Therefore, very few are initiated from the supply-side provider perspectives. There is a definite dearth of studies in India that attempt to quantify the burden of the HIV epidemic on the economic consequences using Disability Adjusted Life Years (DALYs) metrics. There exist very few studies using the health gaps measure. However, none of the available studies has attempted to explore and scrutinised the cost of HIV/AIDS services in the Northeast regions.

1.6 Conceptual Framework

HIV/AIDS causes mortality and morbidity of young adults (15-49 age group), affecting the economy, households and society. The labour supply, household savings, public spending, private/public investment and poverty trap are the several ways HIV/AIDS affects the economy. According to Theodore (2001) model, there are four routes through which HIV/AIDS affects the economy: production, allocation, distribution, and regeneration, as shown in Fig:1.1. The first route adverts how the epidemic determines the main determinants of production (labour and capital) due to its morbidity and mortality losses. The second ensures efficient resource allocation where the epidemic diverts resources to medical expenses and other productive uses. The third route implies the impact on income distribution where the epidemic hikes the health expenditures spending and exhaust the income base widening the variations between different social bracket. Finally, the fourth route applies to the investments in the human capital, which obliged to keep the economy flourishing.

In macroeconomics, human capital is one of the factors of production along with land, labour, and capital (physical), determining economic growth. According to Grossman (1972), human capital is a consumption good and an investment good. The theoretical framework followed in the analysis is based on the human capital approach that measures productivity loss due to temporary/permanent work absences from premature death or disability (Goeree et al., 1999). In health evaluation, the human capital approach is applied to measure the monetary value of loss of health due to work absence from illness, diseases, injury, and other risk factors. It estimates the potential value of productivity loss due to mortality or morbidity, where *“the value of the human capital is determined by the value of the average future earnings”* (Weisbrod, 1961a; 1961b; Klarman, 1963; Rice, 1967; Clabaugh & Ward, 2008; Grosse, 2009). The work absenteeism due to illness is contemplated and evaluated by the achievable gross income. It calculated the indirect costs of productivity losses using wages as a measure of output.

Figure 1.1: Conceptual framework for the economic impact of HIV/AIDS



Source: Theodore, K. (2001). Available from:

<https://www.un.org/en/development/desa/population/publications/pdf/hiv/impact/chap8.pdf>

The economic evaluation considers both resources used and health consequences in health care interventions. Drummond et al. (2015) defined economic evaluation as *"the comparative analysis of alternative courses of action in terms of both their costs and consequences."* Therefore, full economic evaluation deals in identifying, measuring, and comparing the cost and outcomes of alternate activities, strategies, or policies. The tools used for this are Cost-Benefit Analysis (CBA), Cost-Effectiveness Analysis (CE), Cost-Utility Analysis (CUA), and Cost-Minimization Analysis (CMA). Partial evaluation deals in measuring the cost of resources consumed; it describes the cost of the disease to society perspective without alternative comparison or compared alternative with only considering the cost (Drummond, 1992). The partial evaluation includes outcome description, cost description (such as cost of illness or burden of disease), cost-outcome description, efficacy or effectiveness evaluation (such as randomized clinical trials), and cost analyses, as shown in Table 1.6. For this study,

partial evaluation is done through cost analysis and the burden of disease was calculated.

Table 1.6: Distribution of characteristics of health care evaluations

Is there a comparison of two or more alternatives?	Are both costs (inputs) and consequences (outputs) of the alternatives examined?			
	No	No		Yes
		Examines only consequences	Examines only costs	
		1A Partial Evaluation Outcome description	1B Partial Evaluation Cost description	2 Partial Evaluation Outcome description
	Yes	3A Partial Evaluation Efficacy or effectiveness evaluation	3B Partial Evaluation Cost analysis	Full economic Evaluation What should count? How should it be measured? How should it be valued?

Source: Drummond et al. (2015)

The conceptual framework for this study aspires to contemplate the weights of HIV/AIDS in India in terms of its productivity losses and its healthcare expenditure. This research adapted to the burden of the epidemic from the public sector perspectives. The burden is calculated using the DALYs measures, where estimating its impact on the GDP becomes a significant contribution to this. The epidemic's impact is measured by calculating the expenditure of the services and calculating the cost of providing treatment and screening to the HIV patients and general population. The indirect productivity loss and the direct cost of HIV services will determine the impact of the epidemic on the economy.

1.7 Research Questions

The study seeks to answer the following research questions:

1. What is the impact of the HIV/AIDS epidemic on the GDP in India?
2. What is the impact of the HIV/AIDS epidemic on the GSDP in the Northeast Indian states?
3. What is the cost of HIV/AIDS programmes in Mizoram?
4. Any evidence from the data showing that changes in the allocation of resources. Does it show any changes in the outcome measures?
5. What is the cost of providing free HIV screening and counselling?
6. What is the cost of providing free Antiretroviral therapy (ART) to HIV patients?

1.8 Objectives of the study

The primary objective of the thesis is to study the burden of HIV/AIDS in India and assess the provision cost of the HIV/AIDS services in Mizoram. The specific objectives are:

1. To calculate the Disability Adjusted Life Years (DALYs) of people living with HIV/AIDS in India and Northeast States.
2. To calculate the burden of HIV/AIDS using DALYs in India and Northeast States.
3. To understand the functions of the Mizoram State AIDS Control Society (SACS).
4. To examine the distribution pattern of expenditure of the Mizoram State AIDS Control Society (MSACS) by functions and components.
5. To estimate the unit cost of ICTC and ARTC services in Mizoram.

1.9 Significance of the study

The high HIV prevalence and incidence rate proposes the necessity to understand the HIV/AIDS burden at the national and regional level. The study on the burden of HIV/AIDS would greatly help the health policy, planning, health sector, and other public sectors because it will determine the repercussions on individual health conditions at the population level, comparably and consistently. Furthermore, with the size and diversity of India and its disparity in HIV/AIDS services, a comprehensive analysis should be embarked on to gain a better insight into health care costing for different types of services and provide more extensive information for policy purposes. Hence, it is crucial to study the mortality and morbidity outcomes of HIV/AIDS in India and its supply responses to tackle them.

The study will expand the understanding of the burden of the epidemic in terms of the relevant health gap measure. The findings will give the '*years of life lost due to premature HIV/AIDS deaths*' and the '*years of life HIV/AIDS people lived with illness or disability*.' The findings will enhance how the epidemic affects the economy through the indirect productivity loss of income among the working-age groups. Since 2007, the Northeast states have higher HIV adult prevalence than the national average. As a result, it will reveal the extent of the burden of HIV/AIDS distinctly among these hardest-hit regions. There will be an improved perception of the significant relationship between health and human capital.

The current achievement is yet still far from the desired goal, and the HIV/AIDS epidemic in Mizoram is alarming. The study will help understand the state response to the epidemic by providing in-depth performances, achievements, and interventions to tackle the epidemic and its related issues. Analysis of expenditure at the level of service points of the HIV/AIDS programme becomes important in prioritising the allocation of resources. This will help decision-makers to make the best use of scarce resources. The study will extend existing knowledge about the direct cost of HIV/AIDS services under the NACP-IV, and the scope of the study is restricted to five ARTC and ICTC in Mizoram. The study will also serve as a future reference for researcher on the burden of diseases and costing analyses.

1.10 Chapterization of the thesis

The thesis consists of eight chapters, as follows;

Chapter 1: Introduction and Literature Review

The first chapter briefly discusses the current global and national HIV/AIDS scenario and its responses to combat the epidemic. Then, it contains the existing literature on the key concept of the study on the various impact of HIV/AIDS, focussing on the economic burden and cost of HIV/AIDS services. It also discusses the research gap and provides a conceptual framework of the study. It then presents the research questions, specific objectives, significance and chapterization of the thesis.

Chapter 2: Methodology

This chapter explains the study area, sample selection, the methodological approach used for calculating the burden of disease, classification of expenditure and the unit cost of services to meet the objectives. It describes the data sources and operational definitions used in the study. It also includes the research design and ethical consideration.

Chapter 3: The burden of HIV/AIDS

The third chapter first gives the background and the stepwise calculation of the burden of HIV/AIDS. Then, the chapter is divided into two sections; 1. The burden of HIV/AIDS in India and 2. The burden of HIV/AIDS in Northeast India. Each section gives the variables and their descriptions used in the study, such as death and prevalent cases of HIV/AIDS, standard life expectancy and HIV/AIDS disability weights. Both sections give the years of life lost due to premature death (YLL), years of life lived with disability (YLD) and disability adjusted life years (DALYs). This chapter also compares the national average and Northeast India, and it outlines the chapter summary.

Chapter 4: The Scenario of HIV/AIDS in Mizoram

The fourth chapter explains trends of the HIV/AIDS epidemic in the state, focusing on NACP-IV. It illustrates the Mizoram State AIDS Control Society (MSACS) by

defining the functions, performances, and services under the NACP. It also includes various NGOs' contributions, highlighting the specific emphasis from data collected from various sources.

Chapter 5: Distribution of expenditure of MSACS Across Major Activities

This chapter explains the sources of funds, resource allocation, and utilisation under the National AIDS Control Organisation (NACO) and Mizoram State AIDS Control Society (MSACS). These MSACS programme costs were distributed into various activities and several cost elements. Here, all cost inputs are classified into nonrecurrent (capital) resources and recurring resources.

Chapter 6: Distribution of Expenditure of MSACS by Component

This chapter attempts to classify the five-activity budget of MSACS into the NACP-IV key strategies/components. The strategies are Prevention Services (PS), Care Support and Treatment (CST), IEC and Social Mobilisation & Mainstreaming, Strategic Information Management System (SIMS), and Capacity Building (CB). It examines the flow of expenditure, highlighting the requirement of resources under each strategy.

Chapter 7: Time allocation and unit cost of services in the ICTC and ARTC

In this chapter, the time spent by all the staff members in the ICTC and ARTC is taken into account to examine the time allocation of different activities. This chapter estimates the expenditure of five ICTC and five ARTC for 2017-18 FY. The unit cost of services is calculated by taking the capital and recurrent costs into consideration.

Chapter 8: Conclusions and Policy Recommendations

The final chapter of the thesis summarises the main findings of the research and gives policy recommendations. It also lists out the limitations of the study and recommendations for future research.

Chapter 2

Methodology

2.1 Background

The study has looked at the impact of HIV/AIDS affecting the demand-supply side and its supply response to the epidemic. The demand side of HIV/AIDS includes studying the disease's burden by measuring the individual's DALYs lost due to HIV/AIDS. The National AIDS Control Programme (NACP) has progressed with critical efforts to combat the HIV epidemic. NACO under the MoHFW, GOI, is the supply response to the HIV/AIDS epidemic in the country through the State AIDS Control Society (SACS) in each respective state. Each SACS performs and monitor the NACP at the state level. Under SACS, the ARTC and ICTC are identified as the service delivery points for HIV/AIDS treatment and testing.

This chapter explains the research approach, methodology, and analysis to achieve the objectives of the study. It also presents a brief profile of the study area, research design, sources of data and the operational definition used in the study.

2.2 The study area

India is the seventh-largest country globally, with a total area of 3,287,240 sq. km; it approximately shares 2.4 per cent of the total geographical area of the world. Situated in the Asia continent, it is the second-largest country in Asia and the largest country in the South Asia region. India shared its border with Pakistan, Afghanistan, China, Nepal, Bhutan, Myanmar and Bangladesh and surrounded by the Indian Ocean, Arabian Sea, Lakshadweep Sea and Bay of Bengal. It lies in the north of the equator between 8°4'N to 37°6'N latitude and 68°7'E to 97°25'E longitude.

India is the second-largest populous country globally, with 1,210,854,977 population (Census, 2011). Indian working-age groups (15-45 years) accounted for 48 per cent of the entire population. It is referred to as a developing country characterized by a low-middle income economy. Since the 21st century, the annual average GDP growth

These 35 States/UTs are classified into six regions; north, east, west, south, central, northeast.

- North Region: Chandigarh, Delhi, Haryana, Jammu & Kashmir, Punjab, Rajasthan, Himachal Pradesh and Uttarakhand.
- Central Region: Chhattisgarh, Madhya Pradesh and Uttar Pradesh.
- East Region: Bihar, Jharkhand, Odisha and West Bengal.
- Northeast Region: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.
- West Region: Dadra & Nagar Haveli, Daman & Diu, Goa, Gujarat and Maharashtra.
- South Region: Andaman & Nicobar Islands, Andhra Pradesh, Karnataka, Kerala, Puducherry, Tamil Nadu and Telangana.

According to NACO 2019 estimation, the South and West regions account for three-fifths of the total PLHIV in India. In contrast, the East, North and Central regions accounted for around 35 per cent and the Northeast region for 4.5 per cent. The Northeast, West and South regions have the highest HIV prevalence above the national average. At the same time, the Northeast region comprises just around four per cent of the total population (Census, 2011). Of which Assam state comprises 68 per cent of the total northeast region population. The Northeast region constitutes 2.62 lakh sq. km (7.9%) of the total geographical area and one-quarter of the forest cover of the country. It comprises a higher rural population than the national average except for Mizoram, where 52 per cent of its population resides in urban areas. Besides, the regions average literacy rate (78.6%) is more than the national average (73%). On the other hand, due to the economic backwardness, this region has less than a 5 per cent contribution to the national GDP.

2.3 Selection of the study area

India has around 2.1 million PLHIV and currently hold the world's third-largest country with the HIV/AIDS epidemic (UNAIDS, 2017a). The HIV prevalence rate for the working-age (15-49 years) population was estimated at 0.2 per cent. HIV/AIDS has been an alarming issue during the last decades in the Northeast States of India. In

2017, three states topped the highest prevalence rate, higher than the national average, namely Mizoram with 2.04 per cent, Manipur with 1.43 per cent, and Nagaland with 1.15 per cent. Moreover, the annual new HIV infections have compounded in Assam, Mizoram, and Meghalaya. The HIV estimation 2017 report showed that the number of AIDS-related deaths has not declined in Assam. Accordingly, the estimation of the burden of HIV becomes imperative. To know the burden of HIV individuals in a country, India is selected for the study. The eight states of Northeast India are distinctly selected for the study. The study is performed to compare within the northeast region and the national average. The study is based on secondary sources collected from 2000 to 2019 annual data and its financial years.

In India, Mizoram state has the highest prevalence rate despite being the second least populous state. It accounts for 0.09 per cent of the country's population (Census, 2011). During 2004-2015, HIV new infection cases in Mizoram shot up by 18 per cent even though the national average declined by 27 per cent. According to 2017 estimation, nine HIV/AIDS cases were detected per day. Sharing the international borderline with Bangladesh and Myanmar, the state has been a victim of drug trafficking where narcotic substances (like methamphetamine, heroin) are smuggled in from Myanmar. As a result, three-tenths of HIV transmission was caused through infected needles sharing within the drug user. The report revealed that the productive age group (15-49 years) were specifically most vulnerable. The HIV prevalence rate for 15-24 years accounts for 23 per cent, 25-34 years for 42 per cent, and 35-49 years for 26 per cent.

Accordingly, it is crucial to examine the state response to the epidemic. The Mizoram State AIDS Control Society (MSACS) was selected for the study for estimating the cost of HIV/AIDS services by collecting data from secondary sources. Data on expenditures were collected for 2012-13, 2013-14, 2014-15, 2015-16, 2016-17, and 2017-18 financial years. Under MSACS, the Integrated Counselling and Testing Centres (ICTC) and Anti-Retroviral Therapy Centre (ARTC) are identified as the service delivery points for HIV/AIDS testing and treatment. To calculate the unit cost of services, five ICTC and ARTC were purposively selected from four districts for convenience: Aizawl, Lunglei, Champhai, and Kolasib. Secondary data was also collected from the selected ICTC and ARTC for the 2017-18 financial year. All the

staff members of the selected ICTC and ARTC were included in the time allocation of daily activities observation.

2.4 Methodological approaches to study the burden of disease

Cost of illness (COI), also called the burden of disease (BOD), comprises a country, region, or individuals' various dimensions of the disease's consequences on the health outcomes. Its requisite purpose is to assess the economic burden that a disease or illness caused on society. (Jo, C., 2014). Jefferson et al. (2000) stated, "*the aim of COI studies is descriptive: to itemize, value, sum the costs of a particular problem with the aim of giving an idea of its economic burden.*" There are three cost categories under the COI studies; direct, indirect, and intangible. The direct cost refers to the cost incurred by the health system (such as expenditure on treatment and prevention) or cost incurred by the patients (such as health care consumption). The indirect cost refers to the productivity loss due to morbidity and mortality. The intangible cost deals with the social and emotional cost that cannot be quantified in monetary terms. For the study, direct and indirect costs were taken into consideration.

2.4.1 Global Burden of Disease (GBD)

During the 1990s, the Harvard School of Public Health, the World Bank, and the World Health Organization (WHO) jointly formulated the concept of the burden of disease, which aimed at defining the death and health loss across regions due to non-fatal condition, diseases/injuries and other risk factors. In addition, it addresses to measure the burden in a currency for further intervention uses (Brown, 1996). Therefore, the first Global Burden of Disease (GBD) study was the '*GBD 1990*'. It measured health effects across eight regions of the world with exceeding a hundred diseases and injuries. In 1993, the World Development Report featured a new metric disability-adjusted life year (DALY). DALYs measure disease burden by combining the healthy life of '*years lost due to premature mortality and the years lived with disability.*' The global burden of diseases is noted as the total loss of DALYs (Berkley et al., 1993). WHO updated the study for 2000-2002 by using a Comparative Risk Factor Assessment (CRA) framework. In 2012, an independent global health research centre known as the Institute of Health Metrics and Evaluation (IHME) at the

University of Washington collaborated with other academic partners published 'GBD 2010' by introducing new metrics DALYs calculation. IHME continued the work started in the early 1990s by publishing the GBD study. The study provides an exhaustive worldwide observational epidemiological study that puts forward resources to comprehend the health challenges faced globally in the 21st century. IHME also contributed to WHO by providing regional estimates of deaths and DALYs. In 2018, IHME and WHO work in partnership to strengthen GBD validity and improve its policy and use. The burden of disease is calculated utilizing the summary measures of population health.

2.4.2 Summary measures of population health (SMPH)

The SMPH combined information or data concerning the mortality and non-fatal health outcomes. It monitors the population health by identifying health variation across settings. These measures are classified broadly into two categories: health expectancies and health gaps. Health expectancies refer to health indicators expressed in life expectancy in a defined state of health, considering lower weights for the years lived in a health state worse than in full health. According to Murray et al. (2002), it includes measures such as “*active life expectancy (ALE), disability-free life expectancy (DFLE), disability-adjusted life expectancy (DALE), years of healthy life (YHL), quality-adjusted life expectancy (QALE), dementia-free life expectancy (DFLE), and health capital.*” The health gaps quantify the variation linking the actual health and an ideal goal, i.e., living up to standard life expectancy in full health. It explains the relative importance of diseases, injuries, and risk factors for population health levels, such as mortality gap measures. It includes measures such as healthy life years (HLY), quality-adjusted life years (QALY), and disability-adjusted life years (DALY). However, DALY measures have been the most widely used and are applicable across regions/cultures as it uses units of time measure (Pr, A et al., 2003). In the study, the burden of HIV/AIDS is calculated using the DALY approach to measure the health gaps.

2.4.3 Disability-adjusted life years (DALYs)

According to Hessel F (2008), *"The gap between an ideal situation, where everyone lives free of disease and disability, and the cumulated current health status, is defined as the burden of disease."* Therefore, the burden of disease defines the total, cumulative outcomes of a defined disease or a range of fatal and nonfatal diseases in the matter of disabilities in society. The outcomes include the health and social facets and their costs to society. According to WHO, *" the global burden of disease (GBD) is measured using DALYs by combining losses from premature death (years of life lost or YLL) and loss of healthy life resulting from disability (years of life lived with disability or YLD)."* Therefore, 'one DALY' signifies the 'loss of one year of life lived in full health,' represented by the following standard formula:

$$\text{DALY} = \text{YLL} + \text{YLD}$$

YLL= years of life lost due to premature death

YLD= years of life lost due to disability

The year of life lost due to premature death (YLL) metric is represented by multiplying the total number of deaths from a disease or illness by the standard life expectancy at the age of death (represented in years). The basic formula for calculating YLL is as follows;

$$\text{YLL} = \text{N} \times \text{L}$$

N=total number of deaths

L= Life expectancy at the time of death

A demographic survey called the Sample Registration System (SRS) published an abridged life table in India. For the analysis, the SRS-based life expectancy is used instead of the WHO's standard life expectancy.

The years of life lost due to disability (YLD) metrics measure the total time lived with a disability using two methods: prevalence and incidence measure of disability. The former is computed by multiplying the number of prevalent cases by the disability weight factor. The latter is computed by multiplying the number of new incident cases by the average duration of disability and the disability weight factor. The formulae for calculating YLD are:

$\mathbf{YLD=P*DW}$ P= number of prevalent cases DW= disability weights	$\mathbf{YLD=I*DW*L}$ I=number of new incident cases L=average duration of disability (in years)

The disability weight stipulates the severity of the disease on a scale from 0 (perfect health) to 1 (equivalent to death). In the study, the prevalence measure of disability is used for computing YLD. The disability weights of a disease or sequelae provided by the GBD Report is used for the calculation. The monetary value of HIV/AIDS is calculated in the study by using the '*human capital approach*.'

2.4.4 Human Capital Approach (HCA)

The human capital approach is applied to measure the monetary value of loss of health due to work absence from illness, diseases, injury, and other risk factors. HCA calculates the potential value of productivity loss due to mortality or morbidity. The value of the human capital is calculated by the value of the average future earnings.

(Weisbrod, 1961a; Klarman, 1963; Rice, 1967; Clabaugh & Ward, 2008; Grosse, 2009). Therefore, work absenteeism due to illness is considered and valued by the achievable gross income. It can be calculated using wages as a measure of output.

In the study, the economic burden of disability-adjusted life years (DALYs) is calculated after adding the total DALYs loss due to a disease multiplied with the respective country's per capita Gross Domestic Product (GDP) using the human capital approach (Dalal & Svanstrom, 2015).

For the study, the burden of HIV/AIDS was presented for aggregate India. The study covers all HIV infected age groups in India during 2000-19. DALYs were calculated for all HIV infected age groups, and the burden was calculated for the working-age 15-49 years. The study also covers all HIV infected working-age group groups in eight Northeast states, namely Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. The burden of HIV/AIDS was calculated for the working-age group, 15-49 years, during 2007-2019.

2.5 Methodological approaches for calculating costs of providing HIV/AIDS services

Cost analysis determines the cost inputs incurred in health interventions and indicates the relationship with the output in terms of benefits or effects. The approaches used for the cost analytical tools depend on the criteria (context, focus, and nature) of the health intervention. It is a program evaluation and can vary according to the study's choices, perspectives, and time frames. The study used cost analysis to determine the input (program) cost from the Government's perspective.

Cost accounting is a subset of accounting; it encompasses developing and providing a wide range of useful financial information (Finkler, 1999). Cost accounting is an essential element of financial management and managerial accounting that focuses on cost measurement and reporting. The study used the cost accounting method to examine the distribution of costs to various activities using secondary data from the NACO and the SACS finance report and arrive at the unit cost of providing HIV/AIDS services.

The study comprises the Mizoram state response to the HIV/AIDS epidemic. In the light of this, the Mizoram State AIDS Control Society (MSACS) was undertaken to study the supply side's service cost. The ICTC and ARTC from Aizawl E district, Aizawl W district, Champhai district, Lunglei district, and Kolasib district were selected to study the unit cost of HIV/AIDS services.

2.5.1 Cost Classification

In evaluating the health programme costs, it becomes imperative to classify its components into several cost elements. Data on cost inputs were categorized into different activities based on their fund support sources; New Domestic Budget System (NDBS), Targeted Interventions (TI), Link Workers Scheme (LWS), Care Support and Treatment (CST), and Integrated Counselling and Testing Centre (ICTC). The cost inputs under various activities were examined based on WHO's cost classification methods in health care. Accordingly, cost inputs were analyzed under capital and recurrent costs. Capital costs refer to those inputs with more than one year of financial commitments, while recurrent costs are those inputs that had financial commitments in a year. The cost inputs under various activities were further analyzed based on the programme key strategies. The focus is laid on the distribution pattern of actual expenditure in terms of NACP-IV five key strategies/components; Prevention Services (PS), Care Support and Treatment (CST), IEC, Social Mobilisation & Mainstreaming (IEC), Strategic Information Management System (SIMS), and Capacity Building (CB).

2.5.2 Time Allocations

Time was first referred to as an economic factor in terms of the relation between time and space. However, in recent studies, time is considered a production factor (Caragea, 2009). Therefore, time is an essential resource. Time allocation can be defined as the amount of time dedicated to certain work activities according to official requirements, recommendations, or regulations.

In the study, the daily activities of staff in ICTC and ARTC were observed, and a list of activities was categorized and framed based on Callahan and Bertakis (1991),

Walters et al. (2009), and Weigl et al. (2009) approach of evaluating the physician productivity. The time-motion techniques and provider interviews (Bratt et al. 1999) were used to collect the thirty-three activity schedules¹. Therefore, a time-motion study was performed using a stopwatch at the activity intervals. The provider interviews were performed on the counsellors to know the specific time used for counselling.

2.5.3 The unit cost of services

The cost of prevention and treatment services were calculated using the capital and recurring expenditure. The annual depreciation for capital expenditure was measured using a straight-line depreciation method (Walker & Kumaranayake, 2002). Unit cost is the average cost calculated depending on its specified outcome (Moreau & Hager, 1993; UNAIDS, 2000; Chatterjee et al., 2003). In the study, the total cost of the ICTC and ARTC services was divided by the total clients visiting the centre during the whole year to acquire the cost per unit.

2.6 Sources of Data

Data were collected from both primary and secondary sources.

2.6.1 Primary Data

Information was collected from the NGOs such as Young Mizo Associations (YMA), churches, faith-based hospitals, and staff from the MSACS through an informal discussion. The information was based on their response to the epidemic and their adopted measures towards HIV/AIDS-related issues.

Primary data was collected from all the staff members of the selected ARTC and ICTC through interview schedule and personal observation using the work activity schedules. Thirty-three activity tasks were categorized through observations and by following the staff responsibility from the NACO operational guidelines. The activities were grouped into four categories:

¹ See Appendix C.1

- direct patient contact
- indirect patient contact
- other professional activities
- non-productive activities

Direct patient contact refers to the time spent in face-to-face interaction with the patient/clients. The indirect patient contact includes all the administrative work, interaction with the staff and the patient relatives. Other professional activities refer to activities in other departments and research. Non-productive activities are the time spent on breaks, leisure, and personal tasks.

2.6.2 Secondary Data

Secondary data collected from different sources as follows:

- **Institute for Health Metrics and Evaluation (IHME):** It includes data on HIV/AIDS deaths and prevalent cases during 2000-2019 and the disability weights table (2004-2019) from the Global Burden Disease (GBD).
- **World Bank:** India's GDP and per capita GDP at constant prices (2000-2019) was adapted from the World Bank National Accounts Data and the OECD National Accounts data files.
- **Sample Registration System (SRS):** The life tables of India 2000-04, 2005-2009, 2010-2014, and 2014-2018 were used for the study. The life table of Assam state for the year 2005-2009, 2010-2014, and 2014-2018 was also used for the analysis.
- **Reserve Bank of India and Central Statistical Organisation:** The Gross State Domestic Product (GSDP) of India for 2007-2017 and 2013-2019 were collected.
- **Directorate of Economics and Statistics of the Northeast Indian States:** The GSDP at Gross State Value Added by economic activity (at constant prices) during FY 2007-2019 was collected from each of the eight respective states, Northeast India.

- **National AIDS Control Organisation (NACO):** It is the main hub for a secondary data source of HIV/AIDS. The data was collected from NACO publications available from the websites; Status of National AIDS Response 2016, North-East Region Vol-1 (2017), NACO Annual Reports (2004-2018), Operational Guidelines for ART Services (NACO, 2012), National HIV Counselling and Testing Services (HCTS) Guidelines (NACO, 2016), HIV Sentinel Surveillance: Technical Brief, ANC HIV Sentinel Surveillance Reports, HIV Estimations Reports, NACO Statutory Audit Report (2014-2018).
- **Mizoram States AIDS Control Society (MSACS):** Unpublished data was collected from the MSACS through different divisions. Data from the Finance division, such as the main budget activity report (2014-2018), the staff position and salary records (2014-18), and achievements records (2014-2017), were collected. Mizoram SACS IEC activity-wise physical achievement reports and the targets reports (2014-2017) were collected from the IEC and Mainstreaming division.

The number of HIV tested, HIV positive, and transmission routes (2001-2018) was collected from the Monitoring and Evaluation division. The performance, achievement, and annual report of blood safety activities (2010-2017) were collected from the Blood Safety division. The Mizoram SACS Annual Report, 2017-18, was collected from the Targetted Interventions (TI) division. The monthly CST fact sheet (April-March) for FY 2012-2018 and the consolidated stock records (2017-18) were collected from the Care, Support, and Treatment (CST) division.

Register of fixed assets, stock register of consumables and non-consumables was obtained from the Procurement Division to get the cost, maintenance, and other required information for the analysis. MSACS publications such as '*HIV AIDS Engtin zel?*' (2012), '*Thisen Thilthlawnphek hlu ber*' (2011) was used for the study. These publications give immense information on the state measures against the epidemic and other related services.

- **ICTC:** A questionnaire was designed to record the expenditure and information of five ICTC centres of MSACS². The areas covered were; the operating cost, maintenance, consumables, fixed assets, equipment, furniture, and information on specific indicators. In addition, the annual reports were collected from the Counsellors. The scholar filled these questionnaires, and in some centres, the Lab-technician filled the questionnaire on consumables and equipment used.
- **ARTC:** A questionnaire was designed to record the expenditure and information of five ART centres of MSACS³. The areas covered were; operating cost, maintenance, consumables, drugs, local conveyance, fixed assets, equipment, furniture, and information on specific indicators. The register book from ART centres such as the patient visit register, CD4 lab register, CD4 kit & consumable stock register, and fixed assets register was also accessed to gather information. The annual reports were collected from the Data Manager. The scholar filled these questionnaires.
- **District AIDS Prevention and Control Unit (DAPCU):** Among three DAPCU offices in Mizoram state, data were collected from the Aizawl and Kolasib district on ICTC services, HIV factsheet, and annual reports on counselling and blood testing were used for the study.
- **Directorate of Economics and Statistics Mizoram:** *'The Statistical Handbook of Mizoram'* from 2014 to 2018 was used to gather data on various sectors of the economy.
- **The Joint United Nations Programme on HIV/AIDS (UNAIDS):** Information on Global HIV and AIDS statistics, factsheet, publications, data on HIV estimates, and other various resources were used in the study.
- **National Pharmaceutical Pricing Authority (NPPA):** Information on the ARVs prices were obtained from the medicine price fixed by India's

² See Annexure D.1

³ See Annexure D.2

Government (as per the DPCO 2013) under the National Pharmaceutical Pricing Authority (NPPA).

2.7 Operational Definitions

The terminology used in the study may not be the same as those used in general parlance. The definition of such terms is explained with context to the study.

- 1) **ICTC:** A service centre that provides free assistance to the society, such as pre-test counselling, post-test counselling, couple counselling, and HIV blood tests. It linked with ART, STI, OST centres, other health and social departments.
- 2) **ARTC:** A service centre for HIV/AIDS patients which provide free psychological, social, and medical assistance to HIV patients; such as free counselling, ARV drugs, and OI drugs, CD-4 testing, viral load testing, linked with TB, OST, STI centres, and other departments by giving support, treatment, and care.
- 3) **Economic burden:** The potential value of productivity loss due to HIV mortality or morbidity.
- 4) **OST Centre:** A centre that assists the Injecting Drugs User (IDUs) improves their health status by providing free substitution drugs, counselling, and preventing HIV AIDS spread.
- 5) **STI Centre:** A centre that provides treatment by giving free counselling and treats sexually transmitted disease (STD), sexually transmitted infection (STI) clinics, venereal disease (VD), or genitourinary medicine (GUM).
- 6) **Opportunistic Infection (OI):** Infection occurring due to a weak immune system resulting from HIV infection, such as TB, STI, and HCV/HBV.
- 7) **PLHIV:** It refers to all the HIV positive or HIV/AIDS infected people currently alive.
- 8) **Intervention:** A program implemented to decrease the effect of HIV/AIDS
- 9) **ARVs Drugs:** It is antiretroviral drugs used to treat HIV.
- 10) **Strategies/component:** The key functions of the NACP-IV.

- 11) **Prevalent cases:** The number of HIV/AIDS infected people currently alive within a specified timeframe.
- 12) **Incident cases:** The number of people who are newly HIV infected over a specific period.
- 13) **HIV prevalence:** The number of prevalent cases divided by the total population at risk.
- 14) **HIV incidence:** The number of incident cases divided by the total population at risk.
- 15) **Capital costs:** Those inputs with more than one year of financial commitments
- 16) **Recurrent costs:** Those inputs with one-year financial commitments

2.8 Research Design

The study employs a top-down approach, applying a quantitative analysis to estimate HIV/AIDS burden in the societal prospects. A descriptive research design was chosen to examine the expenditure of HIV/AIDS programmes or interventions. A structured schedule was employed to collect data from the MSACS, where the daily activities of 36 ARTC and 13 ICTC staff members were observed in the study.

2.8.1 Ethical Considerations

A research proposal was submitted to the Project Director, Mizoram State AIDS Control Society (MSACS), for permission/opinion related to the study's ethical consideration. The research protocol was approved by the Mizoram State AIDS Control Society [Ref. No.: D.12019/1/2018-MSACS(Research)]⁴. The interview schedule was submitted to the related committee of NGOs such as the Young Mizo Association (YMA), faith-based hospitals, and churches for their opinion about the study's ethical consideration. On another note, IHME Data was available for downloading on the GHDx. Non-commercial users were permitted to share or modify through the Open Data Commons Attribution License.

⁴ See Annexure E.1 and E.2

2.8.2 Data Analysis

Simple frequency tables and cross tables were generated. Descriptive statistics such as the mean, standard deviation, percentage were computed using the statistical software MS-Excel 2016.

Chapter 3

The Burden of HIV/AIDS

“AIDS is not just a serious threat to our social and economic development, it is a real threat to our very existence, and every effort must be made to bring the problem under control.”

-Daniel Arap Moi, President of Kenya

3.1 Background

According to NACO estimation (2017), among the 21.40 lakh PLHIV in India, 97 per cent belong to the adult age group (15+ years). Likewise, the estimates reveal that 96 per cent of the AIDS-related deaths and the new HIV infections cover the adult age group. The epidemic has affected the working-age population extensively at their productive ages. Mizoram, Manipur and Nagaland states from Northeast India have the highest adult prevalence rates above 0.22 per cent of the national average. The new infection and AIDS-related deaths have not declined in Assam since 2005. Thus HIV/AIDS has become an alarming issue in the Northeast states. Since HIV/AIDS affects the economically active population, it is important to calculate its burden on the economy.

This chapter attempts to measure the HIV/AIDS burden using the disability-adjusted life year (DALYs) metric. This chapter is divided into two sections. The first section studies the burden of HIV/AIDS in India. The DALY measure was calculated for different age groups, and the burden was calculated for all India's working-age groups during 2000-2019. The second section studies the burden of HIV/AIDS on the Northeast states of India, namely; Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. The DALY measures and the burden of HIV/AIDS were calculated for the working-age group during 2007-2019.

3.2 Burden of disease approach

The burden of disease defines the total, cumulative consequences of a defined disease or a range of fatal and nonfatal diseases concerning disabilities in society. These outcomes cover the health, social aspects and their costs to society. The burden of disease is calculated by applying the WHO methodology of measuring the global burden of disease (GBD), using DALYs by combining losses from premature death (years of life lost or YLL) and loss of healthy life resulting from disability (years of life lived with disability or YLD). The approach was briefly discussed in Chapter 2. In the study, the burden of HIV/AIDS is calculated using the DALY approach to measure the health gaps. DALY is calculated using the standard formula:

$$\text{DALYs} = \text{YLL} + \text{YLD}$$

YLL= Years of life lost due to premature death, and YLD= Years of life lost due to disability.

The various steps to calculate the health gaps (DALY) in India, the following data are used:

- i. The life expectancy at the time of death was collected from the abridged life tables (2004-18) provided by the Sample Registration System.
- ii. The total number of deaths due to HIV/AIDS in India was extracted from the Institute of Health Metrics and Evaluation.
- iii. HIV/AIDS disability weight was taken from the Global Burden of Disease report.
- iv. The total number of HIV/AIDS prevalent cases in India was collected from the Institute of Health Metrics and Evaluation.

The various steps to calculate the health gaps (DALY) in Northeast states of India, the following data are used:

- i. The life expectancy at the time of death was collected from the abridged life tables (2005-18) provided by the Sample Registration System.
- ii. The total number of deaths due to HIV/AIDS in India was collected from the National AIDS Control Organisation.

- iii. HIV/AIDS disability weight was taken from the Global Burden of Disease report
- iv. The total number of HIV/AIDS prevalent cases in eight different northeast states was taken from the National AIDS Control Organisation.

These data were used to calculate the years of life lost due to premature death and years of life lived with disability. After calculating DALY, the burden of HIV/AIDS is calculated in monetary terms using India's Gross Domestic Product per capita for different years at constant prices, i.e., Total DALYs multiplied by GDP per capita. The nation's gross domestic product per capita at constant prices during 2000-19 was used for India. The respective state gross domestic product per capita at constant prices during 2007-19 was used for the Northeast states.

Section I: The Burden of HIV/AIDS in India

3.3 Variables and their descriptions used to study India

The data for all India was used to measure the burden of the epidemic in the country during 2000-2019. The data variables were collected from various secondary sources viz.: Institute of Health Metrics and Evaluation (IHME), Sample Registration System (SRS), and Global Burden of Disease (GBD) Report. It includes the mortality and prevalence of HIV/AIDS cases from the IHME, the standard life expectancy from the SRS, and disability weights of HIV/AIDS from the GBD Report.

3.3.1 Deaths due to HIV/AIDS in India

India had 2.4 lakh AIDS-related deaths in 2005, 1.6 lakh in 2010, and 6.9 thousand in 2017 (UNAIDS 2017). The mortality rate and new infections cases have decreased considerably over the past few decades. The number of deaths due to HIV/AIDS for different age groups during 2000-19 was collected from the [IHME data](#).

Table 3.1: Number of deaths due to HIV/AIDS among different age groups in India

Year	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total
2000	7135	419	81192	6471	186	95403
2001	7981	595	97254	8331	222	114383
2002	8512	803	111847	10255	257	131674
2003	8670	1027	122651	12221	286	144855
2004	8694	1274	134281	14010	315	158574
2005	8484	1535	139225	15413	341	164998
2006	7903	1797	141397	16269	362	167728
2007	7195	2079	137258	16379	359	163270
2008	6280	2204	130379	16022	345	155230
2009	5474	2221	119034	15277	319	142325
2010	4919	2073	105673	14214	281	127160
2011	4004	1929	94040	13227	254	113454
2012	3475	1845	83371	12450	236	101377
2013	3291	1593	74710	11984	227	91805
2014	3052	1443	63421	11266	212	79394
2015	2758	1293	52408	10137	196	66792
2016	2375	1124	44654	8977	186	57316
2017	2148	1035	38154	8044	181	49562
2018	1968	943	35619	7713	189	46432
2019	1829	858	35479	7918	213	46297

Source: Data extracted from IHME⁵ (For Tables 3.1 to 3.4)

Table 3.1 shows the total number of death due to HIV/AIDS in India during 2000-2019 under five different age groups. It is noticed that the total number of deaths reported more than one lakh cases during 2001-2012. Of this, four-fifths of the deaths are in the 15-49 age group. During 2002-2010, more than one lakh deaths were reported from the 15-49 age groups.

⁵ See IHME (2020) & IHME GDx.

Table 3.2: Gender wise deaths due to HIV/AIDS among different age groups in India

	Male						Female					
Year	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total
2000	3636	211	49504	3922	101	57374	3500	209	31687	2549	85	38030
2001	4073	299	58429	4986	116	67903	3908	297	38825	3345	106	46481
2002	4348	406	67041	6108	132	78035	4164	397	44806	4147	125	53639
2003	4426	511	73044	7271	146	85398	4244	516	49607	4950	141	59458
2004	4440	634	79837	8348	156	93415	4254	640	54445	5662	159	65160
2005	4340	770	81752	9075	162	96099	4144	765	57473	6338	179	68899
2006	4041	896	82308	9432	165	96842	3862	901	59089	6837	196	70885
2007	3677	1045	79154	9346	157	93379	3518	1033	58104	7033	202	69890
2008	3204	1118	73901	8992	146	87361	3076	1086	56479	7030	199	67870
2009	2788	1149	66105	8406	133	78581	2686	1072	52929	6871	186	63744
2010	2502	1096	57240	7674	118	68630	2416	977	48432	6540	163	58528
2011	2027	999	50172	7044	106	60348	1977	930	43868	6183	148	53106
2012	1752	965	44108	6599	101	53525	1723	880	39264	5851	136	47854
2013	1660	851	39309	6370	102	48292	1631	742	35401	5615	125	43514
2014	1543	797	33693	6067	102	42202	1509	647	29728	5200	111	37195
2015	1398	716	27850	5534	101	35599	1360	577	24558	4603	95	31193
2016	1208	627	23762	4979	103	30679	1168	498	20892	3997	83	26638
2017	1092	579	20536	4622	108	26937	1056	456	17618	3422	73	22625
2018	1001	524	19115	4523	117	25280	968	419	16505	3190	72	21154
2019	929	474	18888	4626	132	25049	899	385	16592	3292	81	21249

Source: Compiled from IHME

Table 3.2 presents the number of male and female deaths due to HIV/AIDS in India. It was noticed that the number of deaths under-five age group has reduced over the last two decades. Nine-tenths of the dead were in the working-age population. The total number of male deaths reached its highest peak from 2002 to 2009, where more than seventy-eight thousand male deaths were documented, and the majority belong to the 15-49 age groups. The total number of female deaths reached its highest peak from 2002 to 2011, where more than fifty-three thousand female deaths were documented, and the majority belong to the 15-49 age groups. It is observed that more than one-half of the HIV/AIDS deaths are among males.

Table 3.3: Number of HIV/AIDS prevalent cases in India

Year	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total
2000	29276	8890	1915375	61318	1973	2016832
2001	32280	12905	2032481	72308	2155	2152129
2002	34187	17839	2085974	82641	2327	2222968
2003	35092	23375	2085611	91965	2491	2238534
2004	35196	29135	2045355	100227	2652	2212565
2005	34551	34812	1975484	107339	2777	2154963
2006	33271	40137	1889523	112787	2911	2078629
2007	31613	44801	1792780	118492	3085	1990771
2008	29854	48581	1700918	125221	3309	1907883
2009	28313	51473	1621646	133531	3606	1838569
2010	26462	53569	1556595	143882	3967	1784475
2011	24506	54784	1507315	156204	4413	1747222
2012	23060	55180	1472087	171094	4985	1726406
2013	21996	54630	1445864	188380	5706	1716576
2014	21089	53588	1427660	208276	6623	1717236
2015	20016	52395	1420251	230911	7780	1731353
2016	18932	51102	1419062	255602	9207	1753905
2017	17887	49560	1418650	282691	11039	1779827
2018	16783	47932	1416525	311179	13285	1805704
2019	15676	46261	1408677	339885	15976	1826475

Source: Compiled from IHME

3.3.2 Prevalent cases of HIV/AIDS in India

The prevalent cases adverts to the total number of HIV/AIDS cases existing in a population. It means people with the disease at a point in time. The GBD 2010 study adopted a simpler and basic form of calculation for DALY, known as the prevalence-based approach. The years of life lived with disability (YLD) are calculated from the prevalence estimates by dropping the age-weighting and time discounting. Thus, the prevalence-based approach is applied in the study, and the HIV/AIDS prevalent cases during 2000-19 were obtained from the IHME data.

Table 3.3 shows the total number of HIV/AIDS prevalent cases from 2000-2019 under five different age groups in India. It is noticed that the total number of prevalent cases is higher up than 20 lakhs during 2000-2006. Of this, three-quarters of the prevalent cases belong to the 15-49 age group. It is noted that the total number of prevalent cases declined by 1.9 lakhs during the last two decades.

Table 3.4 shows the number of male and female prevalent cases due to HIV/AIDS in India. It can be noticed that among the males, the prevalence peak was during 2002 and 2003, and the majority was in the age groups 5-49. The female prevalent showed highest in 2003, which was 9.3 lakh cases. The data reveals that almost three-fifths of the prevalent cases represent the male population.

Table 3.4: Gender wise HIV/AIDS prevalent cases in India

	Male						Female					
Year	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total
2000	15272	4655	1143703	35877	871	1200378	14004	4236	771672	25442	1102	816456
2001	16843	6751	1205286	42095	945	1271920	15437	6154	827194	30213	1210	880208
2002	17843	9326	1229237	47996	1012	1305414	16344	8513	856737	34645	1315	917554
2003	18322	12215	1221912	53375	1068	1306892	16771	11160	863700	38590	1423	931644
2004	18382	15221	1191801	58205	1115	1284724	16814	13914	853554	42022	1537	927841
2005	18049	18181	1145016	62385	1151	1244782	16503	16630	830467	44954	1627	910181
2006	17380	20955	1090436	65735	1202	1195708	15891	19182	799087	47052	1709	882921
2007	16511	23379	1030854	69435	1290	1141469	15102	21422	761925	49057	1795	849301
2008	15584	25332	975997	73987	1424	1092324	14270	23248	724921	51234	1885	815558
2009	14765	26819	930321	79725	1615	1053245	13548	24654	691325	53806	1991	785324
2010	13787	27886	893937	86705	1889	1024204	12675	25683	662657	57177	2078	760270
2011	12761	28491	866367	95039	2252	1004910	11745	26294	640948	61165	2161	742313
2012	12005	28677	846376	105146	2696	994900	11055	26503	625711	65948	2289	731506
2013	11450	28379	831177	116681	3252	990939	10546	26251	614688	71699	2454	725638
2014	10979	27832	820878	129594	3957	993240	10110	25756	606782	78682	2666	723996
2015	10424	27206	817033	143773	4847	1003283	9593	25188	603218	87138	2933	728070
2016	9862	26525	816327	158821	5931	1017466	9069	24577	602735	96781	3276	736438
2017	9320	25721	815463	175032	7272	1032808	8567	23838	603187	107659	3767	747018
2018	8745	24875	812957	191930	8850	1047357	8038	23058	603567	119249	4435	758347
2019	8168	24006	806995	208930	10645	1058744	7508	22255	601682	130954	5331	767730

Source: Compiled from IHME

3.3.3 Life Expectancy of India

The term '*life expectancy*' adverts to the number of years a person is expected to live at any given age. It estimates the average years a person is expected to live based on demographic factors, in particular age, sex, and regions. The life expectancy at birth is one of the most common measures, which can be defined in two ways; cohort and period life expectancy (Esteban, 2017). The former refers to the average life length of a group of individuals born in a given year using observed mortality rates. The latter estimates the average length of life for a *hypothetical* cohort or group based on the number of deaths divided by the number of people alive in a specific year. The period life expectancy approach is commonly used by the United Nations, the World Bank, and other international organizations. In the study, '*period life expectancy*' is employed to report the life expectancy figures.

GBD (2004) used the global standard life expectancy to measure the year of life lost (YLL) due to premature death. Using the same principle, the study used the Indian population life expectancies estimated through the Sample Registration System (SRS). India's SRS prepared life tables at five-yearly intervals and estimates separately for rural and urban males and females. The SRS life table was presented in different age intervals up to 85+ age groups. The average life expectancy of the different age groups was used in the study. The total average life expectancy from the abridged life tables of 2000-04, 2005-09, 2010-14 and 2014-18 periods was used for 2000-04, 2005-09, 2010-14 and 2014-18 respectively.

Appendix A.1 shows the expectation of life at different age groups from the abridged life tables. The life expectancy under the age of five increased from 65 to 70 years during the two decades. The life expectancy for age 5-69 years showed an improvement by two to one year, where 70 years and above had decreased by a year. It is observed that the female life expectancy is greater than the male life expectancy in all age groups. These life expectancies are used for estimating the years of life lost due to premature death to measure the DALY.

3.3.4 Disability Weights for HIV/AIDS

Disability weight is a weight factor that indicates the severity of the disease on a scale from 0 to 1; in this, 1 equivalent to perfect health and 0 equivalent to death. It is defined based on the set of disabled sequelae and quantifies societal preferences for health states relating to the societal ideal of good health. GBD study definitions of HIV/AIDS disability weight are based on the disease class, such as the disease sequela and their health state description, given in *Appendix A.2*. The disability weights for HIV/AIDS can be classified into four categories: early HIV, symptomatic HIV, AIDS with antiretroviral treatment, and AIDS without antiretroviral treatment. In GBD 2004 and 2010, the 'early HIV' disability weights were not given as the measurement was updated with new approaches in the later years. It is observed that the average disability weights have decreased from 0.269 to 0.237

The GBD update on disability weight is not available every year. However, the GBD 2004, 2010, 2015, 2016, 2017, and 2019 on disability weights were available during the last two decades.^{6,7} The methodological base and concept to estimate disability weight have been updated and improvised during these years (Murray and Lopez, 1996). For example, the Global Burden of Disease (GBD, 2004) update on disability weights for diseases and conditions was based on GBD 1990 disability weights. The GBD 2010 update on disability weights covers 220 health states to estimate non-fatal health outcomes during 1990-2010. Likewise, the GBD 2015 and 2016 covers 235, GBD 2017 covers 234, and GBD 2019 covers 440 health states to estimate non-fatal health outcomes from the 1990 time period. In the study, the disability weights for the whole population suffering from HIV/AIDS are measured using the average disability weights of the four categories.

⁶ World Health Organization (2004)

⁷ Global Burden of Disease Collaborative Network (2012; 2016; 2017; 2018; 2020)

Table 3.5: Disability Weights for HIV/AIDS during 2000 to 2019

Source	Year	DW
GBD 2004	2000	0.269
	2001	0.269
	2002	0.269
	2003	0.269
	2004	0.269
GBD 2010	2005	0.274
	2006	0.274
	2007	0.274
	2008	0.274
	2009	0.274
	2010	0.274
GBD 2015, 2016, 2017 & 2019	2011	0.237
	2012	0.237
	2013	0.237
	2014	0.237
	2015	0.237
	2016	0.237
	2017	0.237
	2018	0.237
	2019	0.237

Source: Global Burden of Disease Study (2004-2019)

Table 3.5 shows the average disability weights used in the study. GBD 2004 is used for 2000-2004, GBD 2010 for 2005-2010, GBD 2015 for 2011-2015, GBD 2016 and 2017 are used for their respective year, and GBD 2019 for 2018-2019. These disability weights are taken for calculating the years of life lost due to disability to measure the DALY.

3.4 The burden of HIV/AIDS in India

The burden of HIV/AIDS in India is estimated using the DALY approach to measure the health gaps by adding the year of life lost due to premature death (YLL) and the life lived with disability (YLD). Here, DALY signifies the loss of a year of life lived in full health. It is calculated by taking the sum of the YLL and YLD metric. Then, the burden of HIV/AIDS is calculated in monetary terms by multiplying the total DALYs with India's per capita Gross Domestic Product (GDP).

3.4.1 Year of life lost due to premature death (YLL)

The year of life lost due to premature death (YLL) metric is calculated by multiplying the number of HIV/AIDS deaths by the standard life expectancy at the age of death. The basic formula used for calculating YLL is:

$$YLL = N \times L$$

N=total number of deaths

L= standard life expectancy at the time of death (in years)

Table 3.6: Years of life lost due to premature death in India

Year	Total Years of life lost					
	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total
2000	468797	26264	3433597	125729	1602	4055989
2001	524371	37302	4112862	161869	1919	4838323
2002	559252	50320	4730021	199263	2219	5541075
2003	569616	64357	5186901	237460	2470	6060804
2004	571167	79822	5678750	272217	2719	6604675
2005	569255	97256	5953252	301328	2820	6923911
2006	530270	113841	6046132	318064	2994	7011301
2007	482784	131677	5869169	320207	2973	6806810
2008	421371	139632	5575016	313237	2861	6452117
2009	367293	140702	5089904	298666	2641	5899206
2010	339134	133407	4589357	283566	2275	5347739
2011	276067	124127	4084151	263880	2057	4750282
2012	239605	118712	3620813	248372	1913	4229415
2013	226902	102500	3244655	239090	1839	3814986
2014	210420	92871	2754380	224763	1721	3284155
2015	193742	84148	2297569	204064	1537	2781060
2016	166874	73199	1957610	180700	1462	2379845
2017	150914	67361	1672658	161929	1423	2054285
2018	138283	61380	1561550	155268	1481	1917962
2019	128461	55883	1555419	159391	1673	1900827

Source: Author's calculation

Table 3.7: Gender wise years of life lost due to premature death among different age groups in India

	Male						Female					
Year	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total
2000	234510	12859	2011858	71886	822	2331935	234648	13423	1398361	52460	769	1699661
2001	262737	18234	2374554	91398	949	2747872	262022	19094	1713339	68832	961	2064248
2002	280439	24811	2724565	111962	1084	3142861	279218	25533	1977280	85352	1125	2368508
2003	285450	31202	2968504	133277	1191	3419624	284585	33214	2189152	101879	1270	2610100
2004	286354	38734	3244557	153017	1279	3723941	285228	41159	2402641	116530	1433	2846991
2005	284690	47424	3349388	167439	1268	3850209	284685	50023	2570749	131068	1554	3038079
2006	265062	55200	3372160	174016	1294	3867732	265327	58884	2643046	141399	1707	3110363
2007	241203	64376	3242951	172427	1231	3722188	241694	67549	2598997	145448	1757	3055445
2008	210155	68850	3027709	165911	1147	3473772	211332	71010	2526288	145378	1731	2955739
2009	182883	70796	2708328	155083	1041	3118131	184526	70049	2367518	142102	1617	2765812
2010	168537	68517	2384634	145043	903	2767634	170942	64913	2196881	138313	1396	2572445
2011	136495	62433	2090174	133132	816	2423050	139888	61798	1989837	130771	1263	2323557
2012	117987	60323	1837527	124716	772	2141325	121917	58450	1780994	123748	1160	2086269
2013	111780	53163	1637623	120392	780	1923738	115402	49322	1605779	118747	1073	1890323
2014	103913	49785	1403662	114660	783	1672803	106755	42971	1348455	109973	945	1609099
2015	96468	45602	1185288	107092	764	1435214	97362	38409	1111015	96567	774	1344127
2016	83334	39911	1011305	96346	780	1231676	83606	33157	945138	83867	679	1146447
2017	75365	36872	873995	89441	822	1076495	75609	30363	797043	71792	594	975401
2018	69058	33361	813517	87521	888	1004345	69280	27914	746673	66931	583	911381
2019	64117	30167	803867	89518	1002	988671	64397	25631	750604	69063	660	910355

Source: Author's calculation

Table 3.6 shows the total YLL due to HIV/AIDS premature death in India from 2000 to 2019 based on average life expectancy. This demonstrates a fall in the number of years lost due to premature death for age groups under 5 and 15-49 years.

Table 3.7 shows the gender-wise YLL due to HIV/AIDS premature death in India based on the average male and female life expectancy. It was observed that more than half of the years of life lost due to premature death of HIV/AIDS was among the males. The 15-49 age group accounts for more than four-fifths of YLL among males and females. The YLL of females under the 70 above age group has been declining since 2015.

It is observed that since 2007 the YLL due to HIV/AIDS premature death started to show a decreasing trend. In 2015, NACO reported that the annual deaths due to HIV/AIDS had fallen by 54 per cent, consistent with the rapid increase in Antiretroviral Therapy (ART) access to the people living with HIV (PLHIV). Since the free ART services were introduced in 2004, around 4.5 lakhs of lives were saved during 2004-14 in the country. (NACO & NIMS, 2015)

3.4.2 Years of life lived with disability (YLD)

The years of life lost due to disability (YLD) metrics measure the total time of living with a disability using prevalence methods. YLD is computed by multiplying the number of HIV/AIDS prevalent cases by the HIV/AIDS disability weight factor. The formula is:

$$\mathbf{YLD=P \times DW}$$

P= number of prevalent cases

DW= disability weights

Table 3.8: Years of life lived with disability among different age groups in India

Year	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total
2000	7875	2392	515236	16495	531	542529
2001	8683	3472	546737	19451	580	578923
2002	9196	4799	561127	22230	626	597978
2003	9440	6288	561029	24739	670	602166
2004	9468	7837	550201	26961	713	595180
2005	9467	9538	541283	29411	761	590460
2006	9116	10998	517729	30904	798	569545
2007	8662	12275	491222	32467	845	545471
2008	8180	13311	466052	34311	907	522761
2009	7758	14103	444331	36587	988	503767
2010	7251	14678	426507	39424	1087	488947
2011	5808	12984	357234	37020	1046	414092
2012	5465	13078	348885	40549	1182	409159
2013	5213	12947	342670	44646	1352	406828
2014	4998	12700	338355	49361	1570	406984
2015	4744	12418	336599	54726	1844	410331
2016	4487	12111	336318	60578	2182	415676
2017	4239	11746	336220	66998	2616	421819
2018	3977	11360	335716	73749	3149	427951
2019	3715	10964	333857	80553	3786	432875

Source: Author's calculation

Table 3.8 portrays concentrated years of life living with HIV/AIDS disability in India from 2000 to 2019. Since the peak in 2003, the YLD shows a steady decline during the last two decades. Moreover, it shows that the number of YLD has decreased for the age groups under 5 and 15-17 years. On the contrary, the YLD has been increasingly high over the period for the remaining age groups.

Data from Table 3.9 shows the gender-wise YLD due to HIV/AIDS in India. It shows that more than three-fifths of the YLD due to HIV/AIDS are among males. More than three-quarters of the YLD was among the 15-49 age group for males and females.

Table 3.9: Gender-wise Years of Life lived with Disability (YLD) among different age groups in India

	Male						Female					
Year	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total
2000	4108	1252	307656	9651	234	322901	3767	1139	207580	6844	296	219626
2001	4531	1816	324222	11323	254	342146	4153	1655	222515	8127	325	236775
2002	4800	2509	330665	12911	272	351157	4397	2290	230462	9319	354	246822
2003	4929	3286	328694	14358	287	351554	4511	3002	232335	10381	383	250612
2004	4945	4095	320595	15657	300	345592	4523	3743	229606	11304	413	249589
2005	4945	4982	313735	17094	315	341071	4522	4557	227548	12317	446	249390
2006	4762	5742	298779	18011	329	327623	4354	5256	218950	12892	468	241920
2007	4524	6406	282454	19025	353	312762	4138	5869	208767	13442	492	232708
2008	4270	6941	267423	20272	390	299296	3910	6370	198628	14038	517	223463
2009	4046	7348	254908	21845	443	288590	3712	6755	189423	14743	545	215178
2010	3778	7641	244939	23757	518	280633	3473	7037	181568	15667	569	208314
2011	3024	6752	205329	22524	534	238163	2784	6232	151905	14496	512	175929
2012	2845	6796	200591	24920	639	235791	2620	6281	148294	15630	543	173368
2013	2714	6726	196989	27653	771	234853	2499	6221	145681	16993	582	171976
2014	2602	6596	194548	30714	938	235398	2396	6104	143807	18648	632	171587
2015	2470	6448	193637	34074	1149	237778	2273	5970	142963	20652	695	172553
2016	2337	6286	193470	37640	1406	241139	2149	5825	142848	22937	776	174535
2017	2209	6096	193265	41483	1724	244777	2030	5650	142955	25515	893	177043
2018	2073	5895	192671	45487	2097	248223	1905	5465	143045	28262	1051	179728
2019	1936	5689	191258	49516	2523	250922	1779	5274	142599	31036	1263	181951

Source: Author's calculation

The study showed the high numbers of YLL in Table 3.6 and 3.7 compared to YLD in Table 3.8 and 3.9. Therefore, in India, HIV/AIDS causes more losses due to premature death than disability. According to the IHME-GBD India profile, HIV/AIDS ranked 78th among the conditions causing premature death in 1990, which rose to the 12th rank (2.3%) in 2010.

3.4.3 Disability Adjusted Life Years (DALYs)

The disability-adjusted life years lost due to HIV/AIDS in India was calculated by taking the sum of the losses from premature death and loss of healthy life resulting from disability due to HIV/AIDS. The formula for DALY is:

$$\text{DALY} = \text{YLL} + \text{YLD}$$

YLL= years of life lost due to HIV/AIDS death

YLD= years of life lived with disability of HIV/AIDS

Table 3.10 gives the total DALYs lost due to HIV/AIDS in India. The DALY lost by the age group under five years is declining over the decades, while the 50 above age groups showed a rising trend indicating higher DALYs among the elder age groups. It is observed that the DALYs lost due to HIV/AIDS has reduced by 2264814 DALYs (51%) from 2000 to 2019. The highest DALYs lost during the two-decade due to HIV/AIDS has been 7580845 DALYs in 2006; the lowest has been 2333702 DALYs in 2019. It is revealed that four-fifths of the total DALYs lost fall under the 15-49 age groups, as shown in Fig. 3.1. It indicates an absence of a very healthy workforce.

Table 3.10: DALYs lost due to HIV/AIDS by different age groups in India

Year	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total
2000	476672	28656	3948832	142223	2133	4598516
2001	533054	40773	4659600	181319	2499	5417245
2002	568449	55118	5291148	221494	2845	6139054
2003	579056	70645	5747931	262199	3140	6662971
2004	580634	87659	6228951	299179	3432	7199855
2005	578722	106794	6494535	330739	3581	7514371
2006	539386	124839	6563861	348968	3791	7580845
2007	491446	143952	6360391	352674	3819	7352282
2008	429551	152943	6041067	347547	3767	6974875
2009	375051	154805	5534235	335253	3629	6402973
2010	346384	148085	5015864	322990	3362	5836685
2011	281875	137111	4441384	300900	3103	5164373
2012	245070	131790	3969698	288921	3095	4638574
2013	232115	115447	3587325	283736	3191	4221814
2014	215419	105572	3092735	274124	3290	3691140
2015	198486	96565	2634169	258790	3380	3191390
2016	171361	85310	2293927	241277	3644	2795519
2017	155154	79106	2008878	228927	4039	2476104
2018	142260	72740	1897267	229018	4630	2345915
2019	132176	66847	1889275	239944	5460	2333702

Source: Author's Calculation

Figure 3.1: DALYs lost due to HIV/AIDS by different age groups in India

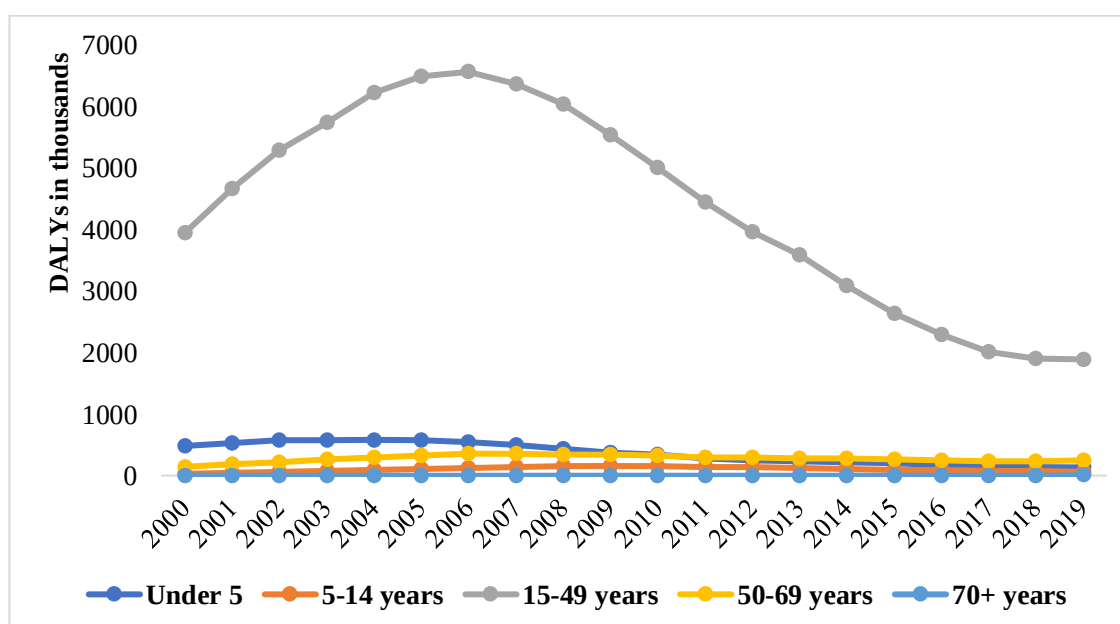


Table 3.11: Gender-wise DALYs lost due to HIV/AIDS by different age groups in India

	Male						Female					
Year	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Total
2000	238618	14111	2319514	81537	1056	2654836	238416	14562	1605941	59304	1065	1919288
2001	267267	20050	2698776	102721	1203	3090017	266174	20749	1935854	76960	1286	2301023
2002	285239	27319	3055230	124873	1356	3494017	283614	27823	2207742	94671	1479	2615329
2003	290378	34488	3297198	147634	1478	3771176	289096	36216	2421487	112259	1653	2860711
2004	291299	42829	3565152	168674	1579	4069533	289751	44902	2632247	127834	1846	3096580
2005	289635	52406	3663122	184533	1583	4191279	289207	54580	2798297	143385	2000	3287469
2006	269824	60942	3670939	192027	1624	4195356	269681	64139	2861996	154292	2176	3352284
2007	245727	70782	3525405	191452	1584	4034950	245832	73418	2807764	158890	2248	3288152
2008	214425	75791	3295132	186184	1537	3773069	215242	77380	2724916	159416	2248	3179202
2009	186928	78144	2963236	176928	1484	3406720	188239	76805	2556941	156845	2163	2980993
2010	172314	76158	2629573	168800	1421	3048266	174415	71950	2378450	153980	1965	2780760
2011	139520	69186	2295503	155656	1350	2661215	142672	68030	2141741	145267	1775	2499485
2012	120832	67120	2038118	149636	1411	2377117	124537	64732	1929288	139378	1703	2259638
2013	114494	59889	1834611	148046	1550	2158590	117902	55544	1751460	135739	1654	2062299
2014	106515	56381	1598210	145373	1721	1908200	109151	49075	1492262	128621	1577	1780686
2015	98938	52050	1378925	141166	1912	1672991	99636	44378	1253978	117219	1469	1516680
2016	85672	46198	1204774	133987	2186	1472817	85756	38982	1087986	106804	1455	1320983
2017	77574	42967	1067260	130923	2545	1321269	77640	36012	939998	97307	1487	1152444
2018	71131	39257	1006188	133008	2986	1252570	71185	33378	889719	95193	1634	1091109
2019	66053	35856	995124	139034	3525	1239592	66176	30905	893202	100099	1923	1092305

Source: Author's calculation

Data from Table 3.11 shows that more than half of the DALYs lost due to HIV/AIDS are among males. In addition, more than four-fifths of the DALYs lost was accounted by the 15-49 age group for both males and females.

More than four-fifths of the DALYs lost fall under the 15-49 age group for both males and females. The DALYs lost due to HIV/AIDS has increased for the age-groups 5-14 years till 2009, 50-69 years, and 70 above years till 2006 for male and female population during the decades.

3.4.4 Economic burden of disease

The human capital approach measures the monetary value of loss of health due to work absence from illness, diseases, injury, and other risk factors. The work absenteeism due to illness is contemplated and evaluated by the achievable gross income. It is calculated using wages as a measure of output. The human capital approach is used to calculate the monetary value of DALYs lost due to HIV/AIDS by multiplying the estimated DALYs lost due to HIV/AIDS with Gross Domestic Product (GDP) per capita for each year. The economic burden of HIV/AIDS is calculated only for the working-age groups 15-49 years.

Here the data on GDP per capita of India was collected from the World Bank database. The GDP per capita at constant local currency units and constant 2010 USD was used for the calculation. The real GDP data is also used to estimate the burden share of the HIV/AIDS epidemic in the economy. *Appendix A.3* shows India's GDP and GDP per capita at constant USD and local currency units (Indian Rupees). It is observed that India's GDP per capita in 2019 was USD 2152 or Rs 1.1 lakhs in local currency.

Table 3.12: Economic burden of HIV/AIDS for 15-49 age groups in India

Year	USD	Rupees	Share of Real GDP (In %)
2000	3264075257.64	161706894697.51	0.37
2001	3968192397.28	196589851482.32	0.43
2002	4599073237.50	227844578638.82	0.48
2003	5300557570.93	262597102488.25	0.52
2004	6099911083.46	302198203588.83	0.55
2005	6756344584.50	334718845623.73	0.57
2006	7265711535.73	359953603233.04	0.56
2007	7466305461.77	369891309417.62	0.54
2008	7204043726.43	356898492931.51	0.50
2009	7018789124.33	347720718502.42	0.45
2010	6809355151.00	337345063899.28	0.41
2011	6264245512.13	310339563102.35	0.36
2012	5832190822.27	288934964028.36	0.31
2013	5541051616.47	274511516902.14	0.28
2014	5072644308.57	251305957828.07	0.24
2015	4614179649.02	228592971584.48	0.20
2016	4302793557.21	213166465151.83	0.17
2017	3990902952.06	197714964416.40	0.15
2018	3958553405.68	196112322235.42	0.14
2019	4065202232.58	201395855628.38	0.14

Source: Author's calculation

Table 3.12 shows the economic burden due to the HIV/AIDS epidemic in India. It shows the productivity lost in monetary terms. It was noted that the burden had been dramatically increasing from 2000 to 2007. The burden share of HIV/AIDS in the national GDP accounts for the highest in 2005, i.e., 0.56 per cent. The share of burden has reduced from 0.37 per cent to 0.14 per cent during the past two decades.

Table 3.13: Gender-wise burden of HIV/AIDS for 15-49 age groups in India

Year	Male			Female		
	USD	Rupees	Share of Real GDP (In %)	USD	Rupees	Share of Real GDP (In %)
2000	1917293033.59	94985402668.34	0.22	1327458492.66	65764167105.40	0.15
2001	2298322113.68	113862121024.06	0.25	1648605268.34	81674231591.45	0.18
2002	2655610217.95	131562677933.71	0.28	1918972620.30	95068611764.28	0.20
2003	3040570525.98	150634154869.65	0.30	2233017530.55	110626839814.67	0.22
2004	3491295830.53	172963722544.06	0.32	2577716665.71	127703721427.87	0.23
2005	3810791096.90	188791968928.63	0.32	2911103102.80	144220156014.15	0.24
2006	4063459545.97	201309520474.44	0.31	3168018908.78	156948127614.99	0.25
2007	4138386355.54	205021500361.12	0.30	3295964936.59	163286754396.98	0.24
2008	3929483265.67	194672146473.74	0.27	3249494737.43	160984555149.43	0.23
2009	3758122172.13	186182676066.08	0.24	3242837974.58	160654769723.63	0.21
2010	3569813061.65	176853576981.36	0.21	3228896799.13	159964104217.25	0.19
2011	3237637643.09	160397137962.72	0.18	3020768383.73	149653128796.82	0.17
2012	2994357156.41	148344679322.17	0.16	2834466312.20	140423461253.95	0.15
2013	2833776228.69	140389273542.98	0.14	2705338652.09	134026294740.05	0.14
2014	2621353727.60	129865563057.25	0.12	2447579881.18	121256561466.73	0.12
2015	2415413073.53	119662972420.26	0.11	2196548614.58	108820118250.63	0.10
2016	2259834189.73	111955374955.52	0.09	2040770596.72	101102655403.96	0.08
2017	2120252976.26	105040324656.14	0.08	1867431193.82	92515176758.48	0.07
2018	2099361784.78	104005345547.53	0.07	1856353867.84	91966390396.66	0.07
2019	2141235251.70	106079816192.46	0.07	1921926688.20	95214960457.02	0.07

Source: Author's calculation

Figure 3.2 Burden of HIV/AIDS in India

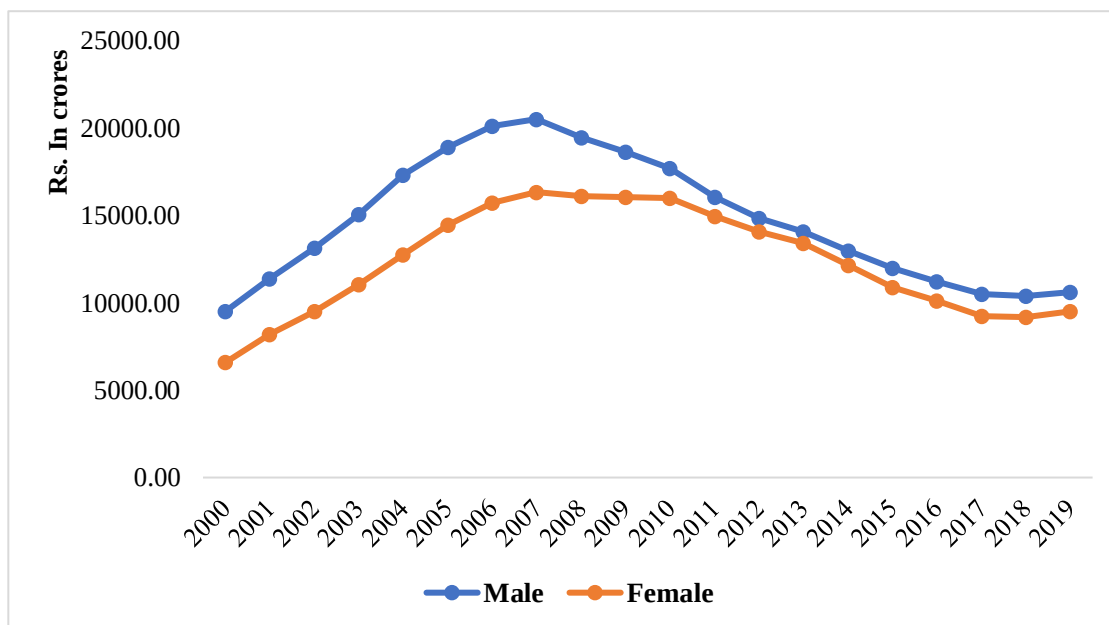
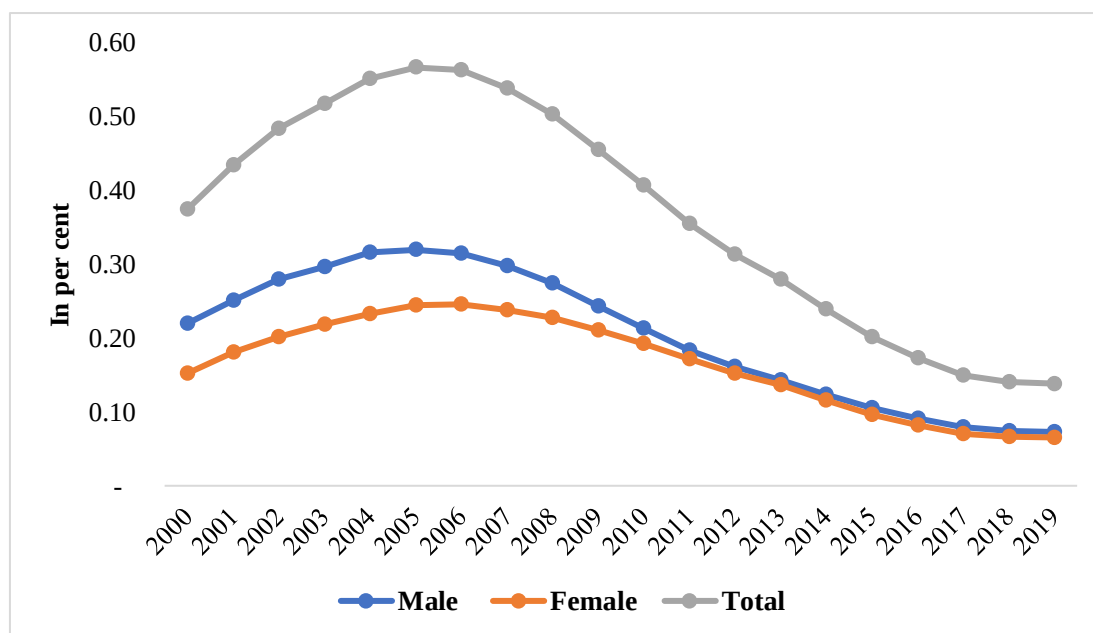


Figure 3.3: Percentage share of India's HIV/AIDS burden in GDP



The data from Table 3.13 shows that the burden of HIV/AIDS has affected both the male and female working population. It is observed that the male population was more affected by the burden compared to the female population over the period (Fig.3.2). During 2018 and 2019, the HIV/AIDS burden's share in the economy declines to 0.07 per cent for both genders (Fig:3.3). The per cent share of the epidemic burden in the economy is below 0.3 per cent during the two decades, which is comparatively low compared to other countries or regions.

However, a 2017 estimate on the healthy life lost in India signifies that HIV/AIDS is not among the top fifteen mortality and disability conditions causing most DALYs in the country (Menon et al., 2019). They estimated that ischaemic heart disease, perinatal conditions, chronic respiratory diseases, diarrhoea, respiratory infections, cancer, stroke, road accidents, tuberculosis, and liver alcohol-related conditions were the mortality causing DALY.

HIV/AIDS is not among the most causing DALYs; however, it can be associated with any disease. The common HIV co-infection is tuberculosis, hepatitis B, hepatitis C, and cancer. Therefore, people with HIV/AIDS are 21 times at greater risk of developing tuberculosis, and the report reveals that 25 per cent of tuberculosis deaths are HIV/AIDS infected person during 2017-18 to 2019-20. (NACO, 2020b).

Section II: The Burden of HIV/AIDS in the Northeast Indian States

3.5 Variables and their description used to study the Northeast Indian States

The Northeast states data is used to measure the burden of the HIV/AIDS epidemic in the country during 2007-19. The burden of HIV/AIDS is calculated on the eight states of the Northeast region in India, viz., Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. The data was collected from secondary sources: the National AIDS Control Organisation, the Reserve Bank of India and Central Statistical Organisation, Directorate of Economics and Statistics of the North-east states, the Sample Registration System (SRS), and the Global Burden of Disease (GBD) Report. It includes the mortality and prevalence of HIV/AIDS cases from NACO, the life expectancy from the SRS, and disability weights of HIV/AIDS from GBD.

3.5.1 Deaths and prevalent cases due to HIV/AIDS

The number of AIDS-related death and HIV prevalent cases were collected from NACO publications such as HIV Estimation (2015, 2017 & 2019), Status of National AIDS Response (2016), and North-East Region Vol-1 (2017). However, due to the unavailability of published data on gender-wise and age-group wise, the study includes only the working-age group 15 to 49 years. Moreover, no publication or report was available for 2018, so the year is excluded from the study.

Data from Table 3.14 (a) shows the estimated number of annual AIDS-related death in the Northeast states. It shows that Manipur has the highest death cases over the period, followed by Nagaland, Assam, Mizoram, and Tripura. The remaining three states Arunachal Pradesh, Sikkim, and Meghalaya, have the least cases below fifty until 2017. It is observed that the death cases in Assam have been showing a rising trend during the years. During 2007-19, more than half of the death cases reported are from Manipur.

Table 3.14 Estimated number of AIDS-related deaths and HIV/AIDS prevalent cases in Northeast Indian states

Northeast States (a)	Estimated no. of annual AIDS-related deaths (15-49 years)											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2019
Mizoram	257	259	238	200	166	145	132	92	78	79	473	279
Manipur	1469	1415	1438	1520	1460	1452	1368	1208	1145	1023	1620	989
Nagaland	723	697	662	570	469	403	358	299	286	280	536	499
Assam	198	193	196	205	197	214	233	234	228	233	265	499
Tripura	147	160	173	183	201	217	238	253	265	279	64	9
Arunachal Pradesh	12	14	17	19	23	27	29	30	31	25	18	14
Sikkim	13	13	13	15	15	18	21	24	26	14	1	3
Meghalaya	45	45	41	36	30	27	25	16	13	18	22	209
Northeast States (b)	Estimated no. of prevalent cases (15-49 years)											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2019
Mizoram	80	79	79	79	79	80	80	80	80	79	204	232
Manipur	194	185	176	166	155	145	134	124	115	106	143	118
Nagaland	98	95	92	90	87	84	82	80	78	76	115	145
Assam	4	4	4	5	5	5	6	6	6	6	6	9
Tripura	15	16	18	20	21	24	26	28	31	34	9	10
Arunachal Pradesh	6	6	7	7	7	7	7	7	7	7	6	6
Sikkim	10	11	12	13	15	17	19	21	23	26	5	7
Meghalaya	6	6	6	6	6	6	6	6	6	6	11	54

Source: NACO HIV Estimates (2015;2017;2019), Status of National AIDS Response (2016) and North-East Region Vol-I (2017)

Data from Table 3.14 (b) shows that four-fifths of the prevalent cases belong to Manipur, Mizoram, and Nagaland over the period. Despite Assam's high number of HIV/AIDS deaths, it has the lowest prevalent case over the years. It is observed that Mizoram and Nagaland prevalent cases profoundly increase from 2017. The AIDS-related death and prevalent cases are used for calculating the year of life lost due to premature death and years lived with disability to measure DALYs.

3.5.2 Life expectancy and HIV/AIDS disability weight

The Sample Registration System (SRS) calculate abridged life tables for India and bigger states such as Andhra Pradesh, Assam, Bihar, Chhattisgarh, NCT of Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand, and West Bengal. Due to the unavailability of life expectancy data from seven Northeast states during 2007-19, the Assam life expectancy table was used. Since the study required only the life expectancy of adults 15-49 years, the Assam life expectancy is assumed to be accurate in representing the other states.

As the SRS life table was presented in different age intervals, the average life expectancy was taken for the 15 to 50 age groups. In the study, the total average life expectancy is used from the abridged life table of 2005-09, 2010-14 and 2014-18 periods for the year 2007-09, 2010-13, and 2014-19 respectively. *Appendix A.4* shows the expectation of life at the 15-49 age group from the abridged life table. It is seen that the life expectancy has increased from 39 years to 42 years during the decade. The life expectancy is used for calculating the year of life lost due to HIV/AIDS premature death for the eight Northeast states.

The Global Burden of Disease (GBD) Study update 2004, 2010, 2015, 2016, 2017, and 2019 on disability weights for diseases and conditions are used in the study. The average disability weight represents the different HIV/AIDS disability stages, as shown in *Appendix A.2*.

Appendix A.4 shows the disability weight used in the calculation. It is observed that the HIV/AIDS disability weight has slightly declined from 2011 onwards. Therefore, these disability weights are used for calculating the year of life lived with disability in Northeast states to evaluate the DALYs lost due to HIV/AIDS.

3.6 The burden of HIV/AIDS in Northeast India

The HIV/AIDS burden in the Northeast states is estimated using the DALY approach to measure the health gaps, estimated by summing the YLL and YLD metric. The DALYs are calculated separately for the eight Northeast states. Then, the burden of HIV/AIDS is calculated in monetary terms by multiplying the DALYs with the state's respective Gross State Domestic Product (GSDP) per capita.

The GSDP per capita at gross state value added by economic activity at constant (2011-12) prices is also used to calculate the DALYs cost. The real GSDP used the base year 2004-05 for 2007-13 and 2011-12 base years for 2013-19. The GSDP at GSVA used the 2011-12 base year for 2011-19.

3.6.1 Years of life lost due to premature death (YLL)

The years of life lost due to HIV/AIDS premature deaths is measured by multiplying the estimated number of AIDS-related death and the life expectancy (Table 3.14 and *Appendix A.4*).

Table 3.15 shows the YLL due to HIV/AIDS premature deaths in different Northeast states. It is seen that Manipur and Nagaland have the highest YLL compared to the other states over the decade. It is noticed that the YLL fluctuated, and the total YLL slightly decline during 2013-16.

Table 3.15: Years of life lost due to premature death in the Northeast States

Year	Northeast States								
	Mizoram	Manipur	Nagaland	Assam	Tripura	Arunachal Pradesh	Sikkim	Meghalaya	Total
2007	10188	58220	28656	7850	5829	479	518	1787	113526
2008	10268	56080	27625	7652	6344	558	519	1787	110832
2009	9435	56991	26239	7771	6860	677	519	1628	110120
2010	8190	62217	23334	8394	7494	781	618	1477	112506
2011	6798	59762	19200	8067	8231	945	618	1232	104854
2012	5939	59435	16499	8763	8886	1109	741	1109	102482
2013	5407	55997	14657	9541	9746	1191	864	1028	98431
2014	3888	50994	12626	9882	10684	1271	1018	680	91043
2015	3297	48335	12077	9629	11190	1313	1102	553	87497
2016	3339	43186	11824	9840	11781	1039	575	743	82326
2017	19970	68385	22629	11190	2706	765	47	933	126626
2019	11781	41750	21068	21068	385	596	131	8827	105605

Source: Author's calculation

3.6.2 Years of life lived with disability (YLD)

The year of life lived with disability of HIV/AIDS for the Northeast states was measured by multiplying the estimated number of HIV prevalent cases and the HIV/AIDS disability weight (Table 3.14 and Appendix A.4).

Table 3.16 showed the YLD due to HIV/AIDS in eight Northeast states. It is revealed that almost two-fifths of the total YLD is borne by Manipur, followed by Mizoram and Nagaland. The YLD due to HIV/AIDS is relatively low compared to YLL due to HIV/AIDS premature death.

Table 3.16: Years of life lived with disability in the Northeast States

	Northeast States								
Year	Mizoram	Manipur	Nagaland	Assam	Tripura	Arunachal Pradesh	Sikkim	Meghalaya	Total
2007	21.92	53.16	26.85	1.10	4.11	1.64	2.74	1.64	113.16
2008	21.65	50.69	26.03	1.10	4.38	1.64	3.01	1.64	110.15
2009	21.65	48.22	25.21	1.10	4.93	1.92	3.29	1.64	107.96
2010	21.65	45.48	24.66	1.37	5.48	1.92	3.56	1.64	105.76
2011	18.72	36.74	20.62	1.19	4.98	1.66	3.56	1.42	88.88
2012	18.96	34.37	19.91	1.19	5.69	1.66	4.03	1.42	87.22
2013	18.96	31.76	19.43	1.42	6.16	1.66	4.50	1.42	85.32
2014	18.96	29.39	18.96	1.42	6.64	1.66	4.98	1.42	83.42
2015	18.96	27.26	18.49	1.42	7.35	1.66	5.45	1.42	82.00
2016	18.72	25.12	18.01	1.42	8.06	1.66	6.16	1.42	80.58
2017	48.35	33.89	27.26	1.42	2.13	1.42	1.19	2.61	118.26
2019	54.98	27.97	34.37	2.13	2.37	1.42	1.66	12.80	137.70

Source: Author's calculation

3.6.3 Disability Adjusted Life Years (DALYs)

The disability-adjusted life years lost in India due to HIV/AIDS are calculated by taking the sum of premature death and loss of healthy life of the HIV/AIDS epidemic (Table 3.15 and Table 3.16). Table 3.17 shows the DALYs lost due to HIV/AIDS in the eight Northeast States.

Table 3.17: DALYs lost due to HIV/AIDS in the Northeast States

Year	Mizoram	Manipur	Nagaland	Assam	Tripura	Arunachal Pradesh	Sikkim	Meghalaya	Total
2007	10210	58273	28683	7851	5833	480	521	1788	113639
2008	10289	56131	27652	7653	6349	560	522	1788	110943
2009	9457	57040	26264	7772	6864	679	522	1630	110228
2010	8211	62263	23359	8396	7499	783	621	1479	112612
2011	6817	59799	19221	8068	8236	947	622	1233	104943
2012	5958	59469	16519	8764	8892	1111	745	1111	102569
2013	5426	56028	14677	9542	9752	1193	868	1029	98516
2014	3907	51024	12644	9883	10690	1273	1023	682	91126
2015	3316	48362	12095	9630	11198	1315	1108	555	87579
2016	3358	43211	11842	9841	11789	1041	581	745	82407
2017	20018	68419	22657	11192	2708	766	48	936	126744
2018	11836	41778	21102	21070	387	597	133	8839	105743

Source: Author's calculation

It is noticed that Manipur and Nagaland have the highest DALYs lost due to HIV/AIDS over the decade (Fig.3.4 and Fig.3.5). The DALY lost due to HIV/AIDS has been increasingly high in 2017 for Manipur, Mizoram, Nagaland, and Assam. Sikkim and Arunachal Pradesh have the least DALY lost due to HIV/AIDS among the states. Assam has the third-highest DALYs lost during the decade, followed by Mizoram and Tripura. It indicates that despite the least losses of healthy life due to disability in Assam, the high losses of premature deaths due to HIV/AIDS contribute to the DALYs losses.

Figure 3.4: DALYs lost due to HIV/AIDS under 15-49 age group in Northeast State

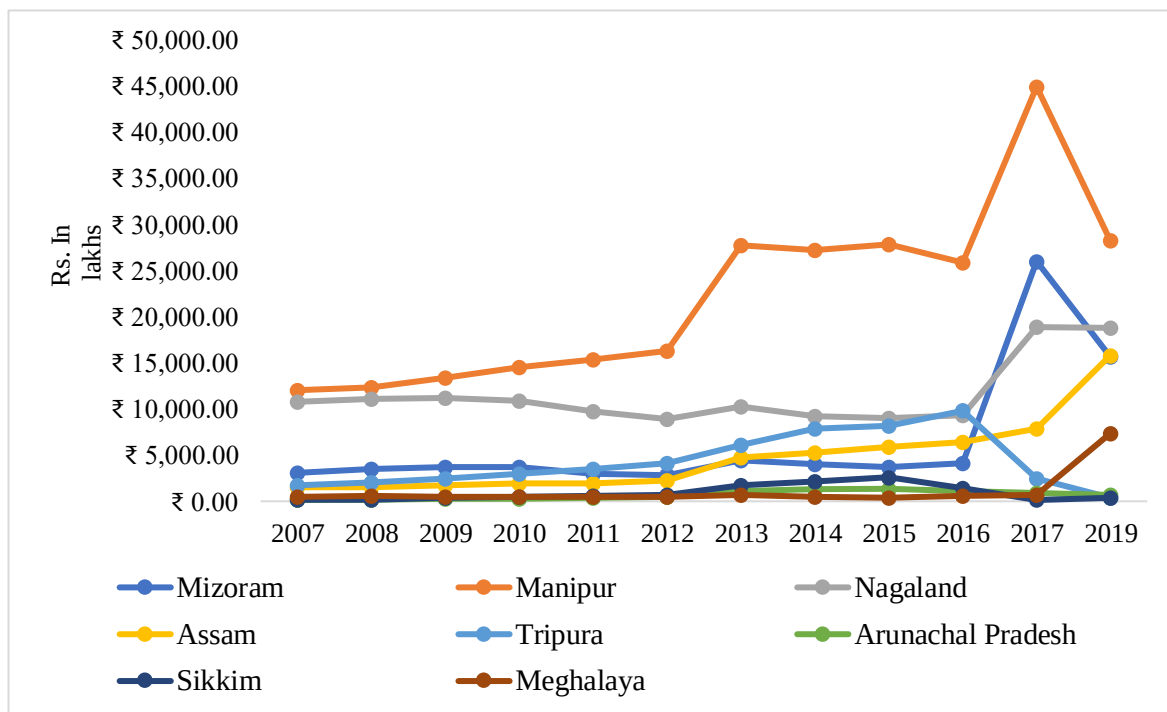
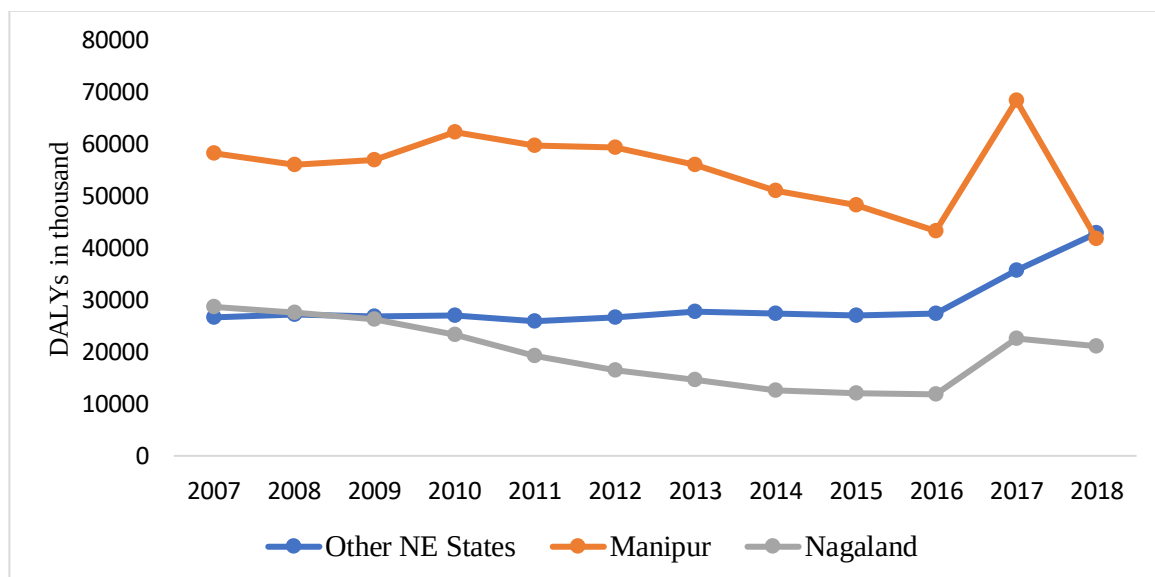


Figure 3.5: DALYs lost due to HIV/AIDS in Manipur, Nagaland, and the other NE States



3.6.4 Economic burden of HIV/AIDS

The value of DALYs lost due to HIV/AIDS is calculated by multiplying the estimated DALYs loss due to HIV/AIDS by the year gross state domestic product (GSDP) per capita. In the study, the Real GSDP per capita of each Northeast States was calculated based on the National Statistical Office's data, Ministry of Statistics and Programme Implementation, GOI. The GSDP at Gross State Value Added by economic activity was collected from the respective state's Directorate of Economics and Statistics.

The GSDP data were calculated based on the financial year; however, data collected from NACO was presented in the annual year. Therefore, the year was adjusted where the GSDP for 2011-12 was calculated with the number of DALYs lost in 2011, respectively. The real GSDP data and GSDP at GSVA is also used in the study to evaluate the share of the burden of HIV/AIDS in the economy. *Appendix A.5 to A.7* shows the northeast State's real GDP, GDP per capita, and GDP at GSVA used for the calculation.

3.6.4.1 Real GSDP

The GSDP per capita at constant prices were computed using the statewise GDP data collected from NSO, MoSPI and the Statewise Population (2011 Census). *Appendix A.6* shows the GSDP per capita, calculated from the statewise GDP collected from the National Statistical Office, Ministry of Statistics and Programme Implementation, and the Statewise Population collected from the 2011 Census.

Table 3.18 shows the burden of HIV/AIDS in the Northeast states during 2007-19. It is noticed that Manipur and Nagaland have the utmost burden of HIV during the decade. Arunachal Pradesh has the lowest burden of HIV/AIDS, followed by Sikkim and Meghalaya. The highest burden lost due to HIV/AIDS during the decade was Rs 38943.31 lakhs in 2017, borne by Manipur. Fig 3.6 shows an increasing trend of HIV/AIDS in the Northeast state, where the burden was relatively rising during 2017 and 2019.

Table 3.18: Burden of HIV/AIDS in the Northeast States (Rs. In lakhs)

	Northeast States							
Year	Mizoram	Manipur	Nagaland	Assam	Tripura	Arunachal Pradesh	Sikkim	Meghalaya
2007	3105.10	12037.18	10790.93	1523.80	1744.56	146.73	185.80	480.36
2008	3546.69	12355.37	11061.82	1570.35	2077.87	185.90	216.40	542.54
2009	3662.98	13420.82	11230.90	1738.27	2486.06	246.81	376.00	526.92
2010	3727.21	14564.22	10922.69	1975.99	2936.65	295.49	486.51	519.05
2011	4454.83	26699.49	11755.30	3674.23	4282.64	748.42	1130.33	817.80
2012	4084.88	26138.38	10564.84	4054.77	5158.62	879.08	1370.15	736.65
2013	4233.01	26178.14	9952.31	4570.85	6613.14	1010.28	1677.83	680.32
2014	3757.21	25195.04	8859.61	4996.79	8278.08	1230.98	2111.89	428.66
2015	3428.35	25176.52	8537.45	5559.90	10441.65	1235.14	2486.90	350.10
2016	3760.57	22895.18	8922.48	5931.22	11952.66	991.86	1382.00	484.44
2017	24279.72	38943.31	17982.27	7290.11	3010.30	773.38	130.04	618.79
2019	14495.33	23954.89	17741.41	14445.56	485.52	618.07	377.33	6256.80

Source: Author's calculation

**Figure 3.6: Burden of HIV/AIDS in the Northeast Indian States during 2007-2019
(Rs. In crores)**

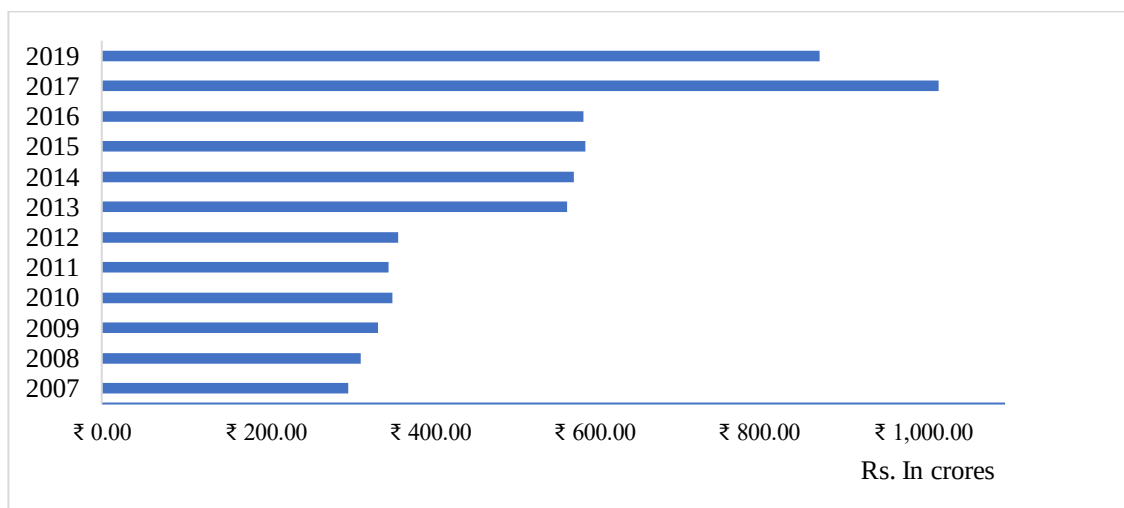


Table 3.19: Percentage share of the burden of HIV/AIDS in Real GSDP in the Northeast States

Year	Mizoram	Manipur	Nagaland	Assam	Tripura	Arunachal Pradesh	Sikkim	Meghalaya
2007	0.93	2.04	1.45	0.03	0.16	0.03	0.09	0.06
2008	0.94	1.97	1.40	0.02	0.17	0.04	0.09	0.06
2009	0.86	2.00	1.33	0.02	0.19	0.05	0.09	0.05
2010	0.75	2.18	1.18	0.03	0.20	0.06	0.10	0.05
2011	0.61	2.07	0.97	0.03	0.22	0.07	0.10	0.04
2012	0.53	2.01	0.82	0.03	0.24	0.08	0.12	0.04
2013	0.47	1.85	0.72	0.03	0.26	0.08	0.14	0.03
2014	0.33	1.65	0.62	0.03	0.28	0.09	0.16	0.02
2015	0.28	1.53	0.58	0.03	0.29	0.09	0.17	0.02
2016	0.28	1.34	0.57	0.03	0.30	0.07	0.09	0.02
2017	1.70	2.08	1.09	0.03	0.07	0.05	0.01	0.03
2019	1.00	1.24	1.01	0.06	0.01	0.04	0.02	0.25

Source: Author's calculation

Table 3.19 shows the HIV/AIDS burden share in the GSDP during 2007-19. It is seen that Manipur and Nagaland have more than one per cent share of the burden in their state economy during the period, followed by Mizoram from 2017. Table 3.12 from section-I shows India's HIV/AIDS burden share in the economy, where the average share during 2000-19 was 0.37 per cent, and 2007-19 was 0.31 per cent. The Northeast state's average HIV/AIDS burden share in the economy can be calculated from Table 3.19. During 2007-19, Manipur had a 1.83 per cent share, followed by Nagaland (0.98%) and Mizoram (0.72%). It is noticed that this burden share in the economy is larger than the national average (0.31%) from 2007-19. It can be stated that the burden of HIV/AIDS is an alarming threat that had widely affected the small states of the Northeast.

3.6.4.2 GSDP at Gross State Value Added

Gross value added (GVA) applies to the value of output, which is less than the value of intermediate consumption. Since the total aggregates of taxes and subsidies on products are available only at the whole economy level, it measures the gross regional domestic product and other measures of the output of entities, which is smaller than a whole economy, i.e.,

$$\text{GVA} = \text{GDP} + \text{Subsidies on products} - \text{Taxes on products}.$$

The study used the GSDP at Gross State Value Added (GSVA) by economic activity at constant (2011-12) prices to calculate the HIV/AIDS burden in the Northeast states. The data on GSDP at GSVA was collected from the Directorate of Economics and Statistics of the respective States. *Appendix A.7* shows the GSDP, statewise projected population, and per capita GSDP used for the calculation. Table 3.20 shows the HIV/AIDS burden calculated at GSVA from 2011 to 2019. It is seen that HIV/AIDS burden is less compared to the burden calculated using real GSDP. The average share of the burden in the GSDP at GSVA calculates 1.83 per cent share in Manipur during 2011-19, followed by Nagaland (0.98%) and Mizoram (0.72%).

Table 3.20: Burden of HIV/AIDS at Gross State Value Added by economic activity at constant (2011-12) prices

The burden of HIV/AIDS at GSVA (Rs. In lakhs)								
NE States	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Mizoram	4454.83	4084.88	4233.01	3757.21	3428.35	3760.57	24279.72	14495.33
Manipur	26699.49	26138.38	26178.14	25195.04	25176.52	22895.18	38943.31	23954.89
Nagaland	11755.30	10564.84	9952.31	8859.61	8537.45	8922.48	17982.27	17741.41
Assam	3674.23	4054.77	4570.85	4996.79	5559.90	5931.22	7290.11	14445.56
Tripura	4282.64	5158.62	6613.14	8278.08	10441.65	11952.66	3010.30	485.52
Arunachal Pradesh	748.42	879.08	1010.28	1230.98	1235.14	991.86	773.38	618.07
Sikkim	1130.33	1370.15	1677.83	2111.89	2486.90	1382.00	130.04	377.33
Meghalaya	817.80	736.65	680.32	428.66	350.10	484.44	618.79	6256.80
Percentage share of the burden of HIV/AIDS in GSDP at GSVA								
NE States	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Mizoram	0.61	0.53	0.47	0.33	0.28	0.28	1.70	1.00
Manipur	2.07	2.01	1.85	1.65	1.53	1.34	2.08	1.24
Nagaland	0.97	0.82	0.72	0.62	0.58	0.57	1.09	1.01
Assam	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.06
Tripura	0.22	0.24	0.26	0.28	0.29	0.30	0.07	0.01
Arunachal Pradesh	0.07	0.08	0.08	0.09	0.09	0.07	0.05	0.04
Sikkim	0.10	0.12	0.14	0.16	0.17	0.09	0.01	0.02
Meghalaya	0.04	0.04	0.03	0.02	0.02	0.02	0.03	0.25

Source: Author's calculation

3.7 The burden of HIV/AIDS in India and Northeast States

The burden of HIV/AIDS in India and the Northeast states were compared from Table 3.12 and Table 3.18. It was found that the Northeast states account for an average of 3.3 per cent of the national burden of HIV/AIDS (Fig. 3.7 and Fig. 3.8). The Northeast states burden of the total national burden of HIV/AIDS increased to 11 per cent in 2017 and 9.2 per cent in 2019.

Figure 3.7: Percentage of the Burden of HIV/AIDS in India during 2007-2019

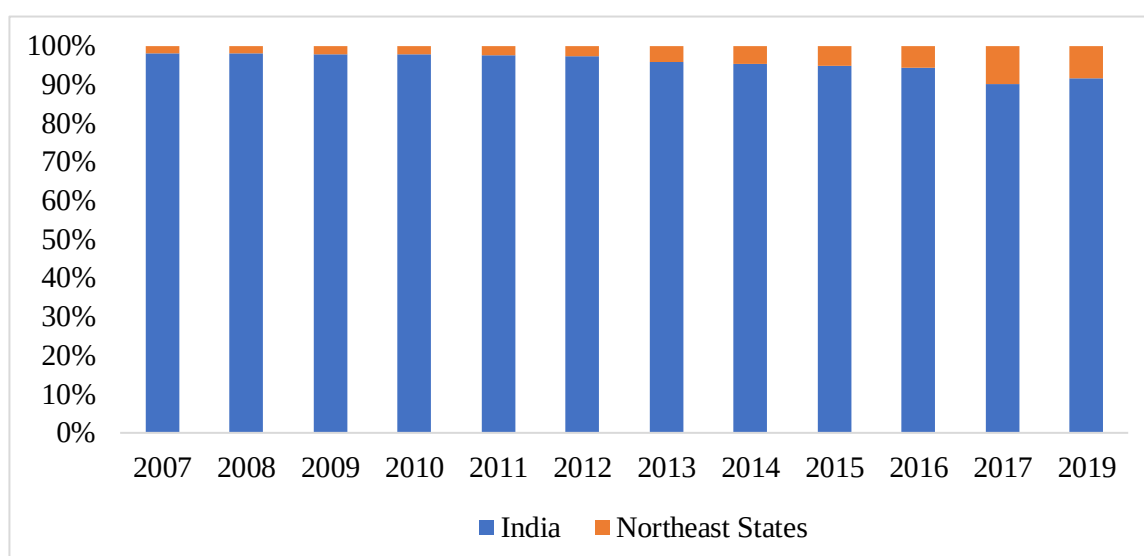
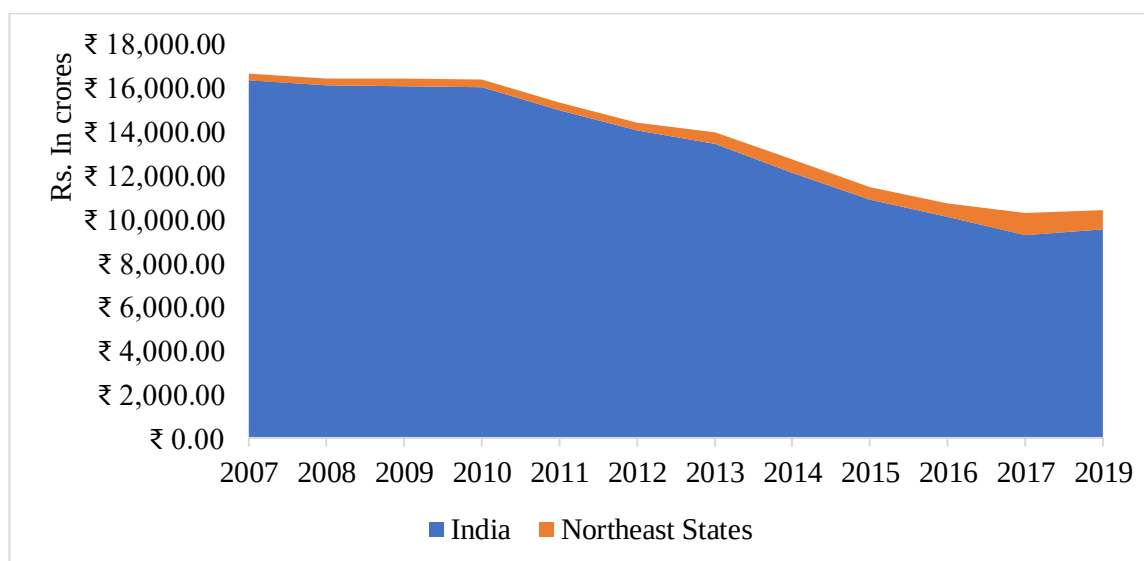


Figure 3.8: Economic burden of HIV/AIDS in India during 2007-2019



3.8 Summary

The analysis of this chapter shows that in India, HIV/AIDS contributed more to mortality losses than to healthy life losses due to disability. It was found that YLL due to HIV/AIDS premature death accounted for more than four-fifths of the DALYs lost. However, the YLD of HIV/AIDS under the 70 above age group have increased over the decades. For the above 70 age group, seven-tenths of the DALYs lost due to HIV/AIDS was caused by disability in 2019. It indicated that the elderly HIV/AIDS people faced more disability than premature death due to HIV/AIDS. The expansion of free Antiretroviral Therapy (ART) treatment to PLHIV has saved and prolonged life.

From 2000 to 2019, the total DALYs lost due to HIV/AIDS for different age groups of both males and females show 102538203 DALYs lost. Of which 85 per cent of the DALYs lost are from the productive age groups, 15-49 years. Likewise, the average DALYs loss accounted for 5126.91 thousand per year. The DALYs lost due to HIV/AIDS in India reached the highest peak during 2007 to 2011, accounting for 29 per cent of the total DALYs lost during the two decades. From 2000 to 2019, the disability adjusted life years lost due to HIV/AIDS for different age groups of males show 55793580 DALYs lost, and females show 46437420 DALYs lost. The total DALYs lost accounted for 55 per cent of males and 45 per cent of females. Of which 47 per cent are 15-49 age groups males, 38 per cent are 15-49 age groups females. The working-age group of males are more highly affected by the DALYs lost. Under-five age groups accounted for 4 per cent of the DALYs lost for both males and females.

The analysis further shows that the HIV/AIDS burden has enormously affected its working-age population, leading to premature death and disabilities. It portrays a concentrated burden of the epidemic on the economy. The economic burden of HIV/AIDS was measured as the productivity loss. During 2000-2019, the total economic burden of HIV/AIDS was Rs.541953.92 crores (109.39 billion USD). The average burden accounted for Rs 27098 crores (5.47 billion USD) per year. It was found that the burden of HIV/AIDS has been rapidly increasing from 2000 to 2007. During 2000-2010, the burden accounted for 109.7 billion USD (at constant prices, 2010) and showed an overall increase of 20 per cent. However, the average burden during 2015-2019 is Rs 20,740 crore per year (\$4186 million). The male population

was affected by 54 per cent higher than the female population over the period by HIV/AIDS. The average burden of HIV/AIDS is Rs 14703 crores (\$2970 million) for males and Rs 12309 crores (\$2485 million) for females per year. The estimates show that the burden share of HIV/AIDS in the national GDP accounts was the highest in 2005, i.e., 0.56 per cent. The share of burden had declined from 0.37 per cent to 0.14 per cent during the two decades. The average share of the HIV/AIDS burden in the economy is 0.37 per cent during the two decades.

During 2007-2019, the Northeast states the economic burden of HIV/AIDS accounted for Rs 6230 crore, with an average burden of Rs 527 crore per year. Northeast states accounted for an average of 3.3 per cent of the national burden of HIV/AIDS from 2007 to 2016. In 2017, it had rapidly increased to 11 per cent. Manipur, Nagaland, and Mizoram states have the HIV/AIDS burden share on the economy more than the national average of 0.14 per cent in 2017 and 2019. Since the peak in 2007, the burden of HIV/AIDS shows a steady decline. However, these underdeveloped states are bearing the most burden of the epidemic. In India, the percentage share of the burden in the GDP is low, but it is huge in absolute number.

CHAPTER 4

The Scenario of HIV/AIDS in Mizoram

4.1 Background

Demographically, Mizoram has the second smallest state population in India and had the highest rate of adult HIV prevalence since the 2017 estimates. In 2017, the state prevalence rate was 2.04 per cent, whereas the national average was 0.22 per cent. Therefore, the HIV prevalence rate continues to rise since the beginning of the NACP-IV plan. Likewise, the state HIV incidence rate was 1.32, almost four times superior to the national average (0.10), which required an imperative focus on the prevention programmes of AIDS. This chapter explains the HIV/AIDS epidemic trends in the state, focusing on NACP-IV. It illustrates the Mizoram State AIDS Control Society (MSACS) by defining the function, performances, and services under the NACP. The contribution from various NGOs is also included highlighting specific emphasis that has been undertaken from data collected from various sources.

4.2 HIV/AIDS in Mizoram

In the mid-1980s, heroin injection begins to appear in Manipur, Mizoram, and Nagaland of the Northeastern States and the highly urbanised states of India. Later in the 1990s, the pharmaceutical injection was evidenced, spreading to many cities and towns across India (Thangsing, 2012). During 1984 the 'Heroin' drugs started to be acknowledged in Mizoram, trading from its neighbouring country Myanmar (Burma), which forms part of the Golden Triangle. Myanmar comprises 25 per cent of the world's opium production after the world-leading producer Afghanistan (UNODC, 2010). As a result, in Mizoram, heroin and oral analgesic drug (proxyvon) addictions started affecting the working-age group and their socio-economic conditions. It was not long until 1990; the first HIV/AIDS case in Mizoram was found among drug users⁸. Consequently, most HIV infection cases were detected among Injecting Drugs User (IDUs) and their partners through the sharing of infected syringes and needles.

⁸ See MSACS. (2012). *HIV AIDS Engtin Zel?*

Earlier in 1986, India's first HIV positive case was found in Tamil Nadu, showing that HIV/AIDS transmission has no barriers from the beginning despite how remote and undeveloped a state could be. Since the discovery of the new HIV case and its rapid increases all over the states, the Government of India started programmes under the Medium-Term Plan (1990-92), NACP-I (1992-1999), NACP-II (1999-2006), NACP-III (2006-2012), and the NACP-IV (2012-17) to combat the HIV epidemic.

4.2.1 Surveillance and Estimations

NACO collaborated with the Indian Council of Medical Research – National Institute of Medical Statistics (ICMR-NIMS) to develop the most extensive surveillance such as HIV Sentinel Surveillance (HSS), Integrated Biological and Behavioural Surveillance (IBBS), and HIV estimations datasets with the latest HIV epidemic information and its programme intervention. Mizoram's state-wise surveillance reports are highlights with relevant indicators, and the statistics of MSACS on the epidemic are observed.

HIV Sentinel Surveillance 2014-15 on Antenatal Clinic Attendees: In 2015, the 14th round of the HSS was conducted at 776 sentinel sites among pregnant women, where the total sample size is 3,04,982⁹. In Mizoram, out of 3,561 pregnant women attending ANC clinic, one-half of the sample belongs to 25 to 34 years; the mean age calculated was 26 years, where the national average was 24 years. The surveillance showed that 2 per cent of ANC attendees were illiterate, and three-tenths have attained an education level between 11th standard to post-graduation. Out of 3,542 respondents, 74 per cent were residing in rural areas. Out of 3,559 respondents, 80 per cent were referred from government hospitals (including ASHA/ANM) and self-referral. The occupation distribution shows that three-quarters of the respondents were housewives, and one-tenth were engaged in government/private jobs. Out of which, 28 per cent of the respondent's spouses engaged in government/private jobs, 17 per cent were non-agricultural labourer, 12 per cent were agricultural labourer, 13 per cent were unemployed, 8 per cent were local transport worker, and 23 per cent of the remaining were truck driver/helper, hotel staff, domestic servant, skilled/semi-skilled worker,

⁹ See NACO (2016a)

large business self-employed, students and local transport worker. Out of 3,536 respondents, only 8 per cent reported spouse migration. Mizoram has the second-highest rate of HIV prevalence among the ANC at 0.91 per cent after Nagaland (1.29%), exceeding three times higher than the national average (0.29%).

HIV Sentinel Surveillance (2016-17): The 15th round of HSS was conducted during 2017 at 1323 sentinel sites, of which 829 sites were among ANCs and 494 sites among high-risk groups (HRGs) and bridge populations¹⁰. Thirteen states have a higher HIV prevalence among Antenatal Clinic (ANC) attendees than the national average (0.28%). Mizoram (1.19%) records the country's highest ANC HIV prevalence; six sentinel sites have more than one per cent, and two sites more than two per cent HIV prevalence. Despite the state having one FSW site, it holds the highest HIV prevalence (24.7%), whereas other states mostly have less than 5 per cent prevalence. Among IDUs, four sites have higher than 5 per cent (>5%), and three sites have higher than 10 per cent (>10%) HIV prevalence. Mizoram has the highest HIV prevalence among the IDUs, with 19.8 per cent, while 6.26 per cent was the national average. The syphilis prevalence at the ANC site was 0.10 per cent for India, and Mizoram recorded less than the national average. The IDU behaviour (also supported through the commercial exchange of sex) has contributed extensively to the high prevalence among HRGs in the state. The report highlights the need to strengthen the prevention project for IDU by embracing needles/syringe exchanges programmes, opioid substitution therapy services, and condom promotion programmes.

HIV Estimations 2017: According to 2017 estimates, Mizoram had the highest adult HIV prevalence with 2.04 per cent, followed by Manipur (1.43%), Nagaland (1.15%), Telangana (0.70%), Andhra Pradesh (0.63%), Karnataka (0.47%), Goa (0.42%), Maharashtra (0.33%), and Delhi (0.30%), whereas the national adult HIV prevalence was estimated at 0.22 per cent¹¹. The estimates showed 21.40 lakh PLHIV in India, of which Mizoram accounts for one per cent of the PLHIV. India's HIV incidence per 1000 uninfected population drops from 0.10 per cent to 0.07 per cent during 2010-2017. Mizoram has the highest estimated HIV incidence rate (1.32%) among the general population and the HRGs. It was estimated that 22,677 HIV positive women

¹⁰ See NACO (2017b)

¹¹ See NACO & ICMR-NIMS (2018).

are giving birth in India, needing ART prophylaxis in order to prevent HIV transmission to their babies. The estimates recommended a strategic focus in Mizoram, and other states with a high HIV incidence rate accounted nearly four times higher than the national average.

Table 4.1: Summary of HIV Estimates in the Northeast States and India Estimates (2019)

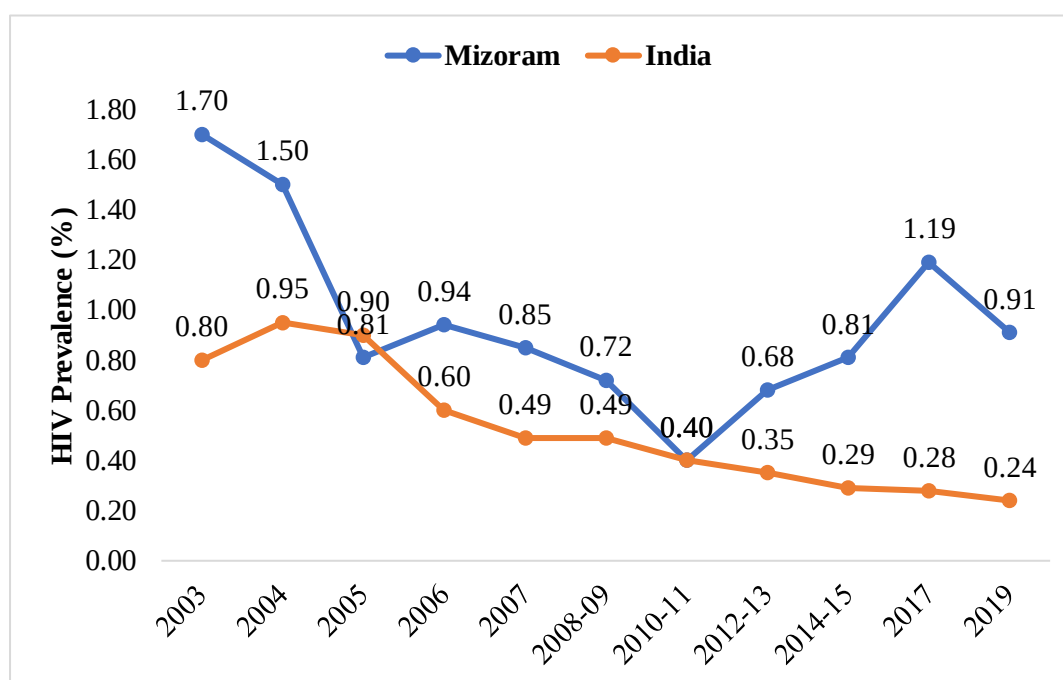
HIV Estimates	Mizoram	Manipur	Nagaland	Assam	Tripura	Arunachal Pradesh	Meghalaya	Sikkim	India
Percentage of adult HIV Prevalence (15-49 yrs.)	2.32	1.18	1.42	0.09	0.10	0.06	0.54	0.07	0.22
Total No. of PLHIV (In thousand)	20.05	28.56	22.55	21.22	2.86	0.06	11.28	0.35	2348.86
HIV incidence per 1,000 uninfected population	1.18	0.34	0.73	0.04	0.11	0.05	0.23	0.03	0.05
Total No. of annual new HIV infections (in thousand)	1.37	0.96	1.55	1.33	0.45	0.07	0.73	0.02	69.22
% change in annual new HIV infections 2010-2019	-0.51	-29.09	-6.47	-22.75	264.52	62.22	-48.67	-34.38	-37.38
AIDS-related mortality per 100,000 population	20.34	36.86	26.20	1.67	0.46	1.14	11.08	0.64	4.43
Total no. of annual AIDS-related deaths (in thousand)	0.36	1.08	0.57	0.57	0.02	0.02	0.36	0.00	58.96
% change in annual AIDS-related deaths	-50.00	-52.42	-34.72	1.79	80.00	88.89	135.53	0.00	-66.07
PMTCT needs (In thousand)	0.27	0.36	0.40	0.33	0.03	0.01	0.28	0.00	20.52

Source: NACO & ICMR-NIMS (2020). Available from:
<http://naco.gov.in/sites/default/files/Estimation%20Report%202019.pdf>

HIV Estimates 2019 Report: The latest biennial HIV estimates had shown that in 2019, the state with the highest rate of adult HIV prevalence in India was Mizoram state with 2.32 per cent, followed by Nagaland with 1.45 per cent and Manipur with 1.18 per cent. In comparison, the national average was 0.22 per cent. Further, it also

has the highest HIV incidence rate, estimated at 1.18 per thousand uninfected population, while 0.05 per 1,000 uninfected population was the national figure. Its incidence rate among HRGs was 1.14 per cent, and IDUs was 2.80 per cent higher than the total incidences. The estimates show that there are 1.37 thousand new infections in Mizoram, which can be interpreted into three new HIV infections per day; otherwise, eight new HIV infection cases happen every eight hours. The AIDS-related mortality per one lakh population was estimated the highest for Manipur with 36.86 deaths, followed by Mizoram and Nagaland higher than 20 deaths, while the national average is 4.43 (Table 4.1). The estimates suggested the urgent need for community-driven responses to combat this relatively high annual new HIV infection in Mizoram and the other northeast states.

Figure 4.1: Comparison of the HIV prevalence of ANC clinic attendees in India and Mizoram, 2003-2019



Source: National AIDS Control Organization (2020c)

HIV Sentinel Surveillance 2019 on Antenatal Clinic Attendees: In 2019, the 16th round of the ‘HSS’ was conducted at 833 sentinel sites among pregnant women, where the total sample size was 3,31,757. In Mizoram, data was collected from 3,434 samples

of pregnant women attending ANC clinics. The mean age of the women was 27.6 years, whereas the national average was 24.3 years. The surveillance data showed that 2.6 per cent of ANC attendees were illiterate, and four-fifths belongs to rural areas. The occupation of spouse showed that 23.7 per cent were non-agricultural labourer, services (22.8%), agricultural labourers (13.5%), unemployed (11.6%), local transport workers (8.8%), others (8.7%), and 3.9 per cent were truck drivers/helpers, hotel staff and agricultural cultivators. Only 4.4 per cent of the ANC attendees report spouse migration. The HIV prevalence among the ANC in Mizoram was below the national average only in 2005 and 2010-11 (Fig.4.1). In 2019, it had the second-highest HIV prevalence (0.91%) among the 35 states/UTs. It is more than three times higher than the national average (5.5%).

4.2.2 Mizoram Statistics

According to the 2011 census, almost two-fifths of the Mizoram population reside in Aizawl District (4,00,309 persons) with a sex ratio of 927. Of this, 79 per cent of the population (3,14,754 persons) reside in urban and 21 per cent (85,555 persons) reside in rural areas. More than three-fifths of the state's population comprises districts such as Lunglei (14.7%), Champhai (11.5%), Lawngtlai (10.7%), Mamit (7.9%), Kolasib (7.7%), Serchhip (5.9%), and Saiha (5.2%).

During FY 2014-19, 3,10,543 HIV tests were conducted in the state, where 1,00,220 were ANC clients, and 1,64,558 were general clients. Of these, 8,985 of the blood tested were found positive; 700 were ANC clients, and 8285 were general clients. From October 1990 to March 2020, 22,130 persons were detected HIV positive in Mizoram, out of which seven-tenths of the people have started taking ART treatment, and 12 per cent have died of HIV/AIDS. In 2017-18, a total number of 48,130 blood samples of people were screened. Out of which 2,093 people were found to be positive, and 1,444 people have died of AIDS.

Table 4.2: Number of blood samples tested and HIV positive cases in Mizoram (2001-02 to 2017-18)

Year	No. of Blood Samples Tested			No. of HIV Positive Cases			Per cent of Positive Cases		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
2001-02	504	163	667	29	13	42	5.8	8.0	6.3
2002-03	2,127	798	2,925	133	84	217	6.3	10.5	7.4
2003-04	2,842	1,066	3,908	153	94	247	5.4	8.8	6.3
2004-05	3,002	1,400	4,402	163	117	280	5.4	8.4	6.4
2005-06	3,925	2,471	6,396	217	152	369	5.5	6.2	5.8
2006-07	5,699	2,872	8,571	240	172	412	4.2	6.0	4.8
2007-08	3,311	1,676	4,987	140	93	233	4.2	5.5	4.7
2008-09	13,804	6,937	20,741	470	267	737	3.4	3.8	3.6
2009-10	20,239	10,574	30,813	718	370	1,088	3.5	3.5	3.5
2010-11	25,193	12,453	37,646	753	412	1,165	3.0	3.3	3.1
2011-12	32,070	16,150	48,220	458	822	1,280	1.4	5.1	2.7
2012-13	25,764	11,951	37,715	644	378	1,022	2.5	3.2	2.7
2013-14	31,722	14,763	46,485	646	399	1,045	2.0	2.7	2.2
2014-15	27,278	12,545	39,823	722	437	1,159	2.6	3.5	2.9
2015-16	29,307	13,436	42,743	866	459	1,325	3.0	3.4	3.1
2016-17	30,256	15,753	46,009	1,364	534	1,898	4.5	3.4	4.1
2017-18	31,469	16,661	48,130	1,489	604	2,093	4.7	3.6	4.3
Total	2,88,512	1,41,669	4,30,181	9,205	5,407	14,612	3.2	3.8	3.4

Source: Monitoring & Evaluation, MSACS

Data from Table 4.2 shows that during 2001-02 to 2017-18, out of the total number of blood samples tested, 67 per cent were males and 33 per cent were females. Out of the total number of HIV positive cases found, 63 per cent were males, and 37 per cent were females. Although the female blood samples tested accounted for only three-tenths of the total number of blood samples tested, its average percentage of HIV positive cases per blood samples tested was 3.8 per cent, which is higher than the male (3.2%) and the total average (3.4%). The percentage of HIV cases tested positive was the highest during 2002-03 (7.8%).

Table 4.3: Route of HIV Transmission in Mizoram during 2001-02 to 2017-18

Year	Sexual Contact (A)			Infected Syringes/needles (B)			Parent to child (C)			Not Specified (D)			Grand Total	A	B	C	D
	M	F	Total	M	F	Total	M	F	Total	M	F	Total		%	%	%	%
2001 ¹² -02	9	9	18	19	3	22	1	1	2	0	0	0	42	42.9	52.4	4.8	0.0
2002-03	41	51	92	75	18	93	5	3	8	10	11	21	214	43.0	43.5	3.7	9.8
2003-04	56	62	118	82	21	103	4	4	8	11	6	17	246	48.0	41.9	3.3	6.9
2004-05	47	79	126	100	30	130	5	3	8	11	5	16	280	45.0	46.4	2.9	5.7
2005-06	104	106	210	93	31	124	5	9	14	14	6	20	368	57.1	33.7	3.8	5.4
2006-07	141	134	275	84	20	104	6	13	19	9	5	14	412	66.7	25.2	4.6	3.4
2007-08	100	77	177	31	6	37	6	9	15	3	1	4	233	76.0	15.9	6.4	1.7
2008-09	266	225	491	175	19	194	11	17	28	18	6	24	737	66.6	26.3	3.8	3.3
2009-10	466	319	785	217	32	249	20	17	37	15	2	17	1088	72.2	22.9	3.4	1.6
2010-11	436	357	793	291	36	327	18	10	28	8	9	17	1165	68.1	28.1	2.4	1.5
2011-12	521	397	918	255	29	284	35	27	62	11	5	16	1280	71.7	22.2	4.8	1.3
2012-13	487	338	825	137	15	152	11	20	31	9	5	14	1022	80.7	14.9	3.0	1.4
2013-14	459	345	804	157	19	176	22	20	42	8	15	23	1045	76.9	16.8	4.0	2.2
2014-15	518	374	892	187	39	226	14	19	33	5	7	12	1163	76.7	19.4	2.8	1.0
2015-16	569	375	944	267	60	327	21	23	44	4	6	10	1325	71.2	24.7	3.3	0.8
2016-17	765	451	1,216	565	58	623	25	22	47	10	3	13	1899	64.0	32.8	2.5	0.7
2017-18	857	494	1,351	605	87	692	13	18	31	14	5	19	2093	64.5	33.1	1.5	0.9
Total	5,842	4,193	10,035	3,340	523	3,863	222	235	457	160	97	257	14612	68.7	26.4	3.1	1.8

Source: Monitoring and Evaluation, MSACS

¹² December 2001 to March 2002

Table 4.4: District-wise HIV blood samples tested and positive cases, 2014-15 to 2018-19

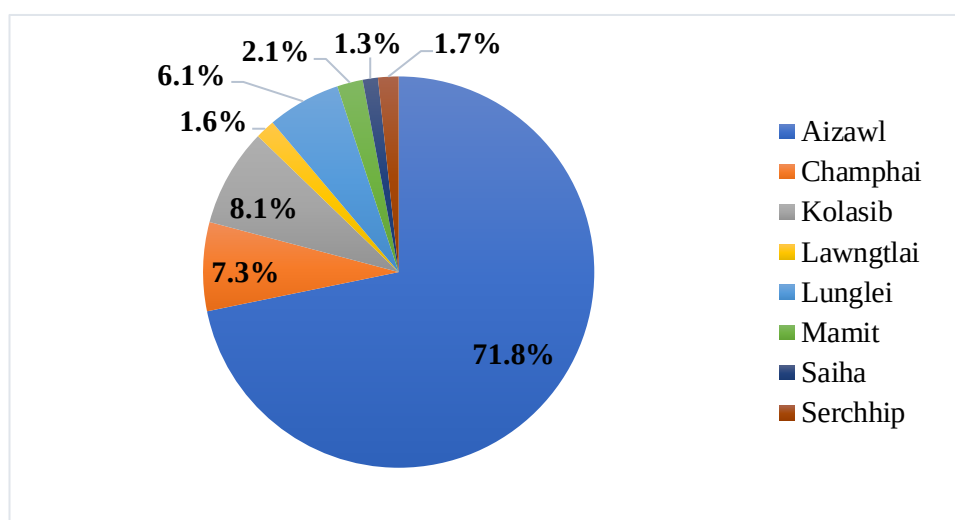
District	Number of blood samples tested						Number of blood samples tested (In per cent)					
	2014-15	2015-16	2016-17	2017-18	2018-19	2014-19	2014-15	2015-16	2016-17	2017-18	2018-19	2014-19
Aizawl	33,064	31,238	32,843	34,267	26,934	1,58,346	52.2	49.2	48.6	50.6	55.7	51.0
Champhai	6,371	6,333	6,835	6,416	4,648	30,603	10.1	10.0	10.1	9.5	9.6	9.9
Kolasib	3,991	4,530	5,407	4,607	3,910	22,445	6.3	7.1	8.0	6.8	8.1	7.2
Lawngtlai	2,616	2,556	3,514	3,637	1,377	13,700	4.1	4.0	5.2	5.4	2.8	4.4
Lunglei	7,781	7,999	8,167	8,385	5,688	38,020	12.3	12.6	12.1	12.4	11.8	12.2
Mamit	3,541	3,965	4,713	4,264	2,338	18,821	5.6	6.3	7.0	6.3	4.8	6.1
Saiha	2,481	2,202	1,929	1,602	1,105	9,319	3.9	3.5	2.9	2.4	2.3	3.0
Serchhip	3,548	4,616	4,149	4,590	2,386	19,289	5.6	7.3	6.1	6.8	4.9	6.2
Total	63,393	63,439	67,557	67,768	48,386	3,10,543	100	100	100	100	100	100
District	No. of HIV positive cases						No. of HIV positive cases (In per cent)					
	2014-15	2015-16	2016-17	2017-18	2018-19	2014-19	2014-15	2015-16	2016-17	2017-18	2018-19	2014-19
Aizawl	921	1025	1468	1666	1370	6450	72.0	70.4	71.7	74.5	69.7	71.8
Champhai	130	125	142	136	126	659	10.2	8.6	6.9	6.1	6.4	7.3
Kolasib	71	113	226	163	155	728	5.5	7.8	11.0	7.3	7.9	8.1
Lawngtlai	19	28	22	55	22	146	1.5	1.9	1.1	2.5	1.1	1.6
Lunglei	75	74	90	108	199	546	5.9	5.1	4.4	4.8	10.1	6.1
Mamit	16	32	46	59	38	191	1.3	2.2	2.2	2.6	1.9	2.1
Saiha	20	22	31	14	26	113	1.6	1.5	1.5	0.6	1.3	1.3
Serchhip	28	36	23	35	30	152	2.2	2.5	1.1	1.6	1.5	1.7
Total	1280	1455	2048	2236	1966	8985	100	100	100	100	100	100

Source: Computed from Monitoring and Evaluation, MSACS

Data from Table 4.3 shows that the main route of HIV transmission was sexual contact. The sexual route of HIV transmission was 43 per cent during 2002-03 and had increased to 64.5 per cent in 2017-18. During 2002-03 to 2017-18, HIV transmission through infected syringes had substantially lowered from 43.5 per cent to 33.1 per cent. In addition, parent to child infection dropped from 3.7 per cent to 1.5 per cent, and not specified cases had largely reduced from 9.8 per cent to 0.9 per cent. Almost three-fifths of transmission through sexual contact and nine-tenths through infected syringes/needle were male.

Data from Table 4.4 shows the district-wise number of blood samples tested and HIV positive cases of both general clients and ANC clients during 2014-15 to 2018-19. It shows that one-half of the blood samples tested were in Aizawl followed by Lunglei (12.4%), Champhai (9.8%), Lawngtlai (4.4%), Mamit (6.0%), Kolasib (7.3%), Serchhip (6.2%), and Saiha (3.0%) districts. Among the HIV positive cases, 71.8 per cent were from the Aizawl district, followed by Kolasib, Champhai, Lunglei, Mamit, Serchhip, Lawngtlai and Saiha districts (Fig:4.2).

Figure 4.2: District-wise status of HIV positive cases during 2014-15 to 2018-19



Aizawl district has the highest HIV-positive cases, and also it has the highest urban population. Among the eight districts in Mizoram, Kolasib district emerges as the sixth-largest in population. Despite its small population size, Kolasib district has the second-highest HIV cases, with a peak increase since FY 2015-16. Champhai District

has the third-highest HIV cases; the trends in the HIV cases decline with the drop in the number of blood samples tested. Lunglei District is the second-largest district in the state and accordingly holds the fourth-highest number of HIV cases, and it shows an increasing trend during 2014-18. However, despite the decline in the number of blood samples tested in the Lunglei district during 2018-19, the number of HIV cases found was doubled in the following year.

Table 4.5: District-wise percentage of HIV positive cases, 2014-15 to 2018-19

District	2014-15	2015-16	2016-17	2017-18	2018-19	2014-19
Aizawl	2.8	3.3	4.5	4.9	5.1	4.1
Champhai	2.0	2.0	2.1	2.1	2.7	2.2
Kolasib	1.8	2.5	4.2	3.5	4.0	3.2
Lawngtlai	0.7	1.1	0.6	1.5	1.6	1.1
Lunglei	1.0	0.9	1.1	1.3	3.5	1.4
Mamit	0.5	0.8	1.0	1.4	1.6	1.0
Saiha	0.8	1.0	1.6	0.9	2.4	1.2
Serchhip	0.8	0.8	0.6	0.8	1.3	0.8
Total	2.0	2.3	3.0	3.3	4.1	2.9

Source: Computed from Monitoring and Evaluation, MSACS

Table 4.5 shows the percentage of HIV positive cases per blood tested during 2014-15 to 2018-19. The number of HIV positive cases double from 2 per cent in 2014-15 to 4.1 per cent in 2018-19. During FY 2014-2019, Aizawl, Champhai and Kolasib districts have positive cases higher than the total average.

4.3 Mizoram State AIDS Control Society

In December 1992, the State AIDS Cell (SAC) was created to respond to the catastrophe of HIV/AIDS within the states. SAC was formed to implement the National AIDS Control Programme (NACP) in every state-funded by GOI, World Bank, GFATM, DFID, USAID, and other international donors. However, for effective implementation of the NACP, all State AIDS Cells were converted into a registered society by the State AIDS Empowered Committee. Since April 1999, the NACP was carried out through the State AIDS Control Society (SACS). SACS works under the National AIDS Control Organization (NACO), a division of the Ministry of Health and Family Welfare. The NACP governs the programs of SACS. It functions with the

aim to deliver medical and public health services, social services, planning, and administrative services. Accordingly, AIDS Cell was introduced in Mizoram in 1992-93, under the Health Department supervised by the Joint Director of Health Services with minimum staff to combat the infection and spread awareness of the epidemic. SAC was converted to Mizoram State AIDS Control Society (MSACS) under the Societies Act on the 22nd of July 1998, chaired by the Hon'ble Secretary, Health and Family Welfare during the NACP-II (1997-2007). The State AIDS Policy was later approved on the 22nd of October 1999 by the Council of Ministers. MSACS is supervised by a Governing body, chaired by the State Health Minister as the Chairman of the Society, including members of the Secretaries of various government departments and the Project Director of MSACS. The Executive council is chaired by the Secretaries of the Health Department and the Project Director as the Member Secretary. Moreover, the Project Director is entirely in charge of the projects and policy issues within the state, supported by the Additional Project Director. The Additional Project Director supervised all technical Divisions at SACS.

From 2008-2009, the HIV prevention and control programme management was allocated at the district level during the NACP-III (2007-12) for a significant structural change. Based on the disease burden, all the country's districts were classified into four categories, viz., A, B, C, and D, according to the HIV Sentinel Surveillance 2004-2006 reports. Out of 195 districts in the country that fall in high disease burden, 80 per cent belong to category A, and 20 per cent to category B. NACO established *District AIDS Prevention and Control Unit (DAPCU)* to ensure programmatic supervision through decentralized facilitating, vigilance, and coordination of its programme activities by covering 96 per cent of the districts in category A and B. In Mizoram, three districts fall under category A and B, and there are three DAPCU centres in Aizawl, Champhai, and Kolasib districts.

4.3.1 Divisions

The MSACS administration can be categorized into twelve divisions that function for implementing the NACP. These Divisions were supervised by the Programme Officer, where each division consists of a Divisional Assistant/Finance Assistant and Procurement Assistant, as shown in *Appendix B.1*. Categories of the officer were

formed under the Joint UN Programme to increase emphasis and uplift the achievement of the NACP. Each division deals with implementing NACP policies in the state and responsible for precisely determining the policies and programme operation to plan, monitor, assess, control, organise, and direct the NACP policies and operations. The divisions are;

1. *Administration Division:* This division functions as the administrative, internal systems, and controls of the main SACS office, such as office maintenance of office assets, administrative expenses, price negotiation, orders and contracts preparation, and stock and inventory registers maintenance. It coordinates with Corporations, Income Tax, VAT, and Service Tax Department, and staff recruitment.

2. *Targeted Intervention Division:* This division engages in the prevention initiative for HIV/AIDS earmarked towards High-Risk Groups (HRGs). It promotes NGOs/CBOs in the intervention programme. It oversees the physical, financial, and facility target achievement, prepares annual plan, training, review meeting, and scaling-up of TIs services.

3. *Basics Services Division:* This division monitor and supervises the HIV counselling and testing service components such as ICTC, PPTCT, HIV-TB programme implemented within the state. It manages the expanded plan for ICTC and PPTCT services to the CHCs, PHCs, and private health institutions. It organizes quarterly review meetings, conducts coordination meetings with the NRHM officials, supervises quality services delivery, capacity building training, monitoring the supply chain of consumables and HIV rapid test kits, prepares ICTC/PPTCT physical and financial annual plan, creates and strengthens its co-ordination to CST, TI, STI, and RNTCP programmes and ensure quality analysis of PPTCT/ICTC data.

4. *Blood Safety Division:* This division manage, control and supervise the blood transfusion services programme within the state, which operates under the National Blood Transfusion Council (NBTC) guidelines. It oversees the physical, financial, and facility target achievement for voluntary blood donation, collecting the blood sample, component separation, and seroprevalence of transfusion-transmitted infection. It prepares annual plan services and works with the State Blood Transfusion Council (SBTC) to ensure that the Regional Blood Transfusion Centres (RBTC)

function creates blood access. It creates and strengthens its referral affiliation between the blood banks to ICTC/OPD for referring seropositive donors. It monitors and supervises quality blood transfusion services, capacity building training, organizes meetings, supervises quality services delivery, and monitoring the supply chain of commodities supplied under the programme.

5. *Information, Education, Communication (IEC) & Mainstreaming Division:* This division manages the IEC, mass media, mid-media, and youth programmes. It coordinates with different stakeholders, NRHM, and other key influencers, to implement its plan. It includes monitoring the availability of material and supplies at different service centres. It organizes documented activities, folk and outdoor media interventions on relevant themes, awareness for behaviour change, intensifying access to services, youth programmes, and Red ribbon clubs in the State. It prepares technical inputs of HIV related IEC for the youth, keeping in mind their vulnerability factors at the community level.

6. *Care, Support & Treatment Division:* This division deals with the administration and management concerning all CST services under the Centres of Excellence (CoE), Paediatric CoE, Antiretroviral Therapy (ART), Link ART Centre (LAC), and Care and Support Centres (CSC) operating guidelines. It oversees the physical, financial, and facility target achievement, manages the scale-up plan for ART services, organizes training and review meetings, monitors the supply chain and relocations stocks of ARV drugs, and procures and provides OI and PEP drugs. It coordinates with the Basic Services Division and strengthens the linkages between ART centres and ICTC, PPTCT (including EID), and HIV-TB. It maintains monthly reports from all the ART centres in the state and sends them to NACO, such as ART centre reports and drug summary sheets. It promotes enhanced coordination with the head officials of Medical Colleges, District hospitals, other hospitals, NGOs, and PLHIV networks. It also supports the highest quality excellence services, particularly towards patient care and clinical practice, by ensuring no discrimination against PLHIV.

7. *Lab Services Division:* This division manages the HIV/CD4 laboratories, Blood Banks, STI laboratories, and its Quality Assurance program. It monitors the supply chain and inventory management of consumables and equipment

such as HIV serology kit, CD4, DBS collection kit, Whole Blood Collection kit. It collects EQAS data from HIV, STI, Blood Banks, CD4 laboratories quarterly, monitors and visits HIV labs, and organises training and workshops.

8. *Finance Division:* This division fully engaged in SACS's financial and funds management, budgeting, compliance reporting, audit, and coordinating efficiently with NACO on financial matters. It manages the supply and demand plan, resource allocation, inventory, relocation, and stock reconciliation of all goods and commodities. It developed and operated an adequate finance management system for the project and adherence to its policies. It is responsible for managing the internal, statutory, and review audit, CFMS system, and reimbursement claim. It prepares budgetary provisions required for implementing the project and timely disbursement claim from the World Bank.

9. *Procurement Division:* This division manages and monitors the overall activities of procurement and supply chain matters in the SACS. It maintains records, warehouse management, inventory, safe drug storage, stocks, and supply chain management of drugs and other commodities.

10. *Sexually transmitted infections (STI) Division:* This division is the management and administration cell for the Sexually Transmitted Infections (STIs) and Reproductive Tract Infections (RTIs) programme in the state through the public sector, emphasizing private and NGO supported STI/RTI clinics. It oversees the physical, financial, and facility target achievement, prepares annual plan service delivery for both NACO and NRHM, monitoring and supervising quality services delivery and capacity building training, creates and strengthens its referral linkages to ICTC, HIV-TB, ART, and other regional centres. It promotes enhanced cooperation between NACP and NRHM within both the state and district levels through meeting and technical support and supervising service delivery at the sub-district level.

11. *Monitoring and Evaluation Division:* This division monitor and evaluates through surveillance, research, and data analysis. It prepares an action plan annually, surveillance reports, bulletins, and analytical publications. It maintained budgets and finances, procurement and supply of material required for surveillance activities. It involves all activities undertaken by NACO/SACS using data

triangulation, HIV estimations, etc. It coordinates with all HIV/AIDS activities and capacity building in data analysis and training.

12. *Link Worker Scheme Division*: This division is the management and administration for the LWS programme under NACO guidelines. It coordinates with NGOs at the district level, monitors the programme's progress, and promotes the technical inputs to the NGO/CBO partners. It oversees the physical, financial, and facility target achievement, prepares annual plan, review meeting, mapping target villages, training needs.

4.3.2 Components

MSACS has eight components-three cells and five service units. The cells are:

- 1) Institutional Strengthening and Project Management (ISPM): It includes the twelve divisions under MSACS.
- 2) District AIDS Prevention and Control Unit (DAPCU): It is currently set up in three districts with the highest HIV cases.
- 3) North East Regional Office (NERO): It is a technical assistance unit, which provides programmatic and capacity building support.

MSACS five service centres are:

- 1) Blood Bank
- 2) Sexually Transmitted Infections (STI) clinics
- 3) Anti-retroviral Therapy Centre (ARTC)
- 4) Integrated Counselling and Testing Centre (ICTC)
- 5) Opioid Substitution Therapy (OST) centres.

These service centres are situated in each district under the NACP. ISPM, DAPCU, and NERO are the administrative and management cells for the MSACS programme, which supervised the five service centres.

**Table 4.6: Component wise number of staff and salary MSACS
(2015-16 to 2017-18)**

Component Wise Staff MSACS	No. of Staff			Salary Amount (Rs in Lakhs)		
	2015-16	2016-17	2017-18	2015-16	2016-17	2017-18
ISPM	40	41	41	154.71	169.77	206.61
DAPCU	11	12	12	24.57	31.18	34.93
NERO	3	4	4	9.00	13.34	34.32
Blood Bank	23	22	21	39.88	41.71	44.89
STI	9	9	10	15.59	17.00	22.26
ARTC	30	31	35	59.84	66.58	85.39
ICTC	99	102	103	171.51	191.91	209.80
OST	43	42	47	82.00	87.97	111.94
Total	258	263	273	557.09	619.47	750.14

Source: Finance Division, MSACS

Table 4.6 shows the number of staff and salary of MSACS under the eight components during 2015-16 to 2017-18. ICTC component holds the highest staff strength, followed by OST, ISPM, ARTC, Blood Bank, DAPCU, STI, and NERU. ISPM component holds the second-highest salary expenditure as it bears the administration head and officers.

4.4 Programmes under MSACS

MSACS programmes are classified into prevention, care support and treatment, institutional strengthening, capacity building, monitoring and evaluation. The prevention programmes/facilities include targeted intervention (TI), Link Worker Schemes (LWS), Integrated Counselling and Testing Centre (ICTC), Sexually Transmitted Infections (STI) Clinics, Blood Safety, and Information, Communication and Education (IEC). The monitoring and evaluation include Computerized Management Information System (CMIS) and surveillance programmes.

4.4.1 Targeted Interventions (TI)

The NACP identified that individuals who are most at risk are the high-risk groups (HRGs) such as Female Sex Workers (FSWs), Men who have sex with Men (MSMs), Transgenders/Hijra (TGs), and Injecting drug users (IDUs). TI are preventive projects

collaborating with the HRGs in a specific geographical area performed through the NGOs, CBOs, core HRGs, and bridge populations. These projects are supported by the State AIDS Control Societies (SACS), Technical Support Unit (TSUs), and NACO. The bridge population consists of individuals having sexual partners in the HRGs, such as sex workers' clients, long-distance truckers, migrants, and partners of IDUs. The core HRGs or core composite (CC) assigns to more than one HRG. According to the programme, the target groups are:

1. High-Risk Groups (HRGs)

- Female sex workers (FSW)
- Male having sex with male (MSM)
- Injecting Drug Users (IDU)
- Transgender (TGs)

2. Bridge population

- Migrants Workers
- Truck drivers/cleaners

3. Vulnerable/general population

- Clients of HRGs
- Spouse/partners of HRGs, bridge population, and PLHIV
- Persons infected and affected by HIV
- Youth

TI targets to reduce the HIV prevalence rate among the HRGs and reduce HIV transmission among the HRGs to the bridge population and the other vulnerable/general population. The vulnerable/general population are the individuals who are the partners/children of the bridge population. This epidemic transmission model clearly shows the efficiency and relevance of the TI projects. The CBOs/NGOs perform an essential role in scaling up the TI programmes. They also provide monthly reports to the SACs on a standard format developed by NACO, contributing to the monitoring and evaluation framework. The package of services offered by TI are the following:

1. Condom distribution/promotion.
2. Promotion/distribution of commodities such as lubricants for MSMs, needles/syringes for IDUs.

3. Health services like Sexually Transmitted Infections (STIs) detection and treatment
4. Health services like oral substitution therapy (OST) for IDUs, detoxification, and rehabilitation.
5. Link to other health services like ICTC Centres, ART Centres, and TB centre.
6. Outreach and communication
7. Creates an environment for the community (HRGs) involvement, participation, organisation, and ownership.
8. Provision of Drop-in Centres (DICs) safe spaces.

Table 4.7: Number of Targeted Interventions functional under MSACS

Typology	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
FSW	1	1	1	1	1	1
MSM	1	1	1	1	1	1
IDU	23	23	23	18	18	18
HTG	-	-	-	-	-	-
Core Composite	8	8	8	6	8	8
Migrants workers	4	4	4	4	4	4
Truckers	-	-	-	-	-	-
Total TIs functional	37	37	37	30	32	32

Source: Compiled from NACO, Annual Reports¹³

Table 4.8: Coverage of Key Risk Groups under MSACS Programmes

HRGs	Typology	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Core Group	FSW	550	892	916	892	690	1,161
	MSM	500	512	472	482	532	595
	IDU	10,050	9,625	9,092	9,255	8,579	10,074
	HTG	-	-	-	-	-	-
Bridge Population	Migrants	25,000	25,000	25,000	25,000	87,992	13,699
	Truckers	-	-	-	-	-	-
Total		36,100	36,029	35,480	35,629	97,793	25,529

Source: Compiled from NACO Annual Reports⁶

¹³ See NACO (2021), *Annual Reports*

According to NACO Report (2017-18), during April-September 2017, NACO supported 1469 TIs projects through seven types of HRGs. The total HRGs coverage under TI was 42,73,511 (76%) for migrants workers, 6,59,104 (12%) for FSW, 3,35,355 (6%) for truckers 2,03,255 (4%) for MSM, 1,14,454 (2%) for IDU, and 30,646 (1%) for HTG. MSACS represents 1.7 per cent of the total national coverage of high-risk groups during 2017-18. Table 4.7 shows the distribution of TI services during 2013-14 to 2018-19. During 2017-18, MSACS is implementing 32 functional TI projects for FSW (1), MSM (1), IDU (18), core composite (7), and migrant-workers (4). Table 4.8 shows the coverage of HRGs interventions. During 2017-18, MSACS covered 97793 HRGs, of which 90 per cent are migrants workers, and the remaining were IDU (8.8%), FSW (0.7%) and MSM (0.5%).

The performance of TIs in terms of coverage is consistent over the years during 2013-14 to 2017-18. As Mizoram is among the three northeastern states with over 5 per cent of HIV prevalence among the FSWs (IBBS, 2014-15), an effort is made to expand the programme and enhance the coverage since 2017-18. However, there is a reduction in FSWs coverage in FY 2016-2018. According to MTA (2016), condom use was unsatisfactory in Mizoram, of which FWSs of the state used only 38 per cent of condom with an occasional client. Furthermore, HIV prevalence among IDU remains high in the state (IBBS, 2015), while the IDU coverage was reduced during FY 2016-18.

Table 4.9 gives data on the target and achievement for eight months during the FY 2017-18. In Mizoram, targeted priority is given high to IDU and migrants. The core composite represents the IDU and FSW, while the bridge population (BP) indicates migrants workers. During FY 2015-16, 27 TIs of MSACS were graded in the half-yearly assessment, of which twenty-five TI grades fall in the category A and B. The qualitative aspect of TIs from the B category to the A category has risen from 9 to 12 in a period of six months (NACO, 2021).

Table 4.9 MSACS Targeted Interventions: Target during 2017-18 and Achievements during April- Nov 2017

District	Typology	No. of TI	Target 2017-18				Achievement April-Nov 2017			
			IDU	FSW	MSM	BP	IDU	FSW	MSM	BP
Aizawl	IDU	12	4490	440	470	10000	4492	365	478	7046
	FSW	1								
	MSM	1								
	Migrant	1								
Champhai	IDU	2	1230	60	0	0	1215	58	0	0
	CC (IDU+FSW)	1								
Kolasib	IDU	1	550	95	0	0	615	97	0	0
	CC (IDU+FSW)	1								
Lunglei	IDU	2	1090	90	50	5000	1184	96	54	5016
	CC (IDU+FSW)	1								
	Migrant	1								
Serchhip	CC (IDU+FSW)	2	400	80	0	0	424	78	0	0
Lawngtlai	CC (IDU+FSW)	1	390	40	0	5000	388	57	0	4070
	Migrant	1								
Saiha	CC (IDU+FSW)	1	300	30	0	0	37	0	0	0
Mamit	IDU	1	600	60	0	5000	613	65	0	3335
	CC (IDU+FSW)	1								
	Migrant	1								
Total		32	9050	895	520	25000	8968	816	532	19467

Source: TI Division, MSACS

4.4.2 Link Workers Scheme

Since 57 per cent of HIV infection was evidence from the rural areas (HSS 2007). Link Workers Scheme (LWS) is the extension of TI services in the selected geographies. It is a preventive programme focusing on rural areas with high prevalence and vulnerability districts. It provides access to HIV awareness, information materials, prevention and treatment services, and linkages to the HRGs, bridge population, and vulnerable/general population to public health services. The scheme intends to improve access to commodities (for instance, condoms, needles/syringes) by working with the nearest TI service centre or other public health facilities.

Table 4.10: Services provided by Link Workers Scheme during 2009-2018

Year	Target	Achievement	District	Name of the NGOs
2009	-	1	Champhai	MSD&RB
2010	3	3	Aizawl, Champhai & Kolasib	Aizawl – FIWDC, Champhai MSD&RB, Kolasib SHADE
2011	3	3	Aizawl, Champhai & Kolasib	Aizawl – FIWDC, Champhai MSD&RB, Kolasib SHADE
2012	3	3	Aizawl, Champhai & Kolasib	Aizawl – FIWDC, Champhai MSD&RB, Kolasib SHADE
2013	3	3	Aizawl, Champhai & Kolasib	Aizawl – FIWDC, Champhai MSD&RB, Kolasib SHADE
2014	3	3	Aizawl, Champhai & Kolasib	Aizawl – FIWDC, Champhai MSD&RB, Kolasib SHADE
2015	3	3	Aizawl, Champhai & Kolasib	Aizawl – FIWDC, Champhai MSD&RB, Kolasib SHADE
2016	3	3	Aizawl, Champhai & Kolasib	Aizawl – FIWDC, Champhai MSD&RB, Kolasib SHADE
2017	3	3	Aizawl, Champhai & Kolasib	Aizawl – FIWDC, Champhai MSD&RB, Kolasib SHADE
2018	3	3	Aizawl, Champhai & Kolasib	Aizawl – FIWDC, Champhai MSD&RB, Kolasib SHADE

**Source: LWS, MSACS. Available from: <https://mizoramsacs.org/>
(Retrieved on 24/09/2020)**

Link Workers Scheme plans to reach the vulnerable population in villages/districts; mapping is performed to assess the population locations and typology. It is designed to find clusters/locations where vulnerable population locates. Link workers are

introduced to cover the vulnerable villages selected through the mapping assessment and work in each cluster of around five thousand village populations supported by village-level volunteers. The scheme objective is to create a suitable environment for people affected and infected by HIV by working with the community groups to overcome the stigma and discrimination. The community groups are Panchayati Raj Institution, Self-Help Groups, Health Committees. In addition, it reaches out to the HRGs/vulnerable populations on STI/HIV prevention and risk reduction, promoting condoms and awareness on utilising STI, ICTC, PPTCT, ART, DOT, and other health services.

MSACS supports its programmes through the NGOs under the guidelines laid down by NACO. The NGOs undertaking LWS projects are Mizoram Social Defence and Rehabilitation Board (MSD&RB), Ferrando Integrated Women Development Centre (FIWDC), and Society for Health Action Development & Environmental Services (SHADES). Out of eight districts in the state, three districts were addressed by one LWS each, based on the district mapping, i.e., Aizawl, Champhai, and Kolasib districts (Table 4.10).

Table 4.11: Link Workers Scheme performances under MSACS during April-Nov 2017

District	NGO	FSW	IDU	MSM	Trucker	Migrant	PLHIV	ANC	TB	OVP*
Champhai	MSD&RB	23	54	0	74	86	76	126	3	440
Serchhip	MSD&RB	0	10	0	23	45	17	50	2	306
Kolasib	SHADE	32	118	6	50	109	85	117	4	487
Mamit	SHADE	37	60	8	45	40	1	98	4	564
Aizawl	FIWDC	124	38	0	179	13	60	87	1	1049
Lunglei	FIWDC	45	89	2	27	27	5	18	0	241
Total		261	369	16	398	320	244	496	14	3087

Source: TI Division, MSACS

**Other Vulnerable Population*

Table 4.11 shows LWS's performances in terms of coverage of HRGs, bridge population, and vulnerable population. Up till November 2017, LWS is established in 6 districts of the state. Through these schemes, over 5205 people are reached in rural areas. The scheme covered 646 HRGs (FSWs, IDUs, and MSMs), 716 bridge population (migrant and truckers), and 3841 vulnerable population (PLHIV, ANC, TB,

and other). Three-fifths of the total coverage reached out to other vulnerable populations (OVP). At the same time, 30 per cent of the coverage is in Aizawl District. On the other hand, the coverage for bridge population, PLHIV, and TB in Serchhip and Lunglei district is low, only 8.7 per cent of the total population.

4.4.3 Basic Services

The basic services of the NACP programme present the fundamental measures in detecting and networking PLHIV to received treatment and care. It delivers counselling, testing services and strengthening HIV prevention. In 1997, India started HIV counselling and testing services (HCTS) by providing screening and confirmatory facilities. Screening facilities included Facility Integrated Counselling and Testing Centres (F-ICTC), Public-Private Partnership-Integrated Counselling and Testing Centres (PPP-ICTC), Targeted Interventions-Integrated Counselling and Testing Centres, Outdoor Patient Department (OPD), Indoor Patient Department (IPD), and emergency wards. In contrast, confirmatory facilities refer to Stand-alone Integrated Counselling and Testing Centres (SA-ICTC). The basic services include Integrated Counselling and Testing Centres (ICTC), Prevention of Parent-To-Child Transmission (PPTCT), and HIV/Tuberculosis collaborative activities.

4.4.3.1 Integrated Counselling and Testing Centres (ICTCs): ICTCs gives information and knowledge on HIV transmission and conducts HIV diagnostic tests and counselling. Under NACP, the functions of ICTC are:

- To conduct HIV diagnostic tests by a person free will or advised by a medical provider.
- To provide necessary information on the modes of HIV transmission and promote behavioural change.
- To provide linkages with HIV prevention and treatment services.

According to NACO, there are two types of ICTCs: Fixed facility and Mobile ICTCs. A fixed facility refers to ICTC placed within an existing health care facilities and can be of two kinds: Stand-alone (SA-ICTC) and Facility-integrated (F-ICTCs). SA-ICTC refers to facilities supported financially and logistically by NACP at a block-

level/districts, with a permanent counsellor and laboratory technician for the HCTS. F-ICTC refers to the facility provided below the block/sub-districts level, which does not provide full-time staff. PPP-ICTC are established in private facilities similar to F-ICTC. Mobile ICTC refers to the transport with the facility performing testing services in the needed community. In 1998 Mizoram started its HIV Counselling and testing services (HCTS). Under MSACS, there are 44 SA-ICTCs, 88 F-ICTCs, and 9 Mobile-ICTC.

4.4.3.2 Prevention of Parent-To-Child Transmission (PPTCT): WHO explained mother-to-child transmission (MTCT) as the *“HIV transmission from an HIV positive mother to her child during pregnancy, labour, delivery, or breastfeeding.”* PPTCT programme provides universal coverage of counselling and testing of all pregnant women in India by screening all pregnant women for HIV test and dispense treatment to prevent the transmission of HIV. In 2004, the PPTCT programme was started in Mizoram. Table 4.12 showed the performances of PPTCT through ICTC centres.

Table 4.12: Performance of Prevention of Parent-To-Child Transmission (PPTCT) during April-November, 2017

Sl no.	Indicators	No. of test performed
1	No tested for HIV (General)	32,689
2	No of positive (General)	1,488
3	Not tested for HIV (Pregnant women)	16,432
4	No. found positive (Pregnant women)	127
5	No. Linked to ART (Pregnant women)	105

Source: Annual Report 2017-18, MSACS

Early Infant Diagnosis (EID): NACO implemented the Early Infant Diagnosis (EID) programme during FY 2015-16 for early infant HIV detection. Early Infant Diagnosis (EID) is the process of performing DNA-PCR tests by using dried blood spot (DBS) and whole blood specimen (WBS) on HIV exposed infants. Under the EID programme, six weeks to six months of infants born to infected pregnant women tested were initiated on CPT. Eighteen months of infants tested were initiated on Pediatric ART.

4.4.3.3 HIV/Tuberculosis collaboratives activities: India has the most significant burden of TB globally, with 26.9 lakh cases estimated in 2019 (WHO, 2020) and the third-highest HIV cases with a rate of 0.22 per cent of adult prevalence. In India, 25 per cent of all PLHIV death is estimated to be due to TB. TB is one of the dominant public health problems and the most common opportunistic infection among HIV-infected patients. In 2001, TB-HIV collaborative framework was implemented by performing an intensified case finding where all ICTC clients and PLHIV attending ART centres were screens for TB. This response is managed and constituted by the National/State/District level TB-HIV Coordination Committee, Technical Working Group. According to the MSACS report, the State TB-HIV Coordination Committee (STCC) conducted annual training/meetings during 2016-17. The State Technical Working Group (SWG) conducts ten during 2016-18, and the eight districts in the state conduct nineteen during 2016-18. Thirty-three Designated Microscopy Centre (DMC) is linked with ICTC/F-ICTC. Three PPP-ICTC centres linked with TB Private Health facility and Cartridge Based Nucleic Acid Amplification Test (CBNAAT) is used in all districts as a rapid TB diagnostic tool.

Table 4.13: Coverage of TB HIV co-infected patients in Mizoram during 2018

Indicators	No. of TB-HIV co-infected patient Registered	No. of patients receiving therapy (%)
ART coverage among TB HIV co-infected patients	283	240 (85%)
CPT coverage among TB HIV co-infected patients	283	282 (99.6%)

Source: ICTC Division, MSACS

The WHO recommended “*Antiretroviral Therapy (ART) and Co-trimoxazole preventive therapy (CPT)* to all PLHIV.” The state TB-HIV coordination showed that ART coverage among TB-HIV co-infected patients is 85 per cent, and CPT coverage among TB-ART co-infected patients is 99.6 per cent (Table 4.13).

Table 4.14: Number of Provider-initiated HIV testing (PITC) among TB cases - Mizoram State during 2018

Indicators	Registered	No. of TB patients with known HIV status (In %)	No. of HIV positive TB patients with known HIV status (In %)
Notified TB patients (Public + Private)	2605	2299 (88%)	283 (12%)
Presumptive TB cases examined	13589	1893 (14%)	227 (12%)

Source: ICTC Division, MSACS

Provider-initiated HIV testing (PITC): It was implemented in each of the eight districts among the presumptive TB cases. Table 4.14 showed that in 2018, out of 2605 registered TB patients, 88 per cent were known HIV status, while 12 per cent were HIV positive, knowing their HIV status. Out of 13,589 presumptive TB cases, 14 per cent were TB patients who are aware of their HIV status, while 12 per cent are HIV positive who are aware of their HIV status. It indicates that out of the total 16,195 cases registered, 29.9 per cent are TB-HIV cases.

4.4.4 Care, support and treatment (CST)

One of the NACP core objectives is to provide the people living with HIV/AIDS (PLHIV) comprehensive care, support, and treatment. CST is the component that provides services through a spectrum of HIV treatment centres established under NACO across the country's health facilities. CST delivers services using HIV treatment centre models such as:

- Antiretroviral Therapy (ART) Plus Centres
- Antiretroviral Therapy Centres (ARTC)
- Centres of Excellence (CoE)
- Pediatric Centres of Excellence (pCoE)
- Facility Integrated ART Centers (FI-ART)
- Link ART Centers (LAC)

- Link ART Plus Center
- Care and Support Centers (CSC).

The primary services include the following packages:

- To provide free antiretroviral medicines to all HIV/AIDS patients.
- To provide free Lab diagnostic services like CD4 testing and viral load testing.
- To provide treatment to opportunistic infection (OI) like TB.
- To provide psychosocial support to PLHIV patients.

CST model of HIV treatment service consists of a three-delivery unit following a top-down approach of services. Firstly, the top of the HIV treatment model contains service centres such as the Centers of Excellence (CoE) and ART Plus, established in the Government selected medical colleges. CoE aid in providing third-level specialized care and treatment, second-line, alternative first-line ART, training and mentoring, and operational study. Pediatric Centres of Excellence (pCoE) played a significant responsibility in care and support delivery to infected children, also providing technical support to other ART centres. ART Plus Centre is the upgraded ART Centre to put forward easy access to second-line ART. ART Centres were set up in a high prevalence state, mainly in the medical colleges, district-level hospitals, private institutions, and sub-district hospitals in relevance to their prevalence level in the region.

The bottom of the CST model consists of services centres such as FI-ART, LAC Plus, and LAC Centers, mainly located in the district hospital and community health centres' ICTC. FI-ART Centers provide treatment services to around 300 infected patients detected at ICTC; its concept is similar to the ART centres. LAC/LAC Plus is linked to a Nodal ART centre and aid the provisions of ART services near the patient's residence to reduce travel costs and time spent. Care and Support Centers (CSC) provide linkages to all HIV treatment services and provide holistic care and support services to infected patients. Co-located ART and OST centre (CAOC) is created for PLHIV, who are also Injecting Drugs Users (IDU).

Table 4.15: Services Centre under Care, Support and Treatment Programme, 2017-18

Sl.	Service Centre under CST	No. of centre	Name/location of Service Centre
1	ART Plus Centre	1	1.Civil Hospital, Aizawl
2	ART Centre	2	1.District Hospital, Lunglei 2.District hospital, Champhai
3	FI-ART Centre	3	1.Kulikawn Hospital 2.District Hospital, Kolasib 3.District Hospital, Mamit
4	Linked ART Centre (LAC) Plus	1	District Hospital, Saiha
5	Linked ART Centre (LAC)	9	1.District Hospital, Serchhip 2.CHC, Khawzawl 3.District Hospital, Lawngtlai 4.CHC, Sakawrdai 5.CHC, Vairengte 6.CHC, Kawrthah 7.PHC, West Phaileng 8.CSC, Aizawl 9.SHALOM DIC
6	Care Support Centre (CSC)	3	1.Aizawl 2.Lunglei 3.Champhai
7	Co-Located ART and OST Centre (CAOC)	6	1.MSR DIC 2.Living Hope DIC 3.Samaritan Society DIC 4.Shalom DIC 5.Champhai AIDS Do Pawl DIC 6. Cod Nerc DIC

Source: CST Division, MSACS

Currently, Mizoram has one ART plus centre located in the capital city, which holds around 70 per cent of HIV positive infection cases. Mizoram has two ART centre, three FI-ART centres, one linked-ART centre (LAC) plus, nine Linked-ART centre (LAC), three Care Support Centre, and six Co-located ART and OST centre (CAOC) (Table 4.15). The service centre provides counselling, psychosocial support, antiretroviral treatment (ART), opportunistic infection management (OI), monitoring of PLHIV on ART, and linkages through other service centres or departments. During 2017-2018, NACO adopted the global treatment goal 90-90-90 target to put an end to AIDS threatening the public health by 2030, to reach 90 per cent of PLHIV to be aware of their status, of which 90 per cent are on antiretroviral therapy (ART), and 90 per cent have viral suppression. To achieve these goals, the 'test and treat' policy was a significant step taken.

Table 4.16: Achievement of CST division on ART services during 2013- 2017

Sl. No	Indicators	Achievement				
		2013	2014	2015	2016	2017*
1	Registered in HIV Care	7177	8300	9478	10558	11837
2	Initiated on ART	3674	4604	5518	7067	8805
3	Currently Alive and on First line ART	2734	3613	4179	5627	6543
4	Currently Alive and on Second-line ART	12	55	53	64	96
5	Children registered in HIV Care	247	340	383	439	463
6	Children alive on ART	182	210	234	278	311
7	Opportunistic infections Treated	1878	2847	2989	5273	3013
8	Cumulative Pre-ART Death	382	415	464	542	629
9	Cumulative ART Death	525	633	755	902	1107
10	Cumulative Pre-ART Lost to Follow Up (LFU)	971	962	966	1145	1470
11	Cumulative ART Lost to Follow Up (LFU)	255	253	381	918	871
12	HIV Pregnant Women initiated on ART	-	431	546	688	776
13	HIV-TB Client initiated on ART	-	251	481	670	775

Source: CST Division, MSACS

**till November 2017 (Half yearly report)*

Table 4.17: Performace of MSACS-ARTC till March 2020

Sl.	Particulars	Achievement
1	Ever Registered in HIV Care	14744
2	Currently Alive and on First-line ART	8568 (88.15%)
3	Currently Alive and on Second-line ART	123
4	Children registered in HIV care	495
5	Children alive and on ART	436
6	Cumulative Pre-ART Death	738
7	Cumulative ART Death	1474
8	Cumulative Pre-ART Lost to Follow Up (LFU)	1181
9	Cumulative ART Lost to Follow Up (LFU)	1473 (13.2%)
10	HIV Pregnant Women initiated on ART	100%
11	HIV-TB client-initiated on ART	95.20%

Source: CST Division, MSACS

Table 4.16 shows the achievement of ART services from 2013 to 2017. The number of patients registered in HIV Care increased by 4660 from 2013 to 2017, of which 74.4 per cent have initiated ART. Out of 8805 started on ART, three-quarters of the initiated patients are currently receiving the first-line ART treatment, 1 per cent are receiving the second-line ART treatment, 8.8 per cent are pregnant women, 3.9 per cent are found to be children, and 8.8 per cent are TB-HIV coinfecting patients. Among the initiated ART, 9.9 per cent have died, out of which 56.8 per cent are on pre-ART.

Table 4.17 shows the achievement of MSACS until March 2020. It can be seen that 88.2 per cent of ART initiated patients are on the first line, which shows an increase in 2,907 new patients registered since 2017. The HIV-TB client-initiated on ART is 95.2 per cent, and the ART lost to follow up is 13.2 per cent, which shows an increase in 602 LFU clients during 2018-20.

4.4.5 Blood Transfusion Services

In 1996, the Supreme Court judgment mandated forming the National Blood Transfusion Council (NBTC), eliminating professional blood donation. Since 1992, NACO ensures blood safety by supporting a network of blood banks across the country at the state and district by providing equipment, blood bags, test kits and reagents, and other recurring expenditures. The services support a network of blood banks in over 600 districts across the country. In April 2002, India's Government adopted the National Blood Policy to develop a national system to establish easy access to the safe supply of blood. The National Blood Transfusion Council (NBTC) is headed by the Secretary and Director General and Joint Director (Blood Safety) of the NACO. NBTC is the head body in policy building for matters related to blood and plasma. It coordinates at the central level by directing, providing management, and promoting the state blood transfusion Council (SBTC). SBTC fulfils the national blood policy and the action plan for safe blood supply in their corresponding states / UT's funded by the state government and the NBTC. NACP-IV aims to reduce HIV transmission by seroreactivity rates reduction among donors. The fundamental component of the State's activities is to ensure safe blood to the patients by performing mandatory tests of HIV, Hepatitis B (HBV), hepatitis C (HCV), a screening test for syphilis VDRL, and Malaria from all the collected blood units by all the blood banks.

Model Blood Banks is a demonstration centre for the States fully supported for the first three years by the NACO and later under the State support concerning human resources, recurrent and maintenances. Blood Component Separation Units (BCSU) is established and supported by NACO in promoting rational blood use. Major Blood Banks (MBB) includes Government and charitable blood banks, which serves as an access point in rural population collecting less than 5000 unit per year. District Level Blood Banks (DLBB) also includes government blood banks and charitable blood banks, which serves as an access point in the district population collecting less than 5000 unit per year. MBB and DLBB are upgraded to BSCU in terms of their increase in blood collection. Blood Transportation Vans perform the process of transporting blood units regularly from one blood storage centre (BSC) to its linked mother blood bank under adequate cold chain support, which then linked to six to eight BSC to supply blood units. The State has one Model Blood Bank in Aizawl district, one BCSU within the Model Blood Bank, one BCSU at Major Blood Banks in Lunglei district, eight district blood banks with two blood banks functioning in a Charitable hospital. There are ten blood storage centres (BSC) linked to the Model blood bank.

The blood transfusion services aim to ensure an accessible supply of safe blood free from transfusion-transmitted infections (TTI) from the non-remunerated voluntary donors, i.e., TTI of HIV, to 0.1 per cent. MSACS reports 0.4 per cent of HIV infection in Voluntary Blood Donation (VBD) during FY 2018-19. It includes various activities such as awareness of voluntary blood donation (VBD), collaborating with IEC campaigns to promote VBD, and conducting a blood donation camp. Since the removal of professional blood donation or selling of blood by the Supreme Court of India in 1998, the classification of blood donors is limited to Voluntary Blood Donors and Replacement Donors. Voluntary Blood Donors (VBD) have the objective of saving others' lives without any expectation of profit from their deeds, donating their blood out of altruism or philanthropy. VBD donate blood as they are fully aware of the necessity, and this type of donation allows the time necessary for screening and cross-matching. Replacement Donors play a pivotal role in the stabilization of stock in the Blood Banks. It is the process where the relatives or friends of the patient donate blood to replace the depleting supply of blood in the Blood Banks

**Table 4.18: Number of Blood Donation Camps organized in Mizoram State
(2010-11 to 2018-19)**

Blood Banks	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18*	2018-19
Aizawl	118	148	198	148	144	145	156	123	156
Durtlang	86	90	79	78	66	73	77	66	76
Champhai	8	9	19	23	12	16	20	16	32
Kolasib	28	24	22	25	16	18	20	14	26
Lawngtlai	11	17	25	52	35	37	39	29	36
Serkawn	10	23	24	34	30	36	29	37	32
Lunglei	23	38	41	18	11	16	14	16	24
Mamit	10	12	10	24	17	13	20	20	32
Saiha	6	26	20	21	17	22	19	17	29
Serchhip	16	19	18	13	9	8	12	8	15
Total	316	406	456	436	357	384	406	346	458

Source: Compiled from Blood Safety Division, MSACS

**March-Dec 2017*

Table 4.18 showed the number of blood donation camps organised by each blood bank in the state during 2010-2019. One-half of the camps were performed in Aizawl and Durtlang blood bank, located in the capital city Aizawl.

**Table 4.19: Annual Report of Blood Collection under Blood Safety Division,
MSACS during 2010-11 to 2018-19**

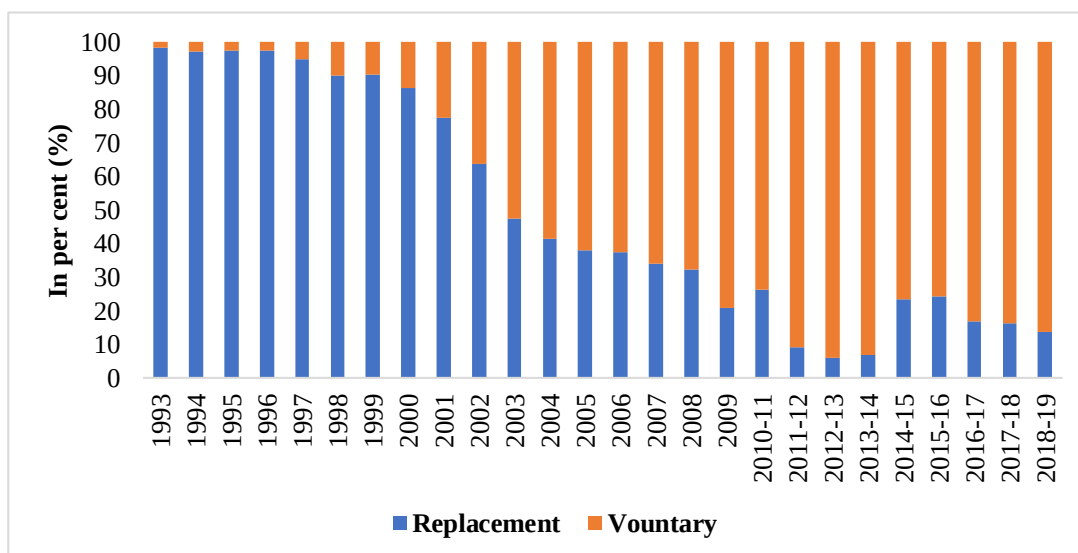
Year	No. of Blood Collection					In per cent (%)			
	Total Collection	Replacement Donors	Voluntary Donors	Collection at Camps	Individual Voluntary	Replacement Donors	Voluntary Donors	Collection at Camps	Individual Voluntary
2010-11	23,358	6,105	17,253	14,481	23,358	26.14	73.86	62.00	11.87
2011-12	22,812	2,047	20,765	18,117	22,812	8.97	91.03	79.42	11.61
2012-13	22,358	1,326	21,032	18,065	22,358	5.93	94.07	80.80	13.27
2013-14	22,226	1,527	20,699	17,429	22,226	6.87	93.13	78.42	14.71
2014-15	23,093	5,430	17,663	13,128	23,093	23.51	76.49	56.85	19.64
2015-16	24,940	6,030	18,910	15,826	24,940	24.18	75.82	63.46	12.37
2016-17	25,895	4,332	21,563	17,286	25,895	16.73	83.27	66.75	16.52
2017-18*	19,483	3,165	16,318	12,918	19,483	16.24	83.76	66.30	17.45
2018-19	27,179	3,688	23,491	18,653	27,179	13.57	86.43	68.63	17.80

Source: Compiled from Blood Safety Division Report, MSACS

**March to Dec 2017*

Table 4.19 shows that more than three-quarters of the blood donation is performed by voluntary donors, of which three-fifths are collected in the blood donation camps. Individuals voluntary donors donate individually in the blood banks rather than blood donation camps. One interesting fact is comparing blood collection reports from 1993-2019, as shown in Figure 4.3. More than three-half of the blood donation was performed through replacement donors from 1993 to 2002. However, with the awareness and campaign for voluntary blood donation and the importance of VBD presented in the state. From 2009 to 2019, the blood donation collection is dominated by voluntary donors

Figure 4.3: Mizoram Blood Donation Report during 1993-2019



Source: Blood Safety Division, MSACS

In Mizoram, VBD camps are organized by various organizations, which are classified into four categories: Religious group, NSS, YMA, and other groups. Various youth associations of churches actively participate in the VBD, such as Kristian Thalai Pawl (KTP), TKP (Thalai Kristian Pawl), Salvation Army Youth (SAY), and Pentecostal Youth Department (PYD). National Service Scheme (NSS) facilitates community service opportunities for students in universities and colleges and extends to higher secondary education levels in the state. The biggest Non-Government Organisation (NGOs) is the Young Mizo Association (YMA), currently with more than 777 branches, including all the branches outside the state. YMA is actively involved in the

VBD in the state and outside the state. The other groups contain an assorted number of political parties, taxi drivers, defence forces, and others organizing VBD collectively.

Table 4.20: Performance of Mizoram Blood Bank during 2013-14 to 2016-17

Year	In Units			In Percent (%)	
	Total Collection	Total Voluntary	Total Replacement	Voluntary	Replacement
2013-14	22,226	20,699	1527	93.13	6.87
2014-15	23,093	17,663	5430	76.49	23.51
2015-16	24,940	18,910	6030	75.82	24.18
2016-17	25,895	21,563	4332	83.27	16.73

Source: BSD, MSACS

Table 4.20 showed the blood collected in Mizoram; three-quarters of the blood units were collected through voluntary donors. Induction training and refresher training were held every year for the Blood Safety Division Unit (BSDU) and Lab Technicians in the Blood Banks. Workshops on VBD blood donor motivators are annually encouraged. World Blood Donation Day (WBDD) on 14th June is annually celebrated, followed by campaigns and awareness on newspaper, radio, and a talk show on the local television. On 1st October every year, the National Voluntary Blood Donation Day (NVBDD) is also annually observed in all districts. Blood Donation Motivation Campaigns and VBD Camps were conducted, followed by programs on VBD on radio and telecasted at DDK. Since 2010, Valentine's Day on 14th February is observed annually by organizing 'Blood for your Valentine' donation camps. During 2014-15, 634 units of blood were collected from Aizawl, Lunglei, Serchhip, and Lawngtlai Districts. The Association for Voluntary Blood Donation (AVBD) organized awards to group donors and individuals donors on the WBDD to motivate and acknowledge the blood donation.

4.4.6 Information, Education, and Communication (IEC) and Mainstreaming

IEC and mainstreaming play a vital function in the National AIDS Control Programme (NACP), creating awareness of prevention services by increasing knowledge among the general population on safe sexual behaviour. It also performs a vital role in motivating access to treatment, care, and support services. It also helps create an environment for appropriate changes in society to overcome stigma and discrimination. IEC activities performed using communication mediums to create HIV/AIDS awareness through mass and mid media.

Table 4.21: Mass Media Program under IEC, MSACS during 2014-17

Mass Media Program	2014-15	2015-16	2016-17
Long format TV Prog.	18	127	40
Long format Radio Prog.	6	6	6
TV	830	857	1003
Radio	1,798	1622	760
Newspaper	43	96	50

Source: IEC Division, MSACS

1. Mass Media: A well-organized mass media campaign on the relevant subject such as voluntary blood donation, condom promotion, sexually transmitted infections (STI), stigma and discrimination are carried out by preparing an annual media calendar. These activities are performed through the Doordarshan, local cable TV channels, satellite channels, All India Radio (AIR), and FM radio networks. MSACS conducted mass media programs using long-format telecasts on regional TV channels and Doordarshan addressing HIV/AIDS awareness and related issues, viz., phone-in and panel discussion programmes. Table 4.21 showed the number of activities achieved under the mass media program during 2014-17. Newspaper advertisements are published as per the media calendar.

2. Outdoor media: MSACS activities include displaying small hoardings in all villages, towns, and the city. Hoardings are also placed on the roadsides between these villages and towns. It provides free stickers and posters on private/public transport such as bus panels and rental kiosks at a strategic location displaying HIV/AIDS information and its related issues. During 2016-17, MSACS reported that 120 rental

kiosks and 2131 small hoardings were displayed. Video Ads on HIV and its related issues are continuously played through LED Display Board throughout the year at the shopping mall in Aizawl.

3. Multi-Media Campaign: During the multi-media campaign in 2016, to promote the importance of safe sexual practices and usage of condoms, MSACS partnered with Zonet Network Private Ltd. This network holds the sole telecast rights of the Mizoram Premier League. As per Mizoram Football Association Calendar, fifty-six matches were played aired from September to December. To reduce new HIV infection among youth through sexual transmission, three TV Spots on 'Safe Sex and Condom Use' were telecasted on live coverage and replay at every match. Moreover, pop up/scroll information was telecast during every match, including three talk shows discussing its related issues.

4. Mid-Media Campaign: It coordinates with the Link Worker Scheme (LWS), assists in planning and implementing the program where the link workers conduct mid-media campaigns in their respective covered areas. In addition to the mass media and outdoor activities, HIV/AIDS Awareness Campaigns are conducted with YMA's, churches, and other organizations. During 2017-18, *the Heroes Campaign* was implemented through 41 Red Ribbon Clubs (RRCs) at colleges and technical institutions in the state, collaborated with the Association for Voluntary Blood donation (AVBD), CARE-World Vision-India, and CZ Foundation. Its objective is to promote voluntary blood donation and motivate the youth to a healthy lifestyle for continuous and regular blood donation.

5. Special Events: It also participates in event planning on significant days, in particular, World AIDS Day, National Voluntary Blood Donors Day, Valentine's Day, World Blood Donors Day, and the International Day against Drugs Trafficking and Illicit Trafficking.

6. Adolescence Education Programme (AEP): This curriculum operates in high school and higher secondary schools to develop youth's life skills by teaching them how to manage physical and psychological changes linked with growing up. HIV/AIDS was included in the ten standard textbooks under the Mizoram Board of School Education (MBSE). The new textbook, '*David's Story*' about Stigma and Discrimination against PLHIV, was included recently. It annually conducts awareness

campaigns at High Schools and Higher Secondary Schools in Aizawl, collaborating with partner NGO's Awareness Campaigns on Drugs abuse and its importance of maintaining abstinence and its relation to HIV. DAPCU team in the districts also conducted awareness campaigns at high schools and higher secondary level.

7. Red Ribbon Clubs (RRCs): RRC aim to stimulate peer to peer communication on information such as HIV prevention, promote voluntary blood donation, and promote awareness on HIV/AIDS and its related issues among young people in the colleges. During 2016-17, meetings were conducted to strengthen the RRC activities at colleges and other institutions and training for nodal officers of the RCC and NSS. There are currently forty-one RRCs in the state.

8. Mainstreaming: Besides IEC activities, it engages with mainstreaming and partnering with other public and private divisions, sectors, departments, institutions, and organizations to strengthen HIV response. It also promotes social protection to refine the quality of life of all HIV infected and affected people and the most-at-risk population (MARPs). For example, during 2016-17, it installed a new CD4 count machine at ART Centre with its funds.

Sensitization programs, awareness campaign, and training were conducted on conductors and drivers, church leaders, and other government departments such as the Sports & Youth Services Department, Transport Department, Urban Development & Poverty Alleviation Department (UD&PA), Rural Development Department, Legal Affairs Department, Department of Commerce & Industries, etc.

It collaborates with Faith-Based Organizations on Talk shows, training, and other HIV/AIDS awareness campaign. However, as the MoU was signed between NACO and the concerned ministry, HIV/AIDS sessions were conducted in every UD&PA department training. On 1st September 2017, training on the trainers for PLHIV on '*Test and Treat Program*' was organized under the Greater Involvement of People living with HIV/AIDS (GIPA) activities.

4.4.7 Other Initiatives under Targeted Interventions (TI)

In 2002, a prevention strategy for Injecting Drug Users (IDUs) called the 'Harm-Reduction' programme was introduced during the NACP-II. Its comprehensive

package includes – NSP, OST, ART, HIV counselling and testing, prevention and treatment programme for STI, condom programme for IDU and their associates, prevention and treatment of Tuberculosis, viral Hepatitis and IEC interventions.

4.4.7.1 Harm Reduction Programme:

A harm reduction initiative of providing clean needles and syringes to Injecting Drug Users (IDUs) called the Needle Syringe Exchange Programme (NSEP) was introduced to mitigate HIV transmission and other blood-borne viruses (for instance, hepatitis B and C). Accordingly, to act on the transmission through this route, the World Health Organization (WHO) recommends 200 sterile needles/syringes per drug injector in a year provision through fixed sites, mobile sites, outreach services, vending machines, pharmacies, and so forth. These programmes confer access to sterile needles and syringes and lessen the sharing of injecting equipment; it initially reduces HIV transmission and other blood-borne viruses. As a result, during 2002-2009, the percentages of IDU HIV positive decreased from 45.8 per cent to 23.6 per cent. Thus, it is evident that the effectiveness of harm reduction initiative programmes for drug users ravaged by the twin epidemic of drug addiction and HIV/AIDS.

4.4.7.2 Injecting Drugs User (IDU):

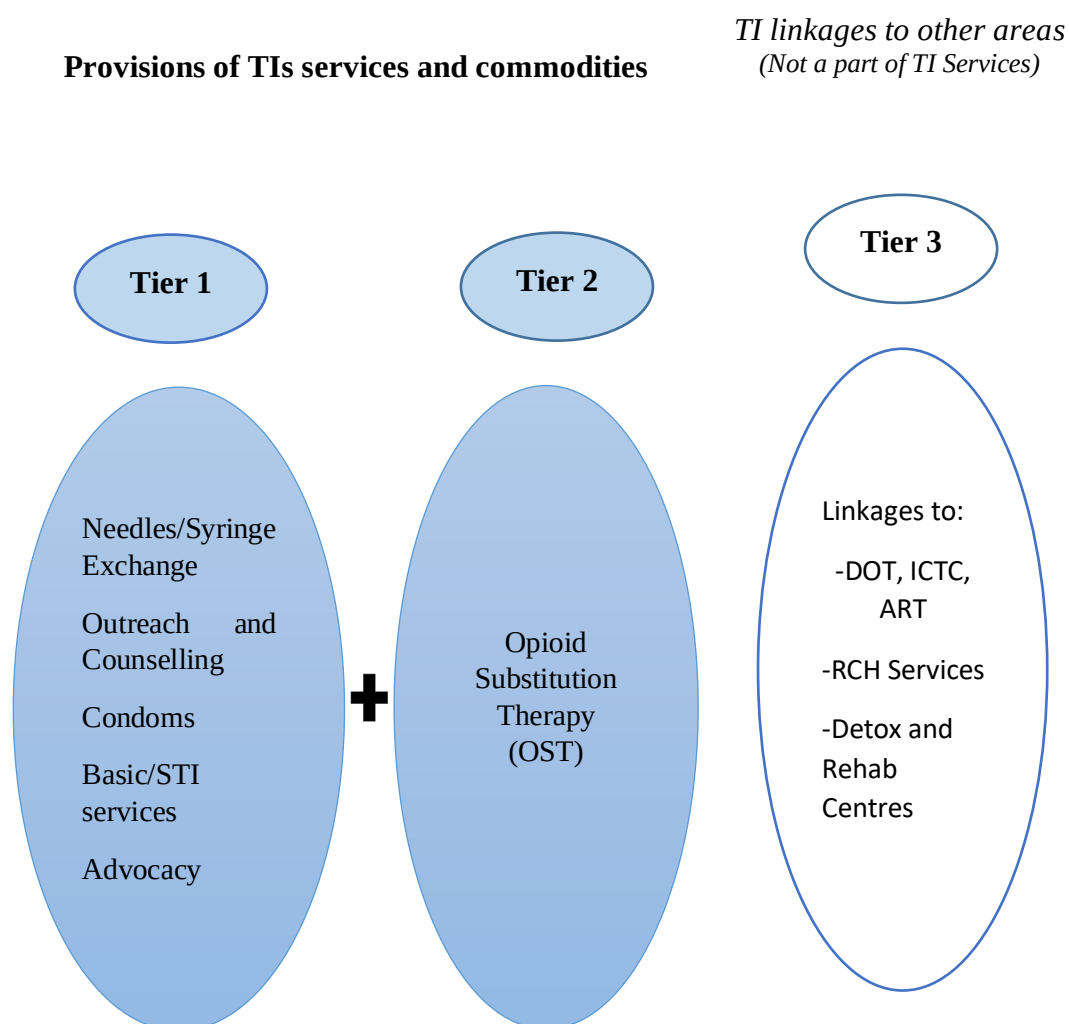
NACP defined IDUs as *“individuals using drugs through injecting routes in the last three months.”* HIV can transmit through the IDUs networks of sharing needles or other injections equipment and quickly expanding into their sexual networks. Moreover, harm reduction is a framework that aims to reduce the transmission of HIV among IDUs and their sexual partners by reducing the harm. According to the NACP, there are three tiers of harm reduction, as shown in Figure 3.4.

Tier 1 indicates the harm reduction of providing a needle/syringe exchange programme (NSEP), condom distribution, STI treatment, counselling, and outreach services.

Tier 2 indicates the transition of injecting opioid drugs with similar properties drugs through non-injecting modes without showing withdrawals.

Tier 3 indicates other linkage services.

Figure 4.4: NACP Tiers of Harm Reduction



Source: NACO, TIs under NACP III

4.4.7.3 IDUs Programme on Opioid Substitution Therapy (OST):

According to the NACO, “*Opioid Substitution Therapy (OST) presents the clinical practice of maintaining opioid-dependent drug users on opioid medicines such as oral substitution treatment, opioid substitution, oral substitution buprenorphine, medication-assisted treatment, buprenorphine maintenance treatment, buprenorphine maintenance treatment, and methadone maintenance treatment.*” It is performed under medical supervision with psychosocial intervention. OST saves clients from harmful effects. It is performed in a safer route through oral/sublingual absorption; it relieves

drug-related withdrawals and craving and reduces dilemmas the clients face as OST is available free of cost in the government/NGOs supported centres and hospitals.

Table 4.22: Mizoram OST Centres achievement during April-November 2017

Year of Roll-out	District	Name of Opioid Substitution Therapy (OST) Centre	Type of Centre	Target	Achievement (April-Nov'17)
2009	Aizawl	Society for Community Care-Agape	NGO	60	65
2010	Aizawl	Samaritan Society of Mizoram	NGO	100	121
2009	Aizawl	SHALOM	NGO	200	234
2014	Aizawl	Civil Hospital, Aizawl	Govt	100	169
2014	Aizawl	OST Centre, Darlawn PHC	Govt	100	40
2009	Aizawl	Grace Inn DIC.MSR	NGO	100	206
2014	Aizawl	Lengpui, OST centre, PHC	Govt	100	18
2012	Champhai	Dist Hospital, Champhai	Govt	100	77
2013	Champhai	Khawzawl, OST Centre, CHC	Govt	100	112
2013	Kolasib	CHC, Vairengte	Govt	100	55
2012	Kolasib	OST Centre, Dist Hospital	Govt	100	227
2013	Lawngtlai	OST Centre, Lawngtlai	Govt	100	70
2012	Lunglei	OST Centre,Civil Hospital Lunglei	Govt	100	173
2013	Mamit	District Hospital, Mamit	Govt	100	138
2013	Serchhip	District Hospital,Serchhip	Govt	100	67
2014	Serchhip	OST Centre, CHC, Thenzawl	Govt	100	48
2012	Saiha	Civil Hospital, Saiha	Govt	100	111
		Total		1760	1931

Source: Annual Report 2017-18, MSACS

According to NACO Annual Report, in 2007, 56 OST centres in India covered more than 5,500 IDU; however, this scale up to 212 OST centres in 2019, covering 29,543 active IDUs (approx) and 13 Satellite centres. During FY 2015-19, Mizoram has seventeen OST centres and seven Satellite centres covering 1137, 1358, 1646, and 2691 IDUs. Therefore, it comprises 8.9 per cent of the total national coverage in 2018-19. Table 4.22 shows the list of OST centres in the state and its target achievement for nine months in 2017.

4.4.7.4 *Sexually Transmitted Infections (STI) and Reproductive Tract Infection (RTI) control and Prevention Programme:*

The chances of HIV transmission are four to five times higher in STI and RTI. Therefore, estimation shows that HIV infection is reported among the five per cent adult population affected by STDs. Hence, one of the principal HIV prevention strategies is controlling and preventing STI/RTI and increasing its access to treatment. The programme aims to provide comprehensive and standardized quality sexual and reproductive health services to all population groups, emphasizing the HRG, bridge, and vulnerable population, including women and adolescents. It includes counselling and testing services for HIV/ AIDS and establishes referral linkages to other service centres. In November 2008, MSACS started STI/RTI services through Designated STI/RTI Centers (DSRCs), also known as Suraksha Clinic. Ten DSRCs/Suraksha Clinic is located in a government hospital in Aizawl, Champhai, Lunglei, Serchip, Kolasib, Mamit, Lawngtlai, Saiha, Kulikawn, and Falkawn.

4.4.7.5 *Programme on Condom Promotion:*

MoHFW, GOI started condom promotion under the National Family Planning Programme in the initial period. However, with the emergence of the HIV threat where sexual contact is the primary route of transmission, the promotion of condoms was taken up under the NACP for preventing the risks of HIV/AIDS, STI, and unwanted pregnancy through unsafe sex practice. Through campaigns on mass media, the programme promotes safe sex practice by regular condom use and supplied free condoms to the HRGs and vulnerable population. According to the NACO report 2018-19, the national estimated annual demand for free condoms was 327,864,732, and the total supply was 294,789,568. In Mizoram, the estimated annual demand for free condoms was 999,996, while its annual supply was 328,727. TI-NGO and SACS perform this estimation based on the HRGs coverages and past usage trends, and existing inventory reviews.

4.4.7.6 *Services in Prison Settings:*

On 3rd October 2016, NACO launched HIV intervention in Aizawl central prison with the MoHFW, GOI, and Joint Secretary. NACO aims to ensure equal treatment and care for those HIV infected inside prisons with the treatment and care available

for the general population. From April to September 2017, there were 624 prisoners in the state, where 91 prisoners were tested for HIV. The programme includes testing HIV, linkage to ART, diagnosis/screening, Hep-C, TB, and STI treatment.

4.5 Faith-based Hospital and NGO's

In Mizoram, faith-based organisations and NGO's play a central role in ensuring the prevention, support, and treatment services on HIV/AIDS.

4.5.1 Local Churches: In Mizoram, almost one-tenth of the population belongs to the Christian community (Census, 2011) in various denominations churches; Mizoram Synod, Baptist Church of Mizoram, Salvation Army, UPC (North-east India), UPC (Mizoram), Seventh Day Adventist, Evangelical Church of Maraland, Lai ram Isua Krista Baptist Kohhran, Roman Catholic and Isua Krista Kohhran. In 2018, there are more than 3,133 churches with 1,026,756 church members, where three-fifths of the member belongs to the Mizoram Synod Church. The churches play a crucial role in response to HIV/AIDS and its related issues; they organised blood donation camps and awareness of stigma and discrimination towards PLHIV and HRGs. It financially supports/runs hospitals, nursing institutions, clinics, rehabilitation, and care centre. It also promotes awareness campaigns and teaching through mass and outdoor media on pre-marital sex, alcohol, and drug abuse. In response to the burden of HIV and drug abuse in the state, the Salvation Army Churches founded Community Health Action Network (CHAN) in 1991 solely to HRGs and alcohol abuse victims by providing livelihood and improving health conditions.

4.5.2 Synod Hospital, Durtlang: It is a multispeciality secondary hospital located at Durtlang in Aizawl District, managed by the Synod Presbyterian Church of Mizoram since 28th February 1958. Moreover, it is the most comprehensive private hospital in the state. It is a mission hospital run by the incomes of the hospital and the contributions of the churches. It has a strength of 355 beds capacity. Synod hospital's speciality is its HIV/AIDS services through hospice care, a special ward for substance abuse, and Palliative Care Clinic.

- *Grace Home:* It was established in 2004, with 20 beds for HIV/AIDS patients. It is the only hospice care for HIV in the state as well as in the

Northeast states. It provides counselling, Opportunistic Infection (OI) management, palliative, and end-of-life care.

- **K-Ward:** It is a special ward solely dedicated to substance abuse victims on alcohol, opioid, benzodiazepines, etc. It has the capacity of 30 beds, 15 beds each for detoxification and wound/abscess. In addition, it regularly provides counselling (individual/group/family) and discussions/talks on health and awareness.
- **Palliative Care:** It provides free of cost service focusing on chronic diseases such as cancer, stroke, HIV/AIDS through home-visit, outpatient, and in-patient/referrals. The activities include pain management through morphine, catheter change, wound dressing, bed sore management, lymphedema care, colostomy, and pleural/ascetic tapping. Currently, palliative care has accomplished around 500 home visits and 121 patient's registration. Moreover, the hospital supports cancer/HIV patients with low socioeconomic conditions by providing food kit (worth Rs. 1000) since November 2017.

4.5.3 Young Mizo Associations (YMA): The Young Mizo Association (YMA): YMA is the largest non-profit and non-Government Organisation (NGOs) in Mizoram, currently with more than 806 branches and 404,722 members. Its objective is to ensure fair use of leisure, focus on developing the Mizo society, and reverse Christian ethics in social life. It is actively involved in organizing voluntary blood donation camps across the state and outside the state. YMA formed a Supply Reduction Service (SRC) squad to reduce drugs and alcohol supply in the state, where members volunteers and performed duty at different branches. During February-June 2018, the anti-drug squad seized drugs (heroin, Alprazolam, Ganja, cough syrup, Addnok, cold tablet, Tramadol) worth Rs 504.37 lakhs. Their protocol was not to directly arrest the drugs user/suppliers; instead, they first gave them a warning and later handed it over to police depending on the cases or assigned them to a rehabilitation centre and provided counselling services. As a result, around 737 people were caught for drug cases, out of which 39 people were referred to the rehabilitation centre, 25 people were consigned to the Excise Department, three-person were consigned to the CID, and 255 people

were given psychosocial counselling. In 2013, the YMA was awarded the 'Best Non-Profit Institution' in India from the Ministry of Social Justice & Empowerment, GOI, for its outstanding services in preventing alcoholism and substance (drug) abuses.

4.6 Summary

NACO HIV estimation in 2017 and 2019 show that the HIV prevalence rate in Mizoram has escalated from 2.04 per cent to 2.32 per cent, while 0.22 per cent was the national average. During 2017 and 2019, among the ANC clinic attendants, the prevalence rate dropped from 0.19 to 0.91 per cent. Till 2019, 22,130 persons were found HIV positive in Mizoram, where seven-tenths of the PLHIV have started ART treatment. Sexual contact (64.5%) and infected syringes/needles (33.1%) were the main HIV transmission routes. Among the eight districts of Mizoram, 36 per cent of the population resides in the Aizawl district. Aizawl district has 51 per cent of the total blood tests done for HIV and 72 per cent of the HIV positive cases of the state. MSACS provided social, medical, and public health services through twelve administrative divisions and its eight components. In addition, it provides service centres, such as blood banks, STI clinics, ART Centre, ICTC Centre, and OST centres.

Under MSACS, prevention programmes target FSWs, MSMs, TGs, and IDUs by providing health services, awareness, and enabling environment. It adopted a preventive programme solely focusing on rural areas. The basic services are provided by performing free counselling and testing for HIV infection through the ICTC, with universal coverage of pregnant women. The programme includes blood transfusion services to ensure an accessible supply of safe blood from non-remunerated voluntary donors. Awareness drives on blood donation, condom promotion, safe sexual behaviour, stigma, and discrimination against PLHIV were organized to reverse HIV/AIDS transmission. Under CST services, all PLHIV are provided free ART treatment, opportunistic infection treatment, and psychosocial counselling.

Non-governmental and faith-based organisations play an essential role in providing HIV/AIDS services and their related issues. For example, the Presbyterian churches manage the Synod Hospital; it provides free in-patient care for HIV/AIDS patients, a special ward for substance abuse and alcohol victims, and free palliative care for

cancer/HIV patients. In addition, YMA is the largest non-profit organization that plays a vital role in conducting/promoting blood donation and preventing alcoholism and substance (drug) abuses.

CHAPTER 5

Distribution of Expenditure of Mizoram State AIDS Control Society Across Major Activities

5.1 Background

In 2001, a Computerized Management Information System (CMIS) was initiated for supervising the implementation of the National AIDS Control Programme (NACP) in India. National AIDS Control Organisation (NACO) also developed a Computerized Project Financial Management System (CPFMS) for effective financial monitoring and managing. In August 2008, NACO launched a web-based tool: Strategic Information Management System (SIMS), for data entry, monitoring, analysing, and report generation. Therefore, SIMS integrates with CPFMS and replaces CMIS, improving the overall reporting and monitoring for the National AIDS Control Programme. This system provides an essential tool for tracking expenditure management as well as transparency in financial management.

Financial management is the fundamental component of NACP planning. The Finance Division of Mizoram State AIDS Control Society (MSACS) also implemented Project Financial Management System (PFMS) in February 2017. During February-March 2017, the MSACS organised a training cum workshop for NGOs and Peripheral units on implementing Expenditure, Advance and Transfer (EAT) Module through PFMS. However, all 65 registered agencies, including MSACS, are booking Expenditure, Advance and Transfer through PFMS. The expenditure filing is the process of feeding the day to day transactions through the EAT Module in the cash book. The MSACS Finance Division role includes budgeting, accounting functions, audit functions, internal financial advisory functions, donor coordination, convening review meetings, management information system for financial concerns report, and practical assistance to CPFMS and submitting claims for reimbursement.

This chapter explains the sources of funds, resource allocation, and utilisation under the National AIDS Control Organisation (NACO) and Mizoram State AIDS Control Society (MSACS). The cost accounting method was used for estimating the programme cost by distributing it into various activities and several cost elements. All

cost inputs are classified into two groups, nonrecurrent (capital) resources and recurring resources.

5.2 Sources of Funds

NACO receives funds from five main sources, namely the Government of India (GOI) Domestic Budget, World Bank and Department for International Development (DFID), United States Agency for International Development (USAID), Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM), and United Nations Development Programme (UNDP). The World Bank and DFID are the Pool Fund Partners of GOI, i.e., the funds pooled with the GOI Domestic Budget. NACO classified funds under different heads into four sources: the domestic and pooled funds, the direct support to states, the state Government funds, the extra-budgetary funds.

Domestic and Pooled Fund includes funds from the Domestic Budget, the Pooled Funds, the United Nations Development Programme (UNDP), the United States Agency for International Development (USAID), and the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM). The Domestic Budget included funds from the National Rural Health Mission (NRHM) for the activity, such as condoms promotion, blood storage units, and STD treatments.

The Pooled Fund includes the GOI direct support to NACO for surveillance, establishment cost, National Blood Transfusion Council (NBTC) expenses, Normal and additional Contingency for North East, the World Bank and DFID. USAID includes activities under AIDS Prevention Control Project (APAC) and AVERT. GFATM includes activities under Round II, III, IV & VI and future Rounds. The UNDP includes mainstreaming and link workers scheme (LWS) activities.

Direct Support to States includes funds to selected states and selected activities. It includes the extra-budgetary support funded by the Bill & Melinda Gates Foundation (BMGF), the United Nations International Children's Emergency Fund (UNICEF), the United States Government (USG). *State Government Funds* includes selected activities through state budgetary provisions. *Extra Budgetary Support* includes funds through NACO for training, capacity building, technical support from BMGF, DFID, and Clinton Foundation. NACO received its budgetary support from the Domestic

Budget System (GOI), the World Bank and Global Fund. The extra-budgetary support is funded mainly from private donations, direct funding from bilateral and UN Organisations such as BMGF, USAID, CDC, UNAIDS, UNDP, UNICEF, WHO, the General component and Corporate Social Responsibility (CSR) initiatives.

Table 5.1: Resource Envelope for NACP-III, 2007-2012

Funding sources	Rs. (In crores)	In per cent (%)
GOI(DBS)	2861	24.70
Pool	2683	23.16
GFATM	2237	19.31
USG	675	5.83
UN Agencies	323	2.79
Others	2806	24.22
Total	11585	100

Source: Annual Report 2010-11, (NACO, 2021)

**Table 5.2: Expenditure incurred during the NACP-III Period
(Rs. In crores)**

Sources	2007-08	2008-09	2009-10	2010-11	2011-12	Total
Domestic Budget System	287.38	188.00	200.75	303.22	136.27	1115.62
Pool Fund (WB+DFID)	500.62	506.99	445.94	588.92	536.89	2579.36
Global Fund	377.49	480.99	404.02	522.32	616.42	2401.24
USAID	23.22	26.25	24.97	33.89	11.52	119.85
UNDP	3.83	2.68	7.11	3.93	3.86	21.41
Total	1192.54	1204.91	1082.79	1452.28	1304.96	6237.48

Source: Annual Report 2012-13, (NACO, 2021)

5.2.1 Funding Sources for the National AIDS Control Programme (NACP)

During NACP-III (2007-2012), Rs. 11,585 crores investment was approved to carry out the full range of the programmes from different sources (Table 5.1). The approval includes the provision of almost 70 per cent (Rs 8023 crores) by way of the government budgetary support and the remaining through extra-budgetary funding. This extra-

budgetary support supplemented the Government of India's domestic contribution. Under the NACP-III period, the total expenditure incurred through budgetary sources was Rs. 6237.48 crores, as shown in Table 5.2. It summarises the real funds expended during the past five years.

Table 5.3: Funding Sources under NACP-IV

Gross Budgetary Sources	Amount (Rs. In crores)
General Component (GC)	8,505.20
Externally Aided Component (EAC) (IDA / The World Bank Rs.1245 Cr + The Global Fund Rs.1826.25 Cr)	3,101.25
Extra Budgetary Support (To be implemented directly by Development Partners)	1,808.60
Grand Total	13,415.05

Source: Annual Report 2013-14, (NACO, 2021)

During NACP-IV (2012-2017), Rs. 13,415 crores investment were required to carry out for the vast array of its interventions. The approval includes more than 86 per cent of the government budgetary support and more than 13 per cent through extra-budgetary funding (Table 5.3). While the proposed estimated cost of NACP-IV estimates Rs. 15,724 crores (NACO Annual Report, 2012-13). The budget estimates of NACP-IV was based on the target projected and current costing norms modified for five years. NACO proposed continuing the 12th Five-year Plan from April 2017 to March 2020, with an estimate of Rs. 7300 Crores by the Finance Committee.

During 2014-15, NACO invested Rs.93587 lakhs through the State AIDS Control Society (SACS) under NACP-IV programme planning, allocated under five main activities funds-wise for the entire state. Table 5.4 shows the fund-wise allocation of funds for Mizoram SACS, of which NACO allocated 1.9 per cent (Rs. 1760.30 lakhs) to Mizoram State among the total 38 State AIDS Control Societies. During 2015-16, the total fund released to MSACS is Rs. 1478.22 lakhs; of the total fund, 1.9 per cent was allocated to 39 SACS. In 2016-17, the total fund released to MSACS comprised 1.6 per cent of the total fund allocated to 37 SACS, i.e., Rs. 1483.39 lakhs.

Table 5.4: NACO Consolidated Releases: Mizoram State

2014-15	Amount (Rs. in Lakhs)
TI	709.51
DBS	658.67
GFATM-II (ICTC)	235.32
GFATM-IV (CST)	90.42
GFATM-VII (LWS)	66.38
2015-16	Amount (Rs. in Lakhs)
NDBS	860.48
TI	617.74
2016-17	Amount (Rs. in Lakhs)
NDBS	668.59
TI	724.60
LWS	90.20

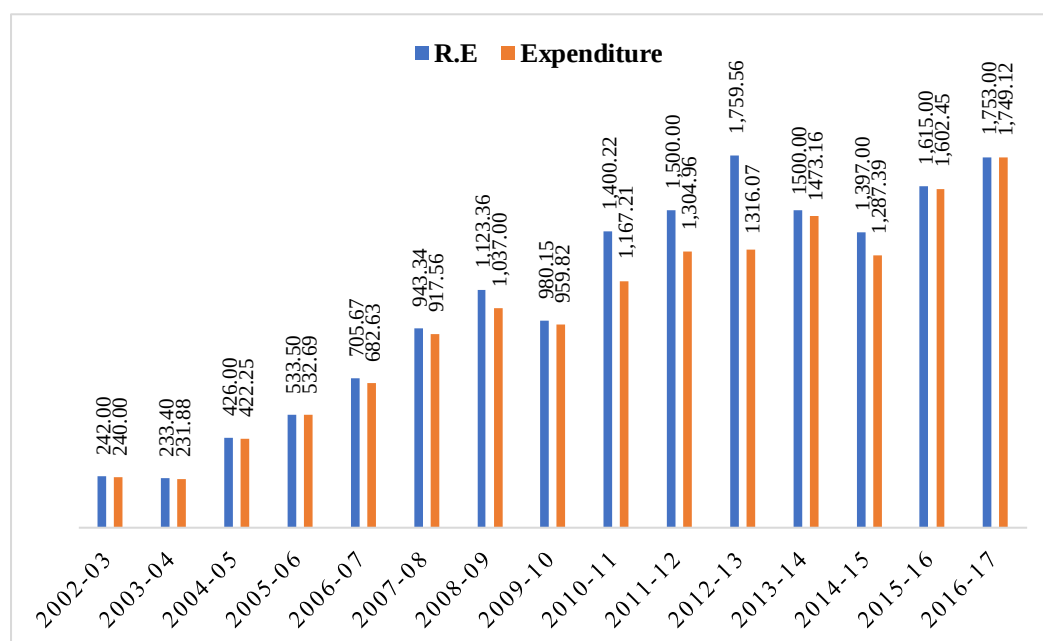
Source: Compiled from Consolidated Fund Releases, NACO. Available from:
<http://naco.gov.in/>

5.2.2 Resource Allocation of Funds

The National AIDS Control Programme (NACP) places the highest priority on prevention efforts. The first phase presented as NACP-I was started from 1992 to 1997, which was extended till 1999. NACP-II initiated in April 1999 to reduce HIV infection and strengthen the long-term steps of the Central and States Governments' capacity on HIV/AIDS. NACP-III commenced from 2007-2012 to mitigate new infections by 60 per cent and 40 per cent in the vulnerable states and states with high prevalence.

NACP-IV commenced from 2012-2017, intending to bring down new infections and ensure comprehensive care and support to all PLHIV and treatment services for all who require it. The total fund allocation and utilisation (budgetary amount) during the National AIDS Control Programme (II, III & IV) are shown year wise in Fig. 5.1. The column shows that during 2002-17, Rs 16,112.2 crores was approved and allotted for the plans, of which Rs 1,41,924.19 crores was spent. It accounted for 93 per cent of the allotted amount during 15 years. During 2010-13, the expenditure accounts for less than 92 per cent of the allotted budget. The expenditure accounts for only 75 per cent of the allotted budget during 2012-13 due to the significant increase in the GOI budget estimate.

Figure 5.1: NACO Allocation and Utilisation, 2002-2017 (Rs. In crores)

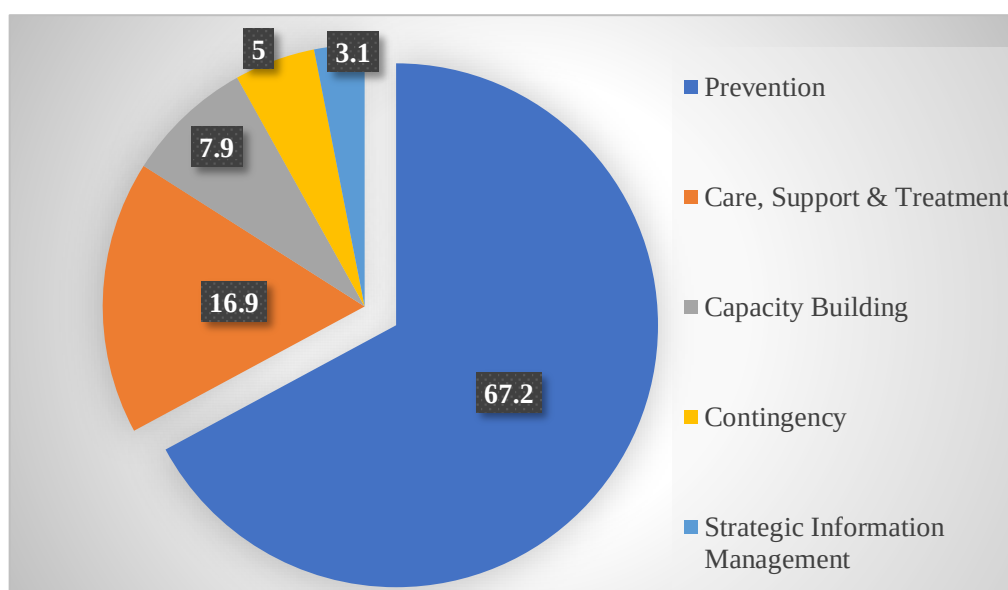


Source: Compiled from NACO Annual Reports

NACP-III: The NACP III goal of 'Halting and Reversing the Epidemic over its five-year period' is achieved through four main strategies. The first strategy focuses on preventing new infections through the saturation of coverage of HRGs with TIs and expanding interventions among the general population. The second is to CST services to a more significant number of people living with HIV/AIDS (PLWHA). Thirdly, it focuses on enhancing the infrastructure and human resources on prevention and treatment programmes at all level of the district, state, and nation. The fourth strategy focuses on strengthening the nationwide Strategic Information Management System (SIMS).

During NACP-III, 67.2 per cent of the budget was allocated for prevention activities, i.e., among HRGs and the general population, 17 per cent for PLHIV through CST services, 8 per cent for the Capacity Building (Programme Management), 3 per cent for Strategic Information and Management (such as M&E, Surveillance, and Research), and the remaining 5 per cent on contingency (Fig.5.2).

Figure 5.2: Resource Allocation for NACP-III



Source: NACO, Annual Report 2008-09

NACP-IV: The NACP-IV launched in early 2014 has two objectives- Lowering the new infections by 50 per cent (2007 baseline of NACP III) and ensuring comprehensive care, support, and treatment to all PLHIV and services for all per requirement. The programme component adopted five key strategies – prevention, care support and treatment, IEC, SIMS, and Institutional Strengthening (Table 5.5).

Table 5.5 shows that out of the total allocated budget, 47.2 per cent on prevention activities represent the actual expenditure during NACP IV (2012-2016), i.e., Targeted Interventions (48%), LWS (90%), ICTC/PPTC (74%), STI (31%), Blood Transfusion Services (20%) and Lab services (21%). The actual expenditure includes more than 58 per cent of the budget allocated for Care, Support and Treatment (CST) of PLHIV, 73 per cent for the Capacity Building (Institutional Strengthening), 49 per cent for IEC and Mainstreaming and 23 per cent for SIMS. Therefore, more than 51 per cent of the allocated budget was spent during 2012-2016.

Table 5.5: Component-wise budget provision under NACP IV

Sl.no.	Programme Component	Budget 2012-17	Plan Approved 2012-17	Expenditure 2012-16	%
I	Prevention	7,166.76	6,277.10	2,962.84	47.2
1	TI	4,119.09	3213.00	1556.89	48.5
2	LWS	169.00	131.84	118.53	89.9
3	ICTC/PPTCT	1,585.13	1236.61	911.65	73.7
4	STI	356.54	278.15	85.79	30.8
5	Blood Transfusion Services	818.80	1325.29 ¹	270.17	20.4
6	Lab Services	118.20	92.21	19.81	21.5
II	Care, Support & Treatment	3,961.15	3090.24	1820.95	58.9
III	Institutional Strengthening	569.70	686.39	500.5	72.9
IV	SIMS	388.40	303.00	71.64	23.6
V	IEC & Mainstreaming	1,329.04	1036.84	510.19	49.2
	Total Budget	13,415.05	11394.00²	5866.12³	51.5

Source: MTA of NACP IV, NACO (2016c)

¹ It includes the establishment of Metro Blood Banks

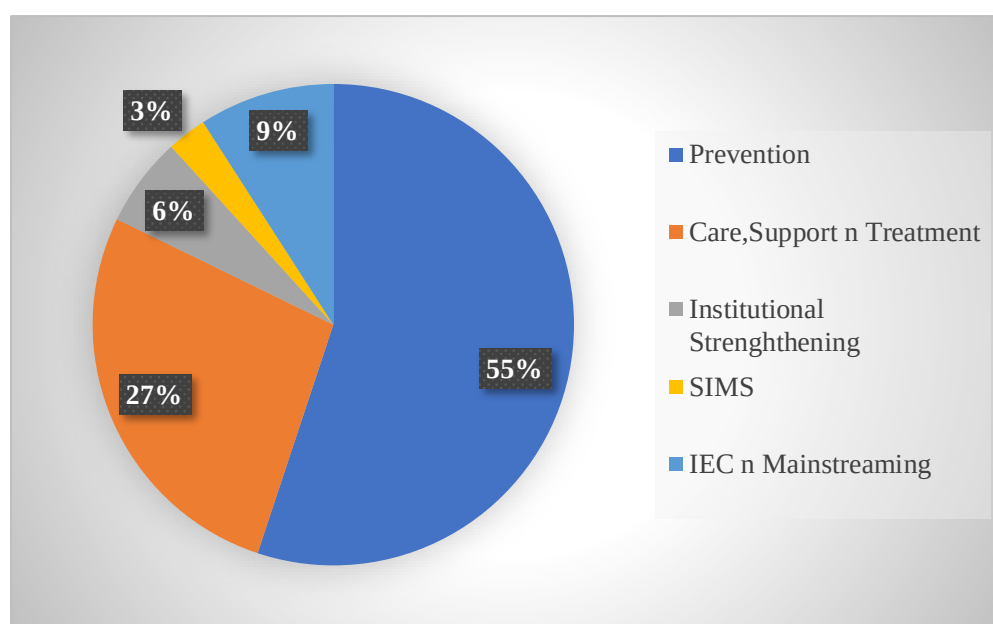
² Plan Document of 12th Five Year Plan (2012-17), Table 20.6

³ It includes the cash balance of 2011-12; the overall expenditure is Rs 187 cr.

During NACP IV (Fig.5.3), more than 55 per cent of the budget was allocated for prevention activities, i.e., Targeted Interventions (51.19%), LWS (2.10 %), ICTC/PPTC (19.17 %), STI (4.43%), Blood Transfusion Services (21.11%) and Lab services (1.47%). Whereas 27 per cent of the budget was allocated for CST services PLHIV, 6 per cent for the Capacity Building (Institutional Strengthening), 3 per cent for IEC and Mainstreaming and 9 per cent for SIMS. The allocation of resources on CST had increased by more than 10 per cent from NACP-III to NACP-IV. Meanwhile, the allocation of budget on prevention had decreased by more than 12 per cent.

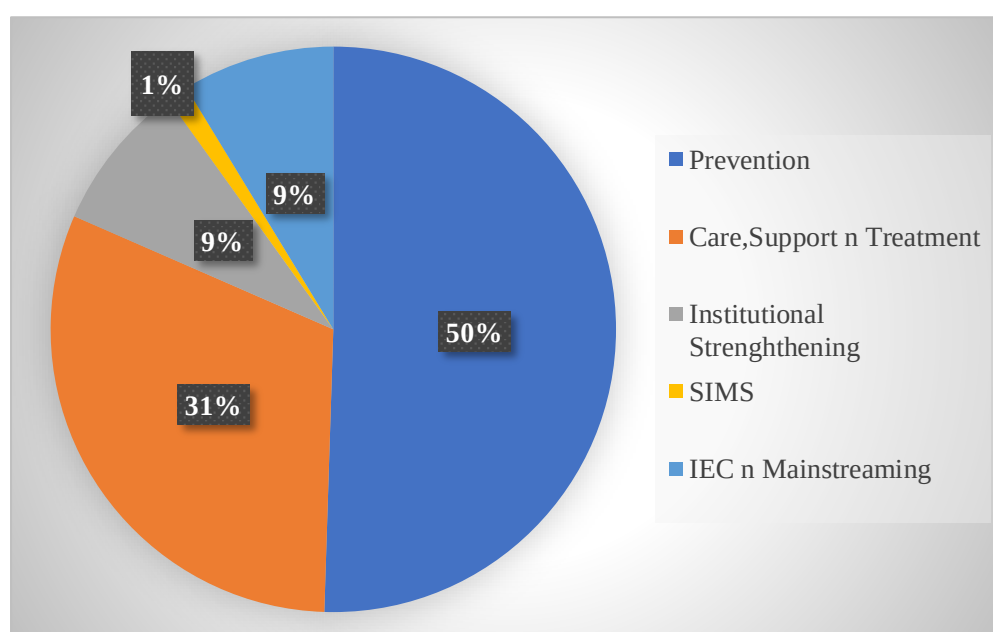
During NACP IV (Fig.4.4), the actual expenditure for the years 2012-2016 comprises 50 per cent for prevention activities, i.e., Targeted Interventions (53%), LWS (4 %), ICTC/PPTC (31 %), STI (3%), Blood Transfusion Services (9%) and Lab services (1%). At the same time, 31 per cent of the expenditure comprises for CST of PLHIV, 9 per cent for the Capacity Building (Institutional Strengthening), 9 per cent for IEC and Mainstreaming and 1 per cent for SIMS. The expenditure on CST exceeds the budget allocation by more than 4 per cent, whereas the budget exceeds the actual expenditure on prevention activities by 5 per cent.

Figure 5.3: Resource Allocation for NACP-IV



Source: Compiled from MTA of NACP-IV, NACO (2016c)

Figure 5.4: Actual Expenditure during NACP-IV (2012-16)



Source: Compiled from MTA of NACP-IV, NACO (2016c)

Table 5.6: Distribution of Total Expenditure of MSACS by Sources of Funds (Rs. In lakhs)

		Total Expenditure					Fund wise (%)				
BUDGET	MSACS Main Activity	2014-15	2015-16	2016-17	2017-18	Total	2014-15	2015-16	2016-17	2017-18	Total
	TI POOL FUND	772.17	617.73	648.19	683.51	2721.60	41.3	41.3	48.8	46.6	44.2
	LWS GFATM Rd II	85.53	68.42	81.40	80.78	316.13	4.6	4.6	6.1	5.5	5.1
	NDBS FOR NACPIV	682.13	545.70	342.18	411.27	1981.28	36.5	36.5	25.8	28.0	32.2
	CST GFATM Rd IV	105.80	84.64	75.99	88.00	354.43	5.7	5.7	5.7	6.0	5.8
	ICTC GFATM Rd VII	225.40	180.32	179.92	202.64	788.28	12.0	12.0	13.6	13.8	12.8
	TOTAL	1871.03	1496.82	1327.67	1466.20	6161.72	100	100	100	100	100
	AVG	374.21	299.36	265.53	293.24	1232.34					
ACTUAL	TI POOL FUND	770.09	588.25	625.36	569.34	2553.04	45.1	40.9	41.9	38.4	41.7
	LWS GFATM Rd II	76.75	67.34	82.91	61.33	288.33	4.5	4.7	5.6	4.1	4.7
	NDBS FOR NACPIV	521.56	470.79	465.90	478.99	1937.24	30.6	32.7	31.2	32.3	31.7
	CST GFATM Rd IV	95.75	100.81	103.79	111.54	411.89	5.6	7.0	7.0	7.5	6.7
	ICTC GFATM Rd VII	242.44	211.44	214.28	259.76	927.92	14.2	14.7	14.4	17.5	15.2
	TOTAL	1706.60	1438.64	1492.24	1480.95	6118.43	100	100	100	100	100
	AVG	341.32	287.73	298.45	296.19	1223.69					

Source: Compiled from MSACS Finance Division (2014-2018)

5.3 The Main Activities Under Mizoram State AIDS Control Society (MSACS)

Mizoram State AIDS Control Society (MSACS) performed the National AIDS Control Programme IV (NACP IV) under five main activity budgets, categorised in its sources of fund support, as shown in Table 5.6. The following are the five main heads of activity in terms of its funds' allocation:

1. New Domestic Budget System (NDBS)

NDBS received extra-budgetary support from BMGF, CDC, and Component sources. The NDBS for NACP-IV comprises more than 32 per cent of the total MSACS main activity budget during the 2014-2018 financial years (Table 5.6). It includes the Blood Banks located in 8 districts, Sexually Transmitted Infections (STI) Centres in 8 districts, Institutional Strengthening & Project Management (ISPM) in Aizawl district, State Reference Laboratory (SRL) in 8 districts, District AIDS Prevention and Control Unit (DAPCU) in 3 districts and Strategic Information Management System (SIMS). The main activity of NDBS under three activities are; Prevention, Capacity Building, and Strategic Information Management.

2. Targeted Interventions Pool Fund (TI)

Under TI, priority is given to the vulnerable population groups. It includes female sex workers (FSW), injecting drug users (IDU), men who have sex with men (MSM), truckers and migrant workers, and Opioid Substitution Therapy (OST) Centres. The pool fund received financial support from the DBS, World Bank, Global Fund, and extra-financial support from BMGF, USAID, CDC, UNAIDS, UNDP, UNICEF. TI comprises more than 44 per cent of the total MSACS main activity budget during the 2014-2018 FY (Table 5.6).

3. Link Workers Scheme (LWS) GFATM Rd II

It is designed especially for the population with high-risk behaviours in rural areas facing poor infrastructure and weak health care systems, i.e., poor connectivity with most facilities. LWS GFATM Rd II received financial support from DBS, Global

Fund, and extra-financial support from UNDP. LWS comprises 5 per cent of the total MSACS main activity budget during the 2014-2018 FY (Table 5.6).

4. Care Support and Treatment (CST) GFATM Rd IV

It includes a comprehensive treatment of PLHIV in terms of opportunistic infections (OI), antiretroviral therapy (ART), psychological support, social support, home-based care, positive prevention, and impact mitigation. (NACO Annual Report, 2008-09). CST GFATM Rd IV received financial support from DBS, Global Fund, and extra-financial support from CDC, WHO, CSR initiatives. CST comprises almost 6 per cent of the total MSACS main activity budget during the 2014-2018 FY (Table 5.6).

5. Integrated Counselling and Testing Centre (ICTC) GFATM Rd VII

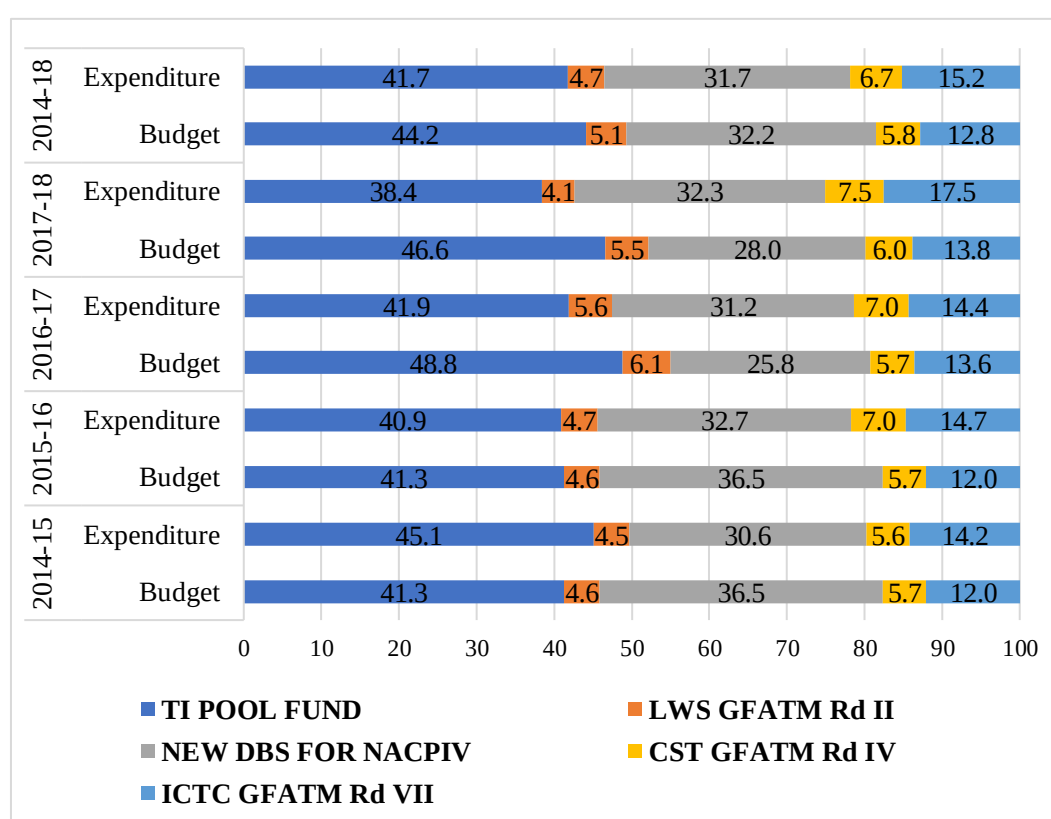
It includes human resources, infrastructure, institutional Governance and Planning, commodities, monitoring and evaluation, and administrative costs under ICTC. ICTC GFATM Rd VII received financial support from DBS, Global Fund, and extra-financial support from UNICEF and WHO. ICTC comprises more than 14 per cent of the total MSACS main activity budget during the 2014-2018 FY (Table 5.6).

MSACS Activity Budget Report: The MSACS budget report is an indicator of the funds allocated (budget), the funds utilised (actual expenditure), and the differences of the funds (variance) during a financial year. The distribution of MSACS expenditure shows the total budget/actual on different activity heads under its five funding sources. Therefore, it showed the implementation of funds under each activity and the fund's amount spent under the five main sources.

During the 2014-15 FY, the budget and actual expenditure comprise more than 30 and 27 per cent of the total computed budget expenditure of 2014-18 FY. The budgeted estimated and actual spending is Rs 1871.03 and Rs.1706.60 lakhs, respectively. The expenditure under Targeted Intervention (TI) and NDBS comprises more than 75 per cent of the total actual spending. However, activities under TI and ICTC exceed the budget estimates (Fig 5.6).

During the 2015-16 FY, the budget and actual expenditure comprise more than 24 and 23 per cent of the total computed budget expenditure of 2014-18 FY. The budgeted estimated and actual spending is Rs 1496.82 and Rs.1438.64 lakhs, respectively. The expenditure under Targeted Intervention (TI) and NDBS comprises more than 74 per cent of the total actual spending. Therefore, the actual expenditure exceeds the budget under LWS, CST and ICTC activities (Fig 5.5).

Figure 5.5: Percentage Distribution of MSACS Budget and Expenditure by Sources of Funds



During 2014-15 to 2017-18, the actual expenditure under TI activities keeps steadily decreasing, i.e., 45 per cent to 38 per cent. Whereas NDBS activity shows a 30 to 32 per cent increase, LWS shows a 14 to 17 per cent increase in their actual expenditure. The above analysis shows that Rs 6161.72 lakhs (2014-2018) has been allotted out of Rs 11,394 crores (2012-17) plan approved, and Rs 6118.43 lakhs (2017-18) was spent, which is nearly 99 per cent of the allotted amount during the four years.

5.4 Classification of Expenditure by Cost Inputs

Cost produces a value of resources in terms of economics. World Health Organisation (WHO) training manual shows the different methods of cost classification in health care. Further, to evaluate a health program's costs, it is vital to classify its components into several cost elements (Creese et al., 1994). The cost accounting method examines the distribution of costs to various activities using secondary data from the NACO Statutory Audit Report. In general, cost accounting is a subset of accounting; encompasses the development and provision of a wide range of useful financial information (Finkler, 1999). The cost inputs under MSACS programmes are grouped under five activities in terms of their sources of fund support; they are:

1. New Domestic Budget System (NDBS)
2. Targeted Interventions (TI)
3. Link Workers Scheme (LWS)
4. Care Support and Treatment (CST)
5. Integrated Counselling and Testing Centre (ICTC)

These five main activities of MSACS of resource allocation component and sub-component was explained and shown in Table 5.5. To estimate the cost inputs of the MSACS programmes, all the cost inputs were classified under different heads of capital costs and recurrent costs. Consequently, capital costs refer to those inputs with more than one year of financial commitments, while recurrent costs are those inputs that had financial commitments in a year. Accordingly, cost inputs are classified under capital and recurrent costs.

Capital Costs

- a. Equipment: Refrigerators, sterilisers, manufacturing machinery, scales, NACP III Blood Bank Equipment, NACP III equipment, and other equipment.
- b. Office Equipment: NACP III office equipment and other equipment.
- c. Vehicles: motorcycles, four-wheel-drive vehicles, trucks.
- d. Furniture & Supplies: NACP III furniture, fixtures, and supplies.
- e. Civil works: NACP III civil works.

- f. Social mobilisation, nonrecurrent: social mobilisation activities, e.g., promotion, publicity campaigns, transfer of asset

Recurrent costs

- a. Personnel (all types): salary, honorarium, leave salary and pension contributions, employer's contribution to CPF, medical expenses,
- b. Supplies: OI drugs, STI drugs, vaccines, syringes, small equipment, other lab supplies, and consumable items
- c. Vehicles, operation, and maintenance: petrol, diesel, lubricants, tyres, spare parts, registration, insurance.
- d. Buildings, operation, and maintenance: Water and electricity charges, equipment maintenance, building maintenance, rent, rates and taxes, expenses on ICTC centre set up and maintenance, and need-based assistance.
- e. Training, recurrent (e.g., short in-services courses) workshop, training, campaigns, Red Ribbon Clubs/Youth Friendly Clubs.
- f. Social mobilisation: Operating expenses, IEC, travelling expenses, IEC, bank charges, miscellaneous expenses, printing and stationery, advertisement (other than IEC), audit fees, postage/courier, quality assessment, other administrative costs, contractual services companies, exposure visits, contingency, transportation expenses, meeting expenses, PLHA expenses, telephone/communication expenses, local conveyance, food expenses, review meeting & supervision of counsellors.
- g. Other operating costs not included above: NGO services for priority interventions, procurements of services for priority interventions, monitoring and evaluation (SIMS), surveillance, and other NGO services.

The expenditure reports of MSACS for 2012-13 to 2017-18 were collected from NACO. These expenditure reports were classified according to their cost inputs into different heads. The expenditure was broken down to analyse each cost inputs, ascertaining the items on which expenditure was incurred. Table 5.7 to 5.11 shows the proportionate distribution of expenditure under capital and recurrent costs during 2012-13 to 2017-18. Table 5.7 shows the classified distribution of expenditure during the starting year of NACP-IV 2012-13 and 2013-14. Table 5.11 shows the overall classified distribution of expenditure during 2012-13 to 2017-18.

Table 5.7 Distribution of MSACS Expenditure by Inputs in 2012-13 and 2013-14

	Types of Expenditure	Year (FY)	Rs In Lakhs						In per cent (%)					
			TI	NDBS	LWS	ICTC	CST	Total	TI	NDBS	LWS	ICTC	CST	Total
CAPITAL	1. Equipment	2012-13	-	132.43	1.64	4.40	5.98	144.44	-	7.90	0.10	0.26	0.36	8.61
		2013-14	-	136.43	1.64	4.40	5.98	148.44	-	7.03	0.08	0.23	0.31	7.64
	2. Office Equipment	2012-13	-	61.70	-	0.52	34.78	97.00	-	3.68	-	0.03	2.07	5.78
		2013-14	5.00	64.86	-	0.52	34.78	105.17	0.26	3.34	-	0.03	1.79	5.42
	3. Vehicles	2012-13	-	17.45	-	55.65	-	73.11	-	1.04	-	3.32	-	4.36
		2013-14	-	17.45	-	55.65	-	73.11	-	0.90	-	2.87	-	3.76
	4. Furniture & Supplies	2012-13	-	33.51	0.91	-	15.00	49.42	-	2.00	0.05	-	0.89	2.95
		2013-14	-	41.51	0.91	-	15.00	57.42	-	2.14	0.05	-	0.77	2.96
	5. Civil Works	2012-13	-	26.74	-	-	17.78	44.51	-	1.59	-	-	1.06	2.65
		2013-14	-	26.74	-	-	17.78	44.51	-	1.38	-	-	0.92	2.29
	Total CE	2012-13	-	271.83	2.55	60.58	73.54	408.49	-	16.21	0.15	3.61	4.39	24.36
		2013-14	5.00	287.00	2.55	60.58	73.54	428.65	0.26	14.78	0.13	3.12	3.79	22.07
RECURRENT	1. Personnel	2012-13	-	222.47	60.15	132.17	65.73	480.53	-	13.27	3.59	7.88	3.92	28.66
		2013-14	153.88	248.81	54.08	164.96	52.64	674.38	7.92	12.81	2.78	8.50	2.71	34.73
	2. Supplies	2012-13	-	9.79	-	-	7.92	17.71	-	0.58	-	-	0.47	1.06
		2013-14	17.08	11.14	-	-	10.24	38.46	0.88	0.57	-	-	0.53	1.98
	3. Vehicles, operation & maintenance	2012-13	-	6.38	-	14.72	2.09	23.19	-	0.38	-	0.88	0.12	1.38
		2013-14	-	11.57	-	13.86	0.40	25.83	-	0.60	-	0.71	0.02	1.33
	4. Buildings, operations & maintenance	2012-13	-	10.76	1.86	12.63	4.48	29.73	-	0.64	0.11	0.75	0.27	1.77
		2013-14	14.62	15.17	2.29	29.94	1.82	63.83	0.75	0.78	0.12	1.54	0.09	3.29
	5. Training recurrent	2012-13	-	67.93	8.37	7.41	4.40	88.11	-	4.05	0.50	0.44	0.26	5.25
		2013-14	7.26	53.61	4.53	10.41	2.89	78.70	0.37	2.76	0.23	0.54	0.15	4.05
	6. Social mobilization Operating	2012-13	-	162.96	26.99	2.27	15.95	208.18	-	9.72	1.61	0.14	0.95	12.42
		2013-14	27.49	269.18	18.86	4.03	12.99	332.55	1.42	13.86	0.97	0.21	0.67	17.13
	7. Other Operating inputs	2012-13	-	419.28	1.62	-	-	420.90	-	25.00	0.10	-	-	25.10
		2013-14	13.16	281.90	4.37	-	-	299.43	0.68	14.52	0.23	-	-	15.42
	Total RE	2012-13	-	899.57	98.99	169.20	100.58	1,268.35	-	53.65	5.90	10.09	75.64	75.64
		2013-14	233.48	891.38	84.13	223.20	80.98	1,513.19	12.02	45.90	4.33	11.49	4.17	77.93
	Grand Total (CE+RE)	2012-13	-	1,171.41	101.54	229.78	174.12	1,676.83	-	69.86	6.06	13.70	10.38	100.00
		2013-14	238.48	1,178.38	86.68	283.78	154.52	1,941.84	12.28	60.68	4.46	14.61	7.96	100.00

Source: Complied and calculated from NACO Reports (2012-14)

5.4.1 Classification of Expenditure Inputs During 2012-13 and 2013-14

In October 2013, the NACP-IV project plan was approved by the GOI and come into effect from 2014 onwards. NACO consider 2012 as the starting year of NACP-IV (NACO,2016). Thus, during these two financial years, the finance allocation is compiled and compared to bring a clear picture of the flow of expenditure for different activities level and cost inputs at the beginning of the new phase of NACP.

In the following financial year, the expenditure data under TI activity was not available in the report. It can be seen in Table 5.7 that during the FY 2012-13, the total expenditure accounted for Rs 1,676.8 lakhs, of which 76 per cent accounts for recurrent expenditure and the remaining 24 per cent for capital expenditure. During FY 2013-14, the total expenditure comprises Rs 1,941.84 lakhs, where 78 per cent of its expenditure was spent on recurrent expenditure, and 22 per cent accounts for capital expenditure. Accordingly, the capital expenditure shows an increasing growth at a rate of 4.9 per cent. Meanwhile, the recurrent expenditure increased by 19.3 per cent, of which personnel increased at 41 per cent.

In 2012-13, one-fourth of the total expenditure accounted for personnel and other operating inputs and 12.4 per cent on social mobilisation operating cost. In 2013-14, one-third of the total expenditure accounted for personnel, 17.2 per cent on social mobilisation operating costs, 15.4 per cent on other operating inputs. Under social mobilisation operating costs, 52 per cent accounts for IEC activity alone. In the analysis, costs inputs that were not listed in the social mobilisation operating costs, such as NGO services for priority interventions, monitoring and evaluation (SIMS), surveillance, and other NGO services, come under other operating inputs.

NDBS: In 2012-13, NDBS comprises 70 per cent of the total expenditure, 54 per cent on recurrent, and 16 per cent on capital expenditure. It accounts for the maximum expenditure on recurrent (such as social mobilisation operating costs, other operating inputs, personnel, and training) and capital (such as equipment, furniture, and civil works). In 2013-14, it accounts for 61 per cent of the total expenditure, 46 per cent was on recurrent, and 15 per cent on capital expenditure. During FY 2012-2014, vehicle operation and maintenance increase at a rate of 81 per cent, social mobilisation operating cost at 63 per cent, buildings operations and maintenance at 40 per cent, and

supplies at 13 per cent. It can be observed that other operating inputs decrease at a rate of 32.8 per cent.

ICTC: In 2012-13, ICTC accounts for 13.7 per cent of the total expenditure, of which 10 per cent of spending was on recurrent and 4 per cent on capital expenditure. In 2013-14, it accounted for 15 per cent of the total expenditure. Of which 12 per cent of spending was on recurrent and 3 per cent on capital expenditure. During FY 2012-2014, 58 per cent of the expenditure was spent on personnel and 24 per cent on mobile ICTC services. The expenditure on buildings, operations, and maintenance increased at a rate of 14 per cent.

CST: In 2012-13, CST comprises 10 per cent of the total expenditure, of which 6 per cent accounted for recurrent expenditure and 4 per cent for capital expenditure. Within CST, 38 per cent was spent on personnel, 20 per cent on office equipment, and 9 per cent on social mobilisation operating costs. In 2013-14, CST's recurrent expenditure decreased at a rate of 11 per cent and accounted for 8 per cent of the total expenditure. However, supplies show an increased rate of 30 per cent.

LWS: In 2012-13, LWS accounts for 6 per cent of the total expenditure, 5.9 per cent on recurrent. Within LWS, above 60 per cent was spent on personnel and 20 per cent of the social mobilisation operating costs. In 2013-14, the expenditure decreased at a rate of 15 per cent and accounted for 4 per cent of the total expenditure on recurrent.

TI: In 2013-14, TI accounts for 12.3 per cent of the total expenditure, of which 12 per cent was spent on recurrent. Within TI, 65 per cent was spent on personnel, 12 per cent on social mobilisation, and 7 per cent on supplies.

Table 5.8: Distribution of Expenditure by Inputs, 2014-15

	2014-15	Rs. In lakhs						In per cent					
	Types of Expenditure	TI	NDBS	LWS	ICTC	CST	Total	TI	NDBS	LWS	ICTC	CST	Total
CAPITAL EXPENDITURE	1. Equipment	-	136.43	1.64	4.40	5.98	148.44	-	6.39	0.08	0.21	0.28	6.96
	2. Office Equipment	6.88	64.86	-	0.52	36.25	108.52	0.32	3.04	-	0.02	1.70	5.09
	3. Vehicles	-	17.45	-	55.65	-	73.11	-	0.82	-	2.61	-	3.43
	4. Furnitures etc	-	41.51	0.91	-	15.00	57.42	-	1.95	0.04	-	0.70	2.69
	5. Civil Works	-	26.74	-	-	24.02	50.76	-	1.25	-	-	1.13	2.38
	6. Other Social Mobilization	-	-	-	-	-	-	-	-	-	-	-	-
	Total CE	6.88	287.00	2.55	60.58	81.25	438.25	0.32	13.45	0.12	2.84	3.81	20.54
RECURRENT EXPENDITURE	1. Personnel	561.36	280.87	49.32	182.19	63.43	1,137.16	26.31	13.16	2.31	8.54	2.97	53.29
	2. Supplies	66.38	20.22	-	-	11.58	98.19	3.11	0.95	-	-	0.54	4.60
	3. Vehicles, operation & maintenance	-	1.61	-	15.73	-	17.34	-	0.08	-	0.74	-	0.81
	4. Buildings, operations & maintenance	57.29	12.94	5.21	34.06	-	109.49	2.68	0.61	0.24	1.60	-	5.13
	5. Training recurrent	20.23	16.28	0.07	4.94	3.36	44.88	0.95	0.76	0.00	0.23	0.16	2.10
	6. Social mobilization recurrent	61.60	165.43	22.12	5.51	9.66	264.32	2.89	7.75	1.04	0.26	0.45	12.39
	7. Other operating inputs	0.14	24.22	0.04	-	-	24.39	0.01	1.13	0.00	-	-	1.14
	Total RE	766.99	521.56	76.75	242.44	88.03	1,695.78	35.94	24.44	3.60	11.36	4.13	79.46
	Grand Total (CE + RE)	773.87	808.56	79.30	303.02	169.29	2,134.03	36.26	37.89	3.72	14.20	7.93	100.00

Source: Compiled and computed from NACO Reports

5.4.2 Classification of Expenditure Inputs During 2014-15

Table 5.8 shows that during FY 2014-15, the total expenditure comprises Rs 2,134.03 lakhs, where 78 per cent of its expenditure was spent on recurrent expenditure and 21 per cent on capital expenditure. Capital expenditure shows an increase at 2.3 per cent, recurrent at 12 per cent, and personnel at 68.8 per cent, from FY 2013-14 (Table 5.7). One half of the total expenditure accounts for personnel, 12 per cent on social mobilisation operating costs, and the remaining on other heads.

The NACP-IV project started practically from 2014; prevention services continue to be the core objective, of which high priority was on preventive interventions with HRGs, also known as Targeted Interventions (TI). It can be noticed that TI activity increases at a rate of 2.3 (69%) from FY 2013-14. It shares 36.3 per cent of the total expenditure; 36 per cent was on recurrent and 0.3 per cent on capital expenditure. Within TI, 73 per cent was spent on personnel. It can be seen that a relatively high priority was given to supplies, building, operations and maintenance, training, and social mobilisation operating costs.

Under NDBS, there were gradual declines in other operating inputs expenditure, of which the activity make up for only 37 per cent of the total expenditure. NGO services that come under other operating inputs were given high priority during the FY 2012-2014 and gradually declined in the following year; this could be due to the high relative priority given to the core intervention under TI.

We can observe that training and other operating inputs decreased under NDBS, LWS, ICTC, and CST. Under LWS, high priority was given to the building, operations, maintenance, and social mobilisation recurrent, aiming to address the need for prevention and support in rural areas. Under ICTC, high priority was given to the building, operations, and maintenance; this indicates equipment set up in new ICTC centres. NACO Annual Report (2014-15) have also highlighted the number and proportion of fixed facility ICTC increasing in India.

Table 5.9: Distribution of Expenditure by Inputs, 2015-16

	2015-16	Rs. In lakhs						In per cent					
	Types of Expenditure	TI	NDBS	LWS	ICTC	CST	Total	TI	NDBS	LWS	ICTC	CST	Total
CAPITAL EXPENDITURE	1. Equipment	-	136.43	1.64	4.40	5.98	148.44	-	7.27	0.09	0.23	0.32	7.91
	2. Office Equipment	6.88	68.53	-	0.52	36.25	112.19	0.37	3.65	-	0.03	1.93	5.98
	3. Vehicles	-	17.45	-	55.65	-	73.11	-	0.93	-	2.97	-	3.90
	4. Furnitures etc	-	41.51	0.91	-	15.00	57.42	-	2.21	0.05	-	0.80	3.06
	5. Civil Works	-	26.74	-	-	24.02	50.76	-	1.42	-	-	1.28	2.70
	6. Other Social Mobilization	-	-	-	-	-	-	-	-	-	-	-	-
	Total CE	6.88	290.67	2.55	60.58	81.25	441.92	0.37	15.49	0.14	3.23	4.33	23.55
RECURRENT EXPENDITURE	1. Personnel	495.12	291.35	52.05	197.97	69.59	1,106.07	26.38	15.52	2.77	10.55	3.71	58.93
	2. Supplies	23.78	1.43	-	-	20.04	45.25	1.27	0.08	-	-	1.07	2.41
	3. Vehicles, operation & maintenance	-	4.82	-	4.29	-	9.11	-	0.26	-	0.23	-	0.49
	4. Buildings, operations & maintenance	40.55	18.48	2.16	8.11	-	69.30	2.16	0.98	0.12	0.43	-	3.69
	5. Training recurrent	3.35	11.84	-	-	1.93	17.11	0.18	0.63	-	-	0.10	0.91
	6. Social mobilization recurrent	25.45	139.21	13.13	1.07	9.26	188.12	1.36	7.42	0.70	0.06	0.49	10.02
	7. Other operating inputs	-	-	-	-	-	-	-	-	-	-	-	-
	Total RE	588.25	467.12	67.34	211.44	100.81	1,434.97	31.34	24.89	3.59	11.27	5.37	76.46
	Grand Total (CE + RE)	595.12	757.79	69.88	272.02	182.07	1,876.88	31.71	40.37	3.72	14.49	9.70	100.00

Source: Compiled and computed from NACO Reports

5.4.3 Classification of Expenditure Inputs During 2015-16

Table 5.9 shows that during the FY 2015-16, the total expenditure accounts for Rs 1,876.8 lakhs, of which 76 per cent of its expenditure was on recurrent expenditure and the remaining 24 per cent on capital expenditure. Three-fifth of the total expenditure accounts for personnel, one-tenth on social mobilisation operating costs, and the remaining on other heads. Capital expenditure shows an increase at a rate of 0.8 per cent during recurrent decrease at 15 per cent and personnel at 3 per cent, from the last FY 2014-15.

It can be examined that TI dropped at a rate of 23 per cent and accounts for two-fifth of the recurrent expenditure. It can be observed that training dropped at a rate of 83 per cent under this activity. Similarly, NACO reported that the capacity building of TIs through STRCs could not be prioritised in the following year attributable to inadequacy in training budget at both the state and national (NACO Annual Report, 2015-16).

It is noticed that capital expenditure increase under NDBS office equipment, which was not observed in the last two financial years. It is noticed from the data that the expenditure on supplies dropped in the following year. However, this is the outcome of the relative maximum priority given in the previous financial year (2014-15); usually, the finance allocation under lab supplies is relatively low compared to consumables items under NDBS. Similarly, within LWS activity, expenditure on social mobilisation falls by 40 per cent; this usually is how the allocation of expenditure function during the previous years. It increases and decreases in the consequent year, and it is evident to be their system of allocating IEC operating costs in the last four financial years.

The expenditure under ICTC's vehicles, operation, and maintenance fall at a high rate due to decreased vehicles and equipment maintenance expenses in the following year. The expenditure under CSTs supplies increases at a 73 per cent rate, shows the supply of opportunistic infections (OI) drugs supply to prevent and treat HIV patients. including

Table 5.10: Distribution of Expenditure by Inputs in 2016-17 and 2017-18

	Types of Expenditure	FY	Rs. In lakhs						In per cent (%)					
			TI	NDBS	LWS	ICTC	CST	Total	TI	NDBS	LWS	ICTC	CST	Total
CAPITAL	1. Equipment	2016-17	-	136.43	1.64	4.40	5.98	148.44	-	7.03	0.08	0.23	0.31	7.65
		2017-18	-	136.43	1.64	4.40	5.98	148.44	-	7.11	0.09	0.23	0.31	7.73
	2. Office Equipment	2016-17	6.88	70.99	-	0.52	36.25	114.64	0.35	3.66	-	0.03	1.87	5.91
		2017-18	20.93	83.94	-	0.52	36.25	141.64	1.09	4.37	-	0.03	1.89	7.38
	3. Vehicles	2016-17	-	17.45	-	55.65	-	73.11	-	0.90	-	2.87	-	3.77
		2017-18	-	17.45	-	55.65	-	73.11	-	0.91	-	2.90	-	3.81
	4. Furnitures etc	2016-17	0.90	41.51	0.91	-	15.00	58.32	0.05	2.14	0.05	-	0.77	3.01
		2017-18	0.90	41.86	0.91	-	15.00	58.66	0.05	2.18	0.05	-	0.78	3.06
	5. Civil Works	2016-17	-	26.74	-	-	24.02	50.76	-	1.38	-	-	1.24	2.62
		2017-18	-	26.74	-	-	24.02	50.76	-	1.39	-	-	1.25	2.64
	5. Other Social mobilization	2016-17	-	-	-	-	0.06	0.06	-	-	-	-	0.00	0.00
		2017-18	-	-	-	-	0.06	0.06	-	-	-	-	0.00	0.00
	Total CE	2016-17	7.77	293.12	2.55	60.58	81.31	445.33	0.40	15.11	0.13	3.12	4.19	22.95
		2017-18	21.82	306.42	2.55	60.58	81.31	472.67	1.14	15.96	0.13	3.16	4.24	24.63
RECURRENT	1. Personnel	2016-17	466.67	297.85	61.73	199.47	81.48	1,107.20	24.05	15.35	3.18	10.28	4.20	57.07
		2017-18	420.42	342.56	46.23	234.58	100.68	1,144.48	21.90	17.85	2.41	12.22	5.25	59.63
	2. Supplies	2016-17	44.65	8.34	-	-	16.60	69.59	2.30	0.43	-	-	0.86	3.59
		2017-18	42.90	0.85	-	-	0.13	43.87	2.24	0.04	-	-	0.01	2.29
	3. Vehicles, operation & maintenance	2016-17	-	7.50	-	3.35	-	10.86	-	0.39	-	0.17	-	0.56
		2017-18	-	10.71	-	0.84	-	11.54	-	0.56	-	0.04	-	0.60
	4. Buildings, operations & maintenance	2016-17	47.68	19.28	2.60	10.86	-	80.42	2.46	0.99	0.13	0.56	-	4.15
		2017-18	36.75	14.36	1.59	23.70	-	76.40	1.91	0.75	0.08	1.23	-	3.98
	5. Training recurrent	2016-17	8.70	4.01	0.32	-	1.11	14.14	0.45	0.21	0.02	-	0.06	0.73
		2017-18	13.23	4.28	-	0.57	2.44	20.51	0.69	0.22	-	0.03	0.13	1.07
	6. Social mobilization Operating Costs	2016-17	49.52	124.37	18.26	0.59	4.61	197.35	2.55	6.41	0.94	0.03	0.24	10.17
		2017-18	31.64	91.86	13.50	0.07	8.30	145.38	1.65	4.79	0.70	0.00	0.43	7.57
	7. Other Operating inputs	2016-17	13.11	2.08	-	-	-	15.19	0.68	0.11	-	-	-	0.78
		2017-18	3.43	1.09	-	-	-	4.52	0.18	0.06	-	-	-	0.24
	Total RE	2016-17	630.34	463.45	82.91	214.28	103.79	1,494.76	32.49	23.89	4.27	11.04	5.35	77.05
		2017-18	548.37	465.69	61.33	259.76	111.54	1,446.69	28.57	24.26	3.20	13.53	5.81	75.37
	Grand Total (CE+RE)	2016-17	638.11	756.57	85.45	274.85	185.10	1,940.09	32.89	39.00	4.40	14.17	9.54	100.00
		2017-18	570.20	772.11	63.87	320.34	192.85	1,919.37	29.71	40.23	3.33	16.69	10.05	100.00

Source: Computed and compiled from NACO Reports

5.4.4 Classification of Expenditure Inputs During 2016-17 and 2017-18

During 2016-17 and 2017-18, the total expenditure accounted for Rs 1,940.09 lakhs and Rs 1,919.37 lakhs, respectively, of which 77 and 75 per cent account for recurrent the remaining 23 and 25 per cent accounts for capital expenditure. In 2016-17, the capital expenditure showed an increased growth rate of 0.9 per cent, recurrent at 4.2 per cent, and personnel at 0.1 per cent from the previous financial year 2015-16. In 2017-18, the capital expenditure showed an increased growth rate of 6 per cent, recurrent decrease at a rate of 3.2 per cent, and personnel increase at a rate of 3.4 per cent from the previous financial year 2016-17.

Personnel: It can be seen in Table 5.10 that more than one half of the expenditure account for personnel. It is noticed that in 2017-18, personnel expenditure under LWS and TI decrease at a rate of 25 per cent and 10 per cent, respectively.

Capital Expenditure: Office equipment under TI and NDBS comprises the increase in capital expenditure.

Social Mobilization: It can be noticed that social mobilisation decreases at a rate of 26 per cent in the recurrent expenditure resulting in a decrease in expenses such as travelling, printing and stationery, audit fees, postage/courier, and IEC.

Training: Another fact was the increase in training by 42 per cent under TI and CST in 2017-2018.

Other operating costs: Under CST, the other operating costs decrease by 73 per cent in 2017-18 from 2016-2017.

Supplies: The supplies under CST decrease to a margin of 2017-18, and TI activity also experienced a 4 per cent decline rate.

Building operations and maintenance: It was found that activity under TI, NDBS, and LWS expenditure decrease, while under ICTC showed an increasing rate of 54 per cent in 2017-18.

Table 5.11: Distribution of MSACS Expenditure during 2012-13 to 2017-18

	Types of expenditure 2012-18	Rs. In lakhs						In per cent (%)					
		TI	NDBS	LWS	ICTC	CST	T.T	TI	NDBS	LWS	ICTC	CST	T.T
CAPITAL	1. Equipment	-	814.58	9.84	26.40	35.88	886.70	-	7.1	0.1	0.2	0.3	7.7
	2. Office Equipment	46.57	414.88	-	3.12	214.56	679.13	0.4	3.6	-	0.0	1.9	5.9
	3. Vehicles	-	104.70	-	333.90	-	438.60	-	0.9	-	2.9	-	3.8
	4. Furnitures etc	1.80	241.41	5.46	-	90.00	338.67	0.0	2.1	0.0	-	0.8	2.9
	5. Civil Works	-	160.44	-	-	131.64	292.08	-	1.4	-	-	1.1	2.5
	6. Other Social Mobilization	-	-	-	-	0.12	0.12	-	-	-	-	0.0	0.0
	Total Capital	48.35	1,736.04	15.30	363.48	472.20	2,635.37	0.4	15.1	0.1	3.2	4.1	22.9
RECURRENT	1. Personnel	2,097.45	1,683.91	323.56	1,111.34	433.55	5,649.81	18.3	14.7	2.8	9.7	3.8	49.2
	2. Supplies	194.79	51.77	-	-	66.51	313.07	1.7	0.5	-	-	0.6	2.7
	3. Vehicles, operation & maintenance	-	42.59	-	52.79	2.49	97.87	-	0.4	-	0.5	0.0	0.9
	4. Buildings, operations & maintenance	196.89	90.99	15.71	119.30	6.30	429.19	1.7	0.8	0.1	1.0	0.1	3.7
	5. Training recurrent	52.77	157.95	13.29	23.33	16.13	263.47	0.5	1.4	0.1	0.2	0.1	2.3
	6. Social mobilisation Operating Costs	195.70	953.01	112.86	13.54	60.77	1,335.88	1.7	8.3	1.0	0.1	0.5	11.6
	7. Other Operating inputs	29.84	728.57	6.03	-	-	764.44	0.3	6.3	0.1	-	-	6.7
	Total Recurrent	2,767.43	3,708.77	471.45	1,320.32	585.73	8,853.70	24.1	32.3	4.1	11.5	5.1	77.1
	Grand Total (CE + RE)	2,815.78	5,444.81	486.72	1,683.79	1,057.93	11,489.03	24.5	47.4	4.2	14.7	9.2	100

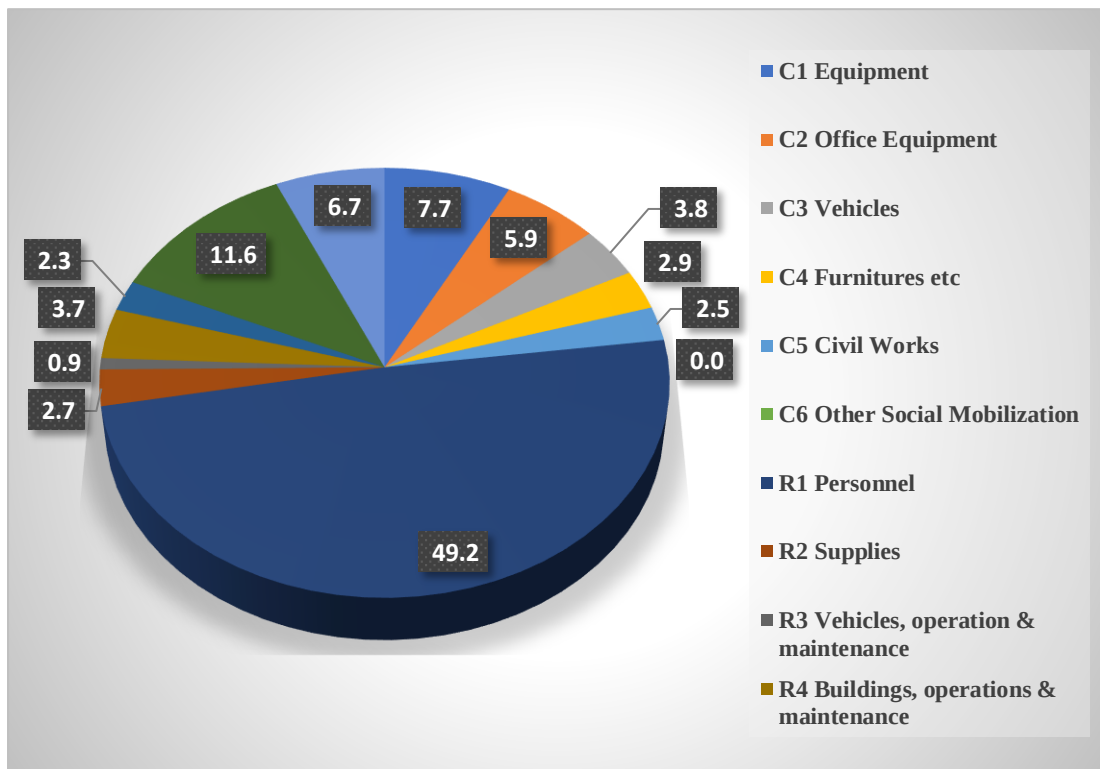
Source: Computed from Table 5.7 to Table 5.10

5.4.5 Classification of Expenditure During 2012-18

The main activity budget in Table 5.6 has shown that TI constitutes 41 per cent of the total recurrent expenditure during 2014-18. During 2014-18, TI's total expenditure accounted for 32.7 per cent and 39.3 per cent for NDBS. However, during the year 2012-13, there were no records of expenditure under TI activity; the expenditure was not distributed to its budget heads record yet concentrated towards NDBS activity.

The analysis of table 5.11 shows that an amount of Rs 11,489 lakhs was spent during 2012-18. During FY 2014-15, the amount spent on TI activity increase by more than 4 per cent, and a 3.3 per cent decrease under NDBS activity. Its total expenditure accounts for 18 per cent of the computed total expenditure during FY 2012-18. Capital expenditure accounts for 22.9 per cent of the total expenditure, where 15.1 per cent accounted for NDBS activity, 4.1 per cent for CST activity, 3.2 per cent for ICTC activity, and the remaining for TI and LWS. On the other hand, recurrent expenditure accounts for 77.1 per cent of the total expenditure, 32.3 per cent accounts for NDBS activity, 24.1 per cent for TI activity, 11.5 per cent for ICTC activity, and 5.1 per cent for CST activity, and 4.1 per cent for LWS activity.

Figure 5.6: Percentage Distribution of Expenditure by Inputs, 2012-18



- R1- The cost inputs classification during 2012-18, as shown in Fig. 5.6, indicates that almost half of the total expenditure was spent on recurrent personnel expenses (R1). TI activity accounts for 18.3 per cent, NDBS activity for 14.7 per cent, ICTC activity for 9.9 per cent, CST activity for 3.8 per cent, and LWS activity for 2.8 per cent spent on personnel expenses.
- R6- Social mobilisation operating cost accounts for 11.6 per cent of the total expenditure, of which NDBS was spent on 8.3 per cent, 1.7 per cent on TI, and the remaining 1.6 per cent on CST, ICTC, and LWS of the total recurrent social mobilisation expenses.
- C1-Capital expenditure on equipment comprises 7.7 per cent of the total expenditure, of which NDBS shares 7.1 per cent and the remaining on CST, LWS, and ICTC of the total capital equipment expenditure.
- R7-Recurrent expenditure on other operating costs comprises 6.7 per cent of the total expenditure, of which NDBS shares 6.3 per cent and the remaining on TI and LWS of the total recurrent other operating cost expenses.
- C2-Capital expenditure on office equipment (C-2) comprises 5.9 per cent of the total expenditure; NDBS shares 3.6 per cent, CST shares 1.9 per cent, and the remaining on ICTC and TI of the total capital office equipment expenses.
- C3-Capital expenditure on vehicles shares for 3.8 per cent of the total expenditure, of which ICTC shares 2.9 per cent and the remaining on NDBS of the total capital vehicle expenses.
- R4-Recurrent expenditure on buildings, operations, and maintenance comprises 3.7 per cent of the total expenditure, of which TI shares 1.7 per cent and the remaining on NDBS, ICTC, LWS, and CST of the total recurrent buildings, operations, and maintenance expenses.
- C4-Capital expenditure on furniture comprises 2.9 per cent of the total expenditure, of which NDBS shares 2.1 per cent and the remaining on NDBS, TI, LWS, and CST of the total capital furniture expenses.

- R2-Recurrent expenditure on supplies comprises 2.7 per cent of the total expenditure; TI shares 1.7 per cent and the remaining on NDBS and CST of the total recurrent supplies' expenses.
- C5-Capital expenditure on civil works comprises 2.5 per cent of the total expenditure, of which NDBS shares 1.4 per cent, and CST shares the remaining 1.1 per cent of the total capital civil works expenses.
- R5-Recurrent expenditure on training comprises 2.3 per cent of the total expenditure; NDBS shares 1.4 per cent and the remaining on TI, LWS, ICTC, and CST activity.
- R3-Recurrent expenditure on vehicles, operation, and maintenance account for 0.9 per cent of the total expenditure on NDBS, ICTC, and CST activity.
- C6-Capital expenditure on other social mobilisation comprises less than 1 per cent of the total CST activity.

5.5 Summary

The present study aims to explain the distribution of budget activities by MSACS. Among the MSACS five activity budgets, TI accounts for more than 44 per cent of the expenditure. NDBS activity shares for 32 per cent, and the remaining 23.7 per cent accounts for LWS, CST, and ICTC activity. The analysis of the distribution of expenditure showed that 77 per cent was spent on recurring and 22.9 per cent on capital expenses. Further, it was found that personnel expenditure accounts for almost half of the total expenses of the recurrent expenditure. The expenditure under NDBS activity contributes almost half of the total expenditure, of which 32.3 per cent was on recurrent expenses, and 15 per cent was on capital expenses. The distribution of expenditure among various components during the FY 2012-18 showed that one half is spent on personnel costs such as salary, honorarium, leave salary and pension contributions, employer's contribution to CPF, and medical expenses.

CHAPTER 6

Distribution of Expenditure of Mizoram State AIDS Control Society by Component

6.1 Background

The fundamental pillars of the NACP are prevention and treatment services. These two-pillar were strengthened and improved with new challenges and strategies in every phase of the NACP. The key strategies of the NACP vary in terms of its component-wise budget provision as the objectives of the NACP phases depend on the previous NACP achievements, challenges, and goals. In 1992, the first programme, NACP, was introduced to slow down the HIV infection spreading and AIDS impact in the country. Its key strategies were to monitor HIV infection by setting up a surveillance system, awareness, access to safe blood, and services for HRGs. In 1999, the NACP-II started to strengthen the existing objectives and adopted key initiatives on HRGs intervention, blood policy, a strategy for HIV/AIDs patients, introducing basic services (counselling and testing), and ART programme. In 2007, the NACP-III was introduced to halt and reverse the epidemic among the HRGs and General Population with care, support, and treatment services. In 2012, the NACP-IV started to expedite the reversal process and expanded the country's epidemic responses.

This chapter attempts to classify the five-activity budget of MSACS into the NACP-IV key strategies/component. The strategies are Prevention Services (PS), Care Support and Treatment (CST), IEC, Social Mobilisation & Mainstreaming (IEC), Strategic Information Management System (SIMS), and Capacity Building (CB). Of course, the amount of expenditure incurred on different activities does not imply its effectiveness or validity; however, it examines the flow of expenditure, highlighting the resources requirement under each strategy. Therefore, ascertaining the budget heads on which the expenditure is incurred in terms of the programme key strategies.

6.2 NACP-IV Key Strategies

In 2012, NACP-IV was launched to consolidate the achievements made during the NACP-III, accelerate and strengthen the country's epidemic response. The two key objectives of NACP-IV are to ease new infections by 50 per cent and ensure comprehensive care, support, and treatment for HIV/AIDS people and improve the health systems. The strategy and plan for NACP-IV (2012-17) have been adopted through an inclusive approach with 15 working groups and 30 subgroups covering all aspects of NACP-IV involving 624 representatives. The representatives include HRGs communities, PLHIV, NRHM, subject experts, other government departments, civil society, development partners and stakeholders, the Department of AIDS Control, and SACS.

The thematic areas include programme implementation, finance management/innovative financing, procurement, laboratory services, STI/RTI, condom programming, IEC, Greater Involvement of People with HIV/AIDS (GIPA), stigma, discrimination, mainstreaming and partnership, blood safety, ICTC/PPTC, CST, SIMS, gender youth and adolescence and targeted interventions. In addition, the thematic working groups have designed a strategy by setting overall goals for a productive and sustainable future based on the priorities, gaps, strength, and lesson learnt from the programme's previous phases.

Under the fourth phase of NACP, the key strategies are aimed at the following five main components/strategies:

- I. Intensifying and strengthening prevention services focusing on HRGs and vulnerable populations.
- II. Increasing and ensuring comprehensive care, support, and treatment.
- III. Expanding Information, Education and Communication (IEC) services for the general population and high-risk groups.
- IV. Building capacities through national, state, district, and facility levels.
- V. Reinforcing the Strategic Information Management Systems.

Strategy 1: Intensifying and Strengthening Prevention services

As the population of HIV negative is more in the country, the priority continues to be on prevention strategy focusing on HRGs and vulnerable populations. It aims to reach out widely to the population having no access and use of the prevention services. Accordingly, the plan is intended to cover nine-tenths of the HRGs through TI services by increasing testing and counselling, treatment, safe practices, condom promotion, STI services, risk reduction counselling, NSEP, provision of OST. It also supports high-risk migrants with their partners/spouses, truckers, and other vulnerable populations collaborating with other departments and voluntary groups. The activities include risk assessing and size estimating of migrant population groups and truckers, generating awareness concerning risk and vulnerability, prevention methods, services availability, increasing safe behaviour services, and reducing stigma.

Strategy 2: Comprehensive Care, Support and Treatment

It aims to perform care, support, and treatment for those required and provide extra support for HIV/AIDS affected/infected women and children. The comprehensive CST services include anti-retroviral treatment (ART), opportunistic infections treatment, positive preventions, social protection and insurance for PLHIV. The activities were plan to be performed by strengthening and expanding the ART services (ART centres, LACs, and Centers of Excellence CoEs) and patient follow-up services.

Strategy 3: Expanding IEC services

IEC plays the most crucial role in the NACP with the scaling-up of services for testing, counselling, and treatment. The NACP-IV IEC strategy focuses on increasing awareness and campaigns among the general population, bridge population, vulnerable population, and HRGs.

Strategy 4: Strengthening the institutional capacities

To achieve the NACP-IV goals, it required quality services and management at all the national, state, district levels and adequate supervision at the field level. Hence, the strategy aims to strengthen the planning process and system by ensuring the annual action plan to be based on priorities, evidence, and alliance with the objectives of NACP-IV. It also includes increasing collaboration with other departments for sustaining the epidemic response.

Strategy 5: Reinforcing the Strategic Information Management Systems (SIMS)

The strategy ensures high-quality data generation systems by strengthening the surveillance, programme monitoring, and research, focusing on capacity enhancing of the epidemiologists, M&E officers, and program managers. The initiatives under SIMS are the National Biological and Behavioural Surveillance (IBBS) among HRG and Bridge Groups, the National Data Analysis Plan, the National Research Plan. In addition, it includes a unified decision support system with advanced analytic and Geographic Information System (GIS) capabilities, institutionalising Data Quality Monitoring System and institutionalising data use management for decision making.

Table 6.1 Distribution of MSACS Budget Expenditure by NACP-IV Components

	MSACS Main Component	Total Expenditure (In Rs lakhs)					Total expenditure (In %)				
		2014-15	2015-16	2016-17	2017-18	Total	2014-15	2015-16	2016-17	2017-18	Total
BUDGET	Prevention Services	1186.57	949.26	977.38	1054.20	4111.11	63.4	63.4	73.6	71.9	67.3
	Care, Support & Treatment	105.80	84.64	75.99	88.00	354.43	5.7	5.7	5.7	6.0	5.8
	IEC, Social Mobilisation & Mainstreaming	222.94	178.33	94.79	90.56	586.62	11.9	11.9	7.1	6.2	9.6
	Strategic Information Management System	20.44	16.36	8.85	9.10	54.75	1.1	1.1	0.7	0.6	0.9
	Capacity Building	335.28	268.23	170.66	224.34	998.51	17.9	17.9	12.9	15.3	16.4
	TOTAL	1871.03	1496.82	1327.67	1466.20	6105.42	100	100	100	100	100
	AVG	374.21	299.36	265.53	293.24	1221.08					
ACTUAL	Prevention Services	1212.14	944.55	993.99	975.19	4125.87	71.0	65.7	66.6	65.8	67.4
	Care, Support & Treatment	95.75	100.81	103.79	111.54	411.89	5.6	7.0	7.0	7.5	6.7
	IEC, Social Mobilisation & Mainstreaming	111.67	107.53	91.48	61.06	371.74	6.5	7.5	6.1	4.1	6.1
	Strategic Information Management	19.51	2.29	4.82	2.92	29.54	1.1	0.2	0.3	0.2	0.5
	Capacity Building	267.54	283.45	298.16	330.25	1179.39	15.7	19.7	20.0	22.3	19.3
	TOTAL	1706.60	1438.64	1492.24	1480.95	6118.43	100	100	100	100	100
	AVG	341.32	287.73	298.45	296.19	1223.69					

Source: Compiled from Finance Division Report, MSACS (2014-2018)

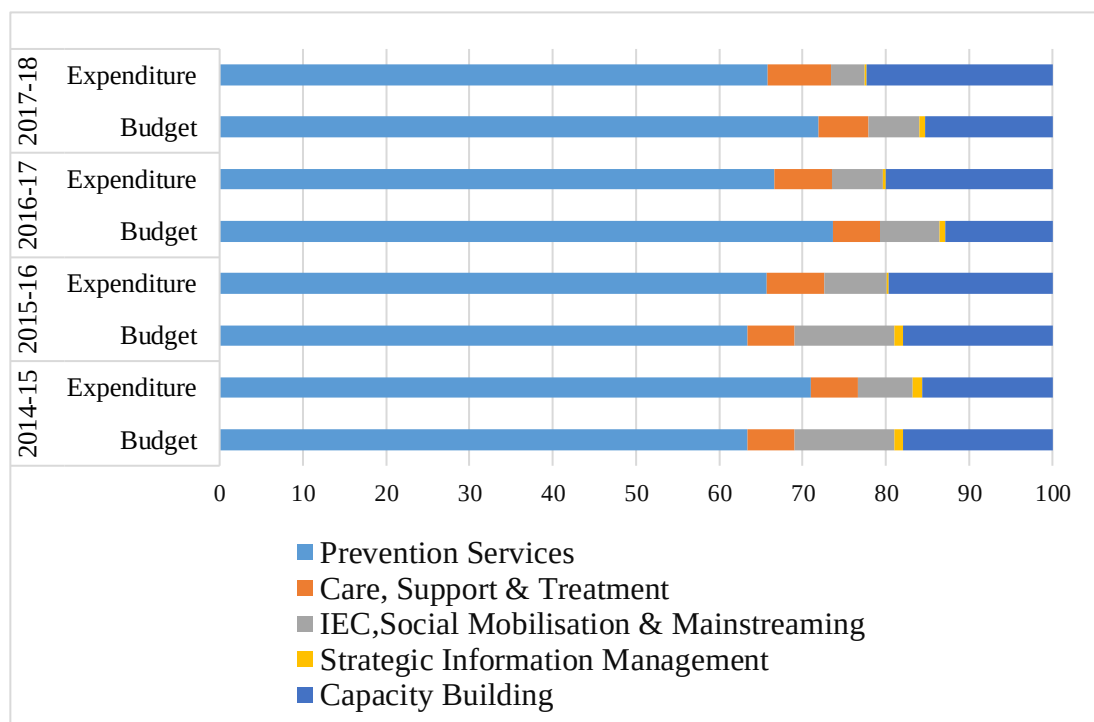
6.3 Distribution of Budget and Expenditure by MSACS Key Strategies

Under NACO, each SACS received funds under various heads of budget activity, as mention in Chapter-4. These five main activity budgets report was collected from the Finance Division, Mizoram SACS. The data on expenditure available from the Finance Division (MSACS) during 2014-2018 is represented in a traditional variance report. Therefore, the traditional Health Care Organization variance report refers to a line-by-line comparison of budgeted and actual expenses for each component/sub-component or cost center (Finkler, 1999). However, this chapter does not perform further variance analysis due to the unavailability of cash flow budget/actual reports. So, instead of explaining the causes of variances, the focus is laid on the distribution pattern of actual expenditure in terms of NACP-IV five key strategies/components, i.e.,

1. Prevention Services
2. Comprehensive Care, Support, and Treatment
3. IEC Services
4. Strategic Information Management Systems (SIMS)
5. Capacity building

Table 6.1 and Fig. 6.1 shows that during the financial years 2014-15 to 2017-18, the maximum budget expenditure concentrated on prevention services, where two-thirds of the total budget of MSACS accounts for prevention services. Capacity building accounted for 16.4 per cent, and the remaining 16.3 per cent comprised resources on CST, IEC, and SIMS. However, the actual expenditure shows variations, of which 19.3 per cent accounts for strengthening capacity building, and the remaining 13.3 per cent on CST, IEC, and SIMS. Therefore, it can be seen that the budget and actual expenditure was maximum during 2014-15, of which prevention expenditure shares for 71 per cent of the actual total expenditure.

Figure 6.1: Distribution of budget expenditure of MSACS under NACP-IV main components (In per cent)



Source: Compiled from Finance Division Report, MSACS

If we consider the budget expenditure during 2015-16 and 2016-17, the capacity building expenditure exceeds the estimated budget. As a result, the actual expenditure under CST keeps increasing between 2 to 7 per cent, while the budget decreases at a 20 per cent rate during the four years. In contrast, the actual expenditure under SIMS and IEC is less than the estimated budget, and its highest variation was during FY 2015-16.

Hence, expenditure classification under NACP-IV key strategies/component helps perform the in-depth flow of actual expenditure through the sub-division/sub-head of each component. Each key strategy/component will be further categorised into its sub-division/heads for a detailed analysis. Again, budget expenditure under each strategy is subdivided and categorised.

Tables 6.1 to 6.17 give a proportionate distribution of expenditure on various components of the MSACS during the years 2014-15, 2015-16, 2016-17, and 2017-18. The focus would be on ascertaining the budget heads on which the MSACS incurred maximum and minimum expenditure under the NACP-IV.

Table 6.2 Distribution of Budget Expenditure of Prevention Services (PS)

	Prevention Services	Rs. In lakhs					In per cent (%)				
		2014-15	2015-16	2016-17	2017-18	Total	2014-15	2015-16	2016-17	2017-18	Total
BUDGET	Blood Safety	65.8	52.64	40.13	59.33	217.9	5.5	5.5	4.1	5.6	5.3
	TI	772.17	617.73	648.19	683.51	2665.3	65.1	65.1	66.3	64.8	64.8
	LWS	85.53	68.42	81.4	80.78	316.13	7.2	7.2	8.3	7.7	7.7
	ICTC	225.4	180.32	179.92	202.64	788.28	19	19	18.4	19.2	19.2
	Others (STD Control, EQAP, NGO, OST)	37.67	30.14	27.75	27.94	123.5	3.2	3.2	2.8	2.7	3
	Total Budget PS	1186.57	949.26	977.38	1054.2	4111.11	100	100	100	100	100
	AVG Budget	237.31	189.85	195.48	210.84	822.22					
ACTUAL	Blood Safety	69.3	52.67	49.37	58.81	230.16	5.7	5.6	5	6	5.6
	TI	770.09	588.25	625.36	569.34	2553.04	63.5	62.3	62.9	58.4	61.9
	LWS	76.75	67.34	82.91	61.33	288.33	6.3	7.1	8.3	6.3	7
	ICTC	242.44	211.44	214.28	259.76	927.92	20	22.4	21.6	26.6	22.5
	Others (STD Control, EQAP, NGO, OST)	53.55	24.85	22.07	25.95	126.41	4.4	2.6	2.2	2.7	3.1
	Total Actual PS	1212.14	944.55	993.99	975.19	4125.87	100	100	100	100	100
	AVG Actual	242.43	188.91	198.8	195.04	825.17					

Source: Compiled from Finance Division Report, MSACS

6.4 Prevention Services

Under the NACP-IV strategy and plan, prevention services occupied the core component of the programme. The component under prevention services can be classified into five activities such as Blood Safety (BS), Targeted Intervention (TI), Link Workers Scheme, Integrated Counselling and Testing Centre (ICTC), and other services such as STD Control, NGO Services for Targeted Interventions, External Quality Assessment Programme (EQAP) and OST implementation through Government centres.

Table 6.2 shows the distribution of budget expenditure within prevention services during 2014-15 to 2017-18. The table reveals that 64.8 per cent of the budget allocates to Targeted Intervention (TI), 19.2 per cent to Integrated Counselling and Testing Centre (ICTC), 5.3 per cent on Blood Safety (BS), 7.7 per cent on Link Workers Scheme (LWS), and 3 per cent on others services (such as STD Control, NGO Services for Targeted Interventions, External Quality Assessment Programme and OST implementation through Government centres). Of the actual expenditure, 61.9 per cent is spent on TI, 22.5 per cent on ICTC, 5.6 per cent on BS, 7 per cent on LWS, and 3.1 per cent on others. Thus, the actual expenditure exceeds the estimated budget by Rs 14.76 lakhs.

Figure 6.2: Total Budget of 5-Subcomponent of Prevention Services (PS) and MSACS 4-Key Strategies during 2014-2018

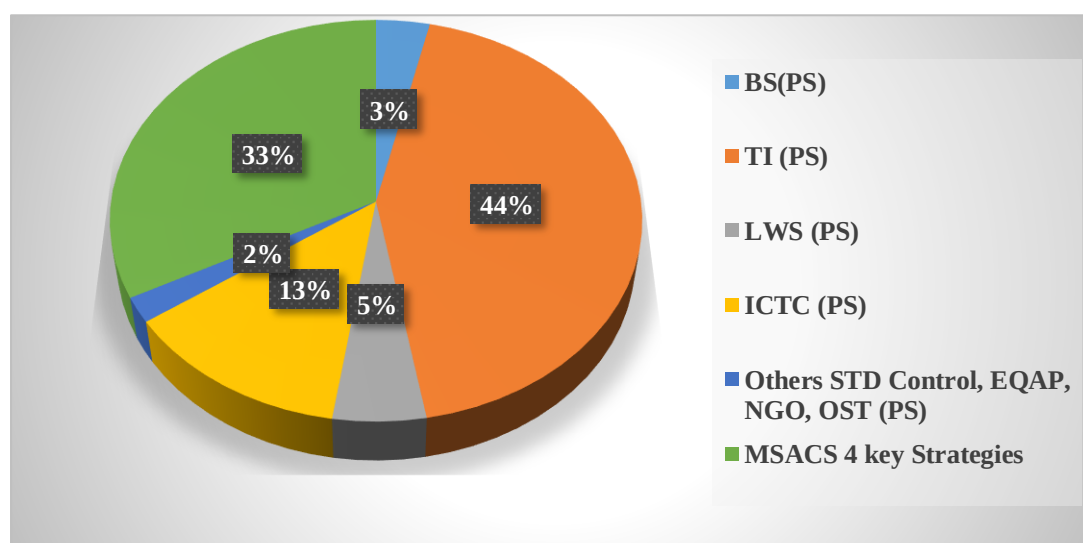
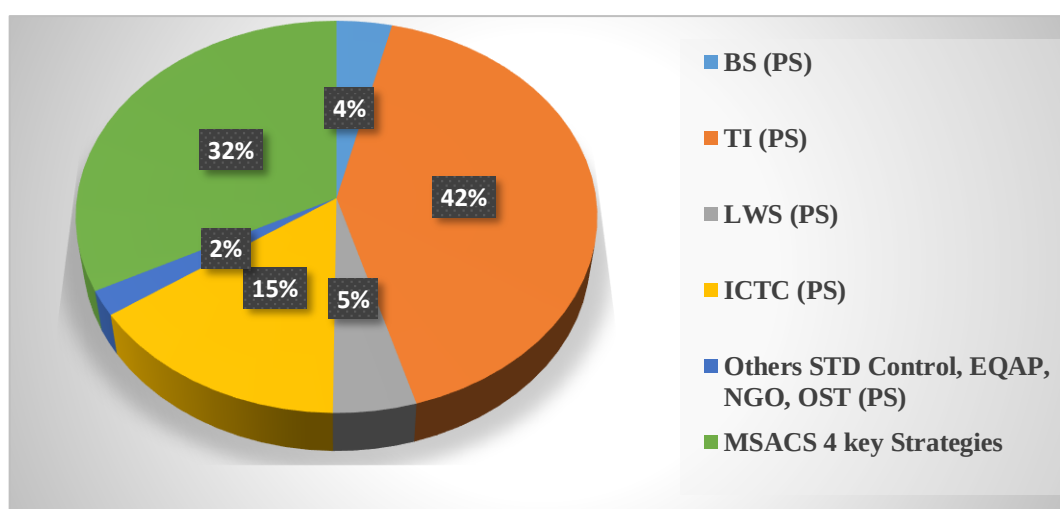


Figure 6.3: Total expenditure of 5-Subcomponent of Prevention Services (PS) and MSACS 4 Key Strategies during 2014-2018



As observed in Table 6.1, prevention services account for 67 per cent of the budget, where other strategies under the MSACS budget account for the remaining 33 per cent. It can be noticed in Fig.6.2, the activities under TI shares for 44 per cent of the total budget and 13 per cent on ICTC, 5 per cent on LWS, 3 per cent on BS, and 2 per cent on other services. Accordingly, 42 per cent of the total MSACS actual expenditure accounts for TI, 15 per cent for ICTC, and 11 per cent for BS, LWS, and others (Fig 6.3). The other four key strategies of MSACS account for only 32 per cent of the actual expenditure.

If one considers the overall figures, one can see that TI and ICTC services emerged as the topmost priority activities in terms of MSACS budget expenditure. Further analysis was done to explore the sub-division/components within each activity.

6.4.1 Targeted Interventions (TI)

TI is the core preventive projects under the NACP-IV, targeted to reduce the HIV prevalence rate among the HRGs and reduce HIV transmission among the HRGs to the bridge population and further to the vulnerable and general population. The prevention of HIV infection among the HRGs is the foremost strategy of the NACP-IV, serving the most significant projects in reducing HIV transmission among the population. TI services constitute Rs 2553 lakhs during 2014-18, i.e. more than 41 per cent of the entire MSACS expenditure and 61 per cent of the total prevention service components. TI activities can be classified into sub-components such as HRGs-FSWs, MSM, IDU, Core Composite, Opioid Substitution Therapy (OST), other vulnerable population migrants, training costs (participants cost, etc.) and its Supply Chain Management (SCM), as shown in Table 6.3

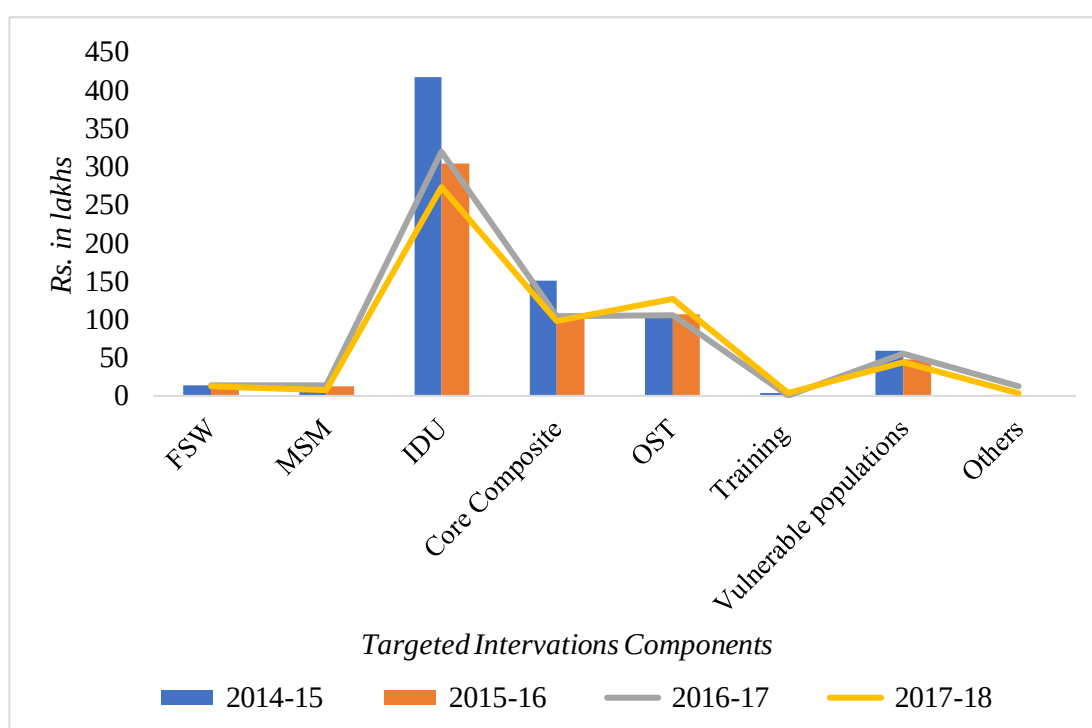
Table 6.3: Distribution of Total Expenditure of Targeted Interventions (TI) under Prevention Services (PS)

Targeted Interventions (TI) under prevention services	Rs. In lakhs					In per cent				
	2014-15	2015-16	2016-17	2017-18	Total	2014-15	2015-16	2016-17	2017-18	Total
HRGs- FSW	13.93	12.20	13.79	12.44	52.36	1.8	2.1	2.2	2.2	2.1
HRGs -MSM	14.85	12.08	13.64	7.27	47.83	1.9	2.1	2.2	1.3	1.9
HRGs-IDU	417.35	304.57	319.53	273.22	1314.67	54.2	51.8	51.1	48	51.5
HRGs-Core Composite	151.36	104.31	103.82	97.75	457.24	19.7	17.7	16.6	17.2	17.9
OST	108.24	106.79	105.91	127.07	448.00	14.1	18.2	16.9	22.3	17.5
Training costs	3.37	0.00	0.44	3.87	7.68	0.4	0	0.1	0.7	0.3
Vulnerable and migrants	59.25	48.30	55.14	44.30	206.99	7.7	8.2	8.8	7.8	8.1
Procurement of services	1.36	0.00	13.11	3.43	17.89	0.2	0	2.1	0.6	0.7
SCM	0.38	0.00	0.00	0.00	0.38	0	0	0	0	0
Total TI	770.09	588.25	625.36	569.34	2553.04	100	100	100	100	100
Total PS	1212.14	944.55	993.99	975.19	4125.87	63.5	62.3	62.9	58.4	61.9
Grand Total Strategies	1706.6	1438.64	1492.24	1480.95	6118.43	45.1	40.9	41.9	38.4	41.7

Source: Compiled from Finance Division Report, MSACS

The data from Table 6.3 shows that half of the expenditure accounts for HRGs-IDU (51.5 %), followed by high-risk groups Core Composite (17.9%) and OST (17.5%). The remaining 13.1 per cent comprises the expenditure on HRGs-FSW (2.1%), HRGs-MSM (1.9%), training costs (0.3%), other vulnerable populations, and migrants (8.1%), and procurement of services (0.7%). According to the report, these expenditures mainly comprise the ongoing intervention; new additional intervention accounts for only 3.5 per cent during 2014-18. The activities under High-risks groups-IDU and Opioid Substitution Therapy (OST), account for 69 per cent of the prevention strategies, comprising more than 28 per cent of the five-key strategies. It is noticed that OST expenditure was highest at 2017-18, while HRGs-IDU and Core Composite keep gradually decreasing (Fig 6.4).

Figure 6.4: Distribution of Total Expenditure of 8-Subcomponent of Targeted Intervention (TI) under Prevention Services (PS)



6.4.2 Integrated Counselling and Testing Centre (ICTC)

During 2014-15 to 2017-18, the ICTC service expenditure comprises mainly six components; human resources, infrastructure, instructional governance and planning, commodities, monitoring and evaluation and administration. Human resources include staff salary, professional remuneration, and human resources for the State Reference Laboratory (SRL). Table 6.4 shows that Rs 927.92 lakhs is spent on ICTC services during the four financial years. An average of Rs 232 lakhs is spent on ICTC services during the years. Table 6.5 shows that ICTC services comprised 22.5 per cent of the prevention services and accounted for 15.2 per cent of the total MSACS expenditure.

Table 6.4: Distribution of Expenditure of Integrated Counselling and Testing Centres (ICTC) under Prevention Services (Rs. In lakhs)

ICTC Services	2014-15	2015-16	2016-17	2017-18	Total
1. Human Resources	123.71	135.69	143.59	153.78	556.77
2. Infrastructure	108.68	74.76	70.19	97.09	350.71
<i>i. Contingency for all existing ICTC's</i>	29.31	8.11	10.64	23.7	71.76
<i>ii. Mobile ICTC Recurring Cost</i>	79.37	66.65	59.55	73.38	278.95
3. Institutional Governance and Planning	4.37	-	-	-	4.37
4. Commodities	0.17	-	-	-	0.17
5. Monitoring and Evaluation	5.46	0.91	0.32	0.03	6.72
6. Administrative Costs	0.05	0.08	0.17	8.87	9.19
Total ICTC	242.44	211.44	214.28	259.76	927.92

Source: Compiled from Finance Division Report, MSACS

Table 6.5: Percentage Distribution of Expenditure of Integrated Counselling and Testing Centres (ICTC) under Prevention Services

ICTC Services	2014-15	2015-16	2016-17	2017-18	Total
1. Human Resources	51.03	64.17	67.01	59.2	60
2. Infrastructure	44.83	35.35	32.76	37.38	37.8
<i>i. Contingency for all existing ICTC's</i>	12.09	3.83	4.96	9.13	7.73
<i>ii. Mobile ICTC Recurring Cost</i>	32.74	31.52	27.79	28.25	30.06
3. Institutional Governance and Planning	1.8	-	-	-	0.5
4. Commodities	0.1	-	-	-	0
5. Monitoring and Evaluation	2.3	0.4	0.1	0	0.7
6. Administrative Costs	0	0	0.1	3.4	1
Total ICTC	100	100	100	100	100
Total PS	20	22.4	21.6	26.6	22.5
Grand Total Strategies	14.2	14.7	14.4	17.5	15.2

Source: Compiled from Finance Division Report, MSACS

It is noticed that human resources account for 60 per cent of the entire ICTC expenditure. Infrastructure shares for 38 per cent of the expenditure, of which contingency for all existing ICTC's accounts for 8 per cent, and 30 per cent on mobile ICTC recurring cost. In 2014-15, 1.8 per cent was spent on the Institutional Governance and Planning and 0.1 per cent on commodities, such as nurse/ANM and Lab Technician's training in 24hrs PHCs and equipment maintenance in old centres. Monitoring and Evaluation (M&E) account for 0.7 per cent of the M&E office, review meetings, and supervision. The administrative cost includes bank and EPF charges, and it comprises 1 per cent of the ICTC expenditure

Table 6.6: Distribution of Expenditure of Link Worker Scheme (LWS) under Prevention Services (PS)

LWS Components	Rs. In lakhs					In per cent (%)				
	2014-15	2015-16	2016-17	2017-18	Total	2014-15	2015-16	2016-17	2017-18	Total
1. District Human Resource	47.89	52.05	61.73	46.23	207.89	62.4	77.3	74.5	75.4	72.1
<i>i. District Recruitment</i>	0.08	1.52	0.06	0.01	1.67	0.1	2.3	0.1	0.0	0.6
<i>ii. District Remuneration</i>	47.81	50.53	61.67	46.22	206.22	62.3	75.0	74.4	75.4	71.5
2. District Meeting	-	0.11	0.17	0.13	0.41	-	0.2	0.2	0.2	0.1
3. District Infrastructure and Equipment	0.06	0.05	0.90	-	1.01	0.1	0.1	1.1	-	0.3
4. District Communication	11.62	0.59	1.70	0.45	14.36	15.1	0.9	2.0	0.7	5.0
5. District Monitoring & Evaluation	0.04	-	-	-	0.04	0.1	-	-	-	0.0
6. District Planning & Administration	15.57	14.54	18.41	14.45	62.97	20.3	21.6	22.2	23.6	21.8
<i>i. District Administrative Expenses</i>	6.61	4.14	2.94	2.81	16.49	8.6	6.1	3.5	4.6	5.7
<i>ii. District Travel Costs</i>	8.96	10.40	15.47	11.64	46.48	11.7	15.4	18.7	19.0	16.1
7. Regional Remuneration	1.43	-	-	-	1.43	1.9	-	-	-	0.5
8. Regional Infrastructure and Equipment	-	0.01	-	-	0.01	-	0.0	-	-	0.0
9. Regional Communication Material	0.11	-	-	-	0.11	0.1	-	-	-	0.0
10. Regional Administrative Expenses	0.03	-	0.01	0.07	0.10	0.0	-	0.0	0.1	0.0
Total LWS	76.75	67.34	82.91	61.33	288.33	100	100	100	100	100
Total PS	1212.14	944.55	993.99	975.19	4125.87	6.3	7.1	8.3	6.3	7.0
Grand Total Strategies	1706.6	1438.64	1492.24	1480.95	6118.43	4.5	4.7	5.6	4.1	4.7

Source: Compiled from Finance Division Report, MSACS

6.4.3 Link Worker Scheme (LWS)

Table 6.6 shows that Rs. 288.33 lakhs is spent on LWS from 2014-2017, an average of Rs 72 lakhs per financial year. LWS expenditure comprises 7 per cent of the prevention services; it also makes up for 4.7 per cent of the total strategies. Under LWS components, district expenditure accounts for 99.4 per cent, while regional accounts for 0.6 per cent. It is observed that human resources account for 72.6 per cent of the LWS expenditure, of which 71.5 per cent on district remuneration and the remaining on recruitment and regional remuneration. The district planning and administration account for 22 per cent of the expenditure, 16 per cent accounts for travel costs and 6 per cent for administrative expenses. Thus, under LWS, human resources and administration in districts comprise the overall expenditure.

Table 6.7: Distribution of Expenditure of Blood Safety under Prevention Services (Rs. In lakhs)

Blood Safety Components	2014-15	2015-16	2016-17	2017-18	Total
1. SBTC	3.57	4.52	2.55	4.34	14.98
2. Major BB	0.05	-	-	-	0.05
3. Model BB	20.71	10.68	15.03	12.51	58.93
4. Major to BCSU	-	-	-	4.5	4.5
5. Regional Centre	3.64	3.84	3.76	2.16	13.4
6. Regional Vans	4.28	4.14	2.76	4.61	15.79
7. Training	1.26	0.7	-	2.4	4.36
8. Maintenance	10.79	-	-	-	10.79
9. Supervisory	0.35	0.24	-	-	0.59
10. Promotion	3.59	5.98	0.05	-	9.63
11. Other activities	0.05	-	-	7.06	7.11
12. DLBB	16.84	18.26	19.3	21.15	75.56
13. Major not BCSU	4.17	4.31	5.91	0.08	14.46
Grand Total	69.3	52.67	49.37	58.81	230.16

Source: Compiled from Finance Division Report, MSACS

6.4.4 Blood Safety

Table 6.7 shows that during 2014-15 to 2017-18, Rs 230.16 lakhs is spent on blood safety services. An average of Rs. 58 lakhs is spent per financial year. Table 6.8 shows

that blood safety services comprise 5.6 per cent of the prevention services; it also comprises 3.8 per cent of the total strategies. It is noticed that 33 per cent of the expenditure is spent on District Level Blood Banks (DLBB) activities and 26 per cent on Model Blood Banks, i.e., Rs. 75.6, and Rs. 58.9 lakhs, respectively.

Table 6.8: Percentage Distribution of Expenditure of Blood Safety under Prevention Services

Blood Safety Components	2014-15	2015-16	2016-17	2017-18	Total
1. SBTC	5.1	8.6	5.2	7.4	6.5
2. Major Blood Banks	0.1	-	-	-	0
3. Model Blood Banks	29.9	20.3	30.4	21.3	25.6
4. Major to BCSU	-	-	-	7.6	2
5. Regional Centre	5.3	7.3	7.6	3.7	5.8
6. Regional Vans	6.2	7.9	5.6	7.8	6.9
7. Training	1.8	1.3	-	4.1	1.9
8. Maintenance	15.6	-	-	-	4.7
9. Supervisory	0.5	0.5	-	-	0.3
10. Promotion	5.2	11.4	0.1	-	4.2
11. Other activities	0.1	-	-	12	3.1
12. DLBB	24.3	34.7	39.1	36	32.8
13. Major not BCSU	6	8.2	12	0.1	6.3
Grand Total	100	100	100	100	100
Total PS	5.7	5.6	5	6	5.6
Grand Total Strategies	4.1	3.7	3.3	4	3.8

Source: Compiled from Finance Division Report, MSACS

Under regional, 5.8 per cent accounts for blood transfusion centres and 6.9 per cent for blood transportation vans. Major Blood Banks upgraded to Blood Component Separating Unit (BCSU) accounts for 2 per cent, while Major Blood Banks without BCSU accounts for 6.3 per cent of the expenditure. The remaining includes State Blood Transfusion Council (SBTC) expenses (6.5 %), training (1.9 %), annual maintenance contract (4.7%), supervisory plan (0.3%), promotion of Voluntary Blood Donation Camps accounts (4.2%), and other activities of Voluntary Blood Donation (3.1%). It is noticed that 65 per cent of the expenditure is spent on Model & Major Blood Banks and DLBB activities, i.e., Rs.77.95 and Rs. 75 lakhs, respectively.

**Table 6.9: Distribution of Expenditure of Other Prevention Services
(Rs. In lakhs)**

Other Prevention Services	2014-15	2015-16	2016-17	2017-18	Total
1. STD Control	20.94	21.48	17.69	23.23	83.34
<i>i. Strengthening of regional STD Lab</i>	20.94	17.68	18.72	23.06	80.4
<i>ii. Establishment of new facilities</i>	-	2.18	-	-	2.18
<i>iii. State Reference Centre</i>	-	1.62	-1.03	0.18	0.76
2. NGO Services for TIs	24.22	-	-	-	24.22
<i>i. High-Risk Group</i>	23.43	-	-	-	23.43
<i>ii. Bridge Population</i>	0.79	-	-	-	0.79
3. External Quality Assessment Programme	7.93	3.36	4.39	2.71	18.39
<i>i. External Quality Assessment Programme</i>	7.43	2.96	4.24	2.71	17.34
<i>ii. STI-State Reference Centers (SRC)</i>	0.5	0.4	0.15	-	1.05
4. OST implementation through Government centres	0.46	-	-	-	0.46
TOTAL	53.55	24.85	22.07	25.95	126.41

Source: Compiled from Finance Division Report, MSACS

6.4.5 Other Services (STD Control, EQAP, NGO, OST)

These services are varied prevention activities such as STD Control and External Quality Assessment Programme (EQAP). It also included NGOs and Government services for TIs activities (HRGs, bridge population, and OST) and was incurred only in 2014-15. Table 6.9 showed that Rs 126.41 lakhs is spent on other services of varied prevention activities, an average of Rs 32 lakhs per financial year. Table 6.10 shows that Other Services (OS) comprises 3 per cent of the prevention services; it also comprises 2.1 per cent of the total strategies.

Table 6.10: Percentage Distribution of Expenditure of Other Prevention Services

Other Prevention Services	2014-15	2015-16	2016-17	2017-18	Total
1. STD Control	39.1	86.5	80.1	89.6	65.9
<i>i. Strengthening of regional STD Lab</i>	39.1	71.2	84.8	88.9	63.6
<i>ii. Establishment of new facilities</i>	-	8.8	-	-	1.7
<i>iii. State Reference Centre</i>	-	6.5	-4.7	0.7	0.6
2. NGO Services for TIs	45.2	-	-	-	19.2
<i>i. High-Risk Group</i>	43.8	-	-	-	18.5
<i>ii. Bridge Population</i>	1.5	-	-	-	0.6
3. External Quality Assessment Programme	14.8	13.5	19.9	10.4	14.6
<i>i. External Quality Assessment Programme</i>	13.9	11.9	19.2	10.4	13.7
<i>ii. STI-State Reference Centers (SRC)</i>	0.9	1.6	0.7	-	0.8
4. OST implementation through Government centers	0.9	-	-	-	0.4
TOTAL OS	100	100	100	100	100
Total PS	4.42	2.63	2.22	2.66	3.06
Grand Total Strategies	3.1	1.7	1.5	1.8	2.1

Source: Compiled from Finance Division Report, MSACS

It is noticed that 66 per cent of the expenditure is spent on STD control, of which strengthening of regional STD Lab accounts for 63.6 per cent, 1.7 per cent on the establishments of new facilities and the remaining on State Reference Centre. The NGOs services for TIs accounts for 19.2 per cent, of which 18.5 is spent on HRGs and the remaining on bridge population. The External Quality Assessment Programme accounts for 14.6 per cent, of which 13.7 comprises EQAP, and the remaining on STI-State Reference Centers (SRC). The OST implementation through the Government centres accounts for 0.9 per cent in the FY 2014-15.

Table 6.11: Distribution of Total Expenditure under Care Support and Treatment (CST) Strategy

Care, Support and Treatment (CST)	Rs. In lakhs					In per cent (%)				
	2014-15	2015-16	2016-17	2017-18	Total	2014-15	2015-16	2016-17	2017-18	Total
1. ART Centers	94.75	92.35	91.23	86.82	365.16	99.0	91.6	87.9	77.8	88.7
a) Non-Recurring	7.72	-	-	-	7.72	8.1	-	-	-	1.9
i. Minor Civil Works and Renovation under ART	6.25	-	-	-	6.25	6.5	-	-	-	1.5
ii. Furnishing Equipment	1.47	-	-	-	1.47	1.5	-	-	-	0.4
b) Recurring Expenses	87.03	92.35	91.23	86.82	357.44	90.9	91.6	87.9	77.8	86.8
i. Salaries/Operational Cost under ART	67.96	65.96	69.93	79.65	283.49	71.0	65.4	67.4	71.4	68.8
ii. Universal Work Precautions under ART	11.10	-	8.84	0.13	20.06	11.6	-	8.5	0.1	4.9
iii. OI Drugs under ART	0.49	20.04	7.37	-	27.90	0.5	19.9	7.1	-	6.8
iv. IEC for ART	-	3.29	-	-	3.29	-	3.3	-	-	0.8
v. Training under ART	3.16	1.93	1.11	2.44	8.63	3.3	1.9	1.1	2.2	2.1
vi. Operational Costs for CD4 testing	2.78	-	-	0.13	2.90	2.9	-	-	0.1	0.7
vii. SCM of ARV Drugs	1.56	1.14	1.90	0.89	5.49	1.6	1.1	1.8	0.8	1.3
viii. HR cost of TB/HIV Activities NFM	-	-	2.09	-	2.09	-	-	2.0	-	0.5
viii. EPF Charges	-	-	-	3.59	3.59	-	-	-	3.2	0.9
2. Salaries/Operational Cost under COE	-	-	0.03	-	0.03	-	-	0.0	-	0.0
3. Recurring (Salaries/operational cost under ICTC)	-0.06	-	-	-	-0.06	-0.1	-	-	-	-0.0
4. ART Link Centers Recurring	0.20	0.01	0.00	-	0.21	0.2	0.0	0.0	-	0.1
i. Salaries/Operational Cost under ART Link Centers	-	0.01	0.00	-	0.01	-	0.0	0.0	-	0.0
ii. Training under ART Link Center	0.20	-	-	-	0.20	0.2	-	-	-	0.0
5. FI-ART Centers Recurring	0.86	8.45	12.52	24.72	46.55	0.9	8.4	12.1	22.2	11.3
i. Salaries/Operational Cost under FI-ART	0.52	8.45	12.17	24.72	45.86	0.5	8.4	11.7	22.2	11.1
ii. Universal Work Precautions under FI-ART	-	-	0.36	-	0.36	-	-	0.3	-	0.1
iii. SCM of ARV Drugs	0.34	-	-	-	0.34	0.4	-	-	-	0.1
Total CST	95.75	100.81	103.79	111.54	411.89	100	100	100	100	100

Source: Compiled from Finance Division Report, MSACS

6.5 Care Support and Treatment (CST)

According to the MSACS report in 2017-18, Mizoram has one ART Plus Centre, two ART Centres, three FI-ART Centre, ninth Linked ART Centres, three Care Support Centre (CSC), and one helpdesk centre in the state. Table 6.11 shows that CST expenditure accounts for Rs 411.89 lakhs, i.e., 6.7 per cent of the total expenditure under the NACP-IV strategy. CST expenditure consists of a non-recurring and recurring component under ART Centres, ART Link Centres, and FI-ART centres. It is observed that four-fifth of the CST expenditure concentrated on ART centres, while 11 per cent on FI-ART Centres, and the remaining on ART Link Centres and operational cost.

Under ART Centres, recurring expenses account for 86.8 per cent and 1.9 per cent non-recurring. The data indicates that no expenditure was incurred on non-recurring since FY 2014-15, where Rs 7.72 Lakhs was spent on minor civil works and renovation and furnishing equipment (TV, DVD, Computers) expenditure. Meanwhile, the recurring expenses show that seven-tenths of the expenditure account for salaries/operational costs, which increase at a 17 per cent rate from 2014-15 to 2017-18. Under ART and FI-ART Centres, almost 80 per cent of its expenditure accounts for salaries/operational costs. The recurring expenses under ART constitute more than nine-tenths of the total expenditure under CST during 2014-16 and then gradually fall to 87 per cent and 77 per cent in 2016-17 and 2017-18. In contrast, the recurring expenses under FI-ART centres constituted less than 1 per cent in FY 2014-15 and increased to 22 per cent in 2017-18.

According to the HIV treatment services model, if the number of patients under the FI-ART centre keeps increasing, it will be upgraded to an ART centre by expanding the staff and facilities. The rise in FI-ART patients can be due to the rapid increase in new HIV cases or the increase in patients availing of HIV treatment. Hence, expanding CST services would give rise to improved patient quality of life and reduced transmission rate. The data shows the progress in HIV treatment services via the scaling up of FI-ART Centres. Nevertheless, the CST expenditure report does not include the procurement supplies to the ART Centres, such as the cost of CD-4 machines, anti-retroviral drugs, and other procurement. It included only the financial costs borne by MSACS where NACO directly subsidizes the drugs, CD-4 machines

and other procurement supplies. Since CST services are both labour and capital intensive, the cost of providing treatment to HIV patients can be captured by further analyzing the economic cost of ART centres services.

6.6 IEC, Social mobilisation & Mainstreaming

IEC's main activities are mass media campaigns like long-format (radio and TV programmes) and print media (advertisements through a newspaper), mid-media like outdoors (hoarding, bus panels, kiosks), folk media and IEC Vans, multimedia campaign, IEC material printing (pamphlets, posters, flipcharts, and article), helpline promotion, Special events/programmes (World AIDS Day) and interventions for youth. The youth programmes include the Adolescence Education Programme (AEP) and Red Ribbon Clubs (RRCs). AEP focuses on helping adolescents cope with negative peer pressure and physical and psychological changes by promoting positive behaviour and awareness. RRC purposes in an educational institution are to promote awareness of HIV/AIDS prevention and treatment services. It also promotes voluntary blood donation and stigma reduction against HIV/AIDS infected people.

Mainstreaming activities under the NACO ensures that all stakeholders and agencies (Ministries/Departments GOI) adapt their programmes and policies in addressing HIV/AIDs issues to provide an enabling environment and social protection for PLHIV. Mizoram SACS activities under IEC, social mobilisation, and mainstream division activities during the FY 2014-2018 are on special Programmes, print media, electronic media, outdoor and mid media including IEC, telephone counselling, multimedia campaign, IEC material production, replication, newsletter and maintenance of the website, Red Ribbon Express Project, school AIDS education programme/formation, Red Ribbon Clubs in colleges, workshops under IEC and intervention of bridge population, training of resource persons for mainstreaming in the government sector and private sector, drop-in centres and other than training and advocacy.

The data from table 6.12 and 6.13 show that IEC, social mobilisation, and mainstreaming strategy account for 6.1 per cent of the total strategies, i.e., Rs 370.74 lakhs during the four financial years. During FY 2014-2018, 53.5 per cent of the expenditure accounts for material production, replication, newsletter, and website

maintenance. It was noticed that 9.6 per cent of the expenditure was spent on workshops under IEC, 9.3 per cent on electronic media, 6.9 per cent on outdoor and mid-media including IEC, 6.9 per cent on resource persons' training for mainstreaming in government and private sector, and 4 per cent on special events. The remaining 9.7 per cent was spent on print media, telephone counselling, drop-in-centres, multimedia campaigns, other than training and advocacy, Red Ribbon Express Project, bridge population intervention, and Red Ribbon Clubs in colleges.

Table 6.12: Distribution of expenditure under IEC, Social mobilisation and Mainstreaming Strategy (Rs. In lakhs)

IEC, Social mobilization & Mainstreaming Strategy	2014-15	2015-16	2016-17	2017-18	Total
i. Special Programmes (WAD) etc	3.69	0.7	5.77	4.75	14.91
ii. Print Media	1.54	-0.2	0.22	0.5	2.06
iii. Electronic Media	14.18	-0.49	11.28	9.71	34.67
iv. Outdoor & Mid Media including IEC	0.16	0.2	9.35	16.01	25.72
v. Tele Counselling	2.78	0.16	-	-	2.94
vi. Training	3.35	12.31	8.26	1.79	25.71
vii. Drop-in centres	-	-	2.08	0.68	2.76
viii. Multi Media Campaign	-	-	1.64	3.25	4.89
ix. Other than training & advocacy	-	-	3.69	1.39	5.08
x. IEC material, website	66.59	94.07	38.12	-	198.79
xi. Red Ribbon Express Project	-	-	-	3.85	3.85
xii. Workshops under IEC	9.9	0.21	9.21	16.35	35.66
xiii. Intervention bridge population	9.24	0.62	-	-	9.86
xiii. Red Ribbon Clubs in colleges	0.24	-0.05	1.87	2.8	4.86
Total IEC	111.67	107.53	91.48	61.06	371.74

Source: Compiled from Finance Division, MSACS

Table 6.13: Percentage Distribution of expenditure under IEC, Social mobilisation and Mainstreaming Strategy

IEC, Social mobilization & Mainstreaming Strategy	2014-15	2015-16	2016-17	2017-18	Total
i. Special Programmes (WAD) etc	3.3	0.6	6.3	7.8	4
ii. Print Media	1.4	-0.2	0.2	0.8	0.6
iii. Electronic Media	12.7	-0.5	12.3	15.9	9.3
iv. Outdoor & Mid Media including IEC	0.1	0.2	10.2	26.2	6.9
v. Tele Counselling	2.5	0.2	-	-	0.8
vi. Training	3	11.4	9	2.9	6.9
vii. Drop-in centres	-	-	2.3	1.1	0.7
viii. Multi Media Campaign	-	-	1.8	5.3	1.3
ix. Other than training & advocacy	-	-	4	2.3	1.4
x. IEC material, website	59.6	87.5	41.7	-	53.5
xi. Red Ribbon Express Project	-	-	-	6.3	1
xii. Workshops under IEC	8.9	0.2	10.1	26.8	9.6
xiii. Intervention bridge population	8.3	0.6	-	-	2.7
xiii. Red Ribbon Clubs in colleges	0.2	0	2	4.6	1.3
Total IEC	100	100	100	100	100

Source: Compiled from Finance Division, MSACS

During the FY 2014-2015, out of the total Rs 111.67 lakhs expenditure, 60 per cent accounts for material production, replication, newsletter, and website maintenance, 12.7 per cent on electronic media, 8.9 per cent on workshops, 8.3 per cent on intervention for bridge population, 3.3 per cent on special programmes, 3 per cent on training, 2.5 per cent on tele-counselling, 1.4 per cent on print media, and 0.3 per cent on Red Ribbon Club, outdoor and mid-media.

During FY 2015-16, out of the total Rs 107.53 lakhs expenditure, 87.5 per cent of the expenditure accounts for material production, replication, newsletter, and website maintenance. Training of resource persons for mainstreaming in government and private sectors accounts for 11.4 per cent (Rs 12.31 Lakhs), which increases at a 26.7 per cent rate. The expenditure under print media, electronic media, and Red Ribbon Club show the balance amount from the previous expenditure, i.e., no expenditure was incurred in the following year. The other activities include special programmes

(0.6%), tele-counselling (0.2%), outdoor and mid-media (0.2%), workshops (0.2%), and intervention for bridge population (0.6%).

During 2016-17, out of the total Rs 91.48 lakhs expenditure, 41.7 per cent accounts for material production, replication, newsletter, and website maintenance. The other activities include electronic media (12.3%), outdoor and mid-media (10.2%), workshops (10%), special programmes (6.3%), training (9%), other than training and advocacy (4%), Red Ribbon Club (2%), multimedia campaign (1.8%) print media (0.2%), and drop-in centres (2.3%).

During FY 2017-18, IEC material production, replication, newsletter, and website maintenance are entirely nil. In contrast, 26.8 per cent is spent on IEC workshops, 26.2 per cent on outdoor and mid media including IEC, 15.9 on electronic media, 7.8 per cent on special events, 6.3 per cent on Red Ribbon Express Project, 5.3 per cent on the multimedia campaign, and 4.6 per cent on Red Ribbon Clubs in colleges.

During 2016-18, the priority falls for tele-counselling and IEC (material production, website maintenance) activities. However, workshops under IEC and outdoor and mid media were highly given priority in the FY 2017-18. It can also be observed that multimedia campaign expenditure emerges from 2016-17 and rises to Rs 3.25 Lakhs in 2017-18. It shows the changes in the form/preferences of receiving information and communication by the society/community during 2014-18.

6.7 Strategic Information Management System (SIMS)

It remains one of the foundations of the NACP. It is a web-based integrated system that strengthens data use with high-quality data generations to disseminate and efficiently use at the state and national levels. SIMU comprises the following four primary functions;

1. Monitoring and Evaluation (M&E)
2. Research and evaluation
3. Surveillance and Epidemiology
4. Data Analysis and Dissemination Unit (DADU)

The activities under M&E includes all the monthly reporting from all the programme units through SIMS (Strategic Information Management System), IMS (Inventory Management System), PALS (PLHIV ART Linkage System), MSDS (Migrant Service Delivery System), and Excel Based Analytical Tool for Core Group (NGO-TI level). NACO developed IMS, an IT application to strengthen the Supply Chain Management System to capture the procurement of consumables and drugs at NACO, SACS, and ART Centre level. PALS and MSDS are web-based applications capturing data of HIV positive patients and High-Risk Migrants tracking, respectively.

Research and evaluation cover diverse fields like epidemiological, social, behavioural, clinical, and operational research to provide instructions to the programme strategies and policies under the NACP. Therefore, the National HIV/AIDS Research Plan (NHRP) is developed for NACP-IV; identifies the information gaps in the generation. It uses the research outcome/evidence to influence policy decisions.

HIV Sentinel Surveillance (HSS) is carried out every two years among the HRGs, the bridge and the general population. It provides epidemiological and demographic data inputs and vital information to comprehend the trends and dynamics of the HIV epidemic. Furthermore, one of the global topmost significant bio-behavioural surveillance, i.e., National Integrated Biological and Behavioural Surveillance (IBBS), completes these HSS, focusing on strengthening HIV surveillance on risk behaviours.

HIV Estimation is updated information from primary sources on the country's current state of the HIV epidemic. It is conducted under the *Technical Resource Group (TRG)* for surveillance and estimations.

Data Analysis and Dissemination Unit (DADU) is the fundamental component of SIMU; it aims to strengthen data quality, data usage, data management, systematic analysis, synthesis, methods and tools development, and datasets validation. It further initiates a public health programme under the NACP, referred to as the National Data Analysis Plan (NDAP) under the NACP.

Table 6.14: Distribution of Expenditure under Strategic Information Management System (Rs. In lakhs)

Strategic Information Management System (SIMS)	2014-15	2015-16	2016-17	2017-18	T. T
1. Sentinel Surveillance under IC	10.61	2.29	4.81	2.89	20.6
<i>i. Procurement of test kits and consumables at SACS Level</i>	3.33	0.1	2.13	0.38	5.94
<i>ii. Surveillance-Training and other meetings</i>	5.51	1.38	2.53	-	9.42
<i>iii. Surveillance -Transportation</i>	1.74	0.71	0.15	-	2.6
<i>iv. Surveillance- Honorarium</i>	-	0.1	-	1	1.1
<i>v. Surveillance- Other expenditure</i>	0.03	-	-	1.51	1.54
2. HMIS and Monitoring and evaluation under IC	-	-	-	0.03	0.03
3. M&E under SIMU	8.9	-	0.01	-	8.91
Total SIMS	19.51	2.29	4.82	2.92	29.54

Source: Compiled from Finance Division Report, MSACS

Table 6.15: Percentage Distribution of Expenditure under Strategic Information Management System

Strategic Information Management System (SIMS)	2014-15	2015-16	2016-17	2017-18	T. T
1. Sentinel Surveillance under IC	54.4	100	99.8	98.9	69.7
<i>i. Procurement of test kits and consumables at SACS Level</i>	17.1	4.4	44.2	13.1	20.1
<i>ii. Surveillance-Training and other meetings</i>	28.3	60.3	52.5	-	31.9
<i>iii. Surveillance -Transportation</i>	8.9	31.1	3.1	-	8.8
<i>iv. Surveillance- Honorarium</i>	-	4.2	-	34.2	3.7
<i>v. Surveillance- Other expenditure</i>	0.2	-	-	51.6	5.2
2. HMIS and Monitoring and evaluation under IC	-	-	-	1.1	0.1
3. M&E under SIMU	45.6	-	0.2	-	30.1
Total SIMS	100	100	100	100	100

Source: Compiled from Finance Division Report, MSACS

The data from table 6.14 and 6.15 show that SIMS strategy accounted for 0.5 per cent of the entire strategies, viz., Rs 29.54 lakhs during the four financial years. During 2014-18, 69.7 per cent of the expenditure account for sentinel surveillance under IC activities, 30 per cent on Monitoring and Evaluation (M&E), and 0.1 per cent accounts for the Health Management Information System (HMIS). Under sentinel surveillance, most of the expenditure is spent on training and other meetings, procurement of test kits and consumables at the SACS level.

During 2014-2015, 54.4 per cent of the expenditure is spent on sentinel surveillance under IC activities, 45.6 per cent on Monitoring and Evaluation (M&E) under SIMU and 28.3 per cent on Health Management Information System (HMIS) and M&E under Infection Control (IC). In addition, under surveillance expenses, priority is given to training and other meetings, procurement of test kits and consumables at the SACS level.

During 2015-16, the total expenditure is spent entirely on sentinel surveillance under IC activities. Of which 60.3 per cent is spent on training and other meetings, 31.1 per cent on transportation, 4.4 per cent on procurement of test kits and consumables at SACS level, and 4.2 per cent on honorarium. There was no expenditure incurred for HMIS and M&E in the following year.

During 2016-2017, the total expenditure is spent mainly on sentinel surveillance under IC activities, where the remaining 0.2 per cent is spent on Monitoring and Evaluation (M&E) activities. Under surveillance expenses, priority is given to training and other meetings and procurement of test kits and consumables SACS level. As a result, the expenditure on the procurement of test kits and consumables SACS level has increased by Rs 2.03 lakhs while the transportation expenditure has reduced.

During 2017-2018, the total expenditure is spent mainly on sentinel surveillance under IC activities, where the remaining 1.1 per cent is spent on HMIS and Monitoring and Evaluation (M&E) under IC. Under surveillance, the majority is spent on other expenditure and honorarium. No expenditure is incurred for training, other meetings and transportation.

It is noticed that the expenditure on SIMS strategy has reduced from Rs 19.51 lakhs to Rs 2.92 lakhs during 2014-15 to 2017-18.

6.8 Capacity Building

Capacity building is an integral part of the NACP. The quality of trained human resources takes the lead in the effectiveness of its programme and services delivery. NACO has also strengthened the capacity building activities by tackling information, communication, and technology. In addition, it prioritises institutional strengthening (IS), including expenditure on the recurring cost of wages and other operational costs of SACS and DAPCU staff.

Table 6.16: Distribution of Expenditure under Capacity Building Strategy (Rs. In lakhs)

Capacity Building	2014-15	2015-16	2016-17	2017-18	Total
1. Training under IS	-	-	0.05	-	0.05
2. Salary of staff under IS	192.09	197.57	208.59	236.32	834.58
3. Administrative Cost of DAPCU Staff	37.39	34.27	29.2	36.25	137.12
<i>i. Salary of regular and contractual staff of DAPCU</i>	29.73	31.54	26.15	33.82	121.23
<i>ii. Operational & Furniture, Fixture & Supplies Expenditure of DAPCU Staff</i>	7.66	2.73	3.05	2.44	15.88
4. Furniture & Supplies and Office Equipment IS	-	3.67	2.46	13.29	19.42
<i>i. Furniture and Fixtures under IS</i>	-	-	-	0.34	0.34
<i>ii. Office equipment under IS</i>	-	3.67	2.46	12.95	19.08
5. Equipment maintenance under IS	2.29	5.18	8.34	2.79	18.61
6. Building Maintenance under IS	-	-	-	0.96	0.96
7. Vehicle maintenance under IS	0.87	4.09	7.5	10.37	22.83
8. Operational Expenses under IS	34.52	37.79	41.98	29.37	143.66
9. Training & capacity Building of SACS Staff & DAPCU	0.37	0.87	0.03	0.89	2.16
Total	267.54	283.45	298.16	330.25	1,179.39

Source: Compiled from Finance Division Report, MSACS

Table 6.16 and 6.17 showed that the capacity-building strategy comprises 19.3 per cent of the total strategies, i.e., Rs 1,179.39 lakhs during the four financial years. During

2014-2018, 81 per cent of the expenditure account for the salary of staff. The salary of staff under institutional strengthening comprises 70.8 per cent, and the salary of regular and contractual staff of DAPCU comprises 10.3 per cent of the expenditure. The staff's salary under IS and DAPCU represents 15.6 per cent of the total strategies under MSACS. Operational expenses under institutional strengthening account for 12.2 per cent of the expenditure and the remain 6.6 per cent accounts for expenditure on operational, furniture, fixture and supplies expenditure of DAPCU staff, training and capacity building of SACS and DAPCU staff, and furniture, supplies, office equipment, equipment maintenance, building maintenance, vehicle maintenance under institutional strengthening.

Table 6.17: Percentage Distribution of Expenditure under Capacity Building Strategy

Capacity Building Strategy	2014-15	2015-16	2016-17	2017-18	Total
1. Training under IS	-	-	0	-	0
2. Salary of staff under IS	71.8	69.7	70	71.6	70.8
3. Administrative Cost of DAPCU Staff	14	12.1	9.8	11	11.6
<i>i. Salary of regular and contractual staff of DAPCU</i>	11.1	11.1	8.8	10.2	10.3
<i>ii. Operational & Furniture, Fixture & Supplies Expenditure of DAPCU Staff</i>	2.9	1	1	0.7	1.3
4. Furniture & Supplies and Office Equipment IS	-	1.3	0.8	4	1.6
<i>i. Furniture and Fixtures under IS</i>	-	-	-	0.1	0
<i>ii. Office equipment under IS</i>	-	1.3	0.8	3.9	1.6
5. Equipment maintenance under IS	0.9	1.8	2.8	0.8	1.6
6. Building Maintenance under IS	-	-	-	0.3	0.1
7. Vehicle maintenance under IS	0.3	1.4	2.5	3.1	1.9
8. Operational Expenses under IS	12.9	13.3	14.1	8.9	12.2
9. Training & capacity Building of SACS Staff & DAPCU	0.1	0.3	0	0.3	0.2
Total	100	100	100	100	100

Source: Compiled from Finance Division Report, MSACS

During 2014-2015, 71 per cent of the expenditure accounted for the salary of staff under institutional strengthening, 12.9 per cent on operational expenses under institutional strengthening, 11.1 per cent on the salary of regular and contractual staff of DAPCU, 2.9 per cent on operational, furniture, fixture and supplies expenditure of DAPCU staff, 0.9 per cent on equipment maintenance under institutional strengthening, 0.3 per cent on vehicle maintenance under institutional strengthening and the remaining 0.1 per cent on training and capacity building of SACS Staff and DAPCU.

During 2015-2016, the expenditure on office equipment, equipment and vehicle maintenance and operational expenses serve the main changes in the expenditure compared to the previous year. In 2016-17, there is a reduction in the administrative cost of DAPCU staff, while equipment, vehicle maintenances and operational expenses have increased. In 2017-18, there is a massive increase in staff salary under IS and DAPCU. Under IS, the expenditure on office equipment and vehicle maintenance has also increased.

It is noticed that the expenditure on capacity building strategy has increased from Rs 267.54 lakhs to Rs 330.25 lakhs during 2014-15 to 2017-18. The staff salary under IS and DAPCU has increased by Rs 48 lakhs during the years. It is seen that significantly less priority is given to staff training and capacity building under IS and DAPCU staff.

6.9 Summary

The five-activity budget is classified into NACP-IV key strategies/components, ascertaining the budget heads on which the expenditure is incurred. The amount of expenditure incurred on different activities shows the flow of expenditure, the activity's concentration, and highlights the running activity. During 2014-15 to 2017-18, the total budget allocated for the NACP-IV in Mizoram was Rs 610.54 crore, and the total expenditure was Rs 611.84 crore. An average of Rs 122.37 crore was spent during each financial years. The National AIDS Control Programme-IV five key strategies/components are Prevention services, CST services, IEC Services, Capacity Building, and SIMS. Prevention services account for 67 per cent of the total expenditures of MSACS and 16.4 per cent on capacity building, and the remaining 16.3 per cent for CST, IEC, and SIMS.

Under NACP-IV, almost seven-tenths of the expenditure allotted to prevention services comprised the general population and the high-risk groups (FSW, MSM, IDU, vulnerable, and migrants). It provides blood banks for blood safety, OST centres for drugs user, ICTC centres for free counselling and HIV testing, an STI clinic, and reaching out to rural areas through the LWS programme. Since HIV negative people are more in the state, the priority continues to be on prevention strategy focusing on HRGs and vulnerable populations. High-risk groups (HRGs) intervention account for Rs 2665.30 lakhs (61%) of the prevention services (Rs 4125.87 lakhs), which was 41 per cent of the total NACP-IV strategies. Accordingly, more than 36 per cent of the entire NACP-IV strategy accounts for the expenditure on IDU, OST, and core composite (FSW and IDU) components. These outcomes indicate the high concentration of spending on HRGs-IDU strategies. Under prevention strategy, the ICTC services account for 12.8 per cent of the entire expenditure, where above 9 per cent accounts for human resources.

The National AIDS Control Programme IV (NACP-IV) key priorities are to intensify and strengthen prevention services on HRGs and vulnerable populations. Despite the high concentration of expenditure on prevention services, the emphasis has decreased during 2017-18. The capacity-building strategy for institutional strengthening comprises higher than 19 per cent of the total expenditure, where 15.6 per cent accounts for staff salary. IEC services played an essential role in promoting the programme and raising awareness. Its benefits are expected to be expanded to reach out to the HRGs and the general population. Still, the expenditure has declined over the years. Since NACO subsidizes the ARV drugs, CD-4 machines and other supplies, these costs are not included in the MSACS expenditure. Therefore, the expenditure of care, support and treatment services comprise only the financial costs under MSACS.

Chapter 7

Time Allocation and Unit Cost of Services in the ICTC and ARTC

7.1 Background

Integrated Counselling and Testing Centres (ICTC) and Anti-retroviral Therapy Centres (ARTC) provide essential free HIV test, counselling, and treatment for HIV infected patients. These services are the cornerstone of the NACP-IV. In this chapter, the time spent by all the staff members in the ICTC and ART Centres is taken into account to examine the time allocation on different activities according to the programme's operational guidelines. The ICTC and ARTC activities are categorized into thirty-three activities under four main heads: direct patient contact, indirect patient contact, other professional activities, and non-productive activities. This chapter estimates the expenditure of five ICTC and ART Centres for 2017-18 FY. The unit cost of services of these two types of centres is calculated by taking the capital and recurrent costs.

7.2 Observation and Time Allocation Methods

Data was collected on the time allocation of staff members by the observation method. The daily activities of all the staff members in the five ICTC and ART Centres were observed, and a list of activities was categorized based on Callahan and Bertakis (1991), Walters et al. (2009), Weigl et al. (2009) approach of evaluating the physician productivity. Finally, thirty-three activity tasks were compiled following the staff responsibility from the NACO operational guidelines for ICTC and ARTC services (Table 7.1). The categories were grouped into:

1. Direct patient contact
2. Indirect patient contact
3. Other professional activities
4. Non-productive activities

Table 7.1: Categorization of ICTC and ARTC Activities of Staff Members

Category	Activities
Direct Patient Contact	
<i>Direct Communication</i>	1 Communication with Patient (Scheduled, consultancy)
	2 Counselling (pre-counselling, post-counselling, follow-up, group/partner counselling)
<i>Diagnostics</i>	3 Physical Examination
	4 Sample Collection
	5 Procedure
	6 Direct Dispense of ART/OI Drugs to patient
Indirect Patient Contact	
<i>Lab Test</i>	7 Lab Tests
<i>Documentation</i>	8 White/Green Card update
	9 Data Entry /record on software
	10 Register Entry/Book Keeping
<i>Conversation</i>	11 Conversation with staff (direct contact)
	12 Conversation with patients' relatives (direct contact)
	13 Conversation with others (direct contact)
	14 Counselling with patient relatives (direct contact)
	15 Conversation with patients (indirect contact)
	16 Conversation with patients' relatives (indirect contact)
	17 Conversation with others (indirect contact)
	18 Conversation with staff (indirect contact)
	19 Counselling patients (indirect contact)
	20 Counselling patients relative (indirect contact)
<i>Organizing</i>	21 Tracking of LFU/MIS/ART
	22 Arranging/Monitoring
	23 Outreach
	24 Travelling/Walking Times
<i>Meetings</i>	25 Meetings with staff
	26 Meeting with Supervisor and other department staff
<i>Other</i>	27 Dispense ARV/OI drugs to patient relatives
Other Professional Activities	28 Consultancy service for other departments
	29 Training/ Workshops/Seminar
	30 Research/Reading
Non-Productive Activities	31 Lunch Breaks
	32 Leisure
	33 Personal Time

Source: Author's categorization

Direct patient contact refers to the time spent in direct interaction with patients. It includes in-person consultancy, counselling, examination, dispense of drugs and procedures activities of the staff with the patients/clients. All the ICTC/ARTC staff activities requiring face-to-face interaction with the patients are included in this category.

Indirect patient contact refers to all administrative work, lab tests, interaction with staff, and patients' relatives. It also includes the staff's impersonal conversation and counselling with the patients/clients using telephone or social media. The activity under 'direct' refers to in-person face-to-face interaction, and 'indirect' refers to communication through phone or writing.

Other professional activities include all the services relating to work but are not within the ICTC/ARTC services. It includes services in another department within/outside the hospital, training, reading, research, and other work-related activities.

Non-productive activities include breaks, personal tasks, and leisure. Breaks and personal tasks refer to the half an hour lunch break and the time used for personal activities. The term 'Leisure' represents the time spent by all the staff members outside the ICTC/ARTC within the working hours. According to NACO guidelines, ICTC and ART Centre's adopted 7 hours of working hours a day (9 am to 4 pm/8 am to 3 pm), which included half an hour of lunch breaks. If the ICTC/ART Centre was not open for 7 hours, the remaining working time was added to the subcategory 'leisure' of the non-productive activities.

Data collection: The scholar filled the activities schedules using two approaches: time-motion techniques and provider interviews (Bratt et al. 1999). A time-motion study was done using a stopwatch at the activity intervals. The scholar has interviewed counsellors to set the average time spent on counselling (Pre-counselling, post-counselling, follow-up counselling, and group/couple counselling). A pilot study was conducted from April to May in 2017 at Champhai district ICTC and ARTC. The allocation of time per week was filled, which was converted into monthly hours. Each activity was classified into four categories of the ART centre functions: medical, psychological, social, and programmatic (NACO, 2012). The activities which do not

fall into the above functions were grouped in the 'other' function. Each function includes the following staff activities:

1. The medical function includes diagnosis, screening for TB, other opportunistic infections, physical examination, consultancy, and sample collection.
2. The psychological function includes psychological support to patients and relatives, such as counselling and education on HIV testing, ART, nutrition, sexual health, and condom usage.
3. The social function includes encouragement to access government and non-government schemes/facility and income generation programmes for the patient.
4. Programmatic functions include meetings, organizing, training, monitoring, tracking patients, outreach, and research.
5. Other functions include non-productive activities (NPA) such as regular breaks, personal tasks, and leisure that are not linked with the other four functions.

The study includes five ICTC and ARTC staff from Champhai, Kulikawn, Kolasib, Aizawl, and Lunglei. In the ICTC, data was collected from thirteen staff members who participated in the study, i.e., seven Counsellors and six Lab-Technicians. Among these, only seven Counsellors were interviewed. In the ART Centre, thirty-six staff participate in the study, i.e., one Senior Medical Officer, five Medical Officers, eight Counsellors, three Pharmacists, five Lab-Technicians, six Staff Nurses, three Care Coordinator, and five Data Manager. Among these, only eight Counsellors were interviewed. The provider interviews were performed on the counsellors to know the specific time used for counselling.

The study does not include the time spent on review meetings, as it was organized biannually. The data were collected between the months where the review meetings are not conducted. The data was collected from January 2018 to May 2019. In the state, Saturday is used as the preparation for the coming Sunday, which results in a smaller number of patients visiting the hospital facility, and the peak visiting time in the ICTC/ART centres was during the weekdays. Some ICTC/ART centres remain closed on Saturday as there are no patients/clients.

Table 7.2: Staff Position and Time Allocation in Five ICTC for One Month, 2017-18

Name of ICTC	Staff Availability		Monthly time spent on each function (In hours)						Monthly time spent on each function (In per cent)					
	Counsellor	Lab-Tech	Medical	Psychological	Social	Programmatic	Others (NPA)	Monthly Hours	Medical	Psychological	Social	Programmatic	Others (NPA)	Total
Champhai	1	1	94	100	6	68	69	336	28	30	2	20	20	100
Kulikawn	1	1	112	83	5	54	82	336	33	25	1	16	24	100
Kolasib	1	1	92	82	5	78	80	336	27	24	1	23	24	100
Aizawl	3	2	97	103	6	64	66	336	29	31	2	19	20	100
Lunglei	1	1	95	102	5	66	67	336	28	30	2	20	20	100
Total	7	6	491	469	26	330	364	1680	29	28	2	20	22	100

Source: Fieldwork

7.3 Time Allocation in ICTC

Table 7.2 shows the availability of staff for each category/position in all the ICTC. The staffing pattern was allotted according to the National HIV Counselling and Testing Services (HCTS) guidelines. The Counsellors were assigned to counsel more than 500 individuals per month, and the Lab-Technician were assigned to perform less than 10,000 tests per year; the additional staff was assigned if the client's load is above the maximum requirement (NACO, 2016b). It is noticed that Aizawl has the maximum number of staff among the other ICTC, i.e., three Counsellors and two Lab-Technicians. In comparison, one Counsellor and Lab-Technician were assigned to Lunglei, Champhai, Kulikawn, and Kolasib ICTC Centres.

7.3.1 Time spent by ICTC Centres on the specific function

Table 7.2 shows the monthly time spent by the five ICTC on different functions. The total service time spent by all staff in the ICTCs was calculated in terms of their activity functions. The function-specific time use is calculated as:

$$\text{Function Specific Time use of ICTC (\%)} = \left\{ \frac{\text{Sum of Specific function (hours) of all Counsellor in the ICTC Centre}}{\text{Total time units (hours) for all the functions by all Counsellors in the ICTC Centres}} \times 100 \right\}$$

The total average time spent shows that ICTC Centres devoted 29 per cent to their medical functions, 28 per cent on psychological functions, 22 per cent on non-productive activities (NPA), 20 per cent on programmatic functions, and 1.5 per cent on social functions. The number of monthly time spent on Non-productive activities is high as the ICTC mainly operated less than 7 hours on Saturday. It is noticed that Kulikawn and Kolasib spend more time on NPA.

Table 7.3: Distribution of time allocated for different function in the five ICTCs

		Champhai ICTC		Kulikawn ICTC		Kolasib ICTC		Aizawl ICTC		Lunglei ICTC	
	Activity Function	Counsellor	Lab Tech	Counsellor	Lab Tech	Counsellor	Lab Tech	Counsellor	Lab Tech	Counsellor	Lab Tech
In hours	Medical	-	94	-	112	-	92	-	195	-	95
	Psychological	100	-	83	-	82	-	309	-	102	-
	Social	6	-	5	-	5	-	17	-	5	-
	Programmatic	30	38	41	13	42	36	86	71	29	37
	Other	33	36	40	42	40	40	92	71	32	35
	Total	168	168	168	168	168	168	504	336	168	168
In per cent	Medical	-	56	-	67	-	55	-	58	-	57
	Psychological	59	-	49	-	49	-	61	-	61	-
	Social	3	-	3	-	3	-	3	-	3	-
	Programmatic	18	22	24	8	25	22	17	21	17	22
	Other	19	21	24	25	24	24	18	21	19	21
	Total	100	100	100	100	100	100	100	100	100	100

*Source: Fieldwork***7.3.2 Time spent by ICTC staff on a specific function**

Table 7.3 shows the monthly time spent by all the ICTC staff on different functions. It further gives the per cent distribution of time spent on each of these functions. The monthly working hours were calculated as 168 hours, 42 hours per week, and 7 hours per day of six working days. Since Aizawl has three Counsellors and two Lab-Technicians,

the average time spent among each staff category was considered for Aizawl. Therefore, the monthly time spent represents the average time spent per individual staff on each function. The formula is as follows:

$$\text{Function Specific Time usage of Staff in ICTC} = \left\{ \frac{\text{No.of time units (hours) for a particular function by a staff category}}{\text{No.of total time units (in hours) for a particular function by staff category}} \right\}$$

Function Specific Time usage of Staff in ICTC (%) =

$$\left\{ \frac{\text{No. of time units (hours) for a particular function by a staff category}}{\text{No. of total time units (in hours) for a particular function by staff category}} \times 100 \right\}$$

Table 7.3 gives staff distribution of time allocation in the five ICTC to various activity functions. The total amount of time spent by Counsellors of each ICTC on the activity functions shows that Kolasib and Kulikawn have the minimum time spent on medical but have maximum time spent on programmatic functions. On the other hand, three-fifths of the Counsellors in Aizawl, Lunglei, and Champhai ICTC have engaged in psychological functions. It is noticed that Lab-Technicians of each ICTC spent more than one-fifth on non-productive activities; meanwhile, Kolasib ICTC Lab-Technician engaged one-quarter of its working hours on it.

Table 7.4: Categorization of staff activities in the five ICTC Centres

Sl.no	Activities	In hours						In per cent					
		Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Total	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Total
1	Direct Patient Contact	114	92	91	345	117	759	34	27	27	41	35	35
(a)	<i>Direct Communication</i>	103	85	82	318	106	694	31	25	25	38	31	32
(b)	<i>Diagnostics</i>	11	7	9	27	11	65	3	2	3	3	3	3
2	Indirect Patient Contact	120	84	130	263	117	714	36	25	39	31	35	33
(a)	<i>Lab Test</i>	47	24	47	93	47	257	14	7	14	11	14	12
(b)	<i>Documentation</i>	27	21	29	71	28	177	8	6	9	8	8	8
(c)	<i>Conversation</i>	18	15	19	41	17	109	5	4	6	5	5	5
(d)	<i>Organizing</i>	26	22	34	53	24	159	8	7	10	6	7	7
(e)	<i>Meetings</i>	2	2	1	5	2	12	1	1	0	1	1	1
3	Other Professional Activities	34	79	35	70	35	254	10	23	11	8	10	12
(a)	<i>Consultancy service for other departments</i>	34	79	34	69	35	252	10	23	10	8	10	12
(b)	<i>Research/Reading</i>	-	-	1	1	0	2	-	-	0	0	0	0
4	Non-Productive Activities	68	81	79	162	67	457	20	24	24	19	20	21
(a)	<i>Lunch Breaks</i>	24	24	24	60	24	156	7	7	7	7	7	7
(b)	<i>Resting</i>	37	46	49	88	37	256	11	14	14	10	11	12
(c)	<i>Personal Time</i>	7	11	7	14	6	45	2	3	2	2	2	2
	Total	336	336	336	840	336	2184	100	100	100	100	100	100

Source: Fieldwork

7.3.3 Activity Specific Time spent by ICTC

The total service time spent by all staff in the ICTC Centres was classified according to their activities. The total number of units of time spent by staff was computed under each category of activity. The activity-specific time use is calculated as:

Activity Specific Time use of ICTC Centre (%) =

$$\left\{ \frac{\text{Sum of specific activity (hours) of all staff in ICTC Centre}}{\text{Total time units (hours) for all the activities in ICTC Centre}} \times 100 \right\}$$

Table 7.4 gives the activity's specific time use by ICTC Centres. Firstly, it is noticed that more than three-tenths of the time is spent on direct patient contact activity. Similarly, three-tenths of the time was spent on indirect patient contact, contributed mainly by Lab-test, documentation, and organizing activity. Secondly, more than one-fifth of the time was spent on non-productive activities. Leisure refers to the time spent not related to the classified ICTC functions during the working hours. It is mainly contributed by the hours the ICTC remains closed during the working hours. The leisure specific time use is calculated as:

The leisure specific time use is calculated as:

$$\text{Leisure Specific Time use of ICTC Centre} = \left\{ \frac{\text{Sum of leisure activities (hours) of all staff in the ICTC Centre}}{\text{Total no.of staff in the ICTC Centres}} \right\}$$

$$\text{Leisure Specific Time use of ICTC Centre} = \left\{ \frac{256.33 \text{ hours}}{13 \text{ ICTC Staff}} \right\}$$

$$\text{Leisure Specific Time use of ART Centre} = \{19.72 \text{ hours}\}$$

Therefore, the average monthly time spent on leisure in the ICTC is 20 hours. The daily time spent on leisure is calculated as:

$$\text{Daily Specific Time use on leisure} = \left\{ \frac{\text{Leisure specific use in the ICTC Centre}}{\text{No.of working days}} \right\}$$

$$\text{Daily Specific Time use on leisure} = \left\{ \frac{19.72 \text{ hours}}{24 \text{ days}} \right\}$$

$$= \{0.82 \text{ hours} * 60\} = \{49 \text{ min and two sec}\}$$

It is found that the ICTC Centres were closed 49 minutes earlier than the time assigned for work. This is because the peak hours in all the ICTC Centres were between OPD timing in the hospital (9 am to 2 pm). The blood sample was collected between 9 am to 12 pm, and lab tests were performed for one hour. One-tenths of the time was spent on other professional activities, and 45 minutes were spent daily on engagement services of other departments. Lab-Technicians spent more time on the work of other departments and served the hospital besides their regular ICTC duties.

Appendix C.2 and C.3 shows the time spent on different activities by all the staff members in the ICTC. The Counsellors time shows that more than half of the time was spent on pre/post counselling. Lab-Technicians spent more time on the work of other departments besides the hospital and their regular ICTC duties. The Lab Technician in Kulikawn ICTC has spent 79 hours (47%) on lab tests of other departments. In the study, the time allocation of ICTC staff members is used for calculating the unit cost of service time spent within the working hours.

Table 7.5: Staff Position and Time Allocation of Five ART Centres for One Month, 2017-18

	Staff	Staff Availability at ART Centres					Average Monthly time spent on each function (In hours)						Average Monthly time spent on each function (In per cent)					
Sl.no	Category	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Medical	Psychological	Social	Programmatic	NPA	Monthly Hours	Medical	Psychological	Social	Programmatic	NPA	Total
1	SMO	-	-	-	1	-	75	-	-	55	38	168	45	-	-	33	23	100
2	Medical Officer	1	1	1	1	1	85	-	-	42	41	168	51	-	-	25	24	100
3	Counsellor	1	1	1	4	1	5	91	5	30	37	168	3	54	3	18	22	100
4	Pharmacist	1	-	-	1	1	45	34	-	51	39	168	27	20	-	30	23	100
5	Data Manager	1	1	-	2	1	6	-	-	122	41	168	3	-	-	73	24	100
6	Lab-Tech	1	1	-	2	1	75	-	-	53	40	168	45	-	-	31	24	100
7	CCC	1	-	-	1	1	26	29	3	71	39	168	16	18	2	42	23	100
8	Nurse	1	1	1	2	1	66	5	7	49	41	168	40	3	4	29	24	100
9	Total	7	5	3	14	7	385	158	15	472	314	1344	29	12	1	35	23	100

Source: Fieldwork

7.4 Time Allocation in ARTC

Table 7.5 shows the staff availability for each category/position in all the ART Centres. It is noticed that the Aizawl ART Centre has the maximum number of staff members compared to other centres. It has four Counsellors, two Data Managers, Lab-Technicians, Nurses, and one Senior medical officer. The staff members were allotted according to the number of patients registered in the ART. Aizawl is an ART Plus Center with a high patient load (4000 & above patients); hence its staff strength is more. Seven staff members are available in Lunglei and Champhai, five at Kulikawn, and three at Kolasib. In the absence of the Pharmacists, Care Coordinators, and Lab-Technician in Kolasib ART Center, the Counsellor and Nurse assign the task. The available staff simultaneously performs the duties of the unavailable staff in some ART Centres. Each ART centres have at least one Medical Officer, Counsellor, and Nurse.

7.4.1 Time spent by ARTC staff on the specific function

Table 7.5 shows the monthly time spent by the different ART staff members on different functions. It further gives the per cent distribution of time spent on each of these functions by different staff categories. The monthly working hours were 168 hours for each staff at the ART Centres, 42 hours per week, and 7 hours per day of six working days. Since Aizawl has four Counsellors and two Data Managers, two Lab-Technicians, two Nurses and one Senior Medical Officer compared to the other centres. The average time spent by each category of the staff member was taken into account for Aizawl. Therefore, the monthly time spent represents the average time spent per individual staff member on each function. The formula is as follows:

$$\text{Function Specific Time usage of Staff in ART} = \left\{ \frac{\text{No.of time units (hours) for a particular function by a staff category}}{\text{No.of total time units (in hours)for a particular function by all staff category}} \right\}$$

Function Specific Time usage of Staff in ART(%) =

$$\left\{ \frac{\text{No. of time units (hours) for a particular function by a staff category}}{\text{No. of total time units (in hours) for a particular function by all staff category}} \times 100 \right\}$$

The SMO, MO, Lab-Technicians, and Nurses have spent the maximum time on medical function. At the same time, the Data Managers spent three-quarters of their time on programmatic function. The Counsellors spent more than one half of their time on psychological functions. The MO, the Data Managers, and the Nurses spent one-quarter of their time on non-productive functions. It is found that the pharmacist spent a balanced amount of their time in each function except on social. It is noticed that the Care Coordinators simultaneously engage in all the medical, psychological, social, and programmatic functions.

The total average time spent on each function shows that 35 per cent was spent on programmatic functions, 29 per cent on medical functions, 23 per cent on non-productive activities (NPA), and 1 per cent on social functions in the ART Centres. The percentage of non-productive activities is high as the ART Centres mainly operated less than 7 hours as it mostly remained closed on Saturday. The Senior Medical Officer (SMO), the Medical Officers (MO), the Data Managers, and the Lab-Technicians were found to be engaged in medical, programmatic, and non-productive functions. The Counsellors, Community Care Coordinator, and nurses were engaged in all five functions, while the pharmacist was engaged in four functions.

7.4.2 Time spent by ART Centres on the specific function

The total service time spent by all staff in the ART Centres was calculated in their functions. The function-specific time use is calculated as:

Function Specific Time use of ART Centre (%) =

$$\left\{ \frac{\text{Sum of Specific function (hours) of all staff in the ART Centre}}{\text{Total time units (hours) for all the functions in the ART Centre}} \times 100 \right\}$$

Table 7.6: Distribution of time allocated for different functions in 5 ART's Centres

	Activity Functions	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Total
In hours	Medical	311	249	176	491	306	1533
	Psychological	159	104	82	468	149	961
	Social	12	7	23	41	11	93
	Programmatic	430	263	103	833	430	2059
	NPA	264	217	120	521	281	1403
	Total	1176	840	504	2352	1176	6048
In per cent	Medical	26	30	35	21	26	25
	Psychological	14	12	16	20	13	16
	Social	1	1	5	2	1	2
	Programmatic	37	31	21	35	37	34
	NPA	22	26	24	22	24	23
	Total	100	100	100	100	100	100

Source: Fieldwork

Table 7.6 gives the distribution of time allocation by staff in the five ART Centres to various activity functions. The total amount of time spent by each ART Centres on the activity functions shows that Kolasib has the minimum time units spent and Aizawl has the maximum time units. This result is due to the difference in the strength of staff members. The percentage distribution shows that ART Centres devoted maximum time to programmatic function. On the other hand, medical, psychological, and social functions were given equal time by all the ART Centres. It is noticed that more than one-fifth of the time was spent on non-productive activities (NPA) by all the ART Centres, especially in Kulikawn. In the case of Kulikawn, this could be due to fewer clients/patients visiting the centres.

Table 7.7: Categorization of staff activities in the five ART Centres

Sl.no	Activities	In hours						In Per cent					
		Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Total	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Total
1	Direct Patient Contact	359	207	178	827	342	1,913	30.53	24.68	35.25	35.18	29.08	30.53
(a)	<i>Direct Communication</i>	276	155	143	654	262	1,491	23.5	18.49	28.44	27.81	22.31	23.5
(b)	<i>Diagnostics</i>	83	52	34	173	80	422	7.03	6.19	6.81	7.37	6.77	7.03
2	Indirect Patient Contact	549	353	162	1,001	530	2,595	46.66	42.02	32.14	42.56	45.1	46.66
(a)	<i>Lab Test</i>	47	45	40	67	47	245	3.97	5.4	7.94	2.83	3.97	3.97
(b)	<i>Documentation</i>	219	115	50	388	204	977	18.59	13.73	9.99	16.51	17.35	18.59
(c)	<i>Conversation</i>	129	80	29	209	112	559	10.97	9.48	5.82	8.89	9.5	10.97
(d)	<i>Organizing</i>	133	102	36	306	154	730	11.34	12.1	7.08	13	13.07	11.34
(e)	<i>Meetings</i>	11	6	3	21	8	50	0.96	0.71	0.66	0.91	0.71	0.96
(f)	<i>Dispense ARV/OI to relatives</i>	10	5	3	10	6	34	0.82	0.6	0.66	0.43	0.51	0.82
3	Other Professional Activities	4	63	44	3	23	137	0.37	7.5	8.73	0.13	1.93	0.37
(a)	<i>Consultancy service for other departments</i>	3	61	44	2	19	129	0.26	7.22	8.73	0.1	1.59	0.26
(b)	<i>Research/Reading</i>	1	2	-	1	4	8	0.11	0.28	-	0.03	0.34	0.11
4	Non-Productive Activities	264	217	120	521	281	1,403	22.45	25.79	23.88	22.14	23.89	22.45
(a)	<i>Lunch Breaks</i>	84	60	36	168	84	432	7.14	7.14	7.14	7.14	7.14	7.14
(b)	<i>Leisure</i>	153	110	66	308	154	791	13.04	13.1	13.1	13.1	13.1	13.04
(c)	<i>Personal Time</i>	27	47	18	45	43	179	2.27	5.56	3.64	1.9	3.66	2.27
	Total	1,176	840	504	2,352	1,176	6,048	100	100	100	100	100	100

Source: Fieldwork

7.4.3 Activity Specific Time spent by ART Centres

The total service time spent by all staff in the ART Centres was classified according to their activities. The total number of units of time spent by staff was computed under each category of activity. The activity-specific time use is calculated as:

Activity Specific Time use of ART Centre (%) =

$$\left\{ \frac{\text{Sum of specific activity (hours) of all staff in the ART Centre}}{\text{Total time units (hours) for all the activity in the ART Centre by all staff}} \times 100 \right\}$$

Table 7.7 gives the activity's specific time use on each activity by ART Centres. Firstly, it is noticed that almost one half of the time spent in the ART Centres engaged in indirect patient contact activity, where documentation occupies the maximum number of hours followed by conversation/interaction and organizing/monitoring. Secondly, three-tenths of the time was spent on direct patient contact, contributed mainly by direct communication/interaction with the patient. Thirdly, more than one-fifth of the time was spent on non-productive activities. Leisure refers to the time spent not related to the classified ARTC functions during working hours. It mainly contains the number of hours the ARTC remain closed during the working hours. The leisure specific time use is calculated as:

$$\text{Leisure Specific Time use of ART Centre} = \left\{ \frac{\text{Sum of leisure activities (hours) of all staff in the ART Centre}}{\text{Total no. of staff in the ART Centres}} \right\}$$

$$\text{Leisure Specific Time use of ART Centre} = \left\{ \frac{791.33 \text{ hours}}{36 \text{ ART Staff}} \right\}$$

Leisure Specific Time use of ART Centre = 22 hours

Therefore, the average monthly time spent on leisure in ART Centres is 22 hours. The daily time spent on leisure is calculated as:

$$\text{Daily Specific Time use on leisure} = \left\{ \frac{\text{Leisure specific use in the ART Centre}}{\text{No. of working days}} \right\}$$

$$\text{Daily Specific Time use on Leisure} = \left\{ \frac{22 \text{ hours}}{24 \text{ days}} \right\} = \{0.92 \text{ hours} * 60\} = \{55 \text{ minutes}\}$$

It was found that the ART Centres were closed 55 minutes earlier than the time assigned for work. This is because the peak hours in all the ART Centres were between OPD timing in the hospital (9 am to 2 pm). This can affect the quality of time spent on counselling and other activities due to the heavy load of clients during those hours. However, in Aizawl, a new roster system was recently developed to cope with clients' overload peak hours. On the other hand, in some ART Centres, this could be due to the smaller number of clients visiting the centres. It was observed that some ART Centres were closed on Saturday due to a lack of clients, whereas others closed after their lunch breaks. It resulted in more leisure time for the ART Centre. The time spent on other professional activities by the staff such as reading/research purposes was less (8 hours only)

Appendix C.4 to C.10 shows the time spent on different activities by all the staff members of the ART Centres. Time spent for other departments is contributed by the Medical Officers and Lab-Technicians as they were assigned to serve the hospital, besides their ART Centers duties. The medical officer in Kolasib ARTC and Lab Technician in Kulikawn ARTC spent 44 hours (26%) on consultancy or lab tests for other departments. In the study, the time allocation of ART staff members is used for calculating the unit cost of service time spent within the working hours.

7.5 Cost of Services

The total costs for providing ICTC and ARTC services were estimated by collecting data from ART and ICTC/PPCTC Centres, Procurement Division, DAPCU, Care Support and Treatment (CST) Division, and Finance Division of the MSACS. The data includes the capital and recurring expenditure during 2017-18 FY. The capital expenditure¹⁴ was classified into furniture and supplies, equipment and instruments, and office equipment. The annual depreciation was calculated by using a straight-line depreciation method (Walker, 2002).

$$\text{Annual depreciation} = \left\{ \frac{\text{Initial Value} - \text{Salvage Value}}{\text{Useful life of the asset}} \right\}$$

$$\text{Annual depreciation rate} = \left\{ \frac{\text{Annual depreciation}}{\text{Initial Value}} \times 100 \right\}$$

The initial value was obtained from official records. According to the Companies Act, 1956 and the Income Tax Act, amended by the Finance Act (2020), the salvage value and the assets' useful life were obtained. The recurrent expenditure¹⁵ includes staff salary, consumables, Anti-retrovirals (ARV) drugs, building maintenance, and operating costs. Building maintenance includes rental value, maintenance, and electricity expenditure. ARV's drug expenditure was calculated using the annual consumption and the price of medicines. The annual ARVs consumption was obtained from the consolidated monthly report of the MSACS, CST Division. The ARVs prices were obtained from the medicine price fixed by India's Government (as per the DPCO 2013) under the National Pharmaceutical Pricing Authority (NPPA).

¹⁴ See Appendix C.11 & C.13

¹⁵ See Appendix C.12 & C.14

Table 7.8: Expenditure of ICTCs during 2017-18 FY (Rs. In lakhs)

Cost Categories	ICTC					
	Champha	Kulikawn	Kolasib	Aizawl	Lunglei	Total
Capital						
Equipment and Instruments	0.19	0.06	0.06	1.97	0.08	2.35
Office Equipment	0.09	0.05	0.05	0.16	0.19	0.53
Furniture and Supplies	0.06	0.04	0.04	0.10	0.09	0.33
Total Capital Costs	0.35	0.15	0.15	2.23	0.35	3.22
Recurrent						
Salary of personnel	3.61	3.76	3.94	9.60	3.76	24.67
Consumable Supplies	1.21	0.29	0.39	11.97	0.90	14.75
Buildings maintenance	0.18	0.04	0.09	0.22	0.20	0.73
Operating costs	0.11	0.02	0.02	0.16	0.11	0.40
Total Recurrent Costs	5.10	4.10	4.43	21.95	4.97	40.55
Total Costs	5.45	4.25	4.58	24.17	5.31	43.77

*Source: Author's calculation***Table 7.9: Expenditure of ICTCs during 2017-18 (In per cent)**

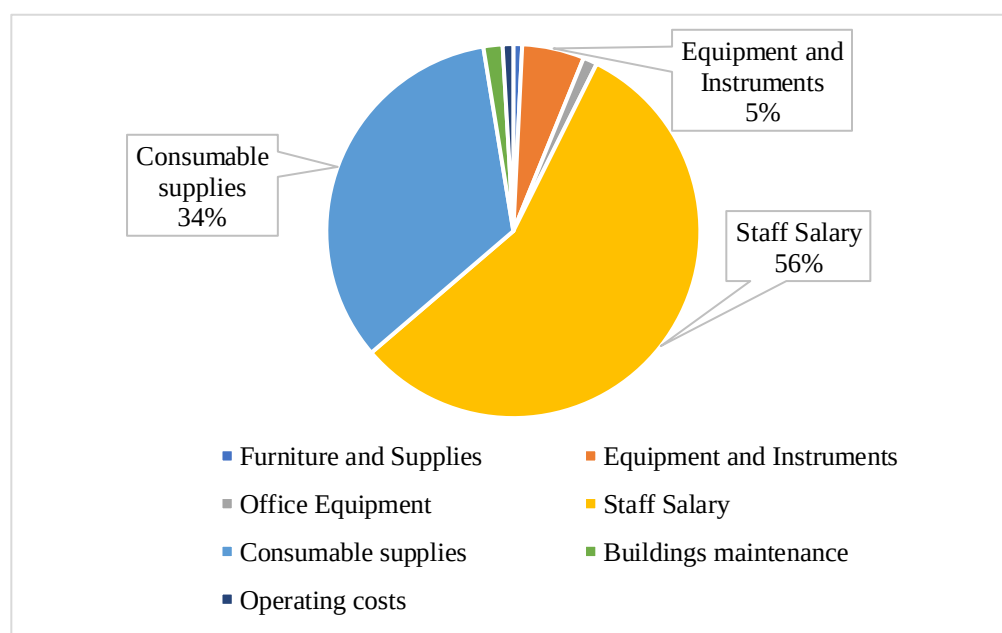
Cost Categories	ICTC					
	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Total
Capital						
Equipment and Instruments	0.44	0.14	0.14	4.49	0.17	5.38
Office Equipment	0.21	0.11	0.11	0.36	0.43	1.22
Furniture and Supplies	0.15	0.10	0.09	0.23	0.19	0.76
Total Capital Costs	0.80	0.35	0.33	5.09	0.79	7.36
Recurrent						
Salary of personnel	8.24	8.59	9.01	21.93	8.59	56.37
Consumable Supplies	2.76	0.66	0.88	27.34	2.05	33.70
Buildings maintenance	0.41	0.08	0.21	0.50	0.46	1.66
Operating costs	0.24	0.03	0.03	0.36	0.24	0.92
Total Recurrent Costs	11.66	9.37	10.13	50.14	11.35	92.64
Total Costs	12.46	9.72	10.46	55.23	12.14	100.00

Source: Author's calculation

7.5.1 Integrated Counselling and Testing Centres (ICTC)

Table 7.8 and 7.9 show that Rs 43.77 lakhs is the annual cost of all ICTC Centres services during 2017-18¹⁶. The capital costs account for Rs 3.22 lakhs (0.25%), and the recurrent cost accounts for Rs 40.55 lakhs (92.64%). It is noticed that Aizawl ICTC Centre comprises more than one-half of the total expenditure, where Rs 11.97 lakhs accounts for consumable supplies. According to the estimates, almost seven-tenths of the total number of blood samples tested in the five ICTC centres was performed in the Aizawl ICTC Centre. The staff salary accounts for almost three-fifths of the total expenditure. More than one-fifth were on consumable supplies, and the remaining was on other cost categories, as shown in Fig.7.1.

Figure 7.1: Total Cost Category of five ICTCs during 2017-18 (In per cent)



¹⁶ See Appendix C.15

Table 7.10 Annual Expenditure of ART Centres during 2017-18 FY (Rs in lakhs)

Cost Categories	ARTC					
	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Total
Capital						
Equipment and Instruments	0.11	0.06	0.06	1.97	0.08	2.27
Office Equipment	0.24	0.05	0.05	0.16	0.19	0.68
Furniture and Supplies	0.11	0.15	0.14	0.31	0.11	0.83
Total Capital	0.46	0.26	0.25	2.44	0.37	3.78
Recurrent						
Salary of personnel	14.66	14.25	9.23	35.63	14.75	88.52
Consumable Supplies	2.82	1.42	0.26	7.42	0.13	12.05
ARV Drugs	209.58	111.63	147.74	837.83	131.96	1438.75
Buildings maintenance	0.19	0.10	0.10	0.22	0.20	0.81
Operating costs	0.57	0.31	0.22	0.59	0.65	2.34
Total Recurrent	227.82	127.72	157.54	881.69	147.69	1542.47
Total Costs	228.29	127.97	157.79	884.13	148.07	1546.24

Source: Author's calculation

Table 7.11: Annual Expenditure of ART Centres during 2017-18 FY (In per cent)

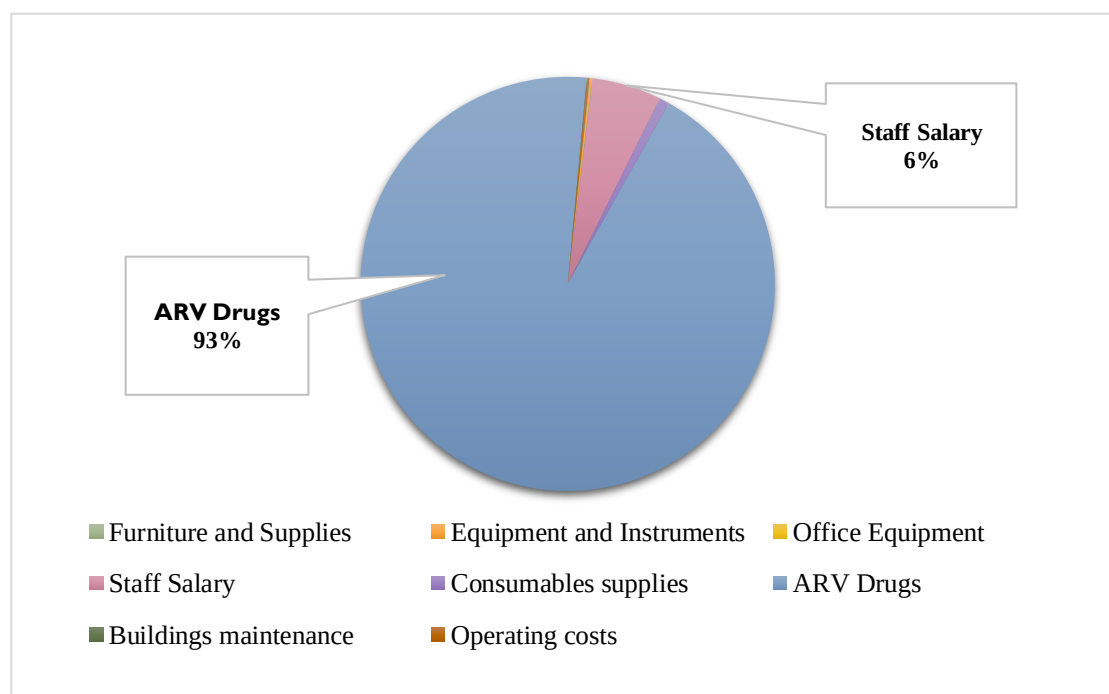
Cost Categories	ARTC					
	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Total
Capital						
Equipment and Instruments	0.01	0.00	0.00	0.13	0.00	0.15
Office Equipment	0.02	0.00	0.00	0.01	0.01	0.04
Furniture and Supplies	0.01	0.01	0.02	0.02	0.01	0.05
Total Capital Costs	0.03	0.02	0.03	0.16	0.02	0.24
Recurrent						
Salary of personnel	0.95	0.92	0.92	2.30	0.95	5.72
Consumable Supplies	0.18	0.09	0.02	0.48	0.01	0.78
ARV Drugs	13.55	7.22	9.55	54.18	8.53	93.05
Buildings maintenance	0.01	0.01	0.01	0.01	0.01	0.05
Operating costs	0.04	0.02	0.01	0.04	9.55	0.15
Total Recurrent Costs	14.73	8.26	10.51	57.02	19.06	99.76
Total Costs	14.76	8.28	10.54	57.18	19.09	100.00

Source: Author's calculation

7.5.2 Anti-retroviral Therapy Centres (ARTC)

Data from Table 7.10 and 7.11 show that Rs 1546.24 lakhs is the annual cost of ARTC services during 2017-18. Of this, the capital costs account for only 0.25 per cent, and the recurrent cost accounts for 99.75 per cent. It is noticed that Aizawl ART Centre accounts for almost three-fifths of the total expenditure, where its ARV drug cost accounts for Rs 884.13 lakhs (54.35%) of the total annual expenditure. Till March 2018, MSACS reported 9583 PLIV registered in Aizawl ARTC, which is seven-tenths of the total PLHIV registered in HIV care. It was further noticed that ARV drugs comprise 93 per cent of the total expenditure, whereas the salary of staff members accounted for only 6 per cent (Fig.7.2).

Figure 7.2: Total Cost Category of five ARTC during 2017-18 (In per cent)



7.6 Unit Cost of services

Unit cost is the average of the cost, which is calculated depending on its specified outcome Moreau and Hager (1993); UNAIDS (2000); and Chatterjee S et al. (2003).

$$\text{Unit Cost} = \left\{ \frac{\text{Total Cost}}{\text{Total no.of service units}} \right\}$$

The unit cost of services is calculated using ICTC and ARTC annual cost data for 2017-18 FY. Staff services' unit cost is estimated by taking the time spent on medical, psychological, social, and programmatic functions. The monthly gross salary was divided by the total number of monthly working hours, and we get the cost of services per hours. The monthly time spent on leisure is multiplied by the cost of services per hour, and we get the cost of leisure time. The staff members cost of services was calculated by subtracting the cost of leisure hours from the monthly salary. ICTC provides free HIV blood testing and counselling, and ARTC provides free treatment and care to HIV positive patients.

The unit cost of ICTC and ARTC services is calculated separately for the following type of patients:

- Clients blood screened for HIV and found negative
- Clients blood screened for HIV and found positive
- Pre-ART patients
- ART initiated patients

7.6.1 Unit cost of ICTC services

The total cost of the ICTC services was divided by the total number of clients visiting the centre for the whole year. The number of clients screened for HIV and the number of individual HIV positive cases is taken as the number of outcome indicators. Here two outcome indicators are considered:

1. Clients screened HIV negative.
2. Clients screened HIV positive.

Data from Table 7.12 shows that the unit cost per client screened for HIV positive is double the cost per client screened for HIV negative. Kulikawn ICTC Centre has the highest unit cost per client, Rs 452 for HIV negative and Rs 904 for HIV positive. It has the lowest number of clients screened HIV negative despite a considerable number of positive cases. Aizawl ICTC Centre has the highest client load, and the unit cost per client is below the average. However, Lunglei has the lowest unit cost for both clients who tested HIV negative and positive. This is because it has many clients screened, and the lowest number of individuals test HIV negative.

Table 7.12: Cost of ICTC Services during 2017-18 (Rs in lakhs)

ICTC Centres	No. of clients screened for HIV negative	Total cost of clients screened for HIV negative	No. of clients screened for HIV positive	Total cost of clients screened for HIV positive	Unit cost per client screened for HIV negative	Unit cost per client screened for HIV positive
Champhai	2,708	30,330	78	11,660	177	353
Kulikawn	678	1,97,758	76	1,63,012	452	905
Kolasib	2,170	9,64,037	104	6,28,969	169	338
Aizawl	12,652	9,65,400	797	8,75,685	163	327
Lunglei	4,139	36,098	54	16,098	114	231
Total	34,685	22,262	1,162	11,562	1,075	2,153
Mean	4,469	4,452	222	2,312	215	431

Source: Author's calculation

Table 7.13: Unit cost of screening for HIV negative at ICTC (In Rupees)

	Item	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Mean
Capital Expenditure	Furniture and Supplies	2.23	5.36	1.60	0.72	2.00	2.38
	Equipment and Instruments	6.71	7.30	2.54	13.87	1.78	6.44
	Office Equipment	3.28	5.65	1.96	1.12	4.40	3.28
	Total Capital	12.22	18.31	6.10	15.71	8.18	12.11
Recurrent Expenditure	Salary	112.19	392.86	142.09	60.63	78.90	157.33
	Consumables	42.22	35.05	16.29	84.41	21.12	39.82
	Building maintenance	6.28	4.24	3.78	1.55	4.71	4.11
	Operating costs	3.74	1.82	0.63	1.11	2.52	1.96
	Total Recurrent	164.44	433.96	162.79	147.71	107.25	203.23
	Grand Total	176.66	452.27	168.90	163.42	115.43	215.33

*Source: Author's calculation***Table 7.14: Unit cost of screening for HIV positive cases at ICTC (In Rupees)**

	Item	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Mean
Capital Expenditure	Furniture and Supplies	4.47	10.71	3.21	1.44	4.01	4.77
	Equipment and Instruments	13.42	14.60	5.07	27.74	3.56	12.88
	Office Equipment	6.56	11.31	3.93	2.25	8.79	6.57
	Total Capital	24.44	36.62	12.21	31.43	16.36	24.21
Recurrent Expenditure	Salary	224.39	785.71	284.18	121.26	157.79	314.67
	Consumables	84.44	70.09	32.58	168.82	42.25	79.64
	Building maintenance	12.57	8.47	7.57	3.10	9.42	8.23
	Operating costs	7.47	3.63	1.26	2.23	5.04	3.93
	Total Recurrent	328.87	867.91	325.58	295.41	214.50	406.46
	Grand Total	353.32	904.53	337.79	326.84	230.86	430.67

Source: Author's calculation

The procedure in screening HIV followed the steps; clients were counselled, and blood samples were collected for HIV tests. If blood tests were negative, post-counselling was done. The average cost of blood screening is Rs 215, as shown in Table 7.13. Of this, three-fourths accounts for the salary component.

In the case of positive blood test results, follow-up counselling was performed, and a further confirmatory test was performed. Data from Table 7.14. shows that the average cost per client screened for HIV positive is Rs 431.

7.6.2 Unit cost of ARTC services

The total cost of the ARTC services was divided by the total number of clients visiting the centre for the whole year. The patients in the ARTC were categorized into Pre-ART and ART initiated. Pre-ART means the newly registered HIV positive who has not started ARV drugs treatment. The ART initiated means the patients who have started taking ARV drugs treatment. The unit cost of services per patients is estimated for both Pre-ART and ART initiated, as detailed in Table 7.15.

Table 7.15: Cost of ARTC Services during 2017-18 (Rs in lakhs)

ARTC	Pre-ART patients	The total cost of Pre ART services	ART patients	Total cost of initiating ART service	Unit cost of Pre-ART services	Unit cost of ART patients services
Champhai	1422	10,07,249	949	2,16,30,640	708	22,793
Kulikawn	625	7,14,525	641	1,18,96,126	1,143	18,559
Kolasib	707	4,81,620	591	1,51,76,618	681	25,680
Aizawl	1058	8,46,611	4,145	8,70,99,532	800	21,013
Lunglei	167	3,12,642	590	1,43,00,999	1,872	24,239
Total	3979	33,62,646	6,916	15,01,03,916	5,205	1,12,283
Mean	796	6,72,529	1,383	3,00,20,783	1,041	22,457

Source: Author's calculation

The average cost per Pre-ART patient is Rs 1041, and ART patient is Rs 22457. The unit cost per ART patients is more than twenty-one times that of a Pre-ART patient. Lunglei ARTC has the highest unit cost per Pre-ART patient (Rs 1872.11), and Kolasib ARTC has the highest unit cost per ART initiated patient (Rs 25680). The unit cost is high as the number of Pre-ART patients and the number of ART initiated patients is less where the total annual cost does not decrease. Despite the fact that many pre-ART and ART initiated patients in Aizawl, its unit cost remains below the average.

Table 7.16 shows the ART and non-ART costs categories in five ARTCs. It is noticed that Lunglei has a unit cost of non-ART higher than the average. Despite the infrastructure and resources allocation, the number of HIV positive cases is less. Aizawl, Champhai and Kolasib have the highest HIV cases in the state.

Table 7.16: Unit cost of ARTC services during 2017-18 FY (In Rupees)

Cost Categories	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Total	Mean
Non-ART costs							
Equipment and Instruments	4.62	4.76	4.65	37.79	9.99	61.81	12.36
Office Equipment	10.21	3.69	3.60	3.06	24.66	45.22	9.04
Furniture and Supplies	4.62	11.80	11.06	5.98	14.77	48.23	9.65
Personnel	537.96	978.35	617.77	595.08	1693.55	4422.71	884.54
Consumable Supplies	118.87	112.25	19.87	142.66	16.95	410.61	82.12
Building maintenance	8.01	7.90	7.70	4.23	26.42	54.26	10.85
Operating costs	24.04	24.49	16.56	11.40	85.76	162.25	32.45
Total Non-ART costs	708.33	1143.24	681.22	800.20	1872.11	5205.09	1041.02
Antiretroviral Drugs Cost							
ARV	22084.76	17415.46	24998.34	20212.96	22366.88	107078.39	21415.68
Pre-ART cost	708.33	1143.24	681.22	800.20	1872.11	5205.09	1041.02
PLHIV (non-ART and ART)	22793.09	18558.70	25679.56	21013.16	24238.98	112283.48	22456.70

Source: Author's calculation

7.7 Summary

Data were collected from 13 staff members of five ICTC for time allocation. The time allocation of staff members in the ICTC shows that 29 per cent of the time is allocated to psychological and social function. This function includes counselling and educating on HIV testing, ART, nutrition, sexual health, condom usage, encouragement to access government and non-government schemes/facility and income generation programmes for the patient. Medical function accounts for 29 per cent of sample collection activities. Programmatic function accounts for 20 per cent of the time, and the remaining (22%) time was spent on non-productive activities.

Data were collected from 36 staff members of five ARTC for time allocation. The time allocation of staff members in the ART shows that 35 per cent of the average time was allocated on programmatic function such as organizing, monitoring, tracking patients, outreach, research, training and meeting. Medical function accounts for 29 per cent of activities such as diagnosis, physical examination, consultancy, sample collection, screening for TB and other opportunistic infections. Psychological and social function accounts for 13 per cent, and the remaining (23%) time was spent on non-productive activities.

The time allocation of staff members in ICTC and ARTC estimates the unit cost of services per activity within the working hours. The non-productive activity is mainly contributed by leisure time, which includes when the ARTC remains closed during working hours. Therefore, the leisure time spent is deducted to get accurate service time per activity.

The annual cost of all ICTC Centres services during 2017-18 is Rs 43.77 lakhs, 0.25 per cent for capital and 92.64 per cent for recurrent. Aizawl ICTC Centre comprise higher than one-half of the total expenditure; almost seven-tenths of the total number of blood tested in the five ICTC centres was performed in the Aizawl ICTC Centre. The average cost of blood screening is Rs 215, and the cost per client screened for HIV positive is Rs 431.

The annual cost of ART Centre services during 2017-18 is that Rs 1546 lakhs. The capital costs account for Rs 3.78 lakhs (0.25%), and the recurrent cost accounts for Rs 1542 lakhs (99.75%). ARV drugs comprise 93 per cent of the total expenditure,

whereas the staff salary accounted for 6 per cent only. Aizawl ARTC accounts for almost three-fifths of the total expenditure. The average cost per Pre-ART patient is Rs 104, and ART initiated patient is Rs 22457.

It is noticed that the cost of providing ICTC and ARTC services in Mizoram during 2017-18 is Rs. 216 per 34,638 clients blood screened for HIV and found negative, Rs 431 per 1162 clients blood screened for HIV and found positive, Rs. 104 per 3979 Pre-ART patients and Rs 22457 per 6916 ART initiated patients. Lunglei has a higher unit cost of ART services than the average due to fewer HIV patients. However, Lunglei accounts for the second-highest blood screened for HIV with the least HIV positive cases. Its unit cost of ICTC services is below the average. During 2017-18, out of 4139, blood screened 1.3 per cent (54 cases) were HIV positive.

These unit costs of services per patients estimated the total cost of providing ICTC and ARTC services, calculated as Rs 980.58 lakhs, Rs 79.83 lakhs on ICTC and Rs 900.76 lakhs on ARTC. Therefore, the per patients/clients estimates can be portrayed as Rs. 74.82 on clients blood screened for HIV and found negative, Rs 5 lakh on clients blood screened for HIV and found positive, Rs 893.56 lakhs on ART initiated patients and Rs 7.19 lakhs on Pre-ART patients,

In 2017-18, Rs 9.81 crore was spent to provide services in five ICTC and ARTC, and the public sector bears this cost. With the high cost of providing services, there is a need for a policy measure to monitor the ICTC and ARTC services and improved the quality of time spent for counselling by reducing the time for non-productive activities. In addition, with the high cost of ARV drugs, the cost of patients stopping ART treatment will also be high, so there is a need to supervise the patients' proper intake of medicines and quality services.

Chapter 8

Conclusions and Policy Recommendations

8.1 Background

This chapter summarises the main findings and the policy recommendations of the research. The study has looked at the impact of HIV/AIDS and its supply response by the state. It estimates the HIV/AIDS burden in India and the Northeast States using the DALYs metrics. The policy and programs for preventing, controlling, and treating the HIV/AIDS response are studied with special reference to the Mizoram State. The Mizoram State AIDS Control Society (MSACS) under the National AIDS Control Programme-IV was analysed to study the cost of provision of HIV/AIDS services from the supply-side perspective. The unit cost of providing HIV/AIDS treatment and testing services through ICTC and ARTC is also calculated.

Globally, HIV/AIDS epidemic is a significant threat to public health and becomes a development challenge. It remains one of the dominant causes of death in lower-income countries. The HIV/AIDS epidemic has affected the working-age population extensively at their productive ages. It affects economic growth due to its marked impact on mortality and morbidity. The rapid spread of HIV threatened the existing health services by enhancing demand for medical, psychological, social and programmatic care and support. During the last decade, HIV/AIDS is one of the diseases with the highest causes of death in India among the productive age group (30 to 49 years). It has been an alarming issue in the Northeast States of India, where Mizoram has the second smallest state population in India and had the highest adult HIV prevalence since 2017.

HIV/AIDS is one of the dominant causes of mortality and burden globally. It became the top 5 global causes of DALYs in 2010 and the top causes of DALYs for both sexes for 30–44 age groups (Murray and Lopez, 2013; Ortblad et al., 2013). The Global Burden of Disease Study 2017 (IHME, 2018) reports that the age groups 15 to 49 years and under-five years are the most at risk of HIV/AIDS-related deaths. It has been one of the leading global causes of death, and Eastern and Southern Africa have been the

hardest hit. Botswana, South Africa, Lesotho, Eswatini and Mozambique has an HIV/AIDS burden 14 times higher than the global average (Gona et al., 2020). Many studies have noted that HIV-positive life expectancy has increased during the past decade (May et al., 2011; Samji et al., 2013; Johnson et al., 2013; Nsanzimana et al., 2015; May et al., 2015; Patterson et al., 2015).

In 2017, an estimate on the healthy life lost in India showed that HIV/AIDS is not one of the top fifteen mortality and disability conditions causing most DALYs in the country (Menon et al., 2019). HIV/AIDS presents a relatively small fraction of the total disease burden; however, it shares a huge part of the global HIV/AIDS burden. Studies showed that in 2010, India comprises 11.4 per cent of global HIV/AIDS DALYs while it shares 1.8 per cent of its country's total burden (Ortblad et al., 2013). Likewise, HIV/AIDS can be associated with any disease where the common HIV co-infection is tuberculosis, hepatitis B, hepatitis C, and cancer. People living with HIV (PLHIV) are 21 times at an increased risk of developing tuberculosis; it comprises 25 per cent of PLHIV deaths in the country during 2017-18 to 2019-20. (NACO, 2020a; 2020b).

The enormous increase in HIV/AIDS mortality and morbidity has led to a vicious circle of poverty or development trap due to its contribution to productivity loss and income loss/reduction. Different studies revealed that AIDS-affected households cause a rapid shift into relative poverty (Haworth et al., 1991; Baier, 1997; Basu et al., 1997; Bloom et al., 1997; Béchu, 1998; Janjaroen, 1998; Menon et al., 1998). The direct household burden of HIV/AIDS due to mortality and morbidity are loss of income of the breadwinner in the family, increased household expenditure such as medical costs, and the opportunity cost of taking care of AIDS patients (United Nations, 2004). Its impact includes an increased orphanage, decreased reproduction, increased management costs and hampers educational attainment (Ainsworth et al., 2002; Bicego et al., 2003; Busingye et al., 2003; Monasch et al., 2003; Case et al., 2004).

The HIV/AIDS epidemic has a tremendous strike on the health systems of developing countries. It increases the demand for public sector services, especially the health sector service. There is evidence that a 5 per cent HIV prevalence rate could give rise to 26 per cent increase in demand for treatment of opportunistic infection alone (Callen et al., 2004). There are numerous studies and extensive research which indicate the

impact of HIV/AIDS on the economy. The HIV/AIDS epidemic has lowered the average national growth rates by 2 to 4 per cent per annual across Africa (Dixon et al., 2002). In India during 1986-95, the total annual cost of HIV/AIDS without including ARV drugs costs was estimated at Rs 20.16 billion, i.e., 1 per cent of the GDP (Anand et al., 1999). During 2013-14 FY, the cost for ART services in India was estimated at US\$ 133.89 (Rs 8032) per patient per year. Of which 66 per cent is for antiretroviral drugs and 34 per cent is for non-ART recurrent expenditure (Agarwal et al., 2017).

The high prevalence and incidence of HIV/AIDS among the working-age population suggest a systematic analysis to understand the burden of the epidemic in India. Existing studies have their limitation and mainly focus on the clinical and medical aspects and some on the household and social perspectives. There is no evidence of any study done on the economic burden of HIV/AIDS using the DALYs metrics and the cost of HIV/AIDS services in India and the highly affected states with HIV/AIDS. Given the country's size, diversity, and variations across HIV/AIDS services, an extensive study should be initiated to understand the health care costing for different types of services and provide more comprehensive information for policy purposes. The current HIV/AIDS achievement is still distinct from the target goal. Hence, it is crucial to study the mortality and morbidity outcomes of HIV/AIDS in India and its supply responses to tackle them.

The main objective of the thesis was to study the economic burden of HIV/AIDS in India and assess the provision cost of the HIV/AIDS services in Mizoram. The specific objectives are:

1. To calculate the Disability Adjusted Life Years (DALYs) of people living with HIV/AIDS in India and Northeast States.
2. To calculate the burden of HIV/AIDS using DALYs in India and Northeast States.
3. To understand the functions of the Mizoram State AIDS Control Society (SACS).
4. To examine the distribution pattern of expenditure of the Mizoram State AIDS Control Society (MSACS) by functions and components.
5. To estimate the unit cost of ICTC and ARTC services in Mizoram.

8.2 Methodology

The researcher adopted a quantitative approach for the study based on both primary and secondary data sources. Secondary data was collected from Institute for Health Metrics and Evaluation (IHME), World Bank, Sample Registration System (SRS), National AIDS Control Organisation (NACO), and the Mizoram States AIDS Control Society (MSACS). The burden of HIV/AIDS is calculated using the disability-adjusted life years (DALYs) approach to measure the health gaps by combining the years of life lost due to premature death (YLL) and the years of life lived with disability (YLD). The economic burden of HIV/AIDS is calculated in monetary terms by multiplying DALYs with India's per capita Gross Domestic Product (GDP) at constant 2010 prices.

Five ICTC and ARTC were purposively selected from four districts, Aizawl, Lunglei, Champhai, and Kolasib, to study the cost of providing HIV testing and treatment services. The study used the cost accounting method to examine the distribution of MSACS expenditure into various activities. The unit cost of providing HIV testing and treatment services was estimated by dividing the total cost of ICTC/ARTC services by the total number of clients who visited the centre during a year. The salary component of the staff members was calculated using the allocation of time for different activities by the staff members. All the staff members of the selected ARTC and ICTC were included in the time allocation of daily activities observation.

8.3 Main Findings

The thesis has been divided into eight chapters. *Chapter 1* discusses the global and Indian scenario of HIV/AIDS, literature review, identified research gaps, defined the objectives and significance of the study. *Chapter 2* explained the methodological approach, study area, data sources and methods used for analysis. *Chapter 3* gives a comprehensive account of the economic burden of HIV/AIDS in India and Northeast states. *Chapter 4* gives a detailed profile of the HIV/AIDS epidemic in Mizoram. *Chapter 5* explains the sources of funds, resource allocation, and utilisation under the NACO and distribution of the MSACS expenditure into various activities and several cost elements. *Chapter 6* classifies the five-activity budget of MSACS into the NACP-IV key strategies/components. *Chapter 7* gives the time allocation of different

activities of ICTC and ARTC staff members and estimates the expenditure of five ICTC and five ARTC and their unit cost of services. *Chapter 8* brings out the summary, policy implications and limitations of the thesis.

The main findings from chapters 3 to 7 can be categorized into the following:

8.3.1 The burden of HIV/AIDS in India

India's HIV/AIDS burden was calculated using the disability-adjusted life years (DALYs) approach for different age groups. The economic burden was calculated for the working-age groups (15-49 years) during 2000-2019 for India.

Years of life lost due to premature death (YLL) and years of life lived with disability (YLD): During the two decades, the years of life lost due to premature death (YLL) and the years of life lived with disability (YLD) steadily decreased. It was found that HIV/AIDS causes more losses due to premature death than a life lived with disability. It was found that death due to HIV/AIDS has declined by 54 per cent from 2007 for all age groups. During 2000-2019, YLL under-five age groups started to decline by 73 per cent. On the contrary, YLD has been increasing over the period for the elderly.

Disability Adjusted Life Years (DALYs): More than four-fifths of the DALYs lost due to HIV/AIDS in India have fallen under the 15-49 age groups for both males and females. During 2000-2019, the DALYs lost by the age group under five years have declined over the decades, while the 50 above age groups showed a rising trend indicating higher DALYs among the elder age groups. It is observed that the DALYs lost due to HIV/AIDS have reduced by 2264814 DALYs (51%) during 2000-2019. Half of the DALYs lost due to HIV/AIDS are among males.

Economic burden of HIV/AIDS: The economic burden of HIV/AIDS was measured as the productivity lost in monetary terms. It was found that the HIV/AIDS burden has been rapidly increasing from 2000 to 2007. During 2000-2010, the burden accounted for 109.7 Billion USD (at constant prices, 2010) and showed an overall increase of 20 per cent. The average burden of HIV/AIDS in India was Rs 27,080 crore (\$ 5,4670 Million) per year. However, the average burden during 2015-2019 is Rs 20,740 crore per year (\$4186 Million). It is observed that the male population was affected by 54 per cent higher than the female population over the period by HIV/AIDS. Therefore,

the average burden of HIV/AIDS is Rs 14703 crore (\$2970 Million) for males and Rs 12309 crore (\$2485 Million) for females per year.

Burden share in the National GDP: The estimates show that the burden share of HIV/AIDS in the national GDP accounts was the highest in 2005, i.e., 0.56 per cent. The share of burden had declined from 0.37 per cent to 0.14 per cent during the two decades. The average share of the HIV/AIDS burden in the economy is below 0.4 per cent during the two decades. During 2018 and 2019, the HIV/AIDS burden share in the economy had declined to 0.07% for both genders. Even though the percentage share is low, it is huge in absolute number and needed greater attention.

8.3.2 The burden of HIV/AIDS in Northeast India

The burden of HIV/AIDS in the Northeast states was calculated using the DALYs approach for the working-age groups (15-49 years) during 2007-2019. The burden of HIV/AIDS is calculated for the following Northeast states, viz., Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura.

Years of life lost due to premature death (YLL) and years of life lived with disability (YLD): During 2007-2019, the northeast states have 1246 thousand YLL due to HIV/AIDS, i.e., Manipur (53%), Nagaland (19%), Assam (10%), Mizoram (8%), Tripura (7%), Meghalaya (2%), Sikkim (>1%) and Arunachal Pradesh (>1%). The years of life lived with disability is relatively low compared to the years lost due to premature death. During 2007-2019, the northeast states have 1200 YLD due to HIV/AIDS, i.e., Manipur (37%), Mizoram (25%), Nagaland (23%), Tripura (5%), Sikkim (4%), Meghalaya (3%), Arunachal Pradesh (2%) and Assam (1%).

Disability Adjusted Life Years (DALYs): During 2007-2019, 1247049 DALYs were lost due to HIV/AIDS in the Northeast States. In 2017, the DALYs rapidly increased in Manipur (68419 DALYs), Nagaland (22657 DALYs), Mizoram (20018 DALYs) and Assam (11192 DALYs). It was found that Manipur lost 661797 DALYs, Nagaland 236715 DALYs, and Assam 119662 DALYs. These three states have the highest DALYs lost due to HIV/AIDS over the decade. Sikkim (7314 DALYs) has the least DALY lost during this period. Assam has the least YLD, but its high YLL contributes to the DALYs losses and has the third-highest DALY lost due to HIV/AIDS.

Economic burden of HIV/AIDS: During 2007-2019, the burden accounted for Rs 6230 crore. It was evident that HIV/AIDS burden has increased by 62 per cent during 2007-2019. The average burden of HIV/AIDS in the northeast states is Rs 527 crore per year. However, the average burden during the last five years is Rs 630 crore per year. It is observed that Manipur was more affected and comprised 46 per cent of the burden over the years. Arunachal Pradesh has the lowest burden of HIV/AIDS, followed by Sikkim and Meghalaya.

Burden share in the GSDP: The estimates show that Manipur (1.8%) and Nagaland (1%) have an average of above one per cent share of the burden in their respective GSDP during the twelve years, followed by Mizoram (1.4%) in 2017 and 2019.

8.3.3 The burden of HIV/AIDS in India vs. Northeast

The Indian average burden share of HIV/AIDS in the national economy was 0.37 per cent during 2000-2019 and 0.31 per cent during 2007-19. The average HIV/AIDS burden share in the state economy during 2007-19 showed that Manipur with 1.83 per cent, followed by Nagaland (0.98%) and Mizoram (0.72%). It is noticed that this burden share in the economy is more than the national average (0.31%) during 2007-19. The burden of HIV/AIDS in India and the Northeast states were compared and estimates that the Northeast states account for an average of 3.3 per cent of the national burden of HIV/AIDS. However, the Northeast states burden in the national burden of HIV/AIDS rapidly increased to 11 per cent in 2017 and 9.2 per cent in 2019. Thus, the burden of HIV/AIDS is an alarming threat that had widely affected the small states of the Northeast.

8.3.4 The scenario of HIV/AIDS in Mizoram

During 2017-19 estimates, Mizoram's HIV prevalence rate shows the highest peak of 2.32 per cent from 2.04 per cent, while the national average was only 0.22 per cent. Likewise, the state HIV incidence rate was 1.32, roughly four times more than the national average (0.10). Sexual contact (64.5%) and infected syringes/needles (33.1%) were the main HIV transmission routes. Among the eight districts, 36 per cent of the entire state's population resides in the Aizawl district, which comprises 51 per cent of the total blood test done for HIV and 72 per cent of the total HIV positive cases in the state. Mizoram State AIDS Control Society (MSACS) provides service centres, such as blood banks, STI clinics, ICTC, ART and OST centres. Under MSACS, prevention programmes are targeted towards Female Sex Workers (FSWs), Men who have sex with Men (MSMs), Transgenders/Hijra (TGs), and Injecting drug users (IDUs) by providing health services, awareness, and enabling environment. It adopted a preventive programme solely focusing on rural areas. The essential services are provided by performing free counselling and testing for HIV infections through the Integrated Counselling and Testing Centre (ICTC), with universal coverage of pregnant women. The programme includes blood transfusion services to provide an accessible supply of safe blood from the non-remunerated voluntary donors, awareness campaigns on blood donation, condom promotion, safe sexual behaviour, stigma, and discrimination against PLHIV were organised to reverse HIV/AIDS transmission. Under care, support, and treatment services, all PLHIV are provided free ART treatment, opportunistic infection treatment, and psychosocial counselling. Non-governmental and faith-based organisations also play a vital role in providing HIV/AIDS services and their related issues.

8.3.5 Distribution pattern of expenditure of MSACS

NACO receives funds from the five main sources, namely: the Government of India (GOI) Domestic Budget, World Bank and Department for International Development (DFID), the United States Agency for International Development (USAID), the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM) and the United Nations Development Programme (UNDP). Mizoram State AIDS Control Society (MSACS)

performed the National AIDS Control Programme IV (NACP IV) under five main activity budgets, categorised in terms of its funding sources they are:

1. New Domestic Budget System (NDBS)
2. Targeted Interventions (TI)
3. Link Workers Scheme (LWS)
4. Care Support and Treatment (CST)
5. Integrated Counselling and Testing Centre (ICTC)

The expenditure reports of MSACS for the financial years 2012-2018 were collected from NACO and were classified according to their cost inputs into different heads. Among the MSACS five activity budgets, TI accounts for more than 44 per cent of the expenditure. NDBS activity comprises 32 per cent, and the remaining 23.7 per cent accounts for LWS, CST, and ICTC activity. Cost inputs were classified into two different heads, i.e., capital costs and recurrent costs. The analysis shows that 77 per cent was spent on recurring and 22.9 per cent on capital expenses. It was found that 63 per cent of the total recurrent expenditure accounts for personnel costs such as salary, honorarium, leave salary and pension contributions, employer's contribution to CPF, and medical expenses. The analysis during 2012-2018 showed that one half is spent on personnel costs out of the total Rs 11,489 lakhs of the HIV/AIDS programmes expenditure. The expenditure under NDBS activity contributes almost half of the total expenditure, of which 32.3 per cent was on recurrent expenses, and 15 per cent was on capital expenses.

8.3.6 Distribution of expenditure by component/strategy

The five main activity budgets of MSACS during 2014-2018 were classified based on the National AIDS Control Programme-IV five key strategies/components: prevention services; care, support and treatment (CST); IEC Services; capacity building; and Strategic Information Management Systems (SIMS). During the financial year 2014-18, Rs 611.2 crore was spent under the NACP-IV in Mizoram. Prevention services computed for 67 per cent of the total expenditure, 16.4 per cent on capacity building, and the remaining 16.3 per cent for CST, IEC, and SIMS. It was found that expenditure

on treatment services and capacity rises during the years while IEC services declined by 45 per cent and prevention services were decreased by 20 per cent during the years.

The National AIDS Control Programme IV key priorities are to intensify and strengthen prevention services on HRGs and vulnerable populations. Prevention services covered the general population and the high-risk-groups (FSW, MSM, IDU, vulnerable, and migrants) by providing services such as Blood Banks for blood safety, OST centre for drugs user, ICTC centre for free counselling and HIV testing, STI clinic and reaching out rural areas through LWS programme. Since the population of HIV negative is more in the state, the priority continues to be on prevention strategy focusing on HRGs and vulnerable populations. High-risk groups (HRGs) intervention accounted for 61 per cent (Rs 2665.30 lakhs) of the prevention services (Rs 4125.87 lakhs), which was 41 per cent of the total NACP-IV strategies. Therefore, more than 36 per cent of the entire NACP-IV strategy accounts for the expenditure on IDU, OST, and core composite (FSW and IDU) components. The analysis indicates the high concentration of spending on HRGs-IDU strategies.

The capacity building comprises higher than 19 per cent of the total expenditure, where 15.6 per cent accounts for staff salary. ICTC prevention services account for 12.8 per cent of the total expenditure, where more than 9 per cent accounts for human resources. CST accounts for 6.7 per cent (Rs 411 lakhs) of the total expenditure under the NACP-IV strategy. It is observed that four-fifth of the CST expenditure concentrated on ART centres, while 11 per cent on FI-ART Centers, and the remaining on ART Link Centers and operational cost. SIMS strategies account for Rs 29.54 lakhs (0.5%) of the total expenditure, of which 70 per cent account for sentinel surveillance under IC activities.

8.3.7 Time Allocation of ICTC and ARTC staff

The time allocation of staff members in the ICTC shows that 29 per cent of the time is allocated to the psychological and social function. This function includes counselling and educating on HIV testing, ART, nutrition, sexual health, condom usage, encouragement to access government and non-government schemes/facility and income generation programmes for the patient. Medical function accounts for 29 per cent of sample collection activities. Programmatic function accounts for 20 per cent of the time, and the remaining time (22%) was spent on non-productive activities.

The time allocation of staff members in the ARTC shows that 35 per cent of the average time was allocated on programmatic function such as organizing, monitoring, tracking patients, outreach, research, training and meeting. Medical function accounts for 29 per cent of activities such as diagnosis, physical examination, consultancy, sample collection, screening for TB and other opportunistic infections. Psychological and social function accounts for 13 per cent, and the remaining (23%) time was spent on non-productive activities.

The non-productive activity is mainly contributed by leisure time, including when the ICTC and ARTC remain closed during working hours. The time allocation of staff members in ICTC and ARTC is used to calculate the unit cost of services per activity within the working hours. The total salary of each staff member was multiplied by the proportion of time spent on different activities to get the salary component of different activities.

8.3.8 The unit cost of ICTC and ARTC services

The annual cost of all ICTC services during 2017-18 is Rs 43.77 lakhs, 0.25 per cent for capital and 92.64 per cent for recurrent. Aizawl ICTC constitutes more than one-half of the total expenditure; almost seven-tenths of the total number of blood samples tested in the five ICTC were performed in the Aizawl ICTC. The annual cost of ARTC services in Mizoram during 2017-18 was Rs 1546 lakhs. Of this, the capital costs account for Rs 3.78 lakhs (0.25%), and the recurrent cost accounts for Rs 1542 lakhs (99.75%). ARV drugs comprise 93 per cent of the total expenditure, whereas the staff salary accounted for 6 per cent only. Since more than nine-tenths of the expenditure was spent on ARV medicines which might have resulted in controlling the disease and the programme was successful. Aizawl ARTC accounts for almost three-fifths of the total expenditure.

The average cost of blood samples screening is Rs 215, and the cost per client screened for HIV positive is Rs 431. The average cost per Pre-ART patient is Rs 104, and ART initiated patient is Rs 22457. Lunglei has a unit cost of ART services higher than the average due to fewer HIV patients. However, Lunglei accounts for the second-highest blood samples screened for HIV with the fewest HIV positive cases. Its unit cost of

ICTC services is below the average. During 2017-18, out of 4139 blood samples screened, 1.3 per cent (54 cases) were HIV positive.

8.4 Conclusions

It can be concluded that the expansion of HIV/AIDS services such as providing ART drugs and early HIV detection have an enormous influence on the burden of HIV/AIDS during the past decades. Since the peak in 2007, HIV/AIDS deaths have declined by 54 per cent for all age groups. The introduction of prevention of mother-to-child transmission (PMTCT) programmes provides a range of services for women health and prevent their infants from acquiring HIV. The achievement showed that the years of life lost due to premature health has declined by 73 per cent for the under-five age group. It is seen that HIV/AIDS contributes more to mortality losses than to healthy life losses due to disability. The years of life lost due to premature death comprises more than four-fifths of the DALYs lost. However, the years of life lived with a disability under the 70 above age group have increased over the decades. In 2019, seven-tenths of the DALYs lost due to HIV/AIDS is caused by disability among the 70 and above age group. It indicates that the elderly HIV/AIDS people faced more disability than premature deaths due to HIV/AIDS. The expansion of free antiretroviral treatment to PLHIV has saved and prolonged life.

The analysis further shows that the HIV/AIDS burden has enormously affected the Indian working-age population, leading to premature deaths and disabilities. This portrays a concentrated burden on the economy. Since the peak in 2007, the burden of HIV/AIDS shows a steady decline. The Northeast states comprised an average of 3.3 per cent of the national burden of HIV/AIDS during 2007-2019. This burden share had increased to 11 per cent in 2017. In 2017 and 2019, Manipur, Nagaland, and Mizoram states have the HIV/AIDS burden share on the economy higher than the national average. These states required specific attention where their ongoing HIV prevention and treatment services urgently need expeditious action. There has been a rapid increase in the NACO estimates from 2017. In this round, NACO improved the State/UT models' data inputs by updating the sex/age pattern of incidence from the National Family Health Survey (3rd and 4th round). The results from HIV estimates from 2017 are more robust and improved, and it replaces all previous estimates.

According to HIV estimates from 2017 and 2019, Mizoram has the highest HIV prevalence and incidence rate in India. Sexual contact and infected syringes/needles were the main HIV transmission routes, where 72 per cent of the HIV cases were found in the urban area. The analysis shows that in Mizoram, almost four-fifths of the HIV/AIDS programmes expenditure is spent on recurring and one-fifth on capital expenses. One-half of the expenditure is spent on personnel costs such as staff salary, and one-half of the funds are from the Government of India source. NACP-IV in Mizoram prioritises prevention services focusing on HRGs and vulnerable populations which is the right strategy for controlling the HIV/AIDS spread. Almost two-fifths of the expenditure accounts for IDU, OST, and core composite (FSW and IDU) components. These outcomes indicate the high concentration of spending on HRGs-IDU strategies.

ICTC and ARTC services provide free HIV treatment, counselling, screening and testing. The time allocation of staff activities showed that one-fifth of the time is spent on non-productive activities, mainly contributed by leisure time. This is because ICTC and ARTC remain closed during their working hours due to fewer visitors in the afternoon. ICTC devoted most of its time to psychological and social functions, while ARTC devoted to programmatic and medical functions. During 2017-18, data analysis on unit costs showed the average unit cost of providing services for HIV screening is Rs 215, screening HIV positive is Rs 431, the pre-ART patient is Rs 104 and ART initiated patient is Rs 22457. The cost of ART drugs accounted for nine-tenths of the total expenditure. The unit cost of ICTC services is cost saving when the number of blood sample screened surpasses the number of positive cases. The unit cost of ICTC and ARTC services remain high when the number of clients is less.

The unit cost of services per patients estimates that Rs 9.81 crore was spent in 2017-18 to provide services in five ICTC and ARTC, i.e., Rs 79.83 lakhs and Rs 900.76 lakhs, respectively. The public sector bears this cost by providing free of cost services. Further, the estimates showed that 'ART initiated patients' accounted for Rs 893.56 lakhs of the total annual expenditure. It indicates the high cost of ARV drugs treatment. Therefore, the cost of patients stopping ART treatment will also be high, so there is a need to supervise the patients' proper intake of medicines and quality services.

8.5 Policy Recommendations

The findings lead to the following recommendations:

- Despite the decline in HIV mortality during 2000-2019, the HIV/AIDS prevalent cases kept on increasing. It implies that the resource needs for prevention and treatment services are still not up to the requirement. The government needs to strengthen the services by expanding the ARTC, ICTC, Blood Bank, and OST centre in all districts of India with a special focus on the high burden states to reduce the HIV prevalence and incidence rates.
- The study provides insight into the economic burden of HIV/AIDS and the urgent need to provide quality, equitable and affordable healthcare delivery for HIV/AIDS in northeast India. The researcher suggested that Mizoram, Manipur and Nagaland require urgent attention. The ongoing HIV prevention and treatment services should be accelerated to reduce the burden further.
- Policies should target expanding IEC, Social mobilisation and mainstreaming. There is a need for increasing awareness focusing on safe-sex practices, needle/syringes use through media campaigns and youth programmes, promoting the prevention services and expanding the expenditure for IDU interventions through IEC services. Tele-counselling should be extended by providing a care unit through the social media platform. The mass and multimedia should reflect on sex education and moral education.
- ICTC and ARTC should remain open on all working days/hours to avoid peak hours crowd and pressure on staff members and patients. Aizawl ARTC followed a roster system for clients visit; this practise should be introduced to maintain the quality of time spent by clients/relatives for counselling and consultant. The ARTC staff should motivate the clients for group counselling and interaction to build rapport.
- With the high cost of providing ART drugs, there is a need for a policy measure to monitor the ART services for adequate and regular intake of medicine. There is a need for expanding viral load test facility within the state. In Mizoram, the majority of the ICTC and ARTC are situated in public hospitals. There is a

need to expand the services by linking with the private hospitals or institutions for the convenience of people accessing the facility.

- In India, the HIV prevalence rate has probably fallen slightly during 2000-2019. At worst, with the inadequate healthcare facility, HIV/AIDS can be a financial grave like evidence from Southern African countries. Today's health care infrastructure and health knowledge/awareness played the most crucial role in tackling HIV/AIDS or other epidemics. Therefore, the government should prioritise expanding HIV prevention and treatment along with universal access to health care and provide proper health care education and practice for society.

8.6 Limitations of the study

There are certain limitations of the study due to the data and time constraints and others in the methodology used. Despite these limitations, the study provides reasonable accurate findings that would greatly benefit the health policy, planning, health sector, and other public sectors. The limitations of the study are listed below:

8.6.1 Data Constraints

- Due to the case sensitivity, the HIV statistics data availability and accessibility were limited. An attempt was made to collect data based on age group, gender-wise, and district-wise of cases. However, the request was not met due to the unavailability of the data format requested. Among the Northeast Indian states, only Tripura and Manipur SACS websites were transparent in providing helpful information for the study. Therefore, the study on HIV/AIDS's burden in the eight Northeast states is limited to the working-age group of 15-49 years.
- The MSACS budget expenditure distribution by the NACP-IV key strategies was analyzed by observing its expenditure flow without explaining its cost fluctuations. This is because the budget expenditure data available was given in a traditional variance report, and the cash-flow report was not available.

- There was poor maintenance on fixed assets and consumables records in some of the ARTC. This could be due to the shuffling of staff or staff replacement where the record-keeping was neglected. For this reason, the cost of services of ARTC and ICTC was calculated only for FY 2017-18.

8.6.2 Time constraints

- Due to time limitations, unpublished data was not collected from the NACO main office. The Northeast states' mortality and prevalence data were collected from different NACO sources from 2007 to 2019 to get accurate NACO estimates. However, the NACO estimates data for 2018 was not available and was exempted from the calculation.
- Due to limited time, the plan to collect unpublished data from the NACO office was withdrawn. It includes information on equipment supplies, the cost of ARV drugs, and allocation costs to the SACS. Moreover, in the study, ICTC and ARTC of Mamit district were not included as the visit was withdrawn due to time limitations.

8.6.3 Others

- Several methods of calculating the disability adjusted life years (DALYs) metrics are practised and used across extensive studies. However, the basic DALYs calculation was used in the study. Thus, other methods of DALYs calculation which includes time discounting might give different results.
- There were not enough studies prior on the topic to build a strong foundation in pointing out the research problem.

8.7 Suggestions for future research

To tackle the HIV/AIDS epidemic, the government rightly implemented NACP-IV, focusing on prevention and treatment services. The investment in HIV/AIDS services is found to be cost-saving. It tackles the burden of HIV/AIDS in the economy due to the productivity loss of HIV/AIDS people by decreasing morbidity and mortality rates. Therefore, HIV/AIDS services need to be effectively countered. With the increasing cases of HIV transmission through needle/syringe uses, further research is needed to study the cost of providing OST services both from the supply and demand perspectives. Further research is imperative to estimate the unit costs of the different HIV/AIDS services, such as cost related to information, education, and communication activities. The quality of the HIV/AIDS service delivery system, which could not be done in this work, needs to be addressed in future studies.

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Appendix A.1: Expectation of Life at Different Age Groups from Abridged Life Tables (SRS)

	Life Expectancy of India														
Year	Male					Female					Total				
	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Under 5	5-14 years	15-49 years	50-69 years	70+ years	Under 5	5-14 years	15-49 years	50-69 years	70+ years
2000	64.50	61.05	40.64	18.33	8.18	67.05	64.35	44.13	20.58	9.03	65.70	62.65	42.29	19.43	8.63
2001	64.50	61.05	40.64	18.33	8.18	67.05	64.35	44.13	20.58	9.03	65.70	62.65	42.29	19.43	8.63
2002	64.50	61.05	40.64	18.33	8.18	67.05	64.35	44.13	20.58	9.03	65.70	62.65	42.29	19.43	8.63
2003	64.50	61.05	40.64	18.33	8.18	67.05	64.35	44.13	20.58	9.03	65.70	62.65	42.29	19.43	8.63
2004	64.50	61.05	40.64	18.33	8.18	67.05	64.35	44.13	20.58	9.03	65.70	62.65	42.29	19.43	8.63
2005	65.60	61.60	40.97	18.45	7.83	68.70	65.36	44.73	20.68	8.70	67.10	63.35	42.76	19.55	8.28
2006	65.60	61.60	40.97	18.45	7.83	68.70	65.36	44.73	20.68	8.70	67.10	63.35	42.76	19.55	8.28
2007	65.60	61.60	40.97	18.45	7.83	68.70	65.36	44.73	20.68	8.70	67.10	63.35	42.76	19.55	8.28
2008	65.60	61.60	40.97	18.45	7.83	68.70	65.36	44.73	20.68	8.70	67.10	63.35	42.76	19.55	8.28
2009	65.60	61.60	40.97	18.45	7.83	68.70	65.36	44.73	20.68	8.70	67.10	63.35	42.76	19.55	8.28
2010	67.35	62.50	41.66	18.90	7.68	70.75	66.45	45.36	21.15	8.55	68.95	64.35	43.43	19.95	8.10
2011	67.35	62.50	41.66	18.90	7.68	70.75	66.45	45.36	21.15	8.55	68.95	64.35	43.43	19.95	8.10
2012	67.35	62.50	41.66	18.90	7.68	70.75	66.45	45.36	21.15	8.55	68.95	64.35	43.43	19.95	8.10
2013	67.35	62.50	41.66	18.90	7.68	70.75	66.45	45.36	21.15	8.55	68.95	64.35	43.43	19.95	8.10
2014	67.35	62.50	41.66	18.90	7.68	70.75	66.45	45.36	21.15	8.55	68.95	64.35	43.43	19.95	8.10
2015	69.00	63.70	42.56	19.35	7.58	71.60	66.60	45.24	20.98	8.15	70.25	65.10	43.84	20.13	7.85
2016	69.00	63.70	42.56	19.35	7.58	71.60	66.60	45.24	20.98	8.15	70.25	65.10	43.84	20.13	7.85
2017	69.00	63.70	42.56	19.35	7.58	71.60	66.60	45.24	20.98	8.15	70.25	65.10	43.84	20.13	7.85
2018	69.00	63.70	42.56	19.35	7.58	71.60	66.60	45.24	20.98	8.15	70.25	65.10	43.84	20.13	7.85
2019	69.00	63.70	42.56	19.35	7.58	71.60	66.60	45.24	20.98	8.15	70.25	65.10	43.84	20.13	7.85

Source: Compiled from Sample Registration System 2000-2018

Appendix A.2: Disability Weight for HIV/AIDS Sequela

Sl.no	HIV/AIDS Sequela	Health state name	Health state lay description	Global Burden Disease Disability Weights					
				Disability Weights					
				2004	2010	2015	2016	2017	2019
1	Early HIV	Generic, uncomplicated disease: anxiety about diagnosis	has a disease diagnosis that causes some worry but minimal interference with daily activities.	n/a	n/a	0.012	0.012	0.012	0.012
2	Symptomatic HIV	HIV cases, symptomatic, pre-AIDS	has weight loss, fatigue, and frequent infections.	0.135	0.221	0.274	0.274	0.274	0.274
3	AIDS with antiretroviral treatment	HIV/AIDS cases, receiving ARV treatment	has occasional fevers and infections. The person takes daily medication that sometimes causes diarrhoea.	0.167	0.053	0.078	0.078	0.078	0.078
4	AIDS without antiretroviral treatment	AIDS cases, not receiving ARV treatment	has severe weight loss, weakness, fatigue, cough, and fever, frequent infections, skin rashes, and diarrhoea.	0.505	0.547	0.582	0.582	0.582	0.582
Mean				0.269	0.274	0.237	0.237	0.237	0.237

Source: Compiled from Global Burden of Disease Study (2004-2019)

Appendix A.3: India's gross domestic product at constant prices (In US\$ and Indian Rupees)

Gross Domestic Product of India at constant prices				
Series Name	GDP (constant 2010 US\$)	GDP (constant LCU)	GDP per capita (constant 2010 US\$)	GDP per capita (constant LCU)
Series Code	NY.GDP.MKTP.KD	NY.GDP.MKTP.KN	NY.GDP.PCAP.KD	NY.GDP.PCAP.KN
2000 [YR2000]	873357417209.47	43267358976300.00	826.59	40950.56
2001 [YR2001]	915487884378.98	45354561776600.00	851.62	42190.29
2002 [YR2002]	950312817570.94	47079838113700.00	869.20	43061.46
2003 [YR2003]	1025011030242.90	50780492987500.00	922.17	45685.50
2004 [YR2004]	1106222004443.92	54803799258600.00	979.28	48515.10
2005 [YR2005]	1193872737485.77	59146140270800.00	1040.31	51538.54
2006 [YR2006]	1290107626116.85	63913752465300.00	1106.93	54838.70
2007 [YR2007]	1388940385493.75	68810066842800.00	1173.88	58155.44
2008 [YR2008]	1431812781420.86	70934025840800.00	1192.51	59078.71
2009 [YR2009]	1544380310593.35	76510780097200.00	1268.25	62830.86
2010 [YR2010]	1675615335600.56	83012348441800.00	1357.56	67255.62
2011 [YR2011]	1763440111904.05	87363311802800.00	1410.43	69874.51
2012 [YR2012]	1859659734290.56	92130167686000.00	1469.18	72785.13
2013 [YR2013]	1978419583617.95	98013698221800.00	1544.62	76522.62
2014 [YR2014]	2125024977747.68	105276736344200.00	1640.18	81256.87
2015 [YR2015]	2294947360719.64	113694931000000.00	1751.66	86779.93
2016 [YR2016]	2484425233783.80	123081932232700.00	1875.73	92926.42
2017 [YR2017]	2659423696537.16	131751603044500.00	1986.63	98420.60
2018 [YR2018]	2822169439126.61	139814256807700.00	2086.45	103365.71
2019 [YR2019]	2940156656485.46	145659510065400.00	2151.73	106599.54

Source: The World Bank, World Development Indicators (2020)

Appendix A.4: Life Expectancy and Disability Weights used for the Northeast States

North-east States (a)	SRS Life Tables (2005-2018)											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2019
Mizoram	39.63	39.63	39.63	40.93	40.93	40.93	40.93	42.21	42.21	42.21	42.21	42.21
Manipur	39.63	39.63	39.63	40.93	40.93	40.93	40.93	42.21	42.21	42.21	42.21	42.21
Nagaland	39.63	39.63	39.63	40.93	40.93	40.93	40.93	42.21	42.21	42.21	42.21	42.21
Assam	39.63	39.63	39.63	40.93	40.93	40.93	40.93	42.21	42.21	42.21	42.21	42.21
Tripura	39.63	39.63	39.63	40.93	40.93	40.93	40.93	42.21	42.21	42.21	42.21	42.21
Arunachal Pradesh	39.63	39.63	39.63	40.93	40.93	40.93	40.93	42.21	42.21	42.21	42.21	42.21
Sikkim	39.63	39.63	39.63	40.93	40.93	40.93	40.93	42.21	42.21	42.21	42.21	42.21
Meghalaya	39.63	39.63	39.63	40.93	40.93	40.93	40.93	42.21	42.21	42.21	42.21	42.21
North-east States (b)	GBD Disability Weights (2010-2019)											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2019
Mizoram	0.274	0.274	0.274	0.274	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237
Manipur	0.274	0.274	0.274	0.274	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237
Nagaland	0.274	0.274	0.274	0.274	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237
Assam	0.274	0.274	0.274	0.274	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237
Tripura	0.274	0.274	0.274	0.274	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237
Arunachal Pradesh	0.274	0.274	0.274	0.274	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237
Sikkim	0.274	0.274	0.274	0.274	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237
Meghalaya	0.274	0.274	0.274	0.274	0.237	0.237	0.237	0.237	0.237	0.237	0.237	0.237

Source: Sample Registration System, Assam (2005-18), Global Burden Disease (2010-2019)

Appendix A.5: Real Gross State Domestic Product (GSDP) at constant prices (Rs. In lakhs)

	North-east Indian States							
Year	Mizoram	Manipur	Nagaland	Assam	Tripura	Arunachal Pradesh	Sikkim	Meghalaya
2007-08	333621.00	589952.00	744537.00	6056720.00	1098843.00	422680.00	217823.00	796999.00
2008-09	378137.00	628659.00	791687.00	6403256.00	1202492.00	459583.00	253499.00	900104.00
2009-10	424896.00	671986.00	846258.00	6979387.00	1330590.00	502948.00	440101.00	959122.00
2010-11	497932.00	668061.00	925399.00	7344442.00	1438667.00	522041.00	478428.00	1041308.00
2011-12	485206.00	732670.00	1002385.00	7684368.00	1542826.00	551030.00	529904.00	1171520.00
2012-13	520289.00	784251.00	1067106.00	8079864.00	1714939.00	542242.00	570284.00	1216021.00
2013-14	903842.00	1411509.00	1379259.00	15452540.00	2281911.00	1233834.00	1211405.00	2072571.00
2014-15	1126104.00	1524490.00	1439877.00	16521230.00	2696521.00	1438265.00	1307097.00	2014033.00
2015-16	1232359.00	1642368.00	1466049.00	19110899.00	2678690.00	1424046.00	1436950.00	2063842.00
2016-17	1359521.00	1708192.00	1564992.00	20208084.00	3053759.00	1474634.00	1539727.00	2173023.00
2017-18	1425117.00	1875074.00	1648489.00	21991937.00	3361918.00	1594354.00	1767336.00	2256433.00
2018-19	1452439.00	1930041.00	1764736.00	23404790.00	3696278.00	1667595.00	1872227.00	2468196.00

Source: National Statistical Office, Ministry of Statistics and Programme Implementation, GOI

Appendix A.6: Gross State Domestic Product Per Capita of Northeast States (In Rupees)

	North-east Indian States							
Year	Mizoram	Manipur	Nagaland	Assam	Tripura	Arunachal Pradesh	Sikkim	Meghalaya
2007-08	30412.12	20656.58	37621.88	19408.83	29908.63	30540.46	35650.25	26862.12
2008-09	34470.10	22011.87	40004.40	20519.31	32729.78	33206.86	41489.20	30337.18
2009-10	38732.54	23528.92	42761.90	22365.53	36216.39	36340.17	72029.62	32326.32
2010-11	45390.34	23391.49	46760.94	23535.35	39158.06	37719.73	78302.45	35096.33
2011-12	44230.26	25653.71	50651.09	24624.65	41993.09	39814.31	86727.33	39485.00
2012-13	47428.35	27459.77	53921.48	25892.02	46677.71	39179.34	93336.17	40984.87
2013-14	82392.16	49422.58	69694.74	49517.85	62109.72	89149.86	198265.96	69854.10
2014-15	102653.05	53378.50	72757.81	52942.48	73394.69	103920.88	213927.50	67881.13
2015-16	112339.02	57505.88	74080.29	61241.10	72909.36	102893.50	235180.03	69559.89
2016-17	123930.81	59810.64	79079.94	64757.05	83118.10	106548.70	252001.15	73239.74
2017-18	129910.39	65653.85	83299.09	70473.42	91505.66	115198.99	289253.03	76050.99
2018-19	132401.00	67578.47	89173.12	75000.93	100606.37	120490.97	306420.13	83188.27

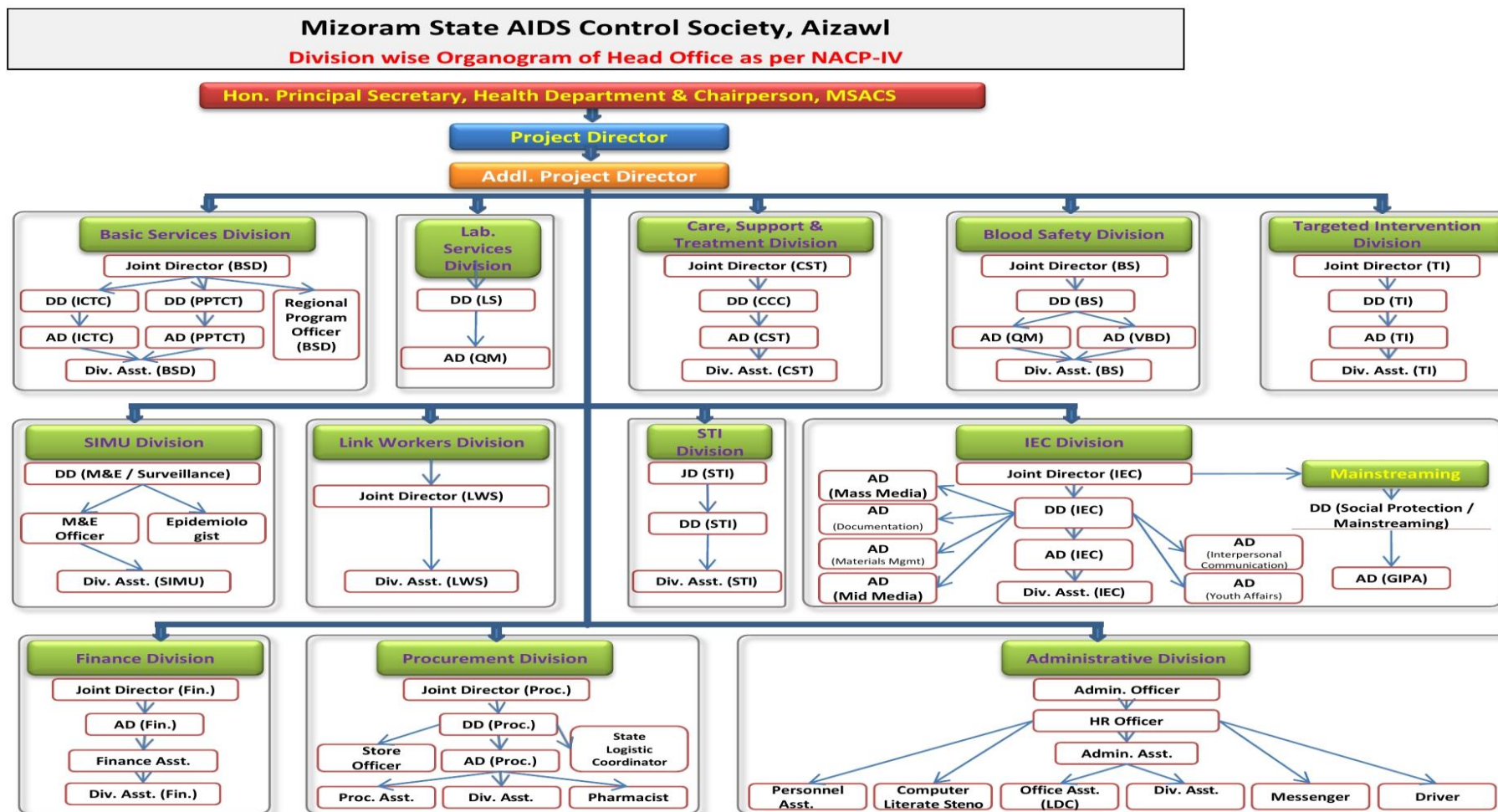
Source: Author Calculation from Statewise GDP (National Statistical Office, Ministry of Statistics and Programme Implementation, GOI) and Statewise Population (2011 Census)

Appendix A.7: GSDP, Population and per capita GSDP at gross state value added by economic activity

North-east States	GSDP at constant prices (Rs. in lakhs)							
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Mizoram	725869	777797	903842	1126104	1232359	1359521	1425117	1452439
Manipur	1291460	1299281	1411509	1524490	1642368	1708192	1875074	1930041
Nagaland	1217674	1286790	1379259	1439877	1466049	1564992	1648489	1764736
Assam	14317491	14734238	15452540	16521230	19110899	20208084	21991937	23404790
Tripura	1920841	2166320	2559283	2953346	3593773	3947940	4371580	4984547
Arunachal Pradesh	1106269	1129917	1233834	1438265	1424046	1474634	1594354	1667595
Sikkim	1116510	1142121	1211405	1307097	1436950	1539727	1767336	1872227
Meghalaya	1991774	2035357	2072571	2014033	2063842	2173023	2256433	2468196
NE States	STATE-WISE TOTAL POPULATION ('00)							
Mizoram	11108	11345	11586	11710	11920	12140	11750	11860
Manipur	28925	29561	30210	30873	31549	32239	32943	33661
Nagaland	19910	20120	20340	20550	20770	20770	20770	20990
Assam	314410	318480	322600	326780	331010	335290	337620	341370
Tripura	36940	37340	37740	38140	38540	38940	39330	39730
Arunachal Pradesh	14000	14280	14570	14870	15160	15470	15790	16110
Sikkim	6140	6210	6270	6330	6400	6470	6540	6600
Meghalaya	30040	30690	31350	32020	32710	33410	34130	34870
NE States	Per Capita GSDP (In Rupees)							
Mizoram	65347	68561	78012	96166	103386	111987	121287	122465
Manipur	44649	43953	46723	49379	52058	52985	56919	57338
Nagaland	61159	63956	67810	70067	70585	75349	79369	84075
Assam	45538	46264	47900	50558	57735	60270	65138	68561
Tripura	51999	58016	67814	77434	93248	101385	111151	125461
Arunachal Pradesh	79019	79126	84683	96723	93934	95322	100972	103513
Sikkim	181842	183916	193207	206492	224523	237979	270235	283671
Meghalaya	66304	66320	66111	62899	63095	65041	66113	70783

Source: Directorate of Economics and Statistics of the respective State/Uts.

Appendix B.1: Division wise Organogram of MSACS



Source: Mumbai SACS, Available from: https://mahasacs.org/~mahasacs/images/rti/organogram_sacs_level.pdf (Retrieved on 15 June 2021)

Appendix C.1: Categorization of ART/ICTC staffs' activities

	Name of category	Activity
1	Direct Patient Contact	
	1. <i>Direct Communication</i>	(a) Communication with patient (b) Counselling
	2. <i>Diagnostics</i>	(a) Physical Examination (b) Sample Collection (c) Procedure
	3. <i>Dispense of ART/OI Drugs</i>	
2	Indirect Patient Contact	
	1. <i>Lab Test</i>	
	2. <i>Documentation</i>	(a) White/green card update (b) Data Entry/record on software (c) Register Entry/Book keeping
	3. <i>Conversation with staff</i>	(a) Conversation with staff (direct) (b) Conversation with staff (indirect)
	4. <i>Conversation with patient</i>	(a) Conversation with patient (indirect) (b) Counselling with patient (indirect)
	5. <i>Conversation with patient relatives</i>	(a) Conversation with patient relative (direct) (b) Conversation with patient relative (indirect) (c) Counselling with patient relative (direct) (d) Counselling with patient relative (indirect)
	6. <i>Conversation with others</i>	(a) Conversation with others (direct) (b) Conversation with others (indirect)
	7. <i>Organizing</i>	(a) Tracking of LFU/MIS/ART (b) Arranging/Monitoring (c) Outreach (d) Travelling/Walking Times
	8. <i>Meetings</i>	(a) Meetings with staff (b) Meeting with Supervisor and other department staff
	9. <i>Dispense ARV/OI drugs to patient relatives</i>	
3	Other Professional Activities	(a) Training/workshops/seminar (b) Consultancy service for other departments (c) Research/Reading
4	Non-Productive Activities	(a) Lunch Breaks (b) Personal Time (c) Leisure

Source: Author's categorization

**Appendix C.2: Time Allocation of Counsellors at different ICTC for One Month
2017-18 (In hour)**

Sl.no	Functions	Champhai ICTC	Kulikawn ICTC	Kolasib ICTC	Aizawl ICTC	Lunglei ICTC	Total
1	Communication with patient	-	-	-	-	-	-
2	Pre-Test Counselling	54	27	47	54	54	236
3	Post-Test Counseling	43	53	29	46	45	216
4	Follow-up Counseling	1	2	3	2	2	11
5	Partner/Group Counseling	2	1	1	2	2	8
6	Physical Examination	-	-	-	-	-	-
7	Sample Collection	-	-	-	-	-	-
8	Dispense of ART/OI Drugs	-	-	-	-	-	-
9	Lab Test	-	-	-	-	-	-
10	White/Green Card update	-	-	-	-	-	-
11	Data Entry /record on software	4	4	4	4	4	20
12	Register Entry/Book Keeping	11	13	13	11	11	59
13	Conversation with staff (direct)	2	2	2	2	2	9
14	Conservation with staff (Indirect)	1	2	1	1	1	6
15	Conversation with patient (indirect)	1	1	1	1	1	3
16	Counselling with patient (Indirect)	2	2	3	2	2	11
17	Conversation with patient relatives (direct)	1	1	1	1	1	5
18	Conversation with patient relatives (Indirect)	1	1	1	1	1	3
19	Counselling with patient relative (direct)	0	0	0	0	0	2
20	Counselling with patient relatives (Indirect)	1	1	1	0	0	3
21	Conversation with others (direct)	2	2	2	2	2	8
22	Conservation with others(Indirect)	-	-	-	-	-	-
23	Tracking of LFU/MIS/ART	-	-	-	-	-	-
24	Arranging/Monitoring	6	13	13	6	6	44
25	Outreach	2	2	5	2	2	13
26	Travelling/Walking Times	2	2	2	1	1	8
27	Meetings with staff	1	1	1	1	1	3
28	Meeting with Supervisor and other department staff	-	-	-	-	-	-
29	Dispense ARV/OI drugs to patient relatives	-	-	-	-	-	-
30	Consultancy service for other departments	-	-	-	-	-	-
31	Research/Reading	-	-	1	0	0	1
32	Lunch Breaks	12	12	12	12	12	60
33	Leisure	17	24	24	16	17	98
34	Personal Time	3	3	3	2	3	15
	Grand Total	168	168	168	168	168	840

Source: Fieldwork (Appendix C.2 to C.10)

Appendix C.3: Time Allocation of Lab Technician at different ICTC for One Month, 2017-18 (In hour)

Sl.no	Functions	Champhai ICTC	Kulikawn ICTC	Kolasib ICTC	Aizawl ICTC	Lunglei ICTC	Total
1	Communication with patient	3	2	2	2	3	12
2	Pre-Test Counselling	-	-	-	-	-	-
3	Post-Test Counseling	-	-	-	-	-	-
4	Follow-up Counseling	-	-	-	-	-	-
5	Partner/Group Counseling	-	-	-	-	-	-
6	Physical Examination	-	-	-	-	-	-
7	Sample Collection	11	7	9	14	11	52
8	Dispense of ART/OI Drugs	-	-	-	-	-	-
9	Lab Test	47	24	47	47	47	211
10	White/Green Card update	-	-	-	-	-	-
11	Data Entry /record on software	-	-	-	-	-	-
12	Register Entry/Book Keeping	12	4	13	14	13	55
13	Conversation with staff (direct)	2	1	2	2	2	9
14	Conservation with staff (Indirect)	2	1	2	2	2	9
15	Conversation with patient (indirect)	-	-	-	-	-	-
16	Counselling with patient (Indirect)	-	-	-	-	-	-
17	Conversation with patient relatives (direct)	-	-	-	-	-	-
18	Conversation with patient relatives (Indirect)	-	-	-	-	-	-
19	Counselling with patient relative (direct)	-	-	-	-	-	-
20	Counselling with patient relatives (Indirect)	-	-	-	-	-	-
21	Conversation with others (direct)	2	1	2	2	2	9
22	Conservation with others (Indirect)	2	1	2	2	2	9
23	Tracking of LFU/MIS/ART	-	-	-	-	-	-
24	Arranging/Monitoring	13	3	12	11	13	51
25	Outreach	-	-	-	-	-	-
26	Travelling/Walking Times	4	2	3	2	2	12
27	Meetings with staff	1	1	1	1	1	4
28	Meeting with Supervisor and other department staff	1	-	-	1	1	2
29	Dispense ARV/OI drugs to patient relatives	-	-	-	-	-	-
30	Consultancy service for other departments	34	79	34	35	35	217
31	Research/Reading	-	-	0	-	-	0
32	Lunch Breaks	12	12	12	12	12	60
33	Leisure	20	22	24	20	20	106
34	Personal Time	4	8	3	3	3	22
	Grand Total	168	168	168	168	168	840

Appendix C.4: Time Allocation of Medical Officer (MO) at different ART Centres for One Month, 2017-18 (In hour)

Sl.no	Functions (In hour)	CPI ARTC	Kulikawn ARTC	Kolasib ARTC	Aizawl ARTC	Lunglei ARTC	Aizawl ARTC
		MO	MO	MO	MO	MO	SMO
1	Communication with patient	47	37	37	49	39	40
2	Counselling	-	-	-	-	-	-
3	Physical Examination	22	20	14	24	18	29
4	Sample Collection	-	-	-	-	-	-
5	Dispense of ART/OI Drugs	-	-	-	-	-	-
6	Lab Test	-	-	-	-	-	-
7	White/Green Card update	8	8	4	8	8	11
8	Data Entry /record on software	1	1	-	2	-	7
9	Register Entry/Book Keeping	8	6	6	9	8	10
10	Conversation with staff (direct)	4	5	0	3	4	2
11	Conservation with staff (Indirect)	1	1	2	1	1	2
12	Conversation with patient (Indirect)	2	3	1	2	2	1
13	Counselling with patient (Indirect)	-	-	-	-	-	-
14	Conversation with patient relatives (direct)	6	5	1	7	3	3
15	Conversation with patient relatives (Indirect)	3	1	0	2	0	1
16	Counselling with patient relative (direct)	-	-	-	-	-	-
17	Counselling with patient (Indirect)	-	-	-	-	-	-
18	Conversation with others (direct)	1	2	2	2	1	2
19	Conservation with others (Indirect)	1	0	1	1	1	1
20	Tracking of LFU/MIS/ART	-	-	-	-	-	-
21	Arranging/Monitoring	15	13	9	14	11	16
22	Outreach	-	-	-	-	-	-
23	Travelling/Walking Times	3	4	4	3	3	2
24	Meetings with staff	1	1	1	1	1	1
25	Meeting with Supervisor and other department staff	2	1	1	1	1	1
26	Dispense ARV/OI drugs to patient relatives	-	-	-	-	-	-
27	Consultancy service for other departments	3	16	44	0	19	2
28	Research/Reading	1	2	-	1	4	-
29	Lunch Breaks	12	12	12	12	12	12
30	Leisure	22	22	22	22	22	22
31	Personal Time	4	8	6	4	10	4
	Grand Total	168	168	168	168	168	168

Appendix C.5: Time Allocation of Counsellor at different ART Centres for One Month, 2017-18 (In hour)

Sl.no	Different Activities	CPI ARTC	Kulikawn ARTC	Kolasib ARTC	Aizawl ARTC	Lunglei ARTC	Total
1	Communication with patient	-	-	-	-	-	-
2	Counselling	100	84	84	101	94	464
3	Physical Examination	-	-	-	-	-	-
4	Sample Collection	-	-	-	-	-	-
5	Dispense of ART/OI Drugs	-	-	-	-	-	-
6	Lab Test	-	-	-	-	-	-
7	White/Green Card update	6	7	7	9	8	37
8	Data Entry /record on software	2	3	7	1	2	14
9	Register Entry/Book Keeping	6	4	6	7	6	29
10	Conversation with staff (direct)	3	4	2	2	3	13
11	Conservation with staff (Indirect)	1	1	2	1	1	5
12	Conversation with patient (Indirect)	1	2	1	2	1	7
13	Counselling with patient (Indirect)	1	2	1	1	1	6
14	Conversation with patient relatives (direct)	2	5	3	2	2	15
15	Conversation with patient relatives (Indirect)	1	1	1	1	1	4
16	Counselling with patient relative (direct)	2	2	1	1	1	6
17	Counselling with patient (Indirect)	1	1	1	0	0	3
18	Conversation with others (direct)	1	1	1	0	1	4
19	Conservation with others (Indirect)	1	1	0	0	0	3
20	Tracking of LFU/MIS/ART	-	3	3	-	1	7
21	Arranging/Monitoring	3	4	8	2	7	24
22	Outreach	1	1	0	0	1	3
23	Travelling/Walking Times	1	2	1	0	2	6
24	Meetings with staff	1	1	1	1	1	5
25	Meeting with Supervisor and other department staff	-	-	-	-	-	-
26	Dispense ARV/OI drugs to patient relatives	-	-	-	-	-	-
27	Consultancy service for other departments	-	1	-	-	-	1
28	Research/Reading	-	-	-	-	-	-
29	Lunch Breaks	12	12	12	12	12	60
30	Leisure	21	22	22	22	22	109
31	Personal Time	1	6	6	1	2	16
	Grand Total	168	168	168	168	168	840

Appendix C.6: Time Allocation of Pharmacist at different ART Centres for One Month, 2017-18 (In hour)

Sl.no	Different Activities	CPI ARTC	Kulikawn ARTC	Kolasib ARTC	Aizawl ARTC	Lunglei ARTC	Total
1	Communication with patient	13	-	-	15	14	42
2	Counselling	25	-	-	36	25	86
3	Physical Examination	-	-	-	-	-	-
4	Sample Collection	-	-	-	-	-	-
5	Dispense of ART/OI Drugs	15	-	-	11	15	41
6	Lab Test	-	-	-	-	-	-
7	White/Green Card update	-	-	-	-	-	-
8	Data Entry /record on software	9	-	-	11	13	33
9	Register Entry/Book Keeping	14	-	-	11	13	37
10	Conversation with staff (direct)	3	-	-	2	3	8
11	Conservation with staff (Indirect)	2	-	-	1	2	5
12	Conversation with patient (Indirect)	3	-	-	2	3	8
13	Counselling with patient (Indirect)	1	-	-	2	2	5
14	Conversation with patient relatives (direct)	6	-	-	6	4	17
15	Conversation with patient relatives (Indirect)	3	-	-	2	2	6
16	Counselling with patient relative (direct)	4	-	-	2	2	8
17	Counselling with patient (Indirect)	2	-	-	1	0	3
18	Conversation with others (direct)	1	-	-	1	1	3
19	Conservation with others (Indirect)	1	-	-	1	1	3
20	Tracking of LFU/MIS/ART	9	-	-	8	10	27
21	Arranging/Monitoring	9	-	-	8	10	27
22	Outreach	-	-	-	-	-	-
23	Travelling/Walking Times	2	-	-	1	2	5
24	Meetings with staff	1	-	-	1	1	4
25	Meeting with Supervisor and other department staff	-	-	-	-	-	-
26	Dispense ARV/OI drugs to patient relatives	8	-	-	8	6	22
27	Consultancy service for other departments	-	-	-	-	-	-
28	Research/Reading	-	-	-	-	-	-
29	Lunch Breaks	12	-	-	12	12	36
30	Leisure	22	-	-	22	22	66
31	Personal Time	3	-	-	5	6	14
	Grand Total	168	-	-	168	168	504

**Appendix C.7: Time Allocation of Data Manager at different ART Centres for One,
Month 2017-18 (In hour)**

Sl.no	Different Activities	CPI ARTC	Kulikawn ARTC	Kolasib ARTC	Aizawl ARTC	Lunglei ARTC	Total
1	Communication with patient	3	9	-	5	2	19
2	Counselling	-	-	-	-	-	-
3	Physical Examination	-	-	-	-	-	-
4	Sample Collection	-	-	-	-	-	-
5	Dispense of ART/OI Drugs	-	3	-	-	-	3
6	Lab Test	-	-	-	-	-	-
7	White/Green Card update	-	-	-	-	-	-
8	Data Entry /record on software	55	31	-	36	50	172
9	Register Entry/Book Keeping	23	22	-	12	23	81
10	Conversation with staff (direct)	7	7	-	4	7	25
11	Conservation with staff (Indirect)	3	1	-	2	1	7
12	Conversation with patient (Indirect)	2	2	-	4	2	10
13	Counselling with patient (Indirect)	-	-	-	-	-	-
14	Conversation with patient relatives (direct)	2	4	-	2	2	10
15	Conversation with patient relatives (Indirect)	2	1	-	3	2	8
16	Counselling with patient relative (direct)	-	-	-	-	-	-
17	Counselling with patient (Indirect)	-	-	-	-	-	-
18	Conversation with others (direct)	2	2	-	1	2	7
19	Conservation with others (Indirect)	1	1	-	1	1	5
20	Tracking of LFU/MIS/ART	10	2	-	22	-	34
21	Arranging/Monitoring	14	31	-	32	31	108
22	Outreach	-	-	-	-	-	-
23	Travelling/Walking Times	4	4	-	4	4	16
24	Meetings with staff	1	1	-	1	1	5
25	Meeting with Supervisor and other department staff	-	-	-	-	-	-
26	Dispense ARV/OI drugs to patient relatives	-	1	-	-	-	1
27	Consultancy service for other departments	-	-	-	-	-	-
28	Research/Reading	-	-	-	-	-	-
29	Lunch Breaks	12	12	-	12	12	48
30	Leisure	22	22	-	22	22	88
31	Personal Time	5	12	-	3	7	27
	Grand Total	168	168	-	168	168	672

Appendix C.8: Time Allocation of Lab-Technician at different ART Centres for One Month, 2017-18 (In hour)

Sl.no	Different Activities	CPI ARTC	Kulikawn ARTC	Kolasib ARTC	Aizawl ARTC	Lunglei ARTC	Total
1	Communication with patient	2	2	-	3	2	9
2	Counselling	-	-	-	-	-	-
3	Physical Examination	-	-	-	-	-	-
4	Sample Collection	12	12	-	20	13	57
5	Dispense of ART/OI Drugs	-	-	-	-	-	-
6	Lab Test	47	45	-	33	47	172
7	White/Green Card update	-	-	-	-	-	-
8	Data Entry /record on software	-	-	-	-	-	-
9	Register Entry/Book Keeping	22	7	-	24	23	76
10	Conversation with staff (direct)	6	2	-	4	4	16
11	Conservation with staff (Indirect)	3	1	-	2	2	7
12	Conversation with patient (Indirect)	3	0	-	1	3	7
13	Counselling with patient (Indirect)	-	-	-	-	-	-
14	Conversation with patient relatives (direct)	2	0	-	1	4	7
15	Conversation with patient relatives (Indirect)	2	0	-	1	3	6
16	Counselling with patient relative (direct)	-	-	-	-	-	-
17	Counselling with patient (Indirect)	-	-	-	-	-	-
18	Conversation with others (direct)	2	2	-	2	1	7
19	Conservation with others (Indirect)	1	0	-	1	0	2
20	Tracking of LFU/MIS/ART	-	-	-	-	-	-
21	Arranging/Monitoring	22	4	-	37	21	83
22	Outreach	-	-	-	-	-	-
23	Travelling/Walking Times	4	5	-	3	4	16
24	Meetings with staff	1	1	-	1	1	5
25	Meeting with Supervisor and other department staff	-	-	-	-	-	-
26	Dispense ARV/OI drugs to patient relatives	-	-	-	-	-	-
27	Consultancy service for other departments	-	44	-	-	-	44
28	Research/Reading	-	-	-	-	-	-
29	Lunch Breaks	12	12	-	12	12	48
30	Leisure	22	22	-	22	22	88
31	Personal Time	5	8	-	3	7	24
	Grand Total	168	168	-	168	168	672

Appendix C.9: Time Allocation of Community Care Coordinator at different ART Centres for One Month, 2017-18 (In hour)

Sl.no	Different Activities	CPI ARTC	Kulikawn ARTC	Kolasib ARTC	Aizawl ARTC	Lunglei ARTC	Total
1	Communication with patient	19	-	-	16	15	50
2	Counselling	25	-	-	31	27	83
3	Physical Examination	-	-	-	-	-	-
4	Sample Collection	-	-	-	-	-	-
5	Dispense of ART/OI Drugs	-	-	-	-	-	-
6	Lab Test	-	-	-	-	-	-
7	White/Green Card update	12	-	-	16	15	43
8	Data Entry /record on software	2	-	-	3	-	5
9	Register Entry/Book Keeping	22	-	-	21	19	62
10	Conversation with staff (direct)	3	-	-	4	4	11
11	Conservation with staff (Indirect)	1	-	-	2	3	6
12	Conversation with patient (Indirect)	3	-	-	4	2	8
13	Counselling with patient (Indirect)	2	-	-	2	2	5
14	Conversation with patient relatives (direct)	6	-	-	7	3	16
15	Conversation with patient relatives (Indirect)	1	-	-	2	2	5
16	Counselling with patient relative (direct)	2	-	-	2	2	6
17	Counselling with patient (Indirect)	1	-	-	1	1	3
18	Conversation with others (direct)	1	-	-	1	3	5
19	Conservation with others (Indirect)	1	-	-	1	3	5
20	Tracking of LFU/MIS/ART	9	-	-	6	8	24
21	Arranging/Monitoring	15	-	-	11	19	44
22	Outreach	-	-	-	-	-	-
23	Travelling/Walking Times	2	-	-	-	3	4
24	Meetings with staff	1	-	-	1	1	4
25	Meeting with Supervisor and other department staff	-	-	-	-	-	-
26	Dispense ARV/OI drugs to patient relatives	-	-	-	-	-	-
27	Consultancy service for other departments	-	-	-	-	-	-
28	Research/Reading	-	-	-	-	-	-
29	Lunch Breaks	12	-	-	12	12	36
30	Leisure	22	-	-	22	22	66
31	Personal Time	3	-	-	5	6	14
	Grand Total	168	-	-	168	168	504

**Appendix C.10: Time Allocation of Nurse at different ART Centres for One Month,
2017-18 (In hour)**

Sl.no	Different Activities	CPI ARTC	Kulikawn ARTC	Kolasib ARTC	Aizawl ARTC	Lunglei ARTC	Total
1	Communication with patient	39	7	6	16	41	108
2	Counselling	3	17	17	7	3	47
3	Physical Examination	31	10	8	34	33	117
4	Sample Collection	1	-	6	-	-	7
5	Dispense of ART/OI Drugs	1	7	6	1	-	15
6	Lab Test	-	-	40	-	-	40
7	White/Green Card update	12	11	7	16	-	46
8	Data Entry /record on software	5	4	4	3	6	22
9	Register Entry/Book Keeping	11	11	10	13	11	56
10	Conversation with staff (direct)	2	3	2	4	4	15
11	Conservation with staff (Indirect)	1	1	1	2	2	7
12	Conversation with patient (Indirect)	2	2	1	3	2	11
13	Counselling with patient (Indirect)	0	2	0	2	-	4
14	Conversation with patient relatives (direct)	2	4	3	7	3	20
15	Conversation with patient relatives (Indirect)	1	1	1	1	1	5
16	Counselling with patient relative (direct)	0	3	1	2	-	6
17	Counselling with patient (Indirect)	0	1	0	1	-	2
18	Conversation with others (direct)	1	2	1	1	1	6
19	Conservation with others (Indirect)	0	1	0	0	1	3
20	Tracking of LFU/MIS/ART	-	10	3	4	4	22
21	Arranging/Monitoring	10	18	7	11	10	56
22	Outreach	-	-	-	-	-	-
23	Travelling/Walking Times	1	2	0	-	4	7
24	Meetings with staff	1	1	1	1	1	5
25	Meeting with Supervisor and other department staff	-	-	-	-	-	-
26	Dispense ARV/OI drugs to patient relatives	1	4	3	1	-	10
27	Consultancy service for other departments	-	-	-	-	-	-
28	Research/Reading	-	-	-	-	-	-
29	Lunch Breaks	12	12	12	12	12	60
30	Leisure	22	22	22	22	22	110
31	Personal Time	5	12	6	5	6	34
	Grand Total	168	168	168	168	168	840

Appendix C.11

CAPITAL EXPENDITURE UNDER ICTC

The items included in capital expenditure under ICTC are as follows:

1. Furniture and Supplies

Computer Chair, Carpet Roll, Table, Steel Almirah, Chair, Display Table Almirah, Plastic Chair, Cupboard, Computer Table, Drawer, Almirah Long Table big, Table for lab-test, Chair with cushion, Godrej Almirah small Godrej Interio almirah small, Shelf-three Storeys, Wooden shelf with drawer Revolving chair, Table Godrej, Table for TV, Godrej drawer four-storeys, five-storeys open shelf, leather Chair, Godrej Interio Almirah Small, Stool Steel, Leaflet Drawer with wooden cabinet, Godrej almirah five-storeys.

2. Equipment and Instrument

Centrifuge, Refrigerator, Rotary Shaker Remi, Accupipette Tarsons, Rotary Shaker Remi, Auto pipette, Auto pipette, Refrigerator Haier, Centrifuge Remi Stopwatch Loudstar, Refrigerator Samsung, Samsung Fridge, LG refrigerator

3. Office Equipment

Computer Set, Television, Stabilizer, Computer, Monitor, UPS, Keyboard, Table Fan, Computer View Sonic, DVD Sony, Television SONY, Jio-Fi Reliance Retail Ltd, Top Glass, Notice Board, Wall Clock, Dustbin General, Dust-bin Infectious, Dustbin-Anatomical Infectious, Filter, Fan, Notice Board Small, UPA, DVD Player, Stabilizer, First Aid Kit, Spill Kit, Bajaj BP-07 Fan, White Board, Heater, Wall Clock, Polycab Fan

Appendix C.12

RECURRENT EXPENDITURE UNDER ICTC

The items included in recurrent expenditure under ICTC are as follows:

1. Staff Salaries

Annual gross salary of all staff in the ICTC

2. Consumable Supplies

Syringe 2ml, Syringe 5ml, Examination Glove, Tissue Paper, Cotton Roll
Spirit, Microtips (Small), Plain Vial & Serum Vial, EDTA Vial, Test Tube
Sodium Hypochloride , Distilled Water, TRIDOT, Needles Accuvet, Coomb
Serum, Meri, Comb AIDS, AIDSCAN, VDRL, EID KIT

3. Buildings maintenance

Building, Universal Work Precaution, Electricity

4. Operating costs

Contingency, Telephone & Internet, Printing and Stationaries,

Appendix C.13

CAPITAL EXPENDITURE UNDER ARTC

The items included in capital expenditure under ARTC are as follows:

1. Furniture and Supplies

Steel Almirah, plastic chair, benches, revolving chair, cabinet, table, patient examination table with mattress, patient examination table, plastic rack, computer table, benches, curtain, table, Almirah small, Godrej Interio almirah, Examination bed, Plastic shelf two storeys, Godrej Interio shelf four storeys, Godrej Table, Wooden chair small, Plastic shelf three-storey, Godrej Interio almirah, Wooden long chair, Filing Cabinet, Cupboard, Drawer

2. Equipment and Instrument

Refrigerator, stethoscope, BP instruments, knee hammer, weighing machine, autoscope, needle destroyer, CD-4 Machine, Godrej Fridge, Refrigerator LG, Refrigerator Samsung, Micro-pipette, Rotary Shaker, Centrifuge, Rotary Shaker, Stopwatch/timer, CD-4 BD Facs Count Machine, BP Set, Top Glass

3. Office Equipment

Television, computer, printer, filter, fax machine, visiontek 3G Data Card, honda PVC-300 water pump, Toshiba external Hard Disk 500GB, Sony Still Camera DSW-w650, Ajanta Wall Clock, Desktop Computer, Computer Monitor, UPS 600 VA, Sign Board, White Board, Suggestion Box, Notice Board, Computer Set, Stabilizer, Filter pure, Dust bin, Brite container, Fan, Dust bin 500lt, Mobbing machine, Wooden notice board, DVD Player, JioFi

Appendix C.14

RECURRENT EXPENDITURE UNDER ARTC

The items included in recurrent expenditure under ARTC are as follows:

1. Staff Salaries

Annual gross salary of all staff in the ARTC

2. Consumable Supplies

Vacutainer (EDTA), Syringe 2 cc, Syringes 5 cc, Alere Pima Cartridges, Delivery Kit, Gloves, Spirit, Tissue Paper, Vacutainer, Cotton Wool (Roll), Sodium Hydrochlorite, CD-4 Reagent (Tests), VDRL & RPR, Plain Vial/Serum Vial, Distilled water, Insulin, COMB AIDS, Microtips (small)

3. ARV Drugs

Tenofovir + Lamivudine + Efavirenz, Zidovudine + Lamivudine + Nevirapine, Zidovudine + Lamivudine, Tenofovir+ Lamivudine, Efavirenz 600mg (tab), Nevirapine 200mg, Atazanavir 300mg + Ritonavir 100mg, Lopinavir/Ritonavir (200/50), ABC600mg+3TC300mg, Raltegravir, Ritonavir, Darunavir, Zidovudine + Lamivudine + Nevirapine (paed), Zidovudine + Lamivudine (paed), Abacavir 3TC (paed), Efavirenz 200 mg(Tab), Nevirapine 50 mg, Lopinavir/Ritonavir 125, Lopinavir/Ritonavir syrup

4. Buildings maintenance

Building, Universal Work Precaution, Electricity etc.

5. Operating costs

Contingency, Telephone & Internet, Cartridges, Postal Courier (relocation of drugs), Printing and Stationaries, Local Conveyance

Appendix C.15: Expenditure of ICTC during 2017-18 (In Rupees)

	Item	Champhai	Kulikawn	Kolasib	Aizawl	Lunglei	Total
Capital Expenditure	Furnitures and Supplies	6,397.60	4,423.90	3,815.80	10,193.00	8,510.80	33,341.10
	Equipment and Instrument	19,214.90	6,030.00	6,030.00	1,96,642.90	7,565.00	2,35,482.80
	Office Equipment	9,389.40	4,670.00	4,670.00	15,935.00	18,670.00	53,334.40
	Total Capital	35,001.90	15,123.90	14,515.80	2,22,770.90	34,745.80	3,22,158.30
Recurrent Expenditure	Salary	3,21,325.00	3,24,500.00	3,37,885.71	8,59,542.86	3,35,067.86	21,78,321.43
	Consumables	1,20,920.70	28,948.00	38,732.50	11,96,702.24	89,715.12	14,75,018.56
	Buildings maintenance	18,000.00	3,500.00	9,000.00	22,000.00	20,000.00	72,500.00
	Operating costs	10,700.00	1,500.00	1,500.00	15,800.00	10,700.00	40,200.00
	Total Recurrent	4,70,945.70	3,58,448.00	3,87,118.21	20,94,045.10	4,55,482.98	37,66,039.99
	Grand Total	5,05,947.60	3,73,571.90	4,01,634.01	23,16,816.00	4,90,228.78	40,88,198.29

Source: Author's calculation

Annexure D.1

SURVEY QUESTIONNAIRE (ICTC)

Name of the Supervisor

Dr. S Sandhya

Professor

School of Economics

University of Hyderabad

Name of the Research Scholar

Juliet F Lalzarzoliani

Ph.D. Scholar

School of Economics

University of Hyderabad

(Confidential and for research purpose only)

Section 1: Identification of the ICTC Centre

1.1. District of the ICTC: _____

1.2. Location of the ICTC: _____

1.3. Type of ICTC (Fixed-facility/Stand-alone//Facility Integrated/Mobile ICTC):

1.4. Year of initiation:

1.5. Date:

Section 2: Strength of ICTC Centre

Sl no.	Designation	Tick	No. of staff
1	SMO		
2	MO		
3	Counsellor		
4	Lab. Technician		
5	Outreach Workers		
6	ANM/staff nurse		
7	Driver		
8	Attendant/Cleaner		
9	Others (Specify)		

Section 3: Information on building and facilities

Sl.	Room uses	No. of room	Sq.feet	Type of building	Whether rent is given or shared with CH
1					
2					
3					

Section 4: Information of test done during the financial year 2017-2018

(According to the ICTC Register Entry)

General Clients	Male	Female	Total
No. of Blood tested			
PPTCTC	Male	Female	Total
No. of Blood tested			
Mode of transmission	Male	Female	Total
Sexual Contact			
IDU's			
Perinatal			
Others			
Total			
Age Group Proportion of HIV Positive	Male	Female	Total
0-14			
15-24			
25-34			
34-49			
50+			
Total			
PPTCTC	Male	Female	Total
No. of blood tested			
No. of HIV Positive			
Positive Delivery			
HIV+ partner tested			
HIV+			

Section 5: Information of fixed assets records

(From the initiation of the ART Centre till the financial year 2017-18)

Sl.	Year	Item	Qty	Purchase by	Cost (a)	Salvage Value (b)	Estimated Lifetime (c)	Cost = (a-b) ÷ (c) × Lifetime used
1								
2								
3								
4								

Section 6: Information on supply of information, education and communication (IEC) materials records.

(From the initiation of the ART Centre till the financial year 2017-18)

Sl.	Item	Issue month / Year	Issue by	No. of units Used/ Issue (a)	Unit Price (b)	C= (a) x (b)
1						
2						
3						
4						
5						

**Section 7: Information of Consumables such as Chemicals, Spare Parts, etc.
during the financial year 2017-2018**

Sl.	Item	Issue month	Issue by	No. of units Used/ Issue (a)	Unit Price (b)	C= (a) x (b)
1	Syringe 2ml					
2	Syringe 5ml					
3	Examination Glove					
4	Tissue Paper					
5	Cotton Roll					
6	Spirit					
7	Microtips (Small)					
8	Plain Vial & Serum Vial					
9	EDTA Vial					
10	Test Tube					
11	Sodium Hypochlorite (5 Litres)					
12	Distilled Water (5 Litres)					
13	Glass Slide					
14	Anti-ABD					
15	Dotted Condom					
14	TRIDOT					
15	Needles Accuvent					
16	Insulin					
17	Pediatric Blood Bag					
18	Coomb Serum					
19	K ₂ Vacutainer					
20	Delivery Kit					
21	Plaster					
22	Hyphal Plaster					
23	Betadine					
24	Betadine Ointment					
25	Dettol 500ml					
26	Centrifuge					
27	Needle destroyer					
28	Micropipette					
29	Color-coded waste disposal bins					
30	Other Specify					

**Section 8: Information on operational costs during the following financial year
(Financial report of the ICTC Centre)**

Financial Support per annum	2015-16	2016-17	2017-18
Consumables			
Reagents			
Stationary			
POL (including fuel for generator)			
Vehicle insurance			
Vehicle maintenance			
Others			
Financial Support one time	Details		2017-2018
Contingency for purchase of vehicle			
Contingency for body works (exterior and interior, furniture and equipment including generator)			
Equipment for laboratory			
Supply of rapid HIV diagnostic kits			
Training of staff in HIV counseling and testing (No. of training			
External quality assurance scheme (EQAS) for HIV testing			
Supply of protective kits for delivery of HIV-positive pregnant women			
Supply of PEP drugs for protection of staff in the event of accidental exposure			
Supply of IEC materials required for an ICTC such as flip charts, posters, take-home materials and condom demonstration models			

Section 9: Time allocation of different categories of ICTC staff

(a) Counsellor

Sl.no of clients	Whether General Clients or ANC	Time spent on Pre-test counselling	Time spent on pre-test form registration	Time spent on post-test counselling	Time spent on Post-test results registration	Time spent on follow-up counselling	Time spent on partner counselling	Time spent on referrals	Other (Specify)
1									
2									
3									

Section 9: Time allocation of different categories of ICTC staff

(b) Lab Technician

Sl.no of clients	Time spent on client's entry	Time spent on specimen collection	Time spent on HIV rapid test following algorithm	Waiting time for laboratory results	Time spent on test results records	Time spent on Laboratory maintenance	Time spent on referrals	Other (Specify)	Other (Specify)
1									
2									

Section 10: Information on visitor/clients during the following one week.

Date	No. test	No. of General Clients	No. of ANC	No. of Pre-test counselling	No. of Post-test counselling	No. of follow-up counselling	No. of partner counselling	No. of referrals	No. of HIV positive

Section 11: Visitor during the financial year 2017-18

(According to the ARTC Register Entry File)

Months	No. of visitor	Male	Female	Pedia
April 2017				
May 2017				
June 2017				
July 2017				
August 2017				
September 2017				
October 2017				
November 2017				
December 2017				
January 2018				
February 2018				
March 2018				
Total				

Section 12: Flowchart of function and work Organization of ICTC

Section 13: Time allocation of different categories of ICTC staff

(a) Laboratory Technician (b) Counsellor

Sl .no	Activities	8:00 AM	8:30 AM	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM
1	Communication with patient																	
2	Pre-Test Counselling																	
3	Post-Test Counseling																	
4	Follow-up Counseling																	
5	Partner/Group Counseling																	
6	Physical Examination																	
7	Sample Collection																	
8	Dispense of ART/OI Drugs																	
9	Lab Test																	
10	White/Green Card update																	
11	Data Entry /record on software																	
12	Register Entry/Book Keeping																	
13	Conversation with staff (direct)																	
14	Conservation with staff (Indirect)																	
15	Conversation with patient (Indirect)																	

16	Counselling with patient (Indirect)	
17	Conversation with patient relatives (direct)	
18	Conversation with patient relatives (Indirect)	
19	Counselling with patient relative (direct)	
20	Counselling with patient (Indirect)	
21	Conversation with others (direct)	
22	Conservation with others(Indirect)	
23	Tracking of LFU/MIS/ART	
24	Arranging/Monitoring	
25	Outreach	
26	Travelling/Walking Times	
27	Meetings with staff	
28	Meeting with Supervisor and other department staff	
29	Dispense ARV/OI drugs to patient relatives	
30	Consultancy service for other departments	
31	Research/Reading	
32	Lunch Breaks	
33	Resting	
34	Personal Time	

Annexure D.2
SURVEY QUESTIONNAIRE (ARTC)

Name of the Supervisor	Name of the Research Scholar
Dr. S Sandhya	Juliet F Lalzarzoliani
Professor	Ph.D. Scholar
School of Economics	School of Economics
University of Hyderabad	University of Hyderabad

(Confidential and for research purpose only)

Section 1: Identification of the ART Centre

1. District of the ART Centre: _____
2. Location of the ART Centre: _____
3. Type of ART Centre (ART Plus/Centre/Link/Facility Integrated): _____
4. Year of initiation: _____
5. Availability of CD4 testing Facility within the centre/hospital (Yes/No): _____
6. If Q.5 is No, where are the CD4 testing done: _____
7. Availability of Viral Load Test within the centre/hospital (Yes/No): _____
8. If Q.7 is No, where are the Viral Load testing done: _____
9. Date: _____

Section 2: Strength of ART Centre

Sl no.	Designation	Tick	No. of staff
1	SMO		
2	MO		
3	Counsellor		
4	Lab. Technician		
5	Data Manager		
6	Staff nurse		
7	Care Coordinator		
8	Inst. Nurse		
9	Others (Specify)		

Section 3: Information of the ART Centre

	Indicators	2013-14	2014-15	2015-16	2016-17	2017-18
1	PLHIV registered in HIV Care (Pre ART)					
2	PLHIV currently alive & on first-line ART					
3	PLHIV currently alive & on second-line ART					
4	CLHIV registered in HIV Care (Pre ART)					
5	CLHIV currently alive & on ART					
6	Pregnant Women initiated on ART					
7	HIV-TB Co-infected patients initiated on ART					
8	Number of PLHIV on ART Linked out to LAC					
9	OI Treated					
10	Number of LFU patients (Pre-ART after 1st Jan 2011)					
11	Number of LFU patients (On-ART)					
13	Number of deaths reported (Pre-ART)					

Comments:

Section 4 (A): Information on CD-4 Test

No. of CD-4 Test	2015-2016	2016-2017	2017-2018
April			
May			
June			
July			
August			
September			
October			
November			
December			
January			
February			
March			
Total			

Section 4 (B): Information on Viral Load Done

VL Copies/ml Month	<1000	>1000	Total	1	2	3	4	5	6	7	8
April											
May											
June											
July											
August											
September											
October											
November											
December											
January											
February											
March											
Total											

*1=Pregnant(ANC),
 *2=Immunological failure,
 *3=Key Population,
 *4=Patient on 2nd Line,

*5=Female,
 *6=Male,
 *7=Below 18,
 *8=TND

Section 5: Antiretroviral Drugs (Direct Costs)

	Drugs name	No. consumed during the financial period 2017-18	No. of drugs that expired during the financial period 2017-18	No. of drugs in stock during the financial period 2017-18	No. of relocated drugs during the financial period 2017-18	Unit Cost of drugs and tariffs (If any)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

*TLE= Tenofovir+Lamivudine+Efavirenz; ZLN= Zidovudine+Lamivudine+Nevirapine; ZL= Zidovudine+Lamivudine; EFV= Efavirenz 600mg; TL=Tenofovir+Lamivudine; NVP= Nevirapine 200g; ATV/r = Atazanavir+Ritonavir; LPV/r = Lopinavir + Ritonavir

Section 6: Information on operational costs during the following financial year (Financial report of the ART Centre)

Contingency/Funds	2014-15	2015-16	2016-17	2017-18
Contingency/Funds				
Electricity etc.				
Telephone & Internet				
Cartridges				
Postal Courier (relocation of drugs)				
Printing and Stationaries				
Local Conveyance				
Other Universal Work Precaution				
CD4 Consumables				

Section 7: Information on building and facilities

Sl.	Room uses	No. of room	Sq.feet	Type of building	Whether rent is given or shared with CH
1					
2					

Section 8: Information of fixed assets records

(From the initiation of the ART Centre till the financial year 2017-2018)

Sl.	Year	Item	Qty	Purchase by	Cost (a)	Salvage Value (b)	Estimated Lifetime (c)	Cost = (a-b) ÷ Cost × Lifetime used
1								
2								
3								
4								
5								

Section 9: Information of Consumables (Stationary, Chemicals, Spare Parts, etc.)

SL	Year	Item	No. of units Used/ Issue (a)	Issue to/by	Unit Price (b)	Balance
1						
2						
3						
4						
5						

Section 10: Visitor during the financial year 2017-18
(According to the ARTC Register Entry File)

Months	No. of visitor	Male	Female	Pedia	Pre-ART	ART
April 2017						
May 2017						
June 2017						
July 2017						
August 2017						
September 2017						
October 2017						
November 2017						
December 2017						
January 2018						
February 2018						
March 2018						
Total						

Section 11: Flowchart of function and work organization of ART Centre

Section 12: Information on visitor/clients during the following one week

Date	No. of Clients	Male	Female	Pedia	Pre-ART	LFU	Collecting ART Follow-up	No. of referrals

Section 13: Time allocation of different categories of ARTC staff

(a) SMO
(b) MO

(c) Counsellor
(d) Pharmacist

(e) Data Manager
(f) Laboratory Technician

(g) Staff Nurse
(h) Care Coordinator

l.no	Activities	8:00 AM	8:30 AM	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM
1	Communication with patient																	
2	Counselling																	
3	Physical Examination																	
4	Sample Collection																	
5	Dispense of ART/OI Drugs																	
6	Lab Test																	
7	White/Green Card update																	
8	Data Entry /record on software																	
9	Register Entry/Book Keeping																	
10	Conversation with staff (direct)																	
11	Conservation with staff (Indirect)																	
12	Conversation with patient (Indirect)																	
13	Counselling with patient (Indirect)																	
14	Conversation with patient relatives (direct)																	

15	Conversation with patient relatives (Indirect)	
16	Counselling with patient relative (direct)	
17	Counselling with patient (Indirect)	
18	Conversation with others (direct)	
19	Conservation with others(Indirect)	
20	Tracking of LFU/MIS/ART	
21	Arranging/Monitoring	
22	Outreach	
23	Travelling/Walking Times	
24	Meetings with staff	
25	Meeting with Supervisor and other department staff	
26	Dispense ARV/OI drugs to patient relatives	
27	Consultancy service for other departments	
28	Research/Reading	
29	Lunch Breaks	
30	Resting	
31	Personal Time	
	Total	

.....

Annexure E.1: Approval from Mizoram State AIDS Control Society



**OFFICE OF THE PROJECT DIRECTOR
STATE AIDS CONTROL SOCIETY
MIZORAM : AIZAWL**



B-50, J. Lalsangzuala Building,
Mission Veng, Aizawl, Mizoram – 796005

Ph: 0389-2321556
E-mail: mizoramsacs@gmail.com

No.D.12019/1/2018-MSACS(Research)

Dated Aizawl, the 15th Jan 2018

OFFICE ORDER

In the interest of public service, Ms. Juliet F.Lalzarzoliani, a student of PhD Economics and is working on her PhD thesis entitled "The Economic Cost of HIV/AIDS in Mizoram" is given the permission to collect secondary data from MSACS, Secondary & Primary data from ART Centres and to interview ART Staff excluding all personal identifiers. Alongwith this, she is permitted to collect MSACS Staff List and she is instructed not to share out all the datas collected beyond her thesis project.

Sd/-DR.LALMALSAWMI SAILO
Project Director
State AIDS Control Society
Mizoram : Aizawl

No.D.12019/1/2018-MSACS(Research)

Dated Aizawl, the 15th Jan 2018

Copy to :

1. Program Officers/Concerned Officers
2. Head Assistant, MSACS for information
- ✓ 3. Concerned person


Project Director
State AIDS Control Society
Mizoram : Aizawl

Annexure E.2: Approval from Civil Hospital, Aizawl



OFFICE OF THE MEDICAL SUPERINTENDENT
CIVIL HOSPITAL, AIZAWL.
(ISO 9001-2008 CERTIFIED HOSPITAL)
email : civilhospital.iso@gmail.com

12.11.19
M. V.
H. A.

OFFICE ORDER

Juliet F. Lalzarzoliani, PhD Scholar of School of Economics, University of Hyderabad is hereby allowed to collect the necessary secondary and primary data from Civil Hospital, Aizawl for the fulfilment of her research.

Sd/- DR. LALH MUCHHUAKA
Medical Superintendent,
Civil Hospital, Aizawl.

Memo No.D.12017/14/2011-MS/128

:

Dated Aizawl, the 10th April, 2019

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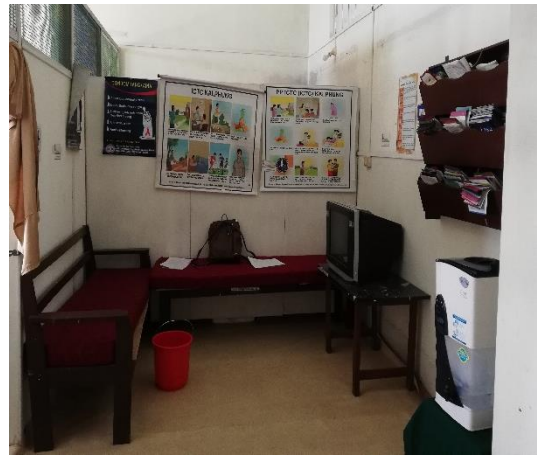
1. HoD Microbiology, Civil Hospital, Aizawl for information and necessary action.
2. Dr. Christina Lalnuntluangi Senior Medical Officer, ART Centre, Civil Hospital, Aizawl for information and necessary action.
3. Senior Medical Record Officer, Civil Hospital, Aizawl for information and necessary action.
4. ~~Person concerned.~~
5. Office order book.


Medical Superintendent,
Civil Hospital, Aizawl.

Annexure F.1: Photos from fieldwork



Entrance towards Lunglei district ART Centre



Waiting Hall of Lunglei ICTC



Leaflet box with HIV awareness materials at Lunglei ICTC



Leaflet with information for parents, caregivers, facts about anti-retroviral treatment (ART) and care for HIV infected children



Lunglei ICTC Laboratory for HIV screening and testing

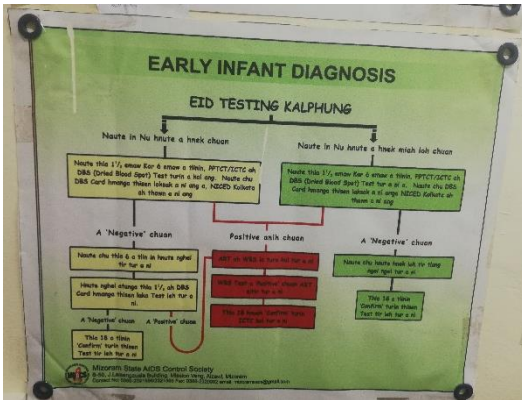
Annexure F.2: Photos from fieldwork



CD4 Testing Room, Aizawl ARTC, Civil Hospital



Lab. Technician Room at Prevention to Parent to Child Transmission (PPTCT) Centre, Aizawl



Poster of 'Early Infant HIV Diagnosis Procedure' instructed in the local (Mizo) language available at every ICTC and PPTCT Centres



Lab. Technician Room at Kolasib District ICTC



A distant view of District Hospital, Kolasib where the signboard of 'Linked ART Centre' and 'ICTC' reflects courage, peace & strength

Annexure G.1: Conference Presentation Certificate

NATIONAL SEMINAR
ON
Maternal and Child Health in India: Issues and Challenges
(15th & 16th November, 2018)

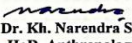
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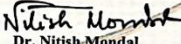
Certificate of Appreciation

This is to appreciate the participation Prof/Dr./Mr./Ms. JULIET F. LALZARZOLIANI of
School of Economics, University of Hyderabad in the National Seminar
on "Maternal and Child Health in India: Issues and Challenges" held on 15th & 16th November, 2018 and acknowledge his/her contribution in
delivering the Key Note Address/ a Plenary Lecture/ as a Session Chair/ Resource Person/ Presenting a Paper/ Participant.

The topic of his/her presentation was The Current Health Scenarios of
Mother to Child Transmission (MTCT) of HIV in India:
A Systematic Review.


Prof. Sivasish Biswas
Pro-Vice Chancellor
Assam University, Diphu Campus


Dr. Kh. Narendra Singh
HoD, Anthropology &
Convener, National Seminar

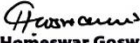

Dr. Nitish Mondal
Organising Secretary
National Seminar

21ST ANNUAL CONFERENCE
NORTH EASTERN ECONOMIC ASSOCIATION (NEEA)
14th and 15th February 2020

Certificate

This is to certify that Dr./Mr./Ms. JULIET F. LALZARZOLIANI
has participated/presented a paper entitled DISTRIBUTION OF EXPENDITURE OF MIZORAM STATE
AIDS CONTROL SOCIETY ACROSS MAJOR ACTIVITIES
in the 21st Annual Conference of NEEA on Achieving Sustainable Development Goals in North Eastern
Region of India organised by Department of Economics, Manipur University.


Prof. Homeswar Goswami
President, NEEA


Prof. Ksh. Rajjit Singh
Chairperson, Organising Committee
& Head, Department of Economics

Annexure G.2: Paper publication

Empirical Economics Letters, 20(4): (April 2021)

ISSN 1681 8997

Distribution of Expenditure of the National AIDS Control Programme-IV across Major Activities in Mizoram, India

Juliet F Lalzarzoliani^{*} and Srigiriraju Sandhya^{**}

*School of Economics, University of Hyderabad
Hyderabad, Telangana, India*

Abstract: HIV/AIDS is globally one of the most severe health and development challenges. In India, the National AIDS Control Organisation (NACO) formulated policy and formed the State AIDS Control Society (SACS) to implement its plans at the state level. The National AIDS Control Programme IV (NACP-IV) was started to accelerate the reversal process and strengthen the country's HIV epidemic response. Mizoram's HIV prevalence rate continues to rise since the beginning of the NACP-IV plan, almost four times higher than the national average. The study examines the distribution pattern of expenditure of the State AIDS Control Society (SACS) of Mizoram by function/component under the National AIDS Control Programme IV. Data are collected from the NACO Statutory Audit Report and SACS Main Budget Activity Reports to examine the distribution of costs to various activities using the cost accounting method. The distribution pattern of actual expenditure is classified into the NACP-IV five key strategies/components. The analysis shows that almost seven-tenths of the expenditure is concentrated directly on preventive services and one-fifth on capacity building for institutional strengthening. Nearly 61 percent of the preventive services are used for High-risk groups (HRGs), of which 47 percent accounts for Injecting Drug Use (IDU) among the HRGs. These outcomes indicate the high concentration of expenditure on HRGs-IDU strategies. The study findings recommend expanding the Information, Education and Communication (IEC) services in reaching out to the HRGs and the general population.

Keywords: NACP-IV, Expenditure, HIV/AIDS, Prevention Services, High-risk-Groups

1. Introduction

India has a 2.1 million HIV infected population in 2017 and currently the third-largest country with the epidemic globally (UNAIDS, 2018). According to NACO HIV Estimates 2017, the adult HIV prevalence rate was estimated at 0.2 percent for the country. In India, around 87.58 thousand new HIV infection cases were estimated in 2017, showing a 27 percent declined between 2010-17 (National AIDS Control Organization, 2020). In Mizoram, the HIV cases keep rising from 2.9 percent to 4.4 percent during 2014-18 with an increase in transmission through Injecting Drug Use (IDU) (Mizoram State AIDS

^{*} Ph.D. Research Scholar, Email: juliet.fanai.woofy@gmail.com

^{**} Professor, Email: srigiriraju10@yahoo.com

Annexure G.3: Plagiarism Report

The Burden of Hiv/Aids in India and its Cost of Services in Mizoram

by Juliet F Lalzarzoliani

Submission date: 28-Jun-2021 03:43PM (UTC+0530)

Submission ID: 1613247148

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