

HIV population screening and early treatment

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Date: Sept 21, 2020

Date modified: September 17, 2021

Interventions included in this evidence brief are:

1. Community-based HIV education and testing services, including referral to care
2. HIV education and counselling for MARPS
3. Household HIV testing and linkage to ART
4. Provider HIV, STI, Hepatitis testing and linkage to care
5. HIV treatment
ART first- line
ART for HIV, no TB

Description of condition and intervention

Human immunodeficiency virus (HIV) is a major global public health problem, having claimed 36.3 million lives. In 2020, 6,80,000 people died from HIV related causes and 1.5 million people acquired new HIV infections (WHO 2020). HIV is an infection that attacks mainly the body's immune system. It attacks the white blood cells (WBCs) called CD4 cells. HIV destroys CD4 cells and weakens the immunity of a person. Infection of HIV leads to many opportunistic infections, such as tuberculosis, fungal infections, bacterial infections, and cancers (WHO 2021). Advanced stage of HIV infection is acquired immunodeficiency syndrome (AIDS). AIDS takes many years

to develop, depending on the individual and treatment. The symptoms of HIV depend upon the stage of infection. People with HIV are more prone to infections in the first few months after being infected, many are unaware of their status until the later stages. The infection progressively weakens the immune system; other signs and symptoms may develop, such as swollen lymph nodes, weight loss, fever, diarrhoea, and cough. Without treatment, patients could also develop severe illnesses such as tuberculosis (TB), cryptococcal meningitis, severe bacterial infections, and cancers.

HIV testing can be conducted for surveillance, diagnosis, or blood screening purpose. In low- and middle-income countries (LMICs) HIV testing is conducted as part of seroprevalence surveys among the population such as pregnant women attending antenatal clinics, patients with STIs, female sex workers, or injection drug users (IDUs). National population-based surveys are also conducted for HIV surveillance. Early treatment of HIV can be managed by treatment regimens which are composed of 3 or more antiretroviral (ARV) drugs. The current antiretroviral therapy (ART) suppresses viral replication and allows an individual's immune system recovery to strengthen the capacity to fight with opportunistic infections and some cancers as well. WHO recommends that all people living with HIV should be provided with lifelong ART, including children, adolescents, adults and pregnant and breastfeeding women, regardless of clinical status or CD4 cell count (WHO 2021).

International guidelines

Organization	Indications/recommendations	Applicability in LIC & Lower MIC settings
WHO	Consolidated guidelines on HIV prevention, testing, Treatment, service Delivery and monitoring: Recommendations for a Public health approach	Yes

Source: WHO July 2021

Intervention attributes

Type of interventions & Delivery platform

Table 1: Type of interventions & delivery platform

Intervention	Type	Delivery platform
1. Community-based HIV education and testing services, including referral to care	Diagnostic	Community
2. HIV education and counselling for MARPS	Preventive	Community
3. Household HIV testing and linkage to ART	Diagnostic	Community
4. Provider HIV, STI, Hepatitis testing and linkage to care	Diagnostic	Health centre
5. HIV treatment	Chronic management care	Health centre

Equity

In addition to considerations like cost-effectiveness and health systems factors, dimensions of equity can be relevant for priority setting. The opportunity for a long and healthy life varies according to the severity of a health condition that individuals might have, so there are inequities in individuals' opportunities for long and healthy lives based on the health conditions they face. Metrics used to estimate the severity of illness at an individual level can be used to help prioritize those with less opportunity for lifetime health. FairChoices: DCP Analytics Tool uses Health adjusted age of death (HAAD), which is a metric that estimates the number of years lived from birth to death, discounting years lived with disability. A high HAAD thus represents a disease less severe in terms of lifetime health loss, while a low HAAD represents a disease that is severe on average, causing early death or a long period of severe disability. It is also possible to estimate the distribution of HAAD across individuals with a health condition. FairChoices shows for each intervention an average HAAD value of the conditions that are affected by respective interventions that have health effects. Additionally, a plot shows HAAD values for around 290 conditions (Johansson KA et al 2020).

Time dependence

Moderate level of urgency. Treatment outcomes not highly affected by some days of delay.

Population in need of interventions

Table 2: Population in need of interventions

Intervention	Treated population		Affected population	
	Treated age	Treated fraction	Affected age	Affected fraction
Community-based HIV education and testing services, including referral to care	15 to 49 years both genders; prevalence based	HIV; No HF	No effects considered for diagnostic interventions	
HIV education and counselling for MARPS	15 to 99 years both genders; all	HIV; No condoms; STI risk		
Household HIV testing and linkage to ART	15 to 49 years both genders; prevalence based	HIV; No HF		
Provider HIV, STI, Hepatitis testing and linkage to care	15 to 99 years both genders; prevalence based	Hiv testing complicated		
HIV treatment ART first line (with no TB)	0 to 99 years both genders; Prevalence	0.96 (Boettiger et al 2016)	0 to 99 years both genders	0.96

Disease state addressed

The interventions listed here are specific to HIV/AIDS resulting in other diseases, and do not include interventions for HIV/AIDS related comorbidities such as tuberculosis infections, which are discussed in the tuberculosis management sections.

Intervention effect and safety

Table 3: *Effect and safety of interventions for HIV/AIDS*

Effect of intervention		Certainty of evidence
Mortality		
HIV treatment ART first-line	Two RCTs found a significantly lower risk of progression to AIDS or death among patients initiating ART treatment early when compared to patients who deferred treatment. One of these studies ART initiated CD4 ≤ 250 cells/mm ³ in delayed group. RR=0.48 (0.26-0.91) (WHO HIV 2013)	See appendix

Model assumptions

Table 4: *Summary of model parameters and values used in FairChoices – DCP Analytical Tool*

Category	Model parameter	Notes
Interventions	1.Community-based HIV education and testing services, including referral to care 2.HIV education and counselling for MARPS 3.Household HIV testing and linkage to ART 4.Provider HIV, STI, Hepatitis testing and linkage to care 5.HIV treatment ART first- line, no TB	
Cost calculation		
Treated population	See Table 2	Epidemiological data from Global Burden of Disease Study 2019
Effect calculation		
Affected population	See Table 2	
Affected fraction		

Comparison	No intervention	
Mortality Reduction (RRR) ART for HIV, no TB	0.52 (WHO HIV 2013)	

Intervention cost

The cost for community-based HIV education and testing services, including referral to care, is estimated to be \$20.83 per client tested in 2007 USD in Kenya (Grabbe 2010). The price is calculated as an average of cost per client tested at mobile HCT (\$14.91) and stand-alone HCT (\$26.75.)

The cost of HIV education and counselling for MARPS is estimated to be BDT 15.35 per person-year in a specified population in 2011 in Bangladesh, using the cost for counselling pregnant women as a proxy (Sarker et al 2013).

The cost for household HIV testing and linkage to ART is estimated to be \$5.88 per person-year in specified population in 2007 USD in Kenya (Negin, Wariero , Mutuo , Jan , Pronyk 2009).

The cost for provider HIV, STI, Hepatitis testing, and linkage to care is estimated to be \$9.36 per client population in 2009 USD in Swaziland. The cost was calculated as the mean cost per client C&T for Swaziland provider-initiated testing and counselling (PITC), averaged for health centres (\$11.79) and public health units (\$6.92.) (Obure et al 2012).

The cost of HIV treatment is estimated to be \$ 157 per person-year in specified population in 2015 USD in Nigeria (facility weighted national average of ART cost) (Bautista-Arredondo 2018).

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Appendix

Literature Review for effectiveness & safety

This literature search is an example of Level 1 search for intervention inputs taken from DCP3 or generated in an ad hoc manner (e.g., quick google search found one study of cervical cancer screening cost-effectiveness that was used to create an effectiveness parameter for that intervention).

Level of evidence of efficacy studies:

1. low (expert opinions, case series, reports, low-quality case control studies)
2. moderate (high quality case control studies, low quality cohort studies)
3. high (high quality cohort studies, individual RCTs)
4. very high (multiple RCTs, metaanalysis, systematic review, clinical practice guidelines)

An overview of interventions in this cluster, with interventions included in evidence brief highlighted in bold:

HIVSTI01	HIV population screening and early treatment
HIVSTI01-01	Community-based HIV education and testing services, including referral to care
HIVSTI01-02	HIV education and counselling for MARPS
HIVSTI01-03	Household HIV testing and linkage to ART
HIVSTI01-04	Provider HIV, STI, Hepatitis testing and linkage to care
HIVSTI01-05	HIV treatment
HIVSTI01-05-01	ART first-line
HIVSTI01-05-01-01	ART for HIV, no TB
HIVSTI02	Management of HIV complications
HIVSTI02-01	Management of opportunistic infections associated with HIV/AIDS
HIVSTI02-02	HIV treatment (ART second-line)
HIVSTI02-03	Cotrimoxazole prophylaxis, HIV (children and mothers)
HIVSTI03	HIV prevention
HIVSTI03-01	Mass media encouraging use of condoms, voluntary medical male circumcision, and STI testing
HIVSTI03-02	Voluntary medical male circumcision service in settings with high prevalence of HIV
HIVSTI03-03	Provision of condoms to MARPS
HIVSTI03-04	PrEP for discordant couples and others at high risk of HIV (in high prevalence settings)
HIVSTI03-05	Prevention of mother to child HIV transmission (PMTCT, option B+) and syphilis
HIVSTI04	IDU-HIV programs
HIVSTI04-01	IDU-HIV: outreach
HIVSTI04-02	IDU-HIV: needle exchange
HIVSTI04-03	IDU-HIV: opioid substitution therapy*

EVIDENCE BRIEF

HIV population screening &
treatment
(DCP4 ID: HIVSTI01-01,02,03,04)
Cluster: HIVSTI

FairChoices
DCP Analytic Tool

HIVSTI05	Syndromic management of common sexual and reproductive tract infections
HIVSTI05-01	Treatment of urinary tract infection (UTI)
HIVSTI05-02	Treatment of syphilis
HIVSTI05-03	Treatment of gonorrhea
HIVSTI05-04	Treatment of chlamydia
HIVSTI05-05	Treatment of trichomoniasis
HIVSTI05-06	Treatment of PID (Pelvic Inflammatory Disease)
HIVSTI05-07	Partner notification STIs (including HIV)