



Leonardo Calza

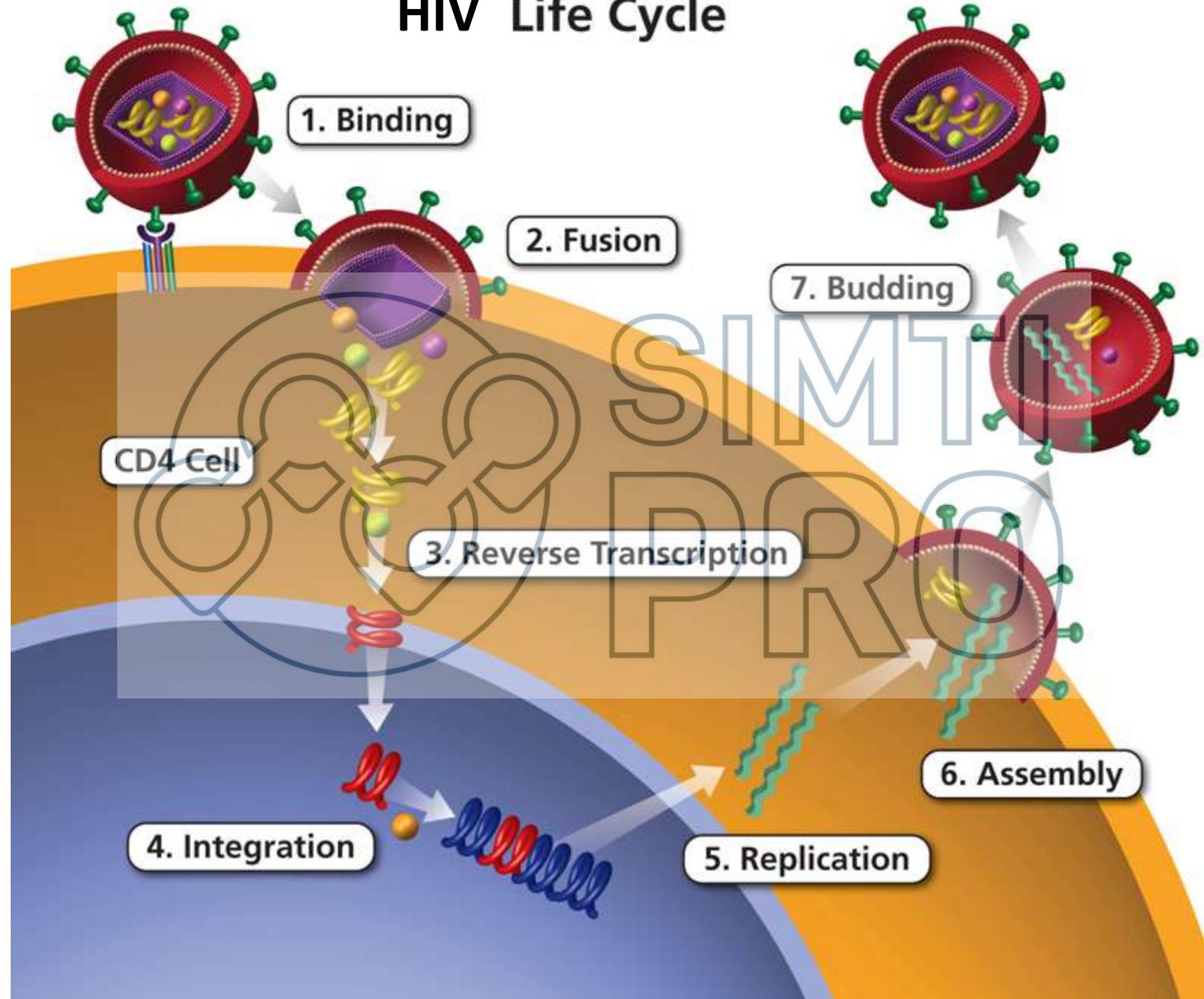
*U.O. Malattie Infettive, Policlinico di S.Orsola,
IRCCS Azienda Ospedaliero-Universitaria di Bologna*

Il sottoscritto Leonardo Calza, in qualità di Relatore, dichiara che negli ultimi due anni ha avuto rapporti anche di finanziamento con i seguenti soggetti portatori di interessi commerciali in campo sanitario:

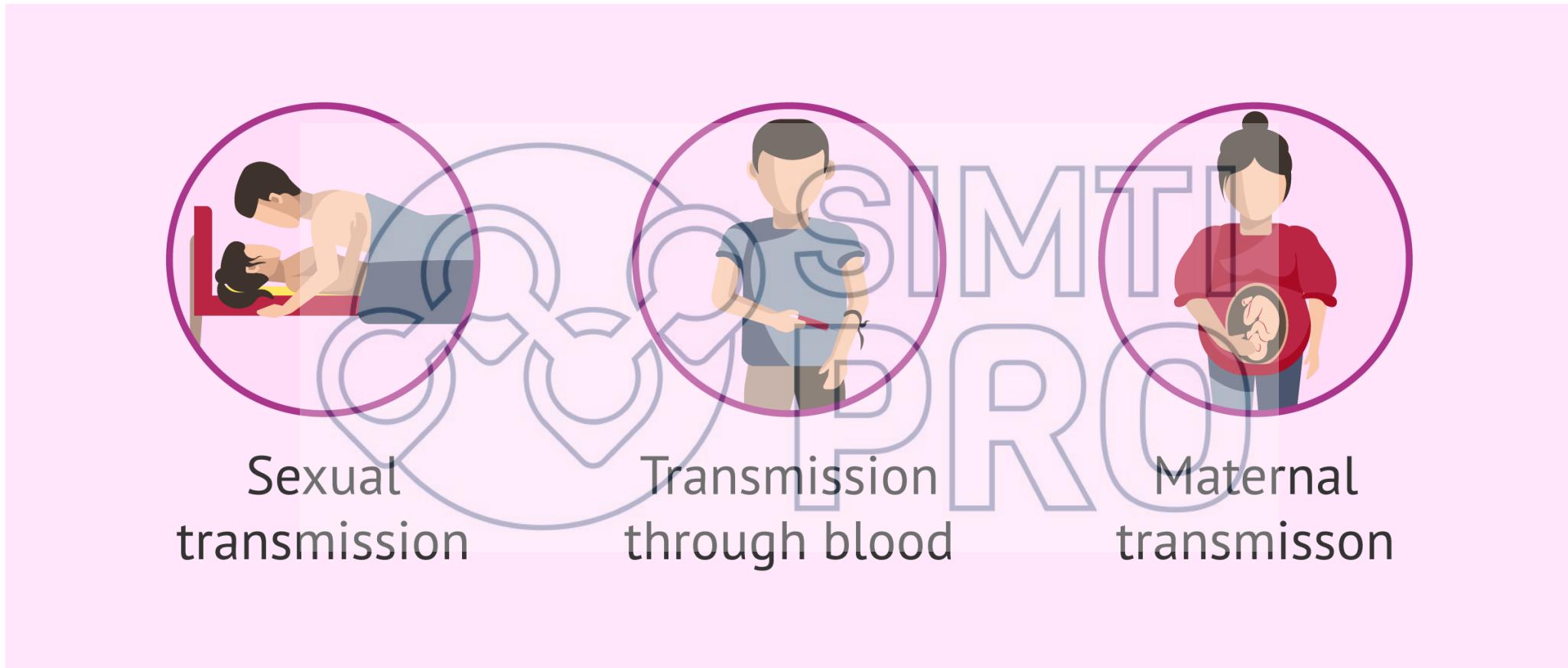
- MSD
- Janssen
- Gilead
- ViiV

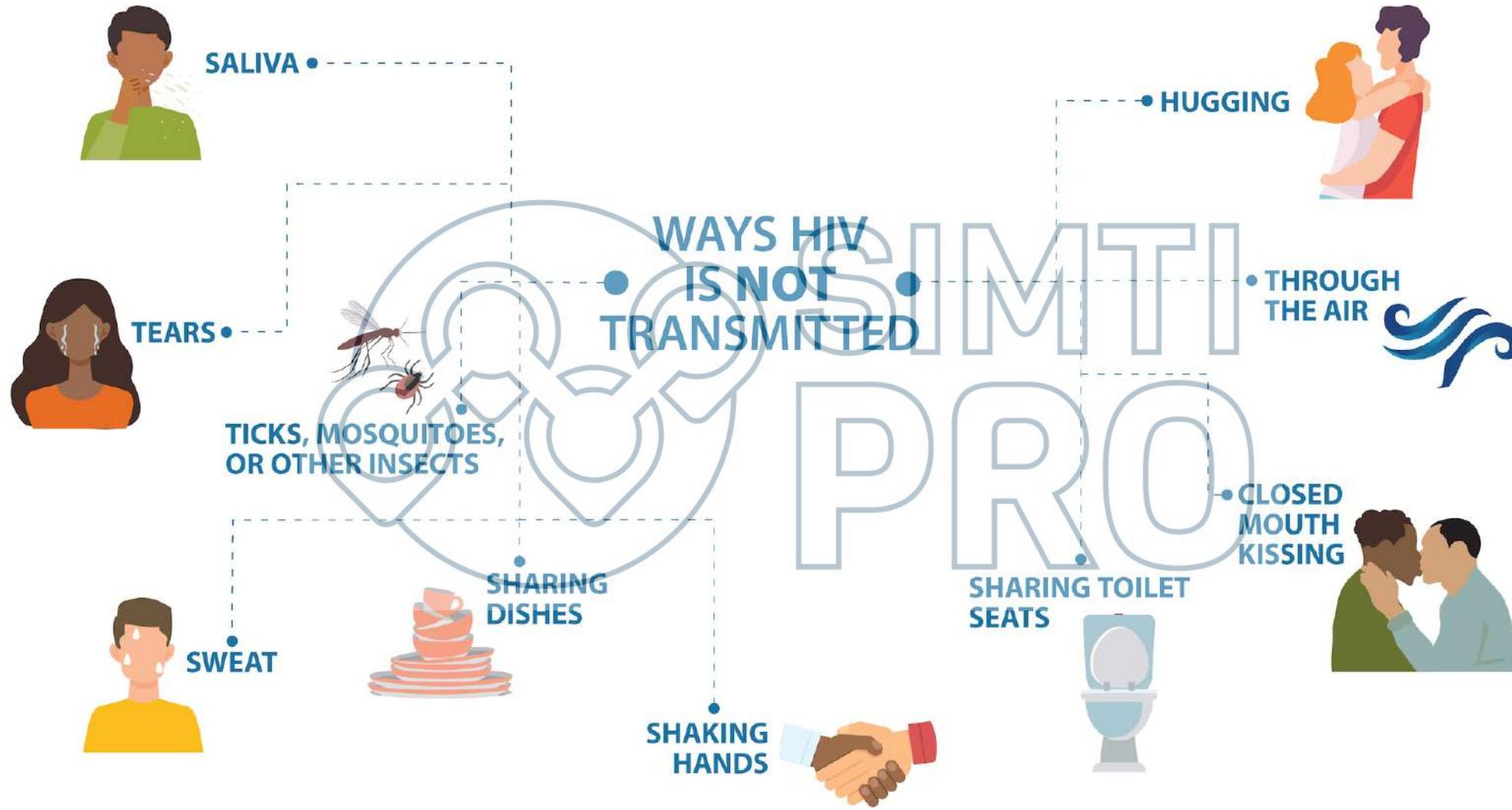


HIV Life Cycle



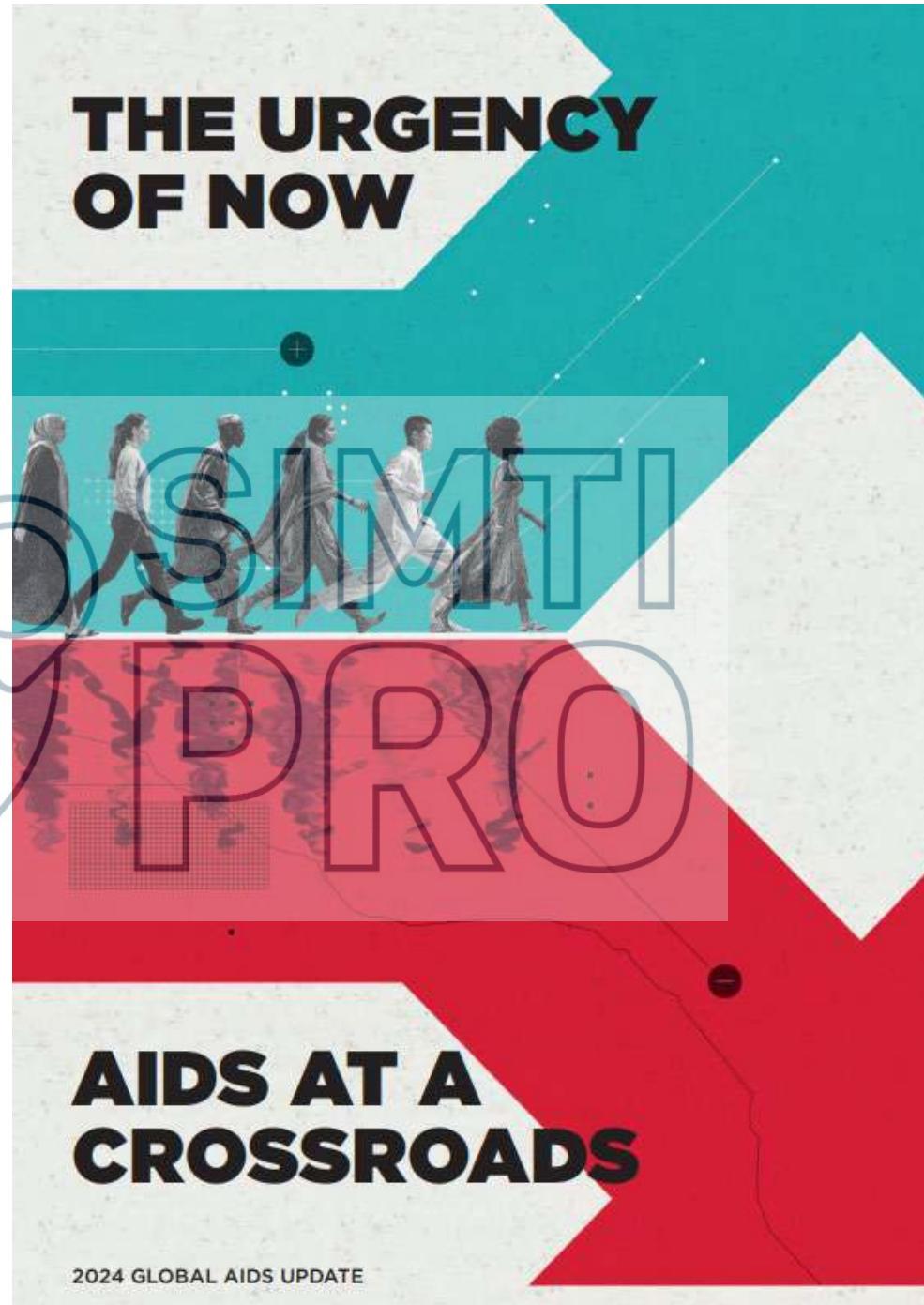
Routes of HIV transmission



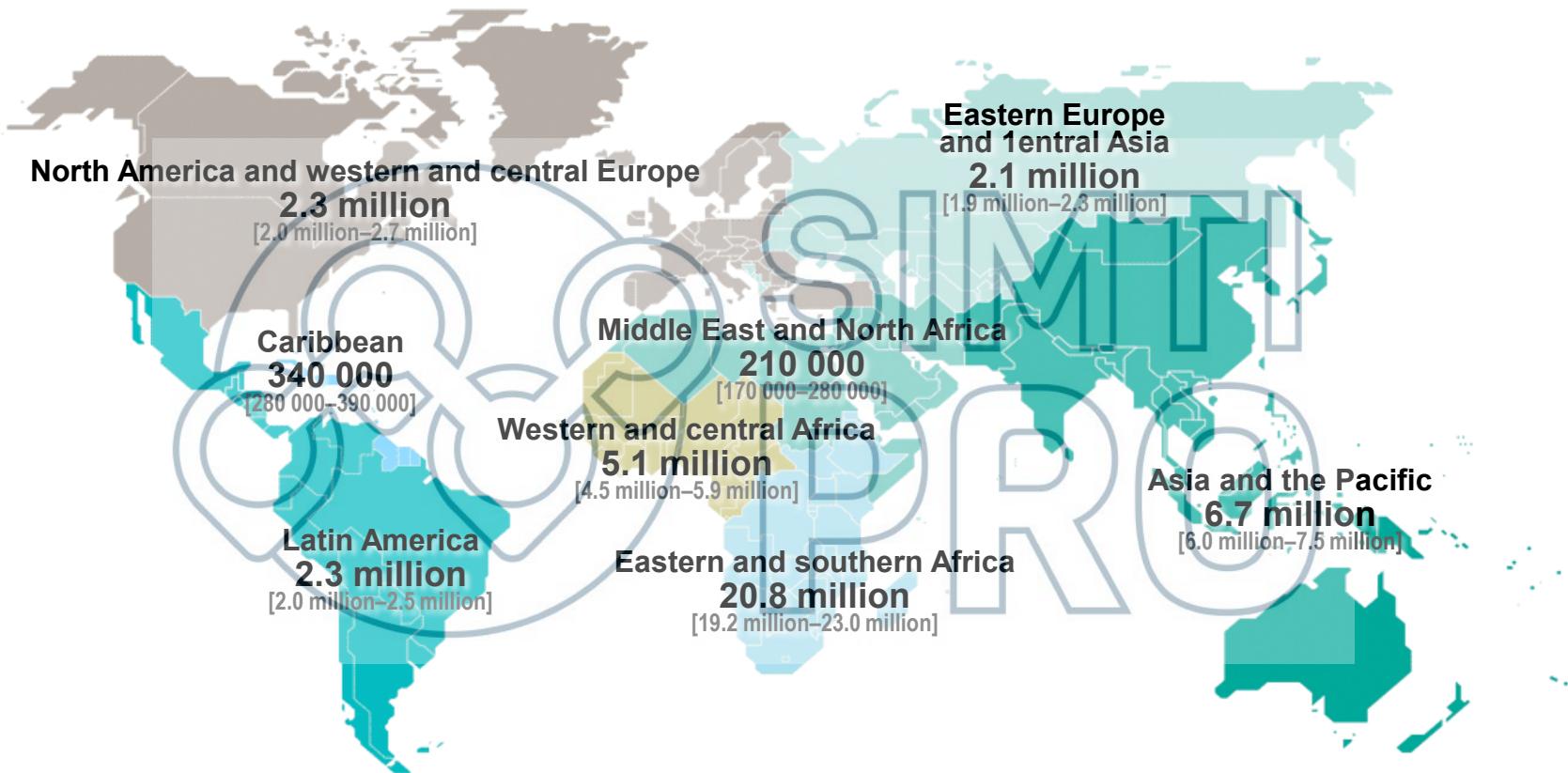


HIV e trasfusioni di sangue

- Ultimo caso di HIV trasmesso con emotrasfusione in Italia diagnosticato nel 1995
- Questionario e visita medica pre-donazione
- Test NAT (Nucleic Acid Test) eseguito su tutte le unità di sangue raccolto (ricerca HIV, HBV, HCV, Treponema pallidum, West Nile, etc.)
- Periodo finestra per HIV: 5 gg
- 2009: rischio di HIV pari a 1 su 1.2 milioni di unità
- 2019: rischio di HIV pari a 1 su 45 milioni di unità
- Oggi la probabilità di contrarre HIV con una trasfusione è considerata trascurabile

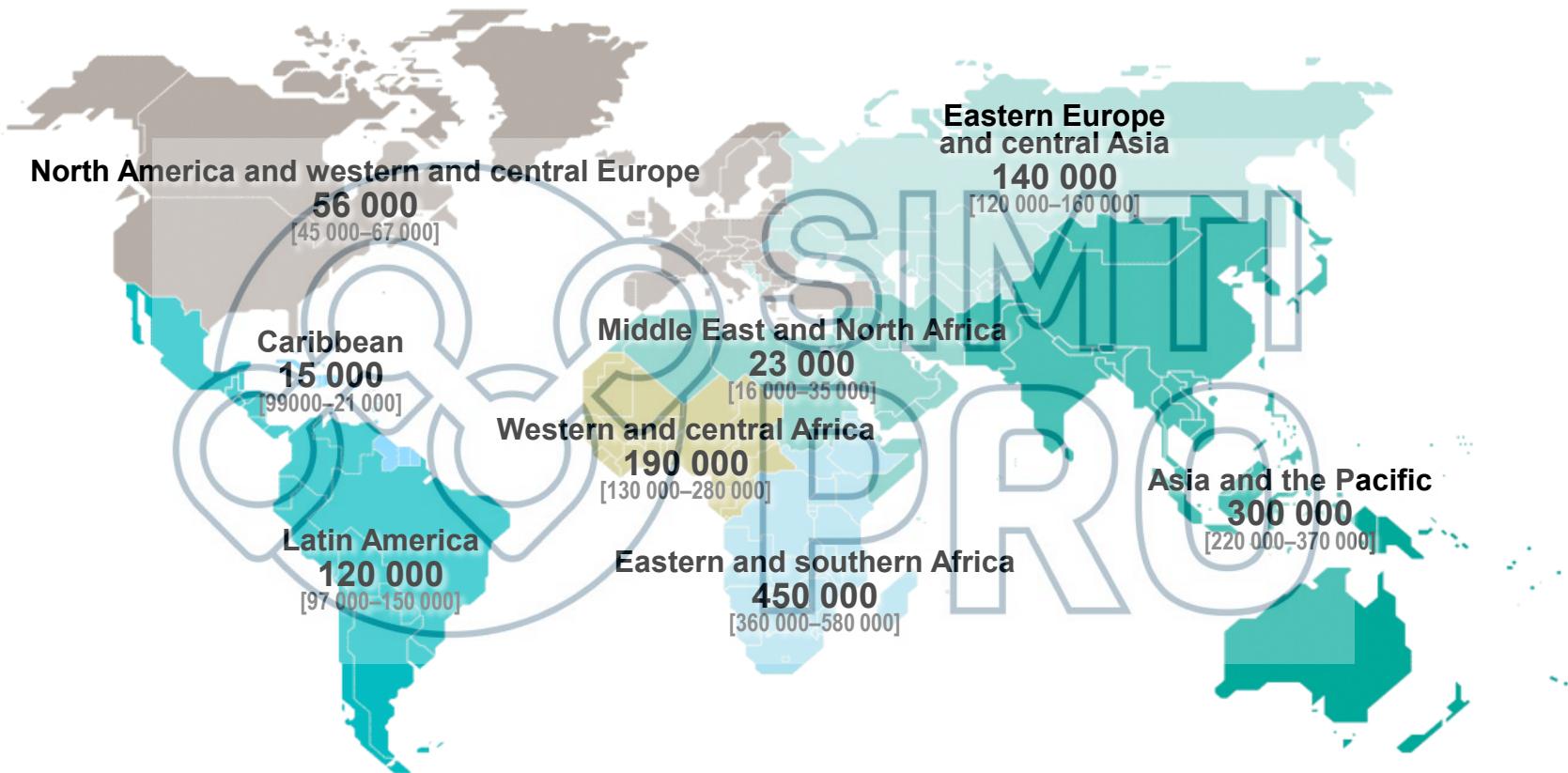


Adults and children estimated to be living with HIV | 2023



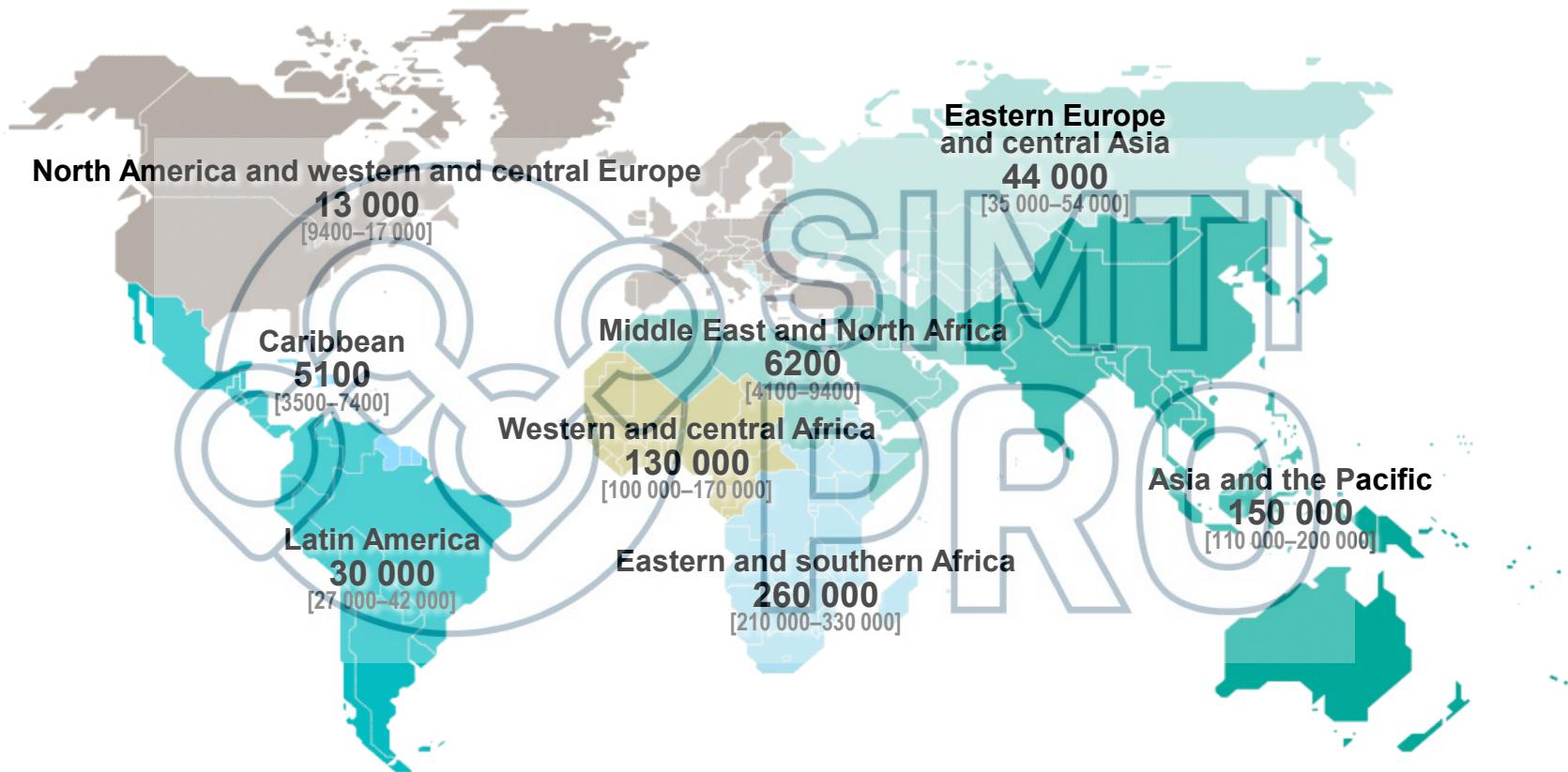
Total: 39.9 million [36.1 million–44.6 million]

Estimated number of adults and children newly infected with HIV | 2023



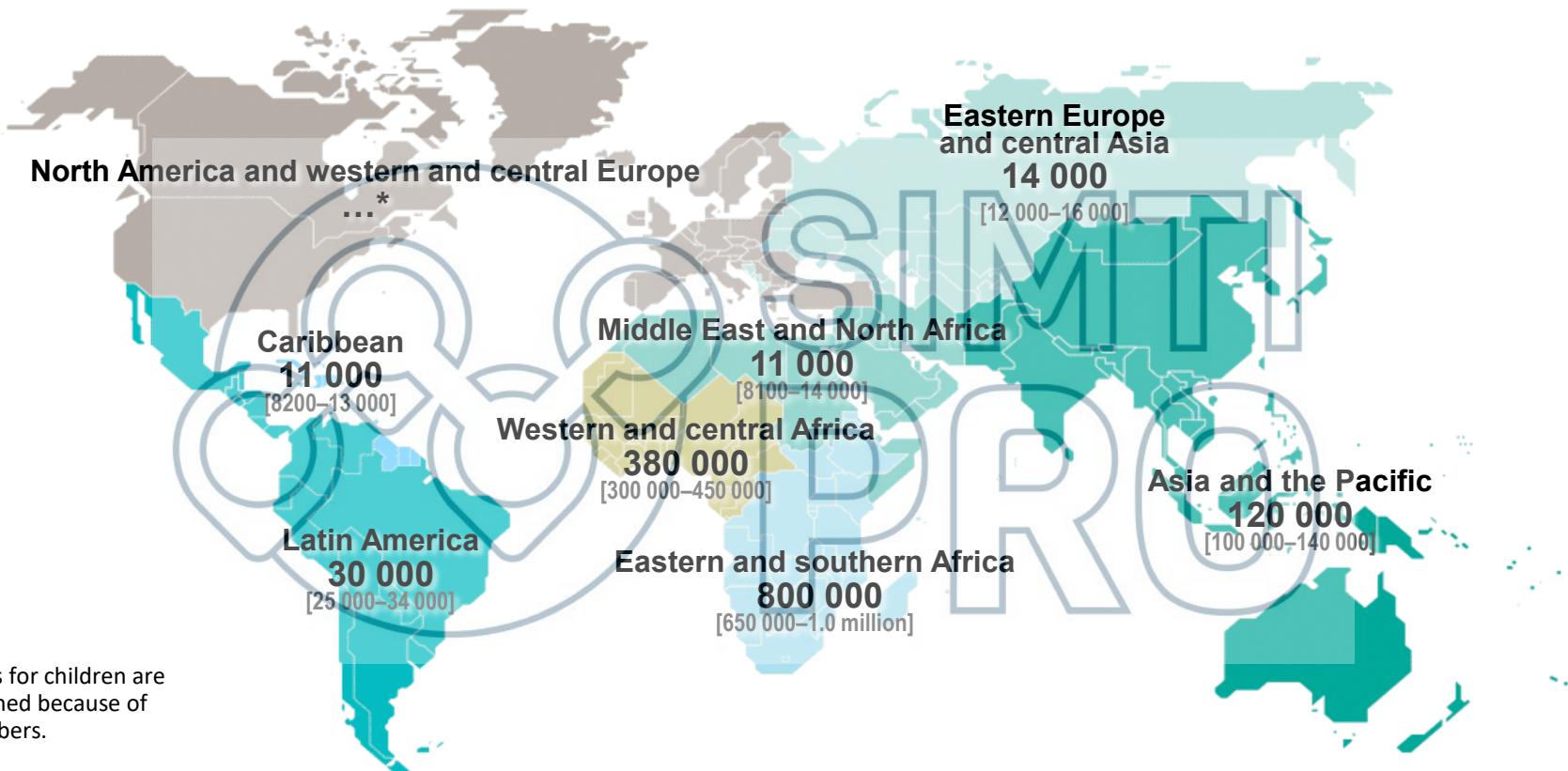
Total: 1.3 million [1.0 million–1.7 million]

Estimated adult and child deaths from AIDS | 2023



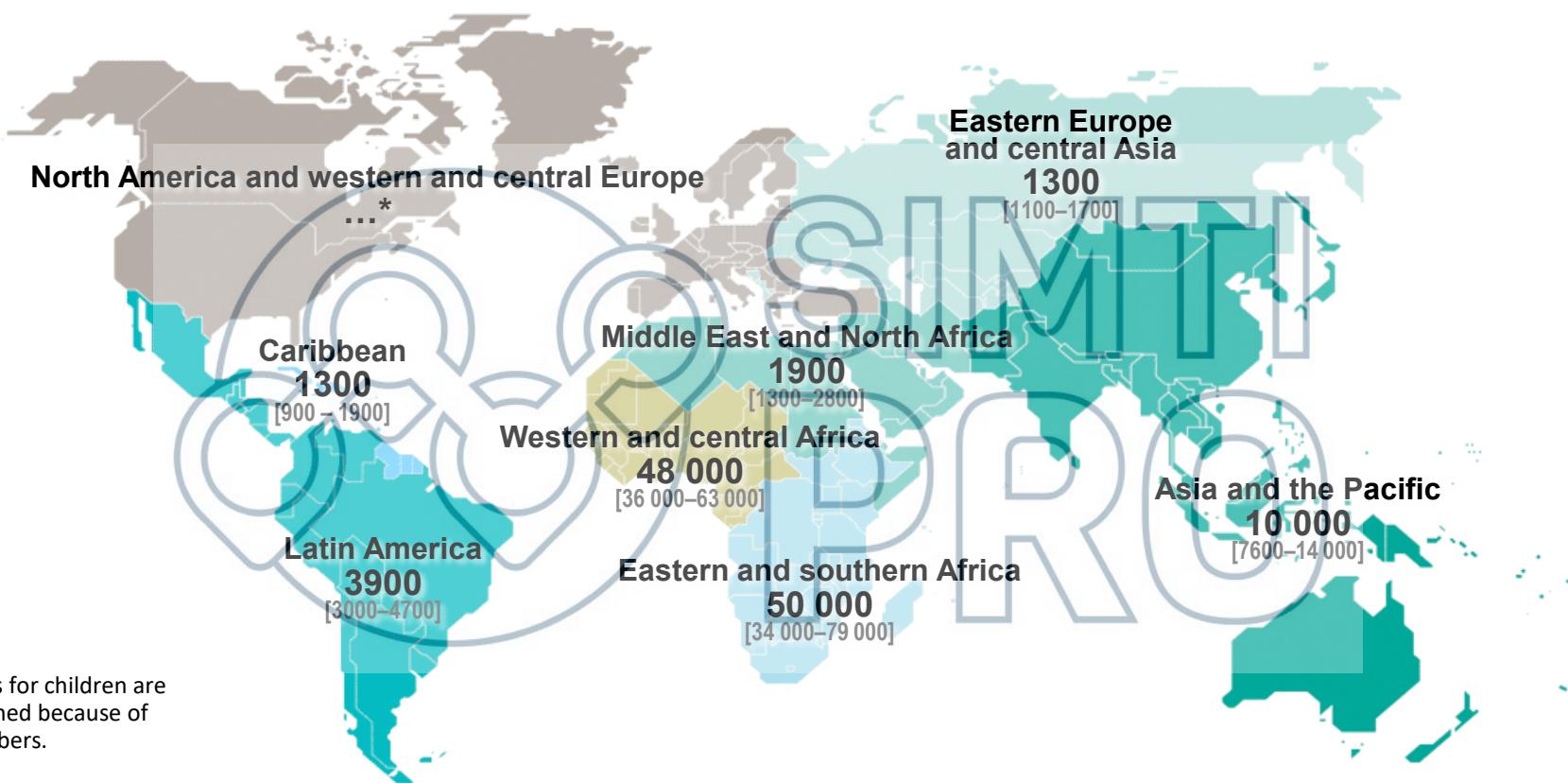
Total: 630 000 [500 000–820 000]

Children (<15 years) estimated to be living with HIV | 2023



Total: 1.4 million [1.1 million–1.7 million]

Estimated number of children (<15 years) newly infected with HIV | 2023

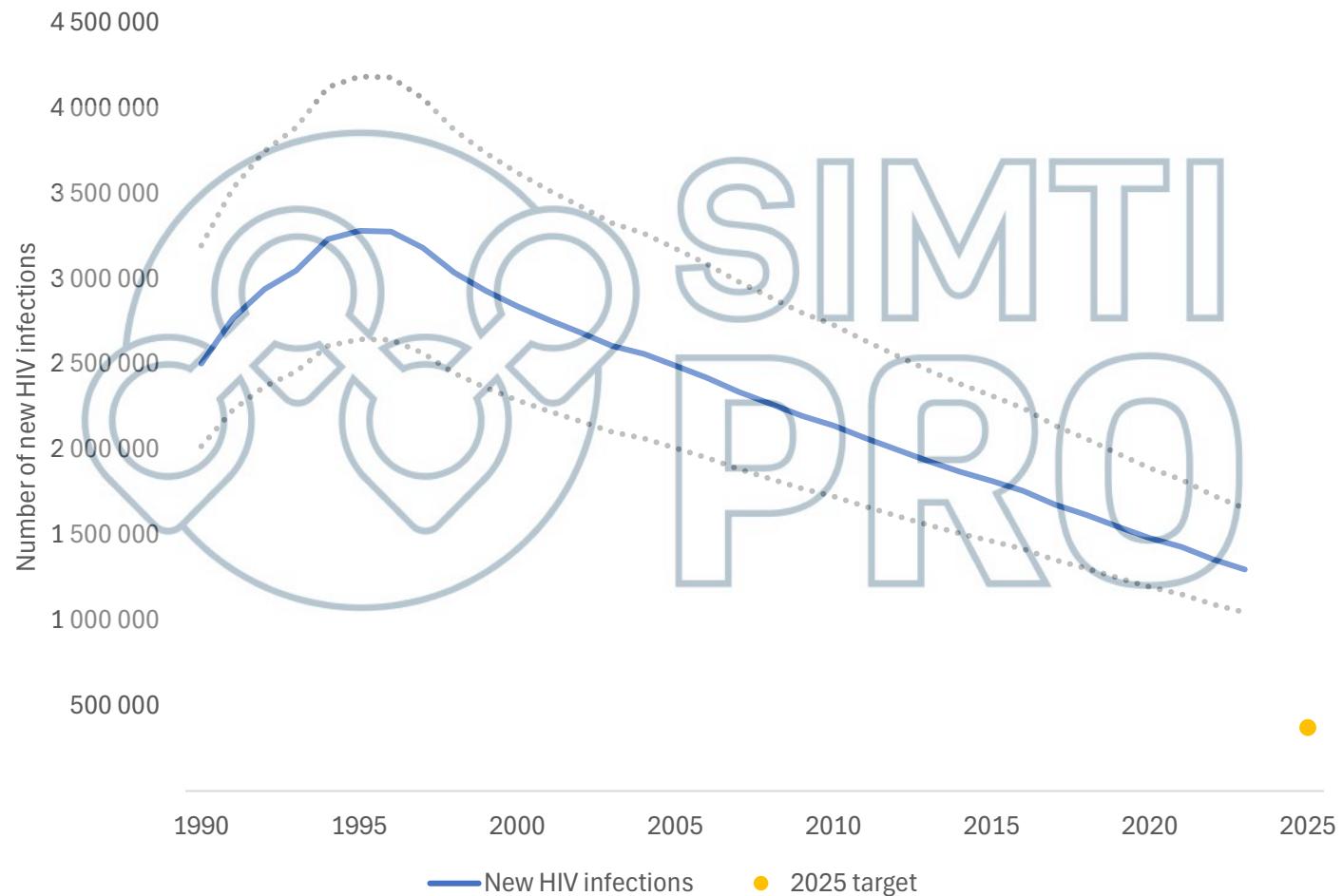


Total: 120 000 [83 000–170 000]

About 3600 new HIV infections (adults and children) a day | 2023

- About 50% are in sub-Saharan Africa
- About 320 are among children under 15 years of age
- About 3200 are among adults aged 15 years and older, of whom:
 - almost 44% are among women
 - about 30% are among young people (15–24)
 - about 17% are among young women (15–24)

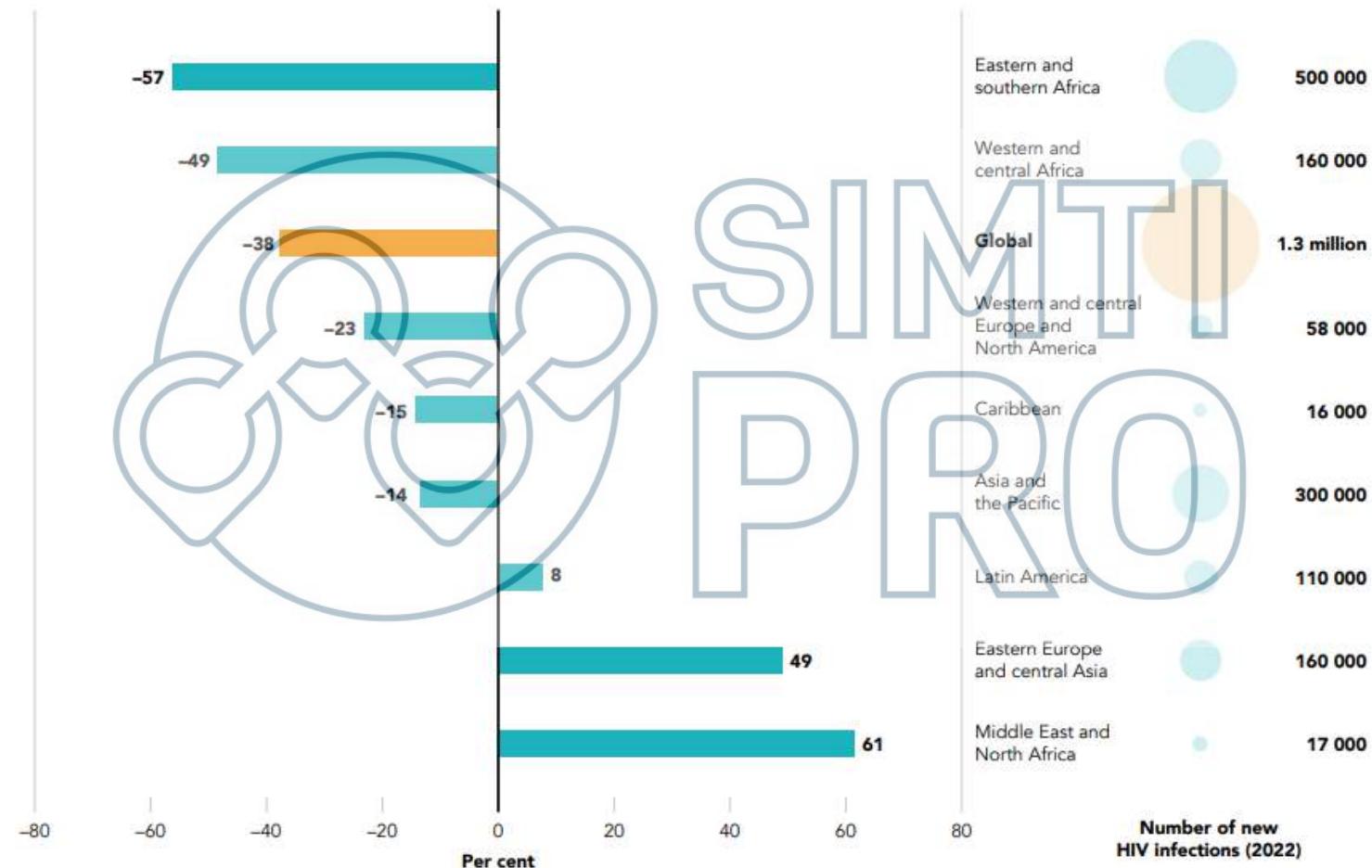
Number of new HIV infections, global, 1990–2023, and 2025 target



Source: UNAIDS 2024 epidemiological estimates

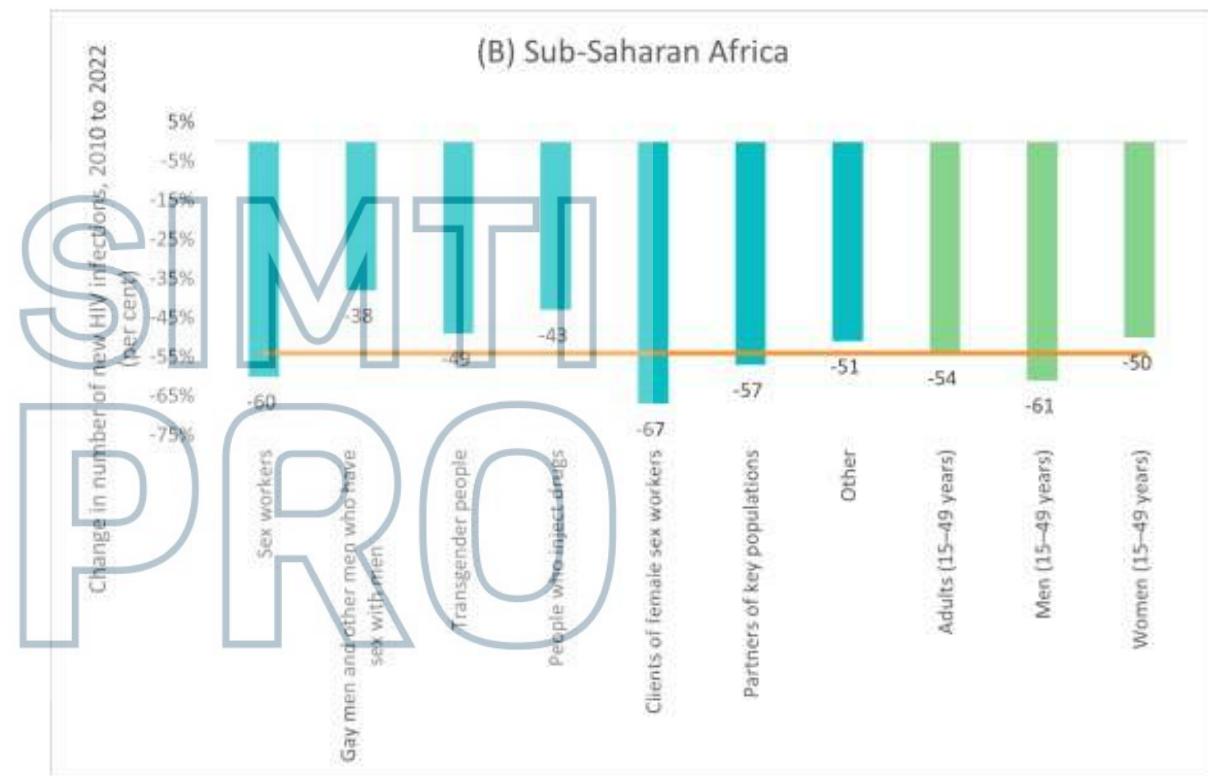
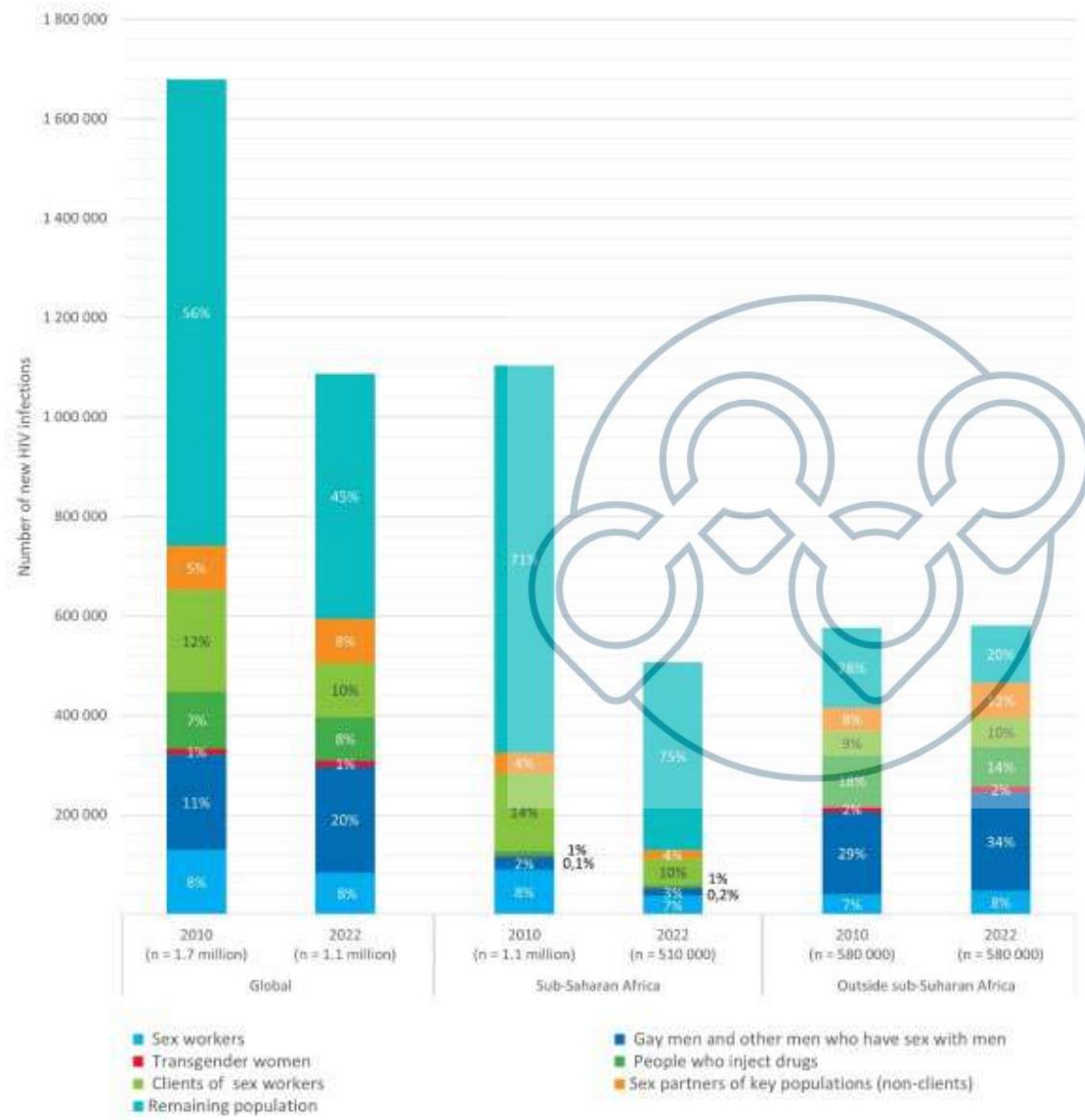
Declines in numbers of new HIV infections are strongest in sub-Saharan Africa

Figure 0.2 Change in number of new HIV infections, 2010–2022, and number of new HIV infections, 2022, global and by region

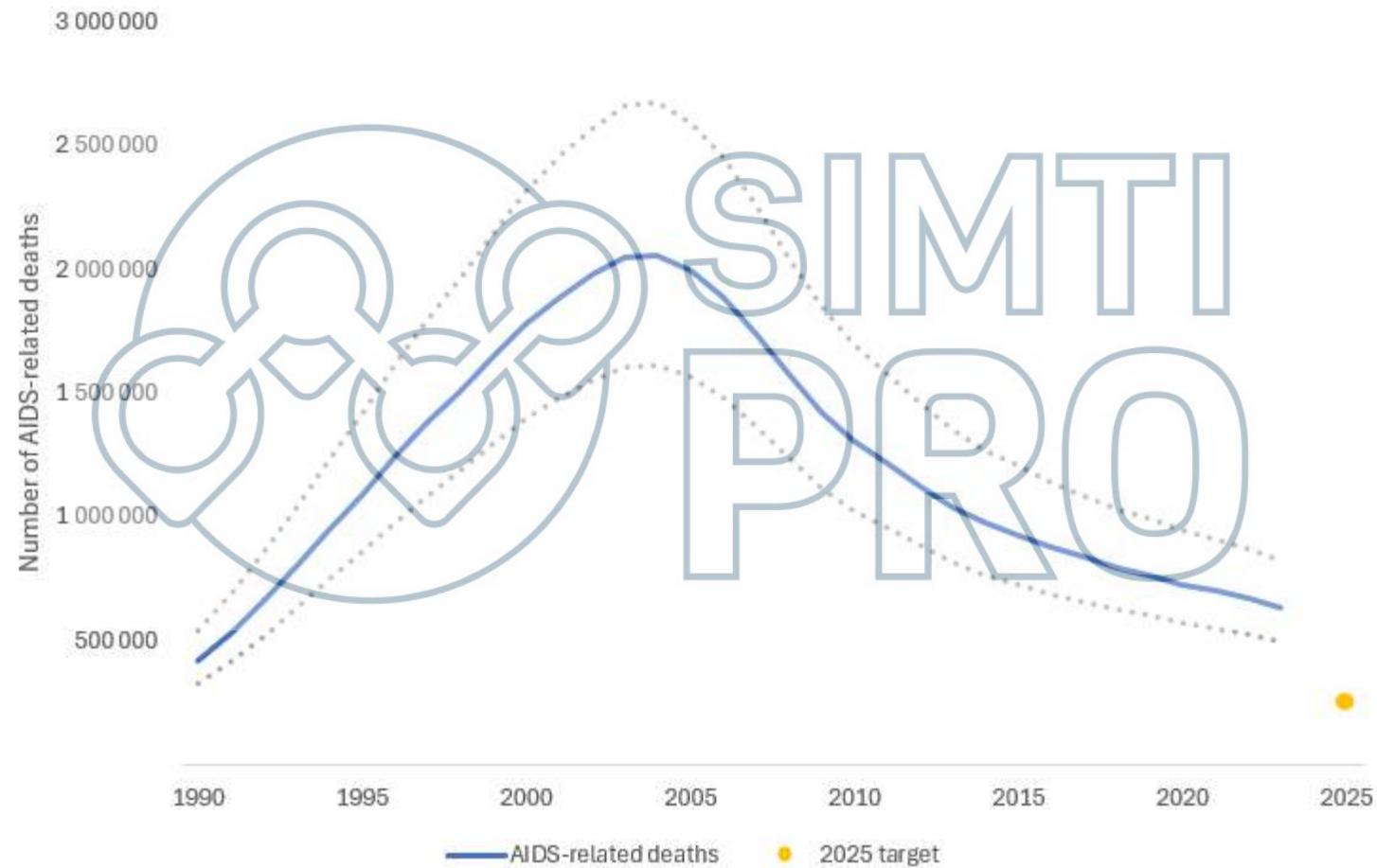


Source: UNAIDS epidemiological estimates, 2023 (<https://aidsinfo.unaids.org/>).

Figure 2. Distribution of adult new HIV infections, global and by region, 2010 and 2022



Number of AIDS-related deaths, global, 1990–2023, and 2025 target



Source: UNAIDS 2024 epidemiological estimates

Middle East & Africa | Making sex safer again

Is the end of AIDS in sight?

The virus can be brought under control, but it's complicated



IMAGE: ANNA PARINI

Sep 17th 2023 | JOHANNESBURG

Share

Farmaci Antiretrovirali, 2024

Inibitori nucleosidici/-tidici della trascrittasi inversa (NRTI):

Zidovudina (AZT, ZDV)
Lamivudina (3TC)
Emtricitabina (FTC)
Abacavir (ABC)
Tenofovir (TDF, TAF)

Inibitori non nucleosidici della trascrittasi inversa (NNRTI):

Nevirapina (NVP), Efavirenz (EFV),
Etravirina (ETV), Rilpivirina (RPV), Doravirina
(DRV)

Inibitori dell'integrasi:

Raltegravir (RGV), Elvitegravir/c (EVG),
Dolutegravir (DTG), Bictegravir (BIC),
Cabotegravir (CAB)

Inibitori della proteasi (PI):

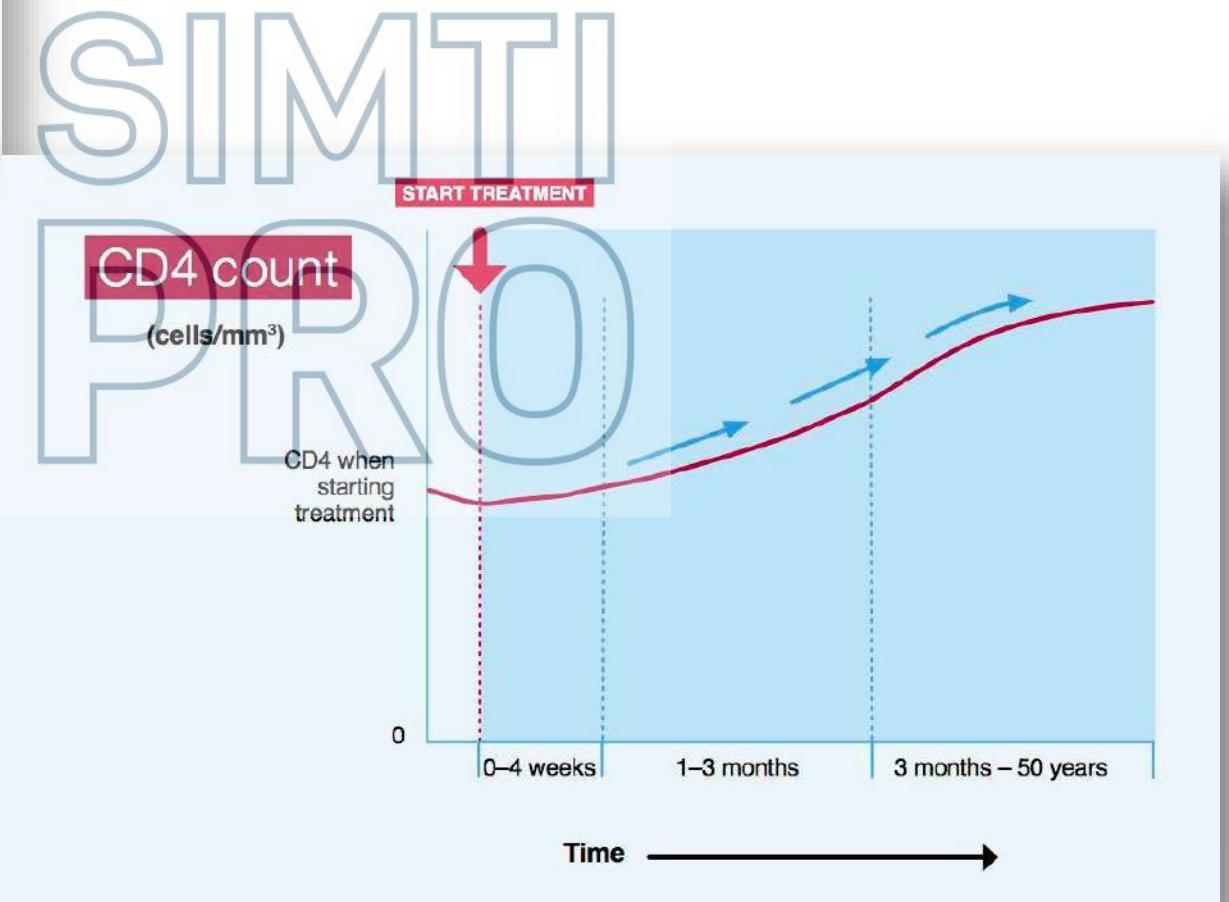
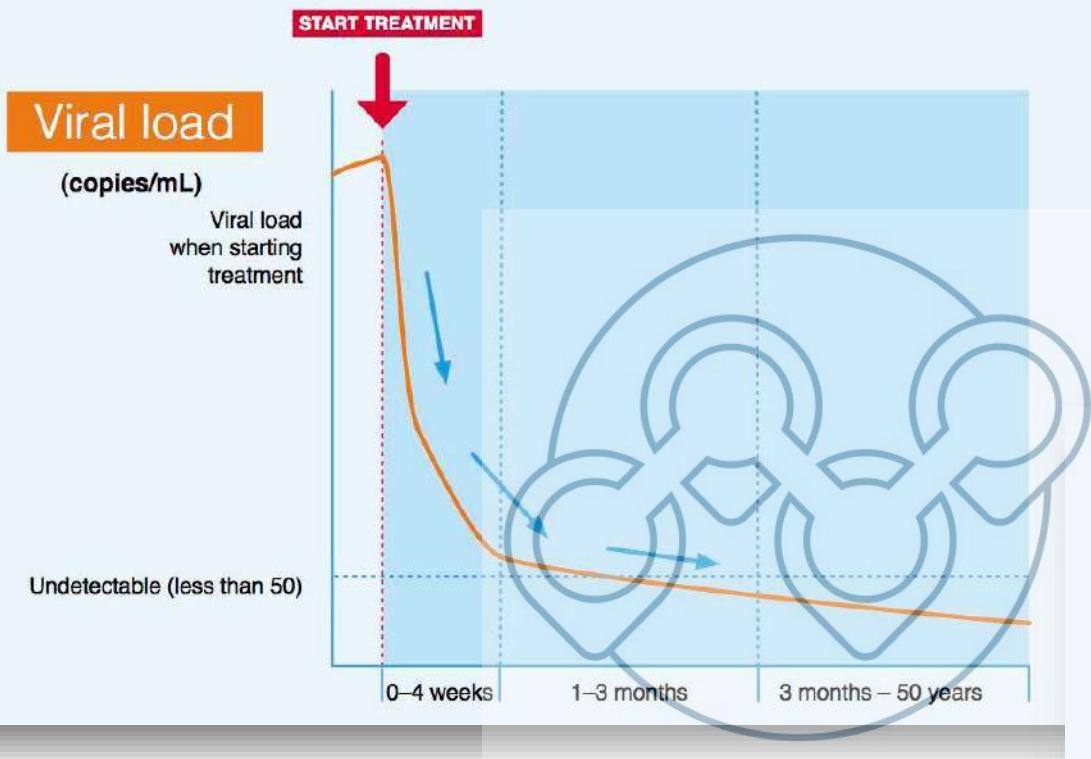
Lopinavir/r (LPV)
Atazanavir (ATV)
Darunavir (DRV)

Inibitori della fusione/ingresso:

Enfuvirtide (T20)

Maraviroc (MVC)

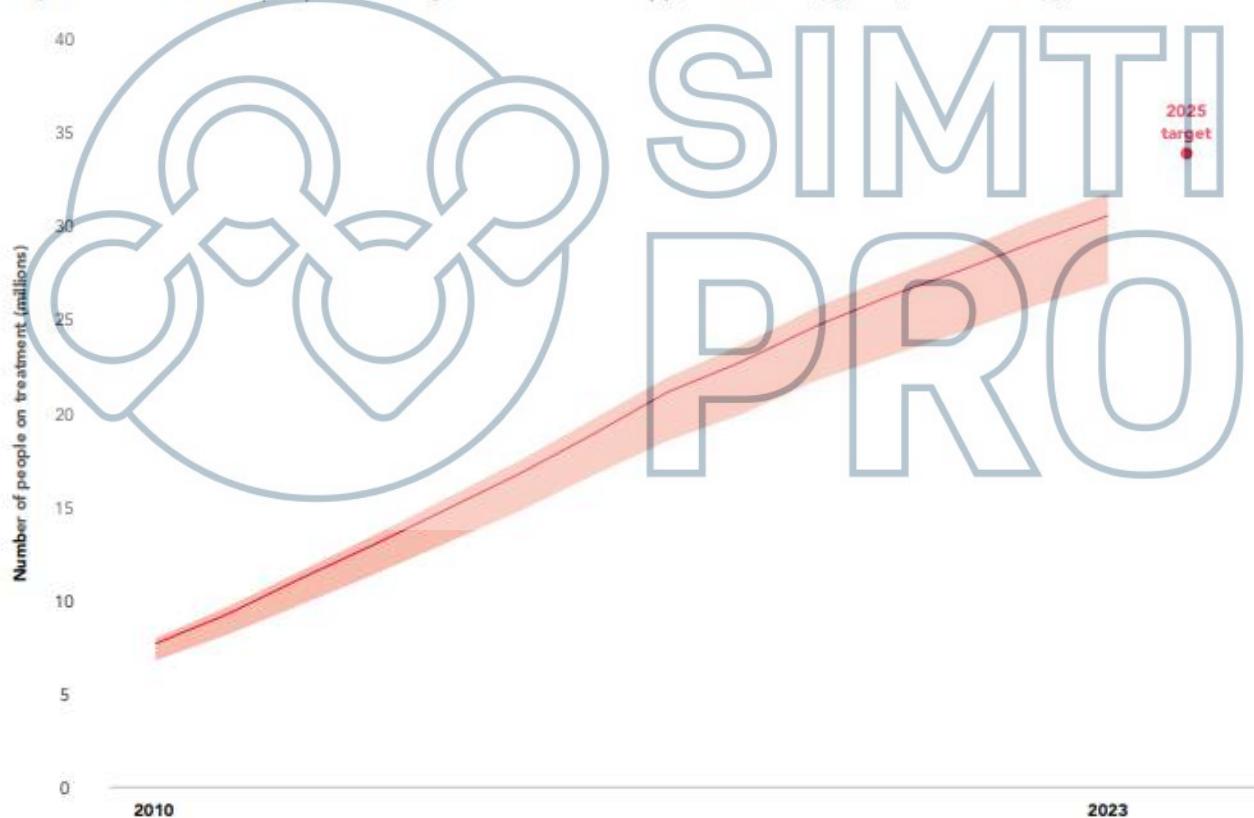
HIV after starting ART



Access to HIV treatment continues to expand

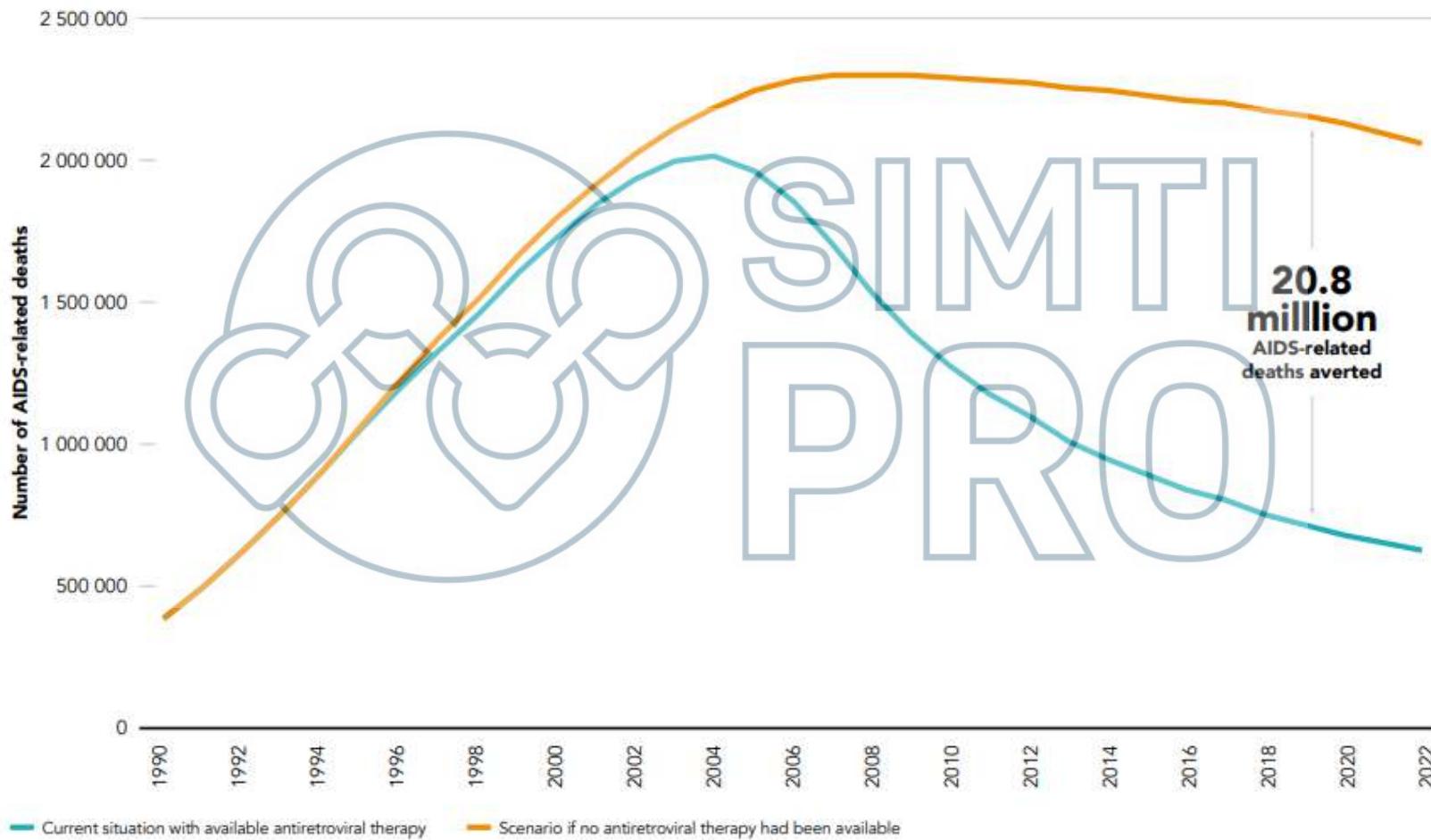
Approximately 30.7 million [27.0 million–31.9 million] of the estimated 39.9 million [36.1 million–44.6 million] people living with HIV globally were receiving antiretroviral therapy in 2023 (Figure 0.5). This is a landmark public health achievement. As recently as 2015, global treatment coverage was only 47% [38–55%]—but in 2023, it stood at 77% [61–89%].

Figure 0.5 Number of people receiving antiretroviral therapy, 2010–2023, global, and 2025 target



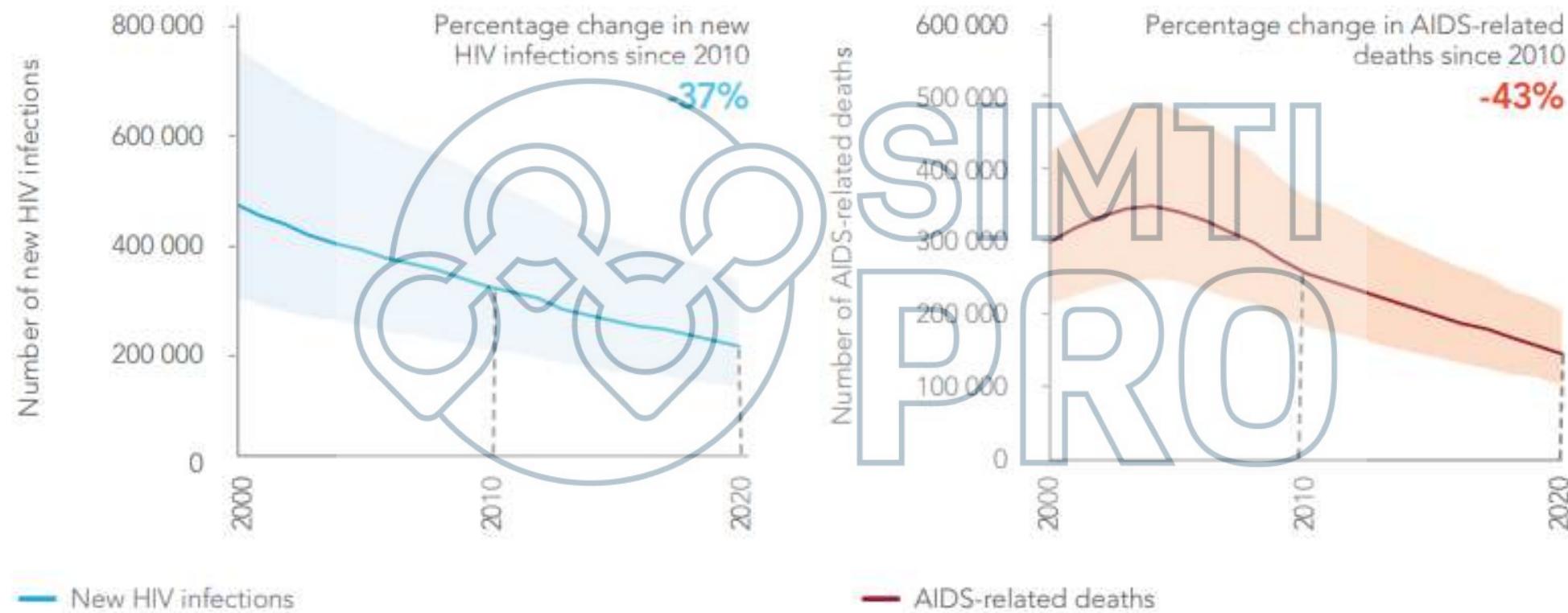
HIV treatment averted almost 21 million AIDS-related deaths between 1996 and 2022

Figure 0.1 Number of AIDS-related deaths: current situation versus scenario without available antiretroviral therapy, 1990–2022



Source: UNAIDS special analysis of epidemiological estimates, 2023.

NUMBER OF NEW HIV INFECTIONS AND AIDS-RELATED DEATHS, WESTERN AND CENTRAL AFRICA, 2000–2020



Source: UNAIDS epidemiological estimates, 2021 (<https://aidsinfo.unaids.org/>).

Map 1a: HIV diagnoses per 100 000 population, 2022

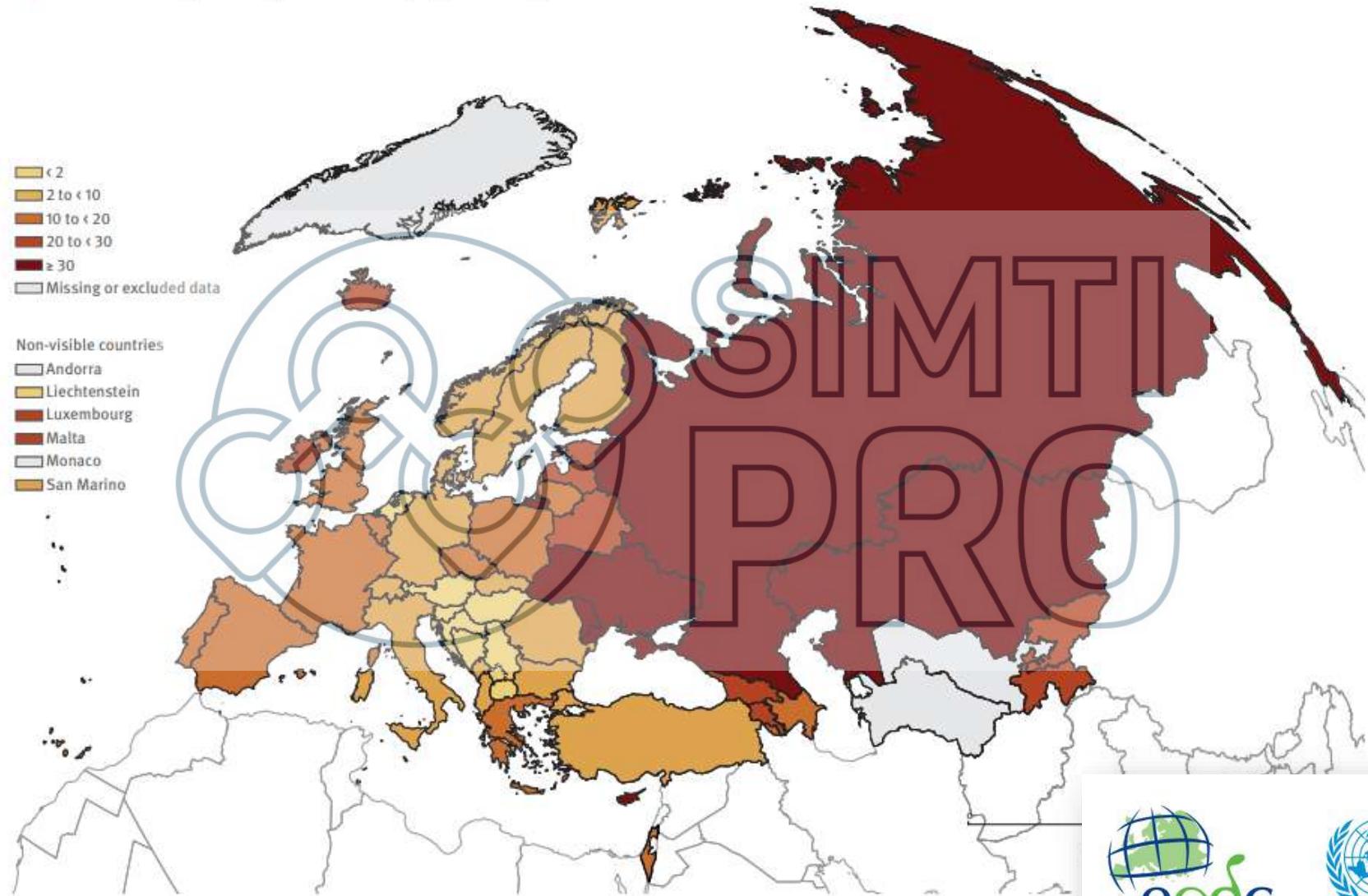
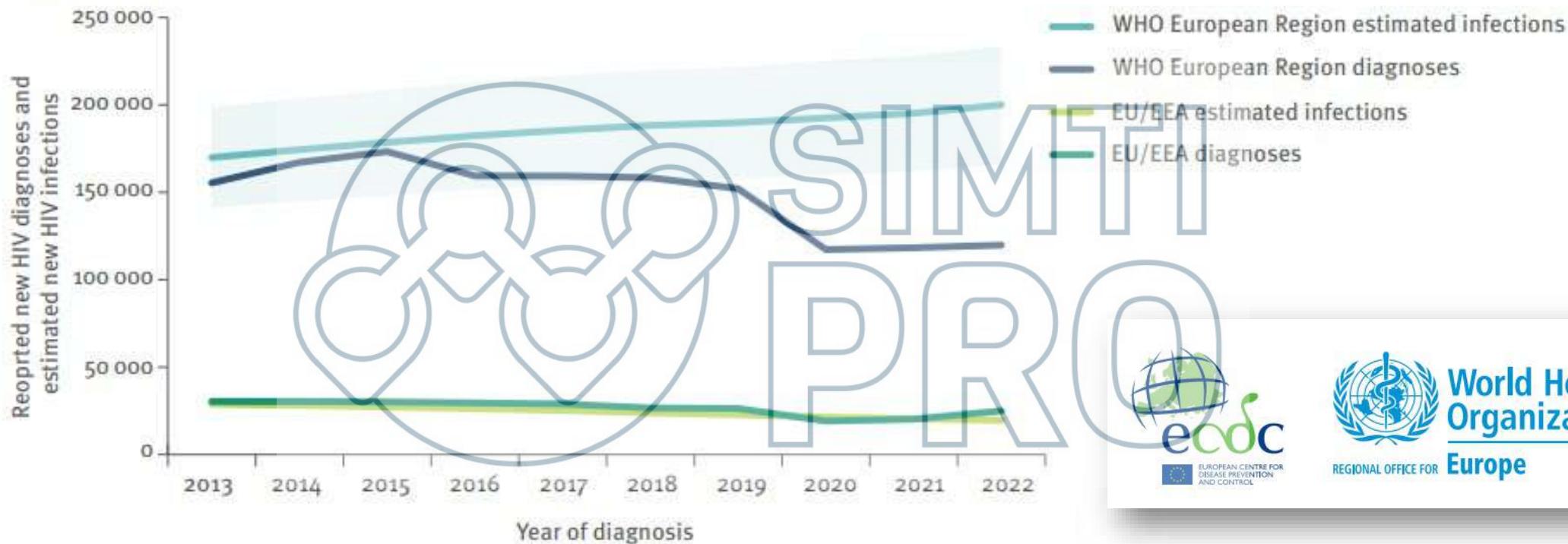


Figure A: Estimated new HIV infections and reported HIV diagnoses in the EU/EEA and WHO European Region, 2013–2022

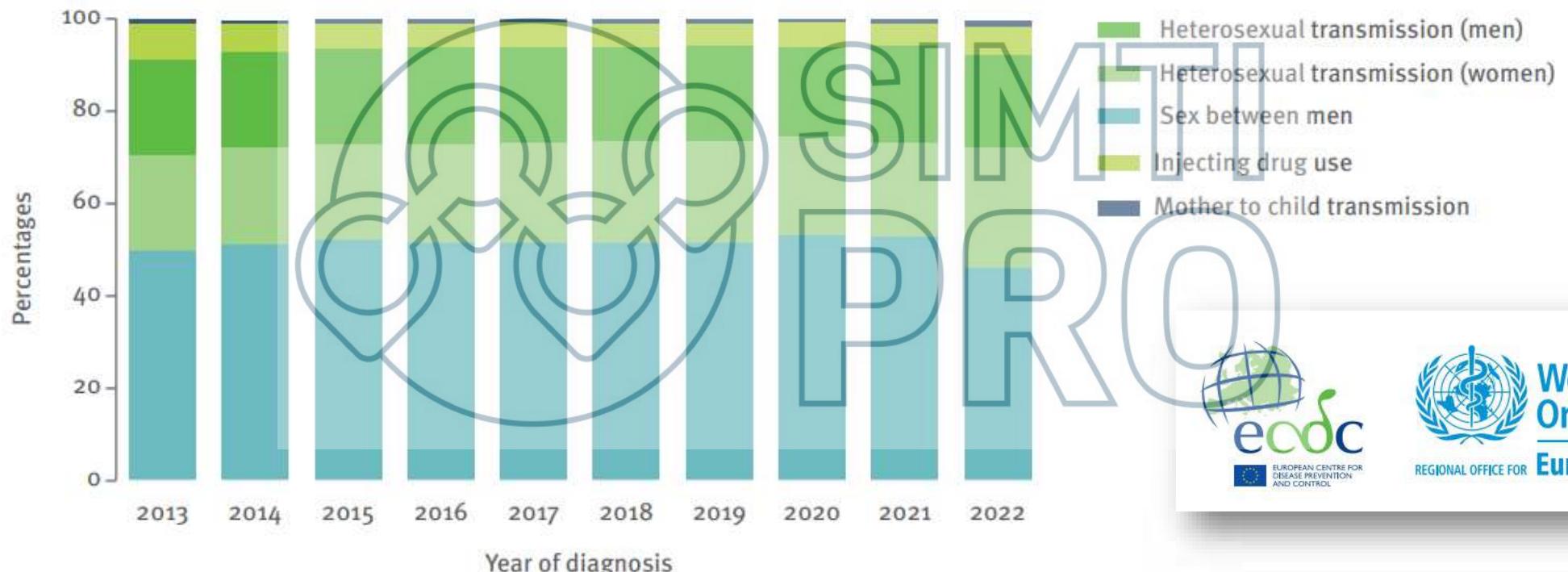


Shaded areas represent uncertainty intervals around the best estimate.

Note: Data from Andorra, Monaco, Turkmenistan, and Uzbekistan were excluded due to inconsistent reporting during the period.



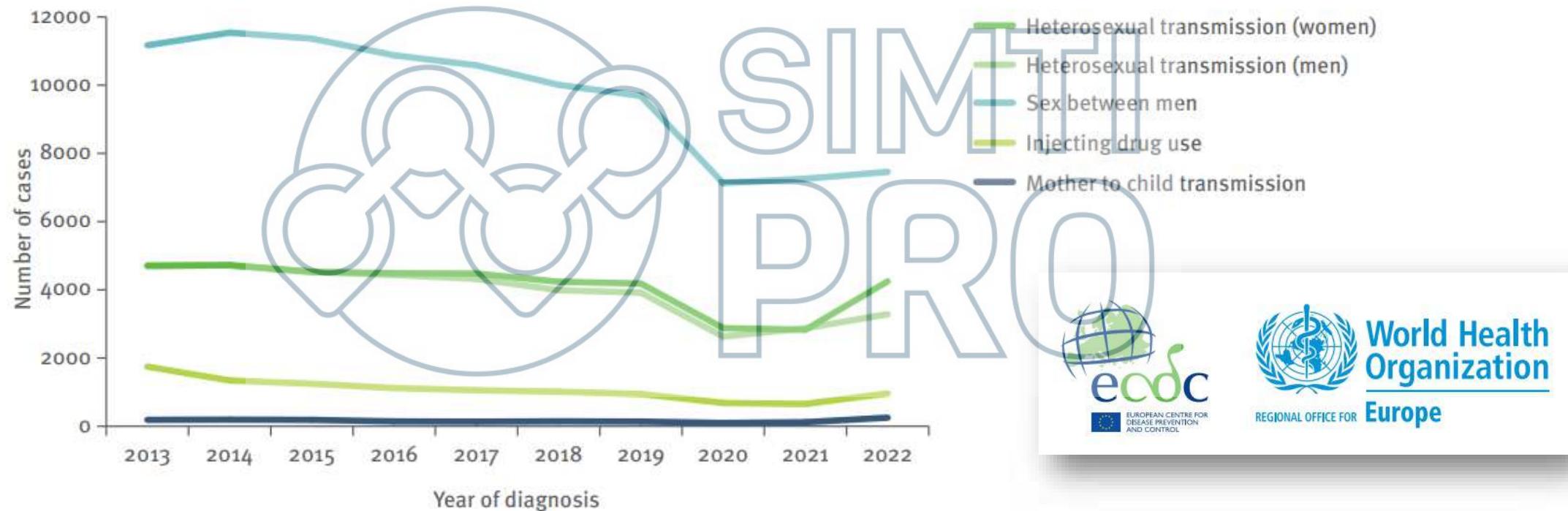
Figure 1.16b: Percentage of HIV diagnoses, by year of diagnosis and transmission mode, EU/EEA, 2013–2022



Notes: Cases where transmission route was unknown or other are not presented here. HIV diagnoses reported by Poland excluded due to incomplete reporting on transmission mode during some years of the previous decade.



Figure 1.16a: HIV diagnoses, by year of diagnosis and transmission mode, EU/EEA, 2013–2022



Notes: HIV diagnoses reported by Poland excluded due to incomplete reporting on transmission mode during some years of the previous decade.

Table A: Characteristics of new HIV and AIDS diagnoses reported in the WHO European Region, the EU/EEA, and West, Centre and East of the WHO European Region, 2022

	WHO European Region	West	Centre	East	EU/EEA
Reporting countries/number of countries ^a	49/53	21/23	15/15	13/15	30/30
Number of HIV diagnoses	110 486	22 397	8 945	7 914	22 995
Rate of HIV diagnoses per 100 000 population	12.4	5.1	4.5	30.7	5.1
Percentage age 15–24 years	5.7%	8.9%	11.7%	4.2%	8.9%
Percentage age 50+ years	16.7%	21.8%	15.1%	15.5%	19.9%
Male-to-female ratio	1.8	2.4	2.9	1.6	2.4
Percentage of migrants ^b	26.7%	52.3%	27.0%	2.2%	48.3%
Transmission mode					
Sex between men	11.3%	35.2%	18.7%	37%	33.3%
Heterosexual transmission (men)	31.7%	15.1%	14.9%	38.3%	14.6%
Heterosexual transmission (women)	29.5%	21.0%	10.5%	34.1%	19.0%
Injecting drug use	16.1%	3.8%	2.1%	21.1%	4.3%
Mother-to-child transmission	0.6%	1.1%	0.8%	0.4%	1.2%
Unknown	10.8%	23.6%	52.8%	2.4%	27.3%
AIDS and late HIV diagnosis					
Percentage HIV diagnoses CD4 <350 cells/mm ³	50.6	46.2	44.5	55.1	47.9%
Number of AIDS diagnoses ^c	7 220	1 873	825	4 522	2 349
Rate of AIDS diagnoses per 100 000 population	1.1	0.5	0.4	4.4	0.6

a No data reported by Andorra, Monaco, Turkmenistan and Uzbekistan.

b Migrants defined as originating from outside of the country in which they were diagnosed

c No data reported by Andorra, Bosnia and Herzegovina, Germany, Monaco, North Macedonia, Russian Federation, Sweden, Turkmenistan or Uzbekistan.

**AGGIORNAMENTO DELLE NUOVE DIAGNOSI
DI INFETZIONE DA HIV E DEI CASI DI AIDS
IN ITALIA AL 31 DICEMBRE 2022**

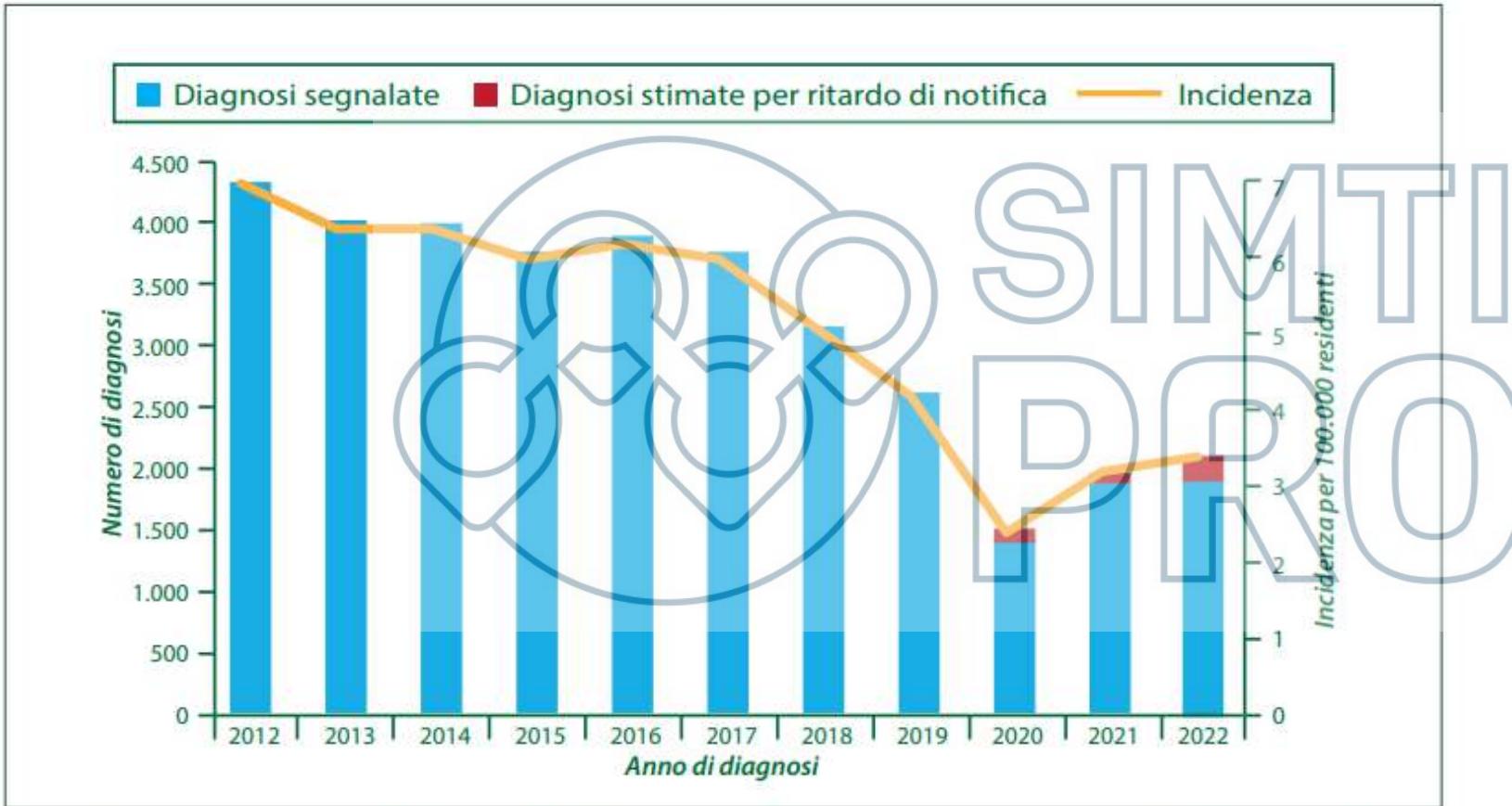
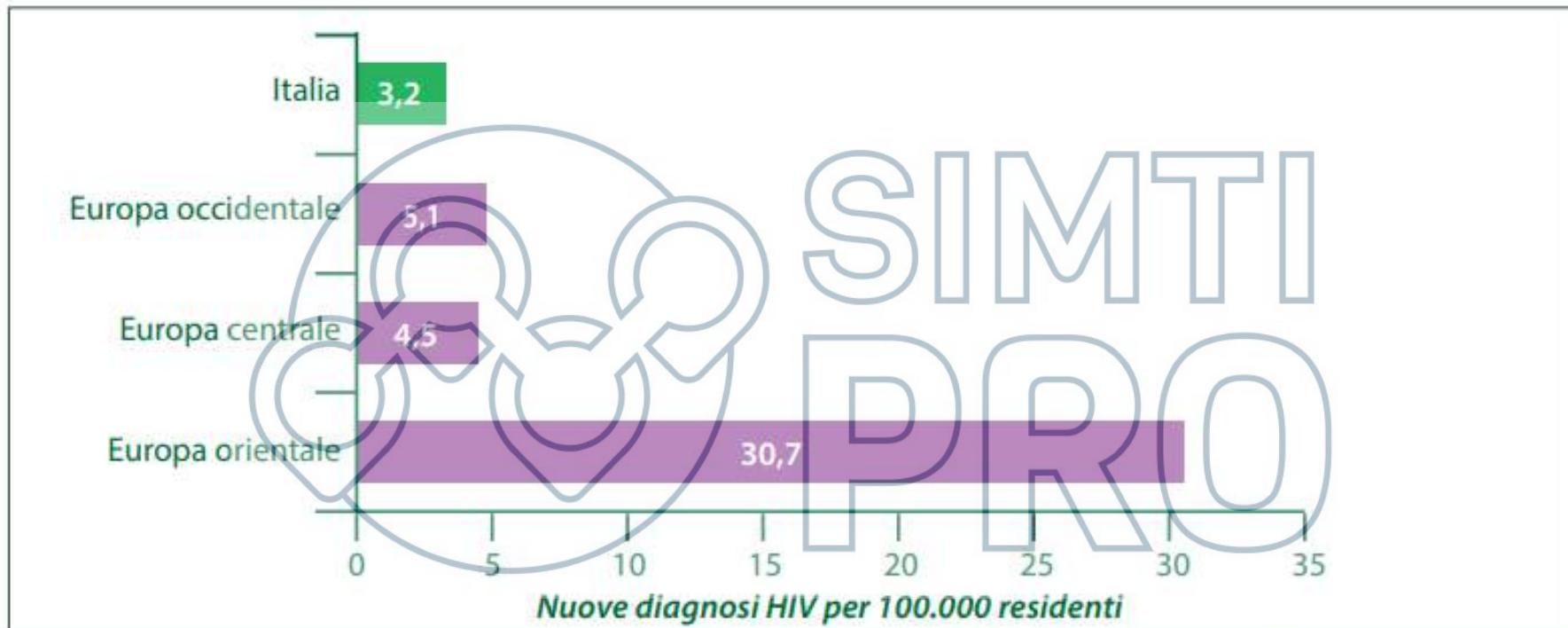


Figura 1 - Nuove diagnosi di infezione da HIV e incidenze corrette per ritardo di notifica (2012-2022)

Incidenza HIV 2022



Incidenza HIV: numero di nuove diagnosi HIV per 100.000 residenti in Italia e nelle principali aree geografiche europee.
Fonti: Sistema di Sorveglianza HIV nazionale, ECDC/WHO. *HIV/AIDS Surveillance in Europe 2023-2022 data* (1) ►

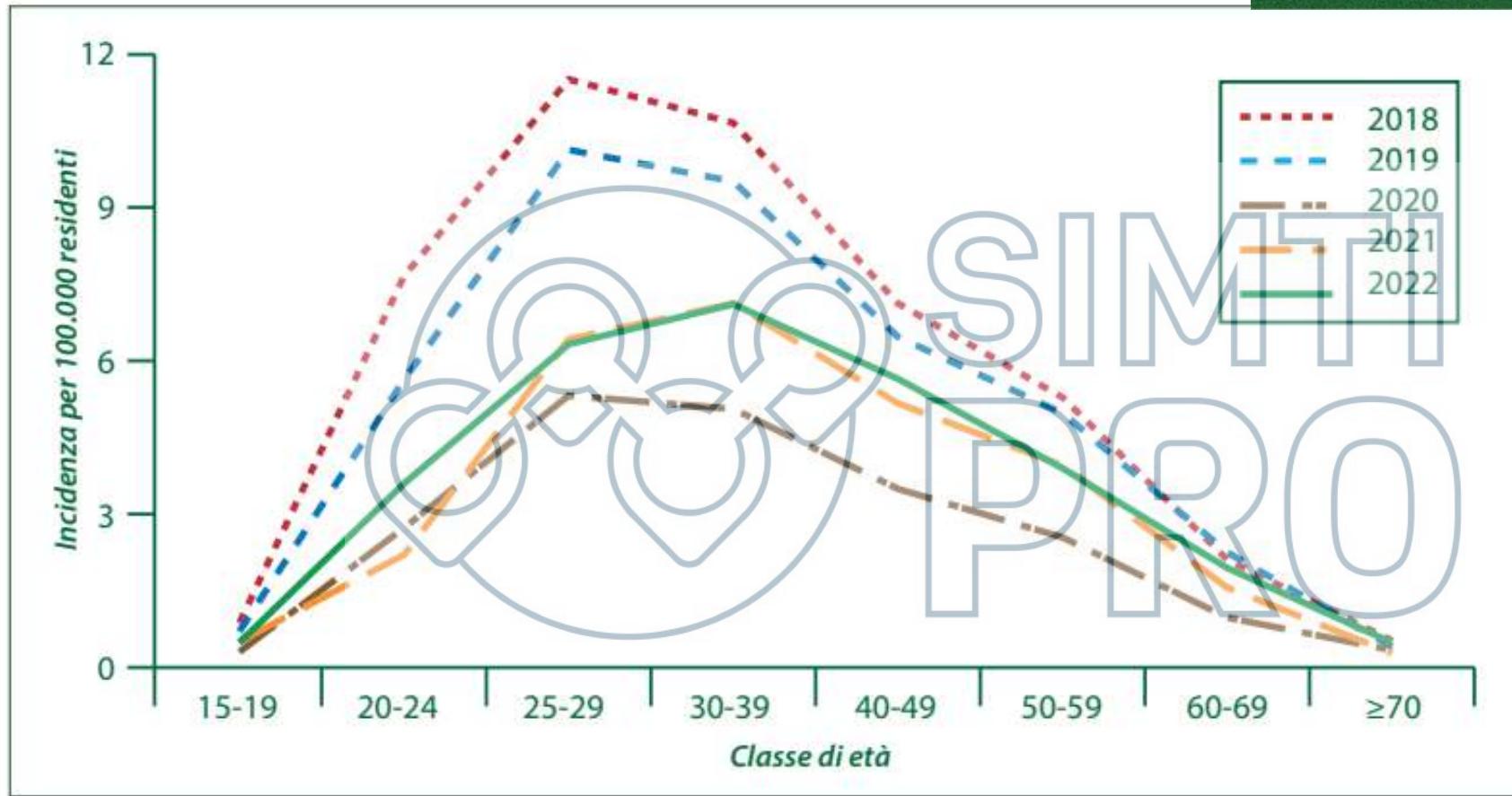
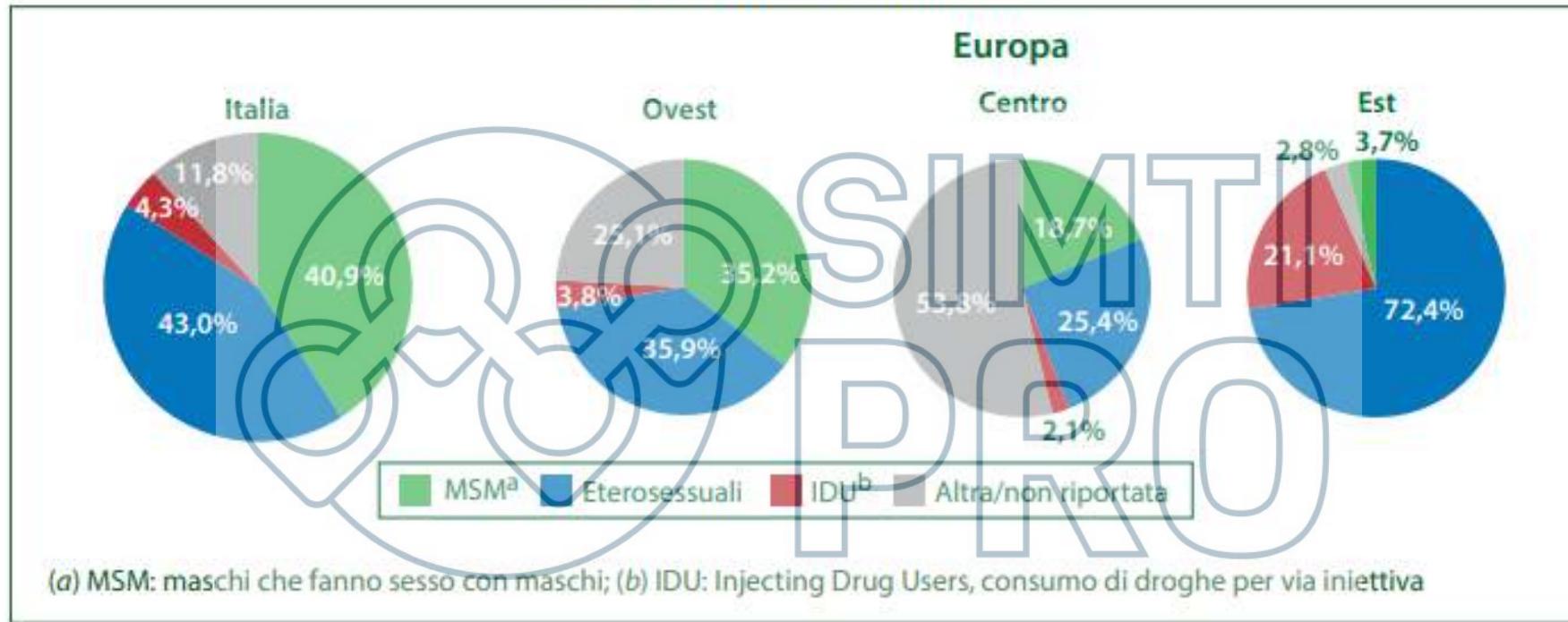


Figura 7 - Incidenza delle nuove diagnosi di infezione da HIV per classe di età (2018-2022)

Modalità di trasmissione 2022



Distribuzione percentuale delle nuove diagnosi di infezione da HIV per modalità di trasmissione 2022.

Fonti: Sistema di Sorveglianza HIV nazionale, ECDC/WHO. HIV/AIDS Surveillance in Europe 2023-2022 data (1)

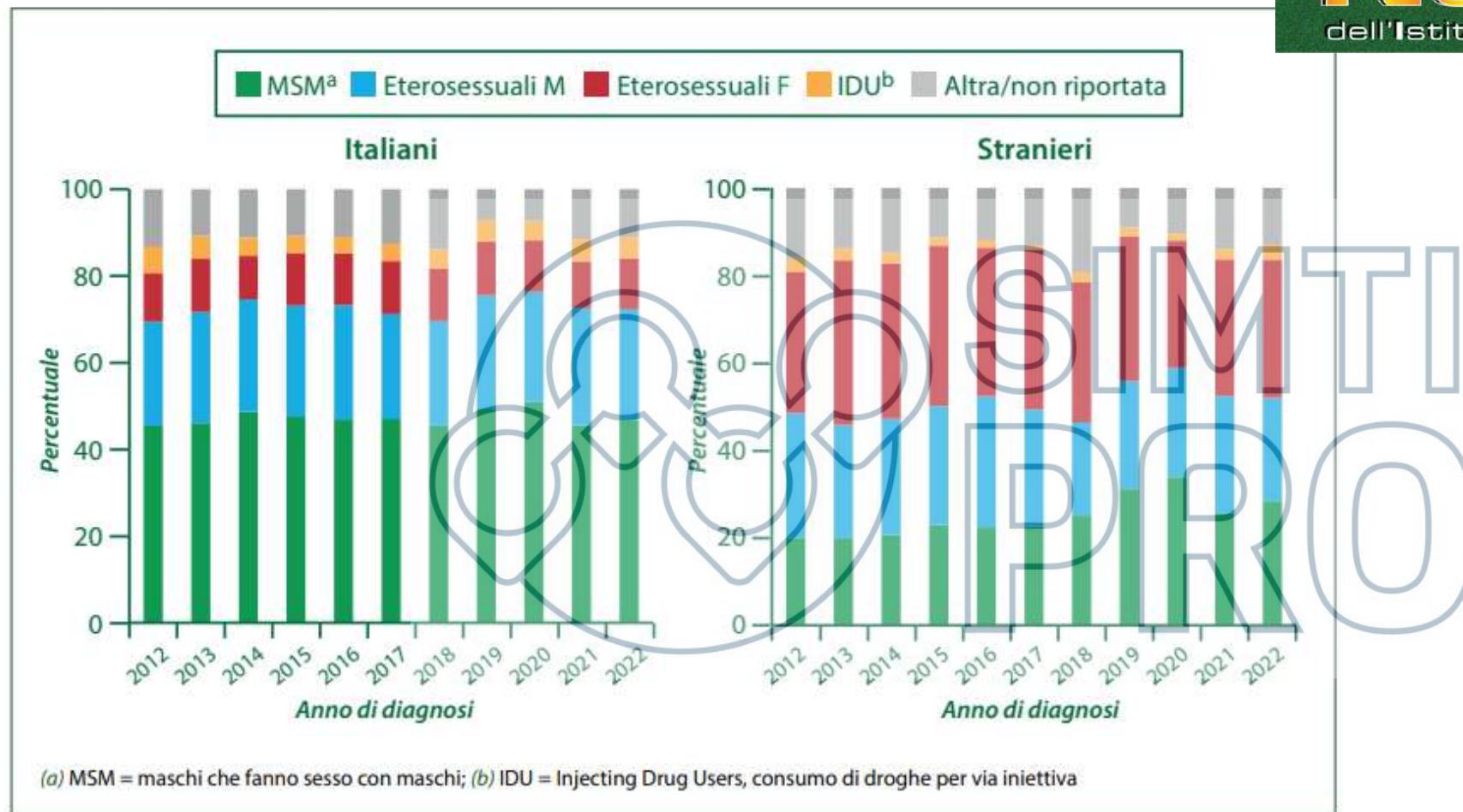


Figura 10 - Nuove diagnosi di infezione da HIV per modalità di trasmissione, nazionalità e anno di diagnosi (2012-2022)

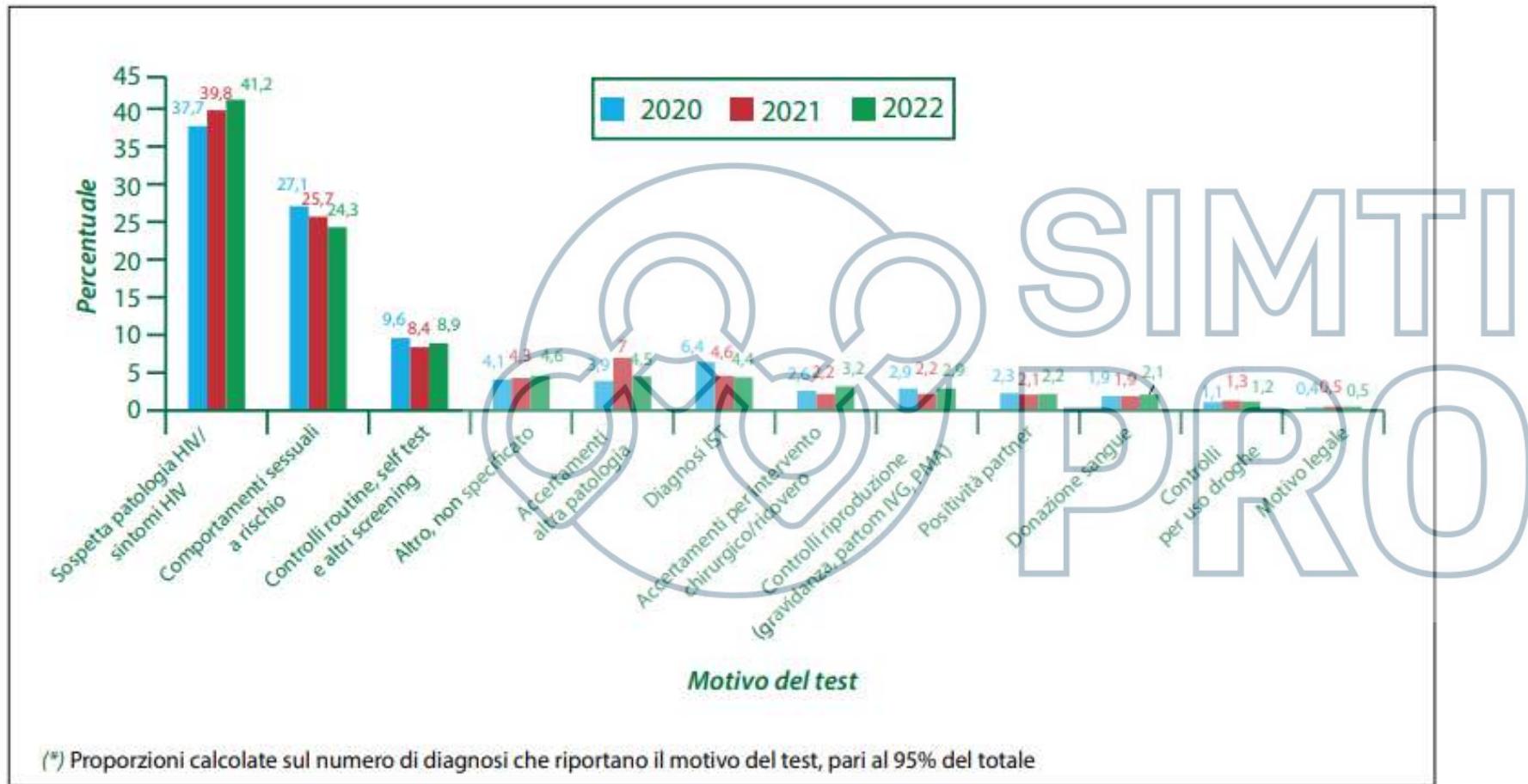
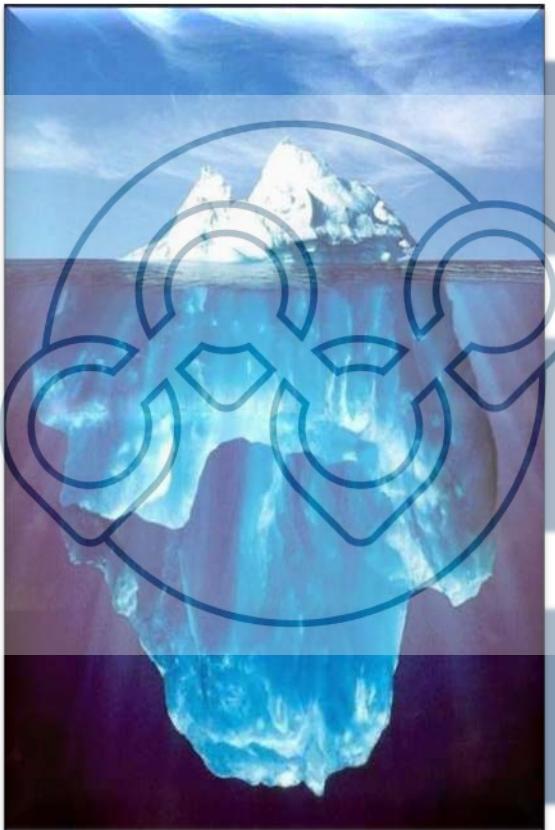


Figura 14 - Nuove diagnosi per motivo di effettuazione del test HIV* (2020-2022)

Il sommerso sostiene le nuove infezioni



Paese	Stima soggetti inconsapevoli
Repubblica Ceca	20-25%
Danimarca	15-20%
Francia	30%
Germania	25-30%
Italia	25%
Lettonia	50%
Olanda	40%
Polonia	> 50%
Slovacchia	20-30%
Svezia	12-20%
Regno Unito	30%
MEDIA UE	≈ 30%

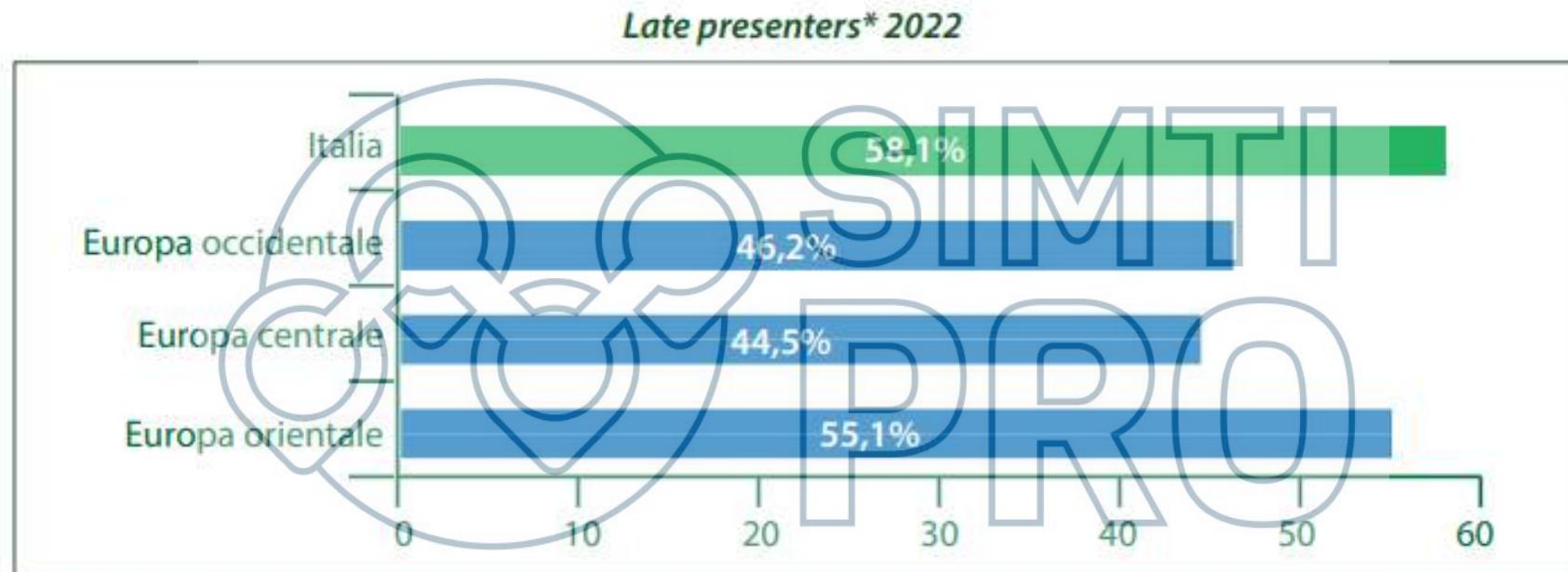
1 in 7 people

living with HIV in the EU/EEA
do not know they are infected



Because it's best to know: find a testing centre near you
all across Europe. Check bit.ly/ECDCHIVtesting

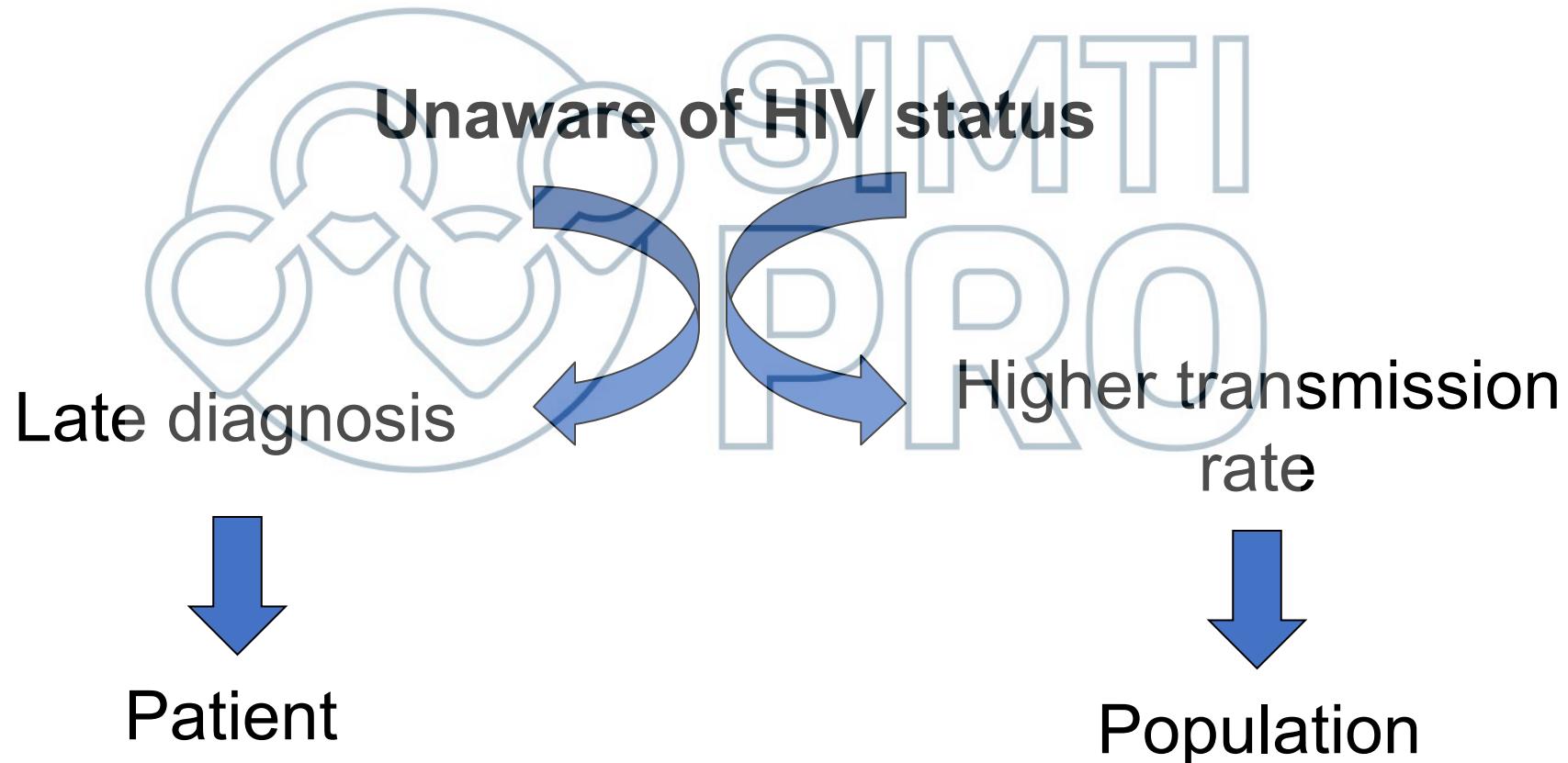




(*) Late presenters: nuove diagnosi di infezione da HIV con numero di linfociti CD4 <350 cell/µl.

Fonti: Sistema di Sorveglianza HIV nazionale, ECDC/WHO. HIV/AIDS Surveillance in Europe 2023-2022 data (1)

Unawareness of HIV: which risks?



Late diagnosis

- Increased HIV-related morbidity and mortality (AIDS- and non-AIDS-related illnesses)
- Shorter survival
- Poor response to treatment
- Increased transmission rate
- Increased healthcare costs

Causes of late diagnosis

- Unawareness of patients
- Unawareness of clinicians
- Barriers to testing
- Barriers to healthcare system
- Stigma and worry
- Social, cultural and linguistic factors

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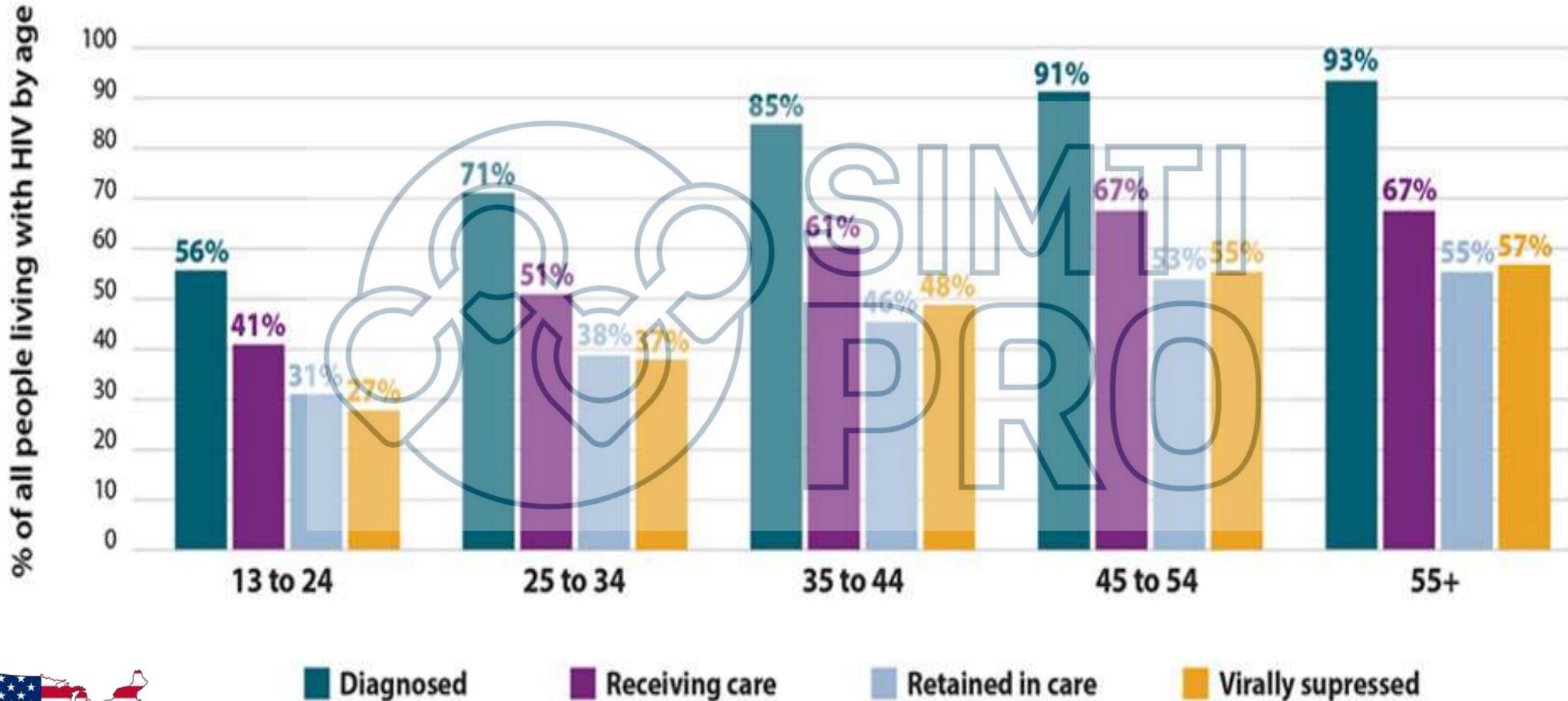
HIV e giovani adulti (1)

- Scarsa conoscenza dei comportamenti a rischio
- Modelli di riferimento spesso ingannevoli
- Scarsa informazione e consapevolezza della gravità dell'infezione da HIV
- Decorso spesso asintomatico delle infezioni e difficoltà nello svolgere le indagini diagnostiche
- Barriere all'accesso ai servizi sanitari per ragioni sia economiche sia di organizzazione degli stessi rispetto alle esigenze degli adolescenti
- Barriere legate a fattori economici, culturali, sociali e religiosi

HIV e giovani adulti (2)

- Prognosi peggiore ad ogni stadio dell'*HIV Care Cascade* rispetto agli adulti in età più avanzata
- Tassi di soppressione virologica più bassi negli adolescenti e nei giovani adulti
- Aderenza alla terapia ARV spesso subottimale
- *Retention in care* spesso inferiore per multipli fattori psicosociali
- Pochi studi sui modelli di implementazione della *retention in care*
- Pochi dati disponibili e spesso non confrontabili
- Gravi conseguenze sull'epidemia globale

CDC HIV Care Continuum 2020



Factors underlying adolescent retention in low and middle-income countries

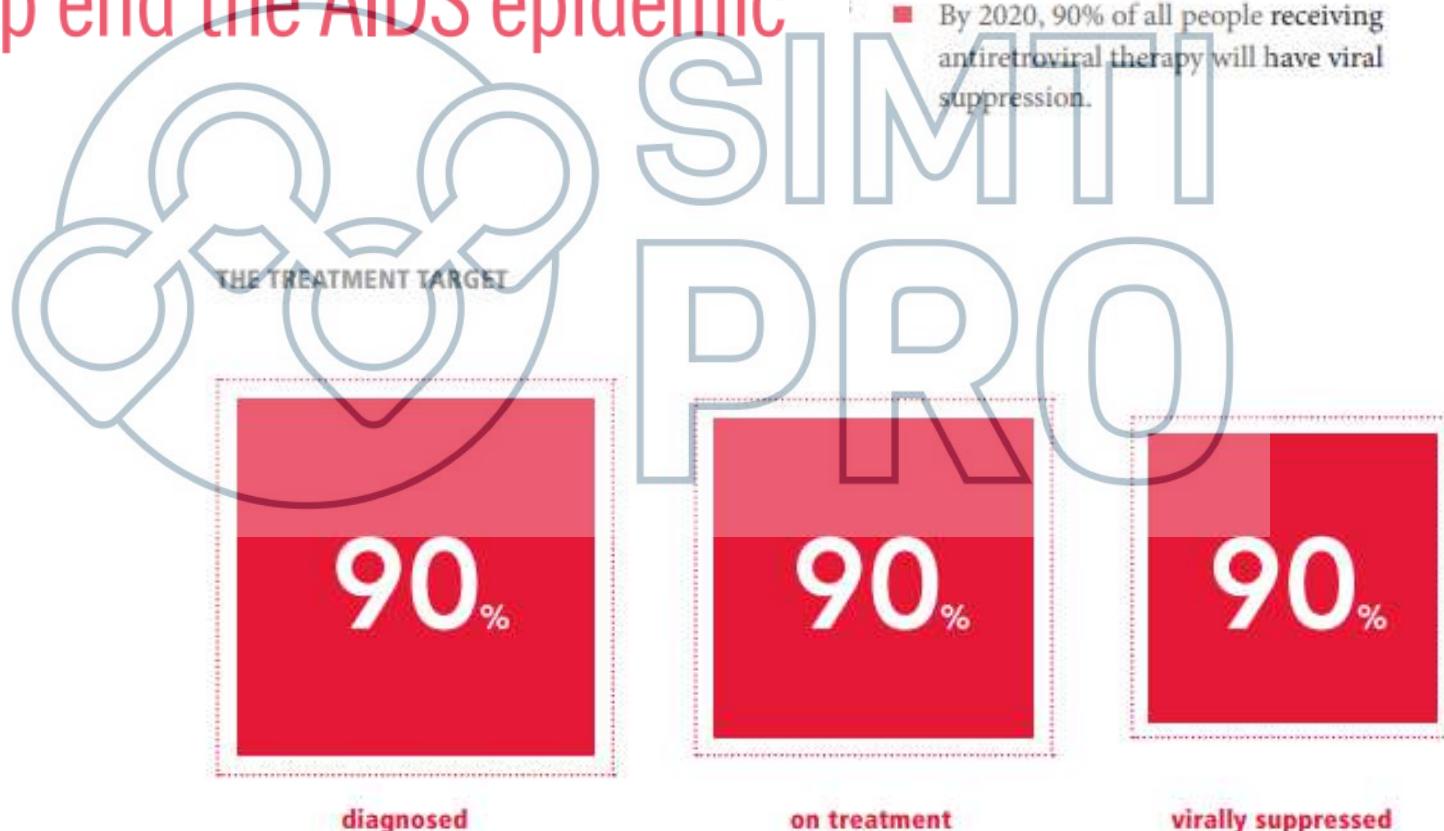
- Stigma and fear of disclosure within the family, school, and work environments
- Lack of financial, family or social support
- Distance to clinic
- Inflexible clinic hours
- Staff shortages
- Pill burden
- Antiretroviral drug side effects
- Lack of policies addressing adolescents and young adults



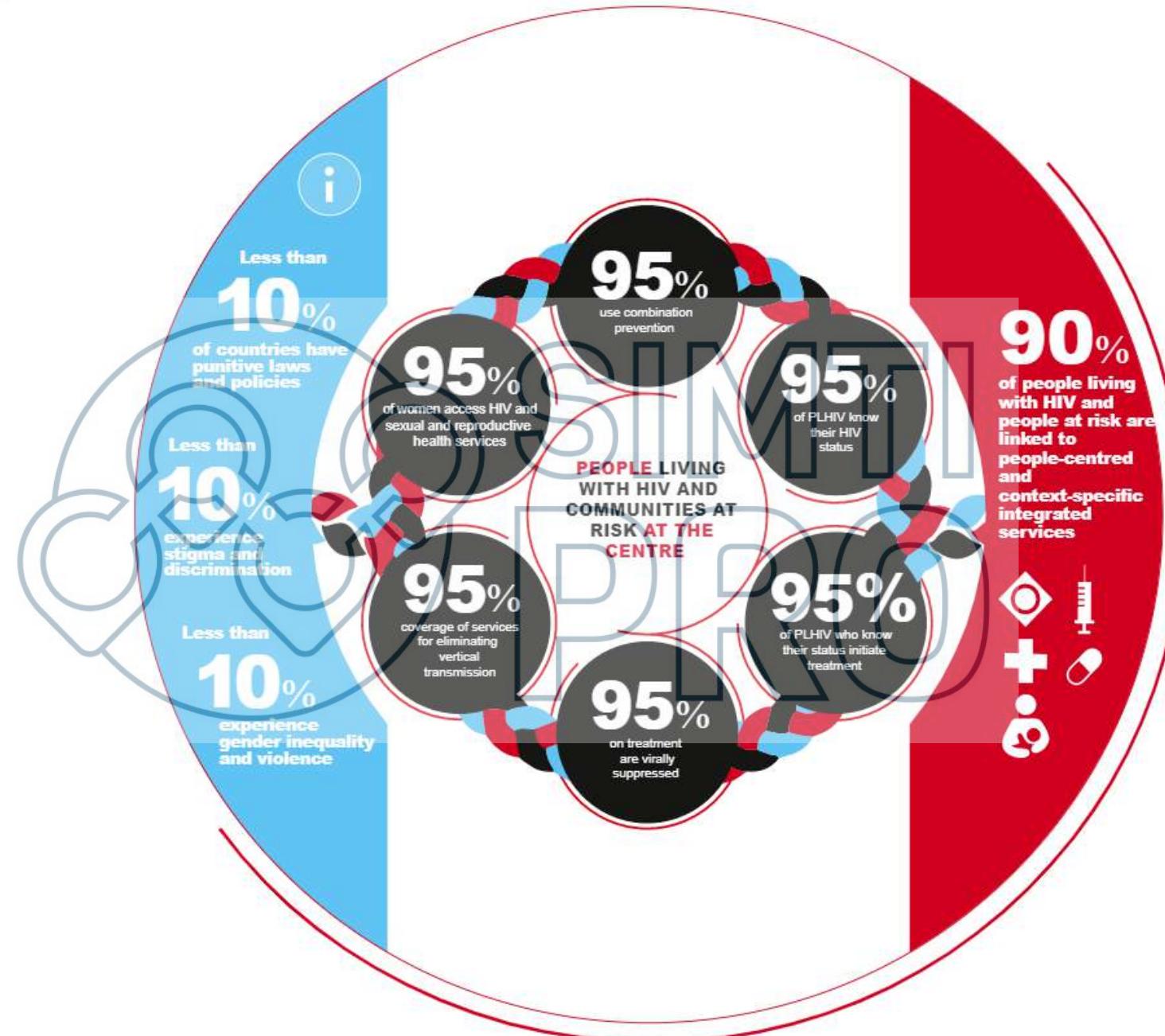


90-90-90

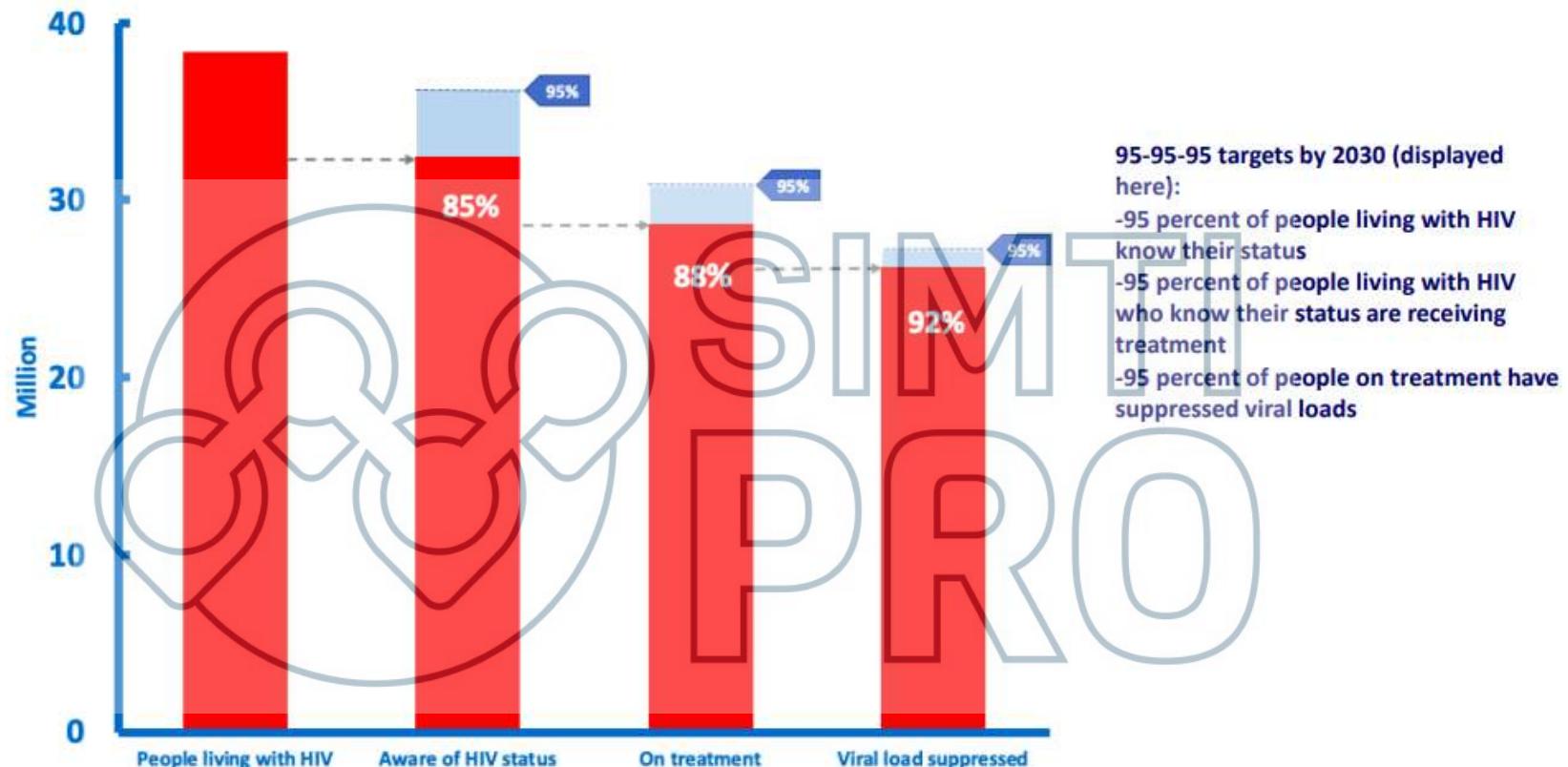
An ambitious treatment target
to help end the AIDS epidemic



2025 AIDS TARGETS



HIV service cascade, global, 2021

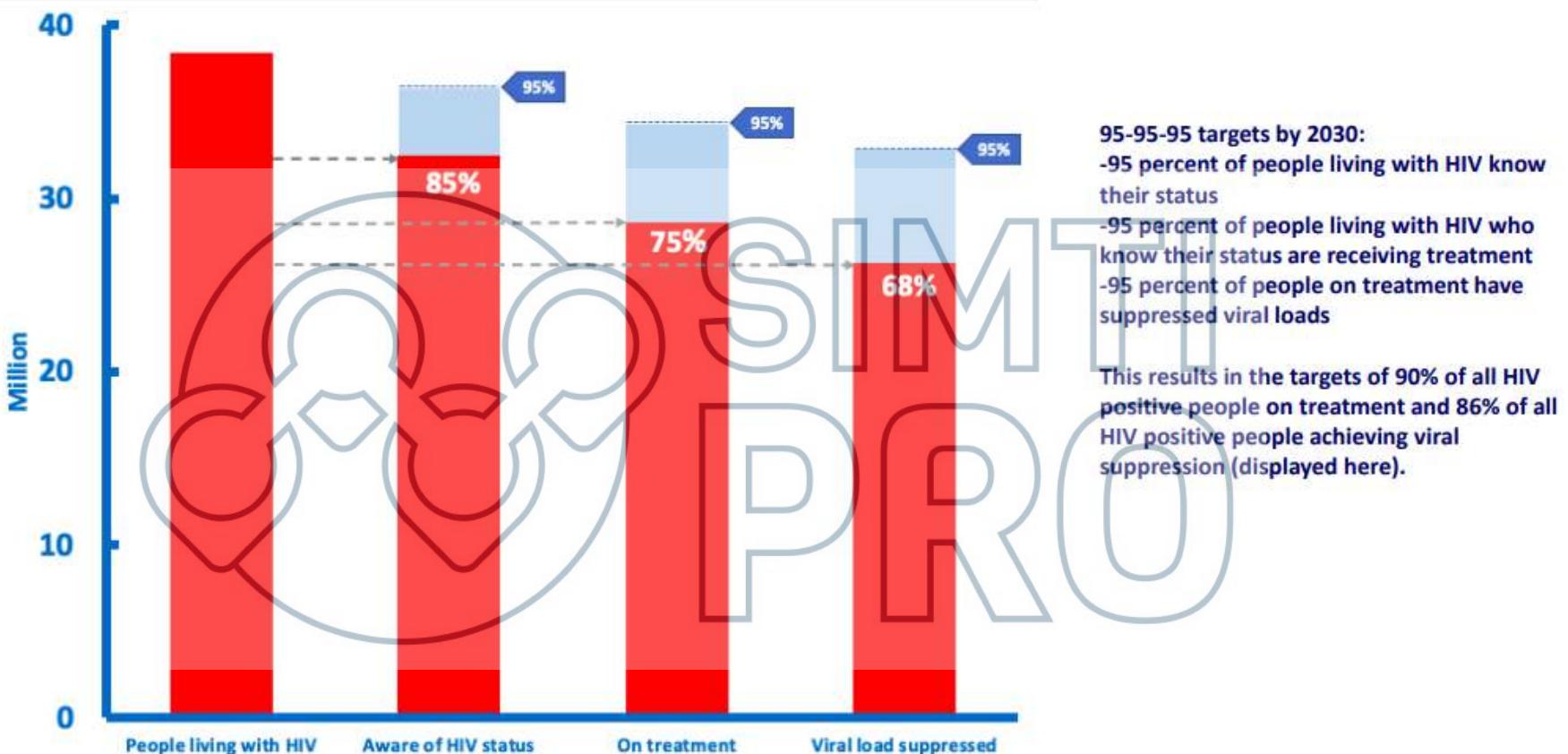


Source: UNAIDS/WHO estimates

The denominator is the value from the previous bar in the last three bars. For example, 88% of people who were aware of their status were receiving ART.

Updated: July 2022

HIV service cascade, global, 2021



Source: UNAIDS/WHO estimates

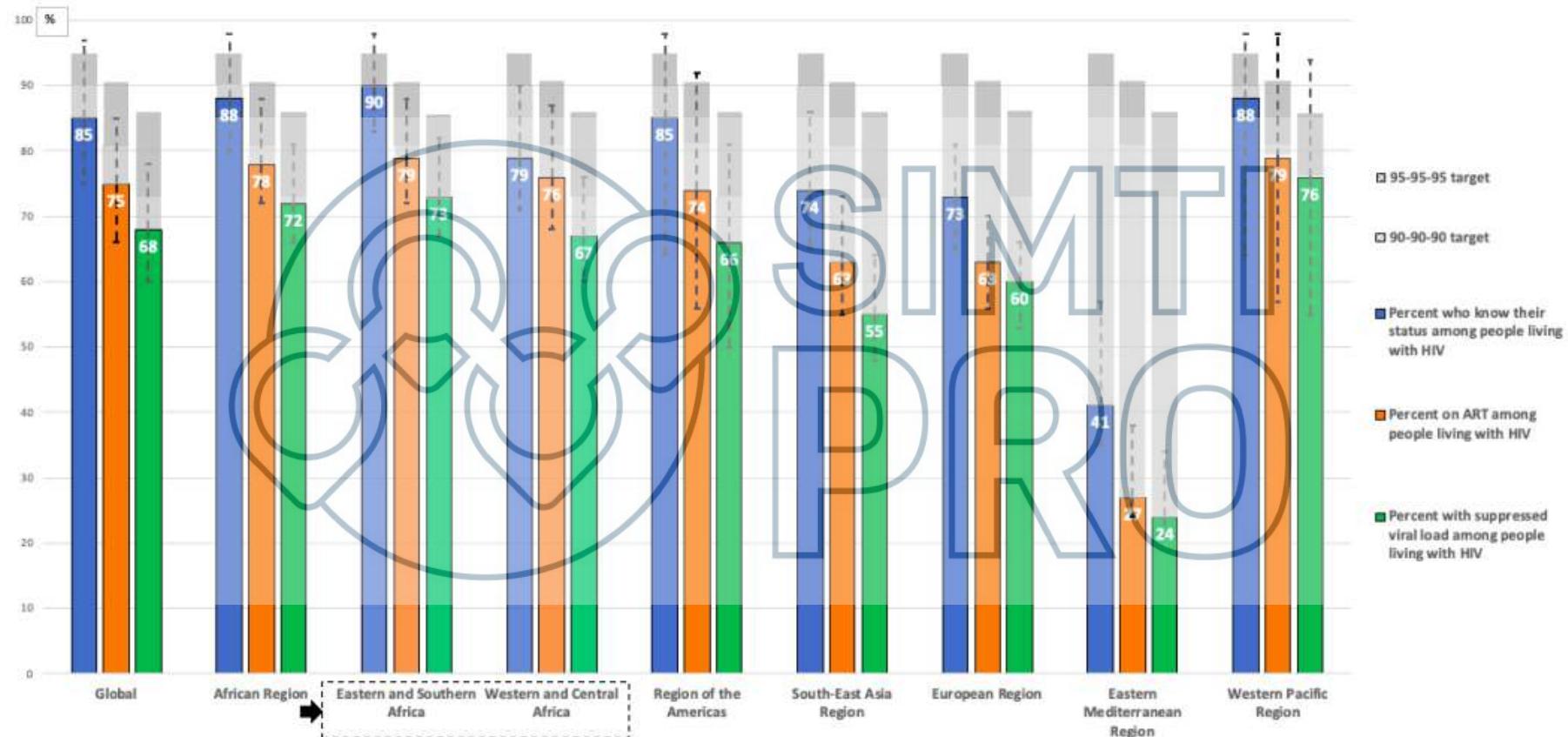
The denominator is “People living with HIV” in the last three bars.

Updated: July 2022



World Health Organization

Progress towards 90–90–90 and 95–95–95 targets of the HIV service cascade, by WHO region, 2021

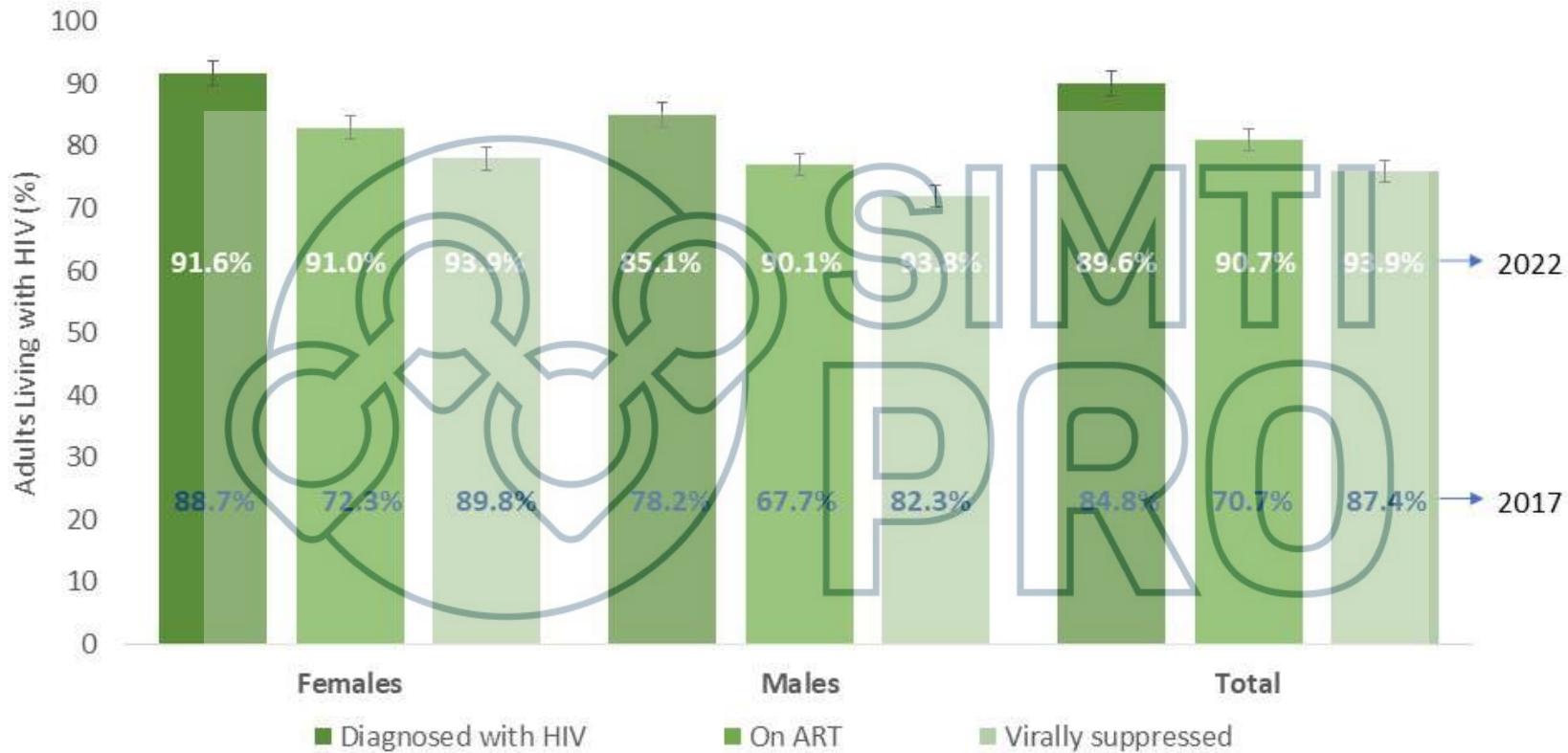


Source: UNAIDS/WHO estimates

Updated: July 2022

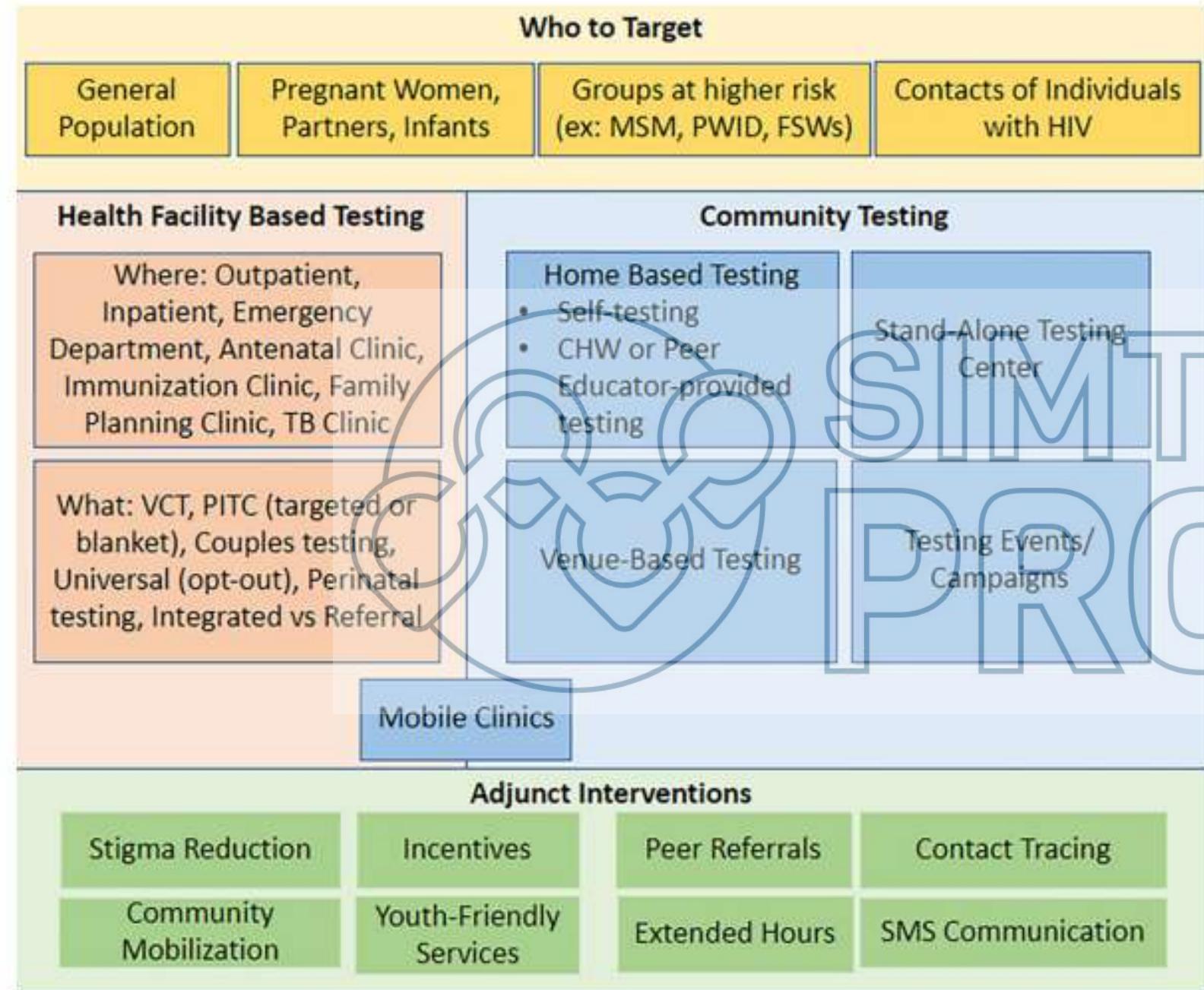


95-95-95 INDICATORS FOR PEOPLE AGED 15+ LIVING WITH HIV, SOUTH AFRICA, 2022



Early identification of HIV

- More active and more widespread offer of HIV testing
- Better knowledge of HIV symptoms
- More consciousness of general practitioners
- Better awareness of exposures at risk
- Improve retention in care strategies
- Contrast stigma



HIV Testing Implementation

(Mannoh I et al., AIDS Behav 2022)

Targets	The COVID-19 impact	Strength of the impact	Opportunities for the future
95% of PLHIV know their HIV status.	<ul style="list-style-type: none"> Reduction in number of HIV-tests. 	<ul style="list-style-type: none"> The number of HIV-tests decreased ranging from 47.6 to 80% in April 2020 in South Africa and Peru, 30% in Uganda, and 20% in Italy. 	<ul style="list-style-type: none"> Increasing the availability of HIV self-testing and rapid test screening in non-hospital settings including community, instead of in-person visits.
95% of PLHIV who know their status initiate treatment.	<ul style="list-style-type: none"> Decreased number of ART initiations. 	<ul style="list-style-type: none"> The median number of ART initiations per week decreased from 571 before the lockdown to 375 per week after the lockdown in 65 South African primary care clinics. The initiation of ART has decreased by 31% between April and June 2020 alone in Uganda. 	<ul style="list-style-type: none"> The near-real-time daily data on COVID-19 cases and mortality reporting addresses surveillance in managing a major pandemic, which can be used in HIV cases management.
95% on treatment are virally suppressed.	<ul style="list-style-type: none"> Patients dropped out of treatment. Decreased ability to monitor treatment outcomes with viral load testing. Drug shortages. 	<ul style="list-style-type: none"> A six-month complete disruption in ART could cause more than 500,000 additional deaths in sub-Saharan Africa during 2020–2021, bringing the region back to 2008 AIDS mortality levels. Even a 20% disruption could cause an additional 110,000 deaths. Manufacturers of viral load testing platforms developed molecular diagnostic capability for SARS-CoV-2 using the same equipment used for HIV viral load testing. Many laboratory staff members were shifted from molecular testing for HIV to testing for SARS-CoV-2. HIV Viral load testing coverage has decreased from 96 to 85%, and CD4 access decreased from 31 to 22% in Uganda between December 2019 and June 2020. 	<ul style="list-style-type: none"> Centralizing patients and decentralizing HIV care, including multi-month dispensing and expanding collection of dried blood spot specimens, directly delivering ART to communities, and integrating HIV viral load testing with ART distribution.

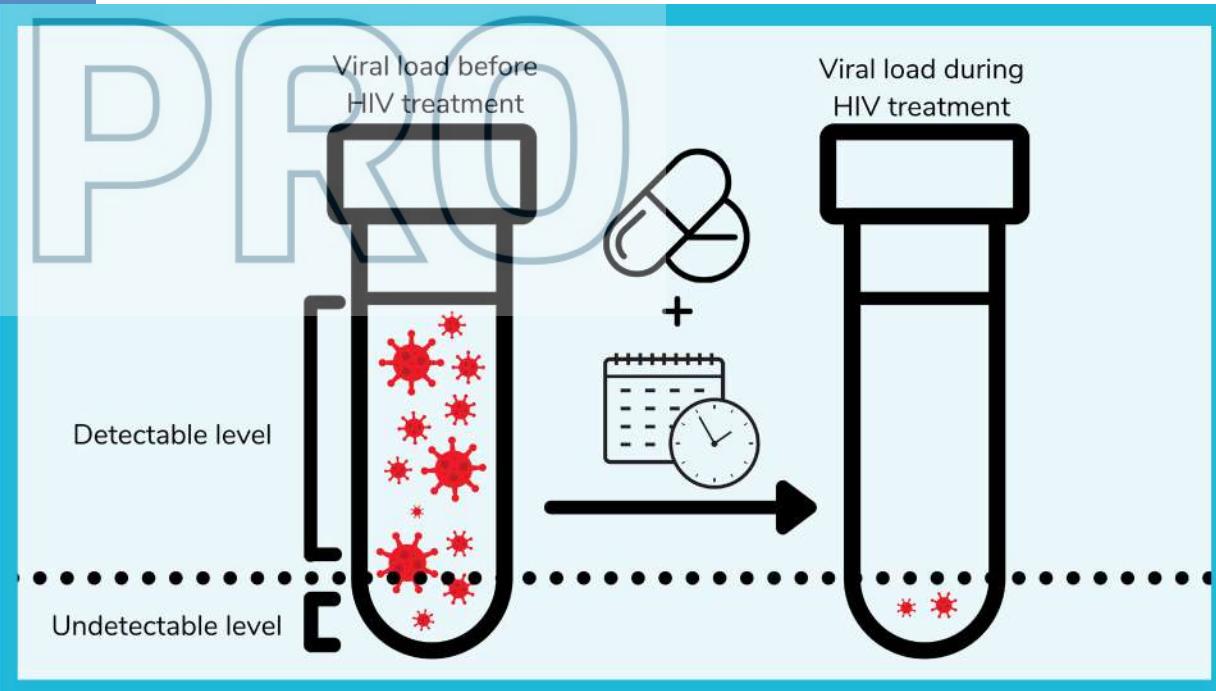
Impact of the COVID-19 Pandemic on the UNAIDS Six 95% HIV Control Targets

Undetectable=Untransmittable

U = U

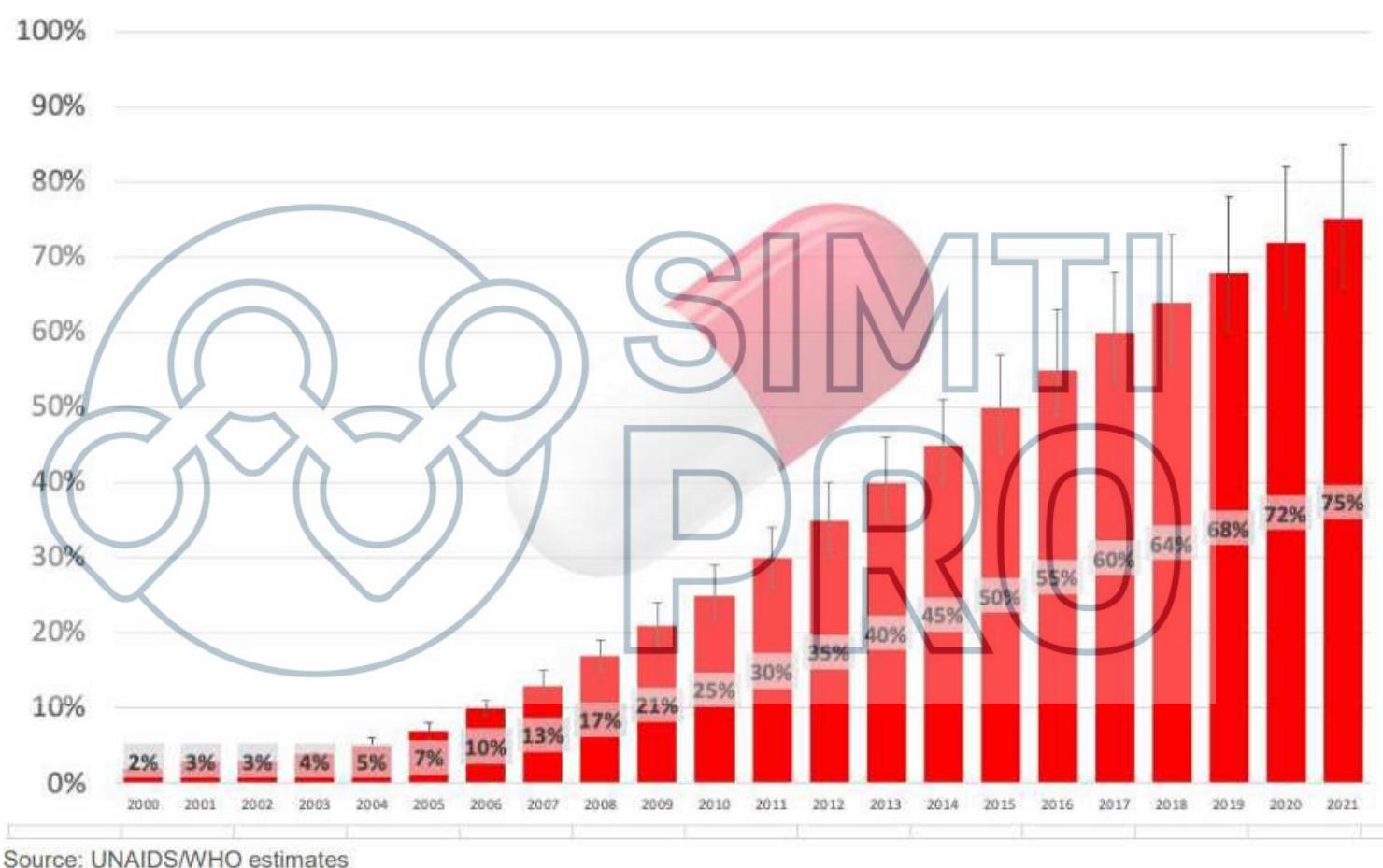


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TasP
Therapy as Prevention

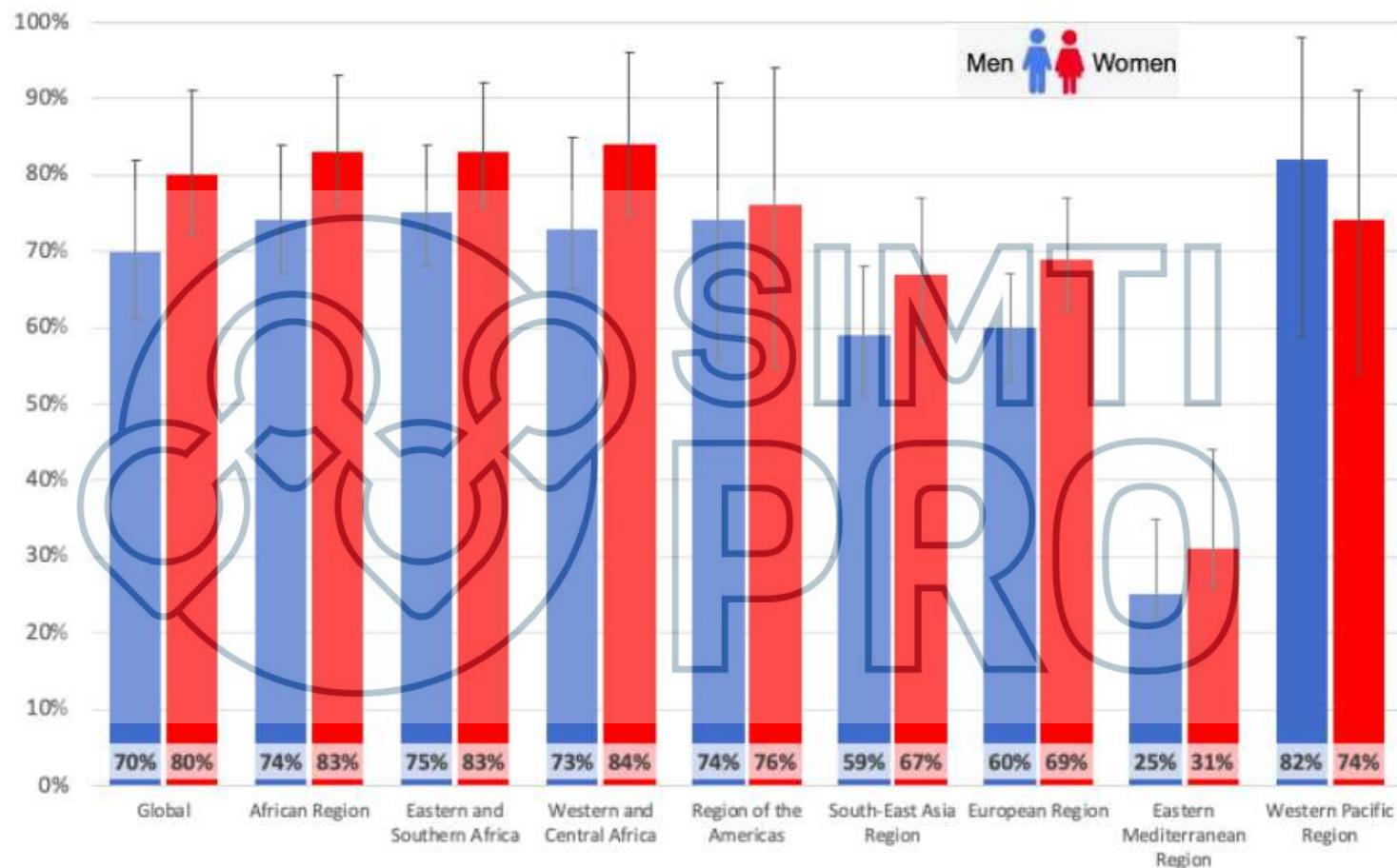
Global antiretroviral therapy coverage over time, 2000–2021



Updated: July 2022



ART coverage by sex among adults, by WHO region, 2021

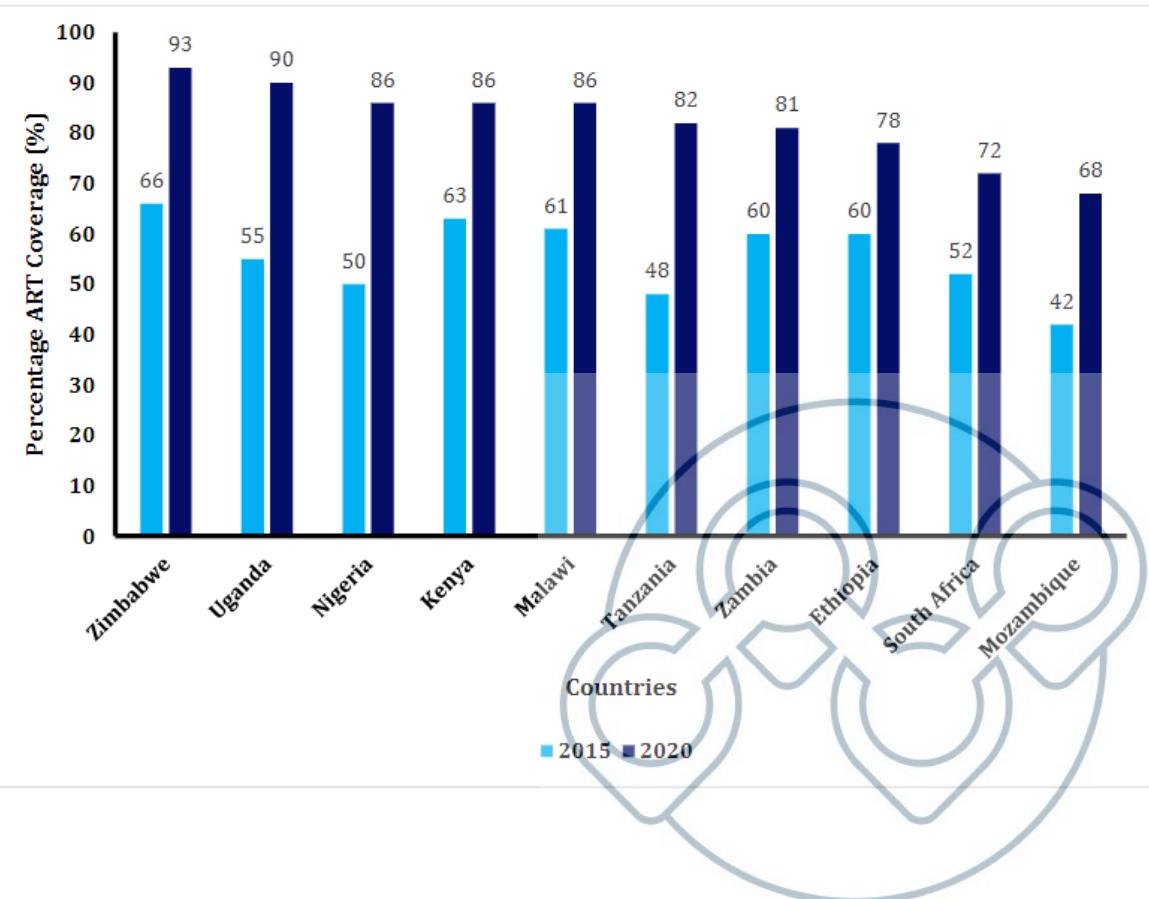


Source: UNAIDS/WHO estimates

Updated: July 2022

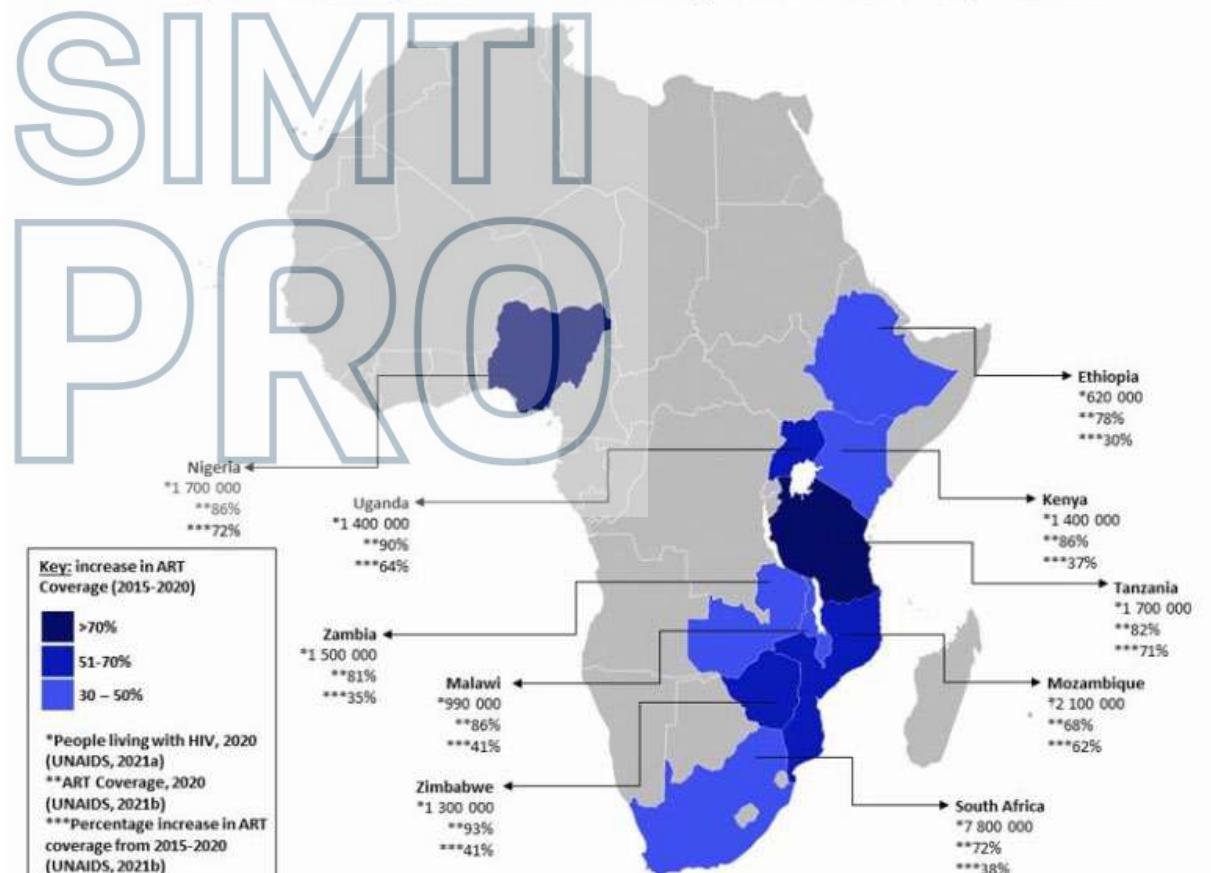


World Health Organization



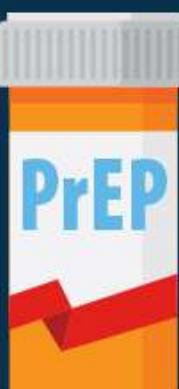
(Babatunde AO et al., J Med Virol 2022)

Figure 2: Percentage increase in ART Coverage from 2015 to 2020 by Countries



MMWR | PrEP: An Essential Tool to End HIV

Pre-exposure Prophylaxis (PrEP)

- A powerful way to prevent HIV
 - Used daily, PrEP dramatically reduces risk of acquiring HIV through sex
- 

More PrEP Use is Needed

PrEP use up from 6% to 35% among MSM**

PrEP use still too low, especially among Black and Hispanic MSM

Healthcare Providers Can Help End HIV!

- ✓ Test for HIV
- ✓ Assess patient risk
- ✓ Prescribe PrEP as needed
- ✓ Use CDC resources*



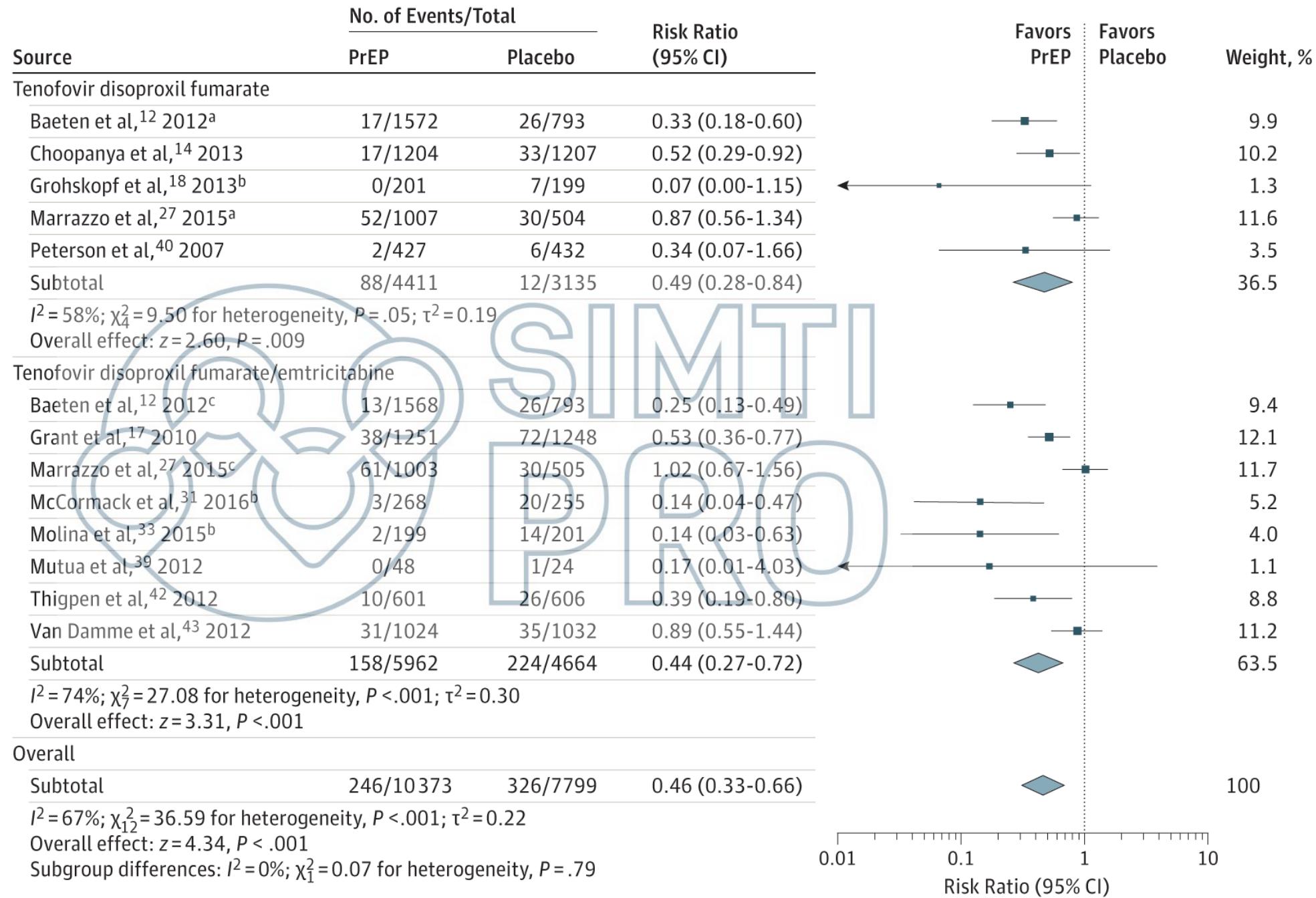
Footnote: Data from CDC's National HIV Behavioral Surveillance (NHBS) (20 cities) as reported in Finlayson et al. MMWR 2019. bit.ly/CDCVA29

*PrEP clinical practice guidelines. <https://www.cdc.gov/hiv/pdf/risk/prep/cdc-hiv-prep-guidelines-2017.pdf>

**Men who have sex with men

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How Does It Work?

In several studies of PrEP, the risk of getting HIV infection was much lower — up to 92% lower — for those who took the medicines consistently than for those who didn't take the pill.

Some of the same medicines prescribed for the treatment of HIV can also be prescribed for its prevention.

When taken every day, PrEP can provide a high level of protection against HIV, and is even more effective when it is combined with condoms and other prevention tools.

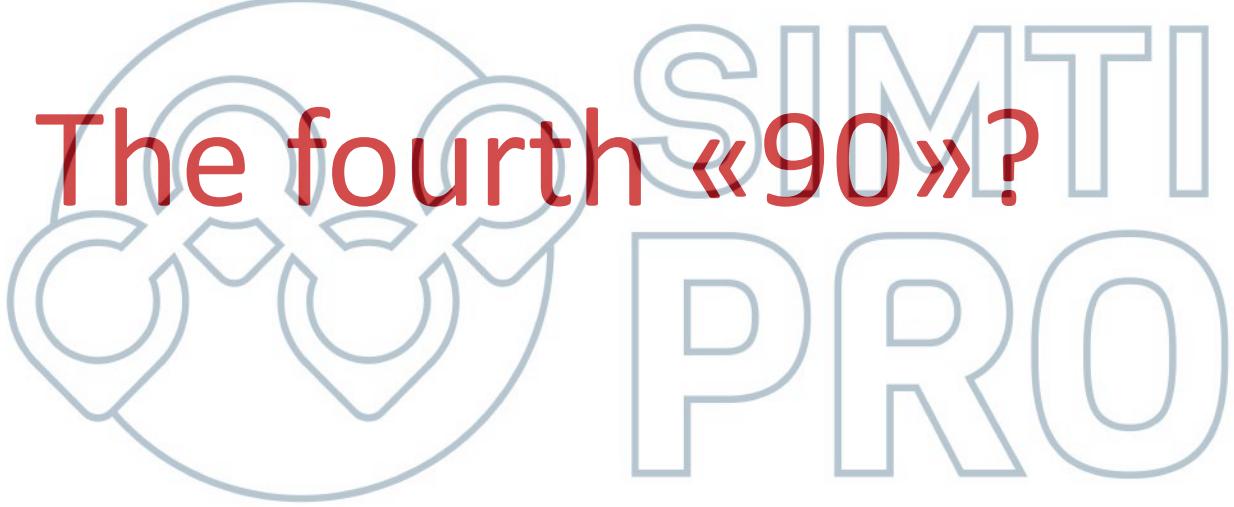
SIDE EFFECTS

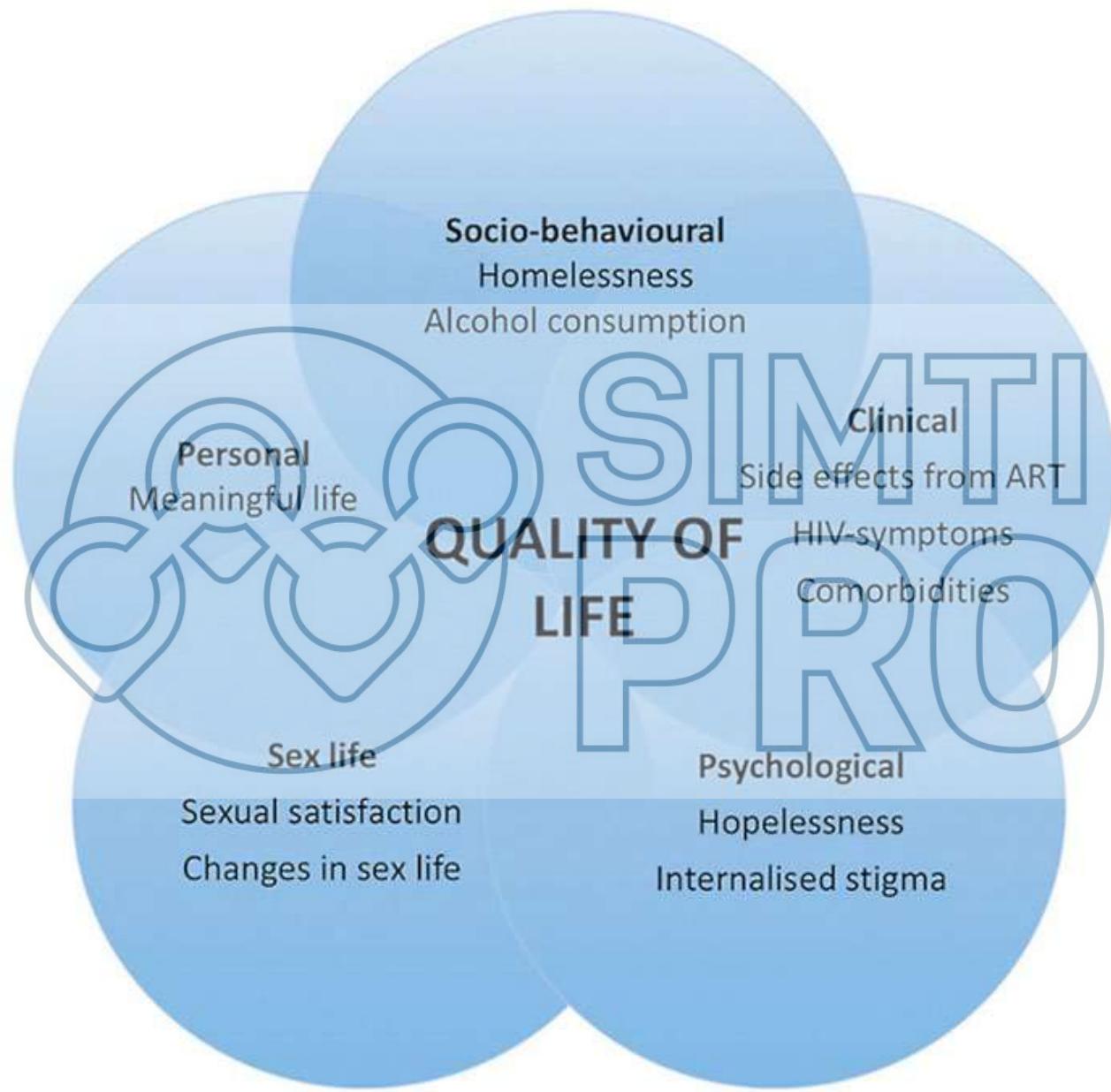
People who use PrEP should take the medicine every day and return to their health care provider every 3 months for follow-up and prescription refills.

Some people in clinical studies of PrEP had early side effects such as an upset stomach or loss of appetite, but these were mild and usually went away in the first month. Some people also had a mild headache. No serious side effects were observed. You should tell your health care provider if these or other symptoms become severe or do not go away.

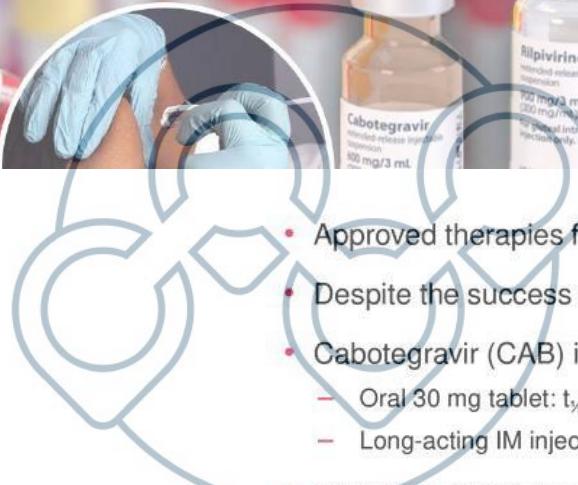
Summary of Guidance for PrEP Use			
	Men Who Have Sex With Men	Heterosexual Women and Men	Injection Drug Users
Detecting substantial risk of acquiring HIV infection:	<ul style="list-style-type: none">Sexual partner with HIVRecent bacterial STDHigh number of sex partnersHistory of inconsistent or no condom useCommercial sex work	<ul style="list-style-type: none">Sexual partner with HIVRecent bacterial STDHigh number of sex partnersHistory of inconsistent or no condom useCommercial sex workLives in high-prevalence area or network	<ul style="list-style-type: none">HIV-positive injecting partnerSharing injection equipmentRecent drug treatment (but currently injecting)
Clinically eligible:		<ul style="list-style-type: none">Documented negative HIV test before prescribing PrEPNo signs/symptoms of acute HIV infectionNormal renal function, no contraindicated medicationsDocumented hepatitis B virus infection and vaccination status	
Prescription	Daily, continuing, oral doses of TDF/FTC (Truvada), ≤90 day supply		
Other services:	<ul style="list-style-type: none">Follow-up visits at least every 3 months to provide:<ul style="list-style-type: none">HIV test, medication adherence counseling, behavioral risk reduction support, side effect assessment, STD symptom assessmentAt 3 months and every 6 months after, assess renal functionEvery 6 months test for bacterial STDsDo oral/rectal STD testingAssess pregnancy intent<ul style="list-style-type: none">Pregnancy test every 3 monthsAccess to clean needles/syringes and drug treatment services		

Source: US Public Health Service. Preexposure prophylaxis for the prevention of HIV infection in the United States —2014: a clinical practice guideline.





Cabotegravir & Rilpivirine long-acting injectable treatment for HIV patients



- Approved therapies for HIV now include once-daily oral regimens containing 2 or 3 antiretrovirals
- Despite the success of daily oral therapy, considerable interest exists in LA treatment options
- Cabotegravir (CAB) is an HIV-1 integrase strand transfer inhibitor
 - Oral 30 mg tablet: $t_{1/2} \approx 40$ hours
 - Long-acting IM injection, 200 mg/mL: $t_{1/2} \approx 40$ days
- Rilpivirine (RPV) is an HIV-1 non-nucleoside reverse transcriptase inhibitor
 - Oral 25 mg tablet: $t_{1/2} \approx 50$ hours
 - Long-acting IM injection, 300 mg/mL: $t_{1/2} \approx 90$ days
- LATTE-2: CAB LA + RPV LA given every 4 or 8 weeks maintained HIV-1 RNA <50 c/mL for >3 years¹
- Two pivotal phase 3 studies (ATLAS² and FLAIR) have reached their primary endpoints at 48 weeks



CAB, cabotegravir; IM, intramuscular; LA, long-acting; RPV, rilpivirine; $t_{1/2}$, half-life.

1. Margolis D, et al. HIV Glasgow 2018; UK. Poster 118; 2. Swindells S, et al. CROI 2019; Seattle, WA, Abstract 1475.

Orkin C, et al. CROI 2019; Seattle, WA. Abstract 3947.

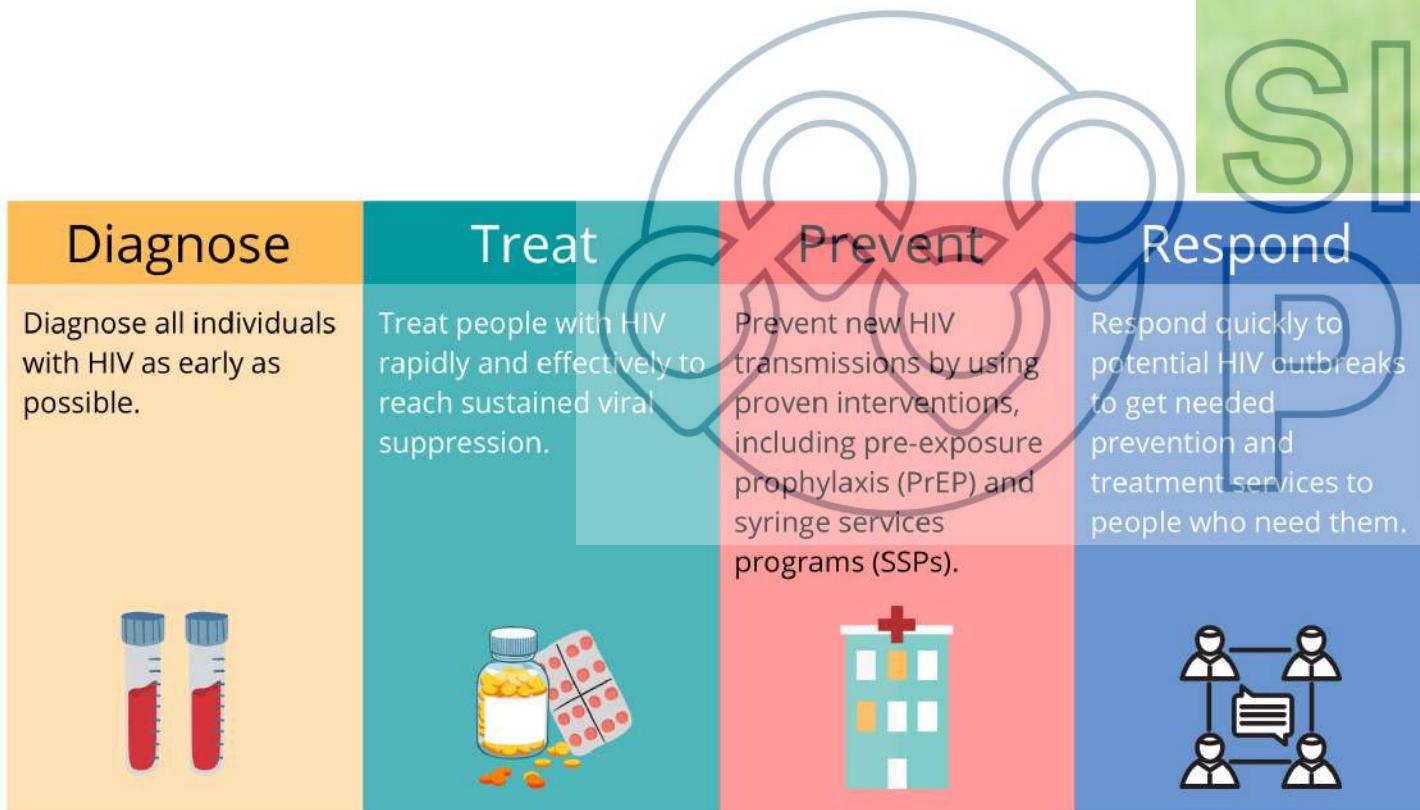
Stigma reduction interventions in people living with HIV to improve health-related quality of life

Key Message Panel

- HIV-related stigma and discrimination remain major obstacles for reaching good health-related quality of life (HRQoL).
- Despite considerable efforts to combat HIV-related stigma and discrimination, the effects experienced by people living with HIV are insufficiently evaluated and documented.
- There is a lack of well-designed intervention studies that document stigma reduction.
- Few interventions specifically assessed the impact of HIV stigma on HRQoL
- Few interventions involved people living with HIV in either the design or implementation, although the existing evidence shows the importance of this for relevant and sustainable impact
- Evidence remains scarce on methods to reduce HIV stigma among several key populations and in many geographic regions.
- Further research is required on how to address intersectional stigma for populations disproportionately affected by HIV, and on how to prevent discrimination from healthcare providers outside HIV-specific care, a growing concern to reach the 4th 90 as it undermines health seeking for mental health disorders and other comorbidities.

THE AIDS EPIDEMIC CAN BE ENDED BY 2030

WITH YOUR HELP



The Porticoes of Bologna

Italy



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