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ANTIRETROVIRAL MEDICINES IN LOW- AND MIDDLE-INCOME COUNTRIES: FORECASTS OF GLOBAL AND REGIONAL DEMAND FOR 2020–2024

DECEMBER 2021

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ACKNOWLEDGEMENTS

ABBREVIATIONS AND ACRONYMS

3TC	lamivudine
ABC	abacavir
ART	antiretroviral therapy
ARV	antiretroviral
ATV	atazanavir
ATV/r	ritonavir-boosted atazanavir
AZT	zidovudine (also known as ZDV)
d4T	stavudine
ddI	didanosine
DRV	darunavir
DTG	dolutegravir
EFV	efavirenz
ETV	etravirine
FTC	emtricitabine
IDV	indinavir
INSTI	integrase strand transfer inhibitor
LPV	lopinavir
LPV/r	ritonavir-boosted lopinavir
NNRTI	non-nucleoside reverse-transcriptase inhibitor
NRTI	nucleoside reverse-transcriptase inhibitor
NtRTI	nucleotide reverse-transcriptase inhibitor
NVP	nevirapine
PAHO	Pan American Health Organization
PI	protease inhibitor
RAL	raltegravir
RTV	ritonavir
SQV	saquinavir
TDF	tenofovir disoproxil fumarate
TAF	tenofovir alafenamide
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Porgramme
UNICEF	United Nations Children's Fund

EXECUTIVE SUMMARY

After exceeding the previous goal of 15 million people receiving antiretroviral therapy (ART) by 2015, the global community was to achieve the Fast-Track or 90–90–90 targets by 2020. As of the end of 2020, about 25 million people were receiving ART in low- and middle-income countries. Between 2017 and 2020, the number of people receiving treatment grew at an average of 1.6 million per year, indicating progress of the test and start initiative.

The goal of this report is to provide countries and suppliers with estimates of the global market for antiretroviral (ARV) medicines in low- and middle-income countries for 2020–2024. The report includes estimates of the global demand for both active pharmaceutical ingredients and ARV drug formulations for adults receiving first-line ART to enable suppliers to manage their manufacturing capacity accordingly.

This report uses three forecasting approaches to project the demand for ART, expressed as the number of people receiving treatment from 2020 to 2024:

- the linear regression forecast extrapolates from the historical trends of the previous three years (2017, 2018 and 2019) in the number of people receiving ARV drugs;

- the country target model reflects the reported programme goals of national programmes; and

- the Fast-Track estimates from 2020 to 2024, which assumes that (1) by 2020, 90% of people living with HIV will know their status, 90% of those who know their HIV-positive status will be receiving ART and 90% of those receiving ART have suppressed viral loads; and (2) beyond 2030, 95% of people living with HIV will know their status, 95% of those who know their HIV-positive status will be receiving ART and 95% of those receiving ART will have suppressed viral loads.

Similar to the ARV drug demand forecast report from the previous year, the Fast-Track projection was used to estimate that the average total number of adults and children receiving treatment will be 31.7 million people by 2024. All three projection methods are based on the WHO surveys capturing ARV drug use in 2017 and 2018 and on the UNAIDS Global AIDS Monitoring tool capturing ARV drug use in 2019.

The assumptions underlying the forecasts for demand for active pharmaceutical ingredients for 2020–2024 were developed through the work of the Technical Working Group Meeting on Global Antiretroviral Demand Forecast, which included staff from the Clinton Health Access Initiative, Avenir Health (formerly Futures Institute), the Global Fund to Fight AIDS, Tuberculosis and Malaria, UNAIDS, the Medicines Patent Pool, the Office of the United States Global AIDS Coordinator, the Global Health Supply Chain, UNICEF, the United States Agency for International Development and WHO. The Technical Working Group coordinated several sources of data on ARV drugs, including the WHO survey on ARV drug use, the Global Price Reporting Mechanism data on procurement, Supply Chain Management System procurement, national guidelines and the Clinton Health Access Initiative data on drug recipients to consolidate key assumptions and generate the projected demand for active pharmaceutical ingredients.

To improve the accuracy of forecasting demand, this year's report was able to build on the depth of historical data from WHO's annual survey of ARV drug use, the Global AIDS Monitoring tool and the Clinton Health Access Initiative consolidated data from 21 countries with the highest global burden of HIV. As a result, the distribution of adults and children receiving ARV drug treatment was calculated based on the average of the WHO surveys of ARV drug use in 2017–2019 and the Clinton Health Access Initiative consolidated data on ARV drug backbones for adults only.

This report also provides the estimated number of adults receiving first-line ART for individual ARV drugs by consolidating data from three key sources: extrapolation of historical WHO surveys on ARV drug use, the Global AIDS Monitoring report for 2019 ARV drug use and the Clinton Health Access Initiative projected market share data for active pharmaceutical ingredients. The market shares of active pharmaceutical ingredients for adults were categorized as follows:

- primary nucleoside reverse-transcriptase inhibitors (NRTIs) and nucleotide reverse-transcriptase inhibitors (NtRTIs): stavudine (d4T), zidovudine (AZT), tenofovir disoproxil fumarate (TDF), abacavir (ABC) and the expected introduction of tenofovir alafenamide (TAF);

- secondary NRTIs: lamivudine (3TC) and emtricitabine (FTC); and

- non-nucleoside reverse-transcriptase inhibitors (NNRTIs) and integrase strand transfer inhibitors (INSTIs): nevirapine (NVP), efavirenz (EFV) and dolutegravir (DTG).

In addition to providing estimated demand for active pharmaceutical ingredients for adults receiving first-line ART, this report includes estimated top first-line adult regimens based on the Clinton Health Access Initiative demand forecast and Medicines Patent Pool 2020 ARV drug sales forecast for ARV drug formulations (in person-years) based on projected procurement data from the Global Fund, Global Health Supply Chain and the Government of South Africa for the second, third and fourth quarters of 2018 and the first three quarters of 2019 (Table 8).

The figures in this report are not meant to determine the definitive consumption of ARV drugs from 2020 to 2024; rather, they provide a range of possible demand for ARV drugs if current trends continue. The linear regression approach projects 29.5 million people receiving treatment by 2024, the country target approach projects 30.7 million and the Fast-Track projection estimates 34.9 million. The average of these three approaches reaches 31.7 million by 2024. The following table shows the results for the number of people receiving ART and the proportion of people receiving first- and second-line ART.

Table 1. Number of adults and children receiving treatment (average scenario), based on an average of linear, country target and Fast Track projections (millions), 2020–2024

	2020	2021	2022	2023	2024
Number of adults receiving ART (millions)	25.1 [23.3–26.3][a]	26.7 [24.7-28.2]	28.1 [26.1-30.1]	29.5 [27.3-32.1]	30.8 [28.5–34]
Number of children receiving ART (millions)	0.95 [0.93–0.91]	0.93 [0.85–0.99]	0.91 [0.8–0.96]	0.89 [0.77–0.96]	0.87 [0.73–0.97]
Number of people receiving ART (millions)	26.1 [24.2–27.3]	27.6 [25.6–29.2]	29.1 [27–31.1]	30.3 [28.3–33]	31.7 [29.5–34.9]
Proportion of people receiving first-line ART (%)	93.5	93.3	93.1	93	92.8
Proportion of people receiving second-line ART (%)	6.5	6.7	6.9	7	7.2

[a]The numbers in brackets show the low and high estimates.

1. INTRODUCTION

The objectives of this report are to:

- provide information on the projected number of people living with HIV who will be receiving antiretroviral therapy (ART) from 2020 to 2024;

- update the forecasts of global demand for antiretroviral (ARV) drugs prepared in 2019; and

- forecast the global demand for first-line ARV drugs for adults from 2020 to 2024.

The data sources for this report are:

- the reported use of ARV drugs and country planning targets for the number of people receiving ART from the 2017 and 2018 annual WHO surveys as well as 2019 Global AIDS Monitoring tool;

- the projected regimen for adults receiving first-line ART prepared by the Clinton Health Access Initiative and the Medicines Patent Pool; and

- the estimated number of people who need ART from the Fast-Track projection projected by UNAIDS.

All these data were compiled and used to project the demand for ARV drugs from 2020 to 2024. The number of people receiving ART for future years has been forecast using three approaches:

- linear projections of historical numbers of people receiving ART by country;

- country target projections, based on planning targets submitted by national programmes; and

- UNAIDS Fast-Track projections.

These three approaches are explained in detail in the following pages. In general, forecasting the global demand for ARV drugs involves the following steps:

- projecting the total number of people receiving ART;

- determining the number of people receiving first-line and second-line therapy, using the average proportions from two sources of data:
  - linear regression based on the WHO ARV drug use surveys conducted in 2018 and 2019 as well as the 2020 Global AIDS Monitoring tool, which assessed the use of ARV medicines at the end of 2017, 2018 and 2019 (1–6);

- calculating the total active pharmaceutical ingredient volumes required to meet the forecast demand for adults receiving first-line ART; and

- present estimated regimens for adults receiving first-line ART based on data from the Clinton Health Access Initiative demand forecast and Medicines Patent Pool sales forecast.

Fig. 1 illustrates the model used for forecasting ARV drug demand in this report. The calculated averages of the results of each step, in terms of the numbers of people receiving ARV drugs and the breakdown of first-line and second-line ART and regimen use, were used as the basis to determine the final estimates of the demand for ARV drug regimens and active pharmaceutical ingredients for 2020–2024.

Fig. 1. **Model used for forecasting ARV drug demand**

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┌──────────────────┐   ┌──────────────────┐   ┌──────────────────┐   ┌──────────────────┐
│ Projected number │   │ Proportion of    │   │ Demand for active│   │ Projected regimen│
│ of adults and    │ ▶ │ adults and       │ ▶ │ pharmaceutical   │ ▶ │ for adults       │
│ children with HIV│   │ children         │   │ ingredients for  │   │ receiving        │
│ receiving ART    │   │ receiving first- │   │ first-line ART   │   │ first-line ART   │
│                  │   │ and second-line  │   │ for adults       │   │                  │
│                  │   │ treatment        │   │                  │   │                  │
└──────────────────┘   └──────────────────┘   └──────────────────┘   └──────────────────┘
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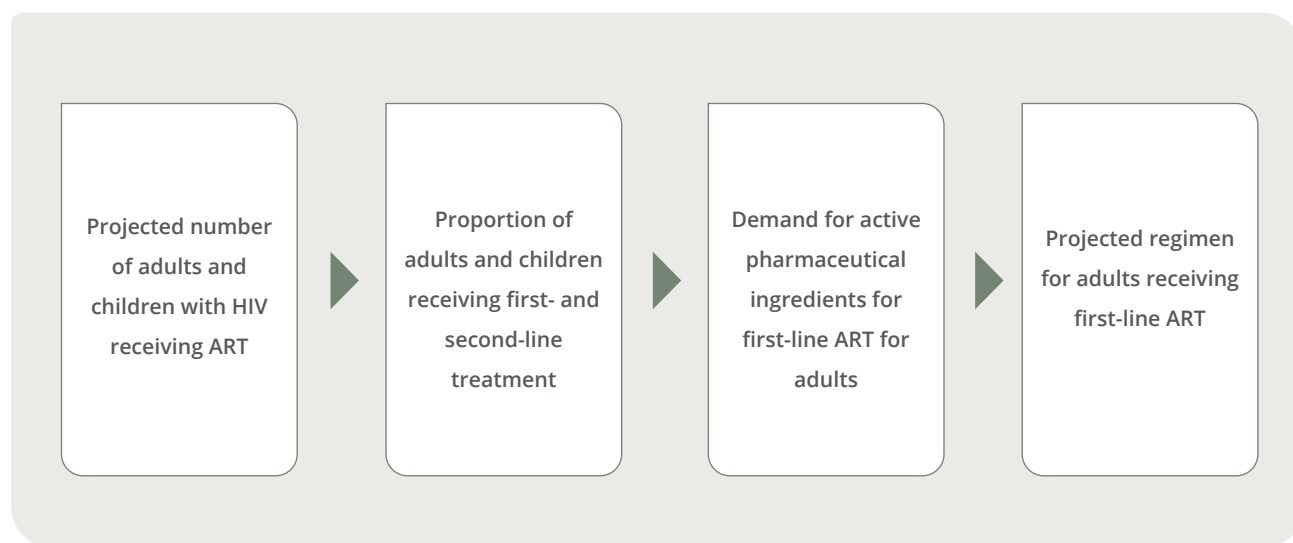
2. METHODS FOR DETERMINING KEY FORECAST VARIABLES

2.1. Total number of people receiving treatment

The WHO global ARV drug use survey and the Global AIDS Response Progress Reporting use the same indicator for the number of people receiving ART. Information in Global AIDS Response Progress Reporting is exported into the WHO global ARV drug use survey; 146 countries provided this information. Table 1 summarizes the underlying assumptions and data sources of the three approaches to forecasting the number of people receiving ART to 2021.

Table 1. Summary of assumptions made in the forecast scenarios

	Forecasting method		
	Linear projection	**Country target projection**	**Fast-Track projection**
Data sources	WHO AIDS Medicines and Diagnostics Service surveys conducted from 2017 to 2019	Country targets for 2020–2024	Spectrum-AIM
Number of countries for which data are used	146 (WHO ARV drug use survey conducted in 2014)	36[a]	28 countries with a high burden of HIV infection
Proportion of people living with HIV in low- and middle-income countries receiving treatment represented in the data set	99%	53% (extrapolated to the remaining 47% of low- and middle-income countries)[b]	85%
Underlying assumption	The number of people living with HIV receiving ARV drugs will increase linearly at the same rate as the linear trend observed in 2014–2016, with the rate of increase limited by the number of people estimated to need treatment by 2020 using the 2013 WHO eligibility criteria	National programme planning targets will be achieved	Assumes that 90% of all people living with HIV will be tested, of which 90% will receive treatment and 90% will attain viral suppression by 2020, after which 95% of all people living with HIV will be tested, of which 95% will receive treatment and 95% will attain viral suppression by 2030

[a] Afghanistan, Argentina, Armenia, Botswana, Burkina Faso, Cambodia, Cameroon, Cabo Verde, China, Congo, Eritrea, Eswatini, Ethiopia, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Madagascar, Malawi, Malaysia, Mali, Mexico, Morocco, Myanmar, Nicaragua, Nigeria, Oman, Papua New Guinea, Paraguay, Philippines, Republic of Moldova, Senegal, South Africa, Sudan, Uzbekistan, Zambia and Zimbabwe.

[b] For details of the composition of the geographical regions, see the explanatory notes for classification of low- and middle-income countries by income level, epidemic level and geographical, UNAIDS, UNICEF and WHO regions on page 152 in *Global HIV/AIDS response: epidemic update and health sector progress towards universal access: progress report 2011 (6)*.

The results for each of the three methods were summed and divided by three to give the average estimated number of people living with HIV receiving ART for all low- and middle-income countries.

Table 2 and Fig. 2 present the three projection scenarios of the estimated number of people living with HIV receiving ART from 2020 to 2024 and the average of the three projections. Table A1 (Annex) provides the average number of people receiving treatment by region for the linear and country target projections.

2.1.1. Linear projection

This forecast estimates the annual increase in the number of people living with HIV receiving treatment based on responses from the 146 countries mentioned in subsection 2.1, representing about 99% of the number of people receiving treatment in all 154 low- and middle-income countries. The survey data are then used to plot a linear regression line fitted to the number of adults and children receiving ART over the past three years (2017, 2018 and 2019), as reported in the reports on universal access to HIV prevention, treatment, care and support by WHO, UNAIDS and UNICEF (4–6). The regression fit uses the actual month and year of each report, and the results of applying linear regression were constrained by the total need for ART estimated by UNAIDS (from Spectrum projections for each country prepared in cooperation with UNAIDS).

The total need for ARV drugs is defined as everyone currently receiving ART, including those who are aware of their status but are not receiving ART as well as those who are HIV-positive but not aware of their HIV-status. With the 2020 update to the WHO treatment guidelines on the use of ARV drugs recommending initiating treatment immediately after confirmation of HIV-positive status, the total number of people who need treatment is estimated to be 29.5 million by 2024. The linear approach is constrained by the estimated number of people living with HIV projected for 2024 from the Spectrum-AIM model.

Table 2. Number of adults and children living with HIV receiving treatment by scenario and average, 2020–2024

Forecasting method	Age group	2020	2021	2022	2023	2024
Linear projection	Adults	23 290 000	24 690 000	26 070 000	27 370 000	28 550 000
	Children	930 000	940 000	950 000	960 000	970 000
	Total	24 220 000	25 630 000	27 020 000	28 330 000	29 520 000
Country target projection	Adults	25 870 000	27 270 000	28 240 000	29 170 000	29 990 000
	Children	910 000	855 000	800 000	770 000	730 000
	Total	26 780 000	28 125 000	29 040 000	29 940 000	30 720 000
Fast-Track	Adults	26 260 000	28 190 000	30 130 000	32 070 000	34 000 000
	Children	1 018 000	991 000	964 000	937 000	910 000
	Total	27 278 000	29 181 000	31 094 000	33 007 000	34 910 000
Average (linear, country target and Fast-Track)	Adults	25 140 000	26 720 000	28 150 000	29 540 000	30 850 000
	Children	950 000	930 000	910 000	890 000	870 000
	Total	26 090 000	27 650 000	29 060 000	30 430 000	31 720 000

Fig. 2. **Comparison of projections of the number of people receiving ART, 2001–2024**
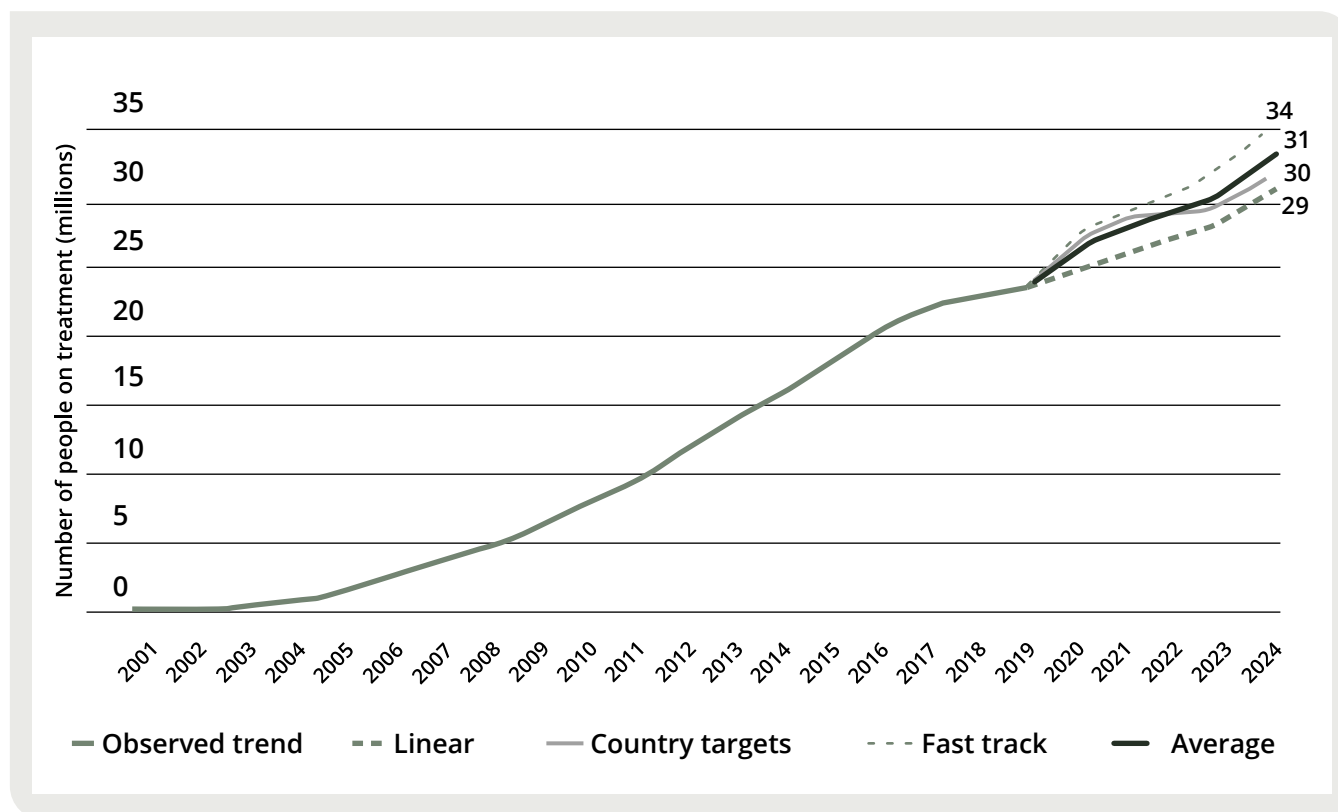
2.1.2 Country target projection

Most countries set their own targets for the number of people they expect to be receiving ART over the next three to five years. These targets consider the realities in each country and their goals for increasing coverage. For the 2020–2024 country target projections, 36 country projections in successive global WHO ARV drug use surveys were used, accounting for about 53% of the people receiving ART in low- and middle-income countries. For countries that did not define targets, it is assumed that the total number of people receiving ART will grow at the same rate as the aggregate projection for these 42 countries. This equates to an average annual growth of nearly 920 000 people per year.

We assume that the number of people receiving ART and the country target projections are based on the test and treat protocols, to reach an estimated 30.7 million receiving treatment by 2024.

2.1.3 Fast-Track projection

For comparison purposes, Table 1 and Fig. 2 also show the Fast-Track projection from UNAIDS (8). This projection assumes that, by 2020, 90% of all people living with HIV know their HIV status, 90% of the people who know their HIV-positive status are accessing treatment and 90% of the people receiving treatment have suppressed viral loads. Beyond 2020, the Fast-Track projection assumes 95% of all people living with HIV will be tested, of which 95% will receive treatment and 95% will attain viral suppression by 2030.

These projections and targets build on the 2020 WHO eligibility recommendations for ART, generating an estimate of 34.9 million receiving treatment by 2024. The Fast-Track projections were made using the Spectrum/Goals model applied to 28 countries with a high burden of HIV infection, which account for mpre than 85% of all people acquiring HIV projected to 2024, and the results are scaled up to represent all low- and middle-income countries. The model estimates the survival among people receiving ART as a function of CD4 cell count at treatment initiation and includes the effect of ART on viral suppression and reductions in infectivity.

2.2 Number of people receiving first- and second-line ART

Two data sources were used to determine the proportion of adults receiving second-line ART:

- linear regression of the proportion of people receiving second-line ART reported in WHO surveys and Global AIDS Monitoring data of ARV use in 2017, 2018 and 2019; and

- the Clinton Health Access Initiative collecting data on the numbers of people receiving second-line ART in 21 countries with high ART use from country teams and published literature and then estimating the future numbers of people receiving second-line ART in each country by considering such factors as treatment failure rates and attrition rates, aggregating the second-line estimates across the 21 countries and extrapolating these results to the people in the remaining low- and middle-income countries, with the proportion of people receiving second-line ART calculated by dividing this figure by the total number of people receiving treatment.

The proportion of children receiving second-line ART was based on the linear regression of the proportion of children receiving second-line ART reported in WHO surveys and Global AIDS Monitoring data of ARV drug use in 2017, 2018 and 2019.

Tables 3 and 4 shows the projected proportion of adults and children receiving second-line ART for each of the three data sources, which are within 1.5 percentage points of each other, as well as the average, which was used in estimating the demand for active pharmaceutical ingredients.

Table 3. Proportion of adults receiving second-line ART, 2020–2024

	Proportion of adults receiving second-line ART (%)				
Data source	**2020**	**2021**	**2022**	**2023**	**2024**
WHO AIDS Survey and Global AIDS Monitoring	6.5	6.7	6.8	7.0	7.1
Clinton Health Access Initiative	5.4	5.4	5.5	5.7	5.8
Average	5.9	6.0	6.2	6.3	6.5

Table 4. Proportion of children receiving second-line ART, 2020–2024

	Proportion of children receiving second-line ART (%)				
Data source	**2020**	**2021**	**2022**	**2023**	**2024**
WHO AIDS Survey and Global AIDS Monitoring	7.6	8.0	8.4	8.7	9.1

The average proportions of adults and children living with HIV receiving second-line ART are then applied to their respective forecasted populations on treatment for 2020–2024 (Table 2). Fig. 3 shows the number of adults and children receiving first- and second-line ART for the average of the linear, country target and Fast-Track projections. Fig. A1–A3 (Annex) show the number of adults and children receiving first- and second-line ART for each of the linear, country target and Fast-Track scenarios.

Fig. 3. Number of adults and children living with HIV receiving first- and second-line ART, 2020–2024, based on the average of three projections

	2020	2021	2022	2023	2024
Children, second line	73 000	74 000	76 000	78 000	80 000
Children, first line	880 000	850 000	830 000	810 000	790 000
Adult, second line	1 630 000	1 780 000	1 920 000	2 060 000	2 200 000
Adult, first line	23 500 000	24 900 000	26 200 000	27 500 000	28 600 000
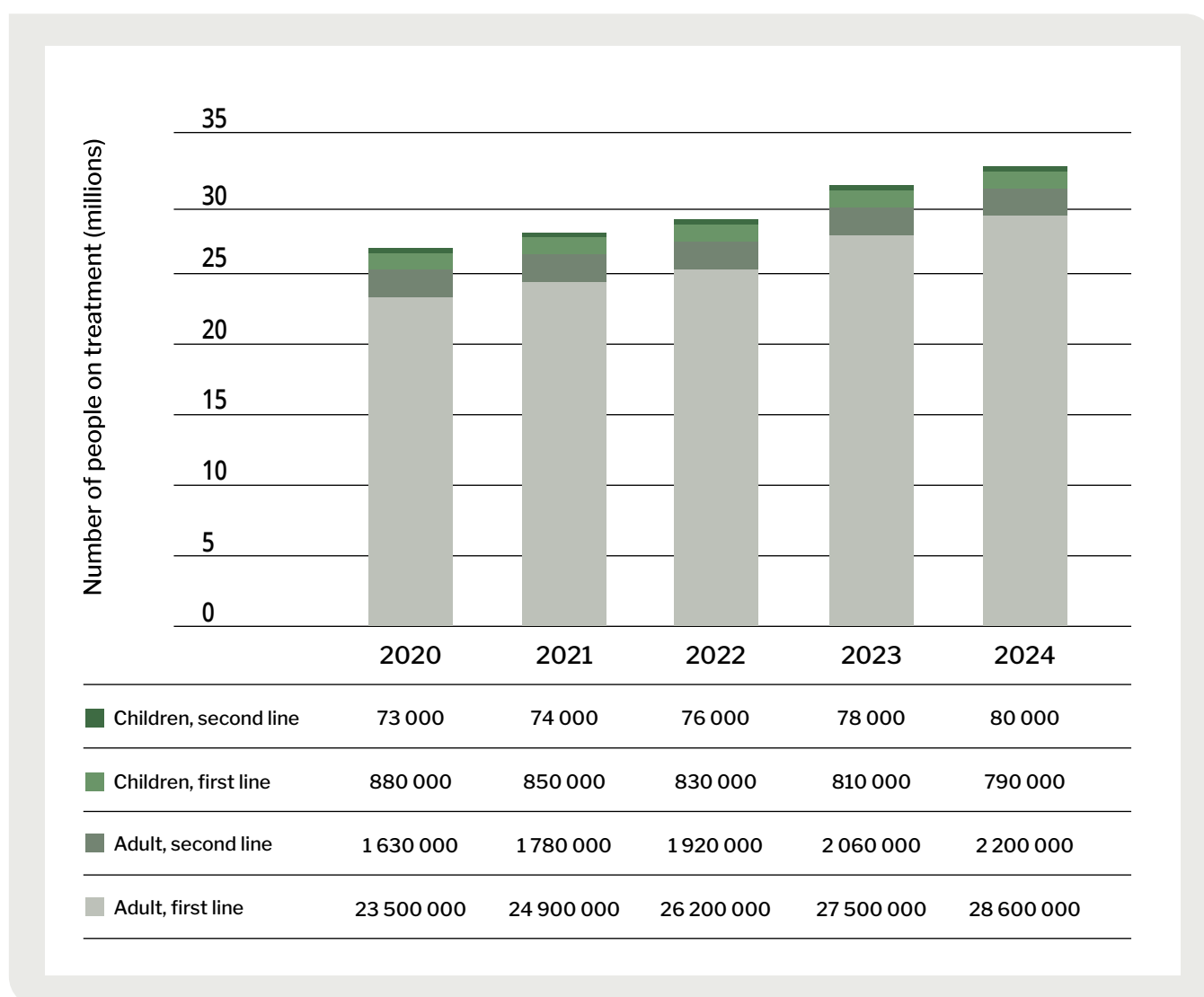
2.3 Proportion of adults receiving first-line ART by ARV drug

With the introduction and uptake of newer generations of ARV medicine, the distribution of people receiving treatment by ARV drug was limited to adults receiving first-line ART. These individual ARV drugs were categorized by the following market categories:

- primary nucleoside reverse-transcriptase inhibitors (NRTIs) and nucleotide reverse-transcriptase inhibitors (NtRTIs): stavudine (d4T), zidovudine (AZT), tenofovir disoproxil fumarate (TDF), abacavir (ABC) and the expected introduction of tenofovir alafenamide (TAF);

- secondary NRTIs: lamivudine (3TC) and emtricitabine (FTC); and

- non-nucleoside reverse-transcriptase inhibitors (NNRTIs) and integrase strand transfer inhibitors (INSTIs): nevirapine (NVP), efavirenz (EFV) and dolutegravir (DTG).

The estimates of adults receiving first-line ART by individual ARV drug presented below are based on historical and projected data.

The historical portion (2011 to 2019) dreive from the WHO surveys and 2019 Global AIDS Monitoring data. The projected portion (2020–2024) of the estimates were based the Clinton Health Access Initiative's global ARV drug forecast. This year, the Clinton Health Access Initiative derived a global ARV forecast for adults in low- and middle-income countries. The Clinton Health Access Initiative collects data from country teams and published literature on ART regimens, national guidelines, attrition rates, failure rates, toxicity rates, future ARV drug trends and other key factors in 21 countries with high ART use. The Clinton Health Access Initiative then uses these data and an internally developed forecasting model to project ARV drug demand by drug and by regimen in each country over the next five years, and then aggregating estimates across the 21 countries and extrapolating these results to the remaining low- and middle-income countries.

Fig. 4.   Projected market share of primary NRTIs for adults, 2012–2024
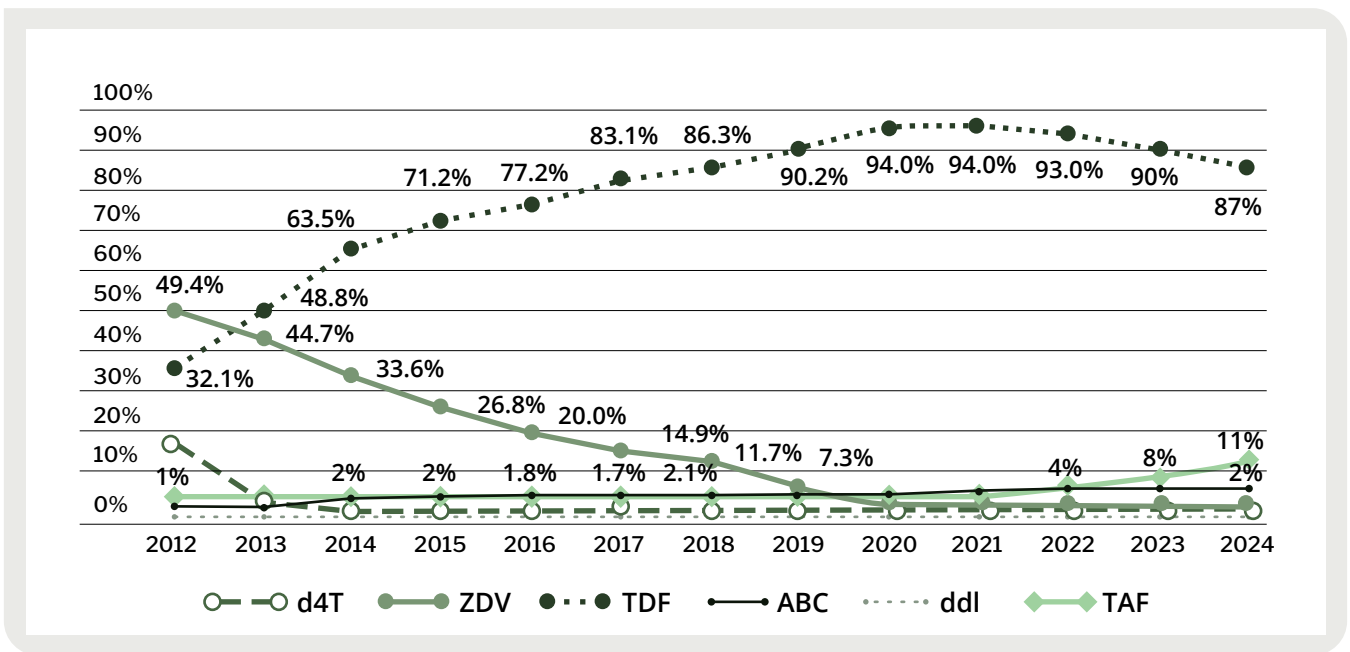
Fig. 5. Projected market share of secondary NRTIs for adults, 2012–2024
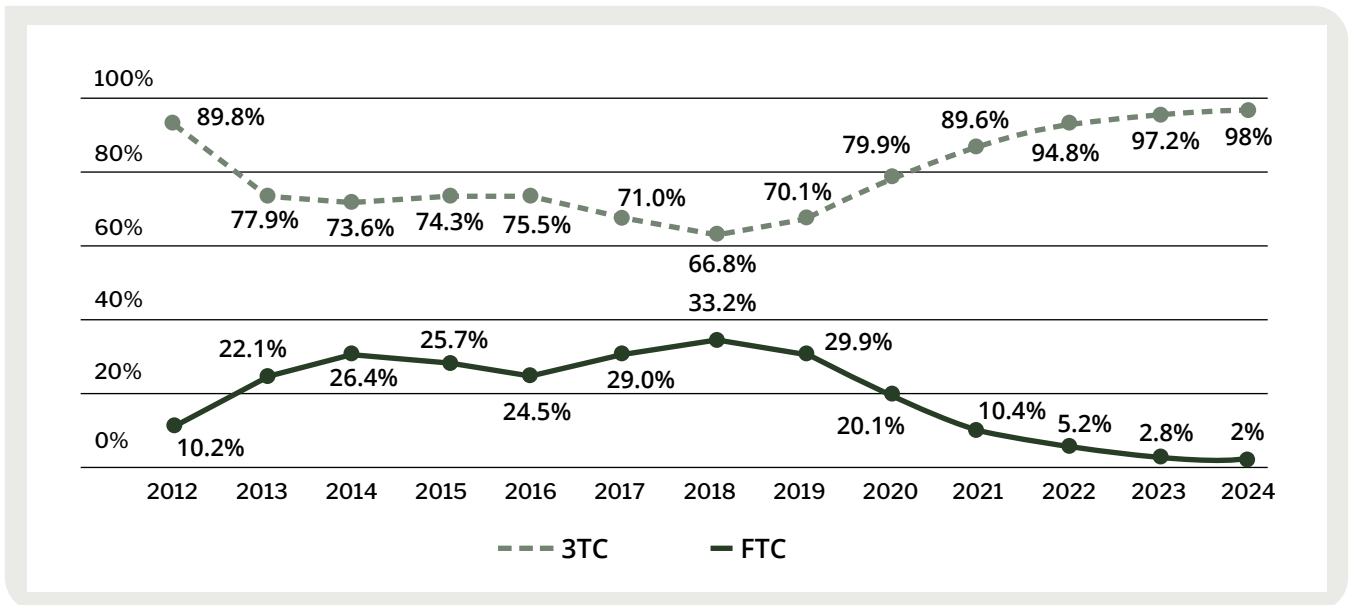
Fig. 6. Projected market share of NNRTIs and DTG for adults, 2015–2024
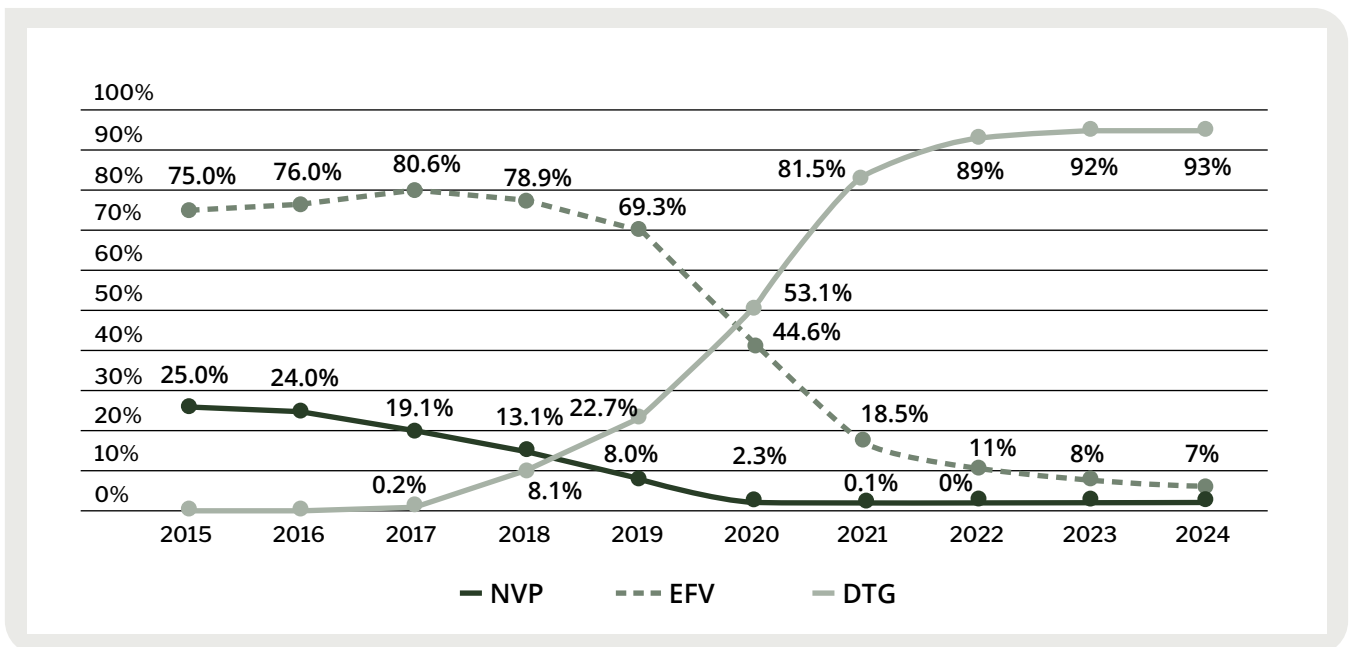
Tables 5 shows the observed and projected market share for each ARV drug for adults receiving first-line ART.

Table 5. Average market share for ARV drugs for adults, 2020–2024

ARV drug	Average market share (%)				
	2020	2021	2022	2023	2024
d4T, TDF, AZT, ABC and TAF share of primary NRTIs					
d4T	0	0	0	0	0
TDF	90.2	94.0	94.1	93.5	90.0
AZT	7.3	3.0	0.9	0.7	0.6
ABC	2.5	2.4	2.1	1.9	1.7
TAF	0.4	0.5	2.9	4.0	8.0
3TC and FTC share of secondary NRTIs					
3TC	79.9	89.6	94.8	97.2	98.3
FTC	20.1	10.4	5.2	2.8	1.7
NVP, EFV and DTG share of NNRTIs					
NVP	2.3	0.1	0.0	0.0	0.0
EFV	44.6	18.5	11.0	8.1	6.7
DTG	53.1	81.5	89.0	91.9	93.3

3. ESTIMATED TOP FIRST-LINE ADULT ART REGIMENS IN GENERIC-ACCESSIBLE LOW- AND MIDDLE-INCOME COUNTRIES

This section provides available information on the proportion of adults receiving first-line ART by regimen. The data were based on the 2020 ARV drug demand forecast by the Clinton Health Access Initiative and ARV drug sales forecast by the Medicines Patent Pool as of October 2020. These forecasts represent a rough estimate based on the best information currently available but involve some uncertainty and may be subject to change.

Fig. 7. Estimated top first-line adult regimens in generic accessible low- and middle-income countries[a], 2019–2022
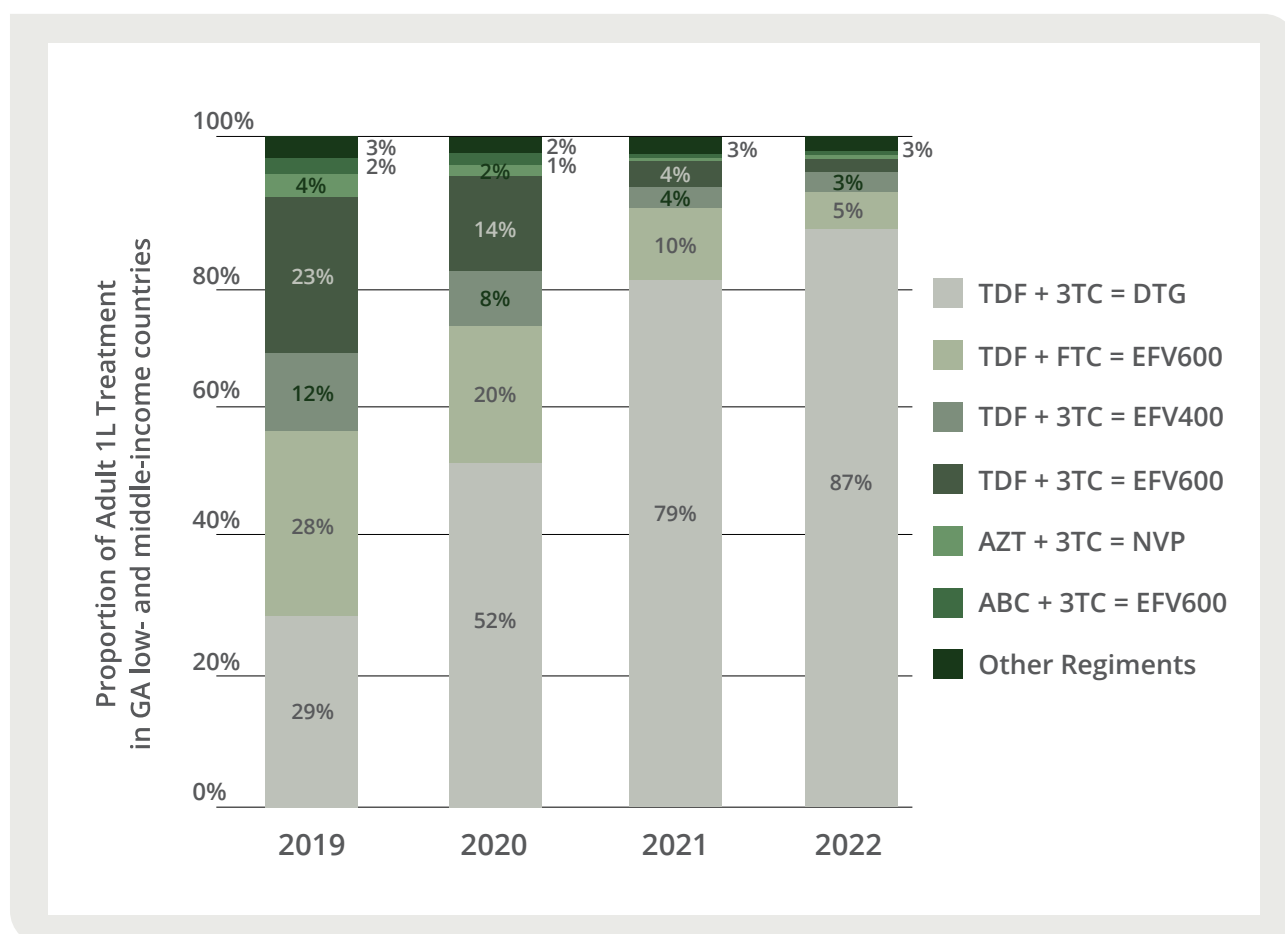
[a]Generic-accessible low- and middle-income countries: defined as the low- and middle-income countries with the majority of their ARV drugs provided by generic manufacturers.

Several questions remain on the place of TAF, 3TC or FTC and DTG in adult first-line ART, and forecasts will evolve based on ongoing research details of the forecast for active pharmaceutical ingredient volumes in person-years and metric tonnes.

4. DISCUSSION

The approach outlined in this report builds on previous annual forecasts by providing an average of projections for adults and children as well as the adult first-line market share for active pharmaceutical ingredients and main ART regimens based on available global procurement and consumption data sources. This year's process builds on multi-year methods to estimate the number of adults and children receiving treatment, best available estimates of the proportion of people receiving first- and second-line ART and the distribution of various ARV drugs and key regimens for adults receiving first-line ART. As the analysis presented here shows, the introduction and expected uptake of more therapeutically effective ARV drugs necessitated a more conservative approach to restricted projections of active pharmaceutical ingredients only to first-line ART. It is encouraging to note that the trend in the number of people receiving treatment continues to grow annually despite a constrained funding environment.

As of the writing of this report, preliminary analysis of the impact of the COVID-19 pandemic showed limited disruption to ART uptake by new users and utilization by continuing users (9). This news and the projected growth in the number of people receiving treatment presented in this report are encouraging despite anticipated global and national resource constraints.

To improve the utility of the ARV drug demand forecast, this year's report provides the distribution for the top regimen projected for adults receiving first-line ART up to 2022. These demand estimates assist suppliers, funding partners supporting national ART programmes and global and regional policy-makers with a range of the volume of active pharmaceutical ingredients and ARV drug formulations required to meet the needs of the new and continuing people receiving treatment.

REFERENCES

1. Global AIDS update: Start Free, Stay Free, AIDS Free. Geneva: UNAIDS; 2017 (https://www.unaids.org/sites/default/files/media_asset/JC2923_SFSFAF_2017progressreport _en.pdf, accessed 17 June 2021).

2. Global AIDS update. Ending AIDS: progress towards the 90–90–90 targets. Geneva: UNAIDS; 2017 (https://www.unaids.org/sites/default/files/media_asset/Global_AIDS_update_2017_en.pdf, accessed 17 June 2021).

3. UNAIDS data 2018. Geneva: UNAIDS; 2018 (https://www.unaids.org/sites/default/files/media_asset/unaids-data-2018_en.pdf, accessed 17 June 2021).

4. UNAIDS data 2019. Geneva: UNAIDS; 2019. (https://www.unaids.org/sites/default/files/media_asset/2019-UNAIDS-data_en.pdf, accessed 17 June 2021).

5. Global AIDS update: seizing the moment. Tackling entrenched inequalities to end epidemics. Geneva: UNAIDS; 2020 (https://www.unaids.org/sites/default/files/media_asset/2020_global-aids-report_en.pdf, accessed 17 June 2021).

6. 2019 guidance. Global AIDS Monitoring 2020: indicators for monitoring the 2016 Political Declaration on Ending AIDS. Geneva: UNAIDS; 2019 (https://www.aidsdatahub.org/sites/default/files/resource/unaids-2020-gam-guidelines-2019 .pdf, accessed 17 June 2021).

7. Fast-Track: ending the AIDS epidemic by 2030. Geneva: UNAIDS; 2014 (http://www.unaids.org/en/resources/campaigns/World-AIDS-Day-Report-2014, accessed 17 June 2021).

8. Gupta A, Juneja S, Vitoria M, Habiyambere V, Nguimfack BD, Doherty M et al. Projected uptake of new antiretroviral (ARV) medicines in adults in low- and middle-income countries: a forecast analysis 2015–2025. PLoS One. 2016;11:e0164619.

9. UNAIDS. COVID-19's impact on HIV treatment less severe than feared. Geneva: World Health Organization; October 2020 (https://www.unaids.org/en/resources/presscentre/featurestories/2020/october/20201016_ covid-impact-on-hiv-treatment-less-severe-than-feared, accessed 17 June 2021).

ANNEX

Table A1. Projected number of people receiving ART by region based on the average of linear and country target projections, 2020–2024

Region	Age group	Projected number of people receiving ART by region based on the average of linear and country target projections				
		2020	2021	2022	2023	2024
Sub-Saharan Africa	Adults	18 200 000	19 100 000	19 900 000	20 600 000	21 300 000
	Children	790 000	780 000	760 000	750 000	740 000
Latin America and the Caribbean	Adults	1 700 000	1 800 000	1 800 000	1 900 000	2 000 000
	Children	18 500	18 000	17 600	17 300	17 100
Eastern Mediterranean	Adults	117 600	129 800	140 900	151 600	162 600
	Children	5 800	6 200	6 600	6 900	7 300
Europe	Adults	880 000	960 000	1 030 000	1 100 000	1 170 000
	Children	19 000	18 200	17 500	17 000	16 600
South and South-East Asia	Adults	2 370 000	2 500 000	2 610 000	2 710 000	2 790 000
	Children	69 600	67 500	65 700	64 700	63 700
Western Pacific	Adults	1 300 000	1 500 000	1 620 000	1 750 000	1 870 000
	Children	13 100	13 100	13 000	12 900	12 900

Fig. A1. Number of people receiving first- and second-line ART based on linear projection, 2020–2024

	2020	2021	2022	2023	2024
Children, second line	71 000	75 500	79 700	83 900	80 000
Children, first line	860 000	870 000	870 000	880 000	880 000
Adult, second line	1 520 000	1 650 000	1 780 000	1 910 000	2 040 000
Adult, first line	21 800 000	23 000 000	24 300 000	25 500 000	26 500 000
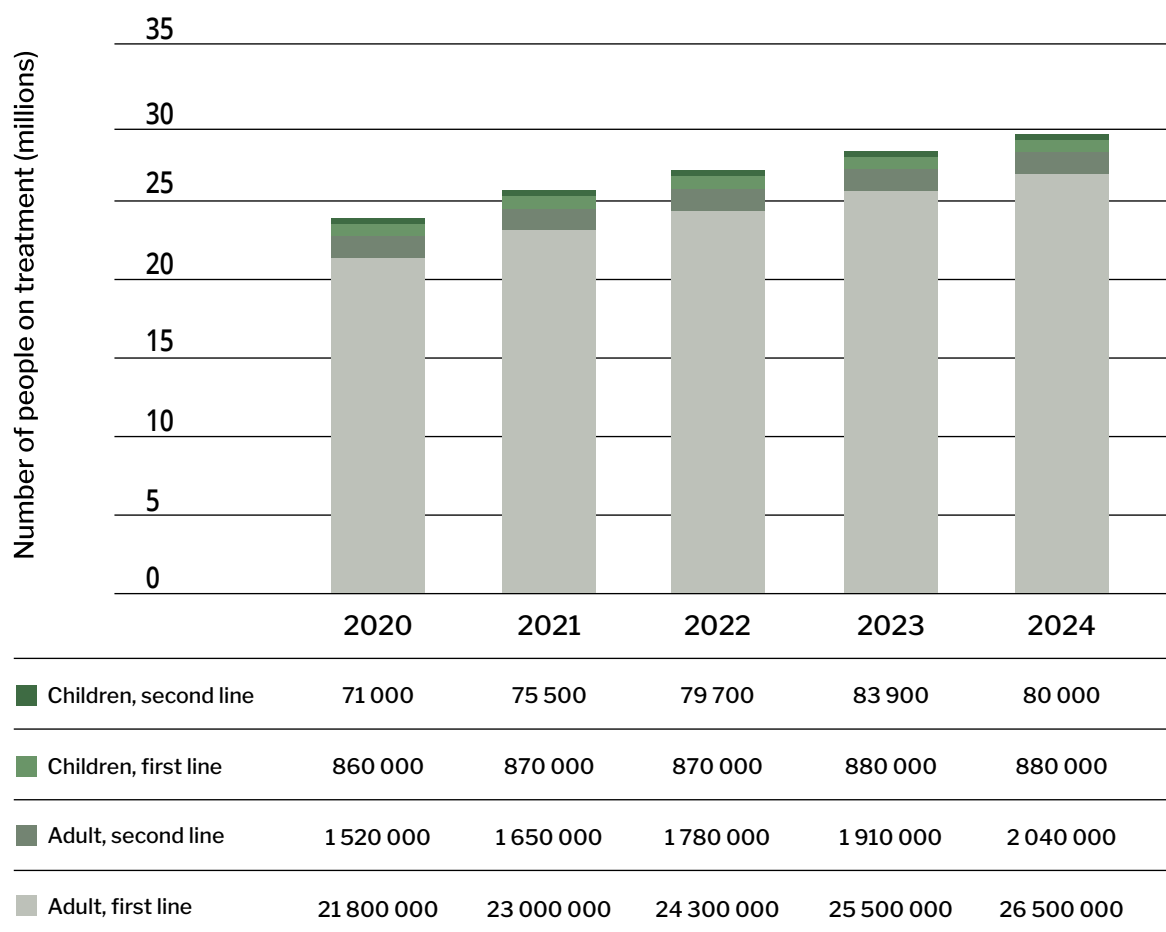
Fig. A2. Number of people receiving first- and second-line ART based on country target projection, 2020–2024

	2020	2021	2022	2023	2024
Children, second line	69 000	68 000	67 000	68 000	67 000
Children, first line	841 000	787 000	735 000	704 000	666 000
Adult, second line	1 670 000	1 810 000	1 920 000	2 020 000	2 130 000
Adult, first line	24 200 000	25 500 000	26 300 000	27 100 000	27 900 000
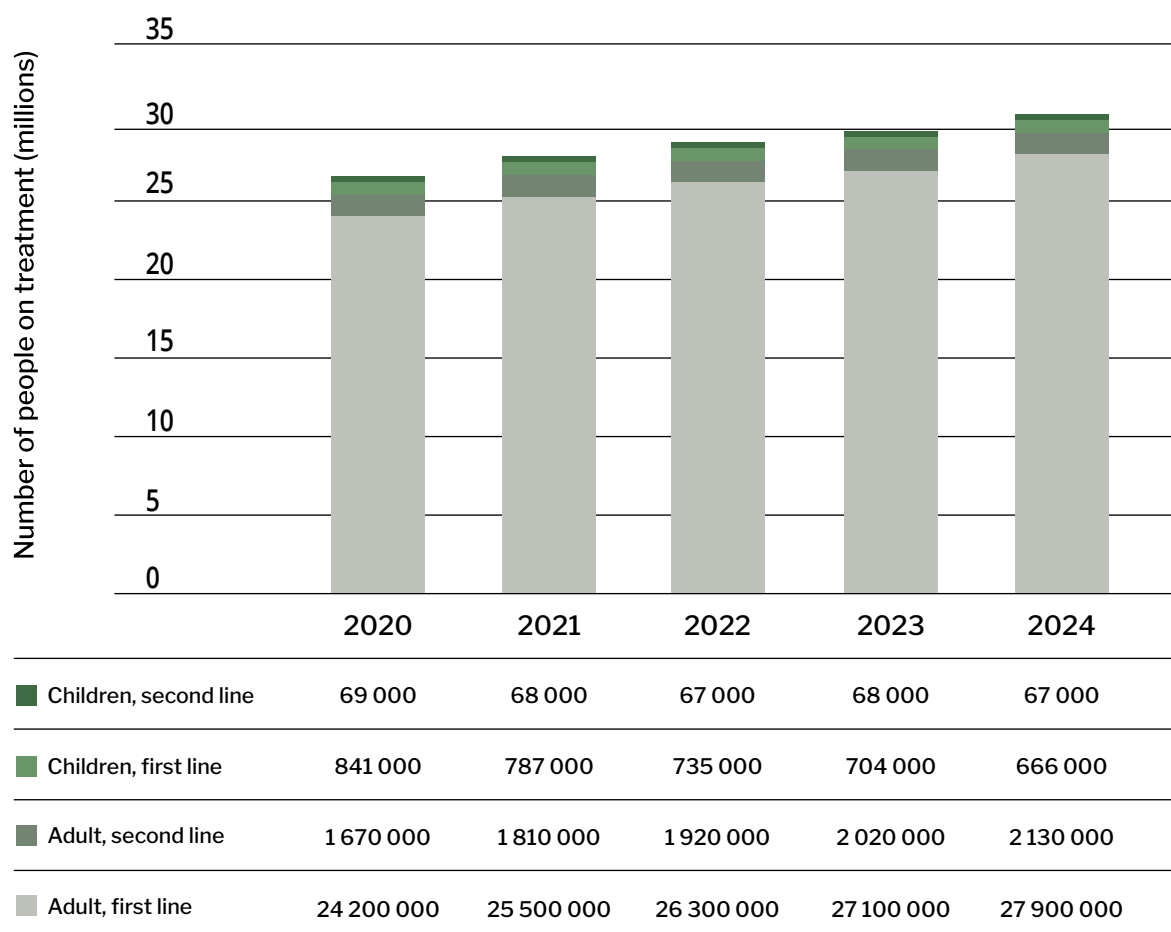
Fig. A3. **Number of people receiving first- and second-line ART based on Fast-Track data, 2020–2024**

Number of people on treatment (millions)

	2020	2021	2022	2023	2024
Children, second line	77 600	79 300	80 700	81 900	83 000
Children, first line	940 000	910 000	880 000	850 000	830 000
Adult, second line	1 560 000	1 700 000	1 860 000	2 030 000	2 200 000
Adult, first line	24 700 000	26 500 000	28 300 000	30 000 000	31 800 000
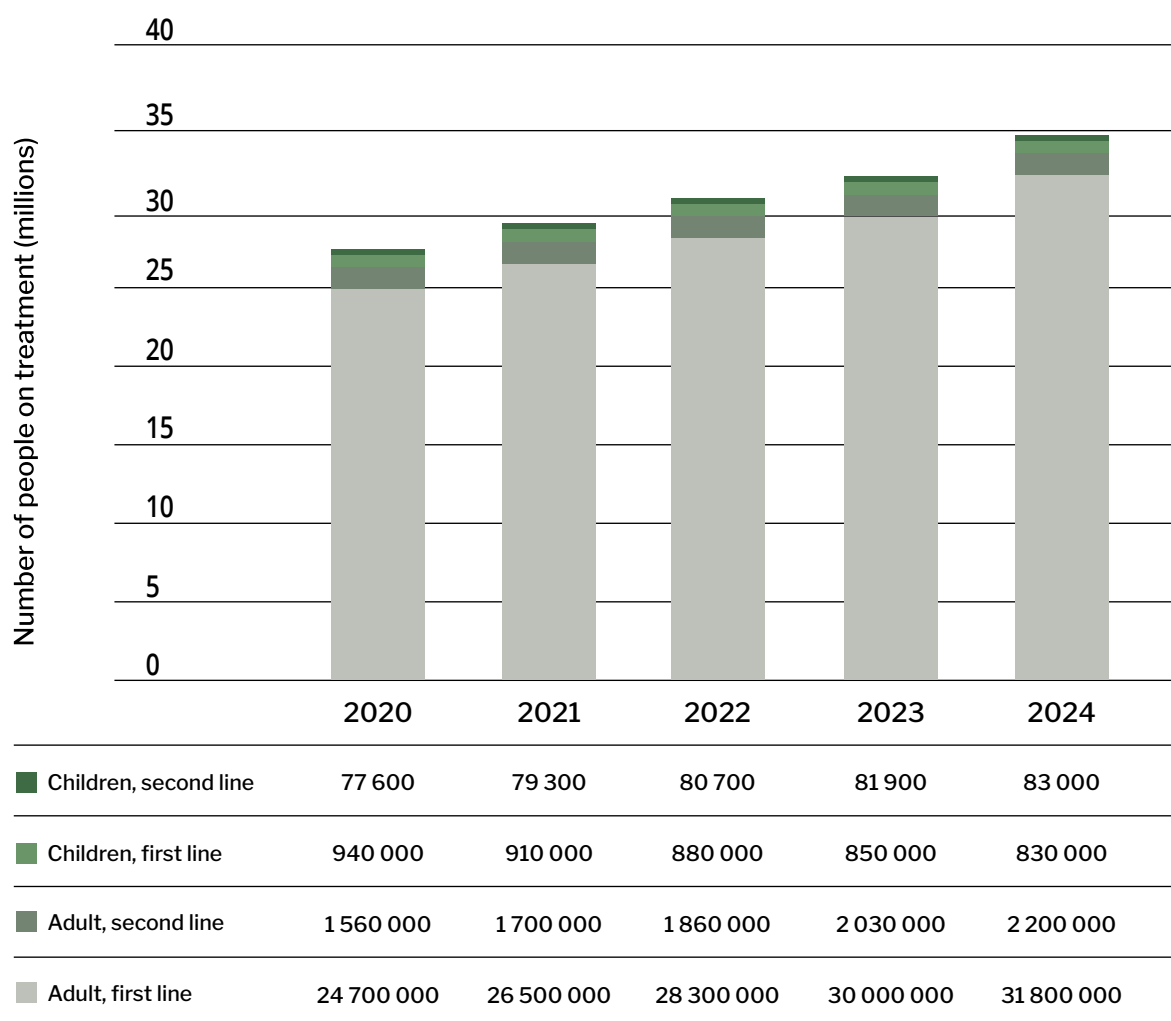
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