

Poster number: TUPED771

# FORECASTED DEMAND FOR ARV MEDICINES IN LOW AND MIDDLE INCOME COUNTRIES UP TO THE END OF 2018

Jos Perriens and Vincent Habiambere (WHO)

## BACKGROUND

WHO convenes a technical working group (Avenir Health, CHAI, the Global Fund, PfSCM, USAID, UNICEF, UNAIDS and DOH of South Africa) which annually produces forecasts of the number of people expected to be on ART, and predicts which drugs they will be using. This provides the manufacturers of ARVs suppliers with independent estimates of what they should target in their production and helps prevent drug shortages.

## METHODS

Data from the 2012-2014 WHO global surveys on ARV use; the Global Price Reporting Mechanism (GPRM); quantification of needs for 2015 and 2016 by the Global Fund and for 15 countries in 2014, 2015 and 2016 by PfSCM; volumes of ARVs reported in CHAI projections and the UNAIDS estimated number of people who need ART were used to generate the forecasts. The number of people projected to be on ART by 2018 was

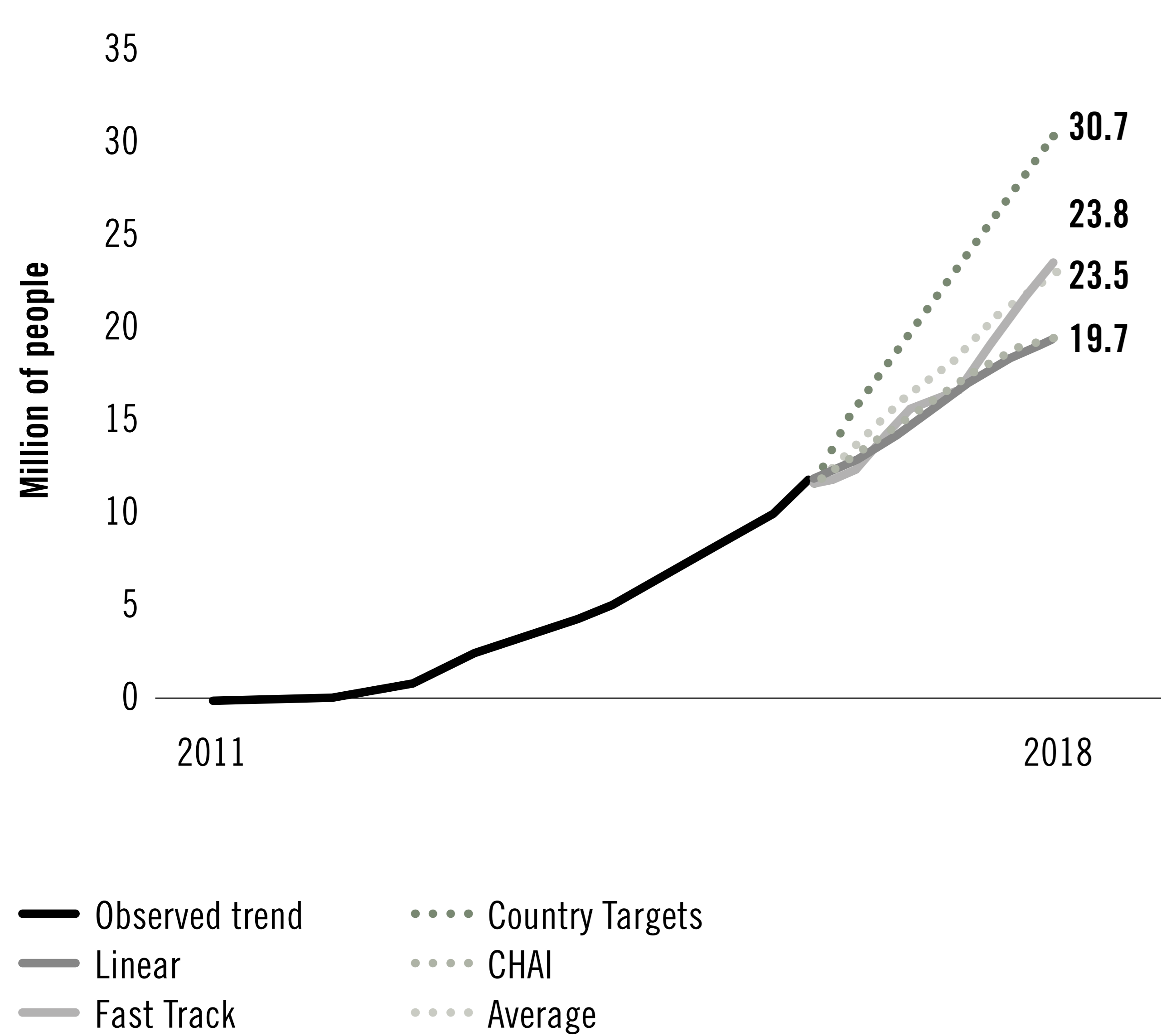
calculated as the average of 4 projections: linear projection of historical numbers of people on ART; country targets submitted by national programmes, and CHAI projections, and compared with the UNAIDS fast track scenario. The number of person-years of treatment and API volumes for each ARV drug was calculated using the average of their proportional representation in the different projections.

## RESULTS

### Number of people receiving ART

It was estimated, from the linear, country targets and CHAI projections that by the end of 2018 23.5 million will be on ART, slightly less than the UNAIDS Fast Track scenario which requires 23.8 million to be on ART by the end of 2018.

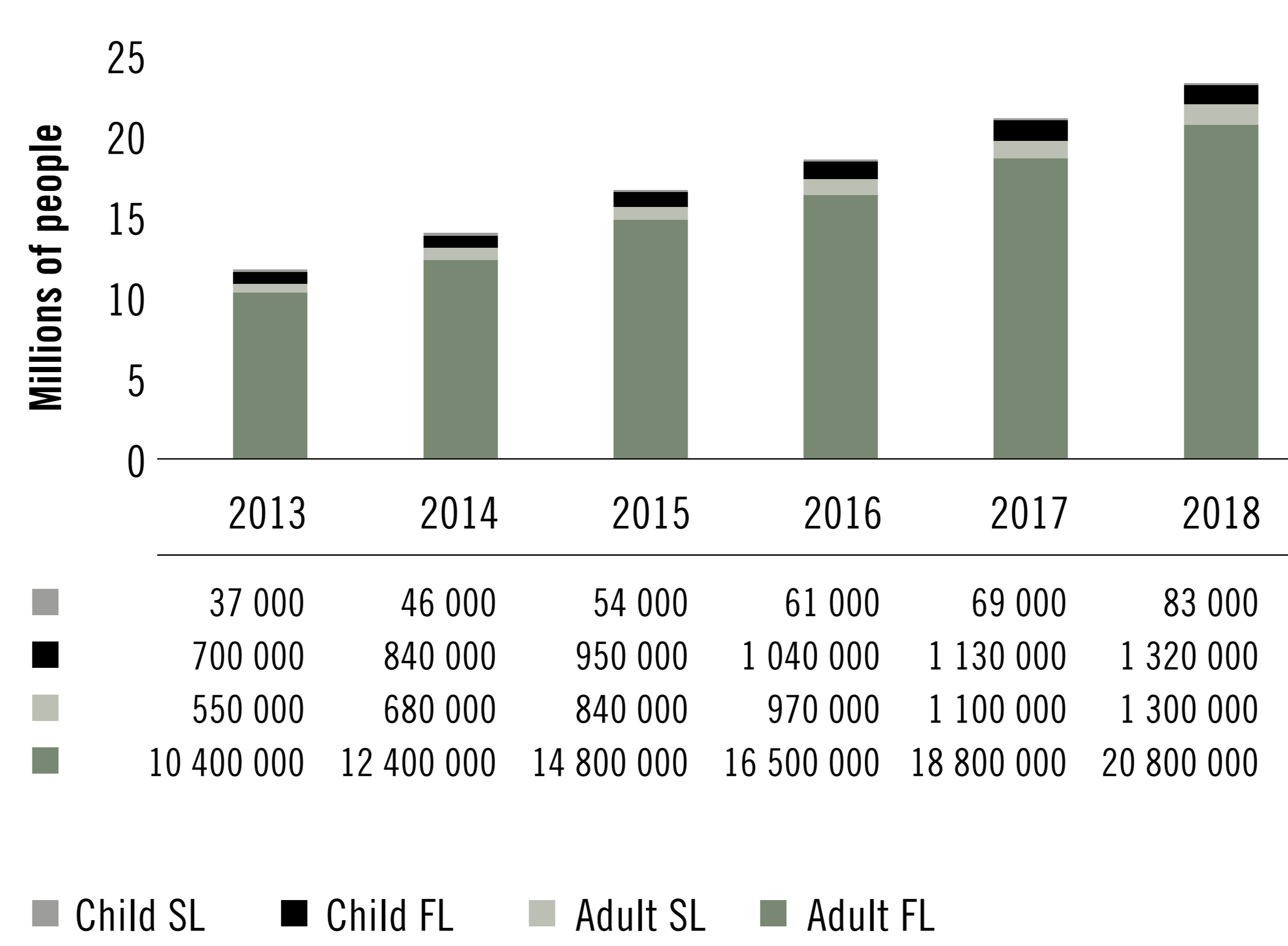
**Figure 1: Projected Number of Patients on ART: Adults and Children, Country Target, Fast Track, Linear and CHAI Projections and Average**



### Distribution between adults and children and by first and second line ART

The projections suggest that uptake of treatment in children will increase up to 2018. There is however considerable uncertainty about whether this is a reliable estimate, given the uncertainty surrounding the effects of scaling up PMTCT. This might limit the demand for paediatric treatment.

**Figure 2: First and second line ART for adults and children based on the average number of people on ART**



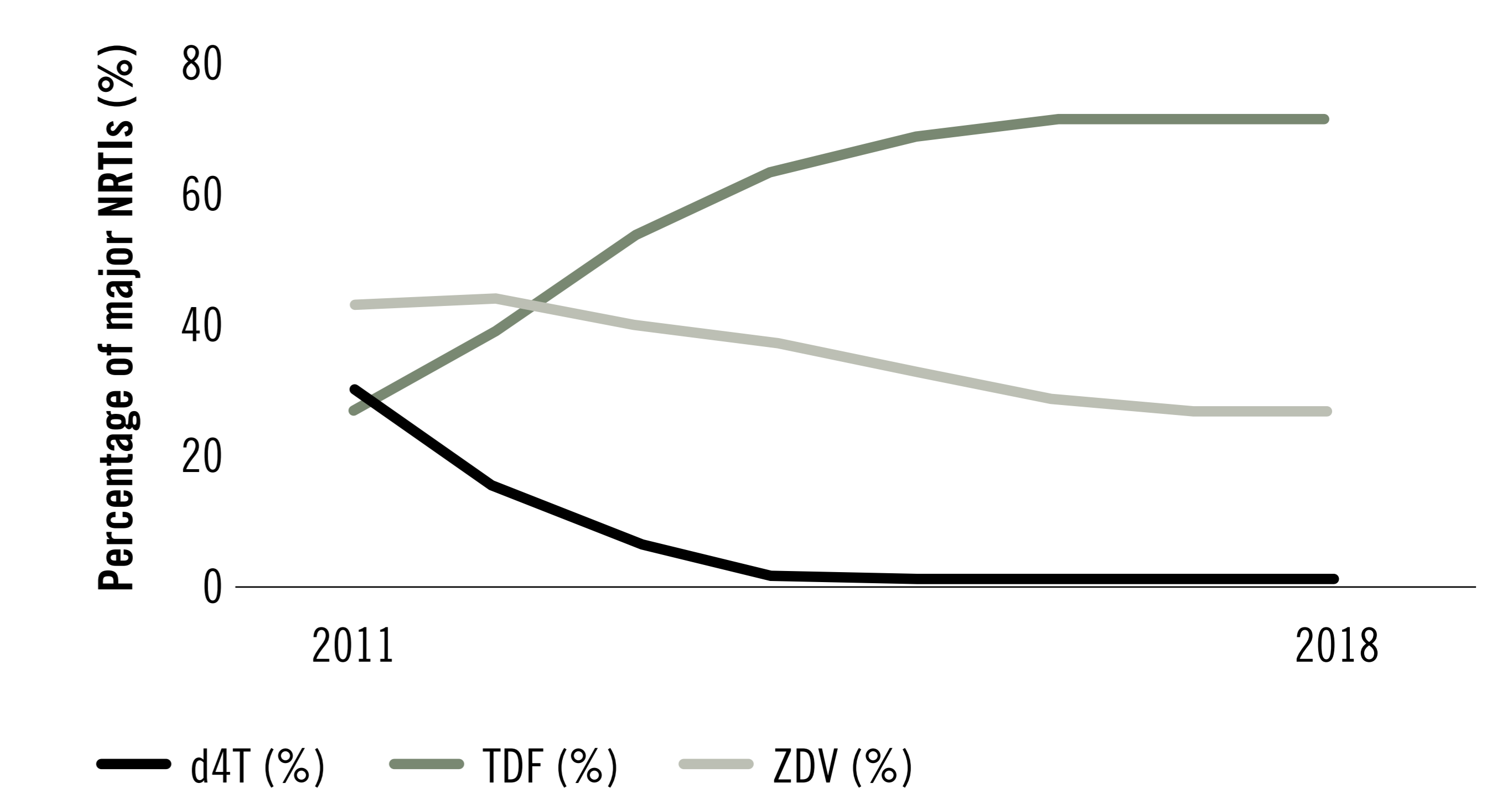
### Major primary NRTIs, NNRTIs and PIs

NVP decreasing up to 28% and EFV increasing up to 72% by 2018. The ATVs market share is increasing and is expected to reach 33% by 2018 while LPV/r is decreasing to reach 67% by 2018. The figures below shows these trends and corresponding PYRs provided.

### Uptake of NRTIs (excluding 3TC and FTC)

By the end of 2018 tenofovir (TDF) will be used by over 70% of PLWH on ART, zidovudine (AZT) use decreases gradually and will be used by 27% of PLWH on ART in 2018. Stavudine (d4T) use will be limited to 1%, and the share of ddI and ABC in adult treatment will be less than 1%.

**Fig. 3. Market share of NRTIs (d4T, TDF and ZDV) excluding 3TC and FTC**



### Production requirements for individual Active Pharmaceutical Ingredients (API)s

Given the continuing increase in the number of people on ART, the production of all APIs for ARVs, also for those ARVs with decreasing market share, will need to increase. The only exception to this general trend is d4T. For those with increasing market share the volumes will need to more than double. The production of protease inhibitors might increase faster than projected if access to viral load testing is faster than projected. The development of their demand will need to be followed closely.

### API demand volume in person-years, based on the average of three projections.

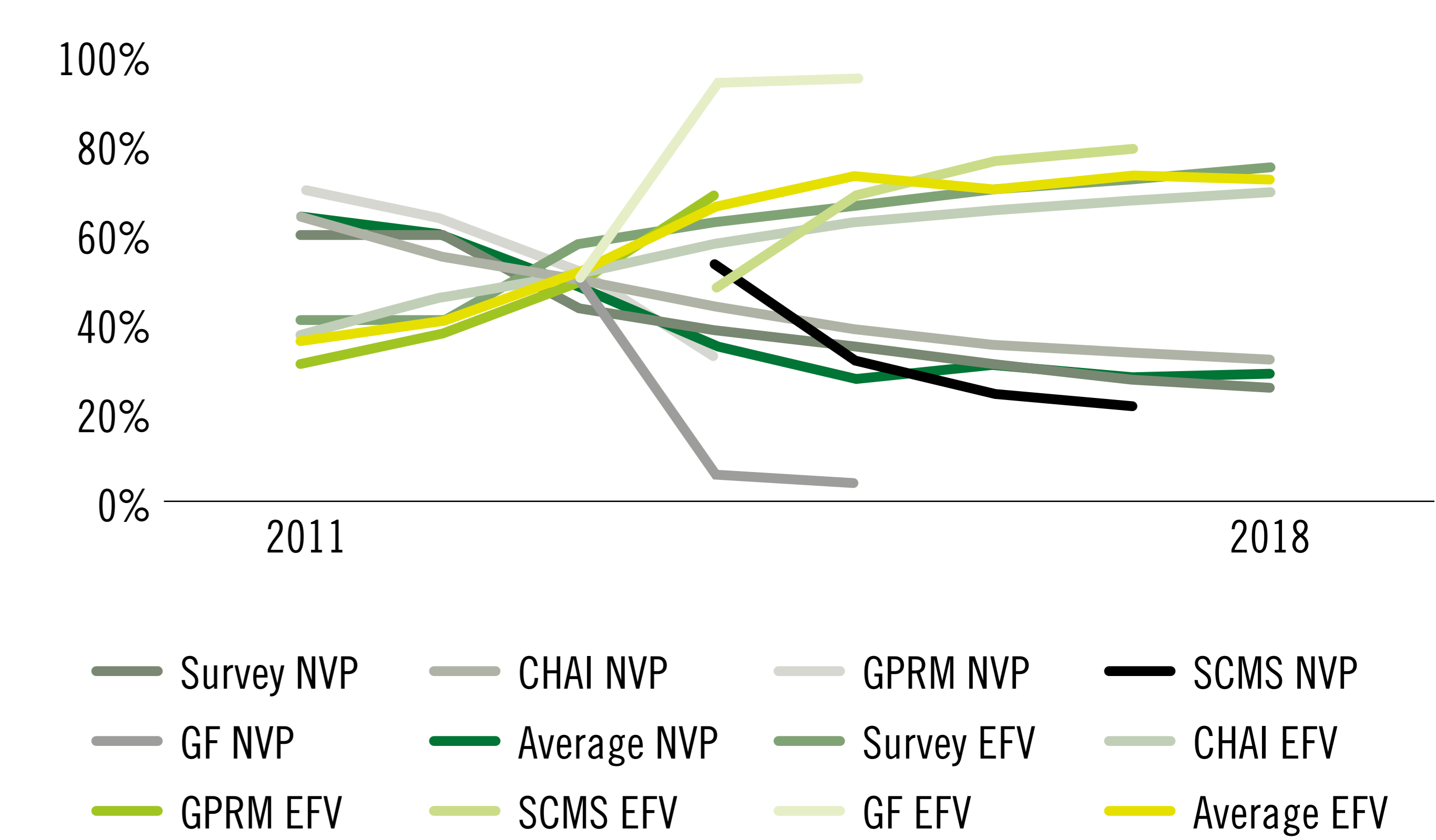
Drug	Demand for APIs (person-years) based on the average of linear, CHAI and country target projected number of patients and API market share				
	2014	2015	2016	2017	2018
d4T	437 000	355 000	285 000	327 000	396 000
AZT	4 800 000	5 400 000	5 800 000	6 200 000	7 000 000
TDF	6 700 000	9 200 000	11 800 000	14 100 000	15 900 000
ABC	333 000	443 000	537 000	742 000	902 000
ddI	142 000	179 000	227 000	282 000	326 000
3TC	9 800 000	11 800 000	13 800 000	14 900 000	15 100 000
FTC	2 200 000	2 500 000	2 800 000	3 700 000	5 300 000
NVP	5 200 000	5 400 000	5 400 000	5 600 000	6 200 000
EFV	6 200 000	8 400 000	10 500 000	12 400 000	13 700 000
LPV	427 000	529 000	597 000	799 000	935 000
ATV	237 000	312 000	393 000	384 000	431 000
RTV <sup>a</sup>	665 000	800 000	1 000 000	1 200 000	1 400 000

<sup>a</sup> Volume of demand is based on the averages of linear and country target projections.

### Uptake of NNRTIs

EFV will be used by 72% of PLWH on first line ART by 2018, and the NVP use will decrease to 28%.

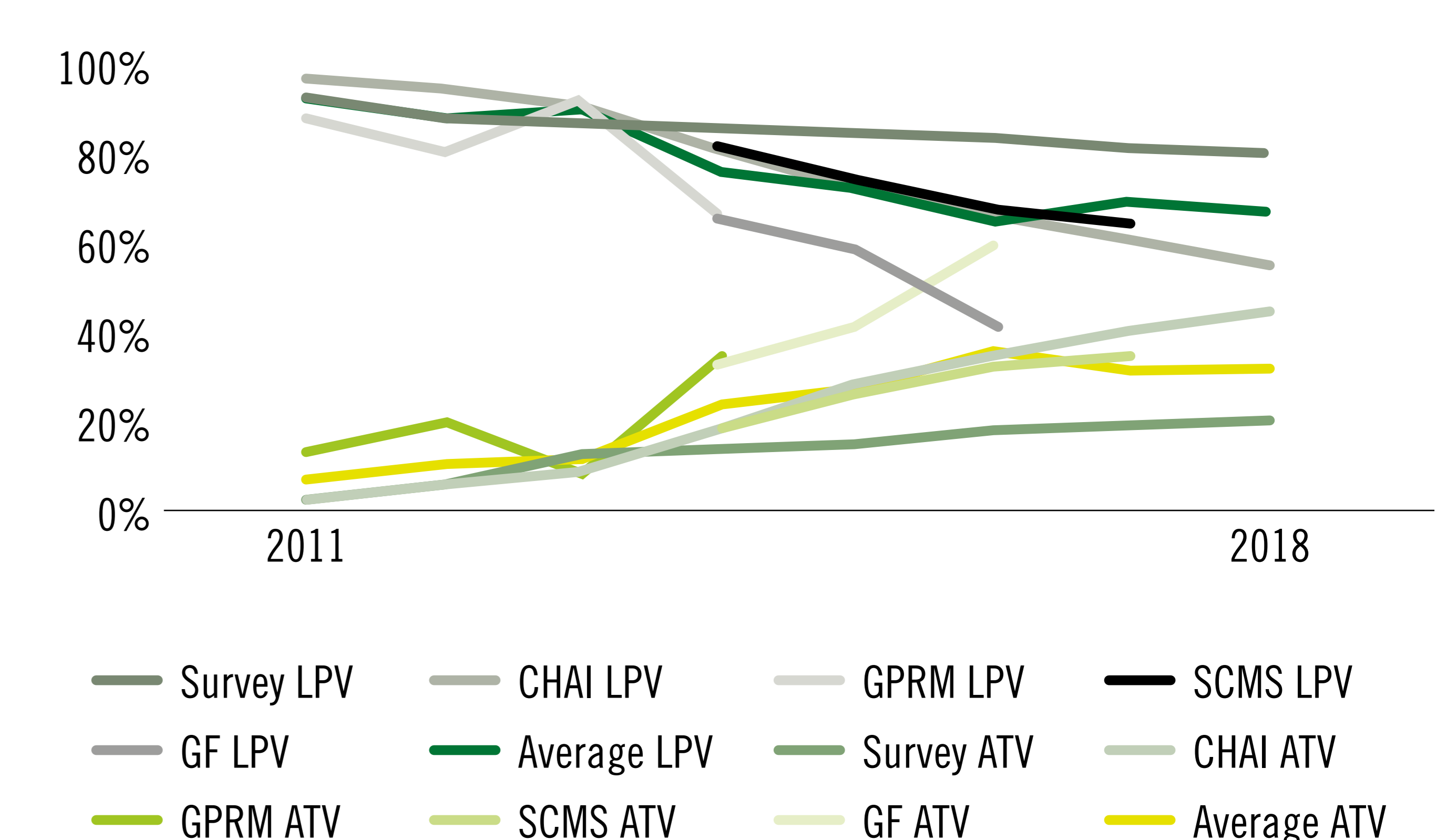
**Fig. 4. Market share of NNRTIs (NVP and EFV) in first line treatment**



### Uptake of PROTEASE INHIBITORS

LPV/r is predicted to remain the most frequently used PI, but the market share of ATV is predicted to increase to 33% by 2018.

**Fig. 5. Market share of PIs (LPV & ATV)**



## DISCUSSION

Despite of flat-lined international funding for HIV, it is projected that the number of people on ART will continue to grow, and will follow a trajectory close to the 90-90-90 Fast Track scenario. This will require continued investment in the production of ARVs and its APIs. If the scale up of VL is faster than anticipated, our estimate of the uptake of PIs might be too low. DRV might take over some of the market share of LPV and ATV when more VL testing becomes available. The earlier than anticipated introduction of TAF and DTG might result in less TDF and ZDV, and less EFV and NVP use, respectively. Those products might become at affordable costs in 2017. When the present forecasts were developed, it was thought that they would not be available before 2018, and their possible use was therefore not included in the present forecasts.

**Acknowledgements:** WHO acknowledges the valuable contributions of the ARV forecasting technical working group: Avenir Health, CHAI, the Global Fund, PfSCM, USAID, UNICEF, UNAIDS and South Africa.