# Updates to Spectrum/AIM software for 2024 Round of Estimates

Version 20 January 2024

## Data entry

1. **Treatment interruption**. Users are now recommended to enter treatment interruption rates for all years with ART. ‘Treatment interruption’ replaces what was previously labelled ‘Lost to Follow-up’. The rates should be calculated from national program data, if reliable.
For years without data, it is recommended to adopt default rates, for which the editors ‘Child Treatment’ and ‘Adult ART’ now have buttons labelled ‘Apply default interruption rate’. Clicking this button will insert the recommended default interruption rate for all years: 5% per year for both adults and children in all regions except high-income countries, where the default is 1.6%.
2. **Breastfeeding patterns** have been updated to incorporate the latest survey data (for 6 sub-Saharan African countries). This will slightly improve estimates of PMTCT for all countries in Southern, Eastern and Western Africa. This is done by selecting Read Survey Data in AIM > PMTCT > Breastfeeding.

1. **Knowledge of status for children**. Since information on the percentage of children knowing their status is scarce, the number of children on ART has been used as a proxy but it is likely an underestimate. Spectrum now offers the option to estimate the number of HIV-positive children knowing their status. This is calculated using the number of children on ART (entered in the Child Treatment editor) plus the number previously treated (estimated using treatment interruption rates in the Child Treatment editor) while also accounting for ageing out from the child (0-14 years) cohort and deaths. Click the button ‘Calculate child Knowledge of Status’ on the Knowledge of Status editor to use this new feature.

## Default Parameters and Regional patterns

1. **On-ART mortality trends**. The time trend in adult on-ART mortality for duration longer than 12 months has been updated to remain constant after 2018. Previously it had been projected to continue declining until 2021 (assuming that improving antiretroviral regimens continued increasing survival). The change implies slightly higher estimates of PLHIV and/or incidence, for some settings.
2. **On-ART mortality regional patterns.** The on-ART mortality rates for the Asia-Pacific and Latin America + Caribbean regions have been updated based on analysis by the IeDEA Consortium, reflecting effects of improved antiretroviral regimens. Since no new data were available from Eastern Europe or the Middle East and North Africa, patterns for these regions have been updated to match their proxy regions: Latin America for Eastern Europe and East Africa for Middle East and North Africa.

## Incidence models

1. **CSAVR** **splines**. An option has been added allowing the user to specify whether the model should use 3, 4 or 5 knots in the spline. The default remains 5; fewer knots will give smoother flatter curves, that are less sensitive to outliers in the data, for example temporary drops in recent case reports during health systems crises.
2. **CSAVR constraint on PLHIV**. CSAVR has been improved to constrain its estimate of people living with HIV to be at least as large as the programme-reported number on ART. In exceptional cases, the user may bypass this constraint if programme ART data are considered unreliable.
3. **CSAVR ‘Fit all models’**. A new button allows the user to fit all six incidence models at the same time, including the two new Spline options.
4. **ECDC**. Spectrum can now read the output of the 2024 version of the ECDC modelling platform.

## Results

1. **Cotrimoxazole for children**. The calculation of the effects of cotrimoxazole on HIV mortality in children has been moved earlier in the projection sequence, to correctly capture the effects in the year of cotrimoxazole provision. This will make a small change in the estimated numbers of child deaths.
2. **Key populations**. If you have completed your Key Populations Workbook and imported the file under Program Statistics > Key Populations, these data and estimates are also available under Results > Adults 15+ > Key population estimates. The charts display new infections, HIV prevalence, ART coverage and population size estimates
3. **Excess PWID mortality**. Spectrum includes excess non-AIDS mortality among PWID. That calculation has now been limited to those files using EPP (with *Concentrated epidemic* configuration) or AEM that include an estimate for PWID.

## Validation

1. **Previously treated children.** A new validation screen under ‘ART’ shows the estimated trend in children who were previously on ART but are not currently on ART. This is similar to the adult display. By default, the display will use the treatment interruption rates entered in the program data editor (Program statistics > Child treatment) but the user can enter a different rate to explore the sensitivity of results to this rate.
2. **ART coverage, from program and survey**. New charts compare coverage of people on ART between program data (entered under Program statistics > Adult ART) and estimates based on a national survey (PHIA or DHS). Spectrum derives the survey-based coverage estimate by multiplying the proportion on ART from the survey by Spectrum’s estimated number of people living with HIV by age and sex. Three displays are available for this validation:
	* ART coverage by age (for 1 survey year)
	* ART coverage over time (showing all surveys, if they measured coverage for the selected age group)
	* Number on ART (for 1 survey year).
3. **ART coverage from program versus ANC data**. A new display compares adult ART coverage estimated by Spectrum from program data with a prediction based on the proportion of HIV-positive pregnant women already on ART before the current pregnancy (entered under Program statistics > PMTCT).
This validation is recommended for countries in sub-Saharan Africa. If the prediction and the program-based estimate are not close, it may indicate problems with one of the sources.