

## Spectrum/AIM Version History

Version	Date	Changes	Effects
6.35		<ol style="list-style-type: none"> <li>1. Corrected a bug in CSAVR that could display too many AIDS deaths if there were HIV+ migrants entered.</li> <li>2. The EPP SUB file now gives the raked 15-49 populations for ASM based files so that they sum to the Spectrum population. It also corrects an error where AIDS deaths were for 15+ (requested by Oli).</li> <li>3. Data calibrations on the EPP Compare dialog are now removed (bug found by Eline)</li> <li>4. The EPP ART Distribution Table issues with EpidemicSets have been corrected so the problems with displaying the ART table in PNG are now fixed.</li> <li>5. EPP corrections to some variables where post-ASM-fitting was being set to 15+ values instead of 15-49 values as expected. This does not affect individual sub-population fits, but has a minor influence on the national fits when those are summed.</li> </ol>	<ul style="list-style-type: none"> <li>•</li> </ul>
6.34		<ol style="list-style-type: none"> <li>6. Fixed a problem with Shiny90 crashing when the country name included accents.</li> <li>7. Treatment adjusted prevalence was missing from Extract. That's been added.</li> <li>8. The Previously Treated Adults and Previously Treated Children validation charts had their own ART interruption rate input editor. These inputs were removed, since they were duplicative of the interruption rates in the adult and child program statistics editors.</li> </ol>	<ul style="list-style-type: none"> <li>• Will allow some countries to use Shiny90.</li> </ul>
6.33	2/8/24	<ol style="list-style-type: none"> <li>9. <b>Display.</b> Translations have been updated for French, Spanish,</li> </ol>	<ul style="list-style-type: none"> <li>• Changes to CSAVR fits.</li> </ul>

		<p>Portuguese, Russian and Arabic in both Spectrum and EPP.</p> <p><b>10. CSAVR.</b> The model has been updated to align AIDS-related deaths with results from AIM.</p> <p><b>11. Target Setting Tool.</b> The button to export to the Datapack in the Naomi District Estimates Tool has been removed since outputs to the Target Setting Tool should now be generated by the Naomi model.</p>	
6.32	1/24/24	<p>12. <b>ART mortality:</b> correction to time trends for MENA</p> <p>13. <b>Completeness Checker:</b> Add check for EPP max adjustment set to 10</p> <p>14. <b>CSAVR:</b> remove training runs</p> <p>15. <b>Database:</b> Added Tanzania THIS 2022-23 to survey database</p> <p>16. <b>Displays:</b> Add (%) to titles and labels on several charts</p> <p>17. <b>ECDC:</b> correct input to refer to 15+ rather than 15-49</p> <p>18. <b>KOS:</b> correct child calculations</p> <p>19. <b>KOS:</b> standardize years when copying results to Excel</p> <p>20. <b>Languages:</b> Update language translations for Spanish, French, Portuguese, Russian, Chinese and Arabic</p> <p>21. <b>Validation:</b> corrected ART coverage prediction when ANC ART coverage is &gt; 100%</p> <p>22. <b>Validation:</b> restore AIDS mortality comparison chart</p> <p><b>23. Validation:</b> restrict final year of all cause deaths chart to 2030</p>	<ul style="list-style-type: none"> <li>• Slight change in ART mortality for countries in MENA</li> <li>• Otherwise, changes are just to interface and will not affect calculations</li> </ul>
6.30	11/30/23	<p><b>Data entry</b></p> <ol style="list-style-type: none"> <li>1. Changed 'Lost to follow-up' to 'treatment interruption'. Recommended defaults are 5% everywhere but 1.6% in WCENA.</li> <li>2. Breastfeeding patterns have been updated with 6 new surveys.</li> <li>3. Knowledge of status for children has a new button 'Apply child defaults' which will estimate KOS as On ART + Previously treated.</li> </ol>	<ul style="list-style-type: none"> <li>• The application of default rates of treatment interruption will have a small effect on AIDS deaths since with higher interruption rates a larger percentage of those on ART will be in the first year of treatment which has higher mortality rates than for treatment duration longer than 12 months. The effect</li> </ul>

		<p>4. In the Knowledge of Status editor the 'Launch Shiny90' button has been removed as that site is not longer supported and the calculations can be done in Spectrum.</p> <p><b>Default patterns</b></p> <p>5. On ART mortality patterns for AP and LA have been updated with new estimates from leDEA.</p> <p>6. For ESA the on-ART mortality time trend has been modified to be constant from 2017</p> <p>7. The upper limit on the fertility rate ratio local adjustment factor has been removed.</p> <p>8. The sex ratio of incidence has been modified to ensure it is smooth at the beginning of the trend for countries with a late start to the epidemic.</p> <p><b>Incidence Model</b></p> <p>9. CSAVR spline options now allow specifications of 3, 4 or 5 knots.</p> <p>10. CSAVR now has a 'Fit all models' button that will fit all models.</p> <p>11. CSAVR fits are now constrained so that PLHIV must be at least as large as number on ART.</p> <p>12. ECDC. The feature to read incidence from ECDC has been updated to use the latest version of the ECDV model.</p> <p><b>Results</b></p> <p>13. There is new display of 'Treatment adjusted prevalence' which is PLHIV not on ART / (population – on ART)</p> <p>14. New displays have been added to show non-AIDS deaths among PLHIV on and off ART.</p> <p>15. The calculation of the effect of cotrimoxazole have been moved earlier in the calculation loop to correctly capture the effects.</p> <p>16. The key population display in the KP editor is now also available in the Results menu.</p> <p>17. Calculation of excess mortality for PWID is now limited to models using EPP concentrated or AEM.</p>	<p>is generally small since the model is still matching the input number on treatment.</p> <ul style="list-style-type: none"> <li>• The new on-ART mortality rates from leDEA will have some small effect on countries in AP and LA if they are using these default rates.</li> <li>• The updated breastfeeding patterns could have a small effect on the number of new child infections.</li> <li>• The new knowledge of status default button for children will result in higher knowledge of status, usually on the order of 5%.</li> <li>• Other changes are mostly focused on displays and data inputs, which should not affect the results.</li> <li>•</li> </ul>
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6.27	2/17/23	<p>1. Corrected the ANC testing 'HIV prevalence at ANC' calculation to correct for implausible prevalence when numbers tested are missing.</p> <p>2. Modified Naomi District Estimates Tool to be able to read both 2022 and 2023 Naomi PEPFAR indicators file</p>	<ul style="list-style-type: none"> <li>• No effects on results</li> </ul>
6.26	2/2/23	3. No changes to AIM	<ul style="list-style-type: none"> <li>• None</li> </ul>
6.25	1/30/23	4. Fixed a problem where Program Statistics could not be opened on some computers due to Shiny90 conflict	<ul style="list-style-type: none"> <li>• No effects on results</li> </ul>
6.24	1/14/23	5. Added single chart display to Shiny90 outputs form	<ul style="list-style-type: none"> <li>• No effect on results</li> </ul>

		6. Added buttons to allow CSV importing to Shiny90 entry form	
6.23	12/12/22	7. Updated eppcsavri686 DLL	•
6.22	12/12/22	8. Fixed problem with SaveAs and AEM implementation	• No effects on results
6.21	12/4/22	9. Fixed problem with Shiny90 execution	• No effects on results
6.20		<p>10. Changed the input on COVID deaths in DemProj to split the 0-4 age group into 0-1 and 1-4</p> <p>11. Upgraded mapping library used for Naomi</p> <p>12. New EPP Jar file (EPP 2023_R1)</p> <ul style="list-style-type: none"> <li>o New EPP Jar file (EPP 2022_R3) <ul style="list-style-type: none"> <li>▪ Adds in EPP modifications to deal with Spectrum’s change in handling of PJNZ files, where it puts all EPP-related files and sub-files in an “EPP” sub-directory when unzipped in the temp directory and then stores them in that revised organizational format when saved.</li> <li>▪ Adds in right click graphs on the PopSetup and ART Distribution pages that allow the user to see the trends over times of the variables there. The PopSetup page graph is done on a log scale to allow good separation of the smaller population sizes normally associated with key populations.</li> <li>▪ Fixed a null pointer exception in the Reassign graph if there has not been a recent fit.</li> <li>▪ Removes the need for the “EPP.ini” file in the PJNZ to locate help files. Help files are now found automatically in the %APPDATA%\Avenir Health\Spectrum\EPP directory.</li> </ul> </li> </ul> <p>13. Updates to Spectrum/AIM software for 2023 Round of Estimates</p> <ul style="list-style-type: none"> <li>o Data entry <ul style="list-style-type: none"> <li>▪ ANC testing editor. Rows have been added to enter program data on the number of births in health facilities and the number of women who are known to be HIV-negative at the first visit. The number of births is displayed on the chart that compares birth, visits and the number of women tested. ▪ Read</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No noticeable effects. Deaths are very low in this age group.</li> </ul>

		<p>program data from ADR. For child and adult ART there are new buttons 'Read from ADR' to read the data directly from the same CSV files used for Naomi. Spectrum will aggregate to the national level and put the result in the editor. The current version requires that the user download the ART from the ADR first. We are working to add direct access to the ADR. ▪ World Population Prospects 2022. The new estimates from WPP 2022 are available for all countries. HIV mortality has been deducted from allcause mortality for the 37 countries with the highest HIV burden. To update to the WPP 2022 numbers you will need to select 'Manager' &gt; 'Default data' and check 'DemProj'. Then 'OK'. ▪ Shiny90*. We are working on integrating Shiny90 into the Knowledge of Status editor, but it will not be ready for the first round of testing. ▪ Fertility rate ratio*. Data on prevalence among ANC attendees that is used for fitting the local adjustment factor is now read directly from the ANC testing editor rather than from EPP. ▪ COVID-19 deaths. The editor for COVID-19 deaths by age has been modified to split the 0-4 age group to &lt;1 and 1-4. ▪ Sub-populations. The sub-populations table can now be displayed for any year range. Previously it was restricted to 5 years before the current year. ▪ Treatment cascade. The treatment cascade labels have been updated from 90-90-90 to 95-95-95. ▪ ART monthly data. We removed the data entry screen for monthly ART data, as it was not having any impact on the estimates. ▪ Default multiplier for on-ART mortality in the Asia region*. The default multiplier for the Asia region has been changed from 1 to 4. This will only have an effect if the Asia region is selected. Countries that have entered a custom pattern will not see any difference unless they change to the Asia pattern. ▪ CSAVR alternate estimates of</p>	
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		<p>mortality*. CSAVR will allow the entry of up to three alternative estimates of HIV-related deaths. All alternatives will be saved with the file. The selected source will be used for CSAVR fitting.</p> <ul style="list-style-type: none"> <li>▪ Testing data*. There is a new editor under 'Program statistics' for entering testing data. <ul style="list-style-type: none"> <li>o Default Patterns</li> </ul> </li> <li>▪ On-ART mortality trends. The time trend of adult ART mortality has been updated. For SSA countries, it now declines from 1.0 in 2017 to 0.95 in 2021 and then remains constant. For countries outside SSA the trend is constant from 2017.</li> <li>▪ On-ART mortality in high income countries. The mortality rates for &gt;500 CD4 counts have been adjusted to be no higher than the rates for 350500. The correct background mortality adjusted pattern for high income countries is now implemented.</li> <li>▪ HIV+ migrants. We are adding a new display to show HIV+ migrants. It will not be ready for the first sprint but should be ready shortly after. <ul style="list-style-type: none"> <li>o Outputs</li> </ul> </li> <li>▪ ART. A new indicator has been added for all-cause deaths to people on ART under the 'Adults 15+' sub-menu.</li> <li>▪ Reference period for demographic estimates. We implemented a number of changes to be consistent with World Population Prospects 2022.</li> <li>▪ All level indicators now refer to Dec 31 of each year (e.g., output of the total population in 2022 refers to Dec 31, 2022)</li> <li>▪ All rate indicators now refer to the calendar year (e.g., output of the number of deaths in 2022 refers to deaths from Jan 1 to Dec 31, 2022)</li> <li>▪ ART coverage is now calculated as the number on ART on Dec 31 divided by PLHIV on Dec 31. Previously the denominator referred to July 1. <ul style="list-style-type: none"> <li>o Validation</li> </ul> </li> </ul>	
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6.19		<ol style="list-style-type: none"> <li>14. Correction to Naomi District Estimates Viewer to display knowledge of status in correct units.</li> <li>15. Removed Validation Checker from automatically starting whenever a file is</li> </ol>	<ul style="list-style-type: none"> <li>• No effects on results except for mean CD4 count at diagnosis in CSAVR models.</li> <li>• Minor effects on number on ART from the GAM, Extract</li> </ul>

		<p>open. The display is still available under the 'Validation' menu.</p> <p>16. Removed the browser warning message from the Naomi District Estimates map view.</p> <p>17. When saving a file, Spectrum will now check if the projection is valid and ask to re-project if it is not. If the projection is invalid it means that the file has not been re-projected after changes were last made to some inputs. (Displaying any indicator will cause the file to be re-projected.)</p> <p>18. Correction to calculation of mean CD4 count at diagnoses in CSAVR.</p> <p>19. UA was not properly adding uncertainty around pediatric ART when entered by five-year age groups. It now handles this by summing CLHIV on ART across age groups to get a 0-14 number, then proceeds as it usually would with 0-14 numbers.</p> <p>20. When converting pediatric ART percentage inputs to Dec31 numbers, Aggregate and GAM were multiplying by mid-year need. That came out different from the corresponding AIM result, which uses Dec31 need. Aggregate and GAM now use Dec31 need, too.</p> <p>21. Aggregate was also excluding age 80+ from "Results &gt; Total population &gt; Number on ART by age 0-80+" because of an off-by-one error. That is fixed.</p> <p>22. Extract changes just directly affect the "UNAIDS custom configuration &gt; AIM inputs (Meta data file)", as other adjusted indicators are handled indirectly through changes in DPUTIL, DPProj, etc. There was a minor issue in the output metadata file, though. That file included separate rows for ART inputs as numbers vs. percentages, but because of an indexing issue numbers and percentages were written to the same row. They now appear on their intended rows.</p>	<p>and Aggregate tools in some circumstances.</p>
6.18	7 March 2022	23. Updated French and Spanish translations for Validation Checker and ANC testing	<ul style="list-style-type: none"> <li>No effects on results except for files with nosocomial</li> </ul>

		<p>24. CSAVR display re-organized to display all information on low resolution screens</p> <p>25. CSAVR display fixed so that IRR check boxes are not lost on form close</p> <p>26. CSAVR DLL created with new compiler. CSAVR will run faster. This should also correct problems with CSAVR freezing or crashing after running many times.</p> <p>27. Correction to nosocomial infections among children 5-14 early in the epidemic. They were being lost if there were no PLHIV already in that age group.</p> <p>28. For South Africa files only, AIM will now apply the trend in mortality reduction for pediatric ART mortality to CLHIV not on ART as well, in order to match Thembisa. This removes the need for a special version for South Africa.</p> <p>29. Correction to map display in the Naomi District Estimates Tool. It will still display a warning message that the browser is out of date but the map will display.</p>	infections among children 5-14.
6.17	23 Feb 22	<p>30. Update to Datapack export feature in Naomi District Estimates Tool to provide additional age groups (50-54, 55-59, 60-64, 65+) for VMMC data and to output September 2022 estimates.</p> <p>31. Update to EPP to allow comparisons with older files when the older file does not have ART coverage variables.</p> <p>32. Update to new display of New Infections and Deaths to PLHIV to allow changing the years of the display.</p>	<ul style="list-style-type: none"> <li>• Countries with PEPFAR support that produce a datapack export file and use VMMC estimates from the DMMPT model should re-run the datapack export.</li> <li>• Not necessary to re-run anything. This just affects the compare feature.</li> </ul>
6.16	16 Feb 22	<ol style="list-style-type: none"> <li>1. The title on the Excel Summary tables have been changed to '2022 HIV Draft estimates'</li> <li>2. The latest PHIA and DHS surveys are now included in the databases</li> <li>3. The District Estimates Tool has been updated to include the full range of age groups from 0-4 to 65+ now used by the PEPFAR datapack, the output is for 2022Q3 and the new infections indicator has been added.</li> <li>4. The Naomi District Estimates Tool has been updated to ensure that the</li> </ol>	None of these changes require re-running AIM, EPP, Shiny90 or Naomi.

		<p>table display shows districts as the lowest level, even for countries that have five geographic levels.</p> <p>5. A new display has been added to show new infections (all ages) and deaths to PLHIV (all ages) on the same graph. It is under Results just after the Dashboard.</p>	
6.15	15 Feb 22	<p>1. Updates to the surveys in the Spectrum database to include the latest surveys for Botswana, Haiti, Lesotho, Malawi, Uganda and Zimbabwe.</p>	<p>No need to re-run except for files for one of these countries that did not already use the latest PHIA results in EPP.</p>
6.14	4 Feb 22	<p>1. Updated version of CSAVR</p> <p>2. Updates to French and Spanish displays to allow longer labels using Tool Tips that appear when the mouse is hovered over the button</p> <p>3. Updates to GAM extract</p> <p>4. Correction to Uncertainty Analysis</p>	<p>Any files with CSAVR should re-run fits.</p> <p>Uncertainty analysis should be re-run to get correct bounds.</p>